DOULA SERVICES TO ADDRESS THE GAP IN INFANT MORTALITY BETWEEN BLACKS AND WHITES IN ALLEGHENY COUNTY

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ABSTRACT

Infant mortality is defined as the death of an infant before 1 year of age. The United States (U.S.) has a national goal to decrease all-cause infant mortality rates. Despite this, the U.S. has a high rate of infant mortality especially compared to other developed nations. Blacks have dramatically higher rates of infant mortality than their white peers. This difference is rather pronounced in Pittsburgh, Allegheny County, Pennsylvania. Here, black infants are three times more likely than whites to die in their first year of life.

A review of causes and factors of infant mortality was conducted to identify contributors to infant mortality specifically within the black community. Current programming in Allegheny County that addresses many of the causes or factors of infant mortality was also reviewed. The emphasis was placed on doula services that have demonstrated effectiveness in impacting the causes and factors that contribute to infant mortality.

Doula services have been shown to be effective for improving maternal and child outcomes. Although information exists on the effectiveness of doula services in combating infant mortality, there is no research investigating black acceptability to doula services especially in Allegheny County.

Eight face-to-face interviews with African-American moms in Allegheny County collected information on their prenatal and birth experiences, their doula experiences, and

consideration for presenting doula services so that they will be acceptable and welcomed by black mothers. Mothers identified some important barriers to acceptability of doula services. These included lack of knowledge about doulas and their services, family concerns, discomfort and lack of trust, established support systems and unaffordability. The mothers offered appropriate information dissemination, relationship building with expectant mothers and supportive others, and affordability as strategies to address these barriers.

This paper is based on interviews with members of a population in need. Based on information from the interviews combined with the existing data about the impact of doula services in other states a recommendation is to begin considering appropriate program and policy steps. These steps would ideally lead to implementation of doula services as an intervention to address the infant mortality gap in Allegheny County. Further research can be conducted to gather more feedback from a greater portion of the population.

Decreasing disparities in health outcomes and decreasing the infant mortality rate in the United States and Allegheny County, PA are both profoundly significant in the field of public health. Providing doulas to support Black mothers during pregnancy and birth could reduce the frequency of adverse maternal and infant outcomes that contribute to infant mortality. Doula services provide the education, support and advocacy that address the causes and factors that contribute to these adverse outcomes. This would have a profound impact on reducing the gap in infant mortality between blacks and whites in the United States and in Allegheny County.

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PREFACE

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1.0 INTRODUCTION

Infant mortality, defined as the death of an infant before their first birthday, is used worldwide as an indicator of heath within a community(CDC, 2016). This is because factors that affect the health of a community can also impact infant mortality. Healthy People 2020, a 10-year list of goals to improve national health, include decreasing all infant mortality(Promotion). Despite this, infant mortality rates (IMR) in the United States (U.S.) remain high with about six deaths for every 1000 births(CDC, 2016). Significant disparities exist for blacks, specifically African-Americans. The IMR for this population is closer to 11 deaths per 1000 births(CDC, 2016).

In Allegheny County, Pennsylvania, that difference is considerably greater. According to the Allegheny County Child Death Review 2005-2008, the rate of deaths of black infants was 3.70 times that of white babies and 8.3 times that of Asian infants (Austin, 2008). This translates to approximately 17.03 deaths per 1000 births for black infants as compared to 4.64 and 2.05 for White and Asian infants respectively (Austin, 2008). The goals of this paper are to examine the factors contributing to the disparities in infant mortality, to explore doula services as an intervention to address this gap, and to assess the acceptability of doula support services among blacks as an intervention to close the gap in infant mortality rate (IMR).

This paper will explore whether doula services would be a viable intervention to address disparities in infant mortality between blacks and whites in Allegheny County. To make this appraisal, causes and factors contributing to infant mortality will be explored, with an emphasis

on those that impact blacks in Allegheny County. Then, the existing interventions to address these causes and factors will be considered. Doula services will be highlighted as they have proven to be effective in reducing adverse maternal and child outcomes across populations. The author will discuss models that have been implemented successfully among similar populations. Next, this paper will present the findings of original research into the attitudes and experiences of black moms in Allegheny County around doula services. The feedback from these interviews will provide the framework for appropriate program, policy and research recommendations.

2.0 BACKGROUND

Throughout the 20th century the IMR in the U.S. declined. Between 1950 and 2000 it declined by over 77% from 29.2 to 6.9 deaths per 1000 births (MacDorman & Mathews, 2008; Statistics, 2005). The infant mortality continued to improve, declining another 15% from 6.9 to 5.82 between 2005 and 2014 (Mathews & Driscoll, 2017). For black women the decrease was quite significant, dropping 20% from 13.63 down to 10.93 nationally during that same time frame (Mathews & Driscoll, 2017). Allegheny County in southwestern Pennsylvania has seen similar declines in the total IMR and that of blacks. According to the 2008-2012 Infant Mortality Birth Cohort Study, the overall IMR for Allegheny County fell from 7.4 to 6.65 in the five years since the 2003-2007 Infant Mortality Birth Cohort Study (Balke, 2015).

Despite the noted declines, disparities still exist in infant mortality between blacks and whites in Allegheny County. The IMR for whites remained low between 2008-2012 decreasing from 6.2 to 4.1 with an average of 4.75 during the five-year period of the study (Balke, 2015). For blacks the IMR decreased from 15.5 to a low of 11.1 with the average IMR over the five-year period of 13.73 (Balke, 2015). That is about three times the average of whites during that time period.

2.1 CAUSES OF INFANT MORTALITY

According to the Centers for Disease Control and Prevention (CDC) over 23,000 infants died in the U.S. in 2015 (CDC, 2016). The majority of these deaths fell into five categories of causes. Birth defects, preterm births and low birth weight, sudden infant death syndrome (SIDS), maternal pregnancy complications and accidental injuries account for most of infant mortality (CDC, 2016; Mathews, MacDorman, & Thoma, 2015). In Allegheny County the bulk of infant deaths were the result of complications due to prematurity and low birth weight, birth defects, maternal complications and sudden infant death (Balke, 2015).

2.1.1 Low Birth Weight and Prematurity (short gestation)

Low birth weight is highly associated with infant mortality (Mathews et al., 2015). Birth weight is separated into three categories according to a CDC report;

Very low birth weight- less than 3lbs. 4oz or less than 1500 g,

Low birth weight- less than 5 lbs. 5 oz. or 2500 g, and

Normal birth weight- above 5lbs and 5oz. or greater than 2500g (Martin, Hamilton, Osterman, Driscoll, & Drake, 2018).

In 2014 8.17% of all births in the U.S. were low birth weight babies and 1.40% of all births were very low birth weight babies. Babies born with low birth weight are at significantly greater risk of mortality than those of higher birth weight (Mathews et al., 2015). In 2013 IMRs were 25 times higher for low birth weight infants that those of normal weight. During this same time the IMR for very low birth weight infants was 219.56 times higher than normal birth weight infants (Mathews et al., 2015).

In a 1996 study of 4183 preterm infants researchers observed significantly higher rates of neonatal death for infants who were small for gestational age (SGA) than for those who were average for gestational age (AGA) (Piper et al., 1996). These pregnancies were stratified by gestational age, used to identify how far along the pregnancy had progressed at its end, in order to understand the relationship specifically between birth weight and mortality (Piper et al., 1996).

Of the 3171 pregnancies in the AGA group 218 (7%) ended in fetal deaths and 320 (10%) ended in neonatal deaths (Piper et al., 1996). For the SGA group, of the 1012 pregnancies, 170 resulted in fetal deaths and 114 infants died in the neonatal period, 17% and 11% respectively (Piper et al., 1996). This indicates that birth weight and gestational age had related but separate influences on birth outcomes and infant mortality.

Prematurity, highly associated with low birth weight, is sometimes considered the most important predictor of infant mortality (Mathews et al., 2015). A baby born before 37 weeks of pregnancy is considered premature or preterm ("Preterm Birth," 2017). Despite the association, prematurity does not necessarily mean low birth weight, thus these are sometimes considered two different causes of mortality. About one out of every ten babies born in the U.S. is premature and the majority of infant deaths occur among those born early ("Preterm Birth," 2017). In 2013 more than two-thirds of infant deaths in the U.S. were among babies born prematurely (Mathews et al., 2015). The highest risk for infant mortality is prior to 32 weeks gestation ("Preterm Birth," 2017). However, even babies who are born only a few weeks early have a much higher risk of infant mortality than those born full term ("Preterm Birth," 2017). In 2013, early term infants, those born at 37-38 weeks, had mortality rates that were 63% higher than for full term infants (Mathews et al., 2015). Significant disparities exist in the occurrence of prematurity and low birth weight. In 2016 the national preterm birth rate for blacks was 14% while the rate for whites

was 9% (Martin et al., 2018; "Preterm Birth," 2017). During that same year the rate of low birth weight births was 6.97% for births to white women but more than double for black women at 13.68% (Martin et al., 2018). In 2015, prematurity and low birth weight combined accounted for about 17% of all infant deaths ("Preterm Birth," 2017).

Allegheny County saw similar trends in birth weight and prematurity. Between 2008 and 2012, 6.6% of all Allegheny County births were low birth weight, and very low birth weight births accounted for 1.2% of total Allegheny County births (Balke, 2015). During this time the majority of infant mortality occurred in babies with very low birth weight (Balke, 2015). Whites saw rates of 235.9 deaths per 1000 births while blacks had 251.7 deaths per 1000 births (Balke, 2015). Across races, IMR declined considerably for low birth weight and normal birth weight babies.

Premature births in Allegheny County are classified by gestational age and split into three categories: extreme immaturity is less than 26 weeks, immaturity is 26-36 weeks and greater than 36 weeks is normal gestation (Balke, 2015). While the black preterm mortality rate decreased between 2008 and 2012 it remained higher than whites in each category (Balke, 2015). See Table 1.

Table 1. Infant mortality by gestational category, Separated by race

	Infant deaths per 1,000 live births	
	Blacks	Whites
Gestational Categories		
Extreme Immaturity	458.7	450.2
Immaturity	16.1	12.8
Normal Gestation	4.2	1.3

2.1.2 Birth Defects

Birth defects, also known as congenital anomalies or congenital abnormalities, are defined as structural changes present at birth that affect any part of the body and can impact how the body work (CDC). Some examples of birth defects are cardiovascular defects, central nervous system defects, and chromosomal defects (CDC). Birth defects are complex in nature and can be caused by a combination of risk factors such as gene defects, unhealthy maternal behaviors, and environmental toxicities. One out of every 33 babies is born with a birth defect (CDC). Not all birth defects are life-threatening but they cause one out of every five infant deaths (CDC).

Birth defects are the leading cause of infant mortality. According to the CDC website, more than 5500 U.S. babies die each year as a result of birth defects. Although some differences have been observed in the patterns of birth defects between the races, no major disparities have been noted in the occurrence of birth defects in the U.S. However, there was a difference in survival of babies with birth defects between the races in the post-neonatal period(CDC). Survival rates for babies between 28 days and one year of life was significantly lower for black babies in 13 of the 21 birth defects studied (CDC). In Allegheny County .9 deaths per 1000 births were a result of birth defects (Balke, 2015).

2.1.3 Sudden Infant Death Syndrome

Sudden Infant Death Syndrome (SIDS) is an unexplained death of a seemingly healthy infant between birth and one year ("About SIDS/Safe to Sleep," 2012). SIDS typically occurs while an infant is asleep. Although there is not a specific cause for SIDS, several factors that make a baby more susceptible to SIDS have been discovered ("About SIDS/Safe to Sleep," 2012). One such

factor is the sleep setting. Placing a baby to sleep on the stomach or side, in a soft sleeping surface such as couches or pillows, in a shared bed, or while wrapped in too many blankets or in a hot environment increases their risk of SIDS ("About SIDS/Safe to Sleep," 2012). Listed as separate causes of infant mortality, low birth weight and birth defects also increase a baby's risk for SIDS (CDC, 2017).

