

Spring 2022

Birth Outcomes for Hispanic Women in South Carolina

Reilly Leaver

Follow this and additional works at: https://scholarcommons.sc.edu/senior_theses



Part of the [Medicine and Health Sciences Commons](#)

Recommended Citation

Leaver, Reilly, "Birth Outcomes for Hispanic Women in South Carolina" (2022). *Senior Theses*. 576.
https://scholarcommons.sc.edu/senior_theses/576

This Thesis is brought to you by the Honors College at Scholar Commons. It has been accepted for inclusion in Senior Theses by an authorized administrator of Scholar Commons. For more information, please contact digres@mailbox.sc.edu.

BIRTH OUTCOMES FOR HISPANIC WOMEN IN SOUTH CAROLINA

By

Reilly Leaver

Submitted in Partial Fulfillment
of the Requirements for
Graduation with Honors from the
South Carolina Honors College

May, 2022

Approved:

Dr. Myriam Torres
Director of Thesis

Dr. Edena Guimaraes
Second Reader

Steve Lynn, Dean
For South Carolina Honors College

TABLE OF CONTENTS

Abstract	2
Introduction	4
Methodology	10
Findings	14
Live Births and Infant Mortality	14
Education Level	15
Delivery Payment Methods.....	15
Prenatal Care	16
Healthy Habits and Lifestyles	17
Discussion	18
Live Births and Infant Mortality	18
Education Level	19
Delivery Payment Methods.....	21
Prenatal Care	23
Healthy Habits and Lifestyles	25
Conclusions & Recommendations	27
Appendix	31
Bibliography	35

ABSTRACT

The United States maintains disproportionately high infant mortality rates compared to other developed countries globally (Arima et al., 2009). High barriers to accessing affordable reproductive health care are key drivers behind this phenomenon, with minority ethnic and racial populations in the Deep South region of the United States facing these barriers at much higher rates than their white counterparts (Davis et al., 2020). Factors such as low levels of education, low use of private health insurance, and low participation in prenatal care generally correlate with adverse birth outcomes. Both Hispanic and Black mothers experience these factors at similarly low levels, and while this correlates with high infant mortality rates within the Black population, Hispanic mothers in South Carolina achieve positive birth outcomes at rates equal to that of their white counterparts, mothers who have higher rates of private insurance use, participate in more prenatal care visits, and have higher education levels. This is a manifestation of the Hispanic Health Paradox, wherein limited access to quality resources is paired with positive health outcomes (Roy et al., 2020). Strong familial and community-based support systems that discourage unhealthy behaviors and lifestyles that exist within Hispanic cultures and supplement formal medicine can begin to explain this paradox (Scribner, 1996). However, the positive health outcomes of this paradox diminish over time as

Hispanic populations become assimilated to United States cultures and behaviors (Scribner, 1996). This creates a need within the country's health care system to implement community-based health care programs that decrease social and cultural distance between doctors and their patients of color and are tailored to the circumstances of minority populations. This study provides evidence that supports the existence of the Hispanic Health Paradox in maternal and infant health, and overall aims to understand the relationships between education, payment method for deliveries, adequacy of prenatal care, tobacco use, and obesity during pregnancy and the discrepancies within these factors and birth outcomes that exist between racial and ethnic groups in South Carolina, with a specific focus on the Hispanic populations.

INTRODUCTION

In 2018, 4 million infants died globally (WHO, 2018). Infant mortality is an issue that is being combatted globally, in the developing world where healthcare infrastructure and policy is underfunded and lacking in regulation, but also in areas of the developed world, where systematic oppression and social norms of a patriarchal society has pushed women, especially women of color's, health under the rug. According to the World Health Organization (WHO), the risk of a child dying before their first birthday was highest in the WHO African Region (mainly inhabited by people of color) at 52 per 1000 live births, over seven times higher than that in the WHO European Region (mainly inhabited by white people) at 7 per 1000 live births.

Although the developed world has significantly fewer infant deaths per 1000 infants born than the total world average (4.3 deaths per 1000 in the developed world compared to 47.7 per 1000 globally), the United States stands out with one of the highest rates of infant mortality in the developed world (Arima et al., 2009) at 5.6 deaths per 1000 and ranking only 47th globally for the lowest rates of infant mortality (The World Bank, 2019). Countries like Iceland, Japan, and Singapore reported rates as low as 2 infant deaths per 1000 births (The World Bank, 2019). As a country that often ranks high in global competitions for things like economic size and high freedom indexes -- the United States economy ranks

1st with the highest GDP globally (The World Bank, 2019), and 6th for economic freedom (Vásquez & McMahon, 2020) -- it seems counterintuitive that health issues like high infant mortality persist in United States society. Despite the United States' abundance of resources and projected attitude of equality and freedom, systematic issues of racial and gender discrimination still seem to outweigh this idealistic perspective and limit women, especially women of color, in their pursuit for access to reproductive healthcare services (Wallace et al., 2017). This systematic oppression shows itself in many different forms all over the United States but is most prevalent in the Deep South (South Carolina, Georgia, Alabama, Mississippi, and Louisiana), where infant mortality is disproportionately high (Davis et al., 2020).

Discrepancies in birth trends and outcomes in the United States compared to the rest of the developed world, and in the North compared to the Deep South of the United States, cannot be easily explained. Relationships of correlation can be speculated, but it is difficult to quantify and study them definitively as relationships of causation; it is a phenomenon deeply rooted in the South's history of slavery, discrimination, and traditional cultural norms (Wallace et al., 2017).

