

Reducing the Risk of Maternal Morbidity and Mortality for Underserved Women

[Simisolaoluwa Olabode](#)¹, [Lana Ruvolo Grasser](#)²

¹Wayne State University, Department of Public Health, College of Liberal Arts and Sciences, Detroit MI, US

²Wayne State University School of Medicine, Department of Psychiatry and Behavioral Neurosciences, Detroit MI, US

<https://doi.org/10.38126/JSPG240112>

Corresponding author: lgrasser@med.wayne.edu

Keywords: health policy; maternal health; health disparities; health equity

Executive Summary: Maternal morbidity and mortality rates have been increasing in the United States. These outcomes are especially devastating for women of color, namely Black women, who are almost three times more likely to die from pregnancy complications, even when accounting for social factors. Disparities also persist for low-income women, veterans, and those in rural environments. To promote maternal health equity, we advocate for the passage of the Black Maternal Health Omnibus Act, which aims to address maternal health disparities for underserved populations. Further, many local and state initiatives can also aid in reducing maternal morbidity and mortality.

I. Introduction

Maternal health refers to the well-being of women during and after pregnancy (“Maternal health” 2023) and is a major indicator of the development of nations. Facets of maternal health include family planning, conception, pregnancy, childbirth, and the postpartum period. On the opposite end of the spectrum is maternal mortality and morbidity. Maternal mortality is defined as pregnancy-related deaths within one year of pregnancy (Creanga et al. 2017, 366). Maternal morbidity is defined as health conditions that are attributed to or complicate pregnancy. The following article details the current state of health policy initiatives towards maternal health, with exemplary models from the city of Detroit and the state of Michigan. In addition, this article outlines novel policy opportunities and provides recommendations.

i. Maternal mortality and morbidity around the world.

Maternal mortality and morbidity are decreasing across the globe in both developing and developed nations (Ozimek and Kilpatrick 2018). In 2016, the World Health Organization (WHO) listed reducing poor obstetric practices (which contribute to a high number of maternal deaths) as its number one priority out of seventeen Sustainable Development

Goals. Among the higher-income countries around the world, maternal morbidity and mortality have been decreasing due to improved access to and quality of health care. This has been facilitated by adoption of either Beveridge or Bismarck systems of care (Wallace 2013, 84). In the Beveridge model of healthcare, utilized by countries like the United Kingdom, Spain, and New Zealand, the government provides healthcare, and the majority of healthcare professionals are designated as government employees. This codifies healthcare as a human right; however, some socioeconomic disparities persist as a small percentage of citizens can afford private healthcare. The Bismarck system of care, used in countries like France, Germany, and Belgium, is a social insurance system financed by employers and employees. The system covers every citizen and reduces the risk of uninsurance or high out-of-pocket costs. Both systems of care have addressed accessibility issues in healthcare, although disparities in access can still persist in rural communities.

ii. Maternal mortality and morbidity in the United States

The United States is the only developed nation where maternal mortality is increasing (Alkema et al. 2016, 462). In fact, both maternal mortality and morbidity have been on a steady incline since 1998 (Hirshberg and Srinivas 2017, 333). This incline, however, is not shared equally across the United States, as rural communities generally have more maternal deaths compared to urban areas (Singh 2021, 29). One such reason for this disparity is healthcare availability. Many hospitals and alternative care settings, including community and academic centers, are located in urban areas, allowing patients quick and easy access to these resources. Suburban communities, while not having the same accessibility to large health centers as urban areas, generally have access to private clinics, depending on the size of the community. Rural areas, on the other hand, lack sufficient healthcare infrastructure, including both facilities and providers. While 20% of Americans reside in rural communities, less than 10% of physicians practice in those communities (Nielson et al. 2017, 363). As well, the quality of care in rural areas is limited. For example, rural non-teaching hospitals have a higher prevalence of postpartum hemorrhage compared to urban hospitals (Kozhimannil et al. 2016). Even when access to healthcare services is available, the lower patient volumes can lead to an increase in the average costs of those services, placing even more financial burden on an already costly experience (Levinson et al. 2023). In addition, maternal deaths in Indigenous rural communities are more prevalent than in White rural communities due to compounding structural inequities (Kozhimannil et al. 2020, 294). Many tribal lands do not have essential services such as clean water, transportation, and sanitation, which contributes to an increased risk of water-related and respiratory illness, and ultimately increased likelihood of maternal morbidity and mortality.

The US healthcare system is also starkly different from the models seen in other countries, especially when it comes to healthcare coverage options. The United States functions under a mixed system of care—in which public health coverage, namely Medicaid and Medicare, coexists with private coverage. Lack of insurance is a significant issue that Medicaid eligibility expansion is attempting to

address. In early 2022, uninsurance rates fell to an all-time low of 8.0% (Lee et al. 2022, 1). There are discrepancies in health outcomes, however, between receiving public or private insurance, and even within private insurance models. For example, one study found that adults eligible for Medicaid had more emergency department visits and fewer outpatient office visits compared to Marketplace-eligible adults, who are eligible for healthcare through the U.S. Healthcare Marketplace (a government-run service for shopping and enrolling in healthcare), potentially reflecting a decrease in preventative care for those with public coverage compared to those with private coverage (Allen et al. 2021). Uninsurance and limited insurance options combined with high preventative care rates greatly impacts one's incentive to seek care due to out-of-pocket costs and increases the likelihood of more costly emergency care. Costs associated with pregnancy and postpartum care average \$18,865, an unaffordable price for most Americans (Rae et al. 2022). Additionally, between-state disparities in Medicaid coverage can impact overall health outcomes. For example, immigrants living in a state with stricter Medicaid coverage restrictions are less likely to receive healthcare than those with less restrictive coverage (Steenland et al. 2023, 238).