With the identification of these factors and the creation of initiatives to address them, SIDS has substantially declined in recent years ("About SIDS/Safe to Sleep," 2012). Yet it remains a major cause of mortality among babies birth to one year. According to the CDC, (2017) in 2015 about 1600 SIDS deaths were recorded. As with most causes of infant deaths SIDS affects African Americans at a higher rate than most populations. The IMR due to SIDS for blacks was .75 compared to whites who had a IMR of about .5 (CDC, 2017).

As noted previously, SIDS is also one of the leading causes of infant mortality in Allegheny County. Between 2008 and 2012 there were .8 infant deaths per 1000 births attributable to SIDS (Balke, 2015). Racial disparities exist with SIDS related deaths. Blacks experienced 2.3 deaths per 1000 births in Allegheny County while, whites experienced .5 deaths per 1000 live births (Balke, 2015).

2.1.4 Pregnancy and Placental Complications

Pregnancy complications, sometimes called maternal complications, are health conditions or issues a woman may experiences while pregnant ("Pregnancy Complications," 2016). Some of these can be relatively minor in nature such as mild discomforts, while others can be life threatening for a mother and her baby. High blood pressure, gestational diabetes, preeclampsia, anemia and other nutritional deficiencies, and infections are all examples of maternal

complications that can lead to infant mortality ("Pregnancy Complications," 2016). These conditions can cause an array of issues ranging from decreased blood supply to the baby and fetal nutrient deficiency to preterm births and cesarean section births.

Conditions of the placenta include placenta abruption, placenta previa, and placenta insufficiency (Jacobson, Zieve, & Ogilvie, 2016; "Pregnancy Complications," 2016). The placenta is attached to the uterus and supplies the oxygen and nutrients to the growing fetus. In placenta insufficiency, the placenta does not get the necessary amount of nutrients to the fetus. This can obstruct the growth and development of the fetus resulting in a baby with low birth weight or birth defects (Jacobson et al., 2016). The fetus may move less frequently than expected and have a lower heart rate than expected in cases of placenta insufficiency (Jacobson et al., 2016).

In placenta abruption the placenta detaches from the uterus causing bleeding ("Pregnancy Complications,"). Similar to placenta insufficiency, the fetus is unable to get the appropriate amount of nutrients when abruption occurs leading to an impediment of fetal growth. Vaginal bleeding, contractions and pelvic pain are symptoms of placenta abruption that should be monitored by medical professionals to determine the appropriate course of action. In placenta previa the placenta is either partially or completely covering the cervix. This blocks the baby's path to the birth canal and may require a caesarean section for delivery. A symptom of placenta previa is vaginal bleeding that should also be monitored by a medical professional("Pregnancy Complications,").

According to the 2008-2012 Infant Mortality Birth Cohort Study conducted by the Allegheny County Health Department (ACHD), the IMR caused by maternal complications of pregnancy was .04 and the rate due to complications of the placenta was .05 (Balke, 2015).

Based on the infant mortality rate and the number of black births in Allegheny County during that time, the expected number of observed deaths was two deaths caused by maternal complications of pregnancy and five caused by placenta complications. Instead, there were 16 and 14 deaths respectively (Balke, 2015).

2.2 FACTORS CONTRIBUTING TO INFANT MORTALITY

A number of factors are conditions that have an influence on the causes of infant mortality but do not directly cause infant mortality. Yet, the presence of these factors may influence infant mortality rate and trends in infant mortality. These include social, behavioral and racial factors.

2.2.1 Social Factors

Socioeconomic status (SES) can be defined by multiple criteria. Income level and educational attainment are the most common considerations in SES. Low SES, specified by low educational attainment and low income, is one factor that contributes to the causes of infant mortality by potentially limiting access to resources that are necessary for a healthy pregnancy. Some such resources are quality housing, quality food and education about healthy prenatal practices. Between 1969 and 2001 a study was conducted looking at infant mortality rates in counties across the U.S. using maternal education information and a deprivation scale (Gopal K. Singh, 2007). This data was gathered from county-linked, statewide IMR information. Between 1995-2000 there was a 43% higher risk of neonatal infant mortality and a 96% higher risk of post neonatal infant mortality in those in the most deprived group compared to those in the least

deprived group (Gopal K. Singh, 2007). In 2001 there was a 41% increase in the relative risk of infant mortality for those with less than 12 years of education than those with higher than 16 years (Gopal K. Singh, 2007).

Nationally and in Allegheny County an inverse relationship exists between educational attainment and IMR for whites (Balke, 2015; Smith, Bentley-Edwards, El-Amin, & Darity, 2018). For blacks, however, the distributions are scattered. Nationally, the highest IMR is among those indicating they had Master's and Doctorial level degrees (Smith et al., 2018). In Allegheny County, the highest IMR existed for those black who indicated they had a high school diploma or a master's degree as their highest level of education. One possible explanation is that there are limited protective factors from the increased experiences of discrimination and stress as they attain higher levels of education. Limited data are available to connect income and IMR in Allegheny County.

Policies can also affect infant mortality. Maternal leave is an example of a social policy that could impact risk for infant mortality. Expectant mothers covered under Family and Medical Leave Act (FMLA) are entitled to up to 12 weeks of unpaid leave per the 1993 maternal leave provision (Rossin, 2011). While unpaid leave through FMLA was related to substantial improvements in IMR for infants of educated and married mothers, the effects were less pronounced for less educated and single mothers (Rossin, 2011). This may be because educated and married mothers are better able to take advantage of the leave policies. Poorer, single working mothers who have to return to work right away are not able to care for their infants at home and are less readily available to adhere to regular recommended care or respond to medical issues immediately (Patton, Costich, & Lidströmer, 2017; Rossin, 2011) .

In contrast to its developed peer nations, the U.S. has no federal paid leave policy and has a high rate of infant mortality (Patton et al., 2017; Ruhm, 2000). As noted above, paid maternity leave policies have been linked to significantly lower infant mortality rates (Patton et al., 2017; Rossin, 2011; Ruhm, 2000). Specifically, such policies have been correlated with a lower rate of infant mortality in the post-neonatal period between one month and one year (Patton et al., 2017; Ruhm, 2000). This is typically when mothers return to work, especially those without a paid leave policy. According to studies a one-week increase in paid parental leave would result in an expected .3% decrease in post-neonatal mortality per 1000 births and an overall decrease in infant mortality per 1000 births of .2% (Patton et al., 2017) .

2.2.2 Behavioral Factors

Several behaviors may impact infant mortality. One is inadequate prenatal care utilization. Inadequate prenatal care utilization can be defined as no prenatal care, late initiation of prenatal care, or a lower number of visits than what is recommended (Kotelchuck, 1994; Partridge, Balayla, Holcroft, & Abenhaim, 2012). In the 1980s the need for expanded prenatal care coverage to address adverse birth outcomes such as stillbirth and infant mortality was recognized. This led to the expansion of Medicaid to include those not previously covered for prenatal care (Epstein & Newhouse, 1998). Between 1987 and 1990 2.6 million additional pregnant women enrolled in Medicaid. Evaluations of state Medicaid services confirmed that the expansion had positively impacted prenatal care utilization (Epstein & Newhouse, 1998).

Despite the increase in access to prenatal care coverage, utilization remains an issue in the U.S. In 2007, only 70.8% of women delivering a live birth received prenatal care beginning in the first trimester (2020). During that same time period 70.5% of pregnant women received

early and adequate prenatal care (2020). A mother may not access prenatal care that is available for a number of reasons such as being under stress, experiencing family issues, having to wait for an appointment, and not believing prenatal care was necessary (Heaman et al., 2015).

In Allegheny County prenatal care promotion is a top priority; however, some individuals are still left behind. In Allegheny County as a whole 72.2% percent of mothers who delivered in 2015 received prenatal care in the first trimester (McAdams, 2017). White moms had the highest percentage of first prenatal care visits in the first trimester at 75.6%. Black moms had the largest percentage of first prenatal care visits in the second and third trimesters at 32.4% and 10.2% respectively (McAdams, 2017). Moreover, these numbers varied by municipality with two municipalities having only 66.7% of women receiving prenatal care in the first trimester (Kurta, Torso, Monroe, & Brink, 2015). This may signify an opportunity to explore barriers to prenatal care utilization within certain municipalities of Allegheny County in order to increase utilization.

Maternal smoking during pregnancy is another behavioral factor that contributes to the risk of infant mortality. Maternal smoking can lead to a number of health complications for the mother and baby, such as separation of the placenta, which supplies the food and oxygen to the fetus ("Smoking During Pregnancy," 2017). Smoking is also associated with low birth weight and prematurity, both previously mentioned as causes of infant mortality ("Smoking During Pregnancy," 2017). Maternal smoking also increases the risk of SIDS ("Smoking During Pregnancy," 2017). Babies of mothers who smoke during pregnancy have a three-fold increased risk of death from SIDS ("Smoking During Pregnancy," 2017). Despite this, 12.3% of women who delivered in the U.S. in 2010 reported smoking during their pregnancy (Tong et al., 2013). One Healthy People 2020 goal is to increase abstinence from smoking during pregnancy to 98.6% (2020). In 2012 the percentage of mothers in Allegheny County who reported smoking

during pregnancy was about 12.2%, indicating that helping mothers with smoking cessation is needed ("Plan for a Healthier Alleghney (2015-2020) Annual Report," 2017).

Breastfeeding is a behavioral factor that has demonstrated many benefits to both mother and baby. Some studies suggest that breastfeeding may lead to a lower risk for type 2 diabetes later in life for mothers and a decrease in obesity and asthma for babies(Gunderson et al., 2015). The protective antibodies passed from mother to baby during breastfeeding are also believed to protect against illness and infections. This protection may contribute to the lower incidence of infant mortality observed among breastfed infants. Disparities in breastfeeding initiation and duration exist between blacks and whites in the U.S(Anstey, Chen, Elam-Evans, & Perrine, 2017). The CDC analyzed survey data from the 2011-2015 National Immunization Survey to investigate breastfeeding behaviors. They found that in 23 of the states significant disparities existed in initiation rates between blacks and whites with 14 states having differences of at least 15%. Inequalities also existed in breastfeeding duration and exclusivity. At six and twelve months the number of states with a difference in exclusive breastfeeding was of least 10% was 12 and 22 respectively (Anstey et al., 2017).

Pennsylvania had similar disproportions. Initiation rates for blacks and whites were 64% and 78%, a 14% difference. Breastfeeding duration differences were approximately 10% at 6 and 12% at 12 months (Anstey et al., 2017). Allegheny County initiation rates by race were not readily available. However, of all women with private insurance in Allegheny County, 81.9% while only 54.6% of Medicaid women intended to breastfeed (Landis, 2016).

2.2.3 Racial Factors

Some of the disparities in infant mortality between blacks and their white peers can be accounted for in social factors such as extremes of maternal age, maternal smoking, frequency of prenatal care and extreme poverty. However, even once these conditions are controlled for, a significant disparity in the infant mortality between black and whites remains (R. David & Collins, 2007; R. J. David & Collins, 1997). Throughout the late 1960s and much of the 1970s researchers concluded that this difference was connected to a race specific gene that caused the observed variation (R. David & Collins, 2007). A 1997 study sought to find this link.

Instead they found an unanticipated outcome. The birth weights of U.S. born whites, U.S. born blacks and African born black U.S. immigrants were compared between 1980 and 1995 (R. David & Collins, 2007; R. J. David & Collins, 1997). The study found that the U.S. born whites and the African-born blacks had babies with birth weights that were almost identical while U.S. born blacks had babies with significantly lower birth weights (R. David & Collins, 2007; R. J. David & Collins, 1997). What is more remarkable is that when the U.S. born daughters of the African immigrants later had children, their birth weights more closely resembled the U.S. born blacks (R. David & Collins, 2007; R. J. David & Collins, 1997). If race were contributing to infant mortality, then we would expect to see similarities in the black immigrant populations and the U.S. born blacks, initially. This study, among many others with similar results, points to the fact that racial discrimination rather than actual race may be contributing to infant mortality of black babies.