The source of traditional values held by many southerners can be traced back to the church (Srikanthan & Reid 2008). The south is home to all but one

(Utah) top 12 most religious states (Chokshi, 2019). One of the biggest taboos in many religions, and certainly in Christianity, the dominant religion in the South, is sex; it isn't discussed in open conversation and strong judgement can be placed on people who have sex before marriage (Srikanthan & Reid, 2008). Thus, many southerners live by and believe in the value that sex should not be discussed in public, which is likely a cause for the limited nature of sex education in the region. If most members of society are secretive about their sexual activity, it may seem on the surface as though young people are not having sex, that sex education is unnecessary and may only encourage teens to engage in sexual activity. Most southern states do not require public schools to provide sex education at all, and many of those that do teach abstinence only, leave out information about birth control, and prohibit discussion of LGBTQ identities and relationships (Planned Parenthood, 2021b). With limited knowledge at best regarding reproductive health, mothers in the Deep South are less aware of their resources, which behaviors they should be adopting or changing to ensure good reproductive health, and their options regarding family planning.

Even if people living in the Deep South have a great understanding of their bodies and their choices regarding reproductive health, it is often very difficult to access reproductive health resources. People who were not educated in reproductive health will have an even harder time seeking out these resources.

The lack of sex education policy in the South parallels to its lack of reproductive healthcare and family planning clinics; both contradict the values held by the church regarding sex (Srikanthan & Reid, 2008). Planned Parenthood is the United States' leading provider and advocate for high quality, affordable healthcare, and while 600 exist nationally, only 2 are in South Carolina, 4 in Georgia, 1 in Alabama, 4 in Louisiana, and 1 in Mississippi. That's 10 clinics in the Deep South and 590 clinics located in the rest of the United States, where poor birth outcomes are less prevalent (Planned Parenthood, 2021a). Although Planned Parenthoods are not the only reproductive healthcare providers in the country, their location density is similar to that of other, smaller clinics (i.e., if there's not a lot of Planned Parenthoods in the area, there's usually not a lot of other clinics either) (Planned Parenthood, 2021a). While higher income individuals have the capabilities to visit and pay for private healthcare providers and comprehensive, high quality maternal healthcare, lower income individuals are reliant on clinics like Planned Parenthood, and if they are few and far away, accessing reproductive health care can be incredibly difficult (Wallace et al., 2017). Mothers who are already economically disadvantaged may have to take off work and find transportation in order to attend important appointments like prenatal visits.

Reproductive healthcare access is more limited in the Southern United States than in the North, but lower income individuals in the South are the most impacted by this discrepancy. White lives are still valued above those of people of color by many of the older generations of politicians and lawmakers, and the interests of men are often regarded as more important than those of women (Wallace et al., 2017). Even if such preferences aren't explicitly stated or acted on, these values are deeply and systematically ingrained in southern culture. Although slavery and segregation are over, many counties and neighborhoods in the Deep South are still either predominantly white or predominantly of color, making it easy to allocate resources to one specific group or deprive resources from others (Mehra et al., 2017). Many people of color live in poorer neighborhoods with lacking education systems and as such have access to fewer opportunities (Ehrenthal et al., 2020). With less economic stability, many of these families are forced to rely on affordable clinics for their healthcare. And if this care is hours away, with clinics few and far between, it can be increasingly difficult for people to access the help they need (Varney, 2021).

Racism exists within our policy making practices, but it is also present in interactions within the healthcare system itself. Even if a mother of color can pay for comprehensive care through a private healthcare provider, she is still at risk of receiving lower quality healthcare -- there are many accounts of white male

doctors refusing to give adequate care to mothers of color and taking advantage of language barriers in one-on-one patient meetings (Smedley et al., 2003). The social distance between doctors, especially white male doctors, and women of color limits low-income parents' quality of affordable reproductive healthcare, and likely is a cause for Black and Hispanic mothers suffering high rates of poor birth outcomes.

Low-income minorities experience high levels of systemic discrimination throughout the entire United States. This discrimination has manifested into limited access to birth-related education and services for minority populations. While there is some published research on why birth characteristic variables differ between Black and white populations, there is little research on how these characteristics and discrepancies manifest within Hispanic communities in the South. In this paper I intend to determine the extent of the relationship between birth outcomes and race and ethnicity, education, socioeconomic status, access to prenatal care, tobacco use, and obesity trends with emphasis on the Hispanic community in South Carolina.

METHODOLOGY

For this study, comparative data was collected from the South Carolina Community Assessment Network (SCAN), an interactive data retrieval system run by the South Carolina Department of Health and Environmental Control (SCDHEC). SCAN allows users to create tables from data sets including birth certificates, death certificates, infant mortality, demographics, and pregnancies. Tables were created to show discrepancies in birth outcomes and how they compare to differences in education level, payment option for the birth, adequacy of prenatal care, tobacco use, and obesity during pregnancy along racial and ethnic lines.

To start, a data table was created detailing rates of live births for different racial and ethnic groups in South Carolina and their change over time (Table 1). A live birth, as defined by SCDHEC, requires complete extraction of the baby, and the baby must show some evidence of life, such as breathing or having a heartbeat (SCDHEC, 2021). Another data table was created to show infant mortality rates between different racial and ethnic groups in South Carolina and their change over time (Table 2). SCDHEC defines infant mortality as death of a live born infant before completion of their first year of life (SCDHEC, 2021). For these tables, birth certificate data from 2010-2019 was used. As of 1990, SCDHEC reports live births by race/ethnicity of mother rather than

race/ethnicity of the child, as this method of reporting is used by the National Center for Health Statistics as well as many other state and federal health departments (SCDHEC, 2021).

Additional data tables were created to display discrepancies in birth characteristic variables among the white, Black, and Hispanic populations in South Carolina. Education level, method of payment for the delivery, adequacy of prenatal health, smoking habits, and obesity levels are all categorized as *Birth Characteristic Variables* by SCDHEC. All live births in the state have been documented with classifications for each of these variables. Each birth characteristic rate represents the selected birth characteristic frequency per 1,000 annual live births (SCDHEC, 2021). One chart was made for each variable using data from 2019.

