Evaluating Rates and Interventions Related to Black Maternal Mortality in Pennsylvania

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Maternal mortality and severe maternal morbidity have become serious concerns in the United States, as rates continue to increase throughout the country. Black women in the United States face disproportionate rates of these conditions due to many causal factors, such as systemic racism, lack of quality access to health care, and the inequitable distribution of social determinants of health. Due to this, interventions that help improve rates of black maternal mortality and morbidity must address these causal factors. The present study seeks to determine which interventions would be the most effective in reducing black maternal morbidity if implemented in Allegheny County. The study provides a mixed-methods exploratory analysis of publicly available health department data to conclude which interventions may be the most effective. The study produced several recommendations for Allegheny County to consider when designing, implementing, and evaluating programs that address black maternal health inequities. Furthermore, the study examines how public health social workers can be utilized to advance black maternal health equity.

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Preface

I would like to acknowledge that I am a black woman born and raised in the United States. I have a background in psychology, sociology, social work, and public health, with interests in racial health equity and mental health. I do acknowledge that my positionality may influence my motivation to complete this project. As a middle-income black woman, I acknowledge the privilege I have had to enter higher education to study the racial disparities that occur in maternal health.

I would also like to thank my committee chair, Professor Richard Garland, and my committee members, Dr. Valire Carr Copeland, Alyssa Monaghan, and Dr. Cynthia Salter for their support and guidance as I completed the thesis process. Their support made the completion of this project possible and helped me learn a lot about black maternal mortality, a subject that I am very passionate about. I would also like to thank my mom, dad, and little sister, as they have supported me throughout my final year of graduate school. My roommate Danielle Nahas, who is also in a dual-degree program, was a motivator throughout our three years of graduate school. And my peers, instructors, friends, and colleagues who have supported me throughout my graduate career have helped me strive to complete my program and move on to a bright future.

1.0 Introduction

In the United States, stark racial and ethnic disparities in maternal morbidity and mortality have persisted for decades, calling for increased awareness among clinical providers and policy makers to take action that addresses this widespread maternal health challenge. Not only have poor maternal health outcomes existed for a long period of time, but now, mothers of color are being disproportionately affected by the COVID-19 pandemic, and the overturning of Roe vs. Wade (Hill, et al., 2022). Before the start of the pandemic, the pregnancy-related mortality rates for black women were three times higher than rates for white women. During the pandemic, maternal deaths increased and the racial disparities among women of color and their non-Hispanic white peers widened even more. The racial disparities that were acknowledged during the pandemic shed a brighter light on the fact that these issues are not new but have intensified to affect the health of black women (Johnson-Agbakwu, 2022).

2.0 Background

2.1 Maternal Mortality

Maternal mortality is defined as the death of a woman during pregnancy, delivery, or within 42 days after delivery. In the United States, approximately 700 women die every year from complications related to pregnancy or delivery (Center for Disease Control (CDC), 2023). Rates of maternal mortality in the United States are much higher than other, comparable high-income nations, signifying this is a major public health challenge within the country. Although the global maternal mortality ratio has decreased by 45% in the last thirty years, the United States maternal mortality ratio has increased by 58%. This is the case, even though the United States spends more on maternity care than any other country in the world (Howell & Zeitlin, 2017). Furthermore, these rates are characterized by stark disparities within the United States, where black women have a mortality rate that is 3.5 times higher than white women (Dagher & Linares, 2022).

2.2 Severe Maternal Morbidity

The Center for Disease Control (CDC) defines severe maternal morbidity (SMM) as an index of 18 indicators of significant events, such as acute myocardial infarction, acute renal failure, thrombotic pulmonary embolism, blood transfusion, hysterectomy, heart failure, eclampsia, respiratory distress, heart failure, and sepsis, amongst others, corresponding to International Classification of Diseases 10 diagnoses during delivery admission (Collier et al., 2019; Dagher &

Linares, 2019). These indicators characterize life-threatening etiology and are associated with short- or long- term morbidity, prolonged hospitalization, and high healthcare costs (Collier et al., 2019). Annually, severe maternal morbidity affects over 60,000 women in the United States. “For every maternal death, 100 women suffer from a severe obstetric morbidity, life threatening diagnosis, or undergo a lifesaving procedure during their delivery”, (Howell et al., 2018, page 1). The incidence of severe maternal morbidity is highest among women with multiple chronic conditions, especially in women of color (Collier et al., 2019). Overall, black women experience higher rates of mortality and severe morbidity from cardiomyopathy, hypertensive disorders of pregnancy, and hemorrhage (Howell et al., 2018). Furthermore, black women suffer from elevated rates of pregnancy-induced conditions, such as chronic hypertension, asthma, placental disorders, gestational diabetes, and blood disorders (Howell et al., 2018). During the last few decades, this trend has been on the rise. Maternal comorbidities such as obesity, hypertension, and diabetes, have been major patient-level factors contributing to the increased incidence of severe morbidities over time (Leonard et al., 2019).

2.2.1 Causes of Racial Disparities in Maternal Mortality and Severe Maternal Morbidity

Many efforts have been dedicated towards understanding racial disparities in black maternal health; however, the main factors driving this issue are multifactorial. Such factors include, but are not limited to, differences in health insurance coverage, access to care, and broader social and economic factors such as systemic racism. For example, when health care providers discriminate and refuse to listen to the health complaints of their patients, this bias can lead to stressful health interactions and further contribute to maternal and infant health complications.

These disparities—stressful communications, existing health conditions, access to care, and systemic inequities reflect the ways in which women of color experience many barriers accessing quality care that could mitigate potential maternal health complications (Hill et al., 2022).

2.2.1.1 Individual Level Factors

Among black and white women, unique and different intrinsic biopsychosocial factors should be considered when examining the differences in rates of maternal morbidity and mortality within these populations. It is important to understand both the across group differences as well as the within group differences. Although black and white women are impacted by the similar factors, black women disproportionately face more severe outcomes because of individual-level factors. However, not all Black women are alike. There are intersectional differences to be examined for developing targeted interventions. The overall health of the mother is one of the most important factors that determines maternal and fetal health outcomes. Conditions such as heart disease, obesity, and diabetes may lead to poor birth outcomes, and black women are disproportionately predisposed to these chronic conditions. In fact, 48% of black women over age 20 have been diagnosed with cardiovascular disease, and nearly two-thirds of black women are considered obese (Reddy et al., 2021). Thus, due to higher incidence of obesity and cardiovascular disease, black women experience a 2.7 times higher case fatality rate for preeclampsia when compared to white women (Malek et al., 2021). This data suggests that although black women develop these severe conditions at an earlier age, they are less likely to have their conditions adequately addressed pre-pregnancy and during pregnancy, further resulting in an increased risk for maternal death and severe maternal morbidity (Howell et al., 2018). Additional risk factors include pregnancy at an advanced age and low educational attainment (Vilda et al., 2019). However, research has shown

that educational status is not a protective factor for black women. Instead, these racial disparities persist across education levels, where black women who have completed a college degree have a 5.2 times higher mortality rate than white women who have also completed a college level education, and 1.6 times higher than white women who have completed a high school degree (Hill et al., 2022; Reddy et al, 2021).

Behavioral and mental health diagnoses are also associated with an increased rate of maternal mortality (Admon et al., 2021). These diagnoses include postpartum depression, history of depressive disorders, anxiety disorders, substance use disorders, and other mood and psychotic disorders (Dagher & Linares, 2022). While mental health diagnoses are important individual factors that can increase severe maternal morbidity and maternal mortality, black women are also more likely to suffer from postpartum depression after delivery in comparison to white women. Notably, 100% of pregnancy-related mental health diagnoses are found to be preventable (Dagher & Linares, 2022).

2.2.1.2 Systemic Racism

A plethora of research outcomes have acknowledged the major impacts that systemic racism has on maternal mortality. Systemic racism is defined as "forms of racism that are pervasively and deeply embedded in and throughout systems, laws, written or unwritten policies, entrenched practices, and established beliefs and attitudes that produce, condone, and perpetuate widespread unfair treatment of people of color" (Braveman et al., 2022, page 171). Systemic racism is an overarching factor that affects nearly every social structure related to the way in which black mothers navigate their lives, access health care, experience receipt health care, and the status of their health. As structural and systemic racism has disproportionately placed black men and

women into lower socioeconomic brackets, black mothers often face disadvantages when addressing their own healthcare needs.

First, even before black women become pregnant, especially low-income black women, they are disproportionately affected by poor health status, as described in the previous section. Lifelong exposures to social and environmental inequities, due to systemic racism, contribute to the development of these health challenges (Burris et al., 2021). Therefore, poor health status is a primary indicator for adverse maternal health outcomes (Howell et al., 2018). Additionally, roughly half of all pregnancies in black women are accidental, which is also associated with adverse perinatal outcomes (Oribhabor et al., 2020). Unintended pregnancies make up a large proportion of pregnancies that result in severe maternal morbidity (Kilpatrick, 2015). To mitigate these poor health outcomes, it is recommended that black women utilize contraception and pre-contraception counseling to determine their health status before trying to conceive (Oribhabor et al., 2020). However, these preventative health services can be very difficult for some black women to access. Having low socioeconomic status determines the types of services and levels of health care access these black women have (Howell, 2016).

2.2.1.3 Social Determinants of Health

Social determinants of health are the environmental context, material, and social conditions in which people live, work, and play. These determinants influence risk factors that affect health, functioning and quality of life, within the individual, interpersonal, community, and societal context. Said factors also occur over multiple levels of influence, such as biologically, behaviorally, within the physical environment, sociocultural environment, and health care system (Dagher & Linares, 2022). The socio-ecological model is commonly used in public health practice

to describe the way in which social determinants of health affect individuals in these different environments (Bingham, & Howell 2019). In the context of maternal health outcomes, the negative influence of certain social determinants of health have been linked to chronic health problems which can lead to maternal mortality (Dagher & Linares, 2022). Key social determinants of health that are related to maternal health outcomes and described earlier, include education, income, socioeconomic status neighborhood characteristics, housing, access to care, safety, and food stability (Crear-Perry et al., 2021).