II. The impact of bias on maternal mortality and morbidity.

The social determinants of health, which references the social circumstances that influence one's health outcomes (such as income level, education, and socioeconomic status), have a significant impact on maternal health outcomes. For example, birthing people with lower socioeconomic status, including lower income and education level, face worse maternal health outcomes compared to those of higher socioeconomic status. Even accounting for social factors like income and education, Black women are three times more likely to die from pregnancy complications as compared to White women (Creanga et al. 2017). Biases heavily affect health outcomes both interpersonally and structurally. Racism is defined as prejudice, discrimination, or antagonism directed against a person or people on the basis of their membership to a particular racial or ethnic group, typically one that is a minority or marginalized (Caruthers 2018). At the individual, institutional, and structural level,

racism has lasting impacts on one's physical and mental health.

Not only does racism impact overall health, it also affects birthing peoples' ability to access quality and affordable healthcare due to structural disparities in healthcare for which the US system fails to account. As a result, women with no insurance or Medicaid coverage are at higher risk of maternal morbidity and mortality (Wang et al. 2020, 896). Even those women who have insurance, but are underinsured, are less likely to receive important pregnancy and postpartum care (Admon et al. 2021). As if this weren't enough, Medicaid coverage greatly limits which providers one is able to choose. A qualitative study exploring provider preferences among people of color notes an overwhelming preference for providers of color and those with strong empathy and sensitivity (Snyder and Truitt 2019, 480). Receiving care from providers with shared identities, including racial identity, has been shown to improve health outcomes (Grasser and Jovanovic 2022, 1230). However, many see their insurance as a barrier to finding providers with shared identities.

i. The historical basis of health bias

The history of obstetrics and gynecology (OB/GYN) has also impacted minority maternal health outcomes. Many discoveries made in American gynecology have been made through the exploitation of Black enslaved women (Owens and Fett 2019, 1343). James Marion Sims, a physician dubbed the "Father of Modern Gynecology," is just one of many physicians who made his mark by exploiting enslaved women. While he had no formal OB/GYN training, and likely no interest in the field, his treatment option for an enslaved patient with pelvic and back pain later evolved into the surgical treatment of the fistula and use of the speculum (de Costa 2003, 660). This is only one of the many instances where Black women were taken advantage of for scientific gain, something that has not, and would not, occur to the same capacity in White women. Biased and false lines of thinking—that Black women, and other women of color, are inherently less human than White women—have misguided the aforementioned practices and continue to influence women of color's ability to receive quality healthcare today. For example, many healthcare providers hold the false belief that Black people are more pain tolerant. As a result, there is a

disparity between the use of epidural anesthesia between Black and White women during labor (Saluja and Bryant 2021, 271).

ii. Bias leads to mistrust in the US healthcare system

These disparities between the quality of care received by Black women, and other women of color, and White women influences many communities' trust in the US healthcare system. Distrust of the American healthcare system only worsens the effects of health disparities, as individuals are less likely to follow the healthcare recommendations of providers and public health practitioners. Interpersonal discrimination also contributes to medical mistrust in minority communities, as assumptions about patients' social history, such as their education level, marital or familial status, and income, impact the quality of care Black women receive. Medical professionals' implicit biases have been an increasingly prevalent issue. Also known as unconscious bias, these perceptions stem from stereotypes and other associations made towards a racial or ethnic group (Chapman et al. 2013, 1505). According to a study measuring bias in doctors, 70% of physicians exhibit a level of implicit bias towards Black and Hispanic patients (Hall et al. 2015, 66). Medical professional sectors, including medical schools, have been addressing this issue by implementing implicit bias training, which teaches healthcare professionals how to recognize and eliminate their own individual biases, as well as how structural racism impacts US healthcare.

iii. Structural racism

Structural racism explains disparities in maternal health above and beyond that of income level, education, or socioeconomic status for Black birthing people (Taylor 2020, 506). Maternal care clinicians, including OB/GYNs, nurses, midwives, doulas, and family medicine practitioners have documented the impact of structural racism in the care of their Black patients (Chambers et al., 2022). An understated impact of structural racism includes the increased surveillance of Black women, e.g., via Child Protective Services and urine toxicology screenings. This is a direct result of implicit bias, as many clinicians note the disproportionate penalties for missing prenatal appointments for Black women as compared to White women. A qualitative study investigating prenatal care quality notes structural barriers, namely transportation and scheduling,

disproportionately affected Black and Medicaid-supported mothers (Coley et al. 2017, 161). Infants born to women of color are also at higher risk of mortality compared to infants born to White women (Jang and Lee 2022, 2). A healthy pregnancy and a healthy mother usually result in a great head start for a child; therefore, as disparities persist in the health of the mother, so do they for the health of the baby.

iv. Trauma and mental health disparities among Black women

Exposure to trauma may also predispose women to pregnancy-related complications, with veteran women being disproportionately affected by stressors such as being separated from support systems, training, long work hours, and of course, military trauma. One common type of military trauma is post-traumatic stress disorder (PTSD), which can increase the susceptibility to pregnancy complications. There are also racial disparities in trauma and PTSD, likely due to the increased stress of structural racism (Roberts et al. 2010, 71). For example, Black female veterans are exposed to trauma at high rates (Powers et al., 2020). The effects of stress, trauma, and resultant psychopathology predisposes women to a variety of physical and mental health conditions that may affect overall maternal health, including cardiovascular and metabolic conditions. In fact, cardiovascular conditions (e.g., heart disease, stroke, and cardiomyopathy) are the leading cause of maternal deaths (Diguisto et al. 2023, 1190). Veteran women are also more susceptible to pregnancy complications such as gestational diabetes and preeclampsia (Horrom 2017).