For the education level variable, the total count and rates of live births for white, Black, and Hispanic mothers in South Carolina that did not graduate high school is shown in Table 3. For the methods of delivery payment variable, the total count and rates of live births for white, Black, and Hispanic parents using different methods of delivery payment are shown. Payment method variables include *Principal source of payment for the delivery: Medicaid* (Table 5), *Principal source of payment for the delivery: Private* (Table 4), and *Principal source of payment for the delivery: Self-pay* (Table 6). For adequacy of prenatal care, the total count

and rates of live births with inadequate Kotelchuck scores for white, Black, and Hispanic parents are shown in Table 7. The Kotelchuck adequacy level is based on when prenatal care began (initiation) and the number of prenatal visits from when prenatal care began until delivery (received services) and uses a scale of expected number of visits based on standards set by the American College of Obstetricians and Gynecologists. It is important to note that this measure of prenatal care does not measure quality of the visit. Table 8 shows the total count and rates of live births for the white, Black, and Hispanic populations to mothers using tobacco during pregnancy. Table 9 shows the total count and rates of live births for the white, Black, and Hispanic populations to mothers who were obese during pregnancy. These tables of Birth Characteristic Variables also show how rates of each variable change over time (2015-2019) and compare between populations.

Through the creation of these tables, patterns in the rates of live births for each racial and ethnic group can be observed and analyzed under each birth characteristic. The first data set shows the discrepancies of infant mortality rates along racial and ethnic lines, proving that the white and Hispanic populations face much lower rates of infant mortality than does the Black population. Comparing these rates to the degree to which each Birth Characteristic Variable impacts the number of live births for each ethnic and racial group shows which

variables are most impactful to birth outcomes, and how each variable manifests differently for each ethnic group. Not only do these data sets show which ethnic and racial groups are at risk, but it also provides correlation insight. For example, a Black mother more frequently has lower education levels than a white mother, and that same Black mother is more likely to have adverse birth outcomes than her white counterpart, indicating that there may be a correlation between ethnicity, education level and birth outcome. Each birth characteristic variable was assessed in this way based solely on quantitative data.

One quantitative analysis was complete, background research was done to further explain these correlations. Using secondary source readings and studies, additional information was collected regarding the relationships between socioeconomic status, education levels, prenatal care participation, healthy habits and lifestyles, and birth outcomes for mothers in South Carolina and the rest of the United States. Findings were consolidated, and connections between quantitative and qualitative data were analyzed. Research on possible solutions to decreasing discrepancies in infant mortality rates along racial and ethnic lines in South Carolina and the United States was also done, and these solutions were compared and analyzed with the perspective of the quantitative data.

FINDINGS

Live Births and Infant Mortality Rates (Tables 1 & 2)

From 2010-2019, the number of white infants born in South Carolina are on average about double the number of Black infants born in South Carolina, and about seven times higher than the number of Hispanic infants born in South Carolina. This reflects the racial and ethnic distribution of the state, which has a majority white population, a smaller Black population, and a much smaller Hispanic population. Birth rates for the Hispanic population are the highest; there were 18.2 births per 1000 Hispanic births in 2019 compared to 10.5 births per 1000 white births and 12.4 births per 1000 Black births. Birth rates have been decreasing over the past decade for all populations.

Infant mortality rates are highest within the Black population in South Carolina. Infant mortality rates for white and Hispanic mothers are very similar, averaging around 5 deaths per 1000 births from 2010-2019. Infant mortality rates for the Black population in South Carolina are on average over double the rates for white and Hispanic mothers, with Black mothers having experienced on average about 12.2 infant deaths per 1000 births from 2010-2019.

Education Level (Table 3)

The Hispanic population has the highest rate of mothers with education levels less than high school, at rates more than double those for the Black and white populations in South Carolina from 2015-2019. While only 130.6 of 1000 white mothers and 121.9 of 1000 Black mothers did not receive education past high school in 2019, there were 372.8 of 1000 Hispanic mothers with education levels less than high school in 2019. However, the rates of mothers with education levels below high school have decreased from 2015-2019 for all populations in South Carolina.

Delivery Payment Methods (Tables 4, 5, & 6)

The white population in South Carolina paid for their births using Medicaid at rates much lower than the Black or Hispanic populations. About 375 of 1000 white mothers paid for their births with Medicaid in 2019, while nearly 700 of 1000 Black mothers and about 625 of 1000 Hispanic mothers paid for their births using Medicaid. Rates of Medicaid use for birth expenses has been decreasing from 2015-2019 for white and Black mothers but has increased on average for the Hispanic population over the same time frame.

Hispanic mothers have the lowest rates of using private insurance to pay for their deliveries at 207.4 of 1000 mothers compared to 263.9 of 1000 Black

mothers and 510.0 white mothers in 2019. Rates of private payment have on average increased from 2015-2019 for white mothers, Black mothers, and Hispanic mothers.

Hispanic mothers have the highest rate of self-payment for their deliveries compared to Black and white mothers. In 2019, 115.7 of 1000 Hispanic mothers self-paid for their deliveries, while only 13.6 of 1000 Black mothers and 39.1 of 1000 white mothers self-paid for their deliveries in 2019.

Prenatal Care (Table 7)

The Kotelchuck Index is a measurement of the adequacy level of prenatal care received by the mother during pregnancy. An inadequate Kotelchuck score indicates inadequate prenatal care for the mother. Rates of inadequate Kotelchuck scores were highest among the Hispanic population and lowest for the white population in South Carolina for the years 2015-2019. In 2019, 147.3 of 1000 white mothers, 196 of 1000 Black mothers, and 273.9 of Hispanic mothers did not receive adequate prenatal care during their pregnancy. The size of the population of Hispanic mothers who did not have access to adequate prenatal care was almost double that of the white population. Rates for poor prenatal care have decreased for all populations from 2015-2019.

