CREATING ANALYTICAL TOOLS CAPTURING FUNDAMENTAL CAUSES OF BLACK MATERNAL MORTALITY

TO BE USED BY MATERNAL MORTALITY REVIEW COMMITTEES

A Thesis

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By
Ceilidh Shea
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Advised by Professor Elizabeth Coggins

Abstract

The risk of maternal mortality in the United States is much higher than nations with similar wealth, access to care, and infrastructure. However, increasing risk of maternal mortality is not distributed equally; Black mothers are three to four times more likely to die of pregnancy related conditions or causes than their White counterparts. Leading to the question, why are Black women predisposed to greater risk? It is not biology. So, what is it about being Black in the United States that has come to shape disparities in pregnancy related death (and nearly all other major disease outcomes)? This thesis will explore the preconditions of Black maternal mortality, developing two tools to capture fundamental causes: the Geography Index Score and the Maternal Perspectives Form. The hope is that these tools might be used to assess the causes of a maternal death and therefore will expose the fundamental causes of Black maternal mortality. Ultimately, by providing a multi-layered framework for determining a cause of death, the Geography Index Score and Maternal Perspectives Form will reflect geography and social determinants of health as informed by anti-Black social and political structures, while also exposing the interpersonal and obstetric racism experienced by Black mothers in medical settings and over the course of their lives. By including these tools in the review of maternal deaths, recommendations and legislation for prevention of Black maternal mortality will be reflective of its true fundamental causes.

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I. Introduction

Globally, maternal mortality - death during or as a result of childbirth and pregnancy – has decreased by 43 percent. One of the greatest public health achievements of the 20th century was a 99 percent decrease in maternal mortality between 1955 and 1985 in the United States[1]. However, it has been steadily rising since and is much higher when compared to peer nations, begging the question, what is causing higher rates of maternal mortality in the United States specifically? Severe bleeding, high blood pressure, cardiovascular complications, and infection are accepted as the leading causes[2]. However, there are clearly other elements at play; Black women[3] are three to four times more likely to experience pregnancy-related complications resulting in death compared to their White counterparts[4]. Evidently, Black women are uniquely vulnerable – but why? This paper will explore the fundamental causes of Black maternal mortality, tools to better capture and express these causes, and their potential use in the reviewing of maternal deaths nationwide.

In many respects, Americans tend to consider geography an aspect of self-identity, and a formative life experience. We are shaped in some way, whether big or small, by where we are born, and where we live over the course of our lives. For many, where we are from, in part, makes us who we are. Geography, it has been said, is destiny. However, there is little conceptualization of how our personal geographies influence our health. The two may seem

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[1] Korbatov, *What Explains the United States' Dismal Maternal Mortality Rates?*
[2] "Maternal Mortality." World Health Organization. https://www.who.int/news-room/fact-sheets/detail/maternal-mortality.
[3] For the purposes of this work, I will be using the terms woman and mother to describe birthing persons. I recognize that not all birthing persons identify as women and/or mothers. I respect that all gender identities should be included and represented in conversations surrounding the pregnancy and birthing processes.
[4] Njoroge, Joyce N. *"Understanding Health Disparities in Cardiovascular Diseases in Pregnancy Among Black Women: Prevalence, Preventive Care, and Peripartum Support Networks."* Current Cardiovascular Risk Reports. Springer Nature, 2020.

distant and unrelated; we get sick because we are unlucky, because we ate something we shouldn't have, or maybe because we forgot to wash our hands. Health seems separate from, if not entirely unassociated with, factors like our zoned school district, or the number of miles we live from a grocery store. However, this is not always the case.

The Center for Disease Control (CDC) defines social determinants of health as the conditions in which people live, learn, work, and play that affect a broad range of health outcomes[5]. Many people in the United States are not just unlucky or poor decisionmakers when it comes to health status. Certain subpopulations are predisposed to adverse health outcomes based on where they live, which in turn has a large effect on where they learn, work, and play. And where they live is no coincidence. Geography, especially for underrepresented populations, is often the result of longstanding and deeply rooted racialized law and policy - the effects of which are still reproduced and reinforced today.

Residential segregation can be defined as the physical geographic separation of ethnic minorities and Whites[6]. Although many underrepresented groups are segregated in the United States, none are as segregated as the Black population; around 70% of Black citizens reside in segregated neighborhoods, while 40-50% reside in hyper segregated neighborhoods[7]. More than 80% of metropolitan areas in the U.S. were more segregated in 2019 than they were in 1990[8].

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[5] "Social Determinants of Health." Healthy People 2030. Center for Disease Control . Accessed 2022. https://health.gov/healthypeople/objectives-and-data/social-determinants-health.
Landrine H, Corral I. "*Separate and unequal: residential segregation and black health disparities*". Ethn Dis. 2009 Spring;19(2):179-84. PMID: 19537230.

[6] Landrine H, Corral I. "*Separate and unequal: residential segregation and black health disparities*". Ethn Dis. 2009 Spring;19(2):179-84. PMID: 19537230.
Landrine, *Separate and Unequal*
[7] Landrine, *Separate and Unequal*
[8] Semuels, Alana. "Segregation Is Increasing in America." Time. Time, June 21, 2021. https://time.com/6074243/segregation-america-increasing/.

These neighborhoods are not simply separate, but they are unequal by a multitude of standards. Residential segregation leaves Black communities with overall lower quality of effectively every social determinant of health, all of which shape health outcomes.

As stated earlier, Black mothers are especially vulnerable; they are three to four times more likely to experience pregnancy-related complications resulting in death compared to White women[9]. Race as a biological explanation for this incredible discrepancy is dangerously inaccurate. However, that Black women are at much higher risk is uncontested. But, why? What explains this devastating disparity? I suggest that geography, obstetric racism, and racism experienced over a lifetime play a central role in shaping Black maternal health outcomes. In suggesting these mechanisms as fundamental causes of Black maternal mortality, I will offer a conceptual outline of two tools measuring geography and racism and how they might be included in reviews of maternal deaths to more adequately address disparities in health outcomes. I will propose the inclusion of these tools in the records made available to Maternal Mortality Review Committees (MMRCs). MMRCs are multidisciplinary committees in cities and states across the country that review deaths occurring within one year of the end of pregnancy[10] and thus, are critical instruments for more completely understanding and addressing disparate outcomes. A later section on MMRCs will provide more in-depth consideration of their processes and methodology.

One of the tools I will create is used to measure the effects of geography on the social determinants of health; geography can help explain exposure to toxins, lower levels of education, and food insecurity, for example – all of which inform health outcomes. It is not the misguided

[9] Njoroge, *Understanding Health Disparities*
[10] *"Pregnancy Mortality Surveillance System."* Centers for Disease Control and Prevention, November 25, 2020. https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm.

narrative of biological susceptibility that makes being Black and pregnant so dangerous. Rather it is, in many ways, where Black women live and how that geography has long been influenced and shaped by racism at every level of government and public policy that creates preexisting risk factors. These stark disparities in pregnancy related deaths beg the question: how has residential segregation hindered access to and quality of basic resources for Black women? In developing a Geography Index Score (GIS), to be understood in tandem with the Maternal Vulnerability Index (a county-level, national-scale tool that identifies maternal vulnerability), I aim to offer a tool to be used by MMRCs to assess the ways in which structural racism has shaped access to and quality of social determinants of health. Obstetric racism and racism experienced over a lifetime are also critical factors that shape Black maternal health outcomes and mortality. Providing first-hand accounts and information pertaining to experiences with racism, through the Maternal Perspectives Form (MPF) tool, will allow MMRCs to address the effects of racism more thoroughly. In the sections following the literature review, both the MPF the and the GIS will be discussed in greater detail.

Before continuing, it is important to address that most pregnancy related deaths are preventable. However, the Black-White racial disparity we see in maternal mortality cannot be addressed through the readjustment of individual behavior that appears to link race to poor health outcomes. The focus must shift to addressing the upstream social conditions which shape individual behavior, alongside obstetric racism and racism experienced over a lifetime. Sociological processes cannot be overlooked; if they are, the true fundamental causes of Black maternal mortality will never emerge at the forefront of the conversation and therefore will continue to negatively affect health outcomes in Black communities across the country. Context matters greatly. The tools I propose aim to target context and what shapes it.

The following literature review will develop a well-rounded understanding pertaining to the need for a GIS (to be used in tandem with the Maternal Vulnerability Index) and MPF for MMRCs. Exploring the social determinants of health (both generally and in specific relationship to Black mothers) and residential segregation will make clear the ways in which noncoincidental geography informs health outcomes. Discussion of obstetric racism, the health effects of racism more generally, and the specific situation of Black mothers will make clear the ways in which racism influences health outcomes. Ultimately, the literature review will illustrate that geography and racism are fundamental and undeniable predeterminants of Black maternal mortality. Therefore, the Geography Index Score in tandem with the Maternal Vulnerability Index (MVI), and the Maternal Perspectives Form must be included in the information available to MMRCs if they are to consistently and accurately identify contributing factors and ensuing recommendations in addressing Black maternal mortality.

II. Literature Review

If physical environment, obstetric racism, and racism experienced over a lifetime are to be understood as fundamental causes of Black maternal mortality, there are important relationships between health, geography, and racism that must be kept in mind throughout this work. The first is a connection illustrating how and why physical environment is shaped by anti-Black residential segregation and in turn how said physical environments affect access to and quality of the social determinants of health. Secondly, it is important to understand how racism, experienced over a lifetime and in medical settings, affects health and health outcomes. The third key connection to keep in mind is that there is currently no means by which to track or quantify obstetric racism and racism experienced over a lifetime for the purposes of understanding Black maternal mortality. And therefore, MMRCs often do not have access to information concerning

the connection between race, geography, and health outcomes during and throughout a pregnancy. The following literature will help develop these understandings, first broadly, and then specifically in relationship to Black mothers.

Effects of Geography and Its Historical Roots

Phelan and Link, in *Social Conditions as Fundamental Causes of Disease,* provide a broad framework for understanding how social determinants of health inform health outcomes. They theorize that the social and physical structure of neighborhoods are critical in shaping access to and quality of social determinants of health for individuals in a given community. Phelan and Link define these neighborhood effects as recreation, nutrition, harmful substances, protection and crime, toxic environmental exposures, and medical care[11]. They explain that oftentimes, there is a tendency to associate disease outcomes with relatively proximate "causes", such as diet, preexisting conditions, lack of exercise, and other individual assessments of behavior. Social factors, such as the neighborhood effects outlines above, are typically understood as distal causes of disease or poor health outcomes[12]. Overwhelmingly, a focus on proximate risk factors, at the individual level, obscure the fact that environment shapes behavior. Therefore, in approaching solutions to poor health outcomes at the level of the individual, there is a failure to truly address the fundamental causes[13]. "A fundamental cause involves access to resources, resources that help individuals avoid diseases and their negative consequences through a variety of mechanisms"[14], therefore even when some diseases are eradicated, for example, an association between fundamental causes and disease will reemerge because the fundamental

[11] Link, Bruce G., and Jo Phelan. *"Social Conditions as Fundamental Causes of Disease." Journal of Health and Social Behavior*, 1995, 80–94. https://doi.org/10.2307/2626958.
[12] Link and Phelan, *Social Conditions*
[13] Link and Phelan, *Social Conditions*
[14] Link and Phelan, *Social Conditions,* p. 81

causes have not been addressed as causal factors[15]. This persistent association highlights the fact that there are sociological processes at work in shaping health outcomes. Link and Phelan explain that the central feature of fundamental social causes is their encompassing of access to resources, which can be used avoid risks or minimize disease outcomes[16]. Oftentimes, variables such as race or gender can be indicative of access to resources. That being said, I will highlight the fundamental causes of Black maternal mortality as they relate to race and maternal health outcomes. Understanding the link between fundamental causes, such as the social determinants of health and racism, is crucial moving forward as it will allow for an understanding of how and why Black mothers are at greater risk based on structural factors, not individual behavior.