Structural racism is considered a root cause for the distribution of many social determinants of health which negatively impact the health of black mothers. Structural racism is embedded at the societal level, structuring social forces, social policy institutional practices, and political ideologies which perpetuate racial and ethnic inequalities. Environmental factors are impacted by these social determinants and can limit access to quality health care and healthy and safe neighborhoods. Black people in low-income communities are also more likely to be exposed to environmental toxins like pollution, traffic, and heavy metal exposure. These environmental factors have all been shown to increase the likelihood of maternal morbidity and mortality (Dagher & Linares, 2022). Cumulative exposure to social determinants of health over a lifetime, such as racism, segregation, discriminations, insufficient resources and social supports, and poor quality of health care has been found to cause accelerated biological aging of the body. This is referred to as weathering and causes long-term wear and tear onto the human body that leads to poorer health outcomes (Geronimous, 1992). This can begin as early as childhood, shown by the association of how adverse childhood events, the stress of poverty, and exposure to racism may lead to maternal mortality (Dagher & Linares, 2022).

Notably, structural racism is pervasive and impacts an individual's ability to change their behavior to improve health outcomes, even if they are knowledgeable and willing to do so. This occurs because factors of health inequalities such as governance, policy, and societal norms that limit the availability of health promoting resources (Crear-Perry et al., 2021). For example, the United States health care system suffers from a shortage of primary care providers and severe gaps in quality of care. The inequitable distribution of quality health care may then delay, or even eliminate, the opportunity for black women to access necessary perinatal care that would decrease the risk of maternal mortality and morbidity (Crear-Perry et al., 2021).

2.2.1.4 Socioeconomic Status and Income Disparities

Existing literature validates black women who are of lower socioeconomic statuses have limited access to prenatal care due to high cost of care, insurance coverage, transportation challenges, and lack of providers who deliver culturally competent care. Furthermore, income inequality is associated with upstream level factors that negatively impact overall health, including but not limited to investment in affordable housing, quality education, public transportation, healthy foods, and quality health care (Vilda et al., 2019). These constraints are also associated with unexpected pregnancy complications, inaccessible prenatal and perinatal care, and severe health risks (Oribhabor et al., 2020). Often, black mothers are unable to attend prenatal care visits that are essential to their health outcomes, due to cost, lack of transportation, wage work requirements, lack of available providers in their residential areas, and lack of insurance coverage. Data has shown that attending no or few prenatal visits is associated with increased rates of maternal death and severe maternal mortality (Howell, 2018). Furthermore, low-socioeconomic

status can affect pre-pregnancy factors, such as women's BMI, self-rated health status, and increased levels of health-related risk behaviors (Vilda et al., 2019).

Some studies suggest the use of contraception to be an effective way to reduce maternal morbidity and mortality among black women (Oribhabor et al., 2020). However, barriers such as access to primary care physicians, and lack of medical homes can prevent black women from obtaining contraceptives (Manuel, 2017). Cost is a major factor that prevents black women from accessing contraceptives, as cost can affect consistent use of contraceptive use, leading to an increased rate of unplanned pregnancies (Sutton et al., 2020). The unaffordability of contraceptives typically occurs due to the lack of insurance coverage, which disproportionately affects black women (Johnston & McMorrow, 2019).

2.2.1.5 Insurance Coverage

Black women are most likely to suffer from the vulnerabilities that come from the lack of health insurance. A substantial risk factor for adverse maternal health outcomes is the lack of having health insurance during pregnancy (Kozhimannil et al., 2022). This disparity has been associated with a higher prevalence of preconception health risk factors, such as higher BMI, unplanned pregnancy, and cigarette use (Dagher & Linares, 2022). Furthermore, black women who have insurance coverage associated with their lower socioeconomic status, such as Medicaid, are discriminated against due to this association and lower federal reimbursement rates of providers, causing providers to less likely to treat Medicaid clients (Alio et al., 2022). However, it is also important to acknowledge that even when medical insurance is available to women who are within the same socioeconomic bracket, disparities between black women and white women still exist, suggesting that racism and other social and clinical factors impact these disparities (Sutton

et al., 2020). With the passage of the Affordable Care Act, in some states with Medicaid Extensions, coverage for the pregnant person is only extended through 60 days after delivery, leaving postpartum people without inadequate coverage. In other states, post-partum care is extended one full year post-delivery (KFF, 2023). This policy change has been shown to improve maternal health outcomes for black women. However, black women continue to struggle when obtaining appropriate care, even with this policy improvement.

2.2.1.6 Perinatal Care Disparities, Quality, and Access

Inconsistent obstetrical practices in hospitals across the United States influence the disparities that exist within the health care system. The Institute of Medicine defines health disparities as the differences in the incidence, prevalence, mortality, burden of disease, and other adverse health outcomes that exist within specific population groups in the United States (Howell & Zeitlin, 2017). Often, obstetric emergencies and pregnancy complications which can be prevented are identified too late in hospitals with fewer obstetrical resources (Agrawal, 2015).

"The Institute of Medicine defines healthcare quality as 'the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and care consistent with current professional knowledge.'" (Howell & Zeitlin, 2017, page.3). The World Health Organization has established specific standards to define quality of maternal and newborn care, as "the extent to which health care services provided to individuals and patient populations improve desired health outcomes and [are] safe, effective, timely, efficient, equitable and people-centered." (Vedam, 2019). Analysis conducted by Howell (2016) found that 48% of the racial disparities in severe maternal morbidity can be attributed to differences in care quality at the hospital level. Obstetrical complications are sensitive to the quality of care provided at

delivery. This can vary at the individual provider level and extend into the hospital level of care provided, as lower performing hospitals typically employ less qualified providers (Howell, 2016). This disparity in quality of care is rooted in the historical structures emanating through decades of systemic racism. Studies have shown that black women and white women receive care from different providers. In comparison to physicians who treat white patients, physicians who treat black patients are less likely to be board certified and have less access to clinical resources that can improve health outcomes (Howell & Zeitlin, 2017).

Low socioeconomic status can also determine which types of hospitals black mothers choose to utilize. According to literature, hospitals in low-income areas that care for patients of color provide lower quality care and have higher risk-adjusted mortality ratios, in comparison to hospitals in higher income areas. While some increased mortality may be explained by the fact that black patients have higher rates of comorbid conditions, it is also very likely that black patients receive worse care than white patients; as Silber et al., (2009) found deaths from "failure to rescue" were higher among black patients than non-Hispanic white patients. Failure to rescue is defined as "the failure or delay in recognizing and responding to a hospitalized patient experiencing complications from a disease process or medical intervention" (Hall, 2020, p. 1). This suggests there are racial differences in monitoring and communication related to patient care in health and hospital settings (Burris et al., 2021).

2.2.1.7 Implicit Bias

Differences in patient monitoring and communication can indicate implicit bias and discrimination from clinicians towards black women. Different reasons for discrimination from clinicians include the patient's type of insurance (ex. Medicaid, uninsured status), race/ethnicity,

immigration status, and religious affiliation (Alio et al., 2022). In high-income countries, the most common forms of discrimination include verbal abuse and failure to respond to requests during care. Another example of discrimination includes the disregard of rights to information about care. Furthermore, when patients had differing opinions about their plan of care, they were more likely to experience mistreatment from their providers, thus showing a disregard for patient autonomy (Vedam et al., 2019).

Bingham et al. (2019) found that clinicians routinely perpetuate structural racism and may be complicit in refusing to acknowledge their roles in sustaining structural racism. This can be observed in the variation of the quality of care that is provided across hospitals, and even within hospitals (Bingham et al., 2019). Research has found that black mothers are more likely to experience explicit discrimination in care (McLemore et al., 2018; Shavers et al., 2012). Black patients also report inequitable treatment in receiving their care in comparison to white patients, such as poor continuity of care, communication gaps, and a perceived lack of attentiveness to patient's physical and emotional concerns, which lead to feelings of isolation and powerlessness during events of severe maternal morbidity (Wang et al., 2021). These unaddressed concerns can cause further maternal health complications, as women may have serious symptoms that may be exacerbated when ignored (Hill et al., 2022). For example, women of color may feel uncomfortable asking questions related to their care due to previous negative experiences from their health care providers in the past. This may demonstrate a lack of trust in their current health care team and can cause them to ignore, not report, or minimize symptoms that may be potentially fatal (Bingham et al., 2019).

Furthermore, a significant number of severe maternal morbidity and mortality events are preventable at the provider level. Factors such as delays in diagnosis, misdiagnosis, lack of

appropriate referrals, poor documentation and communication, and failures within hospital policies and procedures are common elements that contribute to severe maternal morbidity and mortality and require attention (Howell et al., 2018; Dagher & Linares, 2022). These factors may disproportionately affect black women due to structural racism and lower diversity among the United States medical workforce (Dagher & Linares, 2022).

2.2.2 Solutions and Interventions to Address Racial Disparities

Due to the substantial implications that maternal mortality and morbidity disparities impose on society, funding and research have been dedicated to implement programs and interventions to mitigate these disparities. Many public health experts and researchers have formed recommendations of the different types of interventions that should be implemented to address the foundational factors that impact maternal mortality and severe maternal morbidity disparities. Many of these suggestions range from the individual level of the socioecological model, up to the policy level to address root causes of disparities stemming from systemic racism (Collier et al., 2019). For this study, I may examine state and community level interventions. Here, I will present several approaches that have been proposed to address a variety of the imposing factors that were examined in this literature review.

2.2.2.1 Use of Doulas

Individual level interventions can help black women find the social support and resources they need to improve their pre-natal experience and pregnancy outcomes. The utilization of doulas is a common practice among high-income and low-income nations across the world. In countries

that have integrated doulas into their healthcare practice, many benefits are well-documented, such as reducing the rates of unnecessary and costly medical interventions during delivery (Vedam et al., 2018). However, in the United States, standards of regulation, scope of practice, and access to reimbursement of doulas have led to a lack of implementation in regular obstetric practice. Yet, black mothers may especially benefit from the use of doulas. Research has shown that doulas mitigate the influence of social determinants of health for pregnant women at risk and are associated with improved maternal health outcomes (Falconi et al., 2022).