Discussions about health disparities often focus on socioeconomic differences between races. Little has been said about the role of racism in health care delivery. Recently, however researchers have begun to investigate the role of racial bias and discrimination in health service

provision and the role they play in health disparities. Research has shown that racial and ethnic minorities are less likely to receive quality care even when controlling for access to care (Smedley, Stith, & Nelson, 2003). Based on these disparities and growing body of research, The U.S. Congress urged the Institute of Medicine, now known as the National Academy of Medicine, to assess the differences in healthcare not attributable to factors already known (Smedley et al., 2003). Studies suggest that race influences a physician's diagnostic and treatment decisions as well as their feelings about their patients. One study revealed that physicians rated their black patients as less intelligent, less educated and more likely to abuse drugs even after these factors were taken into consideration. Stereotypes and intrinsic biases, often based on prior experiences with individuals of similar characteristics, can lead to misclassification of medical issues and inadequate care (Smedley et al., 2003).

Physicians often attribute some disparities in care to poor adherence to recommended medical care without taking into consideration that this may be due to factors such as poor cultural match between patient and provider, mistrust and misunderstanding of provider instructions (Smedley et al., 2003). A 2009 study of patients perceptions of discrimination compared to their adherence and health measures found that the greater the perceived level of discrimination experienced the lower the report of past adherence to physicians recommendations (Penner et al., 2009). This relationship remained for post-assessments. Correspondingly, there was a significantly negative relationship between perceived discrimination and health (Penner et al., 2009).

2.3 COSTS ASSOCIATED WITH INFANT MORTALITY

Although there are no exact figures for the costs of infant mortality, the costs of maternal and infant health complications associated with infant mortality are available. As of 2016 the average cost of a normal delivery was $10,808 and could be as high as $18,383 ("2015 Comparitive Price Report: Variation in Medical and Hopsital Prices by Country," 2015). For C-section births the average is about $16, 806 and could be as high as $28,473 ("2015 Comparitive Price Report: Variation in Medical and Hopsital Prices by Country," 2015). Preterm births also cause an increase in healthcare spending. It is estimated that they cost the U.S. healthcare system more that $26 billion annually (Behrman & Butler, 2007; Katy B Kozhimannil & Hardeman, 2016). Costs for hospitalizations of those under one year to treat birth defects was $9 billion in 2013 (Arth et al., 2017). Combined, these figures offer a glimpse of the financial implications of infant mortality in the U.S.

2.4 EXISTING INTERVENTIONS

Nationally, there has been a focus on addressing infant mortality. One such example is the Healthy People 2020 goals addressing infant mortality. Similar efforts are taking place in the Allegheny County area through the Allegheny county health department and some of the major hospitals. A number of established interventions exist to address high infant mortality rates both nationally and locally. They vary in focus from in-home prenatal care to breastfeeding support.

2.4.1 Home Visiting Programs

The Maternal and Child Health division of the Allegheny County Health Department (ACHD) hosts a number of home visiting programs to address factors related to and causes of infant mortality. The Nurse Family Partnership Program provides services to first-time expectant mothers in Allegheny County ("Maternal and Child Health Services,"). Through this program, public health nurses visit families in their homes to provide services such as assistance with smoking cessation and information about safe sleep and child safety. Services continue throughout pregnancy and until the child is 24 months ("Maternal and Child Health Services,").

Healthy Families Allegheny is another program offered by the ACHD. This program offers information and support to expectant and new parents living in Braddock, McKeesport, Clairton and Homestead ("Maternal and Child Health Services,"). Services for this program continue until the child is 36 months ("Maternal and Child Health Services,"). Although this includes some boroughs with elevated rates of infant mortality a substantial gap remains in not offering these services to residents in other areas that may also experience high rates of infant mortality.

Limitation in recruitment is one common issue across these programs. In recent years the majority of enrollment takes place through the Allegheny County Link line. The Allegheny Link like is a number for connection to local home visiting programs and some other resources. Some referrals come directly through the clinics and programs partnered with the Maternal and Child health department. This leaves out mothers who are not receiving regular prenatal care nor enrolled in other programming. Additionally, research has shown that even blacks with high income and education suffer a much higher infant mortality than whites with low income and low education (Smith et al., 2018) However, these programs mainly focus on low-income

mothers and families only. This misses an opportunity to address additional members of the most vulnerable populations.

Healthy start, a national prenatal program is another home visiting program. The aim of the Healthy Start program is specifically to reduce infant mortality among at risk populations. Healthy start was launched in 1991 as a program of the United States Public Health Services. In It originally had 15 sites throughout the United States and how operates over 100 sites. In 2015 the infant mortality rate of Healthy Start participants was 5.2, lower than the nations average. Additionally, 68.3% of program participants initiated care in the first trimester. Allegheny County, one of the original sites still exists today. Healthy Start has some of the same limitations as the ACHD home visiting programs. Recruitment is often limited to the link line and participant, or partnered program referrals. This potentially misses individuals who may benefit from the services.

2.4.2 Breastfeeding Programs

The Breastfeeding Promotion Program administered by Healthy Start and the ACHD acknowledges that infant mortality rates are lower for breastfed infants ("Maternal and Child Health Services,"). It offers one-on-one counseling with an experienced lactation consultant to assist mothers with breastfeeding. It also staffs a hotline available Monday through Friday 8:30a.m. to 3:30pm to answer lactation questions ("Maternal and Child Health Services,"). These services are provided on an as-needed basis. This program is voluntary and primarily client-initiated which means that mothers who possibly need support will not receive it if they do not know of the program. Also, the hotline hours are inconvenient especially for working mothers who may have breastfeeding questions after traditional work hours.

Other breastfeeding services exist in Allegheny County although their program goals are not specifically to address infant mortality. These include the Breastfeeding Center and the Pittsburgh Black Breastfeeding Circle. The Breastfeeding Center does have a cost to families, which may be a barrier to receiving its services. It also does not specifically focus on the cultural needs of black women in Allegheny County as the Pittsburgh Black Breastfeeding circle does. One of the most important cultural needs is the feeling of belonging and normalcy within the home community of the mom. One way that The Pittsburgh Black Breastfeeding Circle addresses this cultural need is through its monthly mom meetings. This is a gathering of women of color who are currently breastfeeding or have breastfed in the past to receive and provide support, guidance and feedback from individuals with similar cultural experiences. Women of color also moderate these groups, which contributes to the atmosphere of cultural normalcy.

2.4.3 Doula Services

According to DONA International, the primary organization for certification and training of doulas, they are trained professionals who provide continuous physical, mental, and educational supports to a laboring woman and her partner before, during and shortly after childbirth to help her achieve the healthiest and most satisfying experience possible ("Dona International,"). Research has shown that women who have doula-assisted births use fewer medical interventions during labor, use fewer pain medications, have fewer epidurals and experience fewer cesarean sections (Gruber, Cupito, & Dobson, 2013; Katy B Kozhimannil & Hardeman, 2016; "Overdue: Medicaid and Private Insurance Coverage of Doula Care to Strengthen Maternal and Infant Health," 2016). Mothers whose births are doula-supported also report higher satisfaction with

their birthing experiences, increased breastfeeding initiation and decreased post-partum depression (Gruber et al., 2013).

Many states have begun to adopt doula services as a model to address gaps in infant mortality. Greensboro, New York, Chicago, Baltimore and Cleveland have adopted such programs and have seen positive results (Gruber et al., 2013; Katy B Kozhimannil & Hardeman, 2016; McDaniels, 2017; Zeltner, 2017). In Greensboro, North Carolina, the YWCA launched the Healthy Beginnings Doula Program in 2008. The program consisted of three arms: childbirth education, goal setting and support, and doula services (Gruber et al., 2013). Women who attended at least three childbirth education classes were offered a doula. Of the total 226 participants between 2008-2012, 129 gave birth without a doula and 97 had a doula-assisted birth (Gruber et al., 2013). Demographics of both groups were compared to be sure that they were similar. Birth outcomes were reviewed and significant differences were noted in birth weight and breastfeeding initiation in the two groups. In the doula group 2.1% of infants were low birth weight compared to 8.6% in the non-doula assisted group. Mothers with doulas had a 79.4% breastfeeding initiation rate while mothers without had 67.2% initiation rate(Gruber et al., 2013). Some other differences were observed in the type of birth and birth complications with doula assisted births having fewer complication and lower rates of cesarean sections but the differences were not significant (Gruber et al., 2013).

In New York the By My Side birth support program complements other maternal health home visiting programs to provide support for expectant mothers before, during and after labor (Galarza, 2017; "Healthy Start Brooklyn,"). The program was created in response to the high level of inequities in birth outcomes in the New York area. It is administered through Healthy

Start Brooklyn (Galarza, 2017). The program seeks to address the factors that limit access to doula care for black and low-income women in Central and East Brooklyn (Galarza, 2017).

Also in New York City, the Bronx Health Link coordinated the Infant Mortality Reduction Initiative, which connects mothers to free doulas in their area as well as referring to other programming in the appropriate borough ("Infant Mortality Reduction Initiative (IMRI),"). The citywide program seeks to promote women's health and reduce infant mortality and racial disparities around these issues ("Infant Mortality Reduction Initiative (IMRI)," ; Lewin & Fishman, 2015). A 2012 individual evaluation indicated that the initiative is meeting its goals with city residents ("Infant Mortality Reduction Initiative (IMRI)," ; Lewin & Fishman, 2015). In a 2015 press release from NYC Health the Infant Mortality Reduction Initiative was listed as a program that helped contribute to the historically low infant mortality rate in New York City (Lewin & Fishman, 2015).

In Allegheny County a number of doula agencies exist. Some of these include Birth Doulas of Pittsburgh, Heart to Heart Doulas, Shining Light Doulas, Oli's Angels and The Birth Circle. The birth circle is the only of these to be covered under Medicaid insurance plan. Through UPMC For You insurance plan they offer free doula pregnancy support services to mothers. This intervention reaches mothers already receiving prenatal care. They must also be insured by UPMC for You and attending a UPMC medical facility to receive these services. This is a significant limitation as mother's who are not insured by UPMC, does not wish to attend a UPMC facility and cannot afford to pay for a doula through one of the other agencies.

2.5 DOULA SERVICES

2.5.1 Doula Scope of Work

Since the 1990s when DONA International was created, the popularity of doula services has increased slightly. Still, only 6% of moms report utilizing a doula for their births (Declercq, Sakala, Corry, & Applebaum, 2007; Katy B. Kozhimannil et al., 2014). Recently, doula services have become a trend among more affluent families but their supports and services would be beneficial for all moms.

During births, doulas assist laboring women, families, and partners in administering interventions to assure the maximum comfort of the laboring woman. Doulas are well known for the physical support that they provide to laboring women. Some such interventions may include massages or assistance in changing positions. Doula support has been widely associated with natural births, although doulas can support mothers having all kinds of births.

Doulas typically meet with mothers multiple times prior to the estimated due date. Sometimes they meet in the home and they may attend prenatal appointments as well. These visits are an important part of the relationship building process between the expectant family and the doula. During this period the relationship of emotional support is established. Doulas partner with families to create a plan to deal with high emotions during labor. During labor they become a source of coaching and encouragement, using emotional cues created by and with the expectant family. After the births many doulas visit the families. During this time some use screenings to gauge the emotional state of the mothers. They may use this to provide mental health referral for further support.

There is also a significant amount of education provided to the families by doulas. Doulas educate mothers on how their body will change to prepare for childbirth. They also educate expectant families on what they can do to prepare for both childbirth and bringing baby home. Doulas utilize a number of resources and formats to deliver this education. Some use videos, pamphlets, handouts, and props to reinforce the verbal and anecdotal information that is provided regularly.

Doulas are extremely instrumental during prenatal appointments. Although they may not be the key source of education during these sessions, they oftentimes assist mothers by making sure that they understand the information being relayed to them. They can also be a support by helping families communicate their questions and concerns, thus allowing them to obtain the education they need. This can also be considered advocacy, which is a role that doulas have more recently been taking on. In some training, doulas are recommended not to speak on behalf of the expectant families in the way advocates might be expected to. However, actions such as encouraging families to ask questions, clarifying information being communicated by the medical staff and supporting the expectant families decisions can all be seen as forms of advocacy.