In other important work published by Link and Phelan, *Is Racism a Fundamental Cause of Inequalities in Health?* (2015), the authors explain how socioeconomic status (SES), and therefore social conditions, are related to race. Given the Black median household income is three-fifths that of Whites and Black family wealth is less than one-sixth that of Whites[17], Phelan and Link pose the question: *can systemic racism explain racial inequalities in SES*? And therefore, *can systemic racism account for unequal access to and quality of social determinants of health? Which would then account for differential health outcomes?* The answer is yes; since the era of slavery, "our major institutions have been pervaded by racial stereotypes, ideas, emotions, and practices, reproducing over time...socioeconomic conditions" and residential segregation[18]. Systemic racism pervades virtually every institution in the U.S., such as education, banking, medicine, the criminal justice system, and elected officials at every level of

[15] Link and Phelan, *Social Conditions*
[16] Link and Phelan, *Social Conditions*
[17] Phelan, Jo C, and Bruce G Link. *"Is Racism a Fundamental Cause of Inequalities in Health Outcomes?"* Columbia University, August 2015. https://doi.org/10.1146/annurev-soc-073014-112305
[18] Phelan and Link, *Is Racism a Fundamental Cause*, p. 315

government. Phelan and Link find that systemic racism helps explain residential segregation, which in many ways accounts for the social and economic conditions of said neighborhoods, and therefore the health outcomes of its residents. This sets the stage for understanding that health outcomes cannot be understood as separate from race. There are structures in place that produce and uphold the fundamental causes of poor health outcomes in Black communities. Therefore, the social determinants of health, as stated by Link and Phelan, "cannot be effectively addressed by readjusting the individually-based mechanisms that appear to link them to disease in a given context. If we wish to alter the effects of these potent determinants of disease, we must do so by directly intervening in the ways that change the social conditions themselves"[19]. Here, Link and Phelan set the stage for proposing upstream fundamental causes, such as the social determinants of health, as central to the conversation surrounding race and health outcomes. They also build a foundation that centralizes physical environment as important to health, much like I will do when it comes to Black maternal mortality specifically, operationalized in the form of the GIS.

As made clear by Link and Phelan, where one lives is a key factor in shaping access to and quality of social determinants of health. And given residential segregation in the United States has remained, for the most part, stable since the 1940s, it is important to understand how and why residential segregation persists, in large part because it explains why Black neighborhoods in the U.S. have systematically differential and worse access to social determinants of health. David Williams and Chiquita Collins in *Racism and Health* (2001), illustrate the foundation and legacy of residential segregation. Citing historian John Cell, Williams and Collins begin by offering important background and scale; residential segregation was "one of the most successful political ideologies" of the twentieth century and is "the key

[19] Phelan and Link, *Social Conditions,* p. 89

structural factor for the perpetuation of Black poverty in the U.S."[20]. Segregation can be pointed to as the fundamental cause in differential health outcomes among Black people and Whites given it is the dominant means by which socioeconomic conditions are produced in Black neighborhoods at the level of the individual, household, and community[21]. Therefore, understanding the deeply rooted political underpinnings of segregation is crucial in understanding why Black mothers often live in certain neighborhoods and why these neighborhoods predispose her to greater risk.

Residential segregation was and is an embodiment of White supremacy as a popular political ideology. Legally, segregation was upheld and implemented through policies and laws that required Black citizens to reside in restricted areas[22]. These restrictions were supported by the banking and real estate industries, federal housing policies, and the judicial system[23]. Homeowners enforce restrictive covenants in property deeds that ensured their homes would not be sold to Black families[24]. Segregation was a tenant of virtually every institution in the country. Then, The Civil Rights Act of 1968 outlawed discrimination in the sale or rental of homes, which aimed to strip legal support of segregation. However, discrimination in housing has persisted[25]. In more subtle ways, Black people are still discouraged from renting or buying property in majority White residential areas and Whites still prefer neighborhoods with few or no Black residents; they tend to move out when Black populations increase[26]. In doing so, they reduce the

[20] Williams, David R., and Chiquita Collins. "Racial Residential Segregation: A Fundamental Cause of Racial Disparities in Health." *Public Health Reports (1974-)* 116, no. 5 (2001): 404–16. http://www.jstor.org/stable/4598675. P. 71
[21] Williams and Collins, *Racial Residential Segregation*
[22] Williams and Collins
[23] Williams and Collins
[24] Williams and Collins
[25] Williams and Collins
[26] Williams and Collins

urban tax base of majority Black neighborhoods, leading to an inability for some cities/local governments to provide a wide range of services to economically disadvantaged communities[27].

Williams and Collins argue that in some ways segregation acts as a proxy for SES, given SES is determined, in many ways, by access to education and employment opportunities. Given the funding of public education is controlled by local government and community wealth, and residence determines which public school students can attend, residential segregation often leads to highly segregated schools, which vary greatly in resources and quality. Despite the 1954 ruling in *Brown v. Board of Education*, that determined the segregation of schools unconstitutional, educational segregation persists as a result of residential segregation[28]. As opposed to poor Black families, poor White families tend to be dispersed throughout a community and therefore are more likely to attend a school with greater resources. In 96% of predominantly White schools, the majority of students have middle class backgrounds, whereas in schools that are predominantly Black and Hispanic, the majority of students are poor[29]. High school dropout rates, probability of enrollment in college, and skill sets of high school graduates varies greatly by race[30]. Employment opportunities, too, are affected by segregation. For example, Black people in segregated communities are less likely to have examples of stable employment and/or social networks that might provide leads for potential jobs[31]. Quality of education and access to employment have been shaped by residential segregation and therefore lead to the accumulation of poverty in Black neighborhoods, as quality education and employment often allow for economic mobility. This demonstrates how physical environment

[27] Williams and Collins
[28] Williams and Collins
[29] Williams and Collins
[30] Williams and Collins
[31] Williams and Collins

shapes other social determinants of health, such as socioeconomic status. The socioeconomic status of Black neighborhoods is a direct result of residential segregation and therefore cannot be understood as a its own theme – as it is in the MVI. I aim to centralize physical environment as a precursor, and William and Collins' piece demonstrates its impact and origin. In other words, Williams and Collins allow for an understanding of where Black mothers live and why.

Even greater than disparities in income and economic mobility are wealth disparities across Black-White racial lines. For most families, a major source of wealth comes from housing equity. Therefore, the current Black-White differences in wealth are, in large part, a result of discriminatory housing practices that upheld segregation (practices such as those legally enforced by the federal government prior to the Civil Rights Act of 1968)[32]. Compared to their White counterparts, Black people experience lower returns on investment in real estate as a result of segregation. Growth in housing equity over time is less for Black people in segregated areas than it is for comparable real estate in other areas[33]. Not only does segregation lead to differential income earnings across racial lines, but it also ensures that Black families are less likely to build wealth over time. Poverty is concentrated in Black, segregated neighborhoods as a result.

While Link and Phelan have identified critical social determinants of health and how they are shaped by neighborhood quality, Williams and Collins fill in the gaps by explaining how neighborhoods have come to be so deeply segregated. Majority Black neighborhoods are not poorer because of the individual behavior of residents. They are poorer as a result of residential segregation and the policies and practices that allowed its operation legally, and illegally since then. The reproduction of poverty through the isolation of Black communities is no coincidence;

[32] Williams and Collins
[33] Williams and Collins

and understanding how segregation persists is important in understanding why Black mothers live where they do, and therefore, why their access to and quality of social determinants of health are a reflection of location. Research like that in *Racism in Health* offer background in understanding health disparities by race more generally. I will apply these general understandings to the situations of Black mothers specifically and will also work to posit interpersonal experiences with racism as an equally important part of the story. However, it is crucial not only to understand how social determinants influence health, but the laws and policies that have created differential access based on race. Keeping in mind that these laws and policies, and their legacies, as anti-Black measures is essential.

Williams and Collins have provided an important background which helps pose Black communities as structurally and systemically segregated. The next step, here, is to bring Black mothers into the conversation. Joia Crear-Perry merges the social determinants of health laid out by Link and Phelan with maternal mortality among Black women in *Social and Structural Determinants of Health Inequalities in Maternal Health* (2021). Crear-Perry identifies the social determinants of Black maternal health as education, income, neighborhood characteristics, housing, access to care, safety, and food stability. She offers that instead of focusing on the individual behaviors of Black women, we must address the historical, political, structural, and systemic forces at play that shape the contexts in which people behave. We must also abandon the outdated and scientifically unsupported narrative that race itself is a biological indicator of susceptibility. These efforts, which are scientifically misguided, completely overhaul the centrality that social determinants of health and racism play in maternal mortality outcomes. Crear-Perry also points out, much like Williams, that availability and quality of resources and the social determinants of Black maternal health have been dictated by political and social structures

which have operated with racist intention since the time of slavery. Redlining, Jim Crow, the 13th Amendment, the GI Bill, and mass incarceration are all examples of societal infrastructure that have "endured and adapted over time and continue to shape contemporary access" to resources for Black Americans[34].

Fundamental to the structure of Crear-Perry's argument are these remnants and reimaginations of policies that allow for the reproduction of oppression. In addressing redlining, Jim Crow, the 13th Amendment, the GI Bill, and mass incarceration, Crear-Perry explains why the U.S. is still just as segregated today as it was in the era of Jim Crow. If maternal mortality is, in part, a result of geography, it is essential to understand that geography is a result of explicitly racist and anti-Black political measures, which are still very much relevant in shaping where people live today. Not only does Crear-Perry offer this important positioning, but her work also begins outlining how exactly the social determinants of health apply to the situations of Black mothers. In drawing together the social determinants of health with this demographic specifically, it becomes clear that how access to and quality of social determinants of health are intentionally racialized is a crucial part of the conversation converging the health of all Black mothers.

Structural Racism and Black Maternal Health

As made clear by Link, Phelan, Crear-Perry, and Williams, where one lives is important in determining access to and quality of social determinants of health. And therefore, is vital in the shaping of health outcomes, which are worse in Black neighborhoods as a result of segregation. Yet, Black women in high quality neighborhoods, with better access to and quality

[34] Crear-Perry, Joia, and Rosaly Correa-de-Araujo. *"Social and Structural Determinants of Health Inequities in Maternal Health."* Journal of Women's Health 30, no. 2 (2021): 230–35. https://doi.org/10.1089/jwh.2020.8882.

of social determinants of health, are still more likely to experience maternal mortality compared to their White counterparts. Jamila Taylor in her article *Structural Racism and Maternal Health Among Black Women* (2020)**,** argues that social determinants alone cannot fully explain racial disparities in maternal mortality. In attempting to untangle the web of factors influencing Black maternal health outcomes, Taylor deems implicit bias and explicit discrimination primary causal factors. In providing a historical review of reproductive oppression, Taylor addresses why and how Black women interact with healthcare systems. In detailing the racist foundations of gynecology, forced sterilizations, the promotion of contraceptives in low-income Black communities as a condition of social welfare programs, and interpersonal racism in medical settings, it becomes evident that historical context shapes current interactions and feelings towards healthcare systems. All present-day instances of abuse and reproductive control developed in slavery-era America when white domination over Black women's wombs sustained the economic system of slavery[35]. Medical experimentation on Black women served plantation productivity. Aiming to enhance fertility, 'doctors' experimented on the bodies of Black women without consent or appropriate surgical necessities[36]. The gynecological advances produced by the invasion of Black bodies were used to treat White women and allowed for the continued control of Black reproductive health without consent[37]. Similarly, compulsory sterilization epitomized eugenics as a means of social-sexual control; Black women were represented as behaviorally and medically unfit to reproduce and in many ways still are today. Legal compulsory sterilizations were the norm in many states in the early 1900s, yet forced sterilizations are still very much recent. In the 1970s, many hospitals were exposed for

[35] Taylor, Jamila K. *"Structural Racism and Maternal Health Among Black Women*." The Journal of Law, Medicine & Ethics 48, no. 3 (September 2020): 506–17. https://doi.org/10.1177/1073110520958875.
[36] Taylor, *Structural Racism and Maternal Health*
[37] Taylor, *Structural Racism and Maternal Health*

performing nonconsensual hysterectomies on Black women[38]. Then, during the beginning of and continued struggle for civil rights, Black women have emphasized reproductive justice as a key component of liberation; control over one's body is essential in recognizing full autonomy[39].