2.2.2.2 Systemic Racism and Social Determinants of Health

Historical practices such as redlining, the GI Bill, Jim Crow, and mass incarceration had strong, negative impacts on the black community that persist even today (Crear-Perry et al., 2021). These practices have shifted over time, to continue fundamental inequities that black families face, shaping access to health-promoting resources and opportunities (Crear-Perry et al., 2021). The concept of systemic racism goes hand in hand with the need to implement upstream interventions that reduce the negative impacts of social determinants of health. Addressing social determinants of health is a critical step to improving primary and secondary prevention and treatment of illness. Attending to these factors is a foundational process needed to improve overall health among black mothers, as the social structures that are influenced by social determinants of health (i.e., access to education, access to quality healthcare) impact the delivery and outcomes of their overall health care (Crear-Perry et al., 2020).

In their study, Crear-Perry et al. (2021) identifies five essential tasks needed to integrate social determinants of health into the current health care system. These tasks are listed as awareness, adjustment, assistance, alignment, and advocacy. According to Crear-Perry et al.,

awareness indicates the need for the screening of social determinants of health. Adjustment refers to the need to structure social services to resolve negative determinants of health and promote the positive. Assistance and alignment mean strengthening social supports and redesigning health services to meet the needs of the public. And finally, advocacy includes the use of local, state, and federal governments to support public health efforts to address social determinant of health in clinical care, while also considering the context of the community's needs. Each of these principles acknowledge the major impacts that social determinants of health have with individual health and can determine the steps that should be taken to improve the distribution of social determinants of health (Crear-Perry et al., 2021).

2.2.2.3 Quality and Access

Hospitals are tasked with the responsibility to (1) evaluate their rates of mortality and morbidities; (2) draw conclusions about potential causes and solutions; and (3) to improve their organization's health outcomes. However, few obstetric departments across hospitals in the United States track quality measures by race and ethnicity, therefore being unable to establish goals that target quality improvement efforts to reduce racial disparities (Howell & Zeitlin, 2017). For state and local accountability, Collier et al., (2019) suggests that obstetrical quality evaluation and improvement should (1) focus on hospitals that have particularly higher risk-adjusted morbidity rates, (2) focus on hospitals that care for a disproportionate number of women of color, and (3) standardize quality improvement measures and procedures among these particular hospitals (Collier et al., 2019).

When addressing access to care, major improvements have been made with policy level efforts to expand insurance coverage for those who struggle to obtain appropriate healthcare

insurance. Medicaid expansion under the Affordable Care Act has greatly increased the number of people able to enroll, due to the expansion of Medicaid income requirements. Thus, more black women have been able to enroll in Medicaid and benefit from increased access to preventative care, “reducing adverse health outcomes before, during, and after pregnancies; and reducing incidence of maternal mortality” (Crear-Perry et al., 2021, p 233).The American Rescue Plan Act granted states the option to extend Medicaid postpartum coverage from 60 days to 12 months, which has only been adopted by only 31 states **(**The White House, 2022; KFF, 2023). A recent evaluation study showed that expanded Medicaid coverage reduced the total Maternal Mortality Rate by 7.01 maternal death per 100,000, and displayed that black mothers experienced the highest decrease in the total Maternal Mortality Rate (Dagher & Linares, 2022).

This policy measure, where adopted, has resulted in great improvements in health outcomes for black mothers. However, it must be noted that women still experience hardships with insurance coverage following delivery. However, as noted above, many women are unable to access care designed for the duration of the fourth trimester (12 weeks following childbirth). During the fourth trimester, many cases of maternal mortality occur. Therefore, it is imperative to expand access to healthcare to follow women 12 months after they give birth. Additionally, black mothers and their support network must be educated and aware of warning signs that may warrant re-hospitalization post-delivery discharge (Crear-Perry et al., 2022).

Investing in comprehensive community outreach and primary care efforts can prove to be effective in benefitting black women of reproductive age. These efforts can include increasing funding and resources in care delivery settings such as midwifery maternity centers, nurse practitioner practices, maternal and child health clinics, and hospital outpatient clinics. This community outreach and primary care strategy can increase access to quality services for black

women and they may receive primary preventative care, secondary, and tertiary medical care for chronic conditions, while they receive maternal care (Crear-Perry et al., 2021).

2.2.2.4 Implicit Bias

Training in implicit bias is critical to implement across the health care workforce to bring awareness to the role that implicit bias has on healthcare interactions and timeline for providing care with patients. Several methods have been proposed to achieve this goal, such as team communication improvement modules, the implementation of evidence-based safety bundles, and data driven research studies and interventions to improve systems that will reduce the incidence of preventable maternal death (Collier et al., 2019). Howell (2018) describes the importance of the implementation of safety bundles (listed protocols, checklists, triggers of early warning criteria, simulation trainings), the provision of coordinated care and crew resource management, team training, staff training, credentialing, and the promotion of a safety culture, are all important components needed to be included in training medical personnel.

Vedam et al. (2019) noted that evaluations of respectful maternity care focus on monitoring the quality of interactions between clinicians and patients in low-resource settings to reduce implicit bias. However, Vedam et al., found that women in middle- and high-income settings also report negative experiences during hospital visits, including "being ignored, belittled or verbally humiliated by healthcare providers, having interventions forced upon them, and being separated from their babies without reason or explanation" (Vedam et al., 2019, page 2). This study found that women of all races and ethnic backgrounds who gave birth at home or in birthing centers had fewer experiences with discrimination including, but not limited to, physical abuse, sexual abuse, verbal abuse, stigma and discrimination, failure to meet professional standards of care, poor

rapport between women and providers, and poor conditions and constraints presented by the health system (Vedam et al., 2019).

3.0 Present Study

Individual, community level, and policy level interventions have been developed to reduce racial disparities in maternal mortality and severe maternal morbidity. Many of these interventions have been implemented in conjunction with each other to produce substantial improvements in this realm. The present study examines interventions within the state of Pennsylvania and Allegheny County specifically, and their effectiveness in reducing in black maternal mortality and severe maternal morbidity or their effect of other factors associated with maternal health. Results from this study will provide insight into future directions that should be considered when program planning for future interventions within the county.

4.0 Methods

4.1 Research Design

The current study is a descriptive, exploratory analysis using Center for Disease Control and Prevention (CDC) and State Department of Health state level statistics for overall maternal mortality rates during the years 2014-2019. Pennsylvania statistics will be compared to statistics of the following states: California, Colorado, and Illinois. These states have been chosen due to their similar overall rates of maternal mortality. The state of Massachusetts does have a similar maternal mortality rate to Pennsylvania but was excluded due to lack of available data. The current study will also compare rates of black and white maternal mortality within each of the states mentioned.

In addition, the present study will include an exploratory analysis of qualitative data that describes initiatives designed to reduce black maternal mortality for two states, California and Pennsylvania. Qualitative analysis will be performed on initiatives produced by the California Department of Public Health, Pennsylvania Department of Health, and Allegheny County Health Department. Inclusion criteria consists of publicly available records produced by the California State Department of Health, Pennsylvania Department of Health, and the Allegheny County Health Department. Sources were excluded if initiatives were not specifically designed to decrease black maternal mortality.

4.2 Data Collection and Sample

The data set includes information from various The California Department of Public Health (CADPH), The Colorado Department of Public Health and Environment (CDPHE), The Illinois Department of Public Health, The Pennsylvania Department of Health (PADOH), as well as the Allegheny County Health Department (ACHD). The state level overall maternal mortality rates being used were collected from the CDC's publicly available database. Data examined from these resources were reported between 2014 and 2022. Maternal mortality statistics disaggregated by race were collected from publicly available sources from the California Department of Public Health, Colorado Department of Public Health and Environment, Illinois Department of Public Health, and the Pennsylvania Department of Health.

The qualitative data set includes reports sourced from the California Department of Public Health, the Pennsylvania Department of Health, and the Allegheny County Health Department websites. The following reports from the California Department of Public Health website include: The California Maternal Mortality Surveillance System's California Pregnancy-Associated Mortality Review, reports from the Black Infant Health Program, and The California Maternal Quality Care Collaborative. The reports from the Pennsylvania Department of Health include the following: The Pennsylvania Maternal Mortality Review Committee's Maternal Mortality Review (2021) and the Pennsylvania Perinatal Quality Collaborative. The qualitative data set will also include the 2022 March of Dimes Report Card.

The reports from the Allegheny County Health Department include: The Office of Family and Child Health, The Allegheny County Strategic Plan (2019), The Allegheny County Birth

Plan for Black Babies and Families, and The Allegheny County Department Maternal and Child Health Strategy Team' Comprehensive Maternal and Child Health Strategy Final Report 2020.

4.3 Data Analysis

This exploratory analysis used quantitative statistics and qualitative reports, evaluative plans, and goal statements to draw inferences about which interventions may were effective in reducing black maternal mortality in Allegheny County. Due to the lack of formally published data related to disparities in maternal mortality, this exploratory analysis draws preliminary conclusions as to which interventions the Allegheny County Health Department should consider when implementing evidence-based interventions for reducing black maternal mortality. The present study will produce recommendations for future studies and describe research.