Sometimes, medical staff may perform some procedures without fully alerting the expectant family. By informing the laboring woman of procedures being recommended and providing clarity about them, the doula is acting as an advocate for the laboring woman to be present and aware of her medical care. The article "Impacts of Doulas on Healthy Birth Outcomes" (2013) discusses the high use of intervention throughout the birth process. Through this process decisions are often taken away from mothers. Doulas mediate this by providing

options and information and empowering the mother to make informed decisions about what is best for her and the baby.

2.5.2 Financial Implications of Doula Assisted Births

Medicaid programs pay an estimated $13 billion dollars annually for maternal and newborn care (Katy B Kozhimannil & Hardeman, 2016). These costs are heightened by the high rate of costly birth outcomes such as cesarean sections and additional care for infants with birth defects and low birth weight. Doulas have been shown to impact these birth outcomes. Studies have shown that the assistance of a doula influences the use of interventions such as epidurals and caesarean sections (Gruber et al., 2013; Katy B Kozhimannil & Hardeman, 2016; "Overdue: Medicaid and Private Insurance Coverage of Doula Care to Strengthen Maternal and Infant Health," 2016). They may also affect birth weight, breastfeeding initiation, and preterm birth (Gruber et al., 2013; Katy B Kozhimannil & Hardeman, 2016; "Overdue: Medicaid and Private Insurance Coverage of Doula Care to Strengthen Maternal and Infant Health," 2016). Other factors such as duration of labor and women's overall satisfaction with the labor process, have shown to be influenced by the support of a doula as well (Gruber et al., 2013; Katy B Kozhimannil & Hardeman, 2016; "Overdue: Medicaid and Private Insurance Coverage of Doula Care to Strengthen Maternal and Infant Health," 2016).

In a 2013 study by Gruber et al. of a Greensboro doula program with both adults and adolescents, moms with non-doula assisted births had four times greater incidence of low birth weight babies. Also, 90.2% of the adult moms with doula-assisted births reported successful breastfeeding initiation compared to 73.2% of non-doula assisted births (Gruber et al., 2013). In this same study, comparison between groups showed differences in birth weight that favored

doula assisted births but were not significant when broken down by age group; however, the differences among all moms was significant at 2.1% compared to 8.9% (Gruber et al., 2013). Both groups of moms had the opportunity to enroll in doula support through the Greensboro YWCA.

In a study comparing birth outcomes of Medicaid recipients who received doula supported birth to national data for the birth outcomes of Medicaid recipients, those with doula receiving doula care had lower rates of preterm birth (6.1%) compared to those without (7.3%) (Katy B. Kozhimannil et al., 2014). Those receiving doula care also had significantly lower rates of cesarean sections at 22.3% versus 31.5% (Katy B. Kozhimannil et al., 2014). After controlling for age, race, and pregnancy complications the odds ratio of having a cesarean section for doula-assisted births was 40.9 times lower that for non-doula assisted births. Based on the reduction of cesarean births alone this study found that if doulas were reimbursed at a rate of $200 for the birth only, states could see a cost savings of at least $2 million per year (Katy B. Kozhimannil et al., 2014).

In a study of the birth outcomes in the west north central and east north central U.S., the outcomes of doula assisted Medicaid-reimbursed births were compared to all Medicaid-reimbursed birth outcomes in the region. A cost effective analysis was conducted using a doula reimbursement range of $200-$1200. The average dollar amount where the cost of doula reimbursement was counterbalance by the savings from medical costs was $986, although it ranged from $929-$1047 and varied depending on costs for medical procedures and Medicaid intervention rates (Katy B Kozhimannil & Hardeman, 2016).

3.0 METHODS

One goal of this paper is to determine the acceptability of doula services among black women living in Allegheny County. To make this appraisal, a research study involving individual face-to-face interviews was conducted with African-American moms in the target area. The University of Pittsburgh Institutional Review Board (IRB) approved this research as exempt. Participants were asked about their birth experiences and outcomes and what they might be open to in the future. Eight mothers participated in the study between January 28, 2018, and February 23, 2018. All participants were compensated $25 for their time and participation.

3.1 RECRUITMENT

Through the relationship the author has with Family Foundations Early Head Start mothers were recruited into the research study. Home visitors in the Early Head Start program were encouraged to inform and refer their eligible families of the research study. Additionally, IRB approved research flyers were posted in various locations throughout Allegheny County that mothers may frequent. Some locations included Magee Women's Hospital Outpatient clinic, Mercy Hospital, Father Ryan Art Center, Hosanna House and the University of Pittsburgh Office of Child Development. The flyers included pull-off strips with the interviewer's name and number on it. The same flyers were also sent to organizations that provide services to moms with

kids throughout Allegheny County, including Positive Parenting, Healthy Start, and the Allegheny County Maternal and Child Health Home Visiting Nurses Program. Also, some participants referred other mothers who were interested in participating in the research study.

Mothers who were interested in participation called or texted the researcher to set up an interview. During this call, the IRB approved purpose of research statement was read to the potential participants. This statement informed them that this research was anonymous and voluntary and that they could withdraw at any time. Following the delivery of this statement some qualifying questions were asked in order to assure that the mothers were eligible to participate in the study. Once eligibility was confirmed, an identification number was assigned to the participant. This identification number took the place of the participants' names on the forms. Lastly, the phone number, address and date and time of the interview were collected and recorded on the form. At the conclusion of each interview the form was deleted from the researcher's computer. The researcher did not retain any of the participants' personal information. A copy of the research inquiry form is included in Appendix A.

3.2 STUDY PARTICIPANTS

Study participants were female, 18 years or older and African-American living in Allegheny County. Mothers also had to have completed at least one pregnancy. This means they could not be in their first pregnancy. They did not need to have custody of the child nor have a living child. They had to be U.S. nationals. This is important to note, as some African immigrants with American citizenship reached out about enrolling in the study. These women did not qualify. There were two reasons for these inclusion criteria as it relates to this research. The interviews

were assessing acceptability of doula services as an intervention to decrease the gap in infant mortality. One aspect that contributes to acceptability is culture. Although both African women with American citizenship and U.S. born African-American women are black, they typically differ in their cultural norms. Specifically, having women in the room during labor as support is a lot more acceptable in countries outside of the U.S. while only six percent of births here are doula assisted. As the research was not focused in cultures of African countries it could not be determined how closely the historical and cultural norms of each African woman aligned with African-American culture.

Additionally, there has historically been a mistrust of agencies and organizations among African-Americans in the U.S. By contrast, some immigrant populations often partner with agencies to assist with transition and support. This research is also looking at infant mortality and its potential contributors specifically for African-American women. Research has shows that there is a difference in birth outcomes that impact infant mortality between African-Americans and other groups of blacks (R. David & Collins, 2007; R. J. David & Collins, 1997).

3.3 INTERVIEW GUIDE

The interview guide was used to explore four topics: prenatal experiences and outcomes, experiences with doula services, potential drawbacks and attractive features of doula services, and acceptability of doula services. To develop the interview guide broad categories of information to be explored were first identified. Those topics were then broken down into meaningful sections with a leading question for each of these sections. Within each section probes were identified into areas of detail that might be skipped over or give the answer further

substance. Questions were based on the guide but varied from participant to participant depending on the depth of their answers. Information about age, educational attainment, income, and zip code was also collected. The interview guide is included in the Appendix B.

3.4 ANALYSIS AND CODING

Each interview was audio-recorded with the participant's consent using iPhone voice memos application. Interview recordings were then submitted to TranscribeMe transcription services via the iPhone app and returned as a Word document to the researchers email. TranscribeMe is a service that converts audio files into text using either a machine or individuals selected via an algorithm. If human transcription is selected, the algorithm splits the files among multiple transcribers ensuring that no one individual has access to the complete audio file to protect confidentiality. This also protects confidentiality by assuring that a transcriber cannot elect to convert a file that they have particular interest in. The researcher, with the support of a qualitative methods expert, coded the transcriptions using line-by-line coding. Next, the line-by-line coding was reviewed to identify emerging themes. From these emerging themes a list of codes was created to synthesize information.

4.0 RESULTS

4.1 DEMOGRAPHICS

Some of the demographic information collected was the age, level of education, income, and zip code. The women ranged in age from 22 to 30. Women mostly had high school or equivalency as their highest level of education. Income levels ranged from $0 to about $34000 annually. Participants resided in seven different zip codes with two living in the 15212 area. The table below summarizes the characteristics of the participants.

Table 2. Demographics of research participants

Characteristic	N
Age	
22	1
23	1
24	1
25	1
26	1
27	1
28	1
30	1
Education	
Less than High School	1
High School or Equivalent	5
Some college	1
Associates	1
Income	
0-12,000	3
12,001-24,0000	1
24001-36000	4
Zip Codes	
15212	2
15221	1
15204	1
15217	1
15208	1
15206	1
15224	1

4.2 PRENATAL EXPERIENCES

Women were asked about their prenatal experiences and labor experiences including the number of pregnancies and births, location of care, time of establishment of prenatal care, frequency of prenatal care visits, perceived quality of care, supportive others and their roles, and sources of information about perinatal care and practices. This information provided context for the overall birth experience. In many cases this context later shed light on participants' decisions to use doula services or their overall acceptability of doula services.

The eight moms reported 19 reported pregnancies and 16 births. One birth occurred at an out-of-state hospital but the mother had other qualifying Allegheny County births. Three pregnancies resulted in miscarriage, the death of a fetus prior to the 20th week of pregnancy. Of the 15 qualified births, seven occurred at Magee Women's Hospital of UPMC, seven occurred at West Penn Hospital, and one occurred at Allegheny General Hospital. Mothers received prenatal care from various medical facilities throughout Allegheny County: Magee Community Health Clinic in Wilkinsburg, UPMC St. Margaret Lawrenceville Family Health Center, UPMC Shadyside Family Health Center, Magee outpatient clinic at Magee Women's Hospital, Allegheny General Hospital, West Penn Hospital, UPMC St. Margaret Bloomfield Garfield Family Health Center, The Midwife Center for Birth and Women's Health and Mercy Hospital. Multiple mothers received care from multiple locations for a single pregnancy. Some mothers reported receiving care from multiple facilities as a part of their regular care plan. For example, the mothers who received prenatal care from Lawrenceville Family Health Center and Shadyside Family Health Center also went to Magee for imaging and other advance services that could not be performed at their family health location.

One mother reported switching prenatal care for health reasons. She was considered too high risk to continue receiving care at the Midwife Center for Birth and Women's Health so she switched care to Magee Women's Hospital outpatient clinic. Two mothers reported switching because they were dissatisfied with the care they were receiving. One mother recounted, *"Instead of them either just giving me a blood transfusion or just giving me my iron infusions like I was getting over at Mercy, they were talking about inducing me at 30 weeks"(0029)* in reference to her care at Magee Women's Hospital. At this recommendation she switched to West Penn Hospital where she did not deliver until 40 weeks. Another mom shared her experience of

switching doctors after her doctor dismissed her medical condition by telling her, *“I think it’s in your head” (0022).*

Prior labor experiences similarly varied between mothers and, for mothers with multiple pregnancies, between pregnancies. Only one of the 15 qualified births occurred prior to 37 weeks of pregnancy. Three births resulted in cesarean section deliveries and the other 12 were vaginal deliveries. Mothers received a variety of interventions during their birthing experiences. Most common was the receipt of an epidural for pain management. In 14 of the 15 births mothers received an epidural for pain management. One mother received a spinal tap, a local anesthetic inserted between the vertebrae. For all of the births, moms reported the epidural being at the suggestion of the health care provider. As one mom said,

> *I didn't want an epidural at all, I was just always looking at it and everyone was like-- every story anyone told me they said, "If you move the wrong way you're going to be paralyzed for life." So I went into my pregnancy saying, "No epidural." And then the lady was like, "All right. This is your last chance. Are you sure you don't want it?" So everyone's in a room staring at me and I'm like, "Okay. I have to get it" (0032).*

Six of the births involved the use of Pitocin, synthetic oxytocin, prior to birth to induce labor or increase the strength or frequency of contractions. Moms also reported having their water broken during labor.