Healthy Habits and Lifestyles (Tables 8 & 9)

The population of white mothers has the highest rates of tobacco use compared to Black mothers and Hispanic mothers in South Carolina during 2015-2019. During this period, rates for Hispanic mothers were about $\frac{1}{4}$ of the rates for white mothers, and rates for Black mothers were a little over $\frac{1}{2}$ of the rates for white mothers. In 2019, 87.2 of 1000 white mothers used tobacco during pregnancy compared to 50.4 of 1000 Black mothers and 16.3 of 1000 Hispanic mothers. Rates of tobacco use in pregnant mothers generally decreased for all populations during the years 2015-2019.

Rates of obesity prior to pregnancy in mothers were highest for the Black population in South Carolina for 2015-2019 compared to rates in white and Hispanic mothers. In 2019, the rate of obesity prior to pregnancy for Black mothers was 459.3 out of 1000, while the rate for white mothers was 285.6 of 1000 and the rate for Hispanic mothers was 304.0 of 1000. Obesity rates for white and Hispanic mothers prior to pregnancy during this period were very similar, although rates for Hispanic mothers were slightly higher than those of white mothers. Rates of obesity in mothers prior to pregnancy has been generally increasing for all populations in South Carolina from 2015-2019.

DISCUSSION

Infant Mortality and Birth Rates

Overall, the Hispanic population consistently has the highest birth rates compared to Black and white populations in South Carolina despite having the lowest total number of live births in South Carolina compared to white and Black mothers. This is because the Hispanic population in South Carolina is incredibly small, making up only 6% of the entire South Carolina population (U.S. Census Bureau, 2021), but as their birth rate is so high, the small size of their population does not discredit the importance of understanding the relationships between birth characteristic factors that contribute to infant mortality within this population.

Despite having such a high birth rate, infant mortality rates are just as low for Hispanic mothers as they are for white mothers, at about 5% compared to about 12.2% for the Black population. This reflects what has been termed the Hispanic Health Paradox in literature, where despite poor education, high rates of individuals working dangerous jobs, and low-income levels, the Hispanic populations of the United States tend to be in just as good of health, if not better, than any other racial/ethnic groups in the country (Roy et al., 2020). One possible explanation for this assumes that Hispanic cultures encourage strong familial support systems and healthy behaviors (Scribner, 1996). Hispanic people often

have large families with strong ties that provide help and care to one another. Reproductive related information and support is likely shared through family networks, making this population less dependent on effective sex education in schools and clinic availability when birth complications arise.

Education Levels

As shown in Table 3, the Hispanic population in South Carolina has by far the highest rates of mothers who have not completed high school, at over double the rates for white and Black mothers. On average over the 2015–2019-time frame, about 41 of 1000 Hispanic mothers did not graduate high school, compared to about 137 of 1000 white mothers and 140 of 1000 Black mothers. Rates for mothers with education levels less than high school have been consistently decreasing for all populations. Education levels are improving fastest for the Black population and slowest for the white population, putting the Hispanic population's rate of improved education in the middle, at an improvement rate close to that of the Black population. Despite this growth, the Hispanic population still has the highest rates of mothers who have not graduated high school, and this standing is likely to persist.

Despite having the highest rates of education less than high school, the Hispanic population has been able to avoid high rates of infant mortality. For the

Black population, low education levels correlate with rates of infant mortality over double that of the Hispanic and white populations. It seems intuitive that lacking higher education would decrease an individual's awareness on proper reproductive health practices and resources (Wallace et al., 2017). Low education levels also correlate with low socioeconomic status and income levels, all of which are factors that make it difficult for populations to understand and have access to proper health resources, including prenatal healthcare (Wallace et al., 2017). This is reflected in birth trends for Black mothers, but the Hispanic population is able to avoid adverse birth outcomes despite lacking formal schooling compared to their white counterparts. This indicates that they may be receiving information regarding pregnancy, maternal health, and proper birthing practices from sources other than public and higher university education in the United States, sources that most other people in the United States rely on (Hoefler & Hoefler, 2017). These other sources could be family or community members within the shared cultural social networks of the Hispanic populations in South Carolina who share advice and support when someone within the community becomes pregnant (Scribner, 1996). Regardless of where information on proper pregnancy practices comes from, the Hispanic population likely understands and uses this knowledge to effectively lower their chances of infant

mortality; it's not just luck or genetics that enables positive birth outcomes, but strong support from social networks (Roy et al., 2020).

Delivery Payment Methods

In general, private health insurance enables individuals to access to better healthcare than do government health insurance programs. Privately insured mothers have higher rates of adequate prenatal care (Green, 2018), face less discrimination during birth hospitalization, and report more personalized and intimate relationships with their doctors (Gadson et al., 2017). It follows logic that mothers with private insurance should have better birth outcomes than mothers with public insurance or no insurance at all. However, white mothers, who used private health insurance at over double the rate of Hispanic mothers, had similar rates of infant mortality as Hispanic mothers in South Carolina from 2015-2019 (Table 4). Even though Hispanic mothers are more likely to use public health insurance plans like Medicaid or self-pay out of pocket for birth expenses, their birth outcomes are not adversely affected. Black mothers, however, had similarly low rates of using private health insurance to pay for their deliveries as Hispanic mothers, but their rates of infant mortality were over double those of the Hispanic population, indicating that using public healthcare programs and

paying for deliveries out of pocket may not be directly correlated to higher rates of adverse birth outcomes.