5.0 Findings

5.1 Quantitative Data

5.1.1 State Level Rates of Maternal Mortality

Between 2018 and 20220, overall maternal mortality rates by state are as follows: Pennsylvania (15 per 100,000 births), Colorado (14.4 per 100,000 births), Illinois (12.9 per 100,000 births), and California (10.2 per 100,00 births) (CDC, 2022). In 2018, Pennsylvania's maternal mortality rates by race were 79 deaths per 100,000 births for white women, and 163 deaths per 100,000 births for black women (PADOH, 2020). Between 2014 and 2016, Colorado's maternal mortality rates by race were 47.9 deaths per 10,000 births for white women, and 43.6 deaths per 10,000 births for black women (Colorado Department of Public Health and Environment, n.d). Between 2016 and 2017, Illinois's maternal mortality rates by race were 38 deaths per 100,000 births for white women, and 109 deaths per 100,000 births for black women (Illinois Department of Public Health, 2018). Between 2018 and 2019, California's maternal mortality rates by race were 11.1 deaths per 10,000 births for white women, and 47.3 deaths per 10,000 births for black women (CADPH, 2022).

Table 1. State Level Rates of Overall Maternal Mortality

California	10.2 per 100,000
Colorado	14.4 per 100,000
Illinois	12.9 per 100,000
Pennsylvania	15 per 100,000

Table 2. State Level Rates of Maternal Mortality by Race

State	White Maternal Mortality Rate	Black Maternal Mortality Rate
California (2018-2019)	11.1 per 100,000	47.3 per 100,000
Colorado (2014-2016)	47.9 per 100,000	43.6 per 100,000
Illinois (2016-2017)	38 per 100,000	109 per 100,000
Pennsylvania (2018)	79 per 100,000	163 per 100,000

5.2 Qualitative Data

5.2.1 State Level Policy Implementations

5.2.1.1 2022 March of Dimes Report Card (2022)

March of Dimes is a non-profit organization within the United States that aims to reduce preventable maternal health risks and deaths, reduce preventable preterm birth and infant death, and to close the health equity gap. March of Dimes publishes an annual report card which describes the quality of maternal and infant health on a state level using a letter grade system. The grades

range from A to f, and indicate preterm birth rates within the state, with a range of "greater than or equal to 11.5%" to "less than or equal to 7.7%." For the this study, the author has assumed this grading system can describe the overall state of maternal and infant health within each state. This report also details the different state policy level interventions that have been implemented to improve overall maternal and infant health (March of Dimes, 2022).

The state of California received a B- rating, with a preterm birth rate of 9.1%. The report card states that California has the following state level policies implemented to improve maternal and infant health: Medicaid Expansion, Medicaid Extension, a Midwifery Policy, a Maternal Mortality Review Committee, and a Perinatal Quality Collaborative. The state of California is also in the process of implementing Doula Policy/Legislation. The state of Colorado received a C rating with a preterm birth rate of 9.7%. The report card states that Colorado has the following state level policies implemented to improve maternal and infant health: Medicaid Expansion, Midwifery Policy, Maternal Mortality Review Committee, and a Perinatal Quality Collaborative. Colorado is also in the process of implementing Medicaid Extension and Doula Policy/Legislation. The state of Illinois received a D+ rating with a preterm birth rate of 10.7%. The state of Illinois has implemented the following policy level interventions to improve maternal and infant health: Medicaid Expansion, Medicaid Extension, Midwifery Policy, Maternal Mortality Review Committee, and Perinatal Quality Collaborative. The state of Illinois is also in the process of implementing Doula Policy/Legislation. The state of Pennsylvania received a C rating with a preterm birth rate of 9.8%. The state of Pennsylvania has implemented the following state level policies to improve maternal and infant health: Medicaid Expansion, Medicaid Extension, Midwifery Policy, Maternal Mortality Review Committee, and Perinatal Quality Collaborative.

The state of Pennsylvania is also in the process of implementing Doula Policy/Legislation (March of Dimes, 2022).

5.2.1.2 Interventions Within the California Department of Public Health

5.2.1.2.1 California Pregnancy Surveillance System

The California Pregnancy Mortality Surveillance System (CA-PMSS) was established by the California Pregnancy-Associated Mortality Review (CA-PAMR) to monitor deaths related to pregnancy by utilizing a complex data linkage and expert committee review to document the most accurate information available. This includes determining the underlying causes of pregnancy-related deaths, identifying contributing factors of mortality at the individual, provider, facility, system, and community levels, discussing quality improvement and preventative strategies, and creating data-informed recommendations for preventing maternal mortality and equalizing the birthing experience. The main goal of the CA-PAMR is to eliminate preventable pregnancy-related deaths and the health inequities related to maternal mortality (CADPH, 2022).

The CA-PAMR's most recent published report was released in 2018, reviewing pregnancy-related deaths between the years 2002 and 2007. The CA-PAMR is currently collecting data beginning in 2019 in an ongoing study. However, the CA-PAMR has released preliminary findings related to the California's pregnancy-related mortality ratio in 2019. Key findings include the following statements:

- "California's pregnancy-related mortality ratio (PRMR) in 2019 was 12.8 deaths per 100,000 live births and was lower than the PRMR of 16.1 in 2018."
- "California's PRMR began to rise gradually in 2013 and peaked in 2018."
- "California's PRMR was consistently lower than the U.S. PRMR from 2011 through 2017"

- "Pregnancy-related mortality was examined within the context of social determinants of health by incorporating the California Healthy Places Index (www.healthyplacesindex.org), a validated measure of community well-being."
- "California is among the first in the nation to include a validated measure of community conditions in the analysis of pregnancy-related mortality." (CADPH, 2022)

5.2.1.2.2 Black Infant Health Program

The Black Infant Health Program provides culturally appropriate services that include empowerment-focused group support services, client-centered life planning, and case management to improve the health and social conditions for Black women and their families. The goal of the Black Infant Health Program is "to improve Black infant and maternal health as well as decrease health inequities in infant and maternal mortality rates." Women within the program reported having a better understanding of effective strategies to manage and reduce stress, having stronger positive connections to their heritage and other black women in their communities, and experiencing a higher sense of empowerment to make behavior changes that lead to living a healthier life (CADPH, 2022).

Reports from the Black Infant Health Program noted that they found the largest improvements within their clients in the following health behaviors:

- "60% decrease in no practical and emotional support"
- "51% decrease in smoking within the last month"
- "45% decrease in food insecurity"
- "38% increase in the use of yoga, deep breathing, and/or meditation to manage stress"
- "35% decrease in depressive symptoms"
- "33% increase in intention to put baby to sleep on their back" (CADPH, 2022)

5.2.1.2.3 California Maternal Quality Care Collaborative

The California Maternal Quality Care Collaborative (CMQCC) is a multi-stakeholder organization dedicated to reducing preventable maternal morbidity, mortality, and racial disparities in California's maternity care. The CMQCC utilizes research and its Maternal Data Center to develop quality improvement toolkits, state-wide outreach collaboratives, and improve health outcomes for mothers and infants. Research conducted by the CMQCC has led to their development of cardiovascular disease, sepsis, and hypertensive disorders of pregnancy, and various other toolkits used to address maternal and infant complications. These toolkits provide physicians and maternal care providers detailed instructions on how to intervene during these medical emergencies (CMQCC, n.d).

Research conducted by the CMQCC have presented the following key findings between the years 2017-2019:

- "The rate of pregnancy-related deaths from hypertensive disorders of pregnancy (preeclampsia/eclampsia) decreased significantly in 2017-2019. For the first time, hypertensive disorders are no longer among the top five leading causes of pregnancy-related deaths in California."
- "Cardiovascular disease continued to be the leading cause of pregnancy-related deaths in 2017-2019, followed by hemorrhage, sepsis or infection, thrombotic pulmonary embolism, and amniotic fluid embolism.
- "Racial ethnic disparities in the rates of pregnancy-related deaths" narrowed in 2017-2019 but persist. The PRMR for Black birthing people was three to four times higher than the PRMRs for all other racial/ethnic groups in California." (CADPH, 2022)

5.2.1.3 Interventions Within the Pennsylvania Department of Health

5.2.1.3.1 Pennsylvania Maternal Mortality Review Committee

The Pennsylvania Department of Health's Maternal Mortality Review Committee (PA MMRC) was established in 2018 as a result of congress's establishment of the Preventing Maternal Death Acts in 2018. The goal of the PA MMRC is to utilize vital statistic and death certificate information to better understand the causes of maternal mortality and to develop recommendations for action to prevent maternal deaths. In 2022, the PA MMRC published the Pennsylvania Maternal Mortality Review, reporting on statistics that had been collected in 2018. Maternal death statistics disaggregated by race were reported in Table 1.1. Key findings from the PA MMRC Pennsylvania Maternal Mortality Report (2021) are as follows (PADOH, 2022):

- "Accidental poisonings were the leading cause of maternal deaths in 2018 and accounted for over 50% of all maternal deaths. This category includes drug-related overdose deaths. In 2013, only 19% of pregnancy-associated deaths were due to accidental poisonings. That over half of all deaths in 2018 fell into this category reflects, in part, the continuing devastating impact of Pennsylvania's opioid epidemic on both individuals and families."
- "Seventy-seven percent of maternal deaths were of individuals listed as white on their death certificate (Excluding Philadelphia County) in 2018. While it is not identified in the individual 2018 data year, racial disparities in adverse maternal health outcomes persist in Pennsylvania as evidenced by the fact that non-Hispanic Blacks had a PAMR two times greater than the PAMR for non-Hispanic whites. Racial disparities in maternal mortality stem from the detrimental effects of institutional and interpersonal racism, implicit bias among providers and social determinants of health.
- When determining whether discrimination contributed to maternal death, discrimination did contribute to 2% of all maternal deaths, discrimination "probably" contributed to 18% of deaths, discrimination did not contribute to 41% of maternal deaths, within 25% of cases, it was unknown if discrimination contributed to maternal death, and within 14% of cases, it was left "blank" (PADOH, 2022)

Table 3. Pennsylvania Maternal Mortality Review Committee Determinations on Contributing Factors for the 2018 Maternal Deaths

Did discrimination contribute to the death?	Yes	Probably	No	Unknown	Blank
	1 (2%)	8 (18%)	18 (41%)	11 (25%)	6 (14%)

Key recommendations developed based on these results are as follows:

- "Build infrastructure to provide more comprehensive medical care for all pregnant and postpartum individuals."
    - "Recommendation for Policymakers, inclusive of the General Assembly and State Agencies, include the following: Safeguard continuous Medicaid eligibility for individuals during pregnancy and up to one year postpartum."
- "Recommendations for Health Care Providers and Hospital Systems include the following:"
    - "Establish and implement protocols using national guidelines for pregnant/postpartum hemorrhage and massive transfusion, with particular consideration for small hospitals that may not be equipped to treat high risk patients."
    - "Host drills for pregnant and postpartum hemorrhage response, massive transfusion, and estimating/quantifying blood loss to practice facilities' protocols at least annually.
    - "Have emergency carts and cards in obstetric units and emergency departments for blood loss and cardiac/uncommon emergencies."
    - "Review and update existing emergency medical services (EMS) protocols as appropriate for pregnancy and postpartum hemorrhage, and continue educational efforts directed towards EMS providers on the recognition and treatment of emergency conditions related to pregnancy."
- "Recommendations for Community-Based Organizations include the following:"
    - "Increase community knowledge of social supports available within the community to improve health

outcomes (e.g., doulas, home visiting services, community health workers)."
    - "Connect pregnant and postpartum clients with the resources needed to be able to attend medical appointments (e.g., transportation, information on getting medical coverage, childcare assistance)." (PDH, 2022)

5.2.1.3.2 Pennsylvania Perinatal Quality Collaborative

The Pennsylvania Perinatal Quality Collaborative (PA PQC) was launched as an arm of the Pennsylvania Department of Health's Maternal Mortality Review Committee (PA MMRC). Although the PA PQC does not have publicly accessible data related to maternal mortality, they have established 2023 Initiative Goals and Key Interventions (WHAMglobal, 2023):

- Form, structure, and expand your multi-disciplinary PA PQC Healthcare Team
- Develop and implement a quality improvement plan with your team to translate the key interventions into practice, making continuous improvements
- Submitting at least one quarter's worth of aggregated data for the PA PQC process and outcome measures during a 12-month period.
- Expectations to submit data in a consistent and timely manner (WHAMglobal, 2023).

5.2.2 Interventions Within the Allegheny County Health Department

5.2.2.1 Allegheny County Office of Family and Child Health

The Allegheny County Office of Family and Child Health offers four different interventions dedicated to reducing maternal mortality: the Nurse-Family Partnership program, Healthy Moms and Healthy Babies, and the Home Visiting Network, partnered with Hello Baby. The Nurse Family Partnership is a national program within the United States and partnered with the Allegheny County Health Department. Each of these partnered programs work to reduce

incidence of maternal mortality by offering home visiting services performed by nurses during pregnancy and after birth to ensure that families receive the medical services they need.

5.2.2.1.1 Healthy Start

Healthy Start is a community organization within Allegheny County which seeks to improve maternal and child health outcomes through the utilization of a multidisciplinary team model. Community Health Workers, Certified Lactation Consultants and Counselors, Lamaze Certified Childbirth Educators, Certified Doulas, nurses, licensed mental health clinicians, researchers, Community Health Advocates and other public health practitioners work within Allegheny County to reduce health disparities among families.

5.2.2.2 Allegheny County Strategic Plan 2019 – Health Equity Goals

The Allegheny County Health Department creates an operational plan every three to five years to address critical challenges within the department's ability to improve the health of the residents within Allegheny County. This includes determining high-value action steps that capitalize on emerging opportunities. To reduce maternal mortality within Allegheny County, the health department has set the following goals (ACHD, 2019):

- "GOAL 1: Design programming aimed at reducing disease risks related to physical and social exposures during gestation, childhood, adolescence, adulthood, and older age."
    - "HE.1.1 All ACHD programs will develop a written statement pertaining to how their programs address health equity by June 2020 HE.1.2 Pilot an integrated approach to public health in the Monongahela River Valley communities by establishing a district office focused on connecting residents to all ACHD programs and services by December 2019"

- "GOAL 2: Develop and implement an organizational health equity plan that links initiatives to disaggregated health outcome data. "
    - "HE.2.1 Plan and conduct a health equity assessment by June 2019"
    - "HE.2.2 Begin implementing recommendations from the health equity assessment by March 2020"
- "GOAL 3: Involve residents, especially the most vulnerable, in all decision-making and planning for community health improvement."
    - "HE.3.1 Conduct assessments related health equity work in all PHA areas by June 2022 (and ongoing)"
    - "HE.3.2 Develop strategy to begin adding residents to the ACHD Advisory Coalition and PHA workgroups by December 2019" (ACHD, 2019)

5.2.2.3 Allegheny County Plan for Black Babies and Families

In partnership with the Allegheny County Health Department, Healthy Start developed the Allegheny County Birth Plan for Black Babies and Families in response to the inequities in maternal and child health. The Birth Plan addresses the fact that these inequities were built from systemic racism and uses this foundation to establish goals that are equity-centered. The goals established by Healthy Start revolving around four main themes: (1) strengthening the maternal and child health (MCH) workforce, (2) strengthening systems of care, (3) addressing social determinants of health, an (4) coordinating and streamlining maternal and child health initiatives. Specific goals related to reducing black maternal mortality include (Allegheny County Maternal and Child Health Strategy Team. 2022):

- "Provide supports to retain Black and underrepresented MCH workers"
- "Implement efforts to recruit Black and other underrepresented MCH workers"
- "Support non-physician MCH workers"
- "Establish standards, practices, and training that enable the MCH workforce to provide more compassionate, culturally competent, anti-racist, equitable care"

- "Increase connection to and collaboration with community-based care
- "Invest in and strengthen key sources of community support in Black communities"
- "Establish stronger care coordination and integration."
- "Improve MCH related policies and policy implementation in ways that reduce inequities."
- "Transform Workplace Policies and Environments to be Supportive of Current and Future Parents."
- "Improve Accessibility and Affordability of Child Care" (Allegheny County Maternal and Child Health Strategy Team, 2022)

5.2.2.4 Allegheny County Maternal and Child Health Strategy Team – Comprehensive Maternal and Child Health Strategy Final Report 2020

The Allegheny County Maternal and Child Health Strategy Team (ACMCHST) is composed of representatives from Healthy Start, the Allegheny County Health Department Maternal and Child Health Program, the University of Pittsburgh School of Public Health and Center for Health Equity, the Allegheny County Department of Human Services, and consultant Dr. Vijaya Hogan. This team was created to generate goals and initiatives to improve infant and maternal mortality rates for those experiencing the greatest health disparities. These goals are intended to influence maternal and child health policy, practice, and outcomes within Allegheny County. The strategy team formed an evaluation plan that includes elements of process evaluation and outcome evaluation. This process was intended to engage partners and stakeholders to focus on maternal and child health outcomes, as well as the implications for maternal health outcomes from the standpoints of businesses, housing, and public safety sectors (ACMCHST, 2020).

The process evaluation will focus on building capacity for organizations to address inequities in maternal and child health, as well as developing further strategies to address inequity in maternal and child health. The evaluation plan intends to examine the following areas:

- “a. Development of internal assessments has the organization developed an internal assessment and what are the characteristics of those assessments (qualitative). This will include a review of tools, frameworks and processes used (What processes are used and why).”
- “b. Development of operational frameworks and definitions of equity (including racial and gender equity): has the organization developed a framework or definition of equity within their mission, vision or charge. (qualitative and quantitative)”
- “c. Development of a process to implement internal changes: once internal assessments and initial core visions and missions are established, what processes and resources are put in place to address internal organizational structures, organizational policies and organizational priority setting. (qualitative)”
- “d. Development of process of implementing changes related to public service or care (including forward facing strategies specific to addressing inequity in MCH in the region): once internal processes are established, what process are in place to address any public or forward-facing actions or activities. This could include but not be limited to organizations that provide direct services to the larger community (qualitative).” (ACMCHST, 2020)

The outcome evaluation intends to monitor health outcomes and sociocultural outcomes that change because of the dissemination of the information provided by the report. The outcome evaluation will monitor:

- “1. Maternal and child health outcomes: health service access, maternal morbidity, infant morbidity, child morbidity”
- “2. MCH resource outcomes: interventions and programming specific to MCH patients and community members served” (ACMCHST, 2020)

6.0 Discussion

The implementation maternal health disparity interventions continues to be a lesser explored area within the subject of public health. Although more attention has been brought to address and research the causes of maternal health disparities in black women, more evaluation and implementation of interventions to reduce these disparities must be done. The results of this exploratory analysis have been able to describe potential interventions that may be effective. However, this is just the beginning of the search for effective interventions that would reduce black maternal mortality and morbidity, and health inequities in black women.

6.1 State Level Rates of Maternal Mortality

The presented study is an exploratory analysis comparing selected state level maternal mortality rates in order to determine which states have interventions that the state of Pennsylvania can implement to reduce rates of maternal mortality in black women. The present study found that California, Colorado, and Illinois had similar rates of maternal mortality to Pennsylvania (CDC, 2022). The data in this study indicated that California had the lowest rates of overall maternal mortality, while Pennsylvania had the highest rates of maternal mortality among the states that were examined. In addition, Pennsylvania has the highest disparities of maternal mortality among black women, while Colorado has the lowest disparity of maternal mortality among black women (CDC, 2022).