Finally, the crisis in maternal mental health also disproportionately affects women of color, leading to an impact on their children. Black women have higher instances of perinatal mood disorders, such as postpartum depression and anxiety (Estriplet et al. 2022, 1), both of which are associated with negative parenting factors. For example, children of mothers with maternal depression are at an increased risk of injuries, asthma, malnutrition, and diabetes (Pierce et al. 2019, 356). When mothers and their children are left unsupported, this can also contribute to social dysfunction in the affected child (Mughal et al. 2022). Infants of mothers with depression are 20% more likely to experience

attachment insecurity (Barnes and Theule 2019, 817). Secure attachment is when infants learn about trust and positive communication, and is vital in childhood development. Infants with attachment insecurity are at a higher risk of facing peer rejection and often have low self-esteem (Benoit 2004, 543). As these issues will disproportionately affect Black children, it inherently creates a nonreversible cycle of adversity in the Black community.

III. Current models of improving maternal health outcomes

The city of Detroit provides an exemplary model of health policy efforts to dispel maternal health disparities. For example, the Detroit Health Department's Division of Maternal Child Health has implemented a baby hotline dedicated to directing families to over 200 resources and services within Detroit (e.g., women's health education, postpartum support, home visiting, and health fairs). The Detroit Health Department also offers a volunteer mentor program called SisterFriends, which creates a community for pregnant women to navigate resources and services. Participants of the program, also known as Little Sisters, are matched with a SisterFriends mentor, community health worker, social worker, or nurse that connects them to local resources and provides interpersonal support, as well as education and transportation. SisterFriends mentors commit to aid pregnant women and recently postpartum women (within six months of giving birth) in navigating healthcare barriers. As maternal care issues are especially prevalent in Detroit—a majority-minority city—a community of women intended to achieve healthy pregnancies is highly sought after.

Furthermore, the Perinatal Research Branch of the NICHD (National Institute of Child Health and Human Development) has been hosted by Wayne State University, an R1 research university in Detroit, for the past thirty-two years. This funding supports both basic science and clinical research to improve maternal and infant health outcomes. Having this branch in Detroit, which has a disproportionate rate of preterm birth (14.5% compared to the state average of 10.4%) provides the city with the opportunity to learn about the root causes of this issue and many others ("2023 March of Dimes" 2023).

More broadly, the state of Michigan also serves as an example of how policy can improve maternal health outcomes. The Michigan Department of Health and Human Services (MDHHS) has outlined the Mother Infant Health and Equity Improvement Plan, put into effect between 2020 and 2023. The plan has established six priorities to reduce maternal health disparities: (1) health equity; (2) healthy girls, women, and mothers; (3) optimal birth spacing and intended pregnancies; (4) full term, healthy weight babies; (5) infants safely sleeping; and (6) mental, emotional, and behavioral wellbeing. The main goal of these priorities is to dismantle the upstream causes of maternal health disparities. To work towards this goal, MDHHS connected citizens to new and existing programs that support women and infants and create additional projects as necessary. In addition, one of Michigan's assistance programs, known as Healthy Moms, Healthy Babies, established through the American Rescue Act of 2021 (H.R.1319), provides one year of postpartum Medicaid coverage that includes benefits such as dental care, substance use care, and behavioral health services. Recent highlights show the expansion of maternal health programming in Michigan, including efforts towards full-term pregnancies and mental wellbeing.

At the federal level, the United States has committed itself to the vision of being one of the safest countries to give birth in. The Surgeon General has called to action many initiatives to improve maternal health outcomes, including an initiative to improve patient safety and accurate data reporting. Most notably, the Surgeon General has recommended additional services for hospitals and health systems, some of which include telemedicine for rural communities and expansion of midwifery and doula services to address patient preference. The Black Maternal Health Momnibus Act (H.R.3305, introduced by Rep. Lauren Underwood; S. 1606, introduced by Senator Cory Booker) provides the legislation necessary to achieve these goals.

IV. Current policy options: The Black Maternal Health Momnibus Act

The Black Maternal Health Momnibus Act supports multi-agency efforts to improve maternal health outcomes for underserved communities. This legislation aims "to end preventable maternal mortality, severe maternal morbidity, and maternal

health disparities in the United States" (H.R.3305 – 118th Congress, 2023). The House Bill currently has 193 co-sponsors, and the Senate Bill, S.1606, currently has 32 co-sponsors, with increasing numbers of co-sponsors enhancing the likelihood that the measures will be brought to a vote and pass with greater certainty. The bill would allocate directed funds to the Department of Health and Human Services, the Centers for Medicare and Medicaid Services, the Department of Housing and Urban Development, and the Department of Transportation to address the social determinants of health affecting maternity care outcomes.