Ultimately, Taylor presents historical context as a means of explaining warranted distrust and how history has informed the ways in which medical professionals treat and interact with Black women and their pain. Explaining disparities in rates of maternal mortality using structural and interpersonal racism is undeniable - especially given most pregnancy related deaths are preventable. Taylor allows for a further understanding beyond social determinants of health. Although poor social determinants of health often place Black women at greater risk, they cannot protect them either. Wealth, education, employment status, access to quality medical care, to fresh food, and to reliable transportation do not mean Black mothers are free of racism and its impact on health and health-related outcomes. Merging the explanation offered by Taylor with the social determinants of health provides a more well-rounded picture that includes all Black mothers - with and without access to high quality resources.

Taking a step back to build on the work done by Taylor, Phelan and Link detail how exactly racism and discrimination influence health, on a physical level, beyond the social determinants of health. In *Is Racism a Fundamental Cause of Inequalities in Health?* (2015), Phelan and Link look beyond social determinants of health to explain race as a major indicator of virtually all disease outcomes, no matter where someone lives. When examining the prevalence of six major disease outcomes (hypertension, diabetes, cancer, chronic obstructive pulmonary disease, heart disease and stroke), along with nine nonfatal diseases and five types of disability,

[38] Taylor, *Structural Racism and Maternal Health*
[39] Taylor, *Structural Racism and Maternal Health*

Black people fare worse on 80% of outcomes[40]. Race is socially constructed and therefore is not biologically indicative of susceptibility to certain conditions or disease outcomes. Searching for biological indications of susceptibility in socially constructed categories, such as race, perpetuates the misguided notion that race itself is a risk factor[41]. Therefore, given there is no inherent biological risk factor associated with Blackness, it is important to consider how exactly these outcomes have developed to be so different across various races. Social determinants of health cannot offer a full explanation. When controlling for both SES and education, there remains a broad association between disease outcomes and race[42]. Meaning, even when someone has access to high quality social determinants, they are still more likely than their White counterparts to experience certain adverse health outcomes. Phelan and Link offer an explanation, in part, by pointing to stress, experiences of discrimination, weathering, and allostatic load. Stress, as defined by Link and Phelan, is "a response to threatening or burdensome situations that induces physiological responses that can harm health"[43]. Threatening or burdensome situations most certainly include experiences with racism and discrimination on both individual and collective scales. Experiences of discrimination can be conceptualized as a form of social stress that are particularly harmful to health given they are "uncontrollable, unpredictable, span the life course, are encountered in multiple contexts, and induce the psychically painful state of vigilant anticipation"[44]. Henceforth, the weathering hypothesis states that Black people experience "early physiological and health deterioration as a consequence of the cumulative stress of living in a society that stigmatizes and disadvantages them"[45]. Similarly,

[40] Phelan and Link, *Is Racism a Fundamental Cause*
[41] Phelan and Link
[42] Phelan and Link
[43] Phelan and Link, p. 320
[44] Phelan and Link, p. 320
[45] Phelan and Link, p. 321

allostatic load is defined as the "cumulative wear and tear on the body's system, owing to repeated adaptation stressors"[46]. The experience of being Black in the U.S., in other words, gets 'under the skin'; constant and unrelenting adaptation to stress, stemming from experiences with discrimination, take a toll on the body. Across all ages, Black people have higher mean allostatic load scores than their White counterparts[47]. It is the experience of being Black in the U.S., not being Black itself, that informs weathering and allostatic load. Stress presenting in the body through weathering and allostatic load, informs countless health outcomes, such as hypertension, breast cancer, and obesity[48]. And this stress can come from other places beyond direct interpersonal discrimination. The effects of segregation, such as poverty, lower quality medical services, or lower quality housing, can all lead to presentations of stress in the body as well. It is through both interpersonal and political and socially structured forms of discrimination that stress and its effects have come to define the Black health experience in the U.S.

Moving forward, it is critical to keep in mind how health outcomes are informed by the experiences of discrimination for Black Americans. Examining how Black mothers fit into this narrative will help construct a more well-rounded examination that includes both social determinants and interpersonal and societal discrimination in attempting to fully explain why Black mothers are uniquely vulnerable and therefore why solutions must focus on them specifically.

Obstetric Racism

Dána-Ain Davis, in *Obstetric Racism: The Racial Politics of Pregnancy, Labor, and Birthing* (2018), *f*ocuses on interpersonal racism in medical settings. Where Taylor has provided

[46] Phelan and Link, p. 321
[47] Phelan and Link
[48] Phelan and Link

historical context and Phelan and Link help us further understand how racism affects the body, Davis delves into the present day, individual experiences of Black women before, during, and after childbirth. The accounts offered by Davis parallel the background provided by Taylor; racism, segregation, medical experimentation, and the legacies of enslavement continue to inform the birthing experience for Black women. Davis defines medical racism as occurring when a patient's race affects the perceptions, treatment, and/or decisions about risk made by their medical provider. More specifically, Davis offers a definition of obstetric racism as an extension of medical racism; "It includes, but is not limited to, critical lapses in diagnosis; being neglectful, dismissive, or disrespectful; causing pain; and engaging in medical abuse coercion to perform procedures or performing procedures without consent"[49]. Obstetric racism blatantly ignores and contributes to the collective risk posed by anti-Black racism for Black women and their children.

Davis employs the narratives of several Black women to illustrate the ever-present threat of obstetric racism, using a Black feminist approach to investigating reproduction; "Black feminist theorizing situates women's stories as evidence and the source of theory because the intersection of race, gender, class, and sexuality are often expressed in the most complex ways in Black women's lives"[50]. Many experiences cannot be condensed or easily measured nor are they necessarily observable or quantifiable. Data often reflects outcomes but fails to provide evidence as to how said outcome came to be. Understanding the interpersonal experiences of Black women in medical settings before, during, and after pregnancy requires the deeply personal narratives of women.

[49] Davis, Dána-Ain. "Obstetric Racism: The Racial Politics of Pregnancy, Labor, and Birthing." U.S. National Library of Medicine, December 6, 2018. https://pubmed.ncbi.nlm.nih.gov/30521376/.
[50] Davis, *Obstetric Racism*, p. 564

Davis recounts the stories of three pregnant Black women in the United States. Each woman offers a story as to how she was treated before and throughout the birthing process. One woman, Jessica, experienced a second-degree tear during childbirth. Her midwife, a White woman, proceeded to stitch Jessica without the proper use of numbing medication or consent. Davis concludes that Jessica's experience is very much reminiscent of nineteenth century gynecological abuse by Marion Sims, who in the name of 'advancing gynecological procedure' often subjected enslaved women to medical experiments without the use of numbing medication or consent[51]. Earlier in her article, Davis explains that there is a gendered aspect of medical racism. Medical racism is embedded in the historical narrative that Black women's bodies are "medical super bodies"[52] and are therefore thought to be useful for labor and experimentation (i.e., gynecological experiments) but are not deserving of humane treatment. Jessica's midwife and her decision not to provide Jessica with numbing medication also echoes this medical super body concept.

It is made evident through both Jessica's story and that of other women, that obstetric racism has been a pervasive feature of medical care for Black women since slavery. And although it may operate in less overt ways (and often still in overt ways), it heavily influences the physical, emotional, and mental health of Black women and their children. Obstetric racism makes the birthing process more dangerous for Black women and continues to find ways to dictate experiences. Davis hones in on individual experience in her article. I too will highlight individual experiences with obstetric racism in medical settings, while also positing these

[51] Davis, *Obstetric Racism*
[52] Davis, *Obstetric Racism*, p. 561

experiences with obstetric racism as one of many risk factors for Black women as a result of pervasive racism on a multitude of scales.

Amy Roeder's article, *America Is Failing Its Black Mothers* (2019), illuminates just how pervasive obstetric racism is in her examination of the fact that wealth, education, and access to other high quality social determinants of health cannot protect Black women from outcomes produced by obstetric racism, or racism more generally. Roeder begins by detailing the story of Shalon Irving, a Black woman and epidemiologist at the Center for Disease Control. Although Irving was aware her pregnancy was risky (she had a clotting disorder and history of high blood pressure), she had access to "top quality care" and "a strong support system from family and friends"[53]. For the three weeks following the birth of her daughter, Shalon made recurring visits to her primary care providers for a hematoma, spiking blood pressure, rapid weight gain, blurred vision, and swelling legs[54]. At these appointments Irving was assured that what she was experiencing was normal. However, just hours after her last appointment, Irving took a newly prescribed blood pressure medication, collapsed, and not long after passed away in the hospital[55].

Shalon Irving's B.A. in Sociology, two master's degrees, dual-subject Ph.D., gold-plated insurance, and a highly involved support system were not enough to safeguard her from the horrific trends we see in Black maternal mortality. Although she had preexisting conditions, she also experienced a great deal of obstetric and medical racism. Disparate treatment exists beyond the realm of 'average' Black American women, too[56]. Indeed, both Serena Williams and Beyonce have also spoken out about their negative experiences as Black women before, during,

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[53] Roeder, Amy. *"America Is Failing Its Black Mothers."* Harvard Public Health Magazine, Winter 2019. https://www.hsph.harvard.edu/magazine/magazine_article/america-is-failing-its-black-mothers/.
[54] Roeder, *America Is Failing*
[55] Roeder
[56] Roeder

and after pregnancy, illustrating that no Black woman is untouchable; if it can happen to women like Beyonce or Williams, it can happen to anyone[57]. Roeder provides a highly important aspect of the conversation; Black women, although affected by the social determinants of health, are not protected by them either. Wealth, education, top-notch medical care, and countless other factors are not enough to ensure survival. While it is crucial to understand why mothers like Shalon, Williams, and Beyonce, are more likely to have a history of high blood pressure (despite their success and resources), it is equally as important to understand why such risk factors, among many others, are oftentimes ignored by healthcare providers as a reflection of obstetric racism. I will bridge these two understandings by identifying where we can further connect upstream social determinants that predispose Black mothers to risk with the experiences of medical and obstetric racism that allow for said risk factors to pose an even greater danger.

Earlier, Davis explained the importance of understanding narratives as knowledge production when it comes to Black feminism and reproductive justice. Stories must be understood as evidence. The intersectionality of race and gender, among many other identifiers, are experienced in complex ways, especially for Black mothers. Therefore, relying on narrative as evidence is imperative. Layering this onto the GIS and MVI will allow for a more well-rounded understanding of Black maternal mortality.

Connections Across Literature

Link, Phelan, Williams, and Crear-Perry offer one side of the story which highlights social determinants of health, as influenced by racialized policy and segregation, as fundamental in influencing racial disparities in health outcomes for all Black Americans, Black mothers included. Crear-Perry identifies the social determinants of health for Black mothers as education,

[57] Roeder

income, neighborhood characteristics, housing, access to care, safety, and food stability. Departing from a sole focus on social determinants, Taylor, Link, Phelan, Davis, and Roeder, illustrate the means by which interpersonal discrimination and racism influence maternal health outcomes among Black women. Link and Phelan provide a background detailing how experiences with racism affect the body and Davis defines obstetric racism in order for a more specific perspective when it comes to the discrimination, implicit bias, and racism Black women face in medical settings before, during, and after childbirth. Overall, the gap exists where there is a failure to draw direct correlations between social determinants of health and geography within the context of Black maternal mortality. But more specifically, once there is an understanding of how geography directly and non-coincidentally shapes social determinants of health, these concepts must merge with obstetric racism and racism experienced over one's lifetime in order to fully explain Black maternal mortality. Neither is effective on its own in providing an explanation that accounts for Black maternal mortality as a whole. And therefore, neither is effective on its own as a focus for remediation. The two must be addressed as inextricably linked and therefore inseparable in efforts to absolve Black maternal mortality.