6.2 State Level Policies and Interventions

When assessing state policies that have been implemented, The March of Dimes report indicated that every state in this study has implemented at least four out of six of the federal policies that are offered to improve maternal and infant health (Medicaid Expansion, Medicaid Extension, Midwifery Policy, Maternal Mortality Review Committee, Perinatal Quality Collaborative, Doula Policy or Legislation). California, Colorado, Illinois, and Pennsylvania are all states that are in the process of implementing Doula Policy/Legislation. Furthermore, Colorado is in the process of implementing Medicaid Extension policies (March of Dimes, 2022). Currently, 31 states have either adopted or are in the process of implementing 12-month postpartum extensions (KFF, 2023). As Medicaid expansion under the Affordable Care Act reduced the uninsurance rate for new mothers from 19.2% to 11.3% from 2013 - 2016, reductions of maternal mortality may occur for pregnant and postpartum women under Medicaid. Extended post-partum Medicaid coverage may contribute to reduced maternal mortality, with estimates of saving as many as 7 per 100,000 maternal lives, with the greatest improvements in black women. Additionally, with Medicaid Expansion, maternal coverage via Medicaid improved access to care, allowing for improved chronic disease management. Furthermore, Medicaid-eligible women displayed increased healthcare utilization and better self-rated health (Shah & Friedman, 2022). These benefits to the health of black women can reflect how the implementation of Medicaid extension can reduce black maternal mortality in the future as black women have increased access. Improvement in overall health status will allow for black women to have healthier pregnancies and improved maternal health outcomes. As states continue to collect data related to maternal health outcome resulting

from Medicaid Expansion, the United States may be able to view the long-term beneficial impacts of the implementation of this policy.

Although most of the states have implemented many of the same policies, the way in which these policies have been executed have been drastically different. For one, Congress passed the Preventing Maternal Death Acts in 2018, requiring every state to establish maternal mortality review committees. These committees are tasked with identifying underlying causes of maternal deaths, in order to develop opportunities for prevention (Noursi et al., 2021) However, among the states reviewed in the present study, California's MMRC's report has the most depth, examining specific causes of maternal mortality within their report.

Notably, California's published reports display how the data collected has been incorporated to produce interventions to decrease rates of maternal mortality. For example, the California Maternal Quality Care Collaborative has used their data collected for its Maternal Data Center to create toolkits to address the most common causes pregnancy-related deaths. California's Maternal Quality Care Collaborative has clearly reported improvements of their rates of maternal mortality and racial and ethnic disparities between the years 2017 and 2019 (CMQCC, n.d). Similar to this initiative, the Pennsylvania Maternal Mortality Review established goals to create toolkits that may save lives during maternal complications in the future but has not yet begun the process of implementation (PADOH, 2022).

Pennsylvania's Maternal Mortality Review published their most recent findings in 2022, utilizing data collected from 2021. It is important to note that the PA MMRC's data excluded cases from Philadelphia County. Key findings within the PA MMRC state that while 77% of maternal deaths in Pennsylvania where white women, there is a racial disparity due to the fact that mortality rates among black women are significantly higher than white women. The report does

acknowledge that the cause of this disparity is due to systemic racism, implicit bias, and inequalities in social determinants of health among black women (PADOH, 2022). Since the report notices the fact that systemic racism and social determinants of health influence racial disparities in maternal health, it would be beneficial to see more specific statistics related to how social determinants of health contribute to black maternal mortality. This would be very similar to the CA-PAMR's methods of using social determinants of health as a lens to examine black maternal mortality. One strength that the Pennsylvania Maternal Mortality Review Committee has is that its report describes contributing factors of pregnancy-related deaths, including discrimination and the presence of mental health conditions. However, with the inclusion of "blank", "probably" and "unknown" data responses that describe whether the indicator was a contributing factor, it is very difficult to interpret results of this data in an accurate manner. Furthermore, data about discrimination as a factor that contributed to the maternal death did not clarify what kind of discrimination was being performed, and onto whom. Therefore, it is unclear whether the discrimination was based on race, religion, or socioeconomic status.

Although the Pennsylvania Perinatal Quality Collaborative has not published publicly accessible data related to black maternal mortality, the collaborative has published initiatives and goals that would address reductions in maternal mortality. The goals set by the collaborative all have themes of quality improvement evaluation, including establishing plans for multidisciplinary evaluation teams, and aggregating data from interventions to be submitted for quality improvement evaluations. The PA-PQC would like to utilize their quality improvement plans to develop and implement interventions that reduce maternal mortality, and thus, also reducing black maternal mortality. The PA-PQC established future recommendations as well to strengthen community-based organizations and implement increased doula utilization. Furthermore, the PA-PQC would

like to oversee more equitable resource provision to mothers to address social determinants of health (WHAMglobal, 2023).

One challenge that the state of Pennsylvania experiences with the publishing of this data is that there is no standardized requirement for data collection and reporting timeframes within the state. This means that county level public health departments are not required to report out results from their maternal health sectors before a specific deadline. It is speculated that this may contribute to the exclusion of Philadelphia County maternal mortality statistics within the PA MMRC's 2021 report. While Pennsylvania's Maternal Mortality Review Committee has published recent statistics reviewing the rates causes of maternal deaths, the committee fails to report interventions that have been created in response to these reports.

Examining state-level interventions, this study encountered difficulty to comparing across states, due to the lack of publicly available data related to the interventions implemented; as well as the way in which the data is collected. There appears to be less standardization across the states. For example, while California's Department of Public Health publishes reports describing several programs that have been implemented throughout the state, none of the other states reviewed in the present study produced reports similar to those from California. California's Department of Public Health Black Infant Health Program reported statistics that show how it has improved black women's health behaviors that may improve their birthing experience. The empowerment-focused group support structure of this program implies the use of the health belief model, which has been shown to be effective in improving the health of clients subjected to interventions that contain this component. The core premise of the health belief model states that for individuals who perceive themselves to be subject to a health problem, if they believe that they are capable to perform behaviors to prevent or treat that health problem, they will take those actions (Stout, 1977). Black

maternal health programs which include tenants of the health belief model have been shown to increase perceived benefits of prenatal care, increase self-efficacy, and increase the likelihood of low-income women to seek adequate prenatal care (Stout, 1977). As shown in California's Black Infant Health Program, incorporation of the health belief model within interventions that the state of Pennsylvania develop may be effective in reducing black maternal mortality by promoting positive health behaviors within black women.

Given Pennsylvania's lack of state-level intervention, findings from the Pennsylvania Maternal Mortality Review Committee results could be used to inform state-level initiatives to reduce maternal mortality within Pennsylvania. The California Maternal Quality Care Collaborative's initiative to design toolkits to address the leading causes of maternal mortality can serve as an example of a strategy that Pennsylvania and other states can imitate to reduce incidence of maternal mortality. Additionally, gathering more data related to the leading causes of black maternal mortality, in comparison to the leading causes of white maternal mortality, can provide the foundation for the development of powerful interventions that can be implemented to address racial disparities within maternal health. Moreover, California's Pregnancy Mortality Surveillance System has been one of the first state-level programs to examine its data within a context that includes social determinants of health (CADPH, 2022). If Pennsylvania were to adopt this approach, it would be beneficial to gather information related to which social determinants are greatly contributing to black maternal mortality. This information can promote the development of programs that provide resources to black mothers that would improve their living situations, and thus improving maternal health outcomes.

6.3 Interventions Within the Allegheny County Health Department

The Allegheny County Health Department currently heavily focuses on using home-nurse visiting programs as a resource for low-income and minority women. These programs are utilized specifically to reduce black maternal mortality in Allegheny County. While these programs may be effective in reducing black maternal mortality, it may be beneficial to implement a wider variety of programs that support black mothers. It may be beneficial to construct similar programs to home-visiting programs that would link low-income black women to doulas. Doulas are specifically trained to provide physical, emotional, and informational support during pregnancy. Doulas act as an intermediary between the mother and their medical clinicians, advocating for exceptional medical treatment for the mother, thus mitigating maternal health complications (Falconi, 2022). Currently, Healthy Start is an independent community program that is partnered with the Allegheny County Health Department, which links certified doulas with low-income black women. While the Allegheny Health Department is linked with three different home nursing programs, they are only partnered with one program (Healthy Start) that may specialize in providing linkages to doulas. If the Allegheny County Health Department can form more partnerships with similar programs, or if they were to implement their own intervention, this may be an additional support that can serve more black mothers within the county via community and system level integration.

Group support programs for black mothers may be beneficial for black women in Allegheny County, as the sense of community and social support can improve health outcomes for black mothers. Women's groups in maternal and child health literature are typically community-based organized groups of women who use health promotion techniques and peer support to

promote individual and community action for positive health outcomes (Cantuo et al., 2022). Black mothers can benefit from social support networks, as an important motivating factor to access prenatal care. Stout (1997) found that "Adequacy of prenatal care is positively correlated with maternal feelings of intimacy and comfort with significant others, being hopeful about the future, and having a positive attitude about the pregnancy" (Stout, 1997, p. 173). Similarly, to the Black Infant Health program that has been put in place in California, black mothers in Allegheny County may benefit from the lifestyle changes that come with being a part of an educational group setting.

6.4 Future Directions and Goals for Allegheny County

6.4.1 Directions Towards Improving Health Equity

6.4.1.1 Data Collection, Assessment, and Evaluation

The Allegheny County Health Department's Strategic Plan of 2019 details several goals that address overall health equity, including initiatives to address maternal and infant health disparities (ACHD, 2019). Equity in health implies that ideally, everyone should have the opportunity to reach their full health potential, and that no one should be disadvantaged from this potential. In health equity assessments, this is typically operationalized by comparing the health outcomes of the most disadvantaged populations to the health outcomes of the average population. However, this may sometimes reflect limitations with collecting and analyzing data (Braveman, 2006). These general goals of health equity include plans to use assessment practices to direct the collection of data that disaggregates health outcomes based on race. Goals that were included in

the Allegheny County Health Department's Strategic Plan had been planned to be implemented in the recent past, during the years 2019 and 2020 (ACHD, 2019). Currently, the Allegheny Health Department is in the process of collecting maternal health data to create reports on maternal mortality and morbidity. According to the Strategy Plan, the data that is collected should be disaggregated by race (ACHD, 2019). This strategy will help identify risk factors that impact the health of black men, women, and children. Using this data, the Allegheny County Health Department would be able to design initiatives that would improve their health status, and thus improve maternal health outcomes. Due to the recent implementation, the Allegheny County Health Department is awaiting results from this data collection strategy.

