

Improving Birth Outcomes in North Carolina

Bridging the gap between education and public health stakeholders in the state to make lasting improvements in children's lives

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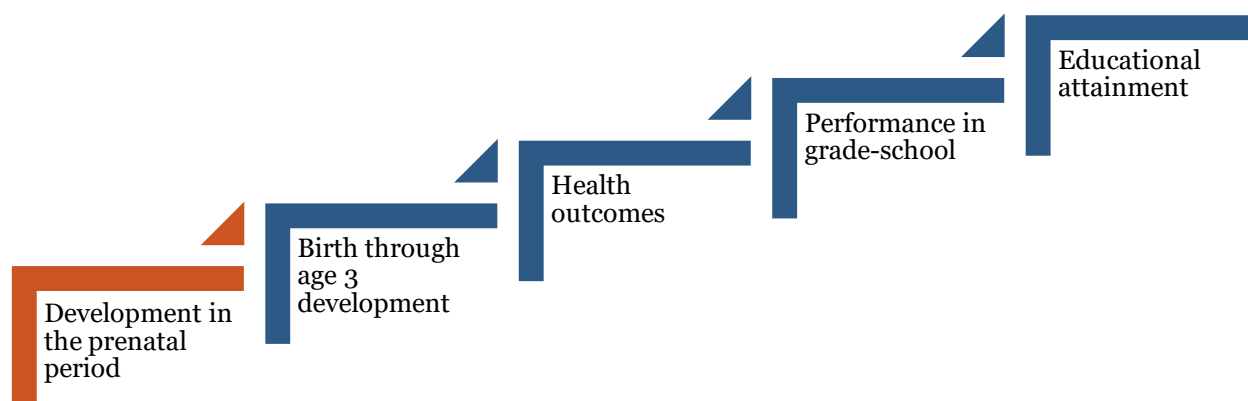
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Executive Summary

Birth outcomes for children are the foundational building block for life after birth. Adverse birth outcomes influence a child's development immediately after birth, and their health outcomes throughout their lives. Health and educational outcomes are closely linked, as health problems affect a child's ability to attend school and their ability to learn.



Adverse birth outcomes are oftentimes preventable. Yet, preterm births and low birthweight are extremely common in North Carolina. These factors are two of the leading causes of infant mortality in the United States, and in North Carolina there is a large racial disparity in the rate of infant deaths between Black and White babies.

This study aimed to address the racial disparity in infant mortality in North Carolina to promote a more equitable place for birth outcomes for all mothers and improve outcomes for children born into the state. The policy questions that drove this study include: **What has been done among education stakeholders in North Carolina to reduce the racial disparity in infant mortality? How can education stakeholders in North Carolina work towards reducing the racial disparity in infant mortality across the state?**

Addressing these policy questions first involved a thorough program search and stakeholder analysis among education-oriented entities in North Carolina to understand their efforts around decreasing the gap in birth outcomes by race. A case study analysis was then conducted to learn from states that have better birth outcomes than North Carolina. California and Massachusetts were selected for the case study analysis based on preterm birth data and the preterm birth disparity ratio in each state. The final stage of the research process included a program search and stakeholder analysis among public health stakeholders in North Carolina working on this issue. The purpose of this process was to gain insight into broader work on improving birth outcomes in the state and provide education stakeholders with an overview of this work moving forward.

The education stakeholders in North Carolina that are working to address racial disparities in infant mortality are focused on advancing access to prenatal care by closing the health insurance gap. While access to prenatal care is important, much more is needed to meaningfully combat this disparity. Prenatal care alone does not address the root cause of the racial disparities in birth outcomes in this country. Various studies have shown that even after accounting for external factors such as poverty status, neighborhood, and educational attainment, Black women and their babies still have worse outcomes. Without addressing the connection between racism and adverse birth outcomes, racial birth disparities will continue to exist.