This legislation outlines its goals in eight sections, called Titles, with each addressing a different aspect of the current maternal health disparity landscape. For example, Title III of the bill provides funding to community and grassroots organizations paired with an outreach campaign to encourage eligible organizations to apply. Independent maternity care organizations aim to provide expectant mothers with support as well as direct mothers towards necessary resources like healthcare, housing, and pregnancy/maternal-related educational assistance via community health workers. Organizations with special consideration include programs led by people from demographic groups disproportionately affected by maternal health disparities—such as Black-led organizations—that aim to provide maternal support for disadvantaged populations or offer programs and resources for those disproportionately affected by maternal health disparities. This initiative leverages existing infrastructure with previously established systems of trust and community to maximize impact. As many minority communities have a history of medical mistrust, especially concerning the field of obstetrics and gynecology, ensuring the sustainability of existing community programs will allow women to seek the care and support they need from people they trust. For example, the program SisterFriends, in Detroit, has gained support with former mentors and mentees alike, as well as reputable local news sources. This type of sustainable support for community programs not only improves health outcomes but slowly increases trust in the US healthcare system, resulting in long-term health and economic gains.

Another section of the bill, Title V, also aims to increase trust in the US healthcare system by growing and diversifying the perinatal health workforce, which would make it easier for women of color to seek necessary medical care from preferred providers. As stated previously, the ability to choose providers with similar identities is important for women of color as it allows patients to feel confident that their concerns and questions are taken seriously. The lack of people of color in maternity care fields directly correlates with health outcomes, as structural racism and stressors related to race and culture are easily addressed with a more diverse healthcare team. It is important to note that structural racism inherently impedes efforts in workforce diversity, which has led to majority-white sectors of medicine (Kyerem and Fukui 2022, 1985). Therefore, intentional efforts are required to undo this history of bias in medical care. The Perinatal Workforce Act, part of the Black Maternal Health Omnibus, aims to increase diversity in the perinatal workforce through three actions: 1) requiring the Secretary of Health and Human Services to disseminate guidance for states on the promotion of diverse maternity care teams backed by evidence-based studies on culturally congruent maternity care, 2) funding and scaling up training programs for nurses, midwives, physicians assistants, doulas, and other perinatal health workers, and 3) identifying barriers that prevent women from underserved communities from entering the maternal healthcare workforce and receiving equitable compensation.

Another facet of this bill seeks to improve data collection methods for maternal morbidity and mortality, which is addressed in Title VI and will enhance data on maternal disparities and identify targets for solutions. The bill would require a streamlined process for community organizations to submit data on maternal deaths. Current methods of collecting health data will be reviewed to identify any potential improvements in processes like social or demographic information reporting on electronic medical records, public reporting by hospitals and health systems, and determining cause of death for states without a medical mortality review committee (H.R.3305 – 118th Congress 2023). Having accurate data regarding maternal morbidity and mortality is imperative for research. While social determinants related to maternal health disparities are relatively

known, finding specific correlations between demographic information or underlying conditions and causes of death is a first step towards learning how to improve maternal health outcomes.

As mentioned earlier, supporting maternal mental health improves the infant's overall health, which is the goal of Title VII of the bill. The Maternal Mental Health Equity Grant Program would fund community organizations working to reduce maternal mental health disparities, hospitals or health systems operating in areas with maternal care disparities, or areas with a health professional shortage (H.R.3305 – 118th Congress 2023). As stated previously, there is a vast difference in the quality-of-life between infants whose mother suffers from mental or behavioral health conditions and those who do not. An increase in awareness of this phenomenon, as well as resources to improve these conditions, will have advantageous effects on maternal health outcomes, especially for those who are disproportionately affected by it.

V. Policy recommendations

i. Support the Black Maternal Health Omnibus Act

We recommend that legislators co-sponsor the Black Maternal Health Omnibus Act and vote 'yes' if and when the omnibus bill package or any of its 13 individual bills come to the floor for a vote. We encourage constituents and vested organizations to contact their representatives with the recommendation to co-sponsor and vote yes. Overall, the omnibus bill package aims to use multiple mediums to improve the state of maternal health in this country. It is comprehensive, including efforts towards recruitment of healthcare workers, addressing the social determinants of health of underserved populations, and support of established programs that have gained the trust of communities. More specifically, the Act is composed of thirteen individual bills targeting social determinants of health, extending women, infants, and children (WIC) eligibility, funding community-based organizations, funding maternal health care for veterans, growing and diversifying the perinatal workforce, data collection processes and quality measures to quantify the maternal health crisis, supporting moms with maternal mental health conditions and substance use disorders, improving maternal care and support for incarcerated moms,

investing in digital health tools, promoting innovative payment models to incentivize higher quality care, reducing maternal and infant health risks during public health emergencies, reducing exposure to climate change-related risks for moms and babies, and promoting maternal vaccinations. Passing the legislation as an omnibus bill package only requires a single vote by the legislature to put policies into action regarding the thirteen aforementioned targets. However, omnibus bills may also face substantial pushback due to their size and complexity. Based on our review of the literature, we believe the individual bills to fund community-based organizations that are working to improve maternal health outcomes and promote equity (H.R.3310 / S.2239 - Kira Johnson Act), to grow and diversify the perinatal workforce (H.R.3523 / S.1710 - Perinatal Workforce Act), and to invest in digital tools to improve maternal health outcomes in underserved areas (H.R.5066 / S.1699 - Tech to Save Moms Act) should be prioritized to address some of the most pressing concerns related to maternal mortality and morbidity. The Protecting Moms Who Served Act of 2021 is one example of a successful individual bill from the Momnibus Act that has successfully been passed into law, requiring the Department of Veterans Affairs to implement a maternity care coordination program comprised of community care providers who are trained to support the unique needs of pregnant and postpartum veterans. Reporting on maternal mortality and morbidity among pregnant and postpartum veterans, with a focus on differences in outcomes based on racial and ethnic group, is required by the bill.