Below, Figure 1 presents a causal web illustrating the fundamental causes of Black maternal mortality. The causal web reflects the literature review as a whole and aims to connect the different concepts laid out by each author.

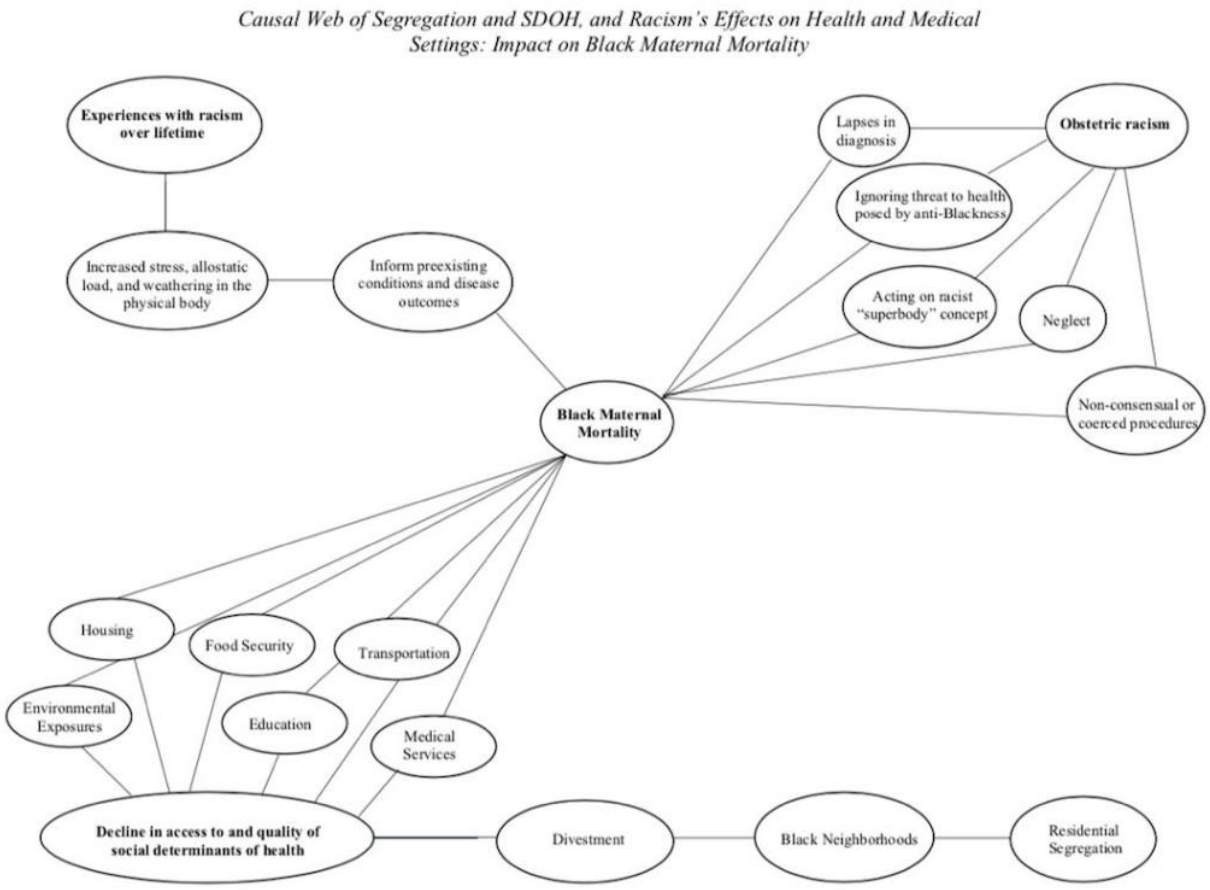

Figure 1. *This figure depicts the groundwork for understanding how the social determinants of health, obstetric racism, and racism encountered over a lifetime contribute to Black maternal mortality. The social determinants of health, obstetric racism, and racism experienced over a lifetime are all in bold to signify their importance in directly producing and upholding some of the more specific causal factors (such as neglect or education). These three boldened concepts are the root causes of Black maternal mortality. Stemming from each root cause are the ensuing results, which in turn play a role in contributing to rates of Black maternal mortality.*

Link and Phelan, Williams, and Crear-Perry lay the foundation for including social determinants of health in the causal web. Taylor, Link, and Phelan lay the groundwork for including experiences with racism over a lifetime. Davis and Roeder develop understandings of obstetric racism to be included as a primary causal factor. In piecing these concepts together, a more well-rounded explanation of Black maternal mortality emerges that accounts for both the

social determinants shaped by geography and the experiences of being Black both over a lifetime and within medical settings more specifically.

In the following sections I will make clear why the GIS (in tandem with the MVI) and the MPF must be included in the records available to MMRCs. The following section, regarding MMRCs, will offer background and a critique of their methodology. Following MMRCs is a section on the GIS and MVI, which will develop an understanding of the tools themselves and why they must be assessed and understood in tandem. Next, the section on Narrative as Evidence will highlight the exclusion of narrative as evidence from traditional research and will make a case for why it must be included in the records available to MMRCs. The following Maternal Perspectives Form section will outline and detail the operationalization of narrative as evidence. These four sections will conclusively illustrate the present inadequacy of MMRCs and how they can move forward, with the MVI, GIS, and MPF, to be more accurate in their determinations of contributing factors and ensuing recommendations for improvement when it comes to Black maternal mortality.

III. Maternal Mortality Review Committees

Currently, MMRCs are the preeminent mechanism to assess causal factors in pregnancy related deaths. 49 states, the District of Columbia, New York City, Philadelphia and Puerto Rico have maternal mortality review committees (or legal requirement to review pregnancy-related deaths)[58]. The composition of an MMRC varies state to state, however they can include obstetricians, gynecologists, midwives, nurses, doulas, public health experts, and community-based organizations, amongst a variety of other representatives from different fields of medicine

[58] "Maternal Mortality Review Committees." Guttmacher Institute, March 1, 2022. https://www.guttmacher.org/state-policy/explore/maternal-mortality-review-committees.

[59]. Their objective is to determine causal factors contributing to a death and what the best recommendations for future prevention might look like. MMRCs review all deaths occurring within one year of the end of a pregnancy. For the most part, the committees deliberate four central items: 1) whether a death was related to pregnancy, 2) whether it could have been prevented, 3) factors that contributed to the death, and 4) recommendations for remediation and prevention[60]. When assessing factors that contributed to a death, an MMRC can reference a list of potential contributing factors. For example, after reviewing a case and deeming structural racism a causal factor in a maternal death, an MMRC might push for the expansion of Medicaid to include coverage for one year postpartum so that more low-income mothers have access to care[61].

Some of the potential contributing factors MMRCs are able to identify include lack of access/financial resources, failure to screen/inadequate assessment of risk, clinical skills/quality care, poor communication/lack of case coordination or management/lack of continuity of care (system perspective), lack of continuity of care (provider or facility perspective), cultural/religious or language factors, delay, discrimination, environmental factors, interpersonal racism, lack of knowledge, inadequate law enforcement response, legal, inadequate community outreach/resources, structural racism, trauma, unstable housing, and violence. Many of these contributing factors are reflective of the social determinants of health as introduced by Link in Phelan in the literature review. The list includes both structural and interpersonal results of

[59] "Pregnancy Mortality Surveillance System." Centers for Disease Control and Prevention, November 25, 2020. https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm.
[60] Center for Disease Control, *Pregnancy Mortality Surveillance System*
[61] Hardeman, R.R., Kheyfets, A., Mantha, A.B. *et al.* Developing Tools to Report Racism in Maternal Health for the CDC Maternal Mortality Review Information Application (MMRIA): Findings from the MMRIA Racism & Discrimination Working Group. *Maternal Child Health J* (2022). https://doi.org/10.1007/s10995-021-03284-3

racism in its various forms. When a contributing factor is chosen it is categorized on one of five levels: patient/family, provider, facility, system, or community. MMRCs are then asked to make a recommendation based on a listed contributing factor and to identify prevention type – primary (prevention before occurrence), secondary (reduce impact after occurrence) or tertiary (reduce impact/progression of ongoing contributing factor). Lastly, the committee lists the prevention based on expected impact – small, medium, large, extra-large, or giant. A giant expected impact might look like addressing the social determinants of health, whereas a small expected impact might look like provider-based health and education promotion.

Although the list of potential contributing factors includes some social determinants of health, interpersonal and structural racism, and discrimination, MMRCs complete these forms based on the information available to them. MMRCs may have access to both clinical and non-clinical records (e.g., vital records, medical records, social service records) (CDC). These records can also include medical files, law enforcement reports, autopsy records, and interviews with witnesses or family members[62]. However, the information made accessible to an MMRC varies state by state. For example, Florida's MMRC only has access to vital statistics and health care/medical records. Oklahoma's MMRC, on the other hand, has access to court records, emergency medical service or first responder records, family or witness interviews, healthcare and medical records, law enforcement records, medical examiner or coroner records, mental health records, and vital statistics[63]. Therefore, the ensuing ways in which MMRCs categorize contributing factors for a given death are based on vastly different degrees of information. It would be much harder for Florida's MMRC to list interpersonal racism as a contributing factor if

[62] Guttmacher Institute, *Maternal Mortality Review Committees*
[63] Guttmacher Institute, *Maternal Mortality Review Committees*

they are assessing a death based solely on vital statistics and medical records. For an MMRC, such as that in Oklahoma, having access to family and witness interviews offers a much more holistic understanding of a death and therefore creates a more accurate understanding of contributing factors. MMRCs that rely solely on medical records for review characterized only 28% of maternal deaths as preventable, while MMRCs conducting more holistic reviews reported 40% to 70% of maternal deaths as preventable, respectively[64]. Clearly, the information available shapes the decision-making process and the ensuing recommendations.

Therefore, although the listing of racism (in its many forms) as a potential contributing factor is indicative of progress, the MMRC Decisions Form does not reflect self-reported experiences of medical and/or obstetric racism. Microaggressions and implicit bias, for example, are not easily detected as causal factors, especially when a mother is no longer able to offer her own perspective. The goal is to prevent recurrence, however, leaving out the narratives of Black mothers themselves does not allow for fundamental causes of Black maternal mortality to be addressed head on. The MMRC Decisions Form might be more effective in identifying structural factors, however medical and obstetric racism are often experienced on levels that are not obvious nor evident to those reviewing a case after the fact. When it comes to accounting for medical and obstetric racism there is currently no effective means by which to measure these experiences and their contribution to Black maternal mortality.

Similar to the lack of Black maternal perspectives, out of the 49 states that have MMRCs, only 14 require that committee membership be reflective of their jurisdiction's demographic composition (such as geography, race, and socioeconomic status) or that such representation is

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[64] Kramer, Michael R., and Andrea E. Strahan. *"Changing the Conversation: Applying a Health Equity Framework to Maternal Mortality Reviews."* American Journal of Obstetrics and Gynecology, September 6, 2019. https://www.sciencedirect.com/science/article/abs/pii/S0002937819311044.

considered during the selection process of committee members in the first place[65]. Therefore, the likelihood that MMRCs are reflective of heavily impacted communities, such as Black neighborhoods and Black women more generally, is less frequent. This further indicates the importance of including Maternal Perspectives Forms in the records and data offered to MMRCs for review. Black women are not as likely to be represented in MMRCs, only furthering the need for a tool used to communicate how obstetric racism and racism experienced over a lifetime affect pregnancy and birthing experiences. The later sections on Narrative as Evidence and the Maternal Perspectives Form will delve into one way this could be done.