In reporting their birthing experiences, mothers also shared some challenging encounters with medical staff such as not being talked through their experiences and not being listened to about their pain. In reference to her first C-section, one mom said,

> *You didn't get talked through it. So it wasn't-- because it was an emergency, it was like go, go, go, go, go. Nobody could take a time to sit down and talk to you about it and be like, "Okay. You know this is what you're going to go through…” And you're nervous and you don't know what's going on and you're scared. And they hurry up and throw this curtain and then they cut you open. And they don't tell you that at the time you're going to feel a little bit of pain (0022).*

By comparison this mom reports that in a later birth the anesthesiologist reviewed her chart, created a plan for her and communicated that plan with her prior to her procedure.

One mom echoed

> *I had to get an antibiotic whenever I was in labor... they were trying to push the antibiotic in and it was really burning really bad-- my arm. And I'm trying to tell them, like, "Look, you got to make this go slow again, how it was going, because my arm is really burning." And it took them maybe five or ten minutes just to fix it. Because at first, she was like, "Oh, well, we need to get this prescription inside of you." I'm just like, "Well, I can't take it. It's burning my arm." So I think that my doula actually talked to her and she was able to put it back to a slower-- and I didn't even deliver until later (0023).*

Another mother found herself crying at her treatment during her labor experience.

> *…everybody had smart comments, smart remarks. Like basically, I would be asking for stuff and, "You're a big girl now. You're growing. You want to make grown decisions. That's how you got here. You're pregnant. You think you're in pain now, just wait." It was completely horrible. I just found myself crying. I didn't want to call for no nurse. They wouldn't come anyway"(0025)*

4.3 DOULA EXPERIENCES

All mothers were asked if they were familiar with doula services whether they reported using one or not. Even the mothers who did not use doulas reported that they were familiar with the doulas' function and scope of work. Doula experiences varied between research participants and even between births. Some participants reported using doulas for one birth but not others. Some enrolled in doula services but did not follow through with the services. Two moms had doulas who were with them throughout the pregnancy but did not attend the birth. One mom had a doula but she was asked to leave by family members before the labor was complete. A table with each participant and their doula usage is included below.

Table 3. Doula use table

Participant	Doula Use	Pregnancy used	Present at Birth
0022	Yes	Third Pregnancy	No
0023	Yes	Only Pregnancy	Yes
0025	No	N/A	N/A
0026	Yes	Second Pregnancy	Yes
0028	No	N/A	N/A
0029	Yes	First Pregnancy	Yes
0030	No	N/A	N/A
0032	No	N/A	N/A

When asked about the role of a doula the most commonly reported function was support. All moms described one role of doula as a support person during pregnancy and labor. One mom who had a doula-assisted birth described a doula as *"your person."* She continued,

> *I would say that your doula is your support person. I can't really think of the word right now, but she would be the person, when you're in labor, if you need anything, she would cater to you. If you need peace and quiet, she would make everybody leave. The doula is just like-- she is the calm in a storm.(0023)*

Another mom who chose not to use a doula during her pregnancy described the role of a doula this way:

> *I think they support you in every way they can throughout your pregnancy, even afterwards if you need any type of help (0030).*

When the same mom was asked about how she believed someone could benefit from doula services she replied,

> *Support. Because that's something I could have benefitted from with me being pregnant with my daughter because I didn't have the support I needed. So, for sure, support. (0028)*

Doulas as a support to partners was also discussed during the interviews. One mom described her experience with her doula supporting primarily the father:

> *She basically just helped him. After, it was more her helping him because he was nervous. And she just told him-- like we couldn't do anything wrong…[she taught him] ways that he can massage the cramps, the contractions out if I was having them, stuff like that... She stood in the back most of the time just because my significant other wanted to be the main support (0026).*

Later this mom describes how the doula was able to step in while dad took a break.

> *I think after ten hours everybody was telling my significant other, "Go get something to drink. Go eat. She can stay in here with me." And he didn't want to, but he ended up leaving for a little bit and she stayed there with me(0026).*

Another mom who used doula services only during pregnancy and not for the delivery explained the support her doula provided for her significant other.

> *If there is a man or a woman, whoever your partner is in the relationship, y'all need to sit down and talk and be like, okay this is what a doula does and explain to that because I'm more open-minded but my husband's more conservative. So he didn't really understand what a doula was. So I had to explain that to him. And we had talked about that with her. And he was like, "Well, every time when you go through the contractions, turn the music on and breathe through it or bounce through it."…They can help him understand and she can help him to be calm when sometimes it gets hard (0022)*

In addition to support, most moms viewed education as one of the advantages of having a doula. Specifically moms who used doulas throughout pregnancy commented on the information and resources they received from their doulas. When asked what kinds of supports she received from her doula, participant 0022, who used a doula only for her third pregnancy, said,

Information that I needed, like how your baby's growing on in size. Different programs that help me find for clothes if I needed to. Kept talking to me about what is your ideas for after birth and do you want to do skin to skin.

One mom described the instruction her doula gave her on breathing and pushing throughout labor:

She was teaching me how to breathe and push, and if she didn't teach me those techniques, I don't really know how I would have pushed that baby out (0023).

Her doula also educated her on breastfeeding and crib safety:

I told her I wanted to breastfeed, so she gave me a lot of information about breastfeeding and where I could go to learn how to breastfeed and stuff like that…She came to visit us to see the baby and stuff like that. And I remember having these things on the crib. It went with her crib set and she was telling me, "Those could be dangerous for the baby," and stuff like that. So I took them off (0023).

Convenience was a benefit of doula services that some participants felt was important. Participant 0025 talked about the convenience she would have experienced had she utilized doula services:

…she could call her at any time. I hated being on wait in line. I will call the line Magee would give me and I will be a wait or I will talk to somebody, and I'll just feel like, "Oh, just come in to be sure." And I come in to be sure, and I'm there, I'm on a monitor for like thirteen hours and they sent me home for no reason. When I could have just talked to somebody who would've really just talked me through it. Braxton hicks come on now. I don't have to come in for that. But only a real woman who's experienced this and been through that would have known." She continues, *"It's way more convenient; you know what I'm saying? They have every single resource and if they don't have it, they will get it or find it for you, you know what I'm saying? So it's just like, literally, a personal support system that come to your house, check on you, go to your appointments with you. Any question you have, they'll get it answered. You don't have to go through all the loops. And you don't feel comfortable talking to your doctor or talking to your spouse, there you have, and it's a perfect educated answer.*

Participant 0028 describes the convenience of her interaction with a doula similarly.

Instead of me once again bothering my doctor, I'd just call her and she just walked me through it. Any type of pains, or me not feeling good, or what I should do, when this happened, or that happened, I just called her.

4.4 BARRIERS TO ACCEPTABILITY

Of the eight participants, four did not use a doula for any pregnancy. In order to discover barriers to using doula services in the black community the researcher explored reasons mothers did not enroll in doula services. Mothers with multiple births who did enroll in doula services for at least one but not all births were asked about what kept them from using doulas for other births. All mothers regardless of doula usage were asked about their perception of potential barriers from using doula services in their communities. Reasons for not using a doula fell into five general areas: lack of knowledge, trust, family concerns, established support system, and affordability.

4.4.1 Lack of Knowledge

Moms overwhelmingly cited lack of or little education about what a doula is or does as a drawback to receiving doula services.

> *So some reasons I think people may not is just because they don't know what it is. A lot of people hear stories of an example of one, or something they heard about, and they just use that judgment and go from there. Another reason is they just don't know what they do. Someone may think a doula is a doctor, where it's not that at all(0032).*

Misconceptions about doulas also were raised by Participant 0022. When asked why someone might not use a doula, this mom offered,

> *Somebody who doesn't understand what they do. There's not enough information out there for real, for real that'll tell you what a doula's supposed to do. Also, too, people not being more open mind with it. People, sometimes people think that doulas are all these hippy people wandering around, they're actually people who are thinking of what's the best for the mother and the child(0022).*

Some moms also mentioned lack of education as their own reason for not exploring doula services. For instance, one mom utilized a doula for her second pregnancy but when asked about why she did not use one for her first pregnancy, she replied,

> *Because it wasn't presented to me. It wasn't something that I thought of. My first pregnancy was kind of just on the smooth, come and go kind of thing. I didn't have anybody to tell me about a doula at that time (0026).*

Another mother was asked why she didn't use a doula for her first two pregnancies and her response was simply, *"I wasn't educated about it" (0025).*

Even a mom who used doulas indicated that lack of knowledge resulted in some reluctance. Participant 0023 describes her initial disinclination to receive doula services due to her lack of knowledge about them.

> *…at first, I'm just like, "What's a doula?" Like, "I don't need that. I have my family support" (0023).*

Later in the interview she stated,

> *I guess somebody who's just not educated on a doula wouldn't want a doula.*

4.4.2 Family Concerns

Family, friends, and supportive others play a significant role in the birthing processes for many women. Mothers described some of the objections families may have to receiving doula services. Two moms chose not to use a doula at the request of a significant other or the father of the baby. When asked why she chose not to use a doula for her third pregnancy after already deciding it was something she needed, Participant 0025 recalled,

I let somebody talk me out of it for my daughter. My daughter's father was-- he's just negative. So he was so against everything. "I'll be that. I'll do that. Okay, whatever." I should've just stuck to what I wanted to do (0025).

Another mom had a similar experience with her child's father.

My son's dad was like, "We don't need this person in our business. This and that." So I'm just like, "Okay" (0028).

Moms reported that family objections could also dissuade them from using doula services.

…it could be a family thing. I know a lot of times when it's time to have a baby, families are like, "Oh. I didn't do this," or, "I didn't have an epidural. I had all y'all natural." I've heard moms say that. Just talking about birth stories with older women, so that could be it too. I feel like sometimes peoples families can discourage them from doing something that they've never really heard of or something that's new or different (0030).

Families may also be concerned about their own role during the birth.

I would just say like the jealousy thing. When you're pregnant, everybody has to mark their territory or have their spot. Best friends are automatically godmom mom, your mom "oh I'm in the room," Dad, "oh no, I'm automatically in the room" then the other grandma, you know what I'm saying? (0025).

During her first labor experience the family of Participant 0029 asked the doula to leave. She recounted the situation:

And with my doula, pretty much, I guess she was pushing the button, the epidural button. And I guess I was out of it the whole time, so my dad cussed her out. And told her to get out because I have six sisters and they said there was only allowed three people in a room.

One mother had the perspective that outside of family and friends societal perceptions may influence some moms.

The last reason may be they just may be afraid. Like nowadays I feel as if society don't do a lot of things because they don't want to be judged. So I feel as if, if someone has a doula, they would think they they're less of the woman that they're supposed to be (0032).

4.4.3 Discomfort and Lack of Trust

Lack of trust and general discomfort were two themes that emerged in the interviews while identifying obstacles. Many participants mentioned that moms may not "want people in their business." In response to why someone may not elect to utilize doula services, one mom answered,

> *Some people, I guess, aren't comfortable with, I guess, a stranger being in the business (0032).*
>
> *…someone who's just not comfortable with a stranger coming to their house (0023).*

Participant 0028 shared that her reason for ending doula services was discomfort:

> *I know with my son I started having one and then I kind of backed off because I didn't have my own house, and I would have felt uncomfortable just inviting someone into somebody else's house* (0028).

Another mom also identified lack of comfort as a potential barrier:

> *They may not feel comfortable and it could be a family thing (0030).*

4.4.4 Established Support

Doulas serve as a support system during birth. It is not surprising that some moms reported an already established support system as a reason for not choosing to use doula services.

> *Prevent them?...Maybe feeling like they have the support they need (0026).*

Two participants explained that even when offered a doula they opted out because they already had an established support system.