From observations drawn from the data collected in this study, it is clear that people within the Hispanic community do not need the services offered by the United States healthcare system to have a healthy baby. Using lower quality healthcare (i.e., public healthcare programs) or simply self-paying out of pocket using no health insurance whatsoever should logically lead to adverse birth outcomes; the high rates of infant mortality paired with low rates of private health insurance use within the Black population is a perfect example of this pattern, especially when compared to the positive birth outcomes and high rates of private health insurance use within the white population. Most Americans depend on prenatal care services offered through health insurance programs for their pregnancies, but it is possible that Hispanic cultural norms and social networks discourage unhealthy behaviors and provide support to one another, and that this kind of support is an effective substitute for formal western medicine.

Based on trend analysis performed on data collected from SCDHEC, the use of private health insurance is increasing for all populations, and the use of self-payments for deliveries is decreasing across the board. Medicaid use is decreasing for Black and white mothers, but it is increasing for Hispanic mothers,

indicating that insurance support from Medicaid will likely become a more important resource for pregnant Hispanic mothers. In coming years, to gain a better understanding of the Hispanic health paradox, it will be important to track exactly how these individuals are using their healthcare -- the demands of pregnant Hispanic mothers for birth-related healthcare, which resources they use and which are unnecessary, the quality of services is executed, and overall, the importance of publicly funded prenatal care programs to the Hispanic population.

Prenatal Care

Based on the Kotelchuck Index and data in Table 7, Hispanic mothers in South Carolina had the highest rates of inadequate prenatal care compared to white and Black mothers from 2015-2019. The Kotelchuck index uses a formula based on two main factors to assess adequacy of prenatal care: first, when prenatal care began (initiation) and second, the number of prenatal visits from when prenatal care began until delivery (received services) (SCDHEC, 2021). It is important to note that this index does not assess the quality of the visits (SCDHEC, 2021). An Inadequate Kotelchuck score indicates that prenatal visits started too late and/or happened too infrequently.

Administering prenatal care to a pregnant mother is associated with many benefits for the mother and the child, including lower rates of preterm and low-birthweight infants, lower rates of cesarean section, (Dubay et al., 2020) and decline in maternal and infant mortality rates (Gadson et al., 2017). Administering prenatal care is also essential to managing pregnancy complications in higher-risk mothers (Green, 2018). Rates for inadequate prenatal care are highest for the Hispanic population, indicating that many babies born to Hispanic mothers may be more at risk for mortality. White mothers had the lowest rates of inadequate scores, indicating that most of their babies received enough care to make them healthier prior to birth.

Here the Hispanic health paradox manifests again; despite discrepancies in adequacy of prenatal care, Hispanic birth outcomes have consistently been similar to white birth outcomes in South Carolina over the past 10 years. Additionally, although rates of inadequate prenatal care are decreasing for all populations, they are not moving swiftly for the Hispanic population. It is possible that pregnant Hispanic mothers and their babies were being cared for in a different manner and outside of the structure of a standard “prenatal visit” with a doctor working in the United States healthcare system (Byrd et al., 1996). Advice and care from familial support systems could be sufficient input to know how to prepare the fetus and mother for birth and deliver a healthy baby.

It is also possible that Hispanic mothers face fewer complications during pregnancy that would make prenatal care essential to their baby's survival. This could be because Hispanic mothers smoke far less than any other ethnic/racial group in South Carolina (Table 8), or because rates of obesity are low for the Hispanic population compared to rates in the Black population of South Carolina (Table 9). It could also be because other community-based factors and expectations within Hispanic social networks improve the general health of Hispanic people in the United States and South Carolina (Scribner, 1996). Regardless of why, Hispanic mothers do not need adequate prenatal care to have birth outcomes equivalent to their white counterparts.

Healthy Habits and Lifestyles

Administering adequate prenatal care is especially important if the mother has unhealthy habits and lifestyles that could lead to complications during pregnancy, such as smoking during pregnancy and being obese during pregnancy. Unhealthy mothers are much more likely to give birth to unhealthy babies, especially if their babies are not closely monitored during pregnancy through things like prenatal care visits (Green, 2018).

It is likely that strong cultural support within the Hispanic communities in South Carolina discourages individuals within these social networks from

adopting unhealthy behaviors common within United States citizens such as smoking, drinking, and poor dietary practices during pregnancy (Bleakney, 2010). With fewer individuals participating in unhealthy behaviors (Tables 8 & 9), there are likely fewer instances of complications during pregnancy, making prenatal care intervention unnecessary.

Thus, it is unsurprising that Hispanic mothers, who have by far the lowest rate of mothers who smoke (at about 16/1000 compared to about 87/1000 white mothers and 50/1000 Black mothers, Table 8), and low rates of obesity (304/1000, Table 9) compared to Black mothers (459.3/1000, Table 9), also have very low rates of infant mortality compared to Black mothers under similar socioeconomic and education statuses. This indicates that mothers who practice healthy habits and have healthy lifestyles may not need prenatal care to achieve successful birth outcomes. Despite high levels of smoking, the white population of mothers can achieve low rates of infant mortality like their Hispanic counterparts, likely because of their adequate participation in prenatal care. Black mothers, who had high rates of obesity, high rates of smoking during pregnancy, and high rates of inadequate levels of prenatal care experience the highest rates of infant mortality in South Carolina. Hispanic mothers had low rates of obesity, smoking, and infant mortality. This correlation indicates that prenatal care is more necessary

for positive birth outcomes when pregnant mothers participate in unhealthy habits that increase likelihood of complications.

CONCLUSIONS & RECOMMENDATIONS

All people living in the Deep South experience barriers to accessing formal reproductive health care through the US healthcare system due to their histories of discrimination. Such is especially true for the economically disadvantaged racial and ethnic minorities in the region, but Hispanic mothers have seemed to find a way to maintain high birth rates and low infant mortality rates despite their limited access to high quality reproductive health care services. Hispanic mothers have the highest rates of education levels below high school, lowest rates of paying for their births with private health care insurance, and highest rates of inadequate prenatal care, all of which are factors that in theory limit successful birth outcomes. However, Hispanic mothers also have the lowest rates of smoking during pregnancy by far compared to their Black and white counterparts, and relatively low obesity rates as well, and participating in healthy behavioral choices such as these improve birth outcomes.