IV. Maternal Vulnerability Index & Geography Index Score

Many of the works and authors included in the literature review emphasize the necessity of providing and reporting data on Black maternal mortality. Legislative action cannot be realized, to its full potential, without accurate understandings of the causes of Black maternal mortality. As demonstrated, MMRCs lack holisticity in their assessments of Black maternal mortality given their deficiency of information. MMRCs do not always have access to records and information that reflect physical environment. However, "by viewing women not only as isolated patients but also as members of a larger environment replete with exposures and opportunities, then upstream health service, social, and environmental determinants of health may be conceived of as underlying contributors to a biomedical cascade of events ending in a tragic death"[66]. Until a measure of geography is included in the records available to MMRCs, they will continue in their inability to address the social determinants of health as influenced by physical environment, and therefore Anti-Black segregation, law, and policy.

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[65] Guttmacher Institute, *Maternal Mortality Review Committees*
[66] Kramer, *Changing the Conversation,* p. 611

If we are to understand anti-Black segregation and therefore differential access to resources as fundamental causes of Black maternal mortality, it is important to create a measurement that is reflective of physical environment as produced by anti-Black residential segregation. Therefore, the GIS will represent a cumulative measure of residential segregation, food security, housing, public transportation, medical services, environmental exposures, and education in a given county. These indicators are included for two reasons: 1) their accessibility and quality are directly affected by where someone lives, and 2) they are therefore directly affected by the anti-Black political measures which gave rise to and have allowed for the continuation of residential segregation. The following discussion will make clear why the MVI must be understood in tandem with the GIS.

In 2021, Surgo Ventures created the Maternal Vulnerability Index (MVI) which is the first county-level, national-scale, open-source tool that can be used to identity where and how maternal health plays out on national, regional, and hyperlocal scales. The MVI accounts for six themes, which collectively comprise 43 indicators associated with maternal health. The six themes explored are reproductive healthcare, physical health, mental health and substance abuse, general healthcare, socioeconomic determinants, and physical environment. Each county in the U.S. has a unique vulnerability profile, with almost all counties considered vulnerable by at least one dimension (whether that be reproductive healthcare or mental health and substance abuse, for example). The MVI is indicative of the social determinants of health as outlined by Link, Phelan, and Crear-Perry in relationship to Black mothers specifically. Yet, where the MVI positions physical environment as one of six major indicators of maternal vulnerability, I will situate it more so as a precursor, informing virtually all the other themes outlined by the MVI, such as reproductive health care and socioeconomic determinants. Physical environment cannot

be viewed as parallel to the conditions it produces. As illustrated by Link and Phelan in the literature review, the social and physical structure of neighborhoods are critical in shaping access to and quality of various social determinants of health. And therefore, it is important to understand and highlight how geography operates as a result of residential segregation. The GIS, in tandem with the MVI, will offer a more conclusive look into the legacies and continuance of residential segregation as produced by anti-Black political and social structures. They are proposed to be understood and assessed in tandem because the GIS will make clear, in part, *why* the measurements of the MVI indicate Black mothers are more vulnerable than their White counterparts. For example, the MVI measures percent of the adult population that reported a routine physical checkup in a given county as an indicator of care seeking behavior, under the general healthcare theme. This metric understood in tandem with a GIS score for the same county would allow for insight into how segregated that community is and how resources are most likely affected as a result (and therefore might affect care seeking behavior). If the Black population is reported to seek care less frequently than their White counterparts, it is more evident why – their geography might influence their access to and quality of the social determinants of health.

Aside from physical environment, the other themes explored by the MVI are reproductive healthcare, physical health, mental health and substance abuse, general healthcare, and socioeconomic determinants. These variables are all heavily affected by, and therefore secondary to, physical environment (or geography). Essentially, the GIS aims to measure the effects of living in a segregated area, within the context of the social determinants of health. In doing so, the GIS will illustrate the effects of structural racism. It is therefore more inclusive of fundamental causes of Black maternal mortality and how proximate these causes are to anti-

Black residential segregation. For this reason, the MVI must be interpreted in tandem with the GIS.

The MVI does illustrate the severity of Black-White racial disparities in maternal mortality, however, it fails to adequately explain why these disparities exist in nearly every county in the country. Even when a Black mother lives in an area where the MVI indicates better quality of and access to the social determinants of health, she is still at higher risk when compared to her White counterparts. This indicates that the factors comprising the MVI cannot fully explain why Black mothers are at greater risk. The MVI does acknowledge the stark racial disparities in their findings; "Structural racism impacts maternal vulnerability as well: Nationally, Black and American Indian/Alaska Native women face vulnerability scores 10-12 points higher than those of their White counterparts"[67]. However, this 10-12 point difference is not indicative of how interpersonal and obstetric racism affect health; it indicates that Black mothers are at greater risk because, on average, they tend to score more vulnerably based on the measurements of the MVI – which are focused on the social determinants of health. The GIS is similar in that it will display vulnerability based on metrics reflective of geographic politics but will fail to completely capture the preeminent forces shaping Black maternal mortality.

Phelan and Link have identified many social determinants of health, some of which I will use as variables configuring the GIS. In dissecting the GIS, it is vital that there is an understanding of the general causal relationship between each social determinant of health and potential health outcomes. It is also essential to understand how these social determinants are affected by geography and therefore often disproportionately impact Black neighborhoods. Table 1 outlines

[67] Surgo Ventures, *The MVI*

how and why each GIS variable leads to overall worse outcomes in Black neighborhoods and communities.

Table 1. GIS Variables and Health Outcomes Connections

GIS Variable	Health Outcomes
Food Security	In segregated Black communities there two to three times as many fast-food outlets as there are in White neighborhoods leading to higher consumption of cheap fast-food. Black neighborhoods have two to three times fewer supermarkets than their White counterparts. Availability of supermarkets is associated with higher consumption of fresh fruits and vegetables. There are higher rates of **obesity** and **diabetes** in Black communities (Phelan and Link 2015).
Quality of Housing	Quality of housing is likely to be lower in segregated neighborhoods and poor housing conditions can influence an array of adverse health outcomes. Some aspects of poor housing include overcrowding, inadequate heat, presence of environmental hazards, noxious pollutants, and allergens (including lead, smog, and particulates). Ultimately, exposure to these stressors and toxins can lead to the development of **asthma**, **cardiovascular disease**, **injury**, and a **host of other health issues** (Williams 2001).
Quality/Access to Medical Facilities	Hospitals and medical facilities in neighborhoods with more Black residents have fewer specialists, board-certified physicians, and technological resources, along with **higher rates of negligent adverse events and deaths** for both Black and White patients. These disparities exemplify an **overall higher risk for patients being treated in medical settings with fewer resources**, therefore leading to worse health outcomes and worse treatment of said outcomes (Phelan and Link 2015).
Environmental Exposures	Environmental exposures are 5 to 20 times as high in minority communities compared to their white counterparts. Black neighborhoods are associated with higher exposure to air toxins, mercury, arsenic, sulfur dioxide, lead, and other carcinogens. Black neighborhoods are also more likely to be proximal to polluters and breathe polluted air. Exposure to persistent organic pollutants (POPs) (such as pesticides and dioxins) play a causal role in the development of **diabetes**, **cardiovascular disease**, and **hypertension** (Landrine 2009).
Quality/Access to Education	Schools with 90 percent or more Black students spend about $733 less per student per year than schools with 90 percent or more white students. Education leads to reduced stress, better social and psychological skills, healthier neighborhoods, better jobs, greater access to better health resources (Virginia Commonwealth University 2015), and therefore better health outcomes.
Quality/Access to Public Transportation	Each year, 3.6 million Americans do not obtain medical care due to transportation difficulties. Black Americans are more likely than their White counterparts to live in large metropolitan areas and are also less likely to have consistent access to a car; they are more likely to rely on public transportation to get to work, medical appointments, and the grocery store (Anderson 2016). Therefore, transportation clearly impacts every aspect of life, but can have specifically harmful effects on access to medical services in Black communities (American Hospital Association).

In addition to the conditions informed by physical environment as outlined in Table 1, it is important to note that when compared to their White counterparts, Black women experience

higher rates of cardiomyopathy, thrombotic pulmonary embolism, and hypertensive disorder leading to pregnancy-related deaths. Across all demographics, conditions such as hypertension, diabetes, and coronary heart disease have increased incidences of complications during pregnancy. Among Black women specifically, the leading causes of maternal death are complications related to cardiovascular disease[68]. As demonstrated, hypertension, diabetes, and cardiovascular disease are all informed by social determinants of health. These pregnancy related conditions are inextricably linked to the social determinants comprising the GIS.

Yet, much like the MVI on its own, the GIS in tandem with the MVI will not be enough to fully explain Black maternal mortality. Like the MVI, I expect that when Black mothers live in neighborhoods with a better GIS, they will still experience pregnancy related death at higher rates than their White counterparts. The GIS and MVI interpreted in tandem will still illustrate the fact that wealth, higher levels of education, and better medical care (for example), cannot protect Black mothers from vulnerability. The GIS, like the MVI, does not measure obstetric racism and racism experienced over a lifetime. Therefore, I predict that the GIS will not be able to fully explain Black-White racial disparities because it does not include measurements of obstetric racism and racism experienced over a lifetime. Therefore, narrative *must* be accepted and understood as evidence – it is the only form of confirmation we can point to that explains the Black-White disparity in full.

Ultimately, the GIS aims to make clear the noncoincidental, anti-Black nature of geography and its harmful effects on Black maternal mortality. The GIS in tandem with the MVI are one piece of the puzzle; to be illustrative of all fundamental causes they must be understood in

[68] Njoroge, *Understanding Health Disparities*

conjunction with Black narratives as evidence of racism – which is operationalized by the Maternal Perspectives Form, to be explored in the following section.

Measurements of the GIS

To fully comprehend the objective of the GIS as a measurement, it is important to understand how each component of the index could potentially be measured. This is a conceptual outline that offers some ideas as to which metrics might comprise each component. The overarching goal is to illustrate that through these various measurements geography will emerge as a fundamental cause of Black maternal mortality as a result of anti-Black law, policy, and their legacies.

Included in the GIS is a measurement of residential segregation. It's important to note that the MVI does not measure residential segregation, which plays a major part in producing many of the conditions it does measure – such as poverty, housing issues, and food insecurity. Including a measure of residential segregation is of the utmost importance and is part of the reason the MVI must be interpreted in tandem with the GIS. Yes, the MVI is an excellent measure of vulnerabilities, however it fails to explain that, in large part, they are often the results of residential segregation (and therefore structural racism/anti-Black law and policy).

One potential way to measure residential segregation is with the dissimilarity index (DI)[69]. The dissimilarity index reflects the differential distribution of Black residents versus White residents in a certain neighborhood or city. DI scores range from 0 to 100, where 0 represents full integration and 100 represents complete segregation. The DI is interpreted as the

[69] "Racial Segregation: About the Dissimilarity Index." Census Scope. Accessed October 17, 2021. https://www.censusscope.org/about_dissimilarity.html.

percentage of Black people (or White people) who would have to move to achieve citywide integration. Nationwide, DI data indicates that 60%-80% of the Black (or White) population would have to move to a different neighborhood to integrate most cities in the US[70].