> *So I was going to use a doula, and I changed my mind near the end, and it was just because my boyfriend's mom was there, and she's a nurse. So I said, since I'm going to have my boyfriend, my mom and her there, that I didn't want to overwhelm myself with*

> *more people. So I just chose not to have one, just because she was like the substitute for one (*0032).

> *The only person I want to-- I guess wanted it to be a more intimate thing I guess. I really just wanted my mom to be there for me. If there was no one else there, I wanted it to be my mom. It had to be her. I didn't really want to take advice-- even though that's their job, I didn't really want it from anyone else. I kind of knew that my mom would know when to step in and when to step out. With someone who that's what they're supposed to do-- check up on you, make sure everything is cool. It's like you're probably going to be trying to talk to me and I just am not feeling it (0030).*

One mom explained that her original perception of doulas support changed once she had more information about what a doula does.

> *I'm like, "Why would you have a doula, or have a person, or a stranger there and your child's dad is involved?" So she kind of told me about everything that was going on. I'm like, "I want that. That's great. I should've did that" (0025).*

4.4.5 Doula Costs

Although the mothers in the research study who reported utilizing doulas all did so through agencies that offered free services, moms identified unaffordability as one of the potential barriers to receiving doula care. One mom used a doula with her first pregnancy but could not with the subsequent ones because it was no longer covered by her insurance

> *I had Gateway but then they covered it. But they won't no more because I wanted either a doula or a midwife with this pregnancy with him (0029).*

When asked what might prevent someone from using doula services Participant 0022 replied, *"if you don't have the money."* Participant 0026 also noted,

> *The cost because I wouldn't have thought of a doula if it wasn't for the program [Family Foundations Early Head Start].*

4.5 ADDRESSING BARRIERS

After collecting information about potential barriers participants were asked about how to address those to make doula services more attractive. The majority of responses centered around education and informing parents about what doulas do, paying for doula services, and making the significant others and families of expectant moms comfortable with a stranger coming into the home and being present during these private moments. Responses were grouped into three themes: information dissemination, relationship building, and affordability.

4.5.1 Information Dissemination

Mothers offered their experiences and opinions on how, when, and where information about doulas could be distributed to expectant families in order to address the lack of education and knowledge about doulas. Multiple mothers suggested that services be offered in the hospitals or medical offices during the obstetrician visits.

> *I mean, I guess trying to get people more educated on it. As in maybe working more with doctors, and hospitals, and stuff like that. So they could promote them more and get them educated.... (0023).*

Some moms suggested specific ways that medical staff could support efforts to encourage moms to use doulas such as providing information to moms during appointments, inviting doulas to join visits, and hanging flyers and posters in the lobby.

> *I think at the hospital, was a good approach, just for a doctor or a nurse just to let the mother know there's always support and help…Because you don't want to run into somebody like, "Oh, hey, by the way. I'm a doula, and I can help you with this and that." Somebody might be like, "I don't even know you. I don't know where you came from" (0028).*

Participants 0030 and 0032 provided a similar suggestion:

> *…maybe depending on where you go, have a onsite one that may have the time to talk to people, come in, introduce themselves, let them know what services they provide, if they're interested in anything, a contact information. For me, they just asked, "Oh, would you like a doula?" and I'm like, "Well, what is it?" And the doctors explained to me, but it was kind of like, "We just have to ask you these questions so we can mark this down." And then they just kind of left it at that, so I was just like, "No. I'm fine. My mom will be there. I wouldn't need anyone like that." But I think if they maybe were present in doctor's offices and stuff like that, where they can make their self accessible to people more, then I think that would be good" (0030).*

> *So I would say just having it offered more, like when you go to your pregnancy appointments, like when you walk, you see signs of like, research you're doing now. I always see signs in doctor's offices for them. But when it comes to doulas, I never see anything. So I don't think it's advertised or mentioned a lot, like other things are (0032).*

Moms also thought that programming similar to Lamaze or childbirth classes involving doulas would be helpful.

> *Well, I mean, I'm not sure. I know when I was pregnant with my daughter-- I think how they have a Lamaze class, maybe have a class like that, like they have a class where you can just come and just listen to what the doula has to say or even have one meet you at a doctor's appointment (0030).*

> *…and maybe even having some type of program at Magee hospital where they introduce doulas and maybe they can show them type of things that they do. Like pregnant moms could come and sit in with their boyfriends or their fiancé, and maybe the doula gave a presentation or even one-on-one type of thing (0023).*

One participant felt that doula services should be offered in schools for adolescent parents:

> *I honestly think that they should maybe have these services-- and it's horrible to say, but I think that they should have these services in schools too. The reality of it is, no one wants their child to be pregnant in high school, but the reality of it is, a lot of our young men and women are becoming parents very young. And one thing I noticed about in school, there were a lot of girls who got pregnant when they were in high school, but there was nothing for them (0030).*

Social media was also recognized as a possible platform for promoting doula services. Participant 0023 remarked,

> *I feel like social media-- we're so much on social media now, so social media, probably. I mean, it sounds crazy, but, I mean, this is what the world's coming to. So I feel like they could promote themselves on social media because that's where everybody's promoting on, where the businesses are any type of business that you see. So why not? (0023).*

All but one mom agreed that the best time to offer doula services would ideally be in the beginning of the pregnancy.

> *Probably from the beginning of your pregnancy once you decide if you want to keep your baby, or if you're going to give your baby up for adoption, or whatever the case may be (0030).*

However, Participant 0032 felt that the third trimester is the most ideal time to introduce services.

> *I would say, of course the third trimester. Probably thirty weeks or so, but it can be a little earlier…Just because during that time, I really don't know what's going on. I'm trying to still figure out myself. And it's like, a lot of people--like for me, I don't want everyone on me, or anyone bothering me, so let me just figure out what's going on first. And then once I figure it out, now I can invite you, because I can tell you about what's going on with me. But I think just the start is just a little too much (0032).*

4.5.2 Building Relationships

Moms were asked how to address the barriers. The feedback on addressing family concerns, lack of trust and comfort and established support was grouped under one common theme, building relationships. Mothers cited relationship building as one reason to being doula services early in pregnancy.

> *I would say at the beginning. That way you all have a chance to grow and get to know each other. Because you don't want to have a doula and you all don't have the same ideas, or you all's not on the same page, or she thinks you should do this but you're sure you want this to happen and she's trying to talk you out of it. You all want to be on the*

same page at all times when it comes to you delivering, her being there during the delivery. You don't want to get to your delivering point and you're like, "Oh, yeah. I don't want her here anymore," and then it was a waste of time (0029).

One mom discussed the role of comfort in relationship building:

It's hard to feel comfortable around someone that you've seen on and off in a ten-month span maybe three or four times. And if now it's time for me to have my baby, this is a very intimate moment. This is special for me and I barely even know who you were. So I think from the very beginning. Just so you can try to build up that relationship (0030).

Another mom talked about how being flexible about meeting can contribute to a family's comfort in service delivery. She said,

Just meeting in public places or wherever the mom feels comfortable. And then, I mean, when I was dealing with the doula it's not like she was trying to be in my business or anything, but just some people might take it as though they're like, "Well, she might not need to know what's going on in my household." And that type of stuff (0028).

When asked how to address family objections, one participant said,

So just sit down and be like, "Hey. If you're interested in doula services, here are some pros. Here are some cons. Here goes the most common things that happen or most common setbacks. You're willing to stick to and then work." It's just like a relationship kind of because you kind of build-- you're around somebody all the time. Kind of build a little relationship. You start to care. You're worried about the baby. So it's just like little "relationships" to get there (0025).

Moms also suggested that the doula's physical presence may be important in the introduction of doula services:

They can come to the, well, where I went was a clinic, but most people go to hospitals. They can be there maybe twice a month and visit people and give them information, get posters and post them up with the information on it, kind of let them know I'm not here to be in your business. I'm here to help if you want that extra help (0026, 2018).

Although not specifically offered as a way to address barriers, it is worth noting that of the six moms who enrolled in doula services at any point in time, four of them enrolled through a

community program with which they were already partnering. This may be a substantial part of the relationship building process as they have a relationship built with the service coordinators of those programs.

4.5.3 Affordability

The four moms who indicated that they received doula services did so through free programs. Some moms recognized the need to address affordability as a potential drawback to receiving doula services. When asked how to address potential drawbacks one who used a free doula said,

> *"pricing would be the main thing I think for me, because if it was a lot, I probably would have been like, 'Oh, no. We can pass'" (0026).*

Another mom who was able to have a free doula through a program partnership offered various suggestions for funding doula services.

> *Maybe you can have a class where a friend of it can learn that from a teacher…If I had a real close friend but I don't have the money to pay for a doula. What if we just pay for the doula class and it's really cheaper and she's my doula, you know what I mean, for me just to kind of offset the cost. Or they can go on classes or like a group like your mom's class. A doula class. And the cost is going to go down because everybody got to pay a percentage? (0022).*

Participant 0029, who was discouraged from using doula services for her last two births because it was not covered, suggested some ideas for payment option as well.

> *I think it would be pretty much good if there was, I wouldn't say a payment arrangement but-- how could I word this? I think if they had more of a program for people who couldn't afford it, then it would be a lot better and easier for other people (0029).*

5.0 DISCUSSION

This paper explored some of the contributors to infant mortality specifically in the African-American community and some of the ways that doulas services have mediated against these contributors. Review of the literature has shown a positive association between doula usage and healthy birth and infant health outcomes by impacting these contributors. The goal of this research was to assess the acceptability of doula services among African-American moms in Allegheny County. Seven out of the eight mothers interviewed indicated that they would use a doula for a future birth if they were to get pregnant again. Even the mother who indicated that she would not use doula services in the future expressed positive feelings about doula services for other mothers. Many mothers introduced doula services and their experiences around them during the prenatal and labor sections of the interview. Based on the literature review and the information gathered from research participants, some next steps and considerations can be recommended.

5.1.1 Program Recommendations

The provision of doula services to black mothers throughout Allegheny County requires a significant level of support and backing from an organization high within county power structure in order to reach a substantial number of mothers. The ACHD is responsible for assuring the

health and safety of the county residents. Its mission is to protect, promote and preserve the health and wellbeing of all Allegheny County residents, particularly the most vulnerable. The existence of disparities in infant mortality between blacks and whites in Allegheny County signifies the presence of a vulnerable population that needs protection. The maternal and child health division of the ACHD, whose mission is to maximize the quality of life and health of mothers, infants, children and their families in Allegheny County, would be an effective facilitator of doula services to moms throughout the county.

As mentioned above, the Nurse Family Partnership program is an existing intervention that provide services for first time expecting mothers. This program can be used to provide doula services throughout the county by training the nurses as doulas. In addition to the clinical services and education these nurses already provide parents, they can also provide the labor support to expectant moms. The provision of doula services by a nurse who is already coming to the home for weekly visits addresses the drawback of lack of trust. By providing services through a program that is already free the issue of affordability is also addressed.

Another course the ACHD could take to provide doula services would be through its Healthy Families Allegheny Program. Similar to the Nurse Family Partnership program this program can train its current employees as doulas to provide the labor support.

Due to the often unpredictable nature of the initiation and duration of births it may not be ideal for the nurses or service providers to also provide doula services. The county could contract with doulas from local doula agencies to provide the services to their participants. The partnership could include payments using program funds for a set number of prenatal and post-partum visits as well as the labor support. The birth experiences and outcomes of those who

choose to use doulas could be compared to those who do not as a means of evaluating the effectiveness of the services over time.

A pilot study of a doula program similar to the Healthy Beginnings doula program in Greensboro, NC would be beneficial for blacks in the county. It would provide comprehensive information about healthy perinatal practices and infant care similar to the programs already in existence in addition to the general doula support. It would also provide further insight into the acceptability of doula services as mothers are offered doulas through the program and have the opportunity to decline. Additionally, comparing data between those who use doulas and those who do not would provide data on the effectiveness of doula services among this specific population.

5.1.2 Research Considerations

This research study recruited eight moms in Allegheny County. The information provided was substantial and informational. However, additional research to include feedback from more moms may be beneficial in making sure that a wider range of attitudes and suggestions are collected.

Although the acceptability of doula services was the focus of the interviews, the responses to the question around quality of prenatal care revealed a lot about the experiences of women in the labor and delivery room. This could be further explored to find out if there is a perceived difference in maternal care between blacks and their white counterparts in Allegheny County. Similar interviews can be conducted with both black and while moms in Allegheny County. Experiences can be compared adjusting for age, income, birth location and presence of

supportive others which may all have an impact on quality of care received. These results may inform appropriate steps to take in the provision of maternal

Research has been conducted on how unexamined intrinsic and extrinsic biases impact health care delivery decisions. This research explored the impact that has on health outcomes of populations considered. This is another area of research that can be explored with maternal care providers in Allegheny County. Standardized measure of biases can be used to assess biases among providers and other staff members. One such measure is the Implicit Association Test, which has been used to assess the biases of medical providers in recent research (Dovidio & Fiske, 2012). These results can be compared to data of provider care procedures to determine the impact biases have on care provision. If biases and discrimination are factors contributing to the gap in IMR in Allegheny County, then identifying those biases and addressing them appropriately is of paramount importance.

Recently, the Magee Women's Research Institute and Foundation was awarded $5 million by the Richard King Mellon Foundation to further understand and rectify differences in infant mortality in Allegheny County ("Plan for a Healthier Alleghney (2015-2020) Annual Report," 2017). This foundation has the funding and structure to be able to conduct research and create doula programming to address the findings.

The University of Pittsburgh and RAND Corporation also received grants from the Richard King Mellon Foundation, in the amounts of $725,000 and $640,000 respectively. These awards are being used to create tools to identify infant mortality risk. Once the tool is developed physicians are expected to be able to connect patients with appropriate resources and interventions to address their needs ("Plan for a Healthier Alleghney (2015-2020) Annual Report," 2017).

5.1.3 Policy Changes

In July 2013, The Centers for Medicare and Medicaid Services Final Rule was passed, making it possible for providers in addition to physicians and other licensed practitioners to provide preventative medical care. This medical care needs to be recommended by the Practitioner as medically necessary and appropriate. However, the procedures for implementing this change are vague and leave it to the state to come up with a new payment and reimbursement system. Very few states have adopted this legislation. Only Kentucky, Minnesota, Mississippi, and Oregon report covering doula services, according to a survey conducted by Kaiser Family Foundation and Health Management Associates (Gifford, Walls, Ranji, Salganicoff, & Gomez, 2017). The Medicaid coverage of doula services as prenatal or birth service would make doula services more accessible for some mothers. This would also open the door for doulas to be hired and provide services directly through hospitals and birthing centers where prenatal care is provided. The coverage of doula services by insurance would address lack of affordability as a drawback. The provision of doulas directly through the hospitals would address the trust and relationship building barrier.

6.0 CONCLUSION

The infant mortality rate of blacks has declined in the past years. However the gap compared to their white peers continues to be of significant concern. This concern is more pronounced in Allegheny County, Pennsylvania. This paper considered many of the factors and causes that contribute to the infant mortality rate and the gap between blacks and whites. These included low birth weight, prematurity, maternal smoking and inadequate prenatal care. Some existing interventions in Allegheny County were explored and the strengths and limitations were discussed such as recruitment restraints, and cultural specificity.

Doula services have been shown to have a positive impact on birth outcomes for mother and baby. Their effectiveness lies in their impact on the causes and factors that contribute to infant mortality. Doula-assisted pregnancies and births are associated with lower rates of prematurity, fewer low birth weight babies, and higher breastfeeding initiation rates. Doulas also act as advocates helping mothers to find their voice in participation in their medical care. Many places are adopting doula services as an intervention to explicitly address infant mortality however that option has not yet been initiated in Allegheny County.

Assessment of the acceptability and viability of doula services program revealed areas to explore in the initiation of doula services as an intervention to address the gap in infant mortality. Some themes identified in interview data were included lack of information about services, discomfort and mistrust, family concerns, and affordability of services. Interviews with

participants revealed that effective information dissemination and use of social media for promotion and education, quality relationship building, and addressing affordability would be ideal paths to address barriers to doula services by blacks in Allegheny County.

The major limitation of this research is small sample size. Restrictions of time and funds prevented a more robust sample of individuals from which to obtain material. Eight moms were self-selected from a convenience sample of moms who chose to enroll in the study by calling in to a number on a poster or being recruited by a service provider or peer. In total, 15 moms contacted the researcher to participate in the study. However, five of the moms canceled or rescheduled their interviews for various reasons and two of the moms reached out after the interviews had concluded. The generalizability or transferability of qualitative interviews is also widely debated. Usually, data cannot be generalized to the entire public due to the individualized context between subjects. Recently, however, some exceptions have been made to this rule specifically when all participants have an equal chance of being selected from a population. However, because this research employed a convenience sample the data would not necessarily be characteristic of the entire population.

These interviews do suggest avenues for further investigation into doula services as a possible intervention in Allegheny County. Social desirability bias is also of concern. Once doula services were introduced as the intervention that was being explored participants may have tailored their answers to impress the researcher. This could mean that some noteworthy themes and feedback were neglected.

This paper has strengths as well. Significant support for doula services and information on some successful doula programs in other black communities with similar disparities in infant mortality is expressed. Furthermore, this research is the only study we know of to look at the

attitudes of African-American women towards doula services. The research includes both moms who have and have not utilized doula services in the past, which provides various perspectives into potential attractive features and barriers to receiving doula services. Moms also contributed their input on how to address these barriers and saturation was reached in more than one thematic area with only eight interviews. This may be an indication that this trend would continue with more interviews.

As the infant mortality rate in the United States continues to decline, black women and babies are being left behind. It is time to move forward in addressing the disparities in infant mortality between blacks and whites in Allegheny County. Doula services have been proven effective in addressing the causes and factors contributing to the adverse birth outcomes and experiences that lead to infant mortality. Recently, the use of doula services to influence infant mortality rates among black women in other areas has been successful. For black mothers, doula services could be the vehicle to drive the change needed here in Allegheny County as well.

APPENDIX A: RESEARCH INQUIRY FORM

The purpose of this research study is to determine an appropriate intervention to address the gap in infant mortality among African-Americans in Allegheny County. For this reason, we will be interviewing African-American mothers age 18 and older from various neighborhoods in Allegheny county. The interview will take approximately 30 minutes to and hour and will assess overall acceptability, perceived drawbacks, perceived advantages and any additional input, which would make interventions acceptable in the African-American community. If you are willing to participate, in addition to your opinion in those categories, you will be asked about background such as age, income and education. There are no foreseeable risks associated with this study nor are there any direct benefits to you. Each participant will receive compensation in the amount of $25 as a token of our appreciation. The entire interview will be audio-recorded. This interview is anonymous and so your responses will not be link with your name. Quotations from the interview may be used but will not include your name. Your participation is voluntary and you may withdraw at anytime. This study is being conducted by Demia Horsley who can be reached at 4126579979 if you have any questions.

I am going to as you a few questions to determine your qualificaltions for this study. Is that okay?

Age-

Race-

National Origin-

County of residence-

Have you completed at least 1 pregnancy?

Based on the answers to your questions you do/do not qualify to participate in this research study.

If you wish to participate, we will now schedule a date and time for the interview and I will collect your address and phone number for contact regarding the interview. This

information will be deleted at the conclusion of the interview, at your request to withdraw, or upon the completion of the research study. Do you wish to participate?

ID#____
Address____
Phone Number____
Date of Interview____
Time of Interview____

APPENDIX B: INTERVIEW GUIDE

Demographic Information

- How old are you?
- What is the highest level of education you've attained?
- Considering all sources of income over the past 12 months, what would you say that your total income was over this past year?
- What is you zip code?

Background

Prior pre-nantal experience

Lead Statement: Tell me about your first pregnency.

- How many pregnancies have you had?
- How many live births have you had?
- How far into your pregnancy were you when you began prenatal care?
- Where did you go for your prenatal appointments?
- How often were you seen by your ob during your pregnancy?
- How would you rate the quality of prenatal care you received during your pregancy?
- Where did you receive information about pregnancy, birth, and postnantal care?
- Who supported you during your pregnancy?
- Who attended your prenatal appointments with you

Prior labor experience

Lead Statement: Tell me about your labor expereinces?

- Who was present during your labor to support you?
- How did the people present support you?
- How did your water break?
- What interventions did you receive (ex. Epidural, pitocin)?
- How would you rate the quality of care by the staff?
- What type of delievry did you have?

Doula Expereince

Lead Question: What has been your experience with doulas?
- What is a Doula?
- How would you define a doula?
- What would you say that a doula does?
- What have you heard about doulas?
- Why did you choose to use or not use a doula?
- How did you find out about doula services?
- What support did the doula offer you?
  - Before labor
  - During labor
  - After labor
- How did having or not having a doula hurt or help your labor experience?

Perceived drawbacks/Perceived advantages

- What would prevent someone from using doula services?
- How would someone benefit from having a doula?

Acceptabilty

- How could a doula address any drawbacks you mentioned (repeat drawbacks)?
- When is the best time of the pregnancy to offer doula services?

- Where is the best place to offer doula services?
- What would attract someone to doula services?

Additional input

Is there anything you would like to add?

BIBLIOGRAPHY

0022. (2018). In D. Horsley (Ed.).
0023. (2018). In D. Horsley (Ed.).
0025. (2018). In D. Horsley (Ed.).
0026. (2018). In D. Horsley (Ed.).
0028. (2018). In D. Horsley (Ed.).
0029. (2018). In D. Horsley (Ed.).
0030. (2018). In D. Horsley (Ed.).
0032. (2018). In D. Horsley (Ed.).

2015 Comparative Price Report: Variation in Medical and Hospital Prices by Country. (2015): International Federation of Health Plans.

2020, H. P. (02/02/2018). Maternal, Infant, and Child Health Retrieved February 2, 2018, from https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives

About SIDS/Safe to Sleep. (2012). *Safe to Sleep.* From https://www1.nichd.nih.gov/sts/about/Pages/default.aspx

Allegheny County Maternal and Child Health Needs Assessment. (2004) (pp. 144).

Arth, A. C., Tinker, S. C., Simeone, R. M., Ailes, E. C., Cragan, J. D., & Grosse, S. D. (2017). Inpatient Hospitalization Costs Associated with Birth Defects Among Persons of All Ages — United States, 2013 (Vol. 66, pp. 41-50). Washington, DC: Centers for Disease Control.

Austin, E. (2008). Allegheny County Child Dealth Review 2005-2008 (pp. 55): Allegheny County Health Department.

Balke, M. (2015). 2008-2012 Infant Mortality Birth Cohort Study. In J. Kokenda (Ed.). Allegheny County, PA: Allegheny County Health Department.

Behrman, R. E., & Butler, A. S. (2007). Preterm Birth: Causes, Consequences, and Prevention. Washington (DC): Institute of Medicine (US) Committee on Understanding Premature Birth and Assuring Healthy Outcomes.

Bilheimer, L. (1992). Factors Contributing to the Infant Mortality Rankng of the United States *CBO Staff Memorandum*: Congressional Budget Office.

David, R., & Collins, J. (2007). Disparities in Infant Mortality: What's Genetics Got to Do With It? *Am J Public Health, 97*(7), 1191-1197.

David, R. J., & Collins, J. W. (1997). Differing Birth Weight among Infants of U.S.-Born Blacks, African-Born Blacks, and U.S.-Born Whites. *New England Journal of Women, 337*, 1209-1214.

Declercq, E. R., Sakala, C., Corry, M. P., & Applebaum, S. (2007). Listening to Mothers II: Report of the Second National U.S. Survey of Women's Childbearing Experiences. *The Journal of Perinatal Education, 16*(4), 9-14.

Disparities and Inequities in Maternal and Infant Health Outcomes. (2012): Association of State and Territorial Health Official.

Dona International. from https://www.dona.org/the-dona-advantage/about/

Dovidio, J. F., & Fiske, S. T. (2012). Under the Radar: How Unexamined Biases in Decision-Making Processes in Clinical Interactions Can Contribute to Health Care Disparities. *Am J Public Health*.