Literature based research indicates that this Hispanic Health Paradox of low access to quality resources paired with positive health outcomes is likely a result of the strong support systems present in Hispanic communities worldwide

(Roy et al., 2020). The care and assistance from family members and others within the community likely take the place of formal medicine, as these networks encourage healthy behaviors like avoiding smoking and obesity during pregnancy. Mothers of other racial and ethnic groups in South Carolina participate in these unhealthy behaviors at a much higher rate, and while white mothers are able to maintain a low infant mortality rate through their participation in frequent and high-quality prenatal visits with private health insurance and high education levels, Black mothers face high levels of adverse birth outcomes due to their lack of access to these resources. Hispanic mothers are facing similar levels of economic and social hardship and discrimination as Black mothers in South Carolina, but they are able to avoid high levels of infant mortality. While this study provides evidence that the Hispanic Health Paradox is very prevalent in maternal health, these explanations behind the paradox are still largely assumptions, and could be further explored in additional research.

One concern regarding the Hispanic Health Paradox is that its benefits decrease over generations as Hispanic families living in the US assimilate to local American cultures, adopting unhealthy habits and losing their large familial and community-based support systems (Scribner, 1996). With this in mind, it is likely that mothers of later generations of Hispanic immigrants will face a gap in their pregnancy support systems as they continue to face economic and social

barriers in accessing quality care US health care system while losing support from community networks.

Losing the benefits of the Hispanic Health Paradox will create a need within the community for accessible, affordable, high quality health care. Trends from this study show that Hispanic mothers are using public programs like Medicaid to pay for their pregnancies at an increasing rate. Medicaid providers should keep this trend in mind when developing their programs, and tailor services to the needs faced by the population of Hispanic mothers. Removing barriers like language differences, lack of cultural understanding by medical professionals and ethnic discrimination by providing support to migrant and Spanish speaking communities through culturally sensitive services provided by bilingual staff will be key to maintaining low infant mortality rates within the Hispanic populations in South Carolina as well as those all around the United States (Fryer et al., 2021).

Community based support systems have been shown to aid in creating favorable birth outcomes for participating mothers. Such has been indicated by the Hispanic Health Paradox, but other successful programs such as First Steps, Washington State's expanded Medicaid prenatal and post-partum care program, observed more favorable birth outcomes due to the increased psychosocial support offered through the program (Arima et al., 2009). Creating spaces where

groups of pregnant women can meet, be educated on healthy behaviors, learn how to access prenatal services, and be emotionally and financially supported during their pregnancy can be very beneficial to fetus, infant, and maternal health. These support systems can also help to make mothers more comfortable with their doctors and decrease the social distance between doctor and patient. Community support systems, combined with quality health care tailored to the needs of the Hispanic and other minority populations should improve infant mortality rates for the United States as a whole.

While Hispanic mothers experience high levels of economic and social hardships in the United States, they are still able to give birth to healthy babies at high rates nearly equal to that of their economically and socially privileged white counterparts. In order to maintain these successful health outcomes, it is essential that public healthcare providers tailor their services to minority populations and create systems of community support as the benefits of the Hispanic Health Paradox diminish over generations. While this study focuses mainly on South Carolina, doing so in all states throughout the Deep South and the whole United States will likely decrease the country's high rates of maternal and infant mortality, and advance the US in its global standing of infant and maternal health. Decreasing the social distance and biases that exist between

health care providers and minority populations is an essential step towards improving infant and maternal health throughout the United States.

APPENDIX

Table 1: Total Live Births in South Carolina by Population Race & Ethnicity

Year	White		Black		Hispanic		SC Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
2010	37,927	11.9	18,972	14.3	5,034	21.4	58,325	12.6
2011	37,406	11.6	18,487	13.8	4,826	19.6	57,338	12.3
2012	37,092	11.4	18,443	13.6	4,649	18.6	57,100	12.1
2013	37,177	11.3	18,087	13.3	4,360	17.1	56,743	11.9
2014	37,923	11.3	18,182	13.2	4,568	17.5	57,631	11.9
2015	38,459	11.3	18,045	13.0	4,852	18.1	58,135	11.9
2016	38,264	11.1	17,322	12.4	5,013	18.3	57,337	11.6
2017	37,601	10.8	17,651	12.5	5,102	17.8	57,030	11.4
2018	37,334	10.6	17,505	12.3	5,136	17.3	56,668	11.1
2019	37,434	10.5	17,770	12.4	5,593	18.2	57,044	11.1

Rates calculated per 1,000 births.

Table 2: Infant Mortality Rates in South Carolina by Race and Ethnicity

Year	White		Black		Hispanic		SC Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
2010	197	5.2	223	11.8	25	5.0	430	7.4
2011	182	4.9	233	12.6	24	5.0	423	7.4
2012	199	5.4	228	12.4	20	4.3	435	7.6
2013	192	5.2	194	10.7	20	4.6	389	6.9
2014	173	4.6	187	10.3	25	5.5	372	6.5
2015	186	4.8	212	11.7	23	4.7	405	7.0
2016	199	5.2	190	11.0	29	5.8	401	7.0
2017	182	4.8	177	10.0	26	5.1	371	6.5
2018	186	5.0	214	12.2	29	5.6	406	7.2
2019	161	4.3	217	12.2	28	5.0	391	6.9

Rates calculated per 1,000 births.