One potential way to measure food security is with the Food Environment Index (FEI), which ranges on a scale of 0 (best) to 10 (worst) and equally weighs two indicators of food security[71]. The first indicator is the percentage of the population that is both low income and does not live close to a grocery store. Low income is defined as having an annual family income of less than or equal to 200 percent of the federally defined poverty threshold in relationship to family size. Proximity to a grocery store, for nonrural areas, is defined as living within one mile of a grocery store. The second component of the FEI is based on the percentage of the population that did not have reliable access to food during the past year, using data from the Community Population Survey, Bureau of Labor Statistics, and American Community Survey to estimate food insecurity[72]. The FEI is a comprehensive measurement of these metrics. In 2020, most counties fell between 1.8 and 3.1[73]. Another appropriate metric would be the Food Insecurity Measure, which estimates the percentage of the population who did not have access to a reliable source of food during the previous year[74]. There are a multitude of ways food insecurity impacts health that aren't captured in the FEI or Food Insecurity Measure. For example, they do not measure density of fast-food outlets in a neighborhood, which often correlates to higher rates of obesity, hypertension, and diabetes. Measurements that explore metrics such as density of fast-

[70] Census Scope, *About the Dissimilarity Index*
[71] *"How Healthy Is Your County?"* County Health Rankings & Roadmaps. County Health Rankings. Accessed October 17, 2021. https://www.countyhealthrankings.org/.
[72] County Health Rankings, *How Healthy Is Your County*
[73] County Health Rankings
[74] County Health Rankings

food outlets would also be indicative and important and therefore could be included in the food security measurement as well.

Quality of housing could be measured by the Severe Housing Problems metric[75]. This measures percentage of the population in a given county experiencing at least one of four severe housing issues: overcrowding, high housing costs, lack of kitchen facilities, and lack of plumbing facilities[76]. This measurement is indicative of poor housing quality and therefore the legacies of residential segregation. However, it does not measure other unsafe aspects of housing which have also been proven to influence health, such as exposure to allergens, environmental hazards, or noxious pollutants like lead or smog. Measurements capturing these issues would be indicative and accurate contributions to the housing measurement of the GIS as well.

Access to medical services might be measured by the uninsured measurement produced by the 2021 County Health Rankings, which measures percentage of the population, under the age of 65, that are uninsured. Although a good indicator of access to medical services, this measurement is not indicative of distance to the closest medical facility, quality of physicians/nurses/care providers, or overall additional expenses - all of which are informed by geography and bar pregnant women from receiving the care they need. Another accurate and informative measure could be percentage of population reporting routine checkups or the minimum distance to the closest abortion clinic[77]. Another potential metric might be the Prevention Quality Indicators, which use hospital discharges data to identify admissions that could have been avoided through access to high-quality outpatient care[78].

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[75] County Health Rankings
[76] County Health Rankings
[77] Surgo Ventures, *The MVI*
[78] "Quality Indicators." Agency for Healthcare Research and Quality. Accessed 2021. https://qualityindicators.ahrq.gov/measures/pqi_resources.

Environmental exposures might be measured by air pollution by average daily density of fine particulate matter in micrograms per cubic meter[79]. The higher the average daily density of fine particulate matter, the more polluted the city. Environmental exposures could also be measured by the number of proximal waste sites, exposure to air toxins, mercury, arsenic, sulfur dioxide, lead, or other carcinogens.

Quality of and access to education could potentially be measured by an overall ranking of the largest 150 metropolitan areas in the United States based on quality of education[80]. The overall score provided to a city is the combination of two metrics: educational attainment and quality of education/attainment gap. Educational attainment is a cumulation of four measurements: share of adults aged 25 and older with a high school diploma or higher, share of adults aged 25 and older with at least some college experience or an associate degree or higher, share of adults aged 25 and older with a bachelor's degree or higher, and share of adults aged 25 and older with a graduate or professional degree. The quality of education and attainment gap dimension is measured by the following metrics: quality of public school system, average quality of universities, enrolled students in 1,009 universities per capita, number of summer learning opportunities per capita, racial education gap, gender education gap, and education equality index score. A city's overall rank is a cumulative representation of these 11 metrics in comparison to other cities[81]. More simplistic metrics might be used, such as percentage with a high school diploma or percentage with a bachelor's degree. Similarly, some measure of a tax base would be indicative of funding for schools and therefore their access to resources.

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[79] County Health Rankings
[80] McCann, Adam. *"Most & Least Educated Cities in America."* WalletHub. WalletHub, July 19, 2021. https://wallethub.com/edu/e/most-and-least-educated-cities/6656.
[81] McCann, *Most and Least Educated*

Public transportation might be measured by a cumulative score and rank, based on three dimensions: accessibility and convenience, safety and reliability, and public transit resources[82]. Accessibility and convenience are an overall assessment of the following factors: share of commuters who use public transit, average commute time for transit users, Transit Connectivity Index, jobs accessible within a 30-minute transit commute, peak hours spent in congestion, annual public transport costs, share of commuters who prefer public transit, presence of dedicated rapid bus and rail transport, and airport accessibility by public transit. Secondly, safety and reliability are measured by the following metrics: public transit safety and security events, public transit injuries, and public transit fatalities (all measured per passenger miles traveled). Lastly, public transit resources are measured by the following metrics: public transport system miles per urbanized area population, total public transport vehicles operating in annual maximum service per service area population, average age of public transport fleet, and average lifetime miles per active vehicle. The three subdivision dimensions are used to form an overall score and ranking for public transportation by city[83]. Another appropriate measurement might be the Transit Connectivity Index, which measures connectivity, access to jobs, and frequency of service in a given county[84].

The measures outlined in this subsection serve as illustrative examples for potential metrics to make up the GIS. What is most important is to keep in mind *why* each component was chosen. Physical environment, as a result of residential segregation, influences many social determinants of health measured by the MVI. The MVI, therefore, must be interpreted in tandem

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[82] McCann, Adam. *"Cities with the Best & Worst Public Transportation."* WalletHub. WalletHub, September 10, 2019. https://wallethub.com/edu/cities-with-the-best-worst-public-transportation/65028.
[83] McCann, *Public Transportation*
[84] "Alltransit." Center for Neighborhood Technology, May 17, 2019. https://cnt.org/tools/alltransit

with the GIS - in doing so, it will make clear *why* physical environment must be understood as a fundamental cause of Black maternal mortality.

V. Narrative as Evidence

Before introducing the Maternal Perspectives Form, it is important to further explore the concept of narrative as evidence, as it is an integral component of understanding disparities in maternal health. In the literature review, Davis touched upon narrative briefly, emphasizing its importance given experiences with racism are often occur in intersectional and complex ways, especially in the lives of Black women. In her book, *Black Feminist Thought* (2000), Patricia Hill Collins helps develop these ideas further:

> "…it is important to stress that no homogeneous Black *woman's* standpoint exists. There is no essential or archetypal Black woman whose experiences stand as normal, normative, and thereby authentic. An essentialist understanding of a Black woman's standpoint suppresses differences among Black women in search of an elusive group unity. Instead, it may be more accurate to say that a Black *women's* collective standpoint does exist, one characterized by the tensions that accrue to different responses to common challenges...Since Black feminist thought both arises within and aims to articulate a Black *women's* group standpoint regarding experiences associated with intersecting oppressions, stressing this group standpoint's heterogeneous composition is significant" (28).

Given the explanation offered by Hill Collins, understanding narratives detailing racism and obstetric racism as reflective of common challenges among Black mothers is pivotal. These narratives are personal and individual; they are not indicative of a homogenous Black experience. However, they are suggestive of a group standpoint. Therefore, they are helpful in attempting to dissect and understand how obstetric racism, and racism more generally, are shared challenges facing Black mothers as a demographic. Narratives must be included in the records

available to MMRCs because they are the only means by which the experiences of Black mothers can be told, understood, and represented accurately and in full. Experiences with racism are best captured through the perspective of those experiencing racism, not those attempting to observe it though an external and removed lens. So much is missed when first-person narrative is not accepted as a pertinent means of collecting research and understanding an issue. If MMRCs are to make their decisions based on the reality of a situation, narrative must be included in the information they use to review a case and identify contributing factors to a death.

In *Examining Racism in Health Services Research: A Disciplinary Self Critique* (2020), Rachel Hardeman explains that the present methods for health measurement, tracking, and understanding operates under white supremacist knowledge production:

> Health...researchers have often elevated large quantitative datasets as the penultimate source of objectivity and the source of empirical fact. However, when we apply a public health critical race praxis methodological approach, we see that our methods are fundamentally flawed because they rarely identify, name, and interrogate the influence of white supremacy, the white racial frame, and structural racism. If we know that racism causes health inequities, we must consider both developing better ways to measure systems of inequity and name racism as the central concept that racial categories attempt to measure (778).

In dissecting the racial disparities we see in maternal mortality, racism must be understood as the core concept measured by 'race'. If maternal mortality is measured by racial category, the results are a reflective measurement of racism – not race as a 'biological' category. Race is a socially contracted category, so measurements of it reflect the ways it has operated in society to produce and uphold disparate outcomes.

Therefore, in developing better ways to measure systematic inequity, it is crucial that there is evaluation of whose evidence we consider real[85]. White supremacy deems only some people capable of generating evidence that is considered important and 'scientifically' accurate. "Our long-held belief systems drive the research questions we ask, the methods we employ, and the interpretation of our research findings"[86]. Narrative as evidence, when it comes to Black maternal mortality, is understood to exist outside the cannon of 'objective' White research and knowledge production. Therefore, if we are to accept and incorporate narrative as evidence into the records made available to MMRCs, it must first be understood and accepted as real. Currently, most bodies of evidence surrounding Black maternal mortality do not fully authenticate or represent the lived experiences of Black mothers[87]. Therefore, it is important to assess how these bodies of evidence are produced and by whom. And, how they can be reimagined to represent fundamental causes of Black maternal mortality in full.

It is also important to keep in mind historical foundations because their legacies are not always easily discernable in the care provided to Black mothers – only furthering the importance of narrative. In the literature review, Taylor's article, *Structural Racism and Maternal Health Among Black Women,* illustrates that the ways in which care provided to and received by Black mothers is heavily influenced by the evolution of reproductive care as a field. The experimentation of gynecological practices on Black women without consent or proper medical procedure has laid the foundation for current racist foundations and underpinnings in various medical settings, especially that of reproductive care. As stated in the literature review, all present-day instances of abuse and reproductive control developed in slavery-era America when

[85] Hardeman RR, Karbeah J. *Examining Racism in Health Services Research: A Disciplinary Self-Critique*. Health Serv Res. 2020;55(Suppl. 2):777–780
[86] Hardeman, *Examining Racism*
[87] Hardeman, *Examining Racism*

white domination over Black women's wombs sustained the economic system of slavery[88]. The legacy of these historical foundations is still operational in the medical care provided to Black women. However, it is not easily detected in many instances - especially to an MMRC reviewing a case based on records that do not include the firsthand narratives of Black mothers. It is impossible to identify the racist foundations of reproductive care without narratives that directly express how Black women are treated and subsequently feel in medical settings. Historical accounts and evidence might offer insight into the foundations of reproductive care; however, they do not determine how these historical events and practices have continued to influence care provided to Black women. Racism, especially in the founding of reproductive care and its historical legacy, can only be addressed through narrative as evidence. Traditional qualitative data and research might be indicative of some elements of racism experienced by Black mothers, but narrative is the most informative of fundamental causes and the extent to which Black reproductive care continues to operate based on the racism central to its founding.

"Both qualitative and quantitative data can corroborate, dispute, or delineate the practices and policies that create, sustain, and reinforce health inequities...mixed-method analysis...can connect structural factors (e.g., policies) to individual outcomes (e.g., recorded via survey or interview)"[89]. As explained by Adkins-Jackson, without the inclusion of measurements of racism (such as narrative), there is difficulty connecting the way in which structural and interpersonal racism influence individual health outcomes farther down the line. Examinations of qualitative data does not provide an understanding that reflects individual experiences with racism in its

[88] Taylor, *Structural Racism and Maternal Health*
[89] Adkins-Jackson, Paris B. "*Measuring Structural Racism: A Guide for Epidemiologists and Other Health Researchers."* American Journal of Epidemiology, September 25, 2021. https://academic.oup.com/aje/advance-article-abstract/doi/10.1093/aje/kwab239/6375136?redirectedFrom=fulltext.

many forms. For example, qualitative data attempting to discern the health effects of racism most likely will not be indicative of how and why the care provided to Black mothers stems from racist foundations and how, in turn, this racist foundation affects the lived experiences of individuals.