It is imperative to combat medical mistrust among women of color. This requires community-based, peer-driven educational efforts targeted towards patients of color and training initiatives to expand the diversity of the maternal healthcare space to ensure that patients of color have access to trusted providers who understand their lived experiences. The Black Maternal Health Momnibus Act provides legislative guidance and fiscal support to improve maternal health literacy and proactiveness amongst women of color. In addition, the bill allocated more funding towards an under-resourced healthcare field, which will help create pipeline programs for a stronger and more diverse perinatal healthcare field.

ii. Implement Implicit Bias Training for Healthcare Professionals

Focused efforts aimed at healthcare professionals and the institutions that train and employ them are necessary to codify the intended results of legislation like the Black Maternal Health Momnibus Act and to ensure its longevity. Educational programs that recognize implicit biases and dispel common medical myths (for example, the myth that Black individuals experience less pain than White counterparts) should be mandatory and routine parts of training and onboarding for healthcare providers. While many hospitals and health systems have implemented implicit bias programs, some common issues have arisen: (1) many implicit bias and anti-racism programs are physician-centered and do not require similar training for nurses, physicians assistants, and technicians and (2) additional training for implicit bias is a passive method of learning. With respect to the first issue, we recommend that nurses, physicians assistants, and technicians also be required to participate in implicit bias programs given their centrality to the patients. With respect to the second issue, recognizing that two-hour implicit bias training is a downstream solution to an upstream problem is a first step. While this training can be successful in making physicians aware of underlying structural issues affecting disadvantaged women's access to care, the gold-standard outcome is whether they incorporate this knowledge into their own practice. Delineating a clear purpose, guidelines, and short- and long-term goals when implementing training is essential to ensure that training is outcome-oriented. We recommend adapting Lingras, Alexander, and Vrieze's (2023) survey on DEI prior to training, immediately following, and annually thereafter to help determine where knowledge gaps or concerns may still exist. Providing an opportunity for patients to provide direct feedback in an anonymized way that ensures their quality of care is not impacted could also help healthcare providers ensure they are successfully incorporating what they learned into their care practices. Additional policies to make all roles in the healthcare team aware of these issues are necessary, including incorporating all hospital roles into anti-bias training. In addition, there has been success in implicit bias and anti-racism curricula in medical school. As an example, Wayne State University School of Medicine kickstarted the

"Healing Between the Lines" curriculum, a course outlining the legacy of redlining and its impact on the lifespan gap in Detroit. We recommend implementing similar programs in other medical institutions, with the assistance of incentives such as grants. An emphasis on these courses in rural medical schools can also help address these disparities in rural environments. Furthermore, the field of medicine and policy sectors, alike, need to analyze alternative solutions to address this issue.

iii. Accurate representation in clinical trials

Policy efforts are required to include women—especially those who are pregnant or of childbearing age—in clinical trials research where appropriate. The historical misstep of treating women as physiologically similar to men has led to a noticeable pattern of adverse drug events in women (McGregor 2020). In addition, the treatment of pregnant women as a protected class has also added to these events. In 1989, the NIH included a policy requiring the inclusion of women in clinical trials. Later, through the NIH Revitalization Act of 1993, these policies were made into law. However, there are still concerns over recruiting a statistically sufficient female participant class to analyze sex differences in results. For example, a previous analysis showed that 64% of federally funded clinical trials did not specify sex differences in their studies (Liu and Mager 2016, 2). Recruitment and retention of more diverse populations for clinical trials starts at the level of the study team. Investigators should build an expert team that is representative of the target community. For example, if the goal is to recruit Black women into a trial testing the efficacy of a maternal health intervention, having members of the research team who are Black women can increase trust and ensure that the unique lived experiences, that only someone from the community would be aware of, can be brought to the table in terms of trial design and implementation. Research teams must then build trust within the community. Research and intervention sites that are meaningful to the community (e.g., sites are easily accessible, close by, and incorporate opportunities for virtual/mobile assessment) should be prioritized for selection. Resources must also be devoted for retention and sharing of data/results, which could include adequate compensation commensurate with time and burden of the study, sharing updates and

findings from the research through flyers, mailers, emails, website updates, etc., and providing opportunities for community members to guide the future directions of the research through feedback listening sessions and participation on community research advisory boards. These actions can be supported by investments from the NIH through the IMPROVE Initiative, that would allocate \$43.4 million towards research on clinical and non-clinical interventions to save lives and promote maternal equity (among other topics related to maternal health and mortality) ("About the IMPROVE"). Specific Requests for Applications (RFAs) from the NIH that set aside funds for awards specifically targeted towards clinical trials serving women, Black and other minoritized women, and maternal mortality and morbidity can also ensure that the goal of accurate representation in clinical trials is achieved.

VI. Conclusion

While pregnancy-related deaths and health complications are decreasing in frequency across most of the world, maternal mortality and morbidity is on the rise in the United States. Black, Indigenous, rural, and other minoritized and underserved women and birthing people are disproportionately at risk for pregnancy-related deaths and health complications. This disproportionate risk is driven, in part, by a compounding series of structural inequities such as access to quality and affordable healthcare, trust and representation in the medical system, and interventions based on research that reflect diverse communities. Other contributing factors also include the historical context of women's health, bias, and mental health disparities. Current models of improving health outcomes include the city of Detroit and the state of Michigan; programs such as SisterFriends Detroit allow mothers to form connections and navigate maternal health resources available in the city. The Black Maternal Health Momnibus Act is a current policy option that takes a holistic, systems-level action to promote maternal health equity through thirteen individual bills targeting maternal healthcare for veterans, digital health technologies to reduce geographic barriers, enhanced training of diverse populations to ensure a representative medical workforce, and other measures in tandem with local and state responses to the crises. Because of these multifaceted solutions to the maternal health crisis, we recommend that

legislators support the Black Maternal Health Momnibus Act.

Policy alone cannot bear the full responsibility. Therefore, it is imperative to support other avenues in achieving maternal health equity. These can include individual-level actions, such as implicit bias training in the workplace, and community-level

initiatives that work towards anti-bias and equity in clinical trial representation. These actions, in combination with support from the nation's preeminent funder of biomedical research, the NIH, are opportunities to undo the history of suppression of people of color and other underserved populations in maternal care and reduce the rates of maternal mortality and morbidity.

References

- "About the IMPROVE Initiative." Eunice Kennedy Shriver National Institute of Child Health and Human Development. Accessed March 13, 2024. <https://www.nichd.nih.gov/research/supported/IMPROVE/about>.
- Admon, Lindsay K., Jamie R. Daw, Tyler N. Winkelman, Katy Backes Kozhimannil, Kara Zivin, Michele Heisler, and Vanessa K. Dalton. "Insurance Coverage and Perinatal Health Care Use among Low-Income Women in the US, 2015-2017." *JAMA Network Open* 4, no. 1 (January 27, 2021). <https://doi.org/10.1001/jamanetworkopen.2020.34549>.
- Alkema, Leontine, Doris Chou, Daniel Hogan, Sanqian Zhang, Ann-Beth Moller, Alison Gemmill, Doris Ma Fat, et al. "Global, Regional, and National Levels and Trends in Maternal Mortality between 1990 and 2015, with Scenario-Based Projections to 2030: A Systematic Analysis by the UN Maternal Mortality Estimation Inter-Agency Group." *The Lancet* 387, no. 10017 (January 2016): 462–74. [https://doi.org/10.1016/s0140-6736\(15\)00838-7](https://doi.org/10.1016/s0140-6736(15)00838-7).
- Allen, Heidi, Sarah H. Gordon, Dennis Lee, Aditi Bhanja, and Benjamin D. Sommers. "Comparison of Utilization, Costs, and Quality of Medicaid vs Subsidized Private Health Insurance for Low-Income Adults." *JAMA Network Open* 4, no. 1 (January 5, 2021). <https://doi.org/10.1001/jamanetworkopen.2020.32669>.
- Barnes, Jennifer, and Jennifer Theule. "Maternal Depression and Infant Attachment Security: A Meta-analysis." *Infant Mental Health Journal* 40, no. 6 (August 15, 2019): 817–34. <https://doi.org/10.1002/imhj.21812>.
- Benoit, Diane. "Infant-Parent Attachment: Definition, Types, Antecedents, Measurement and Outcome." *Paediatrics & Child Health* 9, no. 8 (October 2004): 541–45. <https://doi.org/10.1093/pch/9.8.541>.
- Black Maternal Health Momnibus Act. Bill (2023). <https://www.congress.gov/bill/118th-congress/senate-bill/1606>
- Carruthers, Charlene A. *Unapologetic: A black, queer, and feminist mandate for radical movements*. Boston, MA: Beacon Press, 2019.
- Chapman, Elizabeth N., Anna Kaatz, and Molly Carnes. "Physicians and Implicit Bias: How Doctors May Unwittingly Perpetuate Health Care Disparities." *Journal of General Internal Medicine* 28, no. 11 (April 11, 2013): 1504–10. <https://doi.org/10.1007/s11606-013-2441-1>.
- Coley, Sheryl L., Jasmine Y. Zapata, Rebecca J. Schwei, Glen Ellen Mihalovic, Maya N. Matabele, Elizabeth A. Jacobs, and Cynthia K. Anderson. "More than a 'Number': Perspectives of Prenatal Care Quality from Mothers of Color and Providers." *Women's Health Issues* 28, no. 2 (March 1, 2018): 158–64. <https://doi.org/10.1016/j.whi.2017.10.014>.
- Costa, Caroline M. "James Marion Sims: Some Speculations and a New Position." *Medical Journal of Australia* 178, no. 12 (June 2003): 660–63. <https://doi.org/10.5694/j.1326-5377.2003.tb05401.x>.
- Creanga, Andreea A., Carla Syverson, Kristi Seed, and William M. Callaghan. "Pregnancy-Related Mortality in the United States, 2011–2013." *Obstetrics & Gynecology* 130, no. 2 (August 2017): 366–73. <https://doi.org/10.1097/aog.0000000000002114>.
- Diguisto, Caroline, Pierre-Marie Choinier, Monica Saucedo, Marie Bruyere, Eric Verspyck, Estelle Morau, Marie-Pierre Bonnet, and Catherine Deneux-Tharoux. "Timing and Preventability of Cardiovascular-Related Maternal Death." *Obstetrics & Gynecology* 141, no. 6 (May 3, 2023): 1190–98. <https://doi.org/10.1097/aog.0000000000005176>.
- Estriplet, Tracey, Isabel Morgan, Kelly Davis, Joia Crear Perry, and Kay Matthews. "Black Perinatal Mental Health: Prioritizing Maternal Mental Health to Optimize Infant Health and Wellness." *Frontiers in Psychiatry* 13 (April 29, 2022). <https://doi.org/10.3389/fpsy.2022.807235>.

- Grasser, Lana Ruvolo, and Tanja Jovanovic. "Neural Impacts of Stigma, Racism, and Discrimination." *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* 7, no. 12 (December 2022): 1225–34. <https://doi.org/10.1016/j.bpsc.2022.06.012>.
- Hall, William J., Mimi V. Chapman, Kent M. Lee, Yesenia M. Merino, Tainayah W. Thomas, B. Keith Payne, Eugenia Eng, Steven H. Day, and Tamera Coyne-Beasley. "Implicit Racial/Ethnic Bias among Health Care Professionals and Its Influence on Health Care Outcomes: A Systematic Review." *American Journal of Public Health* 105, no. 12 (December 2015). <https://doi.org/10.2105/ajph.2015.302903>.
- Hirshberg, Adi, and Sindhu K. Srinivas. "Epidemiology of Maternal Morbidity and Mortality." *Seminars in Perinatology* 41, no. 6 (October 2017): 332–37. <https://doi.org/10.1053/j.semperi.2017.07.007>.
- Horrom, Tristan. "Gestational Diabetes and Preeclampsia Rates Higher in Women with PTSD." US Department of Veteran Affairs, April 26, 2017. <https://www.research.va.gov/currents/0417-pregnancy.cfm>.
- Jang, Caleb, and Henry Lee. "A Review of Racial Disparities in Infant Mortality in the US." *Children* 9, no. 2 (February 14, 2022): 257. <https://doi.org/10.3390/children9020257>.
- Kozhimannil, Katy B., Julia D. Interrante, Alena N. Tofte, and Lindsay K. Admon. "Severe Maternal Morbidity and Mortality among Indigenous Women in the United States." *Obstetrics & Gynecology* 135, no. 2 (February 2020): 294–300. <https://doi.org/10.1097/aog.0000000000003647>.
- Kozhimannil, Katy, Viengneese Thao, Peiyin Hung, Ellen Tilden, Aaron Caughey, and Jonathan Snowden. "Association between Hospital Birth Volume and Maternal Morbidity among Low-Risk Pregnancies in Rural, Urban, and Teaching Hospitals in the United States." *American Journal of Perinatology* 33, no. 06 (January 5, 2016): 590–99. <https://doi.org/10.1055/s-0035-1570380>.
- Kyere, Eric, and Sadaaki Fukui. "Structural Racism, Workforce Diversity, and Mental Health Disparities: A Critical Review." *Journal of Racial and Ethnic Health Disparities* 10, no. 4 (August 5, 2022): 1985–96. <https://doi.org/10.1007/s40615-022-01380-w>.
- Lee, Aiden, Joel Ruhter, Christie Peters, Nancy De Lew, and Benjamin D Sommers. "National Uninsured Rate Reaches All-Time Low in Early 2022." Assistant Secretary for Planning and Evaluation, 2022. <https://aspe.hhs.gov/sites/default/files/document/s/15c1f9899b3f203887deba90e3005f5a/Uninsured-Q1-2022-Data-Point-HP-2022-23-08.pdf>.
- Levinson, Zachary, Jamie Godwin, and Scott Hulver. "Rural Hospitals Face Renewed Financial Challenges, Especially in States That Have Not Expanded Medicaid." KFF, February 23, 2023. <https://www.kff.org/health-costs/issue-brief/rural-hospitals-face-renewed-financial-challenges-especially-in-states-that-have-not-expanded-medicaid/#:~:text=Among%20other%20challenges%2C%20rural%20hospitals, facilities%20to%20offer%20specialized%20services>.
- Lingras, Katherine A., M. Elizabeth Alexander, and Danielle M. Vrieze. "Diversity, Equity, and Inclusion Efforts at a Departmental Level: Building a Committee as a Vehicle for Advancing Progress." *Journal of Clinical Psychology in Medical Settings* 30, no. 2 (September 16, 2021): 356–79. <https://doi.org/10.1007/s10880-021-09809-w>.
- Liu, Katherine A., and Natalie A. DiPietro Mager. "Women's Involvement in Clinical Trials: Historical Perspective and Future Implications." *Pharmacy Practice* 14, no. 1 (March 6, 2016): 708–708. <https://doi.org/10.18549/pharmpract.2016.01.708>.
- MarchofDimes. "2023 March of Dimes Report Card for United States." March of Dimes, 2023. <https://www.marchofdimes.org/peristats/reports/united-states/report-card>.
- "Maternal Health." World Health Organization, 2023. https://www.who.int/health-topics/maternal-health#tab=tab_1.
- McGregor, Alyson. *Sex matters: How male-centric medicine endangers women's health and what we can do about it*. London: Quercus, 2021.
- Mughal, Saba, Yusra Azhar, and Waquar Siddiqui. "Postpartum Depression." National Center of Biotechnology Information, October 7, 2022. <https://www.ncbi.nlm.nih.gov/books/NBK519070/>.
- Nielson, Marci, Darrin D'Agostino, and Paula Gregory. "Addressing Rural Health Challenges Head On." *Missouri Medicine* 114, no. Sept/Oct 2017 (2017). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6140198/>.
- Owens, Deirdre Cooper, and Sharla M. Fett. "Black Maternal and Infant Health: Historical Legacies of Slavery." *American Journal of Public Health* 109, no. 10 (October 2019): 1342–45. <https://doi.org/10.2105/ajph.2019.305243>.
- Pierce, Matthias, Holly F. Hope, Adekeye Kolade, Judith Gellatly, Cemre Su Osam, Reena Perchard, Kyriaki Kosidou, et al. "Effects of Parental Mental Illness on Children's Physical Health: Systematic Review and Meta-Analysis." *The British Journal of Psychiatry* 217, no. 1 (October 15, 2019): 354–63. <https://doi.org/10.1192/bjp.2019.216>.

- Powers, Abigail, Briana Woods-Jaeger, Jennifer S. Stevens, Bekh Bradley, Misti B. Patel, Andrea Joyner, Alicia K. Smith, Denise J. Jamieson, Nadine Kaslow, and Vasiliki Michopoulos. "Trauma, Psychiatric Disorders, and Treatment History among Pregnant African American Women." *Psychological Trauma: Theory, Research, Practice, and Policy* 12, no. 2 (February 2020): 138–46. <https://doi.org/10.1037/tra0000507>.
- Rae, Matthew, Cynthia Cox, and Hanna Dingel. "Health Costs Associated with Pregnancy, Childbirth, and Postpartum Care." KFF, July 12, 2022. <https://www.kff.org/health-costs/issue-brief/health-costs-associated-with-pregnancy-childbirth-and-postpartum-care/#:~:text=It%20finds%20that%20health%20costs,by%20the%20type%20of%20delivery>.
- Roberts, A. L., S. E. Gilman, J. Breslau, N. Breslau, and K. C. Koenen. "Race/Ethnic Differences in Exposure to Traumatic Events, Development of Post-Traumatic Stress Disorder, and Treatment-Seeking for Post-Traumatic Stress Disorder in the United States." *Psychological Medicine* 41, no. 1 (March 29, 2010): 71–83. <https://doi.org/10.1017/s0033291710000401>.
- Saluja, Bani, and Zenobia Bryant. "How Implicit Bias Contributes to Racial Disparities in Maternal Morbidity and Mortality in the United States." *Journal of Women's Health* 30, no. 2 (February 1, 2021): 270–73. <https://doi.org/10.1089/jwh.2020.8874>.
- Singh, Gopal K. "Trends and Social Inequalities in Maternal Mortality in the United States, 1969-2018." *International Journal of Maternal and Child Health and AIDS (IJMA)* 10, no. 1 (December 30, 2020): 29–42. <https://doi.org/10.21106/ijma.444>.
- Snyder, Cyndy R, and Anjali R Truitt. "Exploring the Provider Preferences of Multiracial Patients." *Journal of Patient Experience* 7, no. 4 (May 27, 2019): 479–83. <https://doi.org/10.1177/2374373519851694>.
- Steenland, Maria W., Rachel E. Fabi, Meghan Bellerose, Arielle Desir, Maggie S. White, and Laura R. Wherry. "State Public Insurance Coverage Policies and Postpartum Care among Immigrants." *JAMA* 330, no. 3 (July 18, 2023): 238. <https://doi.org/10.1001/jama.2023.10249>.
- Taylor, Jamila K. "Structural Racism and Maternal Health among Black Women." *Journal of Law, Medicine & Ethics* 48, no. 3 (2020): 506–17. <https://doi.org/10.1177/1073110520958875>.
- Wallace, L. S. "A View of Health Care around the World." *The Annals of Family Medicine* 11, no. 1 (January 1, 2013): 84–84. <https://doi.org/10.1370/afm.1484>.
- Wang, Eileen, Kimberly B. Glazer, Elizabeth A. Howell, and Teresa M. Janevic. "Social Determinants of Pregnancy-Related Mortality and Morbidity in the United States." *Obstetrics & Gynecology* 135, no. 4 (April 2020): 896–915. <https://doi.org/10.1097/aog.0000000000003762>.

Simisolaoluwa Olabode (she/her) is a second-year undergraduate student majoring in Public Health, with a minor in Medical Humanities. As a Wayne Med-Direct scholar, Simi aims to pursue a career in medicine and public service through policy. Simi is a member of the National Science Policy Network's chapter at the Wayne State University campus, Science Policy-Detroit.

Lana Ruvolo Grasser, Ph.D. (she/her) is a translational neuroscientist who uses neuroimaging and psychophysiological measures to study posttraumatic stress, irritability, anxiety, and their treatment in youth. She received her BS from Michigan State University and her Ph.D. from Wayne State University. Dr. Grasser received the 2022 International Society for Developmental Psychobiology Dissertation Award for her work titled, "Biomarkers of Risk and Resilience to Trauma in Syrian Refugee Youth". She is also passionate about science policy and advocacy, is a member of the National Science Policy Network, and was the 2022-2023 ACNP/AMP BRAD fellow.

Acknowledgements

Thank you to Dr. Hilary Marusak, Mr. James Williams, and the SciPol Detroit group at Wayne State University for their support to engage in science policy and advocacy training.