The Allegheny County Maternal and Child Health Strategy Team developed an evaluation plan that would be implemented within interventions and programs that address maternal mortality. Implementing the goals that are stated within the process evaluation plan intend to initiate evaluation of these programs with a health equity lens (ACMCHST, 2020). Like the Allegheny County Health Department Strategy Plan of 2019, the MCH Strategy Final Report aims to develop evaluation practices that produce recommended elements of assessment practices (ACMCHST, 2020). The results of these assessments will then determine pinpoints where health equity interventions may be developed. Policies and interventions will be focused to implement changes related to public service and care, including forward facing and clinical strategies that address health inequities. This plan will include monitoring partner organizations and community-based organizations. The outcome evaluation plan seeks to monitor the following maternal and child health outcomes: health service access, maternal morbidity, infant morbidity, and child morbidity. The outcome evaluation will also monitor outcomes produced by the different community organizations in Allegheny County that address maternal and child health

(ACMCHST, 2020). It is important to remember that Allegheny County does have a multitude of non-profit and community-based maternal and child health programs. It is important to be able to establish these evaluation measures within each of these programs, so that in the future, the Allegheny County Health Department may determine which programs are creating the biggest impacts in reducing maternal and child mortality. The results of these evaluation goals may lead to the determination of effective strategies to reduce maternal mortality in the broader implementation throughout Allegheny County and saving more lives.

6.4.1.2 Cultural Competence and Diversifying the Workforce

The Allegheny County Birth Plan for Black Babies and Families establishes specific goals revolving around strengthening and increasing diversity within the maternal and child health workforce, strengthening systems of care, addressing social determinants of health, and streamlining maternal and child health initiatives. The goal to increase diversity within the maternal and child health workforce is supported by the specific aims to provides supports to retain and recruit black and underrepresented maternal and child health (MCH) workers (ACMHST, 2022). Racial concordance is a term that refers to the matching of race between the medical provider and the client. The notion of concordance with healthcare embodies the ideal of forming a therapeutic alliance between patients and providers and helps create strength within the patient to practice their autonomy in treatment. This helps the patient create aligned goals alongside the provider that would benefit the patient (Meghani et al., 2009). Increasing the diversity within the healthcare system will allow for more opportunities of racial concordance in the realm of maternal and child health, and help black women advocate for, and obtain, quality treatment. Additionally, if more black mothers can receive care from black providers, this may reduce incidence of racial

discrimination that black mothers face in the hospital setting, thus reducing incidence of maternal mortality.

The plan also emphasizes establishing standards that require the MCH workforce to learn and practice culturally competent, anti-racist, equitable health care (ACMHST, 2022). Clinical education in the healthcare field on implicit bias and cultural competence has been proven to help clinicians understand the societal context in which they practice and increase awareness of the consequences of differential treatment of patients (Noursi et al., 2021). Maternal and child health professionals in Pittsburgh must be educated about the implications of the structural racism that has historically affected the city, and how that has led to detrimental health outcomes for black women (Howell et al., 2019).

6.4.1.3 Policy Change and Advocacy

Finally, the Allegheny County Birth Plan has goals to direct maternal and child health policies to address inequities. The Plan specifically mentions transforming workplace policies and environments to be supportive of parents, as well as improving accessibility and affordability of childcare (ACMCHST, 2022). Paid parental leave has been proven to benefit child outcomes, including lower maternal mortality (Clark et al., 2022). However, in some states, Paid Family Leave programs require employees to work a certain number of hours before being able to access family leave. Policies such as these and barriers such as working in part-time, seasonal, or low-wage positions that do not have access to health benefits, can disproportionately affect black families (Clark, et al., 2022). Although these policies have not examined its impact on maternal mortality, paid maternal leave may reduce black maternal mortality if black women were not required to return to work during the postpartum period. More than half of maternal deaths occur

up to a year after delivery (Noursi et al., 2021). It can be speculated that policies that required women to return to work, and the stress that contributes to missing work due to economic hardships, may contribute to maternal health complications that lead to maternal mortality. Similarly, the expectations of providing childcare to older siblings can provide stress to mothers who have recently given birth, contributing to maternal health complications and maternal mortality. Policies such as these facilitate the reduction of stressors related to disparate socioeconomic conditions (Stout, 1997).

6.4.2 Community-Based Partnerships

Additionally, The Allegheny County Health Department aims to utilize community participation from vulnerable populations in planning for community health improvement efforts (ACHD, 2019). The use of primary source information from those impacted by health inequity will help compose interventions that will address their primary health concerns. Community-informed models of perinatal health are typically framed by the ideal of reproductive justice and support the individual and community-identified needs of black mothers. Community-informed models of perinatal health acknowledge historical and contemporary harm that is caused by current healthcare systems and seeks to address those structural formations to create mechanisms for promoting health equity (Julian et al., 2020). This strategy would help ensure the creation of a more effective intervention that would benefit black women who are involved in an intervention that was supported and created by other black women.

Similar to the Allegheny County Health Department's Strategy Plan, The Allegheny County Birth Plan for Black Babies and Families also emphasizes the intention to increase

connection and collaboration with community-based care, and to invest in resources that create community support in black communities (ACMCHST, 2022). The Allegheny County Health Department has a number of partnered nurse-home visiting programs, as well as independent non-profit community programs that support black mothers. When implemented, community-informed models used in midwifery-led community-based care, doula-supported care, and nurse-home visiting programs can enhance autonomy in the clinical setting and promote positive clinical outcomes (Julian et al., 2020). ACHD may be able to leverage these community-based programs to improve health outcomes for black women.

6.4.3 Strengthening Systems of Health Care

The Allegheny County Birth Plan for Black Babies and Families contains goals of strengthening systems of care and streamlining maternal and child health. This goal can be supported by the incorporation of multidisciplinary teams in the medical setting (ACMCHST, 2022). The incorporation of multidisciplinary treatment teams can encourage the exchange of ideas and information that may enhance the quality of care by the utilization of different lenses when examining the medical problem. For example, social workers may be utilized to examine implications of psychosocial stressors and racial discrimination during a mother's medical care and can use that information to advocate on behalf of the mother directly to the clinicians providing their care. Additionally, public health practitioners, midwives, health system administrators, policymakers, data analysts, nurses, researchers, educators, and physicals can come together to reimagine and develop models of care provision in the maternal health field. Workforce diversification and health system development towards equitable clinical experiences can improve

maternal health outcomes (Julian et al., 2020). In Allegheny County, hospitals in the University of Pittsburgh and Allegheny Health Network health systems frequently utilize multidisciplinary teams to provide care to their patients. Prompting the education of these teams to consider health equity values can be the first step to improving maternal health outcomes in Allegheny County.

6.5 Next Steps for Allegheny County

To summarize several of the points made above, specific recommendations for the Allegheny County Health Department to consider will be detailed in this section. The main objective of the Health Department would be to begin explicit execution of the goals that had been mentioned in the Allegheny County Health Department Strategic Plan (2019) and The Allegheny County Birth Plan for Black Babies and Families. The goals described in these plans were stated to have been initiated between the years of 2019 and 2020. Next steps related to these goals should include the continuation of data collection and evaluation of community programs with a health equity lens. Results from these assessments and evaluations should then lead to the implementation of effective interventions to reduce black maternal mortality.

The Maternal and Child Health Strategy Final Report (2020) includes evaluation goals that should be implemented not just within the Allegheny County Health Department, but also with independent organizations within Allegheny County that address maternal health equity. Independent organizations and non-profit organizations should be required to begin implementing these evaluation strategies, if they have not yet done so since the publication of this report. Once

these evaluations have been aggregated, the Allegheny County Health Department should analyze this data to determine the most effective programs.

In each of these initiatives, the data collection, assessment, and evaluation process should ensure the disaggregation of race in data sets, so that major risk factors for black mothers are identified and addressed.

The Allegheny County Health Department currently partners with many nurse-home visiting programs. The Department should consider partnering with more programs like Healthy Start that offer doula support, due to the partnership and advocacy benefits they offer black mothers. The Allegheny County Health Department should also consider expanding their maternal and child health programs outside of primarily home visiting programs. Many of the non-profit and community organizations within Allegheny County utilize this strategy to improve maternal health. However, there are so many other interventions that could be expanded upon that would reduce black maternal mortality. Group and education support programs can bring black mothers to develop a healthy community, where they can lean on each other for support, share strategies that help them access high quality care, and cope with the stress of being a black woman while pregnant. These groups also have the potential to promote the adoption of healthy behaviors that not only reduce the risk of maternal mortality, but also support beneficial, long-term health outcomes, thus helping reduce overall health disparities among black women. As there is a multitude of community programs and organizations within Allegheny County that utilize this methodology, as well as other structures that reduce maternal mortality and promote healthy behaviors, the Allegheny County Health Department should consider partnering with these community organizations; similarly to how they do with Healthy Start and other nurse home visiting programs.

Overall, the Allegheny County Health Department and community programs within Allegheny County should emphasize the application of a healthy equity lens in every step of their practice when addressing black maternal mortality. As more information related to black maternal mortality is collected and understood, these processes should influence procedures that advance techniques developed to reduce black maternal mortality rates. These processes should influence next steps to create effective, evidence-based mechanisms to reduce black maternal mortality, as well as improve overall health outcomes for black women. The health equity lens should be applied to data collection, assessment and evaluation procedures. Furthermore, it should also be applied when advocating and implementing policy changes to address maternal health, and within the implementation of clinical processes within healthcare settings, and community organizations and partnerships.

6.6 Social Work and Public Health Implications

The integration of the social work and public health disciplines can be a very beneficial combination to utilize when addressing health equity. These disciplines contain foundations and principles that are dedicated to advocating for the advancement of health equity, as well as developing effective interventions to address health disparities. Both disciplines borrow from one another, such as how social work researchers use epidemiology to frame interventions to address health inequalities, while public health practitioners utilize social work methods like community organizing and empowerment to improve health outcomes within the population (Ruth et al., 2008). Public health social work (PHSW) refers to the multidimensional method and

transdisciplinary practice that blends the roles of researcher, policy analyst, program planner, provider of clinical and direct services, evaluator, and administrator (Ruth et al., 2008). The use of public health social work approaches can be used to promote health equity, as well as mitigating health issues (Pecukonis et al., 2019). The integration of these roles can provide new contexts and information that can be powerful in enacting changes within the healthcare system.