The Survey on Race and Health, created by The Undefeated and The Kaiser Family Foundation "explores the public's views and experiences on the topics of health care, racial discrimination, and the coronavirus pandemic, with a special focus on Black adults, a group that has borne a disproportionate burden of COVID-19 cases and deaths"[90]. Much like maternal mortality, Black communities have been disproportionately affected by the Covid-19 pandemic due to the various ways in which racism affects health. Some of the questions included in the survey asked whether respondents felt it was difficult to find a doctor who shares their background and experience, whether respondents have been personally treated unfairly based on their race while getting healthcare for themselves or a family member in the past twelve months, and whether the healthcare system often treats people unfairly based on their race. Similarly, the survey included questions asking whether the government's pandemic response would be stronger if White people were getting sick and dying at higher rates than people of color and whether they felt confident that coronavirus vaccine development is taking the needs of Black people into account[91]. The following section detailing potential survey questions to include on the MPF is in part inspired by surveys such as The Survey on Race and Health – it is able to capture sentiment, the ways people are treated, and how they have been affected by differential

[90] Lopes Lunna, and Liz Hamel. "*KFF/The Undefeated Survey on Race and Health."* The Kaiser Family Foundation, October 14, 2020. https://www.kff.org/racial-equity-and-health-policy/report/kff-the-undefeated-survey-on-race-and-health/.
[91] Lopes, *Survey on Race and Health*

care overall. However, there will be more open-ended questions included on the MPF to individualize and capture narrative firsthand.

As demonstrated earlier, there is nothing about Blackness, biologically, that is driving Black maternal mortality. Instead, it is the experience of being Black that explains why Black women are at greater risk, even when they live in areas with better physical environment and more protective factors. The experience of being Black before, during, and after pregnancy is best captured, for the purposes of this study, by the Maternal Perspectives Form, to be introduced in the following section. Narratives make clear the challenges, risks, and outcomes posed by obstetric racism and racism experienced over a lifetime. As stated by Davis and Hill Collins, the best way to get at these intersectional experiences with racism, in complex environments, requires that Black women be the ones to share their experiences – doing so in narrative form is the best means of doing so at this time.

VI. Maternal Perspectives Form

MMRCs have no first-hand accounts that detail the experiences of mothers throughout the pregnancy, birthing processes, and post birth periods. Although family or witness interviews can be helpful, they do not offer the firsthand aspect of narrative described earlier by Hill Collins. Experiences, especially those at the intersection of medicine, healthcare, race, and gender, cannot be condensed or easily measured, on an interpersonal or structural level. Nor are they necessarily easily observable or quantifiable. Data, such as vital statistics or medical records, often reflect outcomes but fail to explain causes beyond medicalized conditions. As stated earlier, it is the experience of being Black, not Blackness as a biological phenomenon, that informs adverse health outcomes amongst Black mothers. The experience of being Black is best

captured first-hand. This is central to the argument that narrative must be included in the records available to all MMRCs.

As stated, obstetric racism and racism experienced over a lifetime are pervasive features of medical care for Black women. Racism, as explored in the literature review, can 'get under the skin' to inform health and health outcomes[92]. Obstetric racism, more specifically, can lead to mistreatment, neglect, and a host of other perverse outcomes for Black mothers and their children. Knowing that 1) obstetric racism and racism experienced over a lifetime are prominent features of the care provided to Black women, 2) that these forms of racism (like all others) have negative effects on health and health outcomes, and 3) these experiences with racism and their complexities are best captured through first-hand accounts – it is vital that said accounts are incorporated into the records made available to MMRCs for reviewing processes. If these narratives continue to be excluded, MMRCs will continue failing to make accurate, responsible, and informed recommendations for improvement and eradication of racial disparities in maternal mortality. Aside from occasional secondhand interviews with family members or witnesses, there is quite literally no meaningful or accurate way that obstetric racism is included in records available to an MMRC. Therefore, MMRCs are currently unable to offer recommendations for solutions that address a major fundamental cause of Black maternal mortality. If MMRCs continue to operate with partial information, that does not truly reflect the fundamental causes of Black maternal mortality, their conclusions will be inaccurate and ultimately ineffective.

For this reason, I believe that a standardization and universalization of the Maternal Perspectives Form will help incorporate obstetric racism and racism experienced over a lifetime into MMRCs determination of contributing factors and ensuing recommendations for action. The

[92] Phelan and Link, *Is Racism a Fundamental Cause*

following subsections will explore potential concepts to include on the MPF and potential means for standardization. Much like the GIS, the goal is to illustrate the objective of the form with potential ideas for operationalization.

Ideally, the MPF would be filled out by every pregnant woman in the country at five critical points throughout their pregnancy and birthing experience. These five points of inquiry could potentially be 1st) at some point during the first trimester (1-13 weeks pregnant), 2nd) at some point during the second trimester (13-26 weeks pregnant), 3rd) at some point during the third trimester (week 27-end of pregnancy), 4th) sometime within 2 weeks of childbirth, and 5th) somewhere between four to six months post birth. Although some pregnancy related deaths occur before or sometime in-between any of these five critical points, the goal of the MPF is to gather as much information as possible – one part of the form filled out in the first trimester is better than no information at all. Although dissemination will inevitably fail to be completely uniform and standard, any information in the form of narrative is indicative and informative. Because it won't always be possible to review a death based on all five parts of the MPF, it is important to understand that the goal is not necessarily to create a qualitative, standardized dataset based on these narratives; the goal is to provide MMRCs with more information so that their identification of contributing factors and ensuing recommendations are more reflective of fundamental causes. For this reason, MPFs are not inaccurate or inadequate if a case does not have all five parts completed for review. Some information, in this instance, is better than none at all.

However, standardization is important in the sense that MMRCs will be more effective if all cases they review have at least some completed portions of the MPF included in records available to them. Therefore, it is important to universalize use and dissemination of MPFs.

MPFs can be administered by OBGYNs, primary care practitioners, or nurse-midwives (amongst other specialists or care providers) and uploaded to the Maternal Mortality Review Information Application (MMRIA). The MMRIA is a data system available to all MMRCs, that aims to standardize and organize the information available to a given MMRC. Similarly, in patients' permanent and universal medical records, there should be an indication of which portion of the form the patient filled out last and when their next portion can be administered. Permanent records will not include a patient's answers, only an indication of how far along in the form they are in order to help care providers organize and keep track of progression through the form (especially if portions are administered by different care providers). It is important to note that at this stage the objective is to provide MMRCs with the results of these forms – not care providers, hospitals, or clinics. This must be made clear at the beginning of the MPF; patients are much more likely to answer questions truthfully if they do not fear their care will be affected by their responses.

The MPF is one form made-up of five sections: first trimester, second trimester, third trimester, and two post birth periods. The following subsections will explore each of these five components and their perspective purposes.

1) First Trimester

The goal of the First Trimester section of the MPF is to establish an understanding of a pregnant patient's historical experiences in medical settings, with healthcare more generally, and potentially with discrimination and/or racism. Gathering information that creates foundational knowledge surrounding a patient's background might take the form of questions like: How often do you interact with medical personnel and/or medical settings? Would you characterize these experiences as overwhelmingly positive or negative? Historically, have you felt safe in medical

settings? Historically, have you felt your needs are met in medical settings? Have you felt listened to in medical settings? Have you felt neglected? Have you felt your race influences the quality of care you receive? Have you ever changed care providers because of a negative experience? Have you ever chosen not to make a follow up appointment because of a negative experience with a care provider?

These questions might be asked on a scale of one to ten. For example, when asked about levels of safety and comfort in medical settings, where one is completely safe and ten is extremely unsafe, a patient might answer with an eight based off previous experiences. Later, a patient might report degree to which they believe their race influences quality of care. These questions are not to be interpreted in isolation – examined as a whole, they are indicative and telling. They aim to make clear how racism might influence what a patient expects during a pregnancy in terms of quality of care, comfort, safety, and communication. Hopefully, these questions and their answers can express how past experiences shape the ways a patient approaches medical settings and personnel.

Ultimately, the goal of the First Trimester section is to get MMRCs to begin interpreting a death within a larger context. If MMRCs can gather how and why a patient has been treated poorly, especially if it is in relationship to race, they will then be able to further understand how an adverse outcome might occur later down the line as a result of racism and/or discrimination.

In the literature review, Link and Phelan's piece, *Is Racism a Fundamental Cause of Inequities in Health?* outlined how allostatic load and weathering embody the ways in which stress can affect health. And as stated earlier, the experience of being Black in the U.S. is oftentimes stressful. It gets 'under the skin'; constant and unrelenting adaptation to stress, stemming from experiences with discrimination, take a toll on the body. Knowing that

experiences with racism affect not only health, but attitudes and feelings towards medical settings and personnel, it is crucial that the MPF aims to uncover and make clear these experiences. Therefore, some questions might try to uncover experiences with racism over a lifetime: Do you experience stress at regular intervals? If so, how often? (Answers to this might include daily, weekly, monthly, etc.). Do you feel you have experienced racism (in any form) at some point in your life? If so, can you estimate how often you experience racism? (Answers to this might include daily, weekly, monthly, etc.). Do you feel you experience/have experienced racism within educational, workplace, medical, social, familial, and/or other settings? If so, please circle all that apply. Do you feel your race has affected your ability to get ahead (perhaps with a job or in school)? Do you feel racism is a major obstacle in your life? Answers to these questions might be indicative of weathering, allostatic load, and stress levels – all of which inform preexisting health conditions and overall shape perceptions of medical settings and personnel.

Before moving onto the Second and Third Trimester portions of the form, it is important to note that if a patient is unable to complete the First Trimester portion during the first trimester (either because they do not know they are pregnant yet or for any number of reasons), it is possible for this portion to be filled out in the Second or Third trimester, or even post birth. Because the goal is to bring to light experience occurring over one's lifetime, it is still possible and relevant for this portion to be filled out later in pregnancy. Ideally, a patient is able to fill the form out during the First Trimester so that a) they are able to reflect on their experiences before entering potentially more stressful periods of pregnancy (they might therefore be more aware of experiences with racism throughout the rest of the process if they reflect early on), and b) it will

allow MMRCs to understand where an individual patient is coming from before they interact with medical services and personnel further.

As mentioned in the literature review, it is through both interpersonal and political and socially structured forms of discrimination that stress and its effects have come to define the Black health experience in the U.S. The Frist Trimester portion of the MPF aims to tease out how and to what extent an individual patient has (or has not) been affected by said political and socially structured forms of discrimination through asking about 1) racism experienced over a lifetime, and 2) racism experienced in medical settings.

2) Second and Third Trimester

The Second and Third trimester portions of the form are the same but are to be filled out at two separate times: at sometime during the second trimester and sometime during the third trimester. These sections are made up of the same questions in order to capture the evolving experiences throughout the pregnancy process. Where the First Trimester section of the form aims to provide background information, these two sections will offer information pertaining to experiences during a pregnancy itself. Therefore, it is expected that if obstetric racism is experienced, it is likely that Second and Third trimester portions of the MPF will be reflective of these occurrences.

In the literature review, Davis provided an explanation of obstetric racism as an extension of medical racism which can lead to neglect, disrespect, causing of pain, ignoring of pain, lapses in diagnosis, coercion, and/or performance of medical procedure without consent (among many other harmful outcomes). Oftentimes, pregnancy can be a vulnerable, stressful, and taxing time. It can be traumatic for many women. As these tensions arise, it is important to understand how they are either mitigated by medical settings and personnel or whether medical settings and

personnel are causing or adding to the anxiety and demand of a pregnancy. The Second and Third trimester forms aim to uncover the ways in which pregnant patients are treated during a pregnancy and why.