In California and Massachusetts, the efforts to decrease racial disparities in infant mortality revolve around tackling the root causes of racial birth disparities. Both states highlight the importance of cultural sensitivity in prenatal care, providing continuous support for mothers during the prenatal period and after giving birth, and the importance of addressing the social determinants of health to improve birth outcomes. Public health organizations and advocacy groups have primarily led this work in both states. This report includes a deep dive into two organizations in California and two organizations in Massachusetts that informed the recommendations included in this report.

In order to meaningfully improve birth outcomes for children in the state, particularly for Black babies, recommendations for my client, the North Carolina Public Education Task Force (NCPETF), to take include:

1. Establishing a partnership with the North Carolina Early Childhood Action Council (NC ECAC) to discuss the insights included in this report and coordinating ongoing efforts to decrease racial birth disparities.
2. Forming a multi-sector partnership between education and public health stakeholders and advocacy groups in the state to address adverse birth outcomes.
3. Extending goals for reducing the racial disparity in birth outcomes beyond prenatal care.

Recommendations that require legislative change in North Carolina to improve birth outcomes in the state include:

1. Providing doula support to Medicaid beneficiaries.
2. Addressing systemic racism in healthcare.

Across all recommendations, improvements need to be targeted at the county or local level in order to address the communities with the largest racial birth disparities. In order to combat adverse birth outcomes, public health and education stakeholders invested in improving childhood outcomes need to work together.

1. Introduction

A child’s health status and educational outcomes are linked. Children who have health problems are more likely to be chronically absent from school, which may negatively impact educational attainment throughout a child’s life.¹ Stakeholders in the K-12 education space tend to focus on improving outcomes for children leading up to school-age and beyond. However, interventions are needed earlier on in a child’s life to make lasting improvements in children’s lives – starting in the period before birth.

The link between birth outcomes and educational attainment

Events that take place in early childhood have long-term impacts throughout one’s life course. The prenatal period through age 3 is one of the most sensitive times in a child’s life, affecting future learning, behavior, and health outcomes as a child’s brain rapidly develops during this time.²

Trauma that children and families face during pregnancy have lifelong impacts.³ Adverse birth outcomes impact children’s educational attainment.

“The first few years of life, however, represent a particularly sensitive period in the process of development, a period of tremendous opportunity as well as vulnerability. Starting in the prenatal period and continuing until kindergarten entry, children progress through various developmental milestones associated with healthy development that have implications for cognitive functioning; behavioral, social, and self-regulatory capacities; and physical health. Subsequent developments build upon these early capacities, so they provide an important foundation for future success in school and beyond.”

Source: Lynn A. Karoly, M. Rebecca Kilburn, and Jill S. Cannon, *Early Childhood Interventions: Proven Results, Future Promise* (Santa Monica, CA: Rand, 2005).

¹ Robert Wood Johnson Foundation, “The Relationship Between School Attendance and Health,” September 2016, <https://www.rwjf.org/en/library/research/2016/09/the-relationship-between-school-attendance-and-health.html>.

² Committee on Applying Neurobiological and Socio-Behavioral Sciences from Prenatal Through Early Childhood Development: A Health Equity Approach et al., *Vibrant and Healthy Kids: Aligning Science, Practice, and Policy to Advance Health Equity*, ed. Jennifer E. DeVoe, Amy Geller, and Yamrot Negussie (Washington, D.C.: National Academies Press, 2019), <https://doi.org/10.17226/25466>.

³ Prenatal-to-3 Policy Impact Center, “Why Do We Focus on the Prenatal-to-3 Age Period? Understanding the Importance of the Earliest Years,” January 2021, https://pn3policy.org/wp-content/uploads/2020/12/PN3PolicyImpactCenter_BO01202101_WhyFocusonPN3.pdf.

Adverse birth outcomes include premature birth (born before the 37th week of pregnancy), which is linked with an increased likelihood of low birthweight. Low birