BLACK MOTHERS MATTER: EVALUATING RACIAL DISPARITIES AND ADVANCING MATERNAL JUSTICE IN TEXAS AND THE UNITED STATES

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ABSTRACT

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Title: Black Mothers Matter: Evaluating Racial Disparities and Advancing Maternal Justice in Texas and the United States

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African American women experience a disproportionate burden of severe maternal mortality cases in the United States, an issue that is particularly magnified in the state of Texas. However, maternal mortality makes up only a small percentage of severe morbidity cases, in which women experience potentially life-threatening complications during pregnancy or delivery. Examining cases of both severe morbidity and mortality could paint a clearer picture of maternal health in Texas that additionally takes into consideration a woman's health before and after her pregnancy, as well as the sociodemographic context within which the pregnancy takes place, thus providing a better explanation for why Black women suffer from such poor maternal outcomes. My thesis reviews the current literature on adverse obstetric outcomes as they vary by race/ethnicity, considers the behavioral, social, environmental and access determinants within the context of race, and examines the extent to which public policy directly or indirectly affects maternal health within certain populations. Furthermore, while questions of access at the broader policy level have been discussed extensively, relatively little attention has been devoted towards the value of community-based resources and local, nongovernmental initiatives in improving maternal health outcomes. Thus, another component of my thesis involves in-depth interviews with Austin-area health providers such as OB/GYNs, midwives, and nurse practitioners, pinpointing trends that could explain racial differences in maternal outcomes as well as best practices at the provider and policy levels that can work to reduce racial/ethnic disparities in maternal mortality and morbidity.

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INTRODUCTION

The health of a nation can be reflected in the health of its women, and in this regard, the United States is performing quite poorly. With a reported 21 maternal deaths per 100,000 live births in 2010, the U.S. maternal mortality ratio (MMR) was on par with Iran and Hungary, and higher than most other developed nations.[1] Moreover, according to a recent study published by the American Congress of Obstetrics and Gynecology, the national MMR has risen to 28 maternal deaths per 100,000 live births, despite expansions to reproductive health care access following the Patient Protection and Affordable Care Act.[2] While the increase in maternal mortality is at least partially attributable to more detailed death certificates and better procedural methodology to discern the cause of death, it cannot explain why Black mothers in the U.S. are 3 to 4 times more likely to die from a complication compared to White mothers, nor why this racial disparity continues to widen.[3]

However, because maternal mortality is a relatively rare event, it is also important to consider cases of severe maternal morbidity (SMM), or "near-miss", in which a woman undergoes an acute, potentially life-threatening event during the course of pregnancy or delivery that could result in long-term consequences for her health. Examining cases of SMM not only strengthens statistical analyses and reveals more generalizable trends, but also paints a clearer picture of the status of maternal health in the United States, calling for a thorough examination of the socioeconomic and environmental conditions in which a woman's pregnancy takes place. Not surprisingly, Black-White disparities persist at the level of SMM as well as other less severe pregnancy complications, with Black women at the greatest risk for many of these adverse obstetric outcomes.[4]

The first section of this thesis will briefly examine the medical, social/behavioral, and environmental risk factors for adverse obstetric outcomes, as well as their presence and influence within Black communities. These include: (1) chronic or preexisting medical conditions such as obesity and hypertension, negative health behaviors such as smoking and substance abuse, (2) sociodemographic factors such as pregnancy intendedness and partner support, and (3) health care access variables such as family planning, prenatal care utilization, postpartum follow-up, and quality and type of obstetric care.

Although the higher prevalence of maternal mortality, SMM, and pregnancy complications in Black women have been thoroughly characterized in the literature, the pathways contributing to these disparities have not been well explored. Thus, the second section of my thesis consists of a systematic review of recent literature examining how Black race modifies the complex relationships between the above-mentioned risk factors and adverse maternal outcomes. This review has two goals. The first is to evaluate whether there is any evidence that racial/ethnic disparities in adverse outcomes are associated with particular risk factors that occur more commonly among Black women compared to women of other races and ethnicities. The second goal is to identify any significant gaps in knowledge in the field and propose areas for further study, identifying any need for targeted prevention and intervention strategies to benefit the most vulnerable patient subpopulations.

According to MacDorman and colleagues' 2016 study, maternal death rates in Texas doubled from 2010 to 2011, the highest increase of any single state.[5] Thus, the third, and final, section of this thesis shifts emphasis to explore how the broader themes discussed in the prior two sections inform trends in adverse maternal outcomes within the state of Texas, as well as how local and statewide policies, initiatives, and resources contribute to or reduce racial

disparities in adverse maternal outcomes. Within this section, I examine how legislative policies within our state have affected barriers to maternal care in the recent years, and whether unmet needs within certain demographic groups have shifted to explain higher rates of maternal mortality and morbidity. I intend to draw comparisons in resources and accessibility between Texas and other states, drawing upon best practices from other state initiatives. Furthermore, while questions of access at the broader policy level have been discussed extensively, relatively little attention has been devoted towards policy at the local or institutional levels, nor has the potential value of community-based resources been emphasized. Thus, this section will incorporate qualitative interviews from various local health providers, including OB/GYNs, midwives, and nurse practitioners who work in hospitals, clinical settings and perinatal support groups, to hear their perspective on the needs of their respective patient populations.

My thesis ultimately aims to identify unmet needs amongst specific vulnerable groups, to discuss the effectiveness of existing resources in addressing these populations, and, at the local level, to make recommendations for new targeted initiatives within Texas communities, especially by drawing upon model approaches in other states and the perspectives of local providers.

SECTION ONE: Racial Disparities in the Determinants of Maternal Outcomes

Higher incidence of chronic disease, obesity and metabolic disorders

National studies have shown that pregnant women are increasingly presenting with preexisting comorbidities, and that the proportion of pregnant women with chronic conditions such as hypertension, diabetes, and obesity is increasing. These comorbidities can become aggravated during pregnancy, increasing the risk for severe maternal morbidity or mortality, as well as for poor maternal health in the long term. Moreover, there is evidence that Black women bear a disproportionate burden of the growing prevalence of chronic illness.

Four out of five Black women in the U.S. are overweight or obese (BMI>25), a prevalence higher than any other subpopulation.[6] Black women are also more likely to experience excessive gestational weight gain, and to retain excess weight, which can affect subsequent pregnancies.[7] During pregnancy, obesity increases the risk of hypertensive disorders, gestational diabetes, and cardiovascular morbidities. During delivery and labor, obesity is associated with adverse maternal outcomes such as decreased likelihood of successful vaginal birth, and increased Cesarean section rates, infections, thromboembolism, and anesthetic complications.[8]

Hypertensive disorders of pregnancy include chronic, preexisting hypertension, pregnancy-induced or -aggravated hypertension, preeclampsia, eclampsia, and HELLP syndrome (a clinical presentation that includes hemolysis, elevated liver enzymes, and low platelet count). The racial disparities in the incidence of pregnancy-related hypertension and their associated risk of complications or mortality are well-documented. Gestational hypertension can have lasting negative health consequences, significantly increasing the risk of hypertension, cardiovascular disease and stroke later in life.[9] Preeclampsia and chronic hypertension have previously been

shown to be significantly associated with increased risk in maternal mortality, with adjusted odds ratios of 8.1 and 7.7, respectively.[10] Women who develop preeclampsia or eclampsia during pregnancy are at a heightened risk for severe morbidity indicators such as placental abruption, acute renal failure, pulmonary edema, cerebrovascular and cardiovascular complications, and other symptoms that typically accompany preeclampsia and eclampsia.[11] There is evidence in the literature that non-Hispanic Black women experience more severe hypertension, which could be reflective of poor disease management and/or biological differences in disease manifestation.[12]

Like hypertensive disorders, diabetes during pregnancy, or gestational diabetes mellitus (GDM), can be classified as either pregestational or gestational. According to 2010 CDC estimates, Asian/Pacific Islanders and Hispanic women have the highest prevalence of GDM, at 16.3% and 12.1% respectively.[13] In Black women, however, obesity is a better predictor of GDM compared to in other races and ethnicities; in fact, a study estimates at 65% of GDM cases in Black women could be prevented if all were within the normal weight range.[14] This difference may be a reflection of inherent metabolic or genetic variation, but further studies should be done to determine whether interventions targeting the environmental, behavioral and access determinants of obesity within the Black community could significant decrease the prevalence of GDM in Black mothers.

Between 1996 and 2014, the prevalence of diabetes, including pregestational diabetes as well as GDM, increased 102% amongst Black women, the second highest rate after Hispanic women.[15] GDM is associated with increased risk in hypertensive disorders such as preeclampsia, although the nature of this relationship is unclear.[16] GDM, if unmanaged, can progress into chronic type II diabetes and affect subsequent pregnancies and the woman's health in general; this risk is especially high for Black women.[17] However, studies show that physicians rarely

offer diabetes screenings to women after delivery. [18,19] A variety of factors, including insurance coverage, postpartum care utilization, and variation across clinical practices and education affect the availability of screening.[20]

Mental health and substance use

Suicidal behavior is a relatively rare contributor to maternal mortality and morbidity, but a 2016 study by Zhong et al. found that peripartum suicidal behavior nearly doubled between 2006 and 2012, with the highest proportion of increase in young Black women.[21] The prevalence of suicide ideation and suicidal behavior-related hospitalization, however, may be underreported, because the former relies on subjective evaluation and the latter assumes that all women engaging in suicidal behavior are also presenting to the hospital for care. Although cases of maternal mortality by suicide are rare, maternal depression is quite common, and there are significant correlations between pre-existing mental health conditions and pregnancy complications such as toxemia, pre-eclampsia or eclampsia, anemia, gestational diabetes, placenta previa, hemorrhage, and premature labor.[22] Many of the most significant correlates of antepartum depression, such as discrimination, lack of social or intimate partner support, domestic and community violence, unintended pregnancy and stressful life events, disproportionately affect Black women.[23,24] Depressed Black mothers are more likely to experience a higher number of stressful life events within the year of pregnancy, including marital or relationship troubles, unemployment, and financial adversity. The same study found that pregnant Black women are the least likely to seek care for depression compared to other races/ethnicities.[25]

Much of the literature surrounding maternal depression demonstrates its adverse effects on infant health outcomes and subsequent development into childhood, adolescence and adulthood. Research investigating the relationship between maternal depression and pregnancy complications is relatively scarce, most likely because it is difficult to identify a direct pathway by which depression mediates obstetric outcomes. However, antepartum and postpartum depression are associated with a higher propensity for suicidal behavior, alcohol and substance abuse, lower propensity to seek preventive services to manage risks during pregnancy, and poorer health overall, thus increasing the risk for maternal complications and death. Further studies should be conducted to examine the incidence of maternal depression in pregnancy-related hospitalizations across different races/ethnicities.

Prescription drug abuse and overdose, especially that of opioids, is a growing epidemic in the United States, and women with mood/anxiety disorders are disproportionately affected.[26] According to national data, the incidence of antepartum opioid use has risen from 1.2 to 5.6 per 1,000 births between years 2000 and 2009.[27] Women who used opioids during pregnancy are four times more likely to have a prolonged hospital stay and nearly four times as likely to die before discharge.[28] Opioid use during pregnancy is also significantly associated with other indicators of severe maternal morbidity, including increased odds of cardiac arrest (OR= 3.6), placental abruption (OR=2.4), and hemorrhage requiring a transfusion (OR=1.7).[29] Multiple studies have shown that, when controlling for social or behavioral risk factors (e.g. income level, tobacco and alcohol use), Black women are significantly less likely than White women to use opioids.[30,31] Nevertheless, discriminatory practices could lead to inadequate obstetric pain management, foster an inherent distrust of the healthcare system, and discourage Black women to seek their provider's advice in the future. Furthermore, it could encourage women to seek

nonmedical sources for their pain management needs, potentially increasing the risk of abuse and overdose through other routes. Thus, while there is increasing urgency to curtail the growing problem of prescription overdose, it is also important to be mindful of racially biased assumptions and discriminatory practices or policies within the healthcare setting.

Although tobacco and alcohol use during pregnancy is most frequently discussed in the context of negative neonatal and infant outcomes, both behaviors have physiological effects that pose a risk to the mother as well. Cigarette use during pregnancy is significantly correlated with placental abruption, placenta previa, and premature rupture of membranes in pregnant women, all of which complicate a safe labor and delivery.[32,33] Alcohol consumption during pregnancy, likewise, increases the risk of placental abruption and other placenta-associated syndromes.[34] Although the prevalence of binge drinking behavior before pregnancy is highest in white women, minority women are less likely to reduce binge drinking during pregnancy.[35,36] It is important to emphasize that race/ethnicity itself is not a predictor for maternal alcohol, cigarette or substance use. Rather, the disparate rates can be explained by the multiple burdens and stressors that Black, Hispanic and Native American women experience, including unwanted pregnancy, lack of social support, intimate partner violence, and socioeconomic status, which all contribute to maternal alcohol and tobacco use.[37] Studies indicate that these risk factors tend to cluster together, and since women with these behaviors are often the same ones who delay seeking prenatal care, the risk of morbidity and complications accompanying alcohol and cigarette use is further amplified.

Stress, social support, and structural racism

Although the direct effects of chronic stress on maternal health outcomes are not well researched, there is an abundance of evidence of physiological pathways linking elevated

maternal stress with preterm labor, which in turn puts the mother at higher risk for complications during labor and delivery.[38] Chronic stress can also negatively impact attitudes and perceptions surrounding pregnancy, contributing to lower rates of prenatal care utilization, greater risk of maternal depression, and adverse health behaviors during pregnancy (e.g. tobacco use).[39]

In Black women, the daily stressors that could negatively affect pregnancy are compounded by experiences of institutional, community, and interpersonal racism and discrimination. Stress due community or interpersonal violence, a lack of partner support, and distrust in institutions (e.g. the healthcare system) are also particularly relevant within Black communities.[40] One proposed hypothesis to explain racial disparities in both maternal and infant health outcomes is that this compounded stress contributes to the allostatic load and a persistently heightened neuroendocrine response, which in turn results in poorer overall health and premature aging.[41]

There is evidence that chronic stress precipitated by systemic racism can have transgenerational effects. For instance, maternal stress is correlated with shorter telomere lengths in offspring, which may contribute to aging and disease risk in the next generation. Another study has linked intrauterine stress exposure to a greater predisposition for obesity throughout the child's lifespan, which could in turn complicate pregnancies in adulthood.[42] These transgenerational effects highlight the fact that maternal and child health are inextricably linked, as well as the need to address systemic racism to avoid perpetuating the cycle of adverse maternal health outcomes.[43]

Domestic violence and abuse

In the United States, Black and Hispanic women--particularly those that are young and

unmarried-- experience the highest rate of intimate partner violence (IPV) during pregnancy. IPV may consist of any combination of emotional, physical, and sexual abuse, and contributes to severe maternal morbidity and mortality through various routes, including physical trauma, psychological trauma contributing to depression, other mental disorders and poorer overall health, and an increase in adverse health behaviors such as substance use and low utilization of prenatal care.[44] Furthermore, women with abusive partners often are unable to be assertive about their own reproductive health, leading to unwanted pregnancies or sexually transmitted infections that complicate the pregnancy.[45] Women who experience IPV in the year prior to or during pregnancy are more likely to be hospitalized for a number of severe morbidities, including: preterm labor, vaginal bleeding, placenta-associated syndromes, severe vomiting and dehydration, infections, and premature rupture of membranes.[46]

The U.S. Preventive Services Task Force and the American College of Obstetricians and Gynecologists recommend that clinicians routinely screen all women of childbearing age for IPV using standardized screening instruments, which usually consist of 3-5 questions that providers can ask their patients.[47] However, universal screening practices are not widely implemented by primary care or women's health providers, since data from the Pregnancy Risk Assessment and Monitoring System (PRAMS) indicate that half of pregnant women do not discuss IPV with a healthcare professional during prenatal visits.[48,49,50] Black women tend to be screened at a higher rate for IPV, suggesting that providers are aware of the racial disparities in domestic violence rates. However, the issue is not so simple as confiding in a healthcare provider about abuse and then promptly receiving treatment for it. A Black woman's perception of and experience with domestic violence conflates issues of gender with issues of race; their desire to defend their rights and bodies as women is frequently at odds with their desire to shelter the Black

community from institutional racism and the long history of violence targeting Black men.[51] Other factors, such as stigma, fear of isolation from community networks, and a negative perception of the justice system or social services additionally prevent women, especially women of color, from being open with their provider about domestic issues.

Access to and utilization of care

Prenatal Care

Initiating prenatal care earlier during pregnancy leads to better recognition and management of chronic diseases and pregnancy complications that could otherwise increase the risk for severe maternal morbidity and mortality. According to 2011 national survey data, only 63.4% of non-Hispanic Black women initiated prenatal care in the first trimester prenatal care compared to 78.8% of White women, and only 80.8% of non-Hispanic Black women report receiving adequate prenatal care, defined as 80% or more of recommended visits, compared to 86.6% of White women.[52] These trends are even more dramatic in Texas, where despite geographical variations, discrepancies between the numbers of Black and White women receiving prenatal care within the first trimester were as large as 18%.[53] On average, Black women in Texas are the most likely to experience delayed onset of prenatal care, with only 53.3% receiving care in the first trimester in 2014.[54] In qualitative interviews, the barriers to initiation of prenatal care that were most commonly identified by low-income African-American women were transportation and insurance, recognition of signs/symptoms of pregnancy, perceived poor quality of care, negative or ambivalent attitudes towards pregnancy, and psychosocial stressors that could be exacerbated by lack of social support.[55,56] The same studies

identified that a strong patient-provider relationship, respectful clinical staff and culturally sensitive care are the best motivating factors for women seeking prenatal care.

The issue of perceived negative quality of prenatal care could be better understood by examining the extent to which variations among provider practices exist. These variations could impact the quality of care, nature of the patient-provider relationship, degree of patient education and even the types of services or screenings offered to patients. While clinical guidelines recommend that all patients— regardless of race/ethnicity, socioeconomic status, or other demographic characteristics—are offered the same prenatal services, further studies should be done to compare the quality and types of services and screenings offered by clinics based on the demographics of their populations.

During a pregnancy, uninsured women may qualify for Medicaid, CHIP Perinatal, or assistance from a federally funded clinic. However, delays in coverage are a commonly cited issue, because of the time it takes to recognize a pregnancy, and then to complete and process an application. When women experience complications during this time, their only option is to go to an emergency room, which is not only costly for medical institutions but also does not afford patients any long-term solutions for managing a healthy pregnancy.[57] Furthermore, women who are uninsured face another barrier, in that many do not have a primary care doctor who can refer them to prenatal care, especially for those who are pregnant for the first time.

Postpartum Care

The postpartum period is a critical time during which women are recovering from the physical stress of childbirth and coping with the psychosocial stress associated with taking care of a newborn. Postpartum care presents a unique opportunity for providers to re-engage women in conversations on their own health, especially when so much focus during pregnancy centers

on fetal health. In particular, it is the ideal setting to continue conversations initiated during prenatal care regarding birth spacing and provide women with their contraceptive method of choice, to monitor any persisting obstetric complications or risk factors that presented during pregnancy, to refer care for the management of chronic illnesses, and to identify and treat any conditions that commonly emerge during the postpartum period.[58] Moreover, for those whose Medicaid benefits expire after pregnancy, postpartum care can serve as a gateway for transitioning uninsured women to a stable health care plan.

The incidence of severe maternal morbidity during postpartum hospitalizations is increasing, and women are more often being readmitted to the hospital after delivery for potentially life-threatening complications.[59] As with prenatal care, however, racial disparities exist in postpartum care utilization, with Black women being the least likely to present for a follow-up visit.[60] Among women diagnosed with severe preeclampsia, Black women were the least likely to present for follow-up, leading to a higher risk for postpartum complications.[61] Among women diagnosed with gestational diabetes mellitus, Black and Hispanic women had more risk factors for low postpartum care rates, which could lead to poor chronic diabetes management and put them at higher risk for complications in subsequent pregnancies.[62] In one recent study of California's Medicaid program, Black women attended postpartum visits less often, were less likely to receive any form of contraception, and were less likely to receive highly effective contraception during postpartum visits.[63] Many of the barriers to postpartum care are the same as for prenatal care, including a lack of recognition of the needs or benefits of postpartum care, and logistical factors (especially with a newborn) that make it difficult to attend appointments.[64] However, the majority of women also indicate that they would like more health

information about various topics such as chronic disease, pain and discomfort, family planning, breastfeeding, and infant care.[65]

These disparities clearly highlight the need for targeted outreach to promote awareness of the importance of postpartum care, broadening the array of preventive and educational services offered during postpartum visits along with the medical exam, and enhancing access to postpartum care at various levels--whether in the form of provider-led support groups, clinical visits, home visiting programs, or increased medical supervision for high-risk women.

SECTION TWO: Systematic Review of Racial Disparities in Obstetric Outcomes

I. Background and Significance

In the United States, the maternal mortality ratio has risen to 28 per 100,000 live births, and as the rates of maternal mortality increase, the racial disparity continues to widen. Many of these are complex cases, as maternal demographic, lifestyle, health and medical service utilization characteristics form competing pathways that contribute distinctly to maternal outcomes. However, the disproportionate burden that Black mothers face is unacceptable. The purpose of this review is to isolate the various causes and correlates of maternal mortality, severe obstetric morbidity and complications, to evaluate whether race is an independent risk factor for adverse maternal outcomes, or whether it facilitates certain pathways from determinants to outcomes. This line of inquiry will help to identify areas for further study, as well as inform targeted interventions throughout the life-course of the mother to reduce these racial disparities.

II. Methods

The peer-reviewed publications included this literature review were identified via PubMed and Google Scholar searches, with publication dates from 2006 through 2016 (last ten years), using combinations of the following search terms: “maternal mortality/severe maternal morbidity/obstetric emergencies/pregnancy complications”, “racial/ethnic/minority differences/disparities”, and “United States”. MeSH terms and Boolean logic were used in the PubMed database to ensure the most relevant citations. The original search returned 485 publications, of which only 33 met the review criteria. Other publications were excluded based on the following criteria: languages other than English, analysis not restricted to U.S. data, published earlier than 2006 and thus outside the date range, research questions focusing on neonatal/infant outcomes rather than maternal outcomes, controlled trials testing the

clinical/therapeutic efficacy of an intervention. Conference proceedings, reviews and commentaries were additionally excluded. References from the most relevant articles were crosschecked to ensure a comprehensive review.

III. Theoretical Framework

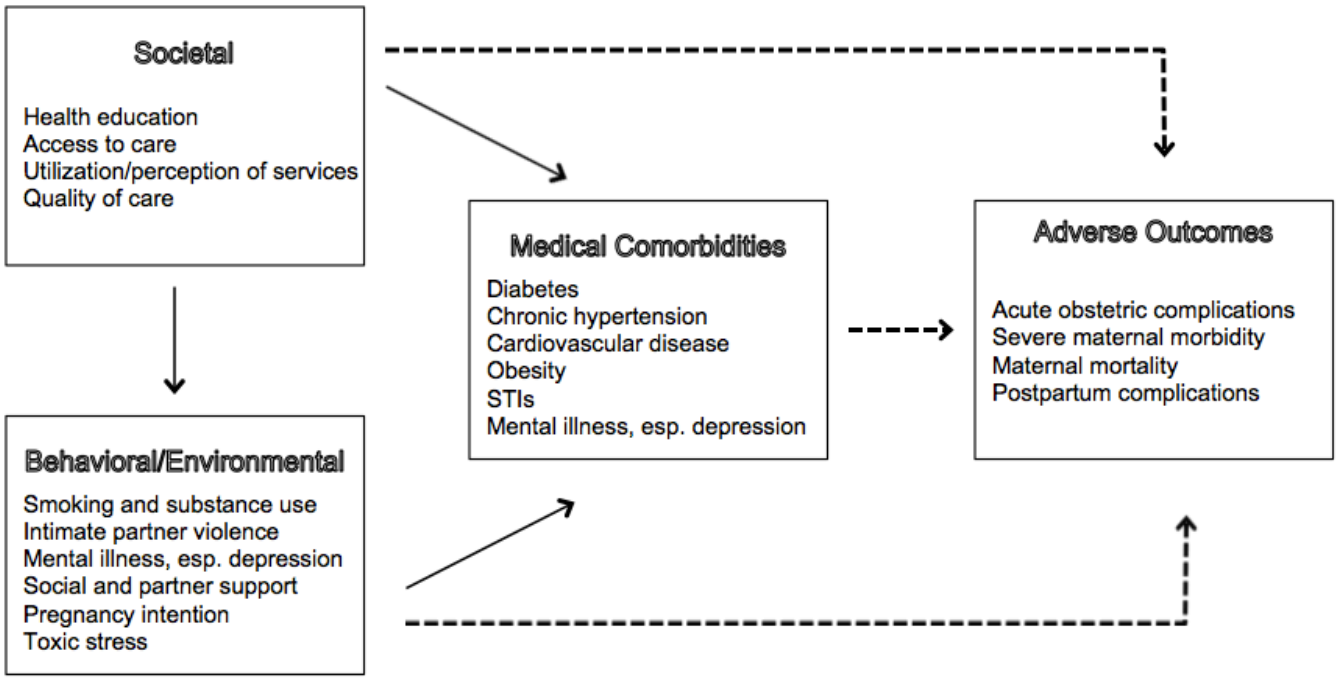

Figure 1. A simplified representation of the pathways between determinants and adverse maternal outcomes. The dotted lines signify the relationships of interest in the literature review.

Maternal outcomes are difficult to define because they vary by degree of severity and time of onset relative to the course of pregnancy. For the purposes of this review, the definition of maternal outcomes is limited to three categories: (1) Maternal mortality; (2) Severe maternal morbidity (SMM) and/or maternal near-miss; and (3) acute obstetric complications. The Centers for Disease Control and Prevention defines maternal mortality as any death arising from pregnancy-related complications or aggravations within one year of gestation. Whether or not a case is considered SMM or near-miss varies depending on clinical protocols or the study itself, so for this category, only publications that specifically defined cases as "severe maternal/obstetric morbidity", "near-miss", or some other phrase indicating a high mortality risk

for the mother are included. Acute obstetric complications are defined as those arising directly as a result of pregnancy, which could heighten the risk of categories (1) and (2) or have lasting implications for the mother's health, but vary by degree of severity.

The adverse outcomes most commonly identified in the literature were: preterm birth, gestational diabetes, preeclampsia, premature rupture of membranes, placenta-associated syndromes such as placenta previa and placental abruption, anesthesia complications, emergency Cesarean delivery, postpartum hemorrhage, perineal trauma, sepsis, peripartum cardiomyopathy, and thrombotic embolism. Since the consequences of preterm birth for maternal health are not as well characterized as their implications for infant health, however, I chose to exclude it from the outcomes examined.

The emphasis of this review is to evaluate how social, behavioral, environmental, and access determinants influence maternal outcomes, and whether these effects vary across racial groups. "Determinants", for the purposes of this review, refers to any condition--whether medical, behavioral, or social--that precedes, and exerts a direct or indirect effect on, the three categories of "maternal outcomes" defined above. Accordingly, the review categorizes publications based on their determinants of interest rather than their outcomes of interest. The review additionally excludes publications that solely highlight racial disparities in the prevalence of certain outcomes without examining potential correlations with the above-mentioned determinants, or those that solely quantify racial disparities in the prevalence of determinants for adverse maternal outcomes. These disparities are discussed more extensively in Section One above, through a selection of the most recent and highest quality literature.

IV. Review of the Literature

Teen Pregnancy

Adolescent pregnancy is associated with higher rates of hypertension, severe anemia, and sepsis.[66,67] Among racial/ethnic groups in the United States, non-Hispanic Blacks have the second highest rates of adolescent pregnancy, with 39 per 1,000 births.[68] However, a 2013 study by Penfield and colleagues found that Black teens had lower rates of pregnancy complications than their White counterparts.[69] There is very limited recent literature evaluating how adverse maternal outcomes in adolescent pregnancies vary by race; most of the studies focus on how teen pregnancy affects the infant, examining outcomes such as preterm birth and low birthweight.

Site-Based Variations in Quality of Care

In their 2016 study of nationwide trends in maternal mortality, Moaddab and colleagues (2016) concluded that "although Washington DC has the highest maternal mortality ratio in the nation, non-Hispanic white patients in this district have the lowest mortality ratio in the United States. Excellent care is apparently available but is not reaching all the people."[70] This implication--that access to preventive resources and quality care are extremely concentrated amongst White patient populations--seems to be a persistent and pervasive trend across the country. Howell and her colleagues (2016) found that hospital performance varies widely in New York City, and that Black women are more likely to deliver in hospitals with poorer obstetric outcomes.[71] A study by Howell et al. using national patient data similarly found that hospitals serving predominantly Black patients tend to have the highest risk for poor maternal outcomes and share certain characteristics such as urban location, high delivery volume, and teaching hospital status.[72] Creanga et. al. pooled together data across 7 states, and found that predominantly Black-serving hospitals performed worse on most delivery indicators than

predominantly White- and Hispanic-serving hospitals.[73] Researchers estimated from the New York study that, if Black mothers delivered at the same hospitals as White mothers, there would be a 47.7% decrease in severe morbidity cases in the former group.[74]

Prenatal Care Access

Maternal mortality is significantly correlated with having fewer prenatal visits.[75] Racial disparities in prenatal care access has been widely discussed in the literature, with African-American women experiencing lower rates of prenatal care utilization and higher rates of delayed initiation of care, compared to women of other races and ethnicities.[76] However, Healy and colleagues (2006) found that women of racial/ethnic minorities experienced more pregnancy complications than White women, although all 35,529 pregnancies reviewed had first-trimester initiation of prenatal care.[77] This indicates that factors beyond prenatal care contribute to a greater risk for pregnancy-related complications in Black women, or that the quality of prenatal care varies widely across different patient populations. To date, there has been little analysis on the correlation between delayed initiation of prenatal care and acute pregnancy-related complications that contribute to severe maternal morbidity and mortality.

Variations in Obstetric Procedures Provided

Mode of Delivery

Cesarean delivery can be a life-saving procedure when vaginal birth poses a significant risk to either mother or infant. However, because of the invasive nature of the procedure, it can also heighten the risk of maternal complications such as severe hemorrhage, and/or negatively affect subsequent pregnancies. Huesch and Doctor (2015) determined that African American women were significantly more likely to undergo both scheduled and emergency C-sections, although there was no significant difference across race/ethnicity lines for repeat Cesareans.[78]

Creanga and colleagues demonstrated, in their 2015 study, that Black women are more likely to experience severe morbidity and complications as a result of Cesarean section.[79]

Moreover, C-sections during first birth are known to increase the risk of subsequent preterm deliveries and severe maternal morbidity.[80] Black mothers, for instance, are twice as likely to suffer from a postpartum VTE after C-section delivery (Abbasi 2014), and amongst those with uterine atony, more than twice as likely to suffer from hemorrhage-related morbidity.[81,82] Several studies (Edmond et al 2013, Washington et al 2012, Kabir et al 2005, Braveman et al 1995) have found that among primiparous women (first time giving birth), Black women are more likely to undergo a C-section earlier in the labor process for contraindications such as fetal distress and failure to progress in labor, and that many of these procedures may be medically unnecessary.[83,84,85,86] Although Braveman et al's and Kabir et al's studies are quite dated, they highlight how the racial disparity in C-section rates has persisted despite medical and technological advancements, clearer contraindications, and more evidence-based hospital protocols.

Women who elect to have a vaginal birth after cesarean delivery (VBAC) have an elevated risk for severe complications such as uterine rupture. Cahill et al. (2008) found that, although Black women are more likely to attempt VBAC and to experience VBAC failure, they are 40% less likely to experience uterine rupture compared to other women.[87] While some findings indicate that Black women are more likely to undergo a C-section than any other race or ethnicity, this study indicates that they are also more likely to undergo a trial of labor when it is riskier to do so.

Mode of Anesthesia During Cesarean Delivery

Regional anesthesia is the preferred method for Cesarean deliveries, since it is associated with a relatively lower risk for maternal death and complications compared to general anesthesia.[88] In an analysis of data from 19 obstetric centers between 1999 and 2002, Butwick et al (2016) found that African-American women undergoing C-section delivery have a significantly higher likelihood of receiving general anesthesia compared to regional anesthesia, even when controlled for other patient characteristics.[89] A Michigan study published in 2007 similarly concluded that African American race is a risk factor for anesthesia-related maternal mortality, although the results were not generalizable due to sample characteristics.[90]

Other Obstetric Procedures

Certain obstetric procedures are correlated with adverse maternal outcomes such as severe postpartum hemorrhage (PPH), perineal laceration, or peripartum infection.[91] There is evidence in the literature that Black mothers are offered or receive different types of obstetric care and therapeutic interventions compared to women of other races/ethnicities presenting with the same condition, although it is unclear whether this variation is due to overt discrimination, implicit bias, anatomical/physiological variations across races/ethnicities, or confounding variables unrelated to race. One study (Harper et al 2007) found that African American women with postpartum hemorrhage were less likely to receive surgical intervention than White women.[92] In a study by Grobman et al (2016), Black women were more likely to receive high-dose oxytocin and general anesthesia for C-section, and less likely to delay pushing or receive as many vaginal examinations during the early stages of labor, compared to any other race/ethnicity. However, Black women did not experience a higher rate of PPH, severe lacerations, or infection compared to other minority women, suggesting a more nuanced relationship between obstetric procedures and severe complications.[93]

Medical Comorbidities

Maternal morbidities such as chronic hypertension, pregestational or gestational diabetes mellitus, pulmonary hypertension, human immunodeficiency virus (HIV), and preeclampsia/eclampsia increase the risk of maternal death during labor and delivery, and more American women are presenting with these medical risk factors than before.[94] Thus, apart from the social, environmental and behavioral factors that predispose African-American women to a higher risk for severe maternal morbidity and mortality, it is also pertinent to evaluate whether racial disparities exist in how acute or chronic comorbidities contribute to these adverse outcomes. Black women bear a disproportionate burden of chronic illness, contributing to a higher number of pregnancy complications and severe maternal morbidity cases in Black women.[95] As seen in Fig. 1, comorbidities can either be conditions that arise during pregnancy, such as preeclampsia, gestational diabetes, and ectopic pregnancy, or preexisting conditions such as obesity, hypertension, diabetes, or STIs.

Obesity

Obesity has been shown to be significantly present in cases of maternal mortality. Harper et al's 2007 study found that, among women diagnosed with either pregnancy-related hypertension, puerperal infection, or hemorrhage, African American women with these conditions were more likely to be obese.[96] Similarly, Halloran and colleagues (2012) found that obese Black teenagers were more likely to suffer from postpartum hemorrhage than their White peers.[97] However, Marshall et al (2014) failed to find differences in the prevalence of cesarean delivery or preeclampsia between obese African-American and obese Caucasian women. In fact, obese Caucasian women appeared to have a greater relative risk of developing preeclampsia compared to normal weight peers than obese Black women.[98]

Ectopic Pregnancy

Creanga et al (2011), examining national death certificates from 1980 to 2007, found that Black women were 6.8 times more likely to die of an ectopic pregnancy than White women.[99] Creanga published a later study with data from 2006 to 2010 that yielded a similar conclusion.[100] Stulberg and her colleagues (2016) analyzed data exclusively from Medicaid beneficiaries, and found that even within women of similar economic means, ectopic pregnancies meant a higher risk of severe complications for Black women than any other race or ethnicity.[101]

Hypertensive Disorders of Pregnancy

Shahul and colleagues (2015) aimed to compare the different degree of effects that preeclampsia and eclampsia have on maternal outcomes depending on the mother's race or ethnicity. They found that, compared to White women with preeclampsia/eclampsia, Black women were more likely to suffer from in-hospital mortality as well as severe maternal complications including cardiac arrest, acute respiratory distress syndrome, pulmonary edema, pulmonary embolism, congestive heart failure, peripartum cardiomyopathy, and mechanical ventilation.[102] Acosta et al (2013) evaluated differences in patient characteristics for the progression from uncomplicated sepsis to severe sepsis, finding that Black women had significantly increased odds of progressing to severe sepsis, and that preeclampsia increases the risk of progression to severe sepsis.[103]

Lo et al. (2013) found that African-American women have a higher risk of mortality from hypertensive disorders of pregnancy compared with any other race/ethnicity.[104] This is often assumed to be due to a higher prevalence of more severe hypertensive disorders amongst the Black population, especially since obesity rates are highest among Black women. However, a 2007 study by Tucker and colleagues (2007) found that while Black women did not have

significantly higher rates of preeclampsia or eclampsia compared to other races/ethnicities, they were 3.3 times more likely to die or suffer a severe complication from preeclampsia, and 3.9 times from eclampsia, compared to White women.[105]

Cardiovascular Conditions

Cardiac complications are significantly correlated with obesity, substance abuse, hypertensive disorders, and advanced maternal age, and some of these factors co-occur more frequently with Black race, resulting in a higher risk for cardiovascular-related obstetric emergencies. Several studies (Schellpfeffer et al 2015, Hameed et al 2015, Small et al 2012, Kao et al 2013) indicate that cardiovascular conditions, including cardiomyopathy, are one of the most prominent causes of maternal mortality and severe maternal morbidity, and that African-American race is a significant predictor for maternal death due to a cardiovascular condition.[106,107,108,109] However, neither of these studies analyze a nationally representative data set-- Schellpfeffer uses Wisconsin data between 2006-2010, Hameed uses California data between 2002-2006, Kao includes data from 6 different states, and Small limited their study to data from the Duke University Medical Center between 2005-2011)--therefore limiting the generalizability of their findings. Strikingly, analysis of population-based data sets revealed that Black women were nearly 16 times more likely than White women to develop peripartum cardiomyopathy (Gentry et al 2010), and 5 times more likely to die from the condition (Creanga et al 2012).[110] A study by Goland et al (2013) found that African American mothers with peripartum cardiomyopathy had distinct clinical characteristics: they were significantly younger, had a higher prevalence of gestational hypertension, were diagnosed more commonly during the postpartum rather than antepartum period, and exhibited poorer recovery and higher mortality compared with White women.[111] Krishnamoorthy and colleagues (2016) similarly found that

African-American women with PPCM were also more likely to have comorbid chronic hypertension and diabetes, which may contribute to their higher mortality rates.[112] Moreover, they concluded that although PPCM is much more prevalent amongst African-American women, Asian women suffer from a higher in-hospital mortality ratio. Nevertheless, because the incidence of PPCM is so much higher in African-American than Asian women (43% compared to 2%), PPCM-related mortality is still a much greater burden for the former group.

V. Conclusion

A common explanation for the racial disparities in SMM and maternal mortality is that Black mothers have a higher prevalence of sociodemographic characteristics or preexisting health conditions that predispose them to a higher risk for complications. However, the studies reviewed here demonstrate that, even after adjusting for patient characteristics that could confound the race variable, these disparities persist.

A few important trends stand out in particular. Firstly, there is significant variation on the performance of hospitals on delivery indicators depending on the predominant racial and ethnic makeup of their patient populations, and hospitals serving mostly Black women tend to perform the worst. These studies suggest that measures should be taken to enhance quality of care in addition to addressing the social and health determinants that lead to poor obstetric outcomes in Black women. However, there are several questions that these studies leave unanswered: Why do women of certain racial/ethnic backgrounds deliver at specific hospitals? Why do such stark discrepancies in hospital performance on obstetric measures exist? How do facility characteristics, physician performance and attitudes, and hospital culture contribute to higher maternal morbidity risk? Understanding these would allow for a more targeted approach to quality improvement in lower-performing hospitals that serve primarily Black patients, thus

reducing the prevalence of severe morbidity and mortality in mothers delivering at these hospitals.

Secondly, evidence in the literature highlights racial disparities in the type and outcomes of obstetric care provided, with findings that Black women are more likely to undergo a medically unnecessary Cesarean delivery, experience more severe complications or mortality during C-section, receive general anesthesia during C-section, and undergo trial of labor when it is riskier to do so. This could be due to limited patient awareness of the risks and medical indications associated with various procedures, and of decreased sense of autonomy in the healthcare setting. One potential area of future study would be how improving health literacy and patient engagement in decision-making affects obstetric outcomes in Black women.

Thirdly, Black women with certain medical comorbidities--including obesity, ectopic pregnancy, hypertensive disorders, and peripartum cardiomyopathy--are more likely to experience severe maternal morbidity or death compared to White women with the same condition and similar patient characteristics.

These results should prompt the consideration of how pathways from disease to outcome are affected by race. Rather than solely focusing on the prevalence of these comorbidities or risk factors in how they are acquired, future research should additionally explore how the type and quality of therapeutic interventions vary by race, the biological, genetic and environmental components of disease progression, and how prepared providers are to recognize these inherent differences and manage their own implicit biases.

Moreover, there is an abundance of literature characterizing the influence that sociobehavioral and environmental factors have on fetal and neonatal outcomes, and many pregnancy complications (e.g. preterm birth, placenta-related disorders) were only studied with

respect to their effects on infant mortality and morbidity. On the other hand, despite evidence linking sociobehavioral factors--including mental health, unintended pregnancy, partner status, and social support--with adverse maternal outcomes, there was a noticeable lack of literature on how these contributed to maternal outcomes differently across racial and ethnic groups.

A few limitations exist in this study. Since this study restricted the definition of "maternal outcomes" to in-hospital obstetric measures, several important indicators of maternal health were excluded as maternal outcomes, including preeclampsia (here defined as a "risk factor" for SMM and mortality) and postpartum depression. Moreover, since the review focuses on outcomes during the narrow window of delivery and labor, it does not consider how pregnancy complications affect the rest of the woman's life, as well as her subsequent pregnancies. Finally, the studies of interest had varying standards for what was considered a risk factor versus an outcome, and defined the severity of complications differently, making it difficult to generalize or compare across studies.

SECTION THREE: Best Practices at the State, Community, and Institutional Levels

The rate of maternal mortality in Texas has grown at an unprecedented rate, nearly doubling between 2011 and 2014. With 35 deaths per 100,000 pregnancies, Texas' rate is the highest in the United States and higher than most developed nations.[113] The racial disparity of maternal mortality in Texas reflects that of the rest of the nation, with Black women in Texas at a three times greater risk for pregnancy-related death compared to women of other races and ethnicities.[114] In response to the troubling statistics, the 83rd Texas Legislature approved the creation of a Maternal Morbidity and Mortality Task Force to study trends in maternal deaths occurring within one year of pregnancy, as well as cases of severe maternal morbidity in Texas. According to the 2016 biennial report jointly published by the Task Force and the Department of State Health Services, the three most common causes of maternal death in the state were cardiac events, hypertensive disorders, and drug overdose, with most deaths occurring 42 days after delivery.[115] In terms of severe maternal morbidity cases, the Task Force found that hemorrhage and blood transfusion cases played a predominant role, and that Black women suffered from hemorrhage at nearly twice the rate of White women (24.4 vs. 13.9 cases per 1,000 hospitalizations).[116] In general, Black women in Texas are the mostly likely to experience at least one severe maternal morbidity indicator during pregnancy, with rate of 41.4 per 1,000 hospitalizations.

As has been demonstrated over the course of this thesis, the issues surrounding maternal health are complex and intersectional, with race serving as a multiplier that enhances the pathways to poor maternal outcomes. The following section will draw together qualitative perspectives from 7 Austin-area providers, findings from the Maternal Mortality and Morbidity Task Force, as well as conclusions drawn from the systematic review (see Section Two), to

evaluate policies, community initiatives, and state programs addressing issues that are particularly salient within Black communities. Each section will examine how specific state programs or benefits are funded in Texas, the barriers to access that minority women face and how existing or potential state policies influences these barriers, and what best practices at the state, community and clinical levels can improve outcomes and reduce disparities.

Methods for Provider Interviews

Semi-structured interviews, each 30-minutes long, were conducted with 7 Austin-area providers, who were invited by email to participate based on recommendations from their colleagues and other interviewed participants. Participants were asked a series of open-ended questions regarding common trends they observed within their demographically diverse patient populations that could contribute to adverse maternal outcomes, with special consideration towards their Black patients. They were also asked to share their insights on current policies and best practices, including promising solutions for eliminating racial disparities in adverse maternal outcomes (See Appendix for the Interview Guide used in their interview).

The participants are comprised of 2 nurse practitioners who are also faculty members at the University of Texas at Austin, 3 OB/GYN and/or reproductive health providers serving predominantly low-income or uninsured patients, 1 OB/GYN at a private woman's health clinic, and 1 prenatal group programs coordinator. Although the sample size is limited, the diversity of the settings in which and patient populations for whom they provide care illustrates a wide range of experiences. The primary goal of these interviews was to gather a qualitative perspective of the community-level maternal care experience—with particular emphasis on Black patient's experiences with the health care system, provider awareness of racial inequities, and available

local resources or unmet need—to explain the racial disparities highlighted in the systematic review.

Policy Focus and Rationale

Following the implementation of the ACA, Texas did not comply with federal Medicaid expansion guidelines, nor has it implemented any extensive state-level policy to expand coverage for its most vulnerable subpopulations. Moreover, Texas has the most stringent Medicaid income eligibility requirements of any state, and as a consequence, contains the highest number of uninsured adults falling under the coverage gap, whose household income also deems them ineligible to receive a federally subsidized health plan.[117] One out of 3 women of childbearing age in Texas are uninsured, and the coverage gap disproportionately affects Black women.[118,119] Accordingly, the state-level policy comparisons and recommendations that follow will largely focus on expanding access to public programs and leveraging Medicaid programs and benefits. By addressing the following priority areas, lawmakers can demonstrate the state's commitment to advancing racial equity in maternal health, and raise standards of care and access for all women in Texas.

Addressing Barriers to Access and Continuity of Care

Access to comprehensive care is critical during pregnancy and the immediate postpartum period, as discussed in Section One. A common theme across the provider interviews was the need to address the fragmented and discontinuous nature of maternal care:

> *"I don't think it's appropriate to stop care [at 60 days postpartum]. You might recognize a problem within those first 60 days, but a new mother has so many things on her plate that she may not be able to get care for any of the conditions that might arise. It's unreasonable to expect mothers to sort of 'get in all the health care they*

can' before their coverage ends, and that's not the kind of mindset [towards health care] we should be promoting anyway." –OB/GYN, private women's health clinic

The discourse and initiatives to improve pregnancy outcomes have increasingly shifted towards a life course approach, since a woman's health status throughout her life can have profound and lasting impacts on both maternal and infant health outcomes:

"The U.S. doesn't place nearly as much emphasis on postpartum and interconception care, compared to other countries that are not just looking narrowly at gynecological issues, but broadly at a woman's health over her life course...especially psychosocial wellbeing after pregnancy. There's a big void [in care] after women give birth, and they are vulnerable to a multitude of behavioral issues like depression, less physical activity, body image issues, high relapse in smoking, etc."

–Maternal and infant health nurse

For this reason, racial disparities in maternal outcomes cannot be properly addressed without considering issues of access and care continuity. This subsection provides an abbreviated view of the healthcare landscape of Texas, considers how issues of fragmented coverage affect women's health, and examines the approaches that other states have taken to address barriers to access.

Insurance Status and Eligibility for State Health Plans

The statewide distribution of health insurance coverage for women of childbearing age is as follows: 56% have an employer-sponsored plan, 7% have a plan purchased directly from the exchange, 11% are covered by Medicaid, and 22% are uninsured, making Texas the state with the highest percentage of uninsured women.[120] Because Texas has not adopted the federal Medicaid expansion under the Affordable Care Act (ACA), it currently has the highest number

of individuals falling into the coverage gap—those whose household income levels make them ineligible for Medicaid but also ineligible to purchase a subsidized plan from the exchange. According to the National Women's Law Center, this means that 687,000 Texas women are left uninsured because of the coverage gap, and the Kaiser Family Foundation found that African-Americans are disproportionately affected.[121,122] Amongst the uninsured, those who are below 203% of the federal poverty level (FPL) are eligible to receive pregnancy Medicaid benefits, and those who are below 207% of FPL can receive CHIP Perinatal coverage. CHIP Perinatal covers all of the benefits that Medicaid for pregnant women does, except for hospital services unrelated to labor/delivery, and tobacco/substance abuse cessation programs. Women who do not qualify for CHIP or Medicaid can receive more limited maternal health benefits through the Department of State Health Services' Expanded Primary Health Care Program (EPHC), as well as clinics funded by the federal Title V grant; however, these do not cover labor/delivery services or postpartum care.[123]

Continuity of Care

Medicaid coverage expires 60 days after pregnancy ends, so women who are left uninsured must find other sources of coverage in order to receive postpartum checkups, continued management of substance abuse disorders and chronic illnesses, and access to contraception and family planning counseling to prevent unwanted subsequent pregnancies. Nearly 60% of maternal deaths in Texas occur after the 42-day mark, suggesting that discontinuity of care during this crucial postpartum period can prove fatal for new mothers. This is especially concerning given that drug overdose was the second leading cause of maternal mortality in the state from 2011-2012, and that 73% of the deaths occurred more than 60 days after delivery.

In 2016, Texas HHSC and DSHS began automatically enrolling women in the Healthy Texas Women program after the expiration of their Medicaid for Pregnant Women coverage, in order to preserve access to necessary services and ensure continuity of care.[124] However, because of distinct income eligibility requirements, not all women who are eligible for Medicaid during pregnancy are eligible for the HTW program. Moreover, because the state cut funding for family planning centers by two-thirds in 2011 and now excludes abortion providers and their affiliates from participating in the HTW program, there are considerably fewer safety-net community health centers offering comprehensive services for those enrolled in Healthy Texas Women, who are predominantly uninsured or underinsured women of color.

Barriers to Enrollment in Medicaid and CHIP

Black women make up only 18% of pregnant Medicaid enrollees in the state, yet this low percentage reflects barriers beyond variations in income eligibility by race. Bureaucratic hurdles can discourage pregnant women of color from applying for public benefits in the first place, especially if they are dealing with a multitude of pregnancy- and nonpregnancy- related stressors at home. Even if they do apply, it can take weeks to months to process the application, and additional time to select and schedule an appointment with an enrolled Medicaid provider, leading to a delayed initiation of prenatal care. More than half of states, Texas included, have adopted "presumptive eligibility" for pregnant women, which allows qualified hospitals and providers to determine whether a patient is eligible (based on household income) to receive immediate short-term benefits while waiting for her application to be processed. Additionally, providers that receive federal Title V funding are required to provide two prenatal visits for women in the process of applying for CHIP Perinatal. However, many pregnant women are unaware of these options, or their provider is not eligible for determining presumptive

eligibility.[125] [126]

Unstable coverage is a significant contributing factor to delayed entry to prenatal care, and therefore delayed management of complications or comorbidities that could lead to life-threatening pregnancy complications.[127] Texas should make it a public priority to develop strategies to promote and facilitate enrollment of eligible pregnant women into Medicaid. This involves: (1) increasing public awareness of the application process, coverage options, presumptive eligibility, and benefits included through media campaigns and targeted marketing strategies; (2) catering outreach efforts to the health concerns commonly faced by pregnant Black women; (3) streamlining the application process by expanding the network and diversity of application assisters; and (4) offering enrollment assistance (or targeting marketing efforts) in public schools, libraries, public transit stations, hair salons, churches, women's shelters, family planning clinics, etc.

Disentangling Issues of Prenatal Care Access

Many have speculated that the statewide spike in maternal mortality could have been exacerbated by severe family planning budget cuts and closure of women's health clinics statewide. However, the hardest hit areas were those near the Southern Texas border and Rio Grande Valley, where existing rural health provider shortages affect mostly Hispanic and Latino communities. The majority of Black communities, on the other hand, reside in urban areas, where state- and federally- funded maternal health services are more concentrated. Moreover, Black women are overall less likely to face language barriers and immigration status issues to the extent that Latinas do. This reality suggests that the issue of provider access may not be the only salient factor within Black communities, and yet data indicate that Black women in general have the lowest rates of prenatal care utilization (see Section Two, Systematic Review).

Thus, issues of coverage of and access to prenatal care must be disentangled from utilization of care, which can be affected by factors like perceived quality, provider trust, and sociobehavioral factors. Texas 2013 data from the Pregnancy Risk Assessment Monitoring System (PRAMS) indicates that 75.2% of Black women surveyed received prenatal care as early as they wanted, even though only 66% of them received prenatal care in the first trimester.[128] The gap in these figures suggests that a significant percentage of Black women do not seek or desire prenatal care in the first trimester. In contrast, 85% of White women both received prenatal care in the first trimester and received prenatal care as early as wanted. While greater barriers to access certainly play a role, historical distrust of the healthcare system--for instance, due to a legacy of forced sterilization and coercive medical practices targeting minorities in the U.S.--and personal experiences of discrimination are also contributing factors.[129]

Several state- and community- based initiatives have proven to be successful in targeting populations that are at risk for late entry to prenatal care. A school-based clinic at North High School in Minneapolis offers comprehensive prenatal care, education, and referrals to its pregnant students, the majority of whom are immigrants or African-American and live in low-income households; these services are provided by a diverse team of professionals including a case manager as well as medical providers.[130] In 2012, Oregon implemented coordinated care organizations (CCOs) as a new approach for delivering care to Medicaid beneficiaries, resulting in a smaller gap in prenatal care quality between private and public payer sources, as well as an increase in the number of Medicaid beneficiaries initiating care within the first trimester.[131] Maryland's State Health Department promotes access and earlier entry to prenatal care by (1) expanding family planning clinics' services to include comprehensive preconception health and assistance with Medicaid eligibility screening, (2) funding perinatal navigation services via

"culturally competent community health workers" who provided individualized guidance to at-risk women of color; and (3) providing temporary Medicaid eligibility to all women for up to 90 days while applications are being processed.[132] In 2014, New Mexico enacted State Bill 69, allotting funding to the Office of African American Affairs for a pilot program to improve infant and maternal health in Black communities.[133] The program uses the Centering Model, where prenatal care is delivered in patient-centered group settings by multiple health professionals (midwives, doctors, nurses, and nurse assistants, etc).[134] Although both Maryland and New Mexico's initiatives were implemented with the goal of reducing racial disparities in infant mortality and morbidity, improving the quality and timing of prenatal care could have positive long-term implications for maternal health as well.

The factors contributing to late entry into prenatal care are numerous and complex. Many women do not recognize the importance of prenatal care in the first trimester, such that the perceived benefits outweigh the logistical and financial barriers that must be overcome to attend a visit. Thus, public awareness regarding the importance of prenatal care can be improved through the use of culturally sensitive multimedia campaigns, and by building upon existing or past health literacy campaigns aimed at pregnant women, such as Zika awareness campaigns. The internet is a particularly useful platform for distributing information about prenatal care, because many women seek advice and support from online forums. Furthermore, information about prenatal care can be disseminated through school health programs, since teens are especially vulnerable to lack of prenatal care. Rather than focusing these informational campaigns on how prenatal care benefits infant outcomes, it may be more effective to emphasize how prenatal care benefits maternal health, because a woman may not yet have fully conceptualized her pregnancy in the early stage. Furthermore, delayed recognition of pregnancy

or ambiguous feelings about the pregnancy can also delay entry to prenatal care. Thus, reducing unintended pregnancy has the potential to improve prenatal care utilization; this is discussed in the following section.[135]

Reducing Unintended Pregnancy

Moadabb et al demonstrated in their 2016 study that a state's maternal mortality ratio is significantly correlated with its unintended pregnancy rate.[136] However, the pathways linking these two factors are poorly defined, and evidence that unintended pregnancy contributes to negative maternal outcomes is inconsistent at best.[137] Nevertheless, reproductive health is the cornerstone of a woman's economic, social wellbeing in addition to her physical and mental health. Thus, from a rights-based perspective, all women should have access to the care and education they need to adequately plan or prevent a pregnancy, whether or not this is reflected in the public health data.

Unintended pregnancy rates remain the highest in Black women across all income levels, suggesting that profound racial inequities exist in access to family planning resources and education.[138] According to Texas 2013 PRAMS data, Black women were the most likely out of any racial/ethnic group to have an unintended, mistimed, or unwanted pregnancy-- 11.7% reported their pregnancy as unwanted, 31.7% as mistimed, and 43.4% as unintended.[139] In response to widespread public criticism following the drastic family planning cuts in 2011, Texas lawmakers have demonstrated, to some degree, a renewed bipartisan interest for contraceptive access, in particular due to its cost effectiveness--for every tax dollar invested in family planning services, an estimated $7.09 in Medicaid spending is averted.[140] State initiatives aimed at reducing unintended pregnancy rates are increasingly focused on expanding access to long-acting reversible contraceptives (LARCs)--which includes IUDs, injections, and implants--due to

their 99% effectiveness rate. However, LARCs remain controversial because they are incorrectly considered by some to be abortifacients, based on the unlikely possibility that IUDs might interfere with fertilization and implantation of the embryo, and are therefore opposed by anti-abortion advocate groups.

For women who have recently given birth, immediate access to postpartum contraception is critical in order to prevent an undesired subsequent pregnancy. There is a demonstrably high unmet need for LARCs as a form of highly effective postpartum contraception. [141] Thus, increasing evidence-based patient and provider awareness of LARCs, facilitating their provision by both public and private, inpatient and outpatient settings, and clarifying reimbursement issues are three key strategies for promoting usage of LARCs and reducing unintended repeat pregnancies.

Currently, fourteen states including Texas have Medicaid policies that reimburse hospitals for immediate postpartum LARC insertions.[142] While the emergence of policies supporting inpatient LARC insertion procedures could eliminate a key barrier to contraceptive access for women who do not have routine access to a physician, several limitations persist. Firstly, opportunities for patient-centered counseling on LARCs in the inpatient setting are limited, because U.S. medical eligibility criteria for contraceptive use specifies that postpartum LARC insertions should only be performed less than 10 minutes after delivery, due to elevated risk of expulsion after 10 minutes and before 4 weeks postpartum.[143] Providers should ideally discuss the full range of contraceptive methods with their patients during prenatal visits, so that LARC methods are not the only options a woman is given. However, prenatal care is not a routine part of every pregnancy, and without comprehensive family planning education for all women, there is the concern that immediate postpartum LARCs could compromise a patient's

autonomy and reproductive freedom, especially in light of abusive and coercive sterilization practices in the past century that have targeted low-income women of color and those with compromised decision-making ability.[144]

Secondly, inpatient sites in Texas are currently poorly equipped to provide postpartum IUDs and implants. Hospital payment systems must be restructured to accommodate billing and reimbursement for LARC counseling, insertion, and removal procedures. Hospital administrations also need to be educated on stocking, billing and reimbursement procedures, and new institutional protocols written to clarify these logistical considerations.[145] Federally funded clinics are eligible to purchase LARCs at a discounted price through the 340B drug program, but eligibility for 340B pricing is limited to federally designated health centers and does not include most hospitals. Consequently, hospitals may face barriers of high upfront costs and concerns of product expiration if they buy in bulk. Furthermore, there is the question of which inpatient providers are qualified to insert LARCs. These providers would need to receive comprehensive training on how to provide contraceptive counseling to patients and evaluate which contraceptive method they prefer, as well as proper practices for the insertion and removal of LARCs.

A third consideration is whether state policies can feasibly mandate that all hospitals offer immediate postpartum LARCs to their patients. Payment systems incentivizing LARC insertions would be problematic because, once again, they introduce the risk of coercive practices targeting disadvantaged groups. Furthermore, some faith-based institutions, such as the Catholic-run Seton Healthcare Family, have taken a stance against the provision of IUDs, which they believe to be abortifacient. Religiously affiliated hospital networks in the state often serve a diverse demographic, including Medicaid beneficiaries. If they opt out of immediate postpartum insertions for religious reasons, a significant number of patients would still be left without the

means to obtain a postpartum IUD, injection or implant.

While immediate postpartum insertions in inpatient settings are currently considered to be a best practice in preventing rapid repeat pregnancies and expanding contraceptive access to those most vulnerable for unintended pregnancy, the value of supporting LARC provision and education in outpatient settings should not be overlooked. Many states have chosen to further support federally funded Title X facilities with state funds and targeted initiatives to promote LARC provision and reduce unintended pregnancy. These have proven especially effective because outpatient family planning service providers already have reimbursement systems in place, and they are equipped to educate women on contraceptive methods and perform insertion and removal procedures. For instance, the Colorado Family Planning Initiative was established in 2009 to provide operational assistance, training, and outreach support for the state's publicly funded family planning clinics, and this enhanced support made it possible for low-income, uninsured women to obtain LARCs free of charge.[146] As a result, the state's teen birth rate dropped by 48 percent and approximately $79 million Medicaid dollars were saved.[147] Since then, other states--including Virginia and Delaware--have followed suit with similar programs intended to increase awareness and provision of LARCs. Motivated in part by the effectiveness of Colorado's LARC initiative in reducing adolescent pregnancy rates, a recently filed bill in the Texas House of Representatives (HB 941) has proposed funding a pilot program that would distribute LARCs through public schools to reduce unintended pregnancy in teens.[148]

In Texas, on the other hand, detrimental cuts to the family planning budget in 2011 and the ensuing widespread closure of outpatient facilities resulted in a 30-35% decrease in the number of women receiving IUD and implants, simply because there were fewer access points for women seeking contraceptives.[149] Although the state has since appropriated more of its

budget towards women's health services, its refusal to fund highly effective providers like Planned Parenthood, as well as the resulting withdrawal of federal funds from the Healthy Texas Women program, severely compromises awareness, access and provision of LARCs while undermining family planning counseling and services as a whole.[150] The reality is that, without devoting attention towards strengthening outpatient programs and community initiatives that educate women on the full spectrum of contraceptive methods, it will be difficult to expand LARC access in a way that protects a woman's reproductive freedom and gives her ample time, beyond the narrowly designated postpartum window, to choose a contraceptive method that best aligns with her lifestyle, preferences, and beliefs.

During the current (85th) Texas Legislative session, Rep. Gina Hinojosa (D-Austin) filed House Bill 3424, which would direct the Department of State Health Services to better understand barriers in access and utilization of LARCs, and develop specific strategies and policy recommendations for expanding access to LARCs with particular emphasis on the uninsured and Medicaid enrollees.[151] If approved, this would be a valuable opportunity for a multidisciplinary workgroup to thoroughly evaluate the strategies and effectiveness of other state programs promoting LARC access, and then consider how similar approaches would benefit the specific needs of Texas women. However, not only should DSHS aim to feasibly implement postpartum LARCs in the inpatient setting, the agency should also make it a priority to strengthen outpatient LARC provision by (1) requiring that all outpatient clinics provide the full range of contraceptive methods, (2) increasing patient and provider awareness of LARCs and their effectiveness through public campaigns, outreach events, and trainings; and (3) raising reimbursement rates for providers to encourage provision of contraceptives.

At the local level, interviews with healthcare providers reinforced the importance of

having open, unbiased conversations with women regarding birth spacing and pregnancy intention. One OB/GYN, who provides prenatal care for low-income women at a nonprofit community clinic, emphasized the value of patient-centered family planning counseling during the pregnancy, postpartum, and interconception periods:

> *"There are some things that every woman needs to be educated about, like contraception. There are a lot of risks to short-interval pregnancies. So part of [prenatal care] is educating women about that, finding out if birth control and birth spacing are consistent with their belief system and social and medical situations, and then providing them with the method that is most congruent with what their needs are."*

One interviewee, who coordinates care and education programs at Mama Sana Vibrant Woman, cited the benefits of unbiased options counseling to assist women who have not yet come to terms with their pregnancy:

> *"When folks first come to us, we have a conversation around whether or not they want to go forward with the pregnancy; we talk about the full spectrum of options, where to go, and what to do. Having a supportive environment and open conversation helps take off some of the burden, especially for young moms or people going through [a pregnancy] for the first time."*

Moreover, having a supportive group environment can be conducive to open and honest conversations about sexual activity, during which women can bring up any misconceptions they have about birth control and get evidence-based information. During group visits at Mama Sana Vibrant Woman, for instance, the women *"are curious about if breastfeeding works [as birth control], they want to know about safe sex practices and the risk of getting*

pregnant again right after."

Besides state initiatives to expand funding for LARCs and renovate Medicaid payment structures, then, communities should invest more resources in innovating the spaces where women can receive reliable information about contraception and family planning while also having the freedom to share their experiences and doubts and explore their reproductive options. In particular, women of color who are at higher risk for unintended pregnancy can benefit from the support and solidarity of a group environment facilitated by a knowledgeable nurse, midwife or other women's health provider. Two nurses—one that previously held childbirth classes and another specializing in maternal and infant health—additionally cited technology as an essential, but often overlooked, safe space for women who may not otherwise have a support network or trusted source of information:

> *"A lot of moms…said they wanted [their health information to be delivered] on an app. For two reasons: one was convenience, the other one was privacy- they don't necessarily want to tell their provider everything. We need to have ways to reach out to women about health and prevention that are not through a traditional healthcare setting."* –Maternal and infant health nurse

Improving Maternal Mental and Behavioral Health

As discussed in Section One, peripartum depression has been linked to a higher incidence of chronic illnesses as well as negative health behaviors such as smoking, alcohol or other substance abuse during pregnancy, which can increase the risk of severe maternal morbidity and mortality if left untreated.[152] According to 2012 Texas data from the DSHS Center for Health Statistics, White women exhibited the highest rate of diagnosed depression during pregnancy-related hospitalizations, at 12.5 per 1,000 hospitalizations, while Black women exhibited the

second highest rate at 7.8 diagnoses per 1,000 pregnancy-related hospitalizations.[153] This statistic does not reflect undiagnosed cases of mental illness, however, and it is possible that social factors, limited healthcare access/utilization and provider variations result in underreporting of the actual prevalence of maternal depression amongst racial and ethnic minorities.

The state's Maternal Morbidity and Mortality Task Force identified mental illness and substance abuse disorders as major contributors to severe maternal morbidity and mortality, finding that there were many missed opportunities for screening women with mental and behavioral health issues and referring them to treatment. Moreover, according to the Maternal Morbidity and Mortality Task Force, of the 19 Texas women on Medicaid during pregnancy who later died of drug overdose, 14 died after their Medicaid coverage expired. These data highlight an increasingly urgent need to address substance use as a core component of antepartum and postpartum care. Early diagnosis and treatment of mental health and substance use disorders leads to less severe conditions, shorter treatment times, fewer emergency room visits and fewer hospitalizations, thus representing a significant cost-saving potential for the state.[154,155] This section looks at strategies to improve maternal mental health services through the lens of perinatal depression, but special consideration is given to substance use disorders at the end.

Maternal depression has gained the attention of lawmakers across the political spectrum, and in 2016, Congress passed the Bringing Postpartum Depression Out of the Shadows Act, authorizing HHS to make federal grants to state programs for screening, education and treatment of postpartum depression.[156] Four states (Illinois, West Virginia, Massachusetts and New Jersey) have implemented mandatory universal screening for postpartum depression, at least four others (Texas, Virginia, Oregon and Minnesota) have mandated patient education on perinatal depression to some degree, and four states (Maine, Maryland, Massachusetts, and Oregon) have

convened task forces or workgroups to study and develop statewide solutions for perinatal depression.[157]

Many factors contribute to missed opportunities for mental health screening during the prenatal and postpartum period. Providers may not be trained to initiate conversations about mental illness with their patients or to recognize potential depressive symptoms during prenatal visits. Lack of postpartum follow-up care also results in missed opportunities for screening and subsequent referral to mental health service; in Texas, 15.6 and 19.1 percent of Black and Hispanic women, respectively, reported not presenting for postpartum care, compared to only 5.8 percent of White women.[158] Although four states have mandated universal screening for postpartum depression, there is little evidence to date that this has improved health outcomes.[159] This is most likely because the transition from screening to treatment presents another barrier to access; without access to a multitude of treatment and counseling, screening alone cannot prevent the adverse outcomes associated with poor mental and behavioral health.

Stigma and lack of awareness surrounding mental illness can prevent women from seeking treatment even if they are screened and diagnosed during the peripartum period. If women are not fully informed that depression is a medical issue, they may discount their symptoms as due to hormonal changes or "baby blues". DSHS requires information about postpartum depression to be included as one component of an extensive resource pamphlet given to new parents. Arguably, however, a paper pamphlet is not most effective means of delivering health information to new mothers, and since neither the mode of message delivery nor the message content is individualized to patient needs, the information may not be reaching its intended audiences.[160] Complex referral pathways and a shortage of mental health service providers are additional limiting factors for women seeking treatment for mental illness.

Physicians may not be aware of mental health providers in their area, especially ones that accept publicly insured patients, and long wait times can discourage women from obtaining necessary follow-up treatment.

Moreover, reducing barriers for women to access treatment for depression requires a broader evaluation of mental health care access in Texas. This involves addressing the provider workforce shortage by increasing reimbursement rates and reducing delay times for approval to join insurance networks, and ensuring mental health parity so that mental health benefits are covered in the same manner as physical health benefits. Several states have adopted innovative approaches that facilitate access to maternal mental health services, and these are outlined below.

Model State and Community-based Approaches

Home visit programs. There is evidence that home visiting programs are effective in reducing postpartum depression.[161162] Kentucky allocates its funding from the federal Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV) grant towards the state-run Health Access Nurturing Development Services (HANDS), which facilitates access to mental health services by integrating cognitive behavioral therapy or counseling sessions into in-home visits.[163] Louisiana and Massachusetts train mental health providers to be included as a part of multidisciplinary home-visiting teams under the Nurse-Family Partnership Model and the Early Intervention Partnership Program, respectively.[164,165] California's Alameda County, in which African-Americans comprise the majority of the population, launched a pilot program with funding from the Substance Abuse and Mental Health Services Administration (SAMHSA) to supplement home visiting programs with highly skilled mental health providers who can provide treatment or make referrals to other specialized professionals as necessary.[166] In Chicago, case managers for home visiting programs would screen and recruit mothers at risk for depression at

local WIC clinics.[167] In North Carolina, physicians screen patients at prenatal visits and then refer those with highest risk of depression to the Nurse-Family Partnership.[168] Home visiting allows mental health professionals to fully appreciate the multidimensionality of a woman's mental health, and help a patient navigate financial challenges, domestic or community violence, institutional racism, medical conditions, and other social/familial stressors that can contribute to depression or other mental illnesses.

Telemedicine or Phone-Based Services. For women who face barriers in finding childcare and transportation to attend visits, or would prefer the anonymity of a phone-based counseling session in the comfort of her own home, there is evidence that supports the effectiveness of telephone-based behavioral counseling services. A pilot program in Washington, DC that offered counseling services from trained mental health professionals in the form of 30-40 minutes phone conversations reduced postpartum depression among program participants by 50 percent.[169] Missouri has a state -funded and -staffed hotline that provides resources and guidance to women suffering from depression and refers them to a phone services staffed by volunteers who have been in similar situations that provide counseling and peer support.[170] However, no states to date have enacted programs to coordinate telebehavioral/telemental health services to address pregnant women specifically. In 2016, the New York Senate voted for S6715, a bill that would have required the state to invest in telehealth services for the treatment of postpartum depression; however, the bill did not make it past the state's lower legislative chamber.[171]

Provider Education. The University of Iowa developed a free online training program (Support and Train to Enhance Primary Care for Postpartum Depression, or STEP-PPD), to educate primary care providers on how postpartum depression affects patients of various backgrounds, how to discuss depression with their patients and integrate screening into their

clinical practices, what evidence-based approaches are utilized for the treatment of postpartum depression, and how to refer patients with depression for treatment.[172] Other states that have implemented online-based provider education include: Florida, Iowa, Massachusetts, Michigan, New Mexico, Nebraska, and Ohio.[173]

Coordinating Care Between Primary Care and Mental Health Providers. To facilitate the transition between screening and treatment, providers must be aware of the full range of mental health services that exist in their area. This allows providers to make evidence-based referrals, while keeping in mind that mental health and substance use disorders occur with varying degrees of severity and that not all individuals respond to the same type of treatment. New Jersey's Perinatal Mood Disorders Initiative directed the health department to create and maintain a statewide directory of perinatal mental health service providers.[174] Iowa similarly operates a website listing mental health providers based on their location, specialty/type of service, and accepted health plans.[175]

Integration of care between the primary care settings and mental health specialties is another important measure, especially because mental health services are so fragmented. This requires that primary care centers are staffed with mental health professionals, or effective systems of collaboration between primary care and mental health providers. For instance, King County in Washington utilizes a Mental Health Integrated Tracking System (MHITS) to manage a collaborative care model for patients with perinatal depression.[176] The MHITS manages patients using the stepped care approach, where basic mental health services are provided in the primary care setting, and more complex or severe cases are referred to more intensive treatment. The program has managed to conserve resources by building upon existing infrastructure and forging community partnerships. Another initiative, Project CLIMB in Colorado, incorporates

mental and behavioral health clinicians within the pediatric primary care setting.[177] Pediatricians are trained identify mothers at-risk for postpartum depression and work with mental health clinicians to provide on-site intervention or make referrals to specialty care.

Current State Practices and Policy Directions

Medicaid for Pregnant Women includes screening as well as any outpatient mental health services that are referred by their provider, but coverage expires 42 days after pregnancy ends. CHIP Perinatal benefits, on the other hand, are covered for a full year from the start of pregnancy, and covers screening but not treatment for mental health disorders. For women who are suffering from or at risk of developing depression, continuity of care is vital for at least a full year after giving birth, since elevated depressive symptoms persist much longer than the immediate postpartum period.[178] In Texas, HB 3115 and its companion, SB 1698, filed during the 84th legislative session, would have mandated screening and treatment of postpartum depression under CHIP Perinatal while extending Medicaid and CHIP Perinatal coverage to year after giving birth, but neither bill made it out of committee despite strong support from advocacy groups like the Texas Medical Association, Texans Care for Children, and the National Alliance on Mental Illness.[179] Since the Maternal Morbidity and Mortality Task Force findings identified depression as a common contributor to maternal morbidity and mortality, legislation surrounding maternal depression has gained more traction during the 85th Legislative Session, with the introduction of two bills relating to the coverage of maternal mental health services. HB 2135 reintroduced HB 3115/SB 1698, once again calling for the expansion of CHIP Perinatal benefits to include maternal mental health services and prolonging coverage to one year after giving birth.[180] HB 2466 would require maternal depression screenings to be covered under the infant's health plan, so that providers can administer screenings during well-child visits.[181]

Based on model state and community practices, Texas should consider: 1) investing more resources into training primary care providers on screening, treatment, and referral networks for mental health disorders; 2) extending coverage for pregnant women to one year postpartum and expand benefits to include comprehensive mental health benefits; 3) integrating mental and behavioral health services with the primary care model by promoting co-locating or collaboration of mental health and primary care providers; 4) diversifying covered treatment options including peer-based counseling, support groups, telebehavioral therapy services, and incorporating mental health professionals into home visiting programs; and 5) developing incentives for provider education, universal screening practices, and effective coordination between primary care and mental health professionals. While promoting public awareness and screening should be on the policy agenda, Texas lawmakers should keep in mind that screening must be paired with treatment to improve health outcomes. Maternal outcomes affected by depression and substance abuse will not see progress unless the state reconsiders the state of mental health care as a whole in Texas--how services are delivered, covered, and accessed by patients.

Addressing Substance Use Disorders Using Evidence-Based Approaches

Substance use disorders are not only limited to the abuse of illicit or prescription drugs, but also encompass varying degrees of tobacco and alcohol use, according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5).[182] As discussed in Section One, substance use during pregnancy leads to deleterious immediate and long-term effects for the mother as well as the fetus. In particular, the growing prevalence of opioid abuse during pregnancy is a major public health concern, having increased five-fold from 2000 to 2012.[183]

Policymakers have found it difficult to address maternal substance abuse at the national and state levels because it involves navigating a delicate balance between the public sphere of

legality and the private, confidential sphere of a patient's health care. Three states (Tennessee, Alabama, and South Carolina) have statutes that deem maternal drug abuse during pregnancy a criminal act on the basis of child endangerment and chemical endangerment, and in 2012, Texas attempted to pass a bill that would make maternal illicit drug use a state felony.[184,185] Eighteen states, including Texas, have laws that define maternal drug use as child abuse, with harsh punitive measures are harsh--women can be detained in treatment programs against their will, lose custody of their child, be prosecuted, fined or even jailed for substance use during pregnancy.[186]

Criminalizing substance abuse during pregnancy damages trust and confidence between patients and care providers, which discourages women from disclosing important health information, seeking prenatal care, or following up on recommended treatment. Rather, there is strong scientific and clinical evidence that substance use disorders are medical conditions with physiological, neurological components; as such, they should be addressed not with legal consequences, but instead with evidence-based therapeutic interventions, just as any other medical condition should be treated.

In order to prevent biased assessments and targeting of specific groups, ACOG recommends universal screening for substance use risk during the first prenatal visit. Since the recommended screening procedure is a short questionnaire, it cannot be effective unless patients are honest with their provider, guaranteed a confidential, non-judgmental environment, and not fearful of being reported. During the current (85th) Texas legislative session, Senator Perry (R-Lubbock) filed a bill that would require health providers to conduct a verbal drug screening at the first prenatal visit with every patient, and refer them to treatment resources if screening results are positive. Since Texas allows for parental rights to be terminated on the basis of

substance use during pregnancy and women would fear their screening results could be used against them, this legislation would not be maximally effective in detecting substance use.

Since substance use disorders during pregnancy must be addressed with particular urgency and cannot afford the long wait times associated with mental health services, 17 states have prioritized access for pregnant women to gain entry to general drug treatment programs.[187] Although access to general drug treatment programs is important, maternal drug abuse requires special considerations of infant and obstetric health, and addressing particular risk factors or barriers that pregnant women face (e.g. domestic violence, family trauma, lack of transportation, housing or childcare, etc.) can reduce barriers and incentivize treatment.[188] As such, nineteen states have either funded or implemented drug treatment programs that are targeted to the maternal population.[189] A particularly successful model is California's Office of Perinatal Substance Abuse, which funds and oversees a statewide network of more than 288 drug treatment programs that are specifically targeted to pregnant women and parents. These programs provide individualized inpatient and outpatient treatment as well as an array of comprehensive social services (housing, food, legal, informational aid) and support groups to assist recovery. Data demonstrate that these programs have proven successful in keeping families together and minimizing the involvement of Child Protective Services and the foster care system.[190]

Ohio has made in a public priority to understand the trends of maternal opiate addiction to better develop standardized prevention and intervention methods. In 2014, Ohio passed a bill that requires cases of neonatal abstinence syndrome (NAS), which occurs as a consequence of maternal opioid use during gestation, to be reported to the Ohio Department of Health, excluding any patient identifying information. In 2012, the state piloted the Maternal Opiate Medical

Support (MOMS) program to improve maternal and fetal health outcomes, implementing the maternal care home model to coordinate team-based care delivery for patients.[191] In Texas, the same bill filed by Sen. Perry that would mandate universal drug screenings during the first prenatal care visit, also proposes making NAS a reportable condition while excluding patient identifying information from public health data. However, Texas has not adopted a comprehensive strategy for targeting maternal opioid abuse like Ohio has, and simply collecting data on NAS will not be an effective solution.

The Texas Department of State Health Services (DSHS) funds and coordinates 19 substance abuse treatment programs across the state that are specifically designed for pregnant and postpartum women, collectively the Pregnancy and Postpartum Intervention Programs (PPI), which is significantly fewer than California's maternal substance abuse treatment network.[192] During the 2016-2017 biennium, DSHS appropriated $11.2 million of the state budget to fund services intended to reduce the infant risks and high costs associated with NAS. This includes $5 million allocated towards creating new state-funded opioid treatment sites, $2.9 million towards existing PPI programs, and $500,000 allocated to expanding the Mommies Program, a highly successful integrated care approach to the treatment of maternal substance abuse and especially opioid abuse.[193]

The Mommies Program originated in San Antonio/Bexar County as a collaborative partnership between The Center for Health Care Services (the local mental health authority), University Health System (UHS), and DSHS.[194] All pregnant women diagnosed with an SUD in Bexar County are eligible for the program, where licensed mental health providers work with mothers to create an individualized care plan that aligns with each patient's needs, and monitor the patient's progression throughout the recovery phase. Women have access to educational

sessions on a variety of topics (e.g. family planning, childbirth, stress management, nutrition, and parenting), specialized programs such as trauma recovery for those with a history of physical and emotional abuse, as well as an on-site benefits coordinator that provides assistance with social services or health care benefits.[195] While the comprehensive array of services that the Mommies Program offers is certainly exemplary, what lies at the core of its success is the shift in cultural perceptions of drug abuse that the program engenders, and their commitment to empowering patients towards long-term recovery and educating providers to create a non-judgmental healthcare environment.

Texas can continue its commitment to reducing the incidence of substance abuse-related maternal mortality and morbidity by directing future policy discussions towards improving maternal health outcomes in addition to improving infant outcomes and preventing NAS, continuing to strengthen and expand maternal substance programs in the future, and surveying the outcomes and opinions of women who have participated in these programs to evaluate program effectiveness and patient satisfaction.

Confronting Racism, Discrimination, and Unconscious Bias

Five out of the 7 providers interviewed--two OB/GYNs, two nurses and one birth companion/care coordinator--cited stress due to discrimination or racism as playing a key role during the pregnancies and life course of Black women. The predominant sentiment was that, from the perspective of access and insurance status, Black women do not face more barriers to prenatal or postpartum care compared to women of other racial/ethnic groups, but that they do exhibit more distrust in the healthcare system, greater reluctance to engage with providers, and lower quality of care due to experiences of discrimination. Each of these points is described below:

1) Many of the providers gave examples of misconceptions that are common amongst health providers as well as the general populace. They also cited instances in which their patients had been the subject of unconscious bias or discriminatory attitudes:

> *"There's actually not a higher rate of smoking, drug use, or STDs in African Americans, so it's not necessarily that African Americans do worse things from a health behavior perspective."*
>
> –OB/GYN, Federally Qualified Health Center

> *"I definitely think that we providers do have these stereotypes or assumptions about Black mothers, such as "the loose woman", that maybe she doesn't deserve the same kind of care...that they're ignorant, so the explanations given might be different... "the welfare queen", they assume you have a lot of kids, or that you're unmarried, or that the pregnancy was unplanned. Basically all the negative behaviors are always assumed to be more common in Black women. This is what that my [nursing] students and the Black women in my childbirth classes have told me, from their own experiences."*
>
> –Professor of Clinical Nursing, UT Austin

> *"I have patients come in who say, 'I had horrible pain and went to the emergency room, but they wouldn't give me pain medicine and I think it's because I'm Black, because they think I'm a drug addict.' I hear that a lot. And it's supported in the literature that African Americans get much less medication to control their pain."*

–OB/GYN, Federally Qualified Health Center

2) Discriminatory systems and attitudes, as well as a lack of patient-provider rapport, can negatively affect whether patients present for care, the quality of care received, or the nature of the patient-provider interaction.

"*...interactions with White patients are more patient-dominated whereas with Black women [the conversations] are more provider-dominated."*

–Professor of Clinical Nursing, UT Austin

"Across the board, it's been shown that African Americans have less trust in the health care system compared to other races. There is more of a hesitancy to engage with the system when [high-risk] symptoms present...If these women feel that they're not going to be taken care of, or that the system is out to get them, they're not going to show up for prenatal care or postpartum care or anything in between." –OB/GYN, Federally Qualified Health Center

"... I also think there's this concept of structural violence or structural violence...our medical and social service structures aren't geared towards African Americans. And if no one is thinking about redesigning the healthcare system through the lens of an African American person's experience with the system, that's all it takes to make the system unresponsive to the needs of that population."

–OB/GYN, Federally Qualified Health Center

"Particularly when we're looking at marginalized patient populations, it's harder to build trust between [a patient and a provider] that come from very disparate backgrounds. If I can't do anything to bridge that divide, if I can't make [my patient] feel at home, she is going to have worse health outcomes."

–OB/GYN, Nonprofit community clinic

"It could be that C-section rates are a reflection of bias or racism...or that Black women have higher C-section rates because providers know that Black infants also have a higher risk of morbidity and mortality, and if they're afraid of that, they're more likely to intervene."

–OB/GYN, private women's health clinic

3) The social contributors of stress are compounded on a daily basis for Black mothers due to racism, discrimination, and the historical burdens faced by the Black community. However, the pathways leading from stress to adverse maternal health outcomes are poorly researched and inconclusive:

"The pathways to birth outcomes and how they affect mothers is really complex, but one that is being explored is the effect of discrimination and racism. But it's hard to look at this from a broad demographic sense because different women react differently [to these experiences]"

–Maternal and infant health nurse

"Another risk that is less tangible than preexisting medical conditions, but still very

real, is psychosocial stress. We definitely know that the stressors of life affect a pregnancy, but they're a little bit harder to quantify. For instance, women who are African American have greater risk of hypertensive disorders during pregnancy, but the hard thing to know is whether that's a biological effect...or does it boil down to social factors? There's more research being done on epigenetic imprinting, in that the stress that the mother experiences can affect the genetic expression of her offspring, which could affect [maternal health] down the line."

–OB/GYN, Nonprofit community clinic

"It became very clear, as I was looking into the literature, that [racial disparities in infant and maternal mortality rates] are not related to education level, socioeconomic level, or access to care...It seems that it's the environment that the women live in--the stress of being a Black woman living in a white-privileged world--that leads to these disparities." –Professor of Clinical Nursing, UT Austin

"There have been studies that look at stress hormones like cortisol, and they've been pretty much inconclusive. Of course the experience of stress or how you perceive it will impact your stress hormones, but I don't think there's a clear pathway yet that has been identified as to how that leads to morbidity in women. We do know that [Black women] have higher rates of hypertension and preeclampsia, and there's probably a stress component involved in that...and stress is probably involved in obesity too...but I think that's part of the problem, is that we haven't ferreted it all out very well." –Maternal and infant health nurse

"What's causing the negative maternal and infant outcomes [in Black women] is connected to toxic stress, weathering, the allostatic load…and experiences in institutional racism. It's not the prenatal care, because Latina immigrants come to the country and get no prenatal care but have healthy babies…60% of Black women in Travis county who have access to prenatal care are still having bad outcomes."

–Prenatal care and programs coordinator, Mama Sana Vibrant Woman

4) In terms of developing approaches to address implicit bias and discrimination, providers agreed that state-level policies would be difficult to implement and enforce, or would not be effective in improving the quality of care. Instead, they suggested that change must initiate from provider awareness, institutional commitment to diversity and anti-discriminatory practices, and sweeping changes to address systems of injustice as a whole:

"You can have guidelines and protocols [for providers]….but institutions themselves must decide to have a culture of inclusiveness....I try during every visit, with every single patient, just to make them feel loved. I usually give them my card, give them my cell phone number, emphasize during every visit that I am there for them, just don't be alone--that's the main thing I do to try and prevent bad outcomes."

–OB/GYN, Federally Qualified Health Center

One nurse practitioner, who is a faculty member at the University of Texas at Austin, emphasized restructuring the healthcare pedagogy to accommodate the multiple perspectives and narratives of race, and to help healthcare professionals be more aware of their own implicit

biases:

> *"I always like to tell my students that we are all racist until proven otherwise. A lot of my graduate students benefitted from hearing Black patients talk about the racism they've personally experienced. I feel like nursing school is a place to address racism, to raise consciousness about it...so that when they leave this institution they are much more conscious of their own behaviors and how it impacts others."*

Others called the attention of a need for diversity and cultural understanding between health providers and patients:

> "*There are certain solutions that are very hard to do, but absolutely critical-- for instance, to have a more racially, ethnically, gender identity- diverse population of physicians. But it can't just be that I take care of all people who look like me; that isn't feasible, nor is it really desirable. For those of us who can't look like or be something we are not for our patients, we need to be conscious of how to narrow that divide, to connect with our patients."* –OB/GYN, Nonprofit community clinic

Mama Sana/Vibrant Woman, an organization in Austin that offers holistic support to women of color during pregnancy, childbirth and the postpartum, gives women the option of having a birth companion accompanying her during labor and delivery, usually a trained doula who has already established a relationship of trust with the woman during her pregnancy. The birth companion model helps navigate the distinct pressures and complexities experienced by Black women in the healthcare system, and serves as an effective protective measure against discrimination:

> *"We're all women of color, the people we're supporting don't always speak the*

language, and most of us are on Medicaid--the system is not used to having folks like us be self-determined. We see the way that the folks we take care of are policed in a certain way…[e.g. some patients are drug tested and/or referred to CPS because of prior history]… so these are things we're watching for, that we're prepared to talk about. [...]Really the only thing that I've seen that does protect women [from stress and bad outcomes due to racism and discrimination] is social support and peer support."

MSVW's maternal justice model also addresses toxic stress in Black mothers by offering them a diverse array of opportunities to engage with other women as well as with their own mental and emotional health:

"We saw really great results with yoga, the birthing workshops, and prenatal dance. We were able to help people manage their high blood pressure with the yoga, stress reduction and relaxation [techniques]. During the prenatal groups, we cook and eat together…I also coordinate spa days three times of year. One of the women who was with us [during her pregnancy] is a masseuse, and the women love that."

Based on the above provider perspectives and patient experiences, the following are key practices to acknowledging racial discrimination as an integral force in a Black patient's reality, improving the quality of care and patient-provider relationships, and renovating healthcare delivery to accommodate the needs of Black women:

1) Promote avenues of social support, such as group prenatal care, community birthing workshops, or interconception focus groups, so that women of color can protect one another from systems of oppression, share negative and positive experiences, and self-

advocate.

2) Enhance patient engagement by strengthening alternative models of care in the Black community, such as midwifery, home visiting, and doula birth companions who can serve as intermediaries and advocates in the traditional hospital setting.
3) Strengthen health education curricula to address implicit racial bias, cultural sensitivity, and how racial inequity health and wellness within the Black community.
4) Encourage racial, ethnic and socioeconomic diversity within healthcare-related professions (including physicians, nurses, midwives, doulas, community health workers, social workers, etc.).

Promoting Patient Engagement in Health Care Decision-Making

Informed consent is a fundamental right of all patients, so that they can properly evaluate the risk of various procedures and integrate clinical evidence with their own values, lifestyle and beliefs to make an informed health care decision. However, marginalized groups, including Black women, are less likely to feel engaged in their own health care, and thus are at higher risk for adverse outcomes, patient dissatisfaction, poor adherence to treatment, and lower follow-up rates.[196] A lack of patient-physician partnership in which a patient can advocate for her own needs and concerns contributes to racial disparities in obstetric interventions like Cesarean section rates, induction of labor, type of anesthesia, and setting of delivery. As concluded in the Systematic Review (See Section Two), these disparities contribute to a heightened risk of morbidity and mortality for Black mothers.[197]

Patients are less likely to participate in a shared decision-making process if they do not feel trust and rapport with their provider, if they or someone they know has had a negative experience (e.g., with discrimination) in the healthcare setting, or if they are not confident in

their health literacy.[198] Thus, it should be a legislative priority to support innovative care delivery models that promote patient-centered care, which other states have already begun to implement.

Home visiting designed for at-risk populations, including Black mothers, are one example of an evidence-based service delivery model that can improve health literacy, patient decision-making, and subsequently maternal outcomes.[199] As mentioned previously, states can receive federal grants to support home visiting programs for at-risk pregnant women and children, under the ACA-created MIECHV program. The Texas Home Visiting Program was established in 2013 by the 83rd legislature, and in 2014, it received $17.1 million in federal grants to support 4 home visiting programs, 3 of which are targeted towards eligible pregnant women.[200] As of 2015, 43 counties are served by these programs, but challenges remain in expanding the provider network and the quality/types of services offered, recruiting and retaining high-risk patients and improving public perception and awareness of the benefits of home visiting.[201] Moreover, program goals are focused on healthy infant and child development, and while that is a priority, the importance of maternal health is overlooked.[202]

Based on the evidence already highlighted in the systematic review and by the DSHS' Maternal Morbidity and Mortality Task Force, the state should pilot a home visiting program with the primary goals of: (1) assisting women in recognizing complications during pregnancy, (2) educating women on how chronic conditions and health behaviors can negatively impact the pregnancy if unmanaged, (3) sharing information on the risks and indications for common obstetric procedures like C-section, episiotomy, and labor induction, (4) initiating discussions about pregnancy intention and postpartum contraceptive methods, (5) assisting the patient in making informed decisions on their mode and site of delivery, and (6) postpartum care, including pain management and screening/management for depression, other mental health and substance

abuse disorders.

In 2013, California received a State Innovation Model (SIM) design grant from the Center for Medicaid and Medicare Innovation (CMMI), designating maternity care one of its four primary focus areas. The California Maternal Quality Care Collaborative identified, through analyzing the state's maternal outcome metrics, that medically unnecessary C-sections and other obstetric interventions are key contributors to the racial disparities in maternal morbidity and mortality in the state.[203] Since then, programs have been implemented to reduce medically unnecessary obstetric procedures using four key strategies: (1) public education campaigns to improve health literacy, (2) programs and training that promote collaborative decision-making between patient and provider, (3) enhanced prenatal care through innovative models to increase patient engagement and improve outcomes; and (4) mobile technology and self-tracking tools that offer patients individualized health information.[204]

Texas also received a $2.9 million SIM grant to develop a state healthcare innovation plan, and the results of this research emphasized the effectiveness of patient-centered medical homes as a new model of care. Fragmented and poorly coordinated care is a common experience that adds to the burden that patients face in navigating the system, and the medical home model--particularly the maternity medical home--could be a potential solution for women with high-risk pregnancies. The maternity medical home involves a coordinated maternal health care team (including nurses, social workers, midwives, obstetricians, gynecologists, family physicians or other primary care providers, and physicians assistants) in a single location, that is wholly accountable for a woman's physical and mental health throughout her pregnancy, providing comprehensive prenatal and postpartum care as well as social services or support.[205] It is a promising model because it targets not only the clinical aspect of the peripartum, but also the

psychological, behavioral, and social factors that can affect pregnancy and birth.

Currently, the state has not widely implemented the maternity medical home model, but it is developing these programs through Medicaid managed care organizations, Texas Collaborative for Health Mothers and Babies, and the 13 participants of the federal Strong Start for Mothers and Newborns initiative.[206] In 2013, the 83rd legislature directed HHSC to develop a pilot program in Harris County to evaluate the effectiveness of maternity medical homes; data collection for the pilot has not concluded at the time that this thesis was written, but the final report will be published by HHSC in Sept. 2017.[207] If the results of the pilot study indicate a significant improvement in maternal outcomes, such as reduction in C-section and preterm labor rates, the state will need to navigate a multitude of barriers in order to successfully implement the medical home model for pregnant women statewide. Firstly, expanding access to the medical maternity home model involves considering how high-risk populations such as Black women will benefit from them. Secondly, best practices for the medical home should strike a balance between being standardized to some degree across health providers (to avoid compromising the integrity and effectiveness of the original model) while also being responsive to the particular needs of diverse communities across the state. Thirdly, practices will face considerable logistical and financial challenges in transitioning to a medical home model, such as recruiting providers and developing efficient methods to share and manage patient information.[208] Because of these barriers, providers themselves must be made aware of the benefits for themselves and their patients before they are inclined to participate.

While overcoming these barriers seems daunting, the maternal medical home model is not intended to be an immediate policy fix, but rather a complete overhaul of our current healthcare delivery landscape, a long-term project with sustainable improvements on how

pregnant women receive care in Texas. A few other states have implemented the medical home model to varying degrees. In North Carolina, for instance, the medical home model has been successfully implemented by nearly all providers that care for the pregnant population, with financial incentives for both patients and providers that participate in the program. Wisconsin, on the other hand, relies on Medicaid HMOs to coordinate the medical home approach and only provides these services to populations identified as high-risk for adverse maternal outcomes in the state: adolescents, the homeless, and women with prior negative pregnancy outcomes.[209] As these states have done, Texas must customize the medical home model by taking into consideration the state's unique demographic needs and existing healthcare infrastructure.

Improving Social Support During Pregnancy

Seeking prenatal or postpartum care through the conventional health care system can be intimidating, and especially for women who have lower levels of social support, pregnancy can be an extremely isolating experience. Moreover, lower levels of social and intimate partner support are more common in Black communities, compared to White and Latino communities, as noted by two of the providers interviewed:

> *"Looking at broad demographics, a lower proportion of African American women are partnered or living with a partner at the time of birth [compared to other races/ethnicities]".* –Maternal and infant health nurse

As a result, there is less partner engagement over the course of pregnancy, according to a clinical nursing faculty member at UT Austin:

> *"As a nurse, I used to offer childbirth classes, and one thing that I noticed was that I hardly ever had any Black couples...sometimes a Black mom and a White dad, or vice versa. And these disparities have hardly changed over the years."*

Prenatal support groups offer a solution to this, creating a safe space where women can voice their experiences, concerns and emotions with other women who are in similar circumstances or come from similar backgrounds:

> *"What is knowledge? The medical and scientific community can give you knowledge. But what a woman experiencing [pregnancy] considers knowledge is what it was like for other women: 'What was it like for you?' 'How did it turn out?'"*
>
> –Maternal infant and health nurse

The same nurse practitioner also noted that support groups are especially beneficial for women of color because they help navigate *"the cultural milieu in which women are giving birth...especially if they're from any group that has some vulnerabilities that they bring with them"*. Moreover, these networks established during prenatal groups can continue well after pregnancy:

> *"What we like is for people to develop relationships so they can be interdependent and start to build their support networks in the community. They're friends, they help each other with their babies, especially in the postpartum when... your body is really vulnerable. The majority of people who come through the clinic still participate in some kind of way."* –Prenatal care and programs coordinator at MSVW

Another similarly innovative model of care delivery is the group prenatal care model (e.g. Centering Pregnancy), in which groups of 8-12 pregnant women near the same gestational stage meet with coordinated health providers (nurses, midwives, OB/GYNs) to receive regular prenatal checkups and information relating to pregnancy, birth, and the postpartum, participate in facilitated discussions to share experiences and knowledge with one another, and build a support network in which women empower one another while developing rapport with the health care

team.[210] Although there is no evidence to date that directly links group prenatal care with lower maternal mortality and morbidity rates compared with individual prenatal care, many studies have demonstrated that women who participated in the group model report greater satisfaction and knowledge about their pregnancy.[211] The CenteringPregnancy Model is met with relatively more resistance in the physician community because it veers away from the conventional one-on-one model of care, and due to concerns about patient privacy and a diminished physician role in care. Thus, growing awareness amongst physicians of the benefits that the Centering approach offers to patient is key to its successful widespread implementation.

The federal Strong Start Initiative, created by the Centers for Medicaid and Medicare Services, is currently evaluating the effectiveness of the group prenatal care model in a variety of healthcare settings across the United States, by providing grants to state programs and institutions to implement the approach. In 2014, Ohio rolled out a list of initiatives to reduce the state's high rate of infant mortality, and piloting the CenteringPregnancy model in high-risk communities was one such initiative. Four Ohio health centers received a $900,000 state grant, and the program will be expanded if it effectively reduces rates of infant mortality in these communities.[212] Similarly, the Tennessee State Department of Health conducted a study evaluating the effect of group prenatal care on various maternal and infant outcomes, collecting data from five different sites across the state that offer the CenteringPregnancy model of care. They found that use of group prenatal care was correlated to reduced preterm birth in Black women, lower rates of Cesarean births, and increased postpartum follow-up.[213]

By conducting a similar pilot program, Texas could determine whether Centering Pregnancy should be widely implemented to effectively reduce racial disparities in adverse maternal outcomes. Because of the state's high rates of maternal mortality and severe morbidity,

Texas is uniquely situated to evaluate whether CenteringPregnancy is as effective in improving maternal outcomes as it has been in improving infant outcomes. In order for the program to benefit those at highest risk for adverse maternal outcomes, Texas legislators should allocate funds towards the development of a pilot prenatal group care program, with specific recruitment strategies that appeal to the uninsured, Black women, and teens. Although reimbursement for "group clinical visits" under Texas Medicaid policy was expanded in 2012 to include group prenatal visits under the CenteringPregnancy model, there is limited provider and patient awareness of this option, and it is largely absent from state policy recommendations to improve prenatal care.[214] Rather than simply updating Medicaid reimbursement codes, a pilot study that ensures implementation of the CenteringPregnancy model amongst a sample group would be a better gateway to strategizing statewide implementation.

Promoting Preconception and Interconception Health

As mentioned previously, the Maternal Morbidity and Mortality Task Force found that the three most common causes of maternal death in Texas from 2011 to 2012 were cardiac events, drug overdose (the majority involving prescription opioids), and hypertensive disorders including preeclampsia/eclampsia, respectively. This implies that a substantial proportion of all maternal deaths in Texas could be prevented, given proper health promotion and disease management measures. While the previous section emphasizes the importance of identifying and managing mental health and substance use disorders during pregnancy and the postpartum, ideally these conditions should be identified and treated as soon as they manifest, which may be during the preconception (before pregnancy) or interconception (in between pregnancies) period. Likewise, inadequate prevention or recognition of emerging chronic illnesses throughout a woman's life course can have grave implications for her future pregnancy outcomes, since the

physiological changes that occur during gestation place considerable stress on the body's organ systems, often aggravating pre-existing conditions such as diabetes, hypertension, and poor cardiovascular health.

Emphasis on chronic disease counseling during preconception and interconception health could be an effective strategy to address racial disparities in maternal outcomes, given that Black women have a higher prevalence of hypertension and obesity as discussed in Section One. As chronic disease becomes an increasing reality in the pregnancies of Texas women, the state should fund promising methods of increasing preconception and interconception health. Several model strategies are highlighted below.

Effective messaging. Several states use targeted outreach strategies to reach African-American communities about the importance of preconception and interconception health, for example: Arizona's Live It Change It program and California's Be Well Women are both informational campaigns that target their messaging to a primarily Black audience. Ohio has a case management program that offers preconception counseling designed specifically for African-American women in urban, low-income neighborhoods, and California's Family Health Council requires that preconception health is integrated into family planning visits at Title X clinics across the state.[215]

Addressing financing barriers. In 2009, Colorado published guidelines for women's health providers to cover 12 essential educational components for all women of reproductive age. A significant barrier in its implementation, however, is the lack of provider reimbursement methods for preconception care services, since payment structures are not designed to accommodate preventive health measures. In Delaware, the Healthy Women, Healthy Babies program addresses this issue by reimbursing providers for services that aren't typically covered

by Medicaid, including preconception care, mental health and nutrition, in regions identified as high-risk for poor maternal and infant outcomes.[216]

State workgroups. California's Preconception Health Council serves as a statewide planning forum for programs and initiatives related to preconception health, and communicates to the legislature on best practices and how to integrate preconception and interconception care into state health benefits and existing payment structures.[217] In 2012, 7 states including Texas participated in a peer-to-peer learning project to share and brainstorm policies, programs and infrastructures necessary for preconception and interconception health.[218] Despite the recommendations that were developed as a result of this collaboration, however, Texas has not seen any state-level initiatives responding to these issues.

When developing strategies to promote preconception and interconception health, especially marketing towards specific demographics, it is important to be mindful of culturally sensitive, effective routes of messaging that avoid perpetuating harmful stereotypes or generalize the diverse issues that specific groups face. To optimize outreach and care strategies, Oklahoma convened a Preconception and Interconception Care and Education Workgroup between 2009 and 2010, inviting women to share in support groups their experiences with preconception and interconception care and education.

Multi-level partnerships. Efforts to expand access to preconception and interconception care require extensive multidisciplinary collaboration, engaging the efforts of health professionals and social services workers, researchers and academics, and state health agencies alike. Wisconsin's Lifecourse Initiative for Healthy Families, developed to address the racial disparity in infant mortality rates through improving the health of African-American women, is a prime example of a successful multilevel partnership. By developing community-specific action

plans that engage local leaders and residents, LIHF is able to address the broader social, economic and environmental inequities that influence preconception and interconception health for Black women.[219]

Innovative care delivery models. The models of care that have demonstrated promise in promoting utilization of prenatal and postpartum care, social support, and patient engagement as highlighted in previous sections can similarly serve as effective routes for health promotion and chronic disease prevention during the preconception and interconception periods. One best practice involves integrating reproductive health care, primary health care, and social support services within the maternity medical home or coordinated care models. Another would be targeting health promotion to women who are at-risk for chronic diseases through community-based home visiting programs, such as the nurse-family partnership model.

CONCLUSION

This thesis has explored in depth how certain medical, environmental and social risk factors—biologically independent of race, but with a higher prevalence in Black communities—converge to negatively affect maternal health during pregnancy and beyond. My systematic literature review has demonstrated that Black race uniquely modifies the pathways between these risk factors and adverse maternal outcomes: Black women are more likely to undergo riskier obstetric procedures, deliver at hospitals with poorer performance indicators, and suffer complications or death from a medical comorbidity, even after adjusting for all other patient characteristics. Despite strong evidence for these conclusions, the systematic review alone does not provide an explanation for *why* these racial disparities exist. In this regard, qualitative interviews with Austin-area providers offered valuable insights into less immediately quantifiable components of the patient experience that population-based quantitative data analyses leave unaddressed. The multitude of experiences and narratives these 7 providers recounted on behalf of their patients converged on one central theme--that the physical and mental health of Black women, the quality of care they receive, and their perception of health and social services structures, are all directly affected by racism and discrimination. Negative experiences or perceptions of the health care system discourage Black women from engaging fully in their health care decisions, and harmful assumptions or a lack of cultural understanding can further strain the patient-provider relationship, contributing to racial disparities in the obstetric setting as highlighted in the literature review. Beyond the obstetric setting, the effects of racism and discrimination are felt in the lingering effects of historical legacies that resulted in hyper-segregated neighborhoods and economic, educational, and social injustice, as well as in the form of toxic stress due to interpersonal or community-based violence and discrimination.

All of these have profound implications for a woman's health throughout her life course.

Notably, the systematic review revealed that there are very few quantitative studies exploring the relationships between social determinants of health--including racism, unintended pregnancy, and social support-- and adverse maternal outcomes. On the other hand, all of the providers interviewed acknowledged these social factors as key contributors to maternal health and the overall care experience. Taken together, the quantitative and qualitative data presented this thesis yield a more holistic view of the Black woman's experience of maternal health care, by integrating population-based trends with individual narratives. While qualitative trends are not intended to survive the rigor of statistical analyses, they reveal the complex ways in which race shapes the trajectory of maternal health, and emphasize the importance of developing solutions to improve patient experiences rather than focusing on improving outcome metrics alone.

As such, while many of the policy recommendations discussed in this thesis are targeted towards specific health measures, such as improving mental health and reducing unintended pregnancy, the most promising solutions are those that incorporate these initiatives into a broader renovation and expansion of maternal health care, and those that rethink health care and social services structures with the unique needs and vulnerabilities of Black women in mind. Moving forward, future policy to reduce maternal morbidity and mortality in Texas and eliminate existing disparities should incorporate six key elements.

1) Support community-based partnerships that address social, economic, educational and environmental injustices within the Black community with respect to maternal health;

2) Invest in evidence-based care delivery models that promote social support and patient engagement, such as home visiting programs, peer support groups, and group prenatal and

postpartum care;

3) Diversify the health care workforce by integrating nurses, midwives, social workers, community health workers, and peer counselors/advocates into statewide frameworks for health care throughout the reproductive life course, to enhance the quality and range of services offered;

4) Prioritize delivery of preventive services (e.g. family planning, chronic disease management, and mental health services) through these expanded care delivery models;

5) Reduce fragmented care by coordinating networks of health professionals (especially primary care, reproductive health and mental health providers) so that women have easy access to a wide range of services through their medical home;

6) Facilitate provider awareness of the unique burdens that Black women face, and equip them with the resources to advocate for their patients and raise standards of care.

Although these recommendations are intended to improve maternal outcomes and the health care experience in Black communities specifically, all women will benefit from systemic changes that diversify maternal care options and incentivize quality-based and patient-centered care delivery. State legislation serves the direct purpose of reducing barriers to care or reinforcing clinical and public health guidelines, but it also has a less direct--but equally as valuable--responsibility: to foster statewide discussions and partnerships, which guide us collectively towards a higher standard of maternal care for all women. There remain many gaps in our knowledge of the inequalities surrounding maternal health, but one thing is certain: maternal justice is not a "single-issue struggle", but rather rooted in all other injustices with which Black mothers are confronted. Thus, truly effective change demands that collaboration extends beyond the medical and public health communities, to engage all individuals who are devoted to facilitating safe pregnancies for all women.

APPENDIX A: Interview Guide

Demographics and health outcomes:

1) Can you tell me a little bit about the patient population you provide for?
2) In your experience, what are the most significant risk factors for adverse maternal outcomes before, during, or after delivery?
3) Follow-up question (if provider doesn't mention): In your own clinical practice, what are some of the health outcomes that disproportionately affect Black women during pregnancy, birth, or after birth?
4) Follow-up question (if provider doesn't mention): Are women of certain groups or demographics more likely to undergo Cesarean section than others? If so, why is this the case?
5) How do you identify your patients as "at-risk" for adverse maternal outcomes?

Determinants of health outcomes:

1) What social circumstances, physical environment and health behaviors specifically affect Black mothers that you have provided for?
2) Have any of your patients told you about an experience (perhaps with another provider or health care system) in which they felt they were the subject of discriminatory attitudes or actions?
3) Follow-up question (if provider doesn't mention): Do you believe that such attitudes are prevalent in healthcare settings?
4) Have you seen problems of access emerge within your patient population, and how do these affect maternal outcomes?
5) Are there any common educational or preventive resources that you make sure your patients of lower means are aware of?

Standardized approaches vs. best practices:

6) Are there standardized approaches for providers to educate their patients about high-risk pregnancies, and do these vary at different levels (ACOG, hospital, local/state, federal)?
7) What do you believe are some best practices in prenatal, perinatal and postpartum care to reduce adverse maternal outcomes, especially in Black women?
8) Do you think providers and communities have the resources to adequately address racial disparities in maternal outcomes? What other solutions would you suggest (e.g. at a policy level)?
9) What intervention do you think would have the most impact on improving maternal outcomes (e.g. in the clinical setting, in policy, etc.)?

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BIOGRAPHY

Michelle Zhang was born in Northeast China and moved with her parents to Austin, Texas, where she spent the majority of her formative years. She enrolled in the University of Texas at Austin in 2013, with a double major in Neuroscience and Plan II, a minor in Spanish, and a pre-med certificate. During college, she completed a health policy internship at State Senator Zaffirini's office at the Texas Capitol, and was active in GlobeMed and the Tzu Chi Collegiate Association. She graduated in May 2017 and will go on to attend the Dell Medical School, where she plans to continue her exploration of community health disparities.