The following are potential questions to include in these sections of the form that target experiences with obstetric racism: How well do you feel you know your obstetrician? Do you have a midwife? If so, how well do you know your midwife? Do you typically feel comfortable around your health care providers? If not, why? Have you felt neglected at any time throughout your pregnancy? If so, when, by whom, and why do you believe this happened? Have you felt that your pain has been ignored and/or dismissed at any time throughout your pregnancy? If so, when, by whom, and why do you believe this happened? Have you felt comfortable advocating for yourself throughout your pregnancy? If not, why do you believe this is? Do you feel your obstetrician, or other care provider, has coerced you into undergoing certain medical procedures or taking certain medications? Do you feel respected by your care providers? Do you feel your race has influenced the quality of care you have received throughout your pregnancy?

In this section of the form, there are some open ended follow up questions in addition to questions asked on a scale of one to ten. If a patient answers yes, they feel their pain has been ignored (on a scale of one to ten), they are then given the opportunity to explain why they think this is, a scenario exemplifying their feelings, or how often this occurs – for example. The objective of including open ended questions ties back to the primary purpose of the MPF, which is to capture narrative. If the experience of being Black in the United States makes pregnancy more dangerous, we must do our best to capture said experiences. Firsthand accounts detailing experiences and feelings in medical settings is the most accurate and informed way to capture the ways in which anti-Blackness poses a threat to Black maternal health. Open ended questions

allow patients to include this narrative beyond a scale of one to ten, which will ultimately expose the ways in which obstetric racism continues to dominate the Black maternal experience in the United States.

3) Immediate Postpartum

Completed sometime within two weeks of birth, the Immediate Postpartum section looks quite similar to the Second and Third trimester portions of the MPF – however, it includes more questions pertaining to the birthing experience itself. The purpose of including the same questions as seen on the Second and Third portions is because post birth, a patient might be able to reflect on some of these questions as they pertain to the birthing experience specifically (as opposed to the pregnancy process more generally). However, there will be an option for patients to indicate that their answer has not changed in order to avoid straining the patient or requiring them to reflect on or relive traumatic experiences.

In addition to the questions seen on the Second and Third Trimester portions of the from, it is important to include questions tailored to the birthing experience; if pregnancy can be stressful and tense, the actual birthing experience can be a heightened realization of these feelings. For many, it is a time of extreme vulnerability, uncertainty, and fear. Capturing obstetric racism as it pertains to the birthing experience is important, especially given it can be an event already characterized by high stress.

Therefore, additional questions on this portion of the form might look like: Did you feel safe and supported during early and active labor? If not, please explain what made you feel unsafe and/or uncomfortable? Did you obstetrician communicate with you clearly? Did you feel comfortable advocating for yourself during early and active labor? Did you at any time feel coerced into taking medication or undergoing a procedure? If so, please describe the situation.

Did you feel your pain was taken seriously during early and active labor? If not, please explain/describe the situation. Did you feel your bodily autonomy was respected by care providers throughout the birthing experience? If not, please explain. Do you feel you were able to make informed decisions about your birthing process (such as medical interventions, location of birth, and/or types of support)? If you felt you were unable to do so, please explain why this might be. Do you feel your care providers mitigated or added stress to your birthing experience? Do you feel your care providers mitigated pain or made pain worse during the birthing experience? Do you feel your race affected the way you were treated during the birthing process?

Much like other sections of the form, the Post Birth section includes some opportunities for open ended responses, which aims to include firsthand narratives in greater detail than an answer on a scale of one to ten might (although the expectation is that these responses, too are indicative of experience).

4) Removed Postpartum

This fifth and final section of the MPF aims to address postpartum follow up care. It is to be filled out anytime between four to six months post birth. In the literature review, Amy Roeder's article *America Is Failing Its Black Mothers*, discussed the story of Shalon Irving – who, weeks after giving birth, returned to her care providers numerous times with concerns about her health. Ultimately, Irving was told everything was normal. She passed away shortly after. Obstetric racism (and racism in many other forms) is pervasive throughout post birth follow up care. This is a time when patients might feel ignored, wrongfully diagnosed, or that there are lapses in diagnosis, for example. Therefore, it is important to capture how a patient is treated as they recover from birth, especially as potential new complications and conditions arise.

Questions included on this portion of the form might look like: Do you feel your concerns are validated and addressed during postpartum checkups? If not, please indicate the situation/s here. Do you feel comfortable advocating for yourself during follow-up appointments? Do you feel your pain is addressed? If not, please explain. Do you feel relevant medical conditions are adequately addressed? Have you ever failed to make a follow up appointment due to a negative experience with a care provider? Do you feel your race affects the ways you are treated by care providers during follow up appointments?

The combination of these five sections constituting the MPF will provide accurate, first-hand evidence of maternal experiences across all races. It is important to address that the goal of these forms is not for Black mothers (or members of other underrepresented groups) to relive trauma or to do all the heavy lifting when it comes to data collection. For many sections of these forms, there should be opportunities for patients to indicate that their answers have not changed (especially for forms containing the same questions, such as the Second and Third Trimester and part of the Immediate Postpartum section). The hope is that patients can reflect on and express experiences without the process feeling tedious and/or causing harm.

VII. Discussion

The Black-White racial gap in maternal mortality is seen nationwide – it is not an issue specific to any region, county, or state. Instead, it is specific to virtually every county in the country. Therefore, every MMRC must standardize the use of the GIS, MVI, and MPF. These tools will make clear the fundamental causes of Black maternal mortality and how deeply rooted they are in anti-Black racism, law, and policy. I imagine that with these tools, MMRCs might more accurately and frequently list lack of access to resources, environmental factors, discrimination, interpersonal racism, inadequate community outreach, unstable housing, social

support/isolation, and structural racism as contributing factors to a maternal death – especially amongst Black mothers.

Amongst all maternal mortality data, severe bleeding, high blood pressure, cardiovascular complications, and infection are generally accepted as the leading 'causes' of maternal mortality across all races[93]. Yes, these conditions and complications can certainly contribute to and/or cause a death. However, when MMRCs focus solely on medialized causes of death, the issue is twofold: 1) the context which often gives rise to these conditions goes unaddressed, and 2) the ensuing recommendations often target downstream phenomenon focused on specific medical conditions rather than the environment which produces them (whether that environment be one steeped in racism and/or affected greatly by access to and quality of social determinants of health). Yes, some patients are simply predisposed to certain pregnancy related conditions due to genetics. However, it is crucial to understand that nearly all disease outcomes vary by a socially constructed category: race. Diabetes is 60% more common among Black Americans compared to White Americans. Black Americans are three times as likely to die from asthma than their White counterparts. Black Americans develop high blood pressure earlier in life, with much higher levels than White Americans. Despite equal success of cancer treatment across all races, Black men have a 40% higher cancer death rate than their White counterparts. Black women have a 20% higher cancer death rate than their White counterparts[94]. The purpose of including these stark figures is to illustrate that it is racism, not race, influencing health outcomes and ensuing

[93] "Maternal Mortality." World Health Organization. https://www.who.int/news-room/fact-sheets/detail/maternal-mortality.
[94] DeNoon, Daniel J. "Why 7 Deadly Diseases Strike Blacks Most." WebMD. Accessed March 2022. https://www.webmd.com/hypertension-high-blood-pressure/features/why-7-deadly-diseases-strike-blacks-most.

racial disparities. Therefore, as stated earlier, eliminating Black-White racial disparities in health outcomes must focus on the experience of being Black in the United States.

In 2020, The American Medical Association launched a campaign called Release the Pressure, which aims to promote heart health by bringing "together Black women from across America - reminding them to make self-care a priority to improve their heart health"[95]. Part of the campaign focuses on educating Black women when it comes to their blood pressure numbers and their sodium intake. Another area of the campaign targets "ways to stop stress in its tracks"[96]. Heart health can inform preexisting conditions that make pregnancy dangerous and more generally is an important area of focus when it comes to health. However, Release the Pressure exemplifies a downstream approach. Yes, if Black women experience higher blood pressure it is important that there are efforts to address this phenomenon. However, addressing an issue at the level of the individual completely disregards the environment and context which produces individual behaviors and outcomes - as illustrated by Link and Phelan in the literature review. Structural causation of health outcomes, in this case for Black mothers specifically, must be addressed head on. Programs such as Release the Pressure may help individuals, however racial disparities in health outcomes, especially in maternal mortality, will continue to exist if efforts remain focused on downstream intervention. These patterns in health will persist if efforts continue focusing on individual behavior that appears to link certain populations to disease outcomes. Henceforth, for MMRCs to truly fulfill their role, they must identify, examine, and provide solutions to the structural phenomenon at play – not just downstream remedial efforts.

[95] "Release the Pressure - Take the Pledge." Release The Pressure - Take the Pledge. American Medical Association, February 23, 2022. https://releasethepressure.org/.
[96] American Medical Association, *Release the Pressure*

Once MMRCs begin addressing structural patterns at play in Black maternal mortality, recommendations and ensuing attempts to address the issue should increasingly involve Black communities. As stated earlier, out of 49 MMRCs, only 14 require committee membership be reflective of their jurisdiction's demographic composition or that such representation is considered during the selection process of committee members to begin with[97]. Given MMRCs are largely made up of healthcare professionals, such as OBGYNs (obstetrician-gynecologist) and midwives, Black representation is lacking; only 11% of OBGYNs are Black[98] and only about 7% of midwives are Black[99]. However, the CDC emphasizes that, "when making recommendations, the MMRC should have representation from the individual or organization with the authority or responsibility to bring the recommendation to fruition on the MMRC; if not, the MMRC should separately consult with the involved stakeholders to engage them in the recommendation process"[100]. If MMRCs increasingly make recommendations based on contributing factors such as structural racism, there must be present those deemed able and willing to work towards implementation of said recommendations. These people might be part of local or federal government, community organizations, public health organizations, groups focused on Black women's health, and/or groups working towards ending Black maternal mortality (such as the National Birth Equity Collaborative, Black Mamas Mater Alliance, or the Black Maternal Health Caucus – for example). The hope is that Black mothers, families, and communities are given the opportunity to become more involved in the recommendation process and follow through, as remedial efforts focus on the social determinants of health, obstetric

[97] Guttmacher Institute, *Maternal Mortality Review Committees*
[98] "OB/GYN Demographics and Statistics in the US." Zippia, December 14, 2021. https://www.zippia.com/ob-gyn-jobs/demographics/.
[99] "American Midwifery Certification Board 2020 Demographic Report." American Midwifery Certification Board, 2020.
[100] Center for Disease Control, *Pregnancy Mortality Surveillance System*

racism, and racism experienced over a lifetime. Hearing from, working with, and listening to the communities most affected by Black maternal mortality is imperative.

As demonstrated throughout this work, emboldened action targeting racism and geography as fundamental causes of Black maternal mortality can only come to fruition if they are demonstrated to be the fundamental causes. Henceforth, if MMRCs can identify them as so, based on tools used to indicate their harmfulness, the true fundamental causes of Black maternal mortality will be more fully realized in a qualitative sense. Action based on this data would then hopefully address the roots of the issue with resources dedicated to its scope. Preventable maternal mortality, especially amongst Black mothers, must be treated as such – preventable. Black mothers cannot continue dying pregnancy related deaths at rates three to four times higher than their White counterparts. It is unjust and shameful. It is a public health crisis that does not receive the resources and tireless national attention it deserves. The hope is that the Geography Index Score, Maternal Vulnerability Index, and the Maternal Perspectives Form will help in directing efforts towards the fundamental causes of Black maternal mortality, making these efforts much more effective.

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