Epstein, A. M., & Newhouse, J. P. (1998). Impact of Medicaid Expansion on Early Prenatal Care and Health Outcomes. *Medicare and Medicaid Research Review, 19*(4), 85-99.

Fiscella, K., Franks, P., Gold, M. R., & Clancy, C. M. (2000). Inequality in Quality: Addressing Socioeconomic, Racial, and Ethnic Disparities in Health Care. *Journal of the American Medical Association, 283*(19), 2579-2584. doi: 10.1001/jama.283.19.2579

Fishbien, M. (2008). A Reasoned Action Approach to Health Promotion. *Medical Decision Making, 28*(6), 10.

Galarza, R. (2017). By My Side Birth Support: Alternative Maternal Care for Brooklyn Moms. *BK Reader*. Retrieved from https://www.bkreader.com/2017/01/side-birth-support-alternative-maternal-care-brooklyn-moms/

Gifford, K., Walls, J., Ranji, U., Salganicoff, A., & Gomez, I. (2017). Medicaid Coverage of Pregnancy and Perinatal Benefits: RESULTS FROM A STATE SURVEY.

Gopal K. Singh, M. D. K. (2007). Persistent Socioeconomic Disparities in Infant, Neonatal, and Postneonatal Mortality Rates in the United States, 1969–2001. *Pediatrics, 119*(4), e928-e939. doi: 10.1542/peds.2005-2181

Grobman, W. A., Bailit, J. L., Rice, M. M., Wapner, R. J., Reddy, U. M., Varner, M. W., . . . VanDorsten, J. P. (2015). Racial and Ethnic Disparities in Maternal Morbidity and Obstetric Care. *Obstetrics and Gynecology, 125*(6), 1460-1467.

Gruber, K. J., Cupito, S. H., & Dobson, a. C. F. (2013). Impact of Doulas on Healthy Birth Outcomes. *The Journal of Perinatal Education, 22*(1), 49-58.

Haider, S. J., Elder, T. E., & Goddeeris, J. H. (2016). Racial and Ethnic Infant Mortality Gaps and Socioeconomic Status. *Labour Economics*(43), 42-54. doi: Elder TE, Goddeeris JH, Haider SJ. Racial and Ethnic Infant Mortality Gaps and the Role of Socio-Economic Status. Labour economics. 2016;43:42-54. doi:10.1016/j.labeco.2016.04.001.

Hauck, F. R., Tanabe, K. O., & Moon, R. Y. (2011). Racial and Ethnic Disparities in Infant Mortality. *Seminars in Perinatology, 35*(4), 209-220. doi: https://doi.org/10.1053/j.semperi.2011.02.018

Healthy Start Brooklyn. *Neighborhood Health.* from https://www1.nyc.gov/site/doh/health/neighborhood-health/healthy-start-brooklyn.page

Heaman, M. I., Moffatt, M., Elliott, L., Sword, W., Helewa, M. E., Morris, H., . . . Cook, C. (2015). Barriers and facilitators related to use of prenatal care by inner-city women: perceptions of health care providers. *BMC Pregnancy and Childbirth, 15*(2).

Infant Mortality Reduction Initiative (IMRI). from https://www.bronxhealthlink.org/tbhl/programs/imri/ Continuous emotional support during labor in a US hospital: A randomized controlled trial.

Jacobson, J. D., Zieve, D., & Ogilvie, I. (2016, March 8, 2018). Placental Insufficiency. *Medical Encyclopedia.*

Key characteristics of parental leave systems. (2017): Organisation for Economic Co-oporation and Development.

Kim, D., & Saada, A. (2013). The Social Determinants of Infant Mortality and Birth Outcomes in Western Developed Nations: A Cross-Country Systematic Review. *The International Journal of Enviornmental Research and Public Health, 10*(6), 2296-2335.

Kochanek, K. D., Murphy, S. L., Xu, J., & Tejada-Vera, B. (2016). Deaths: Final data for 2014 *National Vital Statistics Reports* (Vol. 65). Hyattsville, MD: National Center for Health Statistics.

Kotelchuck, M. (1994). The Adequacy of Prenatal Care Utilization Index: its US distribution and association with low birthweight. *Am J Public Health, 84*(9), 1486-1489.

Kozhimannil, K., & Hardeman, R. (2015). How Medicaid Coverage for Doula Care Could Improve Birth Outcomes, Reduce Costs, and Improve Equity.

Kozhimannil, K. B., Attanasio, L. B., Jou, J., Joarnt, L. K., Johnson, P. J., & Gjerdingen, D. K. (2014). Potential benefits of increased access to doula support during childbirth. *American Journal of Managed Care, 20*(1), e340-e352.

Kozhimannil, K. B., & Hardeman, R. R. (2016). Coverage for Doula Services: How State Medicaid Programs Can Address Concerns About Maternity Care Costs and Quality. *Birth (Berkeley, Calif.), 43*(2), 97-99. doi: 10.1111/birt.12213.

Kurta, M., Torso, L., Monroe, C., & Brink, L. (2015). 2015 Community Health Assessment. Pittsburgh, PA: Alleghney County Health Department.

Landis, E. (2016). 2013 Allegheny County Birth Fact Sheet: Allegheny County Health Department.

Lewin, V., & Fishman, L. (2015). Infant Mortality Rate in New York City Reaches Historic Low [Press release]. Retrieved from https://www1.nyc.gov/site/doh/about/press/pr2015/pr008-15.page

MacDorman, M. F., Hoyert, D. L., & Mathews, T. J. (2013). Recent Declines in Infant Mortality in United States, 2005-2011. *NCHS data brief.*

MacDorman, M. F., & Mathews, T. J. (2008). Recent trends in infant Mortality in the United States. Hyattsville, Maryland: National Center for Disese Statistics.

MacDorman, M. F., Mathews, T. J., Mohangoo, A. D., & Zeitlin, J. (2014). International Comparisons of Infant Mortality and Related Factors: United States and Europe, 2010 *National Vital Statistics Reports* (Vol. 63). Hyattsville, MD: National Center for Health Statistics.

Martin, J. A., Hamilton, B. E., Osterman, M. J. K., Driscoll, A. K., & Drake, P. (2018). Births: Final Data for 2016 *National Vital Statistics Reports* (Vol. 67). Hyattsville, MD: National Center for Health Statistics.

Mathews, T. J., & Driscoll, A. K. (2017). Trends in Infant Mortality in the United States, 2005-2014: National Center for Health Statistics.

Mathews, T. J., MacDorman, M. F., & Thoma, M. E. (2015). Infant mortality Statistics From the 2013 Period Linked Birth/Infant Death Data Set *National Vital Statistics Reports* (Vol. 64). Hyattsville, MD: National Center for Health Statistics.

McAdams, R. (2017). Allegheny County Birth Report: 2015 (S. a. E. Bureau of Assessment, Trans.). Pittsburgh, PA: Allegheny County Health Department.

McDaniels, A. K. (2017). Baltimore Enlists Doulas to help bring infant mortality rate down. *The Baltimore Sun*. Retrieved from http://www.baltimoresun.com/health/bs-hs-doula-infant-mortality-20170725-story.html

Murphy, K. (2015). Pennsylvania Child Death Review Annual Report: Pennsylvania Department of Health.

Overdue: Medicaid and Private Insurance Coverage of Doula Care to Strengthen Maternal and Infant Health. (2016): National Partnership for Women and Families.

Partridge, S., Balayla, J., Holcroft, C. A., & Abenhaim, H. A. (2012). Inadequate Prenatal Care Utilization and Risks of Infant Mortality and Poor Birth Outcome: A Retrospective Analysis of 28,729,765 U.S. Deliveries over 8 Years. *American Journal of Perinatology, 29*(10), 787-794.

Rates in OECD Countries: Policy Implications for the United States. *World Medical and Health Policy, 9*(1), 6-23.

Penner, L. A., Dovidio, J. F., Edmondson, D., Dailey, R. K., Markova, T., Albrecht, T. L., & Gaertner, S. L. (2009). The Experience of Discrimination and Black-White Health Disparities in Medical Care. *Journal of Black Psychology, 35*(2), 180-203.

Piper, J. M., Xenakis, E. M.-J., McFarland, M., Elliott, B. D., D.Berkus, M., & Langer, O. (1996). Do growth-retarded premature infants have different rates of perinatal morbidity and mortality than appropriately grown premature infants? *Obstetrics & Gynecology, 87*(2), 169-174.

Plan for a Healthier Alleghney (2015-2020) Annual Report. (2017). Pittsburgh, PA: Allegheny County Health Department

Pregnancy Complications. (February 8, 2018). *Pregnancy.* From https://www.womenshealth.gov/pregnancy/youre-pregnant-now-what/pregnancy-complications

Pregnancy Complications. (2016). *Reproductive Health.* from https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pregcomplications.htm

Preterm Birth. (2017). *Reproductive Health.* from https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pretermbirth.htm

Riddell, C. A., Harper, S., & Kaufman, J. S. (2017). Trends in Differences in US Mortality Rates Between Black and White Infants. *JAMA Pediatrics, 171*(9), 911-913. doi: 10.1001/jamapediatrics.2017.1365

Rossin, M. (2011). The effects of maternity leave on children's birth and infant health outcomes in the United States. *Journal of Health Economics, 30*(2), 221-239.

Ruhm, C. J. (2000). Parental Leave and Child Health. *Journal of Health Economics, 19*, 932-960.

Shields, S. Lowering U.S. Infant Mortality Rate: FPs May Be the Key. from https://www.aafp.org/news/opinion/20130327infantmortalityedl.html

Smedley, B. D., Stith, A. Y., & Nelson, A. R. (2003). *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, DC: National Academic Press.

Smith, I. Z., Bentley-Edwards, K. L., El-Amin, S., & Darity, W. (2018). Fighting at Birth: Eradicating the Black-White Infant Mortality Gap. Oakland, CA: Duke University.

Smoking During Pregnancy. (2017). *Reproductive Health.* from https://www.cdc.gov/reproductivehealth/maternalinfanthealth/tobaccousepregnancy/index.htm

Statistics, N. C. f. H. (2005). Health, United States, 2005. Hyattsville, Maryland: U.S. Department of Health and Human Services.

Tong, V. T., Dietz, P. M., Morrow, B., D'Angelo, D. V., Farr, S. L., Rockhill, K. M., & England, L. J. (2013). Trends in Smoking Before, During, and After Pregnancy — Pregnancy Risk Assessment Monitoring System, United States, 40 Sites, 2000–2010. *Morbidity and Mortality Weekly Report, 62*(SS06), 1-19.

Torso, L., Monroe, C., & Brink, L. (2015). Allegheny County Health Department 2015 Community Health Assessment (pp. 31-33). Pittsburgh, PA Allegheny County Health Department.

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC). (September 21, 2016). Birth Defects. from https://www.cdc.gov/ncbddd/birthdefects/data.html

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC). (2016, September 15, 2016). Infant Mortality. Retrieved September 16, 2016, 2016, from http://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC). (2017). Sudden Unexpected Infant Death and Sudden Infant Death Syndrome.

Vanderbilt, A. A., Wright, M. S., Brewer, A. E., Murithi, L. K., & Coney, P. (2016). Increasing Knowledge and Health Literacy about Preterm Births in Underserved Communities: An Approach to Decrease Health Disparities, a Pilot Study. *Global Journal of Health Science, 8*(1), 83-89.

Wye, G. V., Betancourt, F., Koshar, K., Lee, E., Li, W., Schwartz, S., & Zimmerman, R. (2015). Summary of Vital Statistics 2013 The City Of New York Infant Mortality (D. o. H. a. M. H. E. Division, Trans.) (pp. 12): New York City Department of Health and Mental Hygiene.

Zeltner, B. (2017). Cleveland doulas fight infant mortality in their neighborhoods, one birth at a time: Saving the Smallest. *Health and Fitness.* from http://www.cleveland.com/healthfit/index.ssf/2017/07/cleveland_doulas_fight_black_i.html