Table 3: Mom's Education Level: Less than High School

Year	White		Black		Hispanic		SC Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
2015	5,596	145.5	2,937	162.8	2,210	455.5	8,749	150.5
2016	5,495	143.6	2,478	143.1	2,265	451.8	8,167	142.4
2017	5,104	135.7	2,462	139.5	2,154	422.2	7,760	136.1
2018	4,849	129.9	2,308	131.8	1,947	379.1	7,356	129.8
2019	4,888	130.6	2,166	121.9	2,085	372.8	7,246	127.0

Rates per 1,000 live births from mothers with education level less than high school.

372.8 of each 1000 babies born to Hispanic mothers had mothers with an education level less than high school.

Table 4: Principal Method of Payment for the Delivery - Private

Year	White		Black		Hispanic		SC Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
2015	18,661	485.2	3,924	217.5	804	165.7	23,386.00	402.3
2016	19,290	504.1	4,052	233.9	932	185.9	24,283.00	423.5
2017	19,178	510.0	4,356	246.8	985	193.1	24,520.00	429.9
2018	18,965	508.0	4,500	257.1	1029	200.4	24,451.00	431.5
2019	19,092	510.0	4,690	263.9	1160	207.4	24,795.00	434.7

Rates per 1,000 live births paid for using private health insurance.

207.4 of each 1000 live births for Hispanic mothers were paid for using private insurance.

Table 5: Principal Method of Payment for the Delivery - Medicaid

Year	White		Black		Hispanic		SC Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
2015	15,751.00	409.6	13,216.00	732.4	2,730.00	562.7	29,560.00	508.5
2016	15,465.00	404.2	12,472.00	720.0	3,072.00	612.8	28,527.00	497.5
2017	15,049.00	400.2	12,609.00	714.4	3,208.00	628.8	28,251.00	495.4
2018	14,810.00	396.7	12,264.00	700.6	3,231.00	629.1	27,677.00	488.4
2019	14,748.00	394.0	12,249.00	689.3	3,487.00	623.5	27,596.00	483.8

Rates per 1,000 live births paid for using Medicaid.

623.5 of each 1000 live births for Hispanic mothers were paid for using Medicaid.

Table 6: Principal Method of Payment for the Delivery - Self-pay

Year	White		Black		Hispanic		SC Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
2015	1,854	48.2	378	20.9	962	198.3	2,342	40.3
2016	1,469	38.4	254	14.7	716	142.8	1,822	31.8
2017	1,350	35.9	197	11.2	618	121.1	1,626	28.5
2018	1,354	36.3	242	13.8	572	111.4	1,696	29.9
2019	1,462	39.1	242	13.6	647	115.7	1,798	31.5

Rates per 1,000 live births paid for using self-pay.

115.7 of each 1000 live births for Hispanic mothers were self-paid for.

Table 7: Inadequate Kotelchuck

Year	White		Black		Hispanic		SC Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
2015	6,515	169.4	4,467	247.5	1,509	311.0	11,346	195.2
2016	6,362	166.3	3,989	230.3	1,546	308.4	10,718	186.9
2017	5,893	156.7	3,829	216.9	1,499	293.8	10,074	176.6
2018	5,740	153.7	3,801	217.1	1,471	286.4	9,952	175.6
2019	5,514	147.3	3,483	196.0	1,532	273.9	9,376	164.4

Rates per 1,000 live births from mothers with inadequate prenatal care based on the Kotelchuck Index.

273.9 of each 1000 babies born to Hispanic mothers had inadequate prenatal care based on the Kotelchuck Index.

Table 8: Tobacco Use During Pregnancy

Year	White		Black		Hispanic		SC Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
2015	4,433	115.3	1,179	65.3	96	19.8	5,686	97.8
2016	4,099	107.1	1,065	61.5	101	20.1	5,223	91.1
2017	3,721	99.0	1,012	57.3	101	19.8	4,791	84.0
2018	3,615	96.8	972	55.5	111	21.6	4,646	82.0
2019	3,263	87.2	896	50.4	91	16.3	4,211	73.8

Rates per 1,000 live births from mothers using tobacco during pregnancy.

16.3 of each 1000 babies born to Hispanic mothers had mothers that used tobacco during pregnancy.

Table 9: Obesity Prior to the Pregnancy

Year	White		Black		Hispanic		SC Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
2015	9,238	240.2	7,416	411.0	1,260	259.7	16,906	290.8
2016	9,647	252.1	7,397	427.0	1,398	278.9	17,310	301.9
2017	9,856	262.1	7,651	433.5	1,427	279.7	17,830	312.6
2018	10,413	278.9	7,924	452.7	1,593	310.2	18,655	329.2
2019	10,691	285.6	8,162	459.3	1,700	304.0	19,172	336.1

Rates per 1,000 live births from mothers who were obese prior to their pregnancy.

304.0 of each 1000 babies born to Hispanic mothers have obese mothers.