Public health social workers can be well versed when working within community-based interventions. Public health social workers are educated on how to perform culturally sensitive community assessments and evaluations to find what specific health issues communities are experiencing, as well as the health issues the community would like addressed. Public health social workers' knowledge of communication skills and relationship building, in conjunction with their knowledge of community practice can be a primary advantage within this realm (Pecukonis et al., 2019). The use of this strategy allows public health social workers to empower community members to exercise their autonomy when choosing what health issues to address, and how they would like them to be addressed, which can lead to better health outcomes for the community. Public health social workers can work within communities and community-based organizations that aim to reduce black maternal mortality, and use their skills to identify specific methods that could help improve the health outcomes of black women, that the women in the community would actively participate in. Moreover, the relationship building and communication strengths that public health social workers have can help them work closely with black women, similarly to doulas, helping them develop strategies to advocate for higher quality treatment within their healthcare settings. Additionally, PHSWs are well equipped to advocatate on the behalf of their clients.

Furthermore, PHSWs can utilize their knowledge of the socioecological model to help their community partners identify risk factors they may face. PHSWs must understand how the social, political, and economic determinants of health contribute to health disparities, structural inequities, and implicit bias. PHSWs must also understand how racism can cause deficits in health status and create challenges to achieving health equity (Pecukonis et al., 2019). This knowledge can help PHSWs examine underlying nuances that can be discovered when identifying multisystem factors that contribute to health inequities and when addressing health inequities. In the example of black maternal mortality, PHSWs may be able to provide individual counseling with black mothers to address the implicit bias they may be experiencing with their medical providers, as well as referring them to resources that would support their ability to find higher quality care. The extensive combinations of services that PHSWs can provide inside and outside of the healthcare setting can wholistically support black mothers who are navigating the healthcare system.

Navigation of the current United States health care system can be further enhanced by the implementation of PHSWs within interdisciplinary teams in the clinical setting. When employed in the medical setting PHSWs have access to the medical records of their patients and are able to meet face to face with their patients to discuss their treatment plans. PHSWs also have direct communication with the multidisciplinary team that is providing care to the patient. This streamlining of communication can help PHSWs advocate on behalf of their patients if they are experiencing inequal or low-quality treatment from the team. Additionally, PHSW can utilize the health belief model when meeting with their patients to educate them on positive health behaviors that they can utilize, while also enhancing the therapeutic relationship and enhancing their autonomy. Furthermore, PHSWs within the medical setting can be utilized to conduct screenings of social determinants of health during initial visits. Due to their knowledge of social determinants

of health, they may effectively identify factors that may cause increased risk for health issues, as well as identifying resources and interventions that may improve their living situation, and thus, improving their health.

Finally, PHSWs have the ability to advocate for and help establish policies that will address health inequities. Advocacy for health equity and social justice are strong concepts that are heavily emphasized within curriculum in public health and social work education. Furthermore, social workers are expected to adhere to the NASW code of ethics, which stresses the importance of being able to advocate on behalf of their clients, as well as supporting the improvement of societal policies that affect the well-being of the population (NASW, 2021). With this knowledge and commitment to the action of advocacy, PHSWs working with black mothers are well equipped to advocate on their behalf, and to improve their health outcomes by advocating for the improvement of quality in their care. Also, PHSWs are well-equipped to advocate for the establishment of policies that will improve health equity and reduce black maternal mortality. Additionally, PHSWs are educated in the use of the socioecological model to identify individual risk factors that may be impacted by upstream and policy level interventions. This context will allow for PHSW to identify the most impactful policies that would influence individual change and subjection to risk factors.

6.7 Gaps in the Literature

When performing the literature and exploratory analysis for this study, the gaps in the literature became more apparent within the data collection and evaluation realm. Although the literature thoroughly describes different causes of black maternal mortality, and there is literature

that makes suggestions as to what can be implemented to reduce black maternal mortality, there is not much published data related to specific interventions that have been applied and their results in reducing black maternal mortality. It is important to be able to note when the results of studies that examine the causes of black maternal mortality are being used as evidence to create and initiate interventions. When performing this exploratory analysis, it was difficult to locate publicly documented collections of data related to interventions that intend on reducing black maternal mortality. Publicly available data that was discovered was typically published through reports that described the key findings of evaluations, rather than aggregate data of the interventions used and the reduction of black maternal mortality rates. From this data, it is difficult to determine which strategies effectively reduced maternal mortality, and thus, conclude which interventions would be the most beneficial to implement.

6.8 Limitations

The exploratory analysis that was performed within this study faced several limitations. For one, the structure of the study being an exploratory analysis can make it more difficult to draw clear conclusions from the data. Inferences using both the quantitative and qualitative data had been made to suggest which future directions Allegheny County should take in order to reduce rates of black maternal mortality. In some instances, state level quantitative data did not translate well to align with state- and county- level qualitative data to create conclusion related to the effectiveness of county level intervention. Another limitation of the study is that only publicly available data from various health departments was examined. Representatives from the Allegheny

County Health Department were also able to produce several reports and resources that were in the process of being publicly published. However, the inclusion of unpublished evaluation data of community interventions and programs would allow for the determination of effective reductions of black maternal mortality. The lack of publicly available program evaluation data made it more difficult for clear conclusions to be drawn.

Furthermore, the exploratory analysis was not comprehensive due to the lack of available data. Although public records from state level and county level public health agencies were utilized for this exploratory analysis, records were specifically selected, thus excluding many records within the public health department databases. Furthermore, this exploratory analysis excluded data from independent non-profit and community organizations that work to reduce black maternal mortality. Evaluation records of these organizations were not publicly available, and thus excluded from the data set. It is also important to note that many community-based organizations do not have the funding or time to perform evaluation studies that determine the impact they are making on the community. Additionally, several variables that contribute to black maternal mortality, such as substance use and intimate partner violence, were excluded from the evaluation of interventions and future directions from this study, making the study design less comprehensive.

A final limitation includes the lack of severe maternal morbidity data. The present study initially intended to examine rates of severe maternal morbidity, and interventions directed towards reducing incidence of severe maternal morbidity in black women. However, the availability of black severe maternal morbidity literature and data that was collected for the present study was very limited, thus being excluded within the study.

7.0 Conclusion

The many causes of black maternal mortality are multi-level, complex, and deep rooted in systemic racism. In order to address this issue, equally complex, multi-level interventions must be developed and implemented. Individual-level, organizational-level, community-level, and policy-level interventions should all be considered when developing initiatives to address black maternal mortality. The integration of these stratified interventions should also be considered, as it may produce the most effective reduction in black maternal mortality.

The present study intended to identify the mechanisms of the most effective interventions that have been implemented within state-level, county-level and community-level contexts. Conduction of this exploratory quantitative and qualitative analysis revealed that the examination of interventions that address black maternal mortality is still a fairly new concept that must be researched further. Literature displays that studies are working to identify causes of black maternal mortality, and to develop interventions that address said causes. However, the collection of literature related to the implementation of interventions that address the causes is much smaller in comparison.

Results of the present exploratory analysis emphasizes that not one intervention is enough to reduce black maternal mortality. The reduction of black maternal mortality requires efforts to review the causes of each death, and to learn from these cases about ways to prevent them. Improving women's health, reducing the inequities related to the distribution of social determinants of health, and ensuring high quality care for pregnancy and postpartum women are integral factors that are needed to reduce black maternal mortality (Peterson et al., 2019).

When examining state level policies and interventions, California can be seen as an example for state policy-level and community-level interventions. California has the lowest rates of overall maternal mortality, showing that it's interventions may be effective in reducing rates. Additionally, California's reports have publicly demonstrated the impact that the state's public health efforts have done to reduce black maternal mortality. The publication of this evidence can allow for other states and community programs to utilize California's example structures within their own systems. The Pennsylvania Department of Health and the Allegheny County Health Department would be able to follow by example in the implementation of interventions similar to the ones seen in California.

The Allegheny County Health Department and its maternal and child health partners have developed many goals to advance health equity and reduce black maternal mortality within the county. As these goals have recently been established, it is now up to the Allegheny County Health Department to formally implement them, and then follow through with evaluation. The use of a health equity lens within health department and community-based programs would be the most effective ways to reduce black maternal mortality.

Public health social workers are equipped with many of the skills that are needed to create and implement policy-level, community-level, and individual-level changes that reduce rates of black maternal mortality. With the integration of program development skills, policy making skills, community engagement skills, and clinical communication skills, public health social workers have a repertoire of tools that they can use to create the most effective, multi-level interventions that serve black women.

Although the present study faced limitations related to the availability of data, the study was able to determine effective next steps for the Allegheny County Health Department to consider

when moving forward in advancing maternal health equity. Additionally, the present study was able to identify gaps in the literature related to black maternal mortality and severe maternal morbidity, calling action to publish more information related to the successful implementation of interventions to address these health inequities. The complexities that come with the examination of black maternal health inequities require further research that will produce evidence that shows which interventions would be the most effective in reducing black maternal mortality. However, addressing the concept of systemic racism and its implications onto black maternal health will be the most effective solution.

Appendix A Glossary

March of Dimes State Level Policy Measure Definitions

Medicaid Expansion – State has adopted this policy to allow women greater access to preventative care during pregnancy

Medicaid Extension – State has recent action to extend coverage for women beyond 60 days postpartum

Midwifery Policy – State allows for Medicaid reimbursement at 90% and above for certified nurse midwives

Maternal Mortality Review Committee (MMRC) – State has a MMRC, which is recognized as essential to understanding and addressing the causes of maternal death

Perinatal Quality Collaborative (PQC) – State has a PQC to identify and improve quality care issues in maternal and infant healthcare

Doula Policy/Legislation – State has allowed for the passage of Medicaid coverage for doula care

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