BIBLIOGRAPHY

- Arima, Y., Guthrie, B. L., Rhew, I. C., & De Roos, A. J. (2009). The impact of the First Steps prenatal care program on birth outcomes among women receiving Medicaid in Washington State. *Health Policy*, 92(1), 49–54. <https://doi-org.pallas2.tcl.sc.edu/10.1016/j.healthpol.2009.02.004>
- Bleakney, C. A. (2010). Prenatal Care of Hispanic Mothers. Chancellor's Honors Program Projects. https://trace.tennessee.edu/utk_chanhonoproj/1376
- Byrd, T. L., Mullen, P. D., Selwyn, B. J., & Lorimor, R. (1996). Initiation of prenatal care by low-income Hispanic women in Houston. *Public health reports (Washington, D.C. : 1974)*, 111(6), 536–540. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1381903/>
- Chokshi, N. (2019, April 8). Map: The most religious states in America. *The Washington Post*. <https://www.washingtonpost.com/blogs/govbeat/wp/2015/02/18/map-the-most-religious-states-in-america/>
- Davis, S. L., Harmon, C. M., Baker Urquhart, B., Moore, B., & Sprague, R. (2020). Women and infants in the Deep South receiving perinatal and neonatal palliative and supportive care services. *Advances in Neonatal Care*, 20(3), 216–222. <https://doi.org/10.1097/anc.0000000000000706>
- Dubay, L., Hill, I., Garrett, B., Blavin, F., Johnston, E., Howell, E., Morgan, J., Courtot, B., Benatar, S., & Cross-Barnet, C. (2020). Improving birth outcomes and lowering costs for women on Medicaid: Impacts of 'strong start for mothers and newborns.' *Health Affairs*, 39(6), 1042–1050. <https://doi.org/10.1377/hlthaff.2019.01042>
- Ehrenthal, D. B., Kuo, H.-H. D., & Kirby, R. S. (2020). Infant mortality in rural and nonrural counties in the United States. *Pediatrics*, 146(5). <https://doi.org/10.1542/peds.2020-0464>
- Fryer, K., Lewis, G., Munoz, C., & Stuebe, A. M. (2021). Identifying barriers and facilitators to prenatal care for Spanish-speaking women. *North Carolina Medical Journal*, 82(1), 7–13. <https://doi.org/10.18043/ncm.82.1.7>
- Gadson, A., Akpovi, E., & Mehta, P. K. (2017). Exploring the social determinants of racial/ethnic disparities in prenatal care utilization and maternal outcome. *Seminars in Perinatology*, 41(5), 308–317. <https://doi.org/10.1053/j.semperi.2017.04.008>
- Green, T. L. (2018). Unpacking racial/ethnic disparities in prenatal care use: The role of individual-, household-, and area-level characteristics. *Journal of Women's Health*, 27(9), 1124–1134. <https://doi.org/10.1089/jwh.2017.6807>

- Hoefler, S. E., & Hoefler, R. (2017). Worth the wait? the consequences of abstinence-only sex education for marginalized students. *American Journal of Sexuality Education*, 12(3), 257–276. <https://doi.org/10.1080/15546128.2017.1359802>
- Infant mortality rate by country 2022. (2022). Retrieved March 24, 2022, from <https://worldpopulationreview.com/country-rankings/infant-mortality-rate-by-country>
- Mehra, R., Boyd, L. M., & Ickovics, J. R. (2017). Racial residential segregation and adverse birth outcomes: A systematic review and meta-analysis. *Social science & medicine* (1982), 191, 237–250. <https://doi.org/10.1016/j.socscimed.2017.09.018>
- Planned Parenthood. (2021a). Find A health center. Planned Parenthood. Retrieved September 29, 2021, from <https://www.plannedparenthood.org/health-center>.
- Planned Parenthood. (2021b). Sex education laws and state attacks. Planned Parenthood Action Fund. Retrieved September 29, 2021, from <https://www.plannedparenthoodaction.org/issues/sex-education/sex-education-laws-and-state-attacks>
- Roy, S. B., Olsen, R. N., & Tseng, H. (2020). Do Hispanic immigrants spend less on medical care? implications of the hispanic health paradox. *Applied Economics*, 52(36), 3951–3964. <https://doi.org/10.1080/00036846.2020.1726863>
- South Carolina Department of Health and Environmental Control. (2021). Definitions. SCAN Birth Certificate Data. Retrieved September 29, 2021, from https://apps.dhec.sc.gov/Health/SCAN_BDP/defn/birthtabledefn.aspx.
- Scribner R. (1996). Paradox as paradigm--the health outcomes of Mexican Americans. *American journal of public health*, 86(3), 303–305. <https://doi.org/10.2105/ajph.86.3.303>
- Smedley, B. D., Stith, A. Y., & Nelson, A. R. (2003). *Unequal treatment: Confronting racial and ethnic disparities in health care*. National Academy Press. [10.17226/12875](https://doi.org/10.17226/12875)
- Srikanthan, A., & Reid, R. L. (2008). Religious and cultural influences on contraception. *Journal of Obstetrics and Gynaecology Canada*, 30(2), 129–137. [https://doi.org/10.1016/s1701-2163\(16\)32736-0](https://doi.org/10.1016/s1701-2163(16)32736-0)
- The World Bank. (2019). Mortality rate, infant (per 1,000 live births). Data. Retrieved December 12, 2021, from https://data.worldbank.org/indicator/SP.DYN.IMRT.IN?most_recent_value_desc=false
- U.S. Census Bureau. (2021, July). U.S. Census Bureau QuickFacts: South Carolina. South Carolina. Retrieved December 23, 2021, from <https://www.census.gov/quickfacts/fact/table/SC/PST045219>

- Varney, S. (2021, August 2). Long drives, costly flights, and wearying waits: What abortion requires in the South. NPR. Retrieved September 24, 2021, from <https://www.npr.org/sections/health-shots/2021/08/02/1022860226/long-drives-costly-flights-and-wearying-waits-what-abortion-requires-in-the-south>
- Vásquez, I., & McMahon, F. (2020). The Human Freedom Index. The Cato Institute. Retrieved September 24, 2021, from <https://www.fraserinstitute.org/sites/default/files/human-freedom-index-2020.pdf>
- Wallace, M., Crear-Perry, J., Richardson, L., Tarver, M., & Theall, K. (2017). Separate and unequal: Structural racism and infant mortality in the US. *Health & Place*, 45, 140–144. <https://doi.org/10.1016/j.healthplace.2017.03.012>
- World Health Organization. (2018). Infant mortality. World Health Organization. Retrieved September 24, 2021, from <https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/infant-mortality#:~:text=Globally%2C%20the%20infant%20mortality%20rate,to%204.0%20million%20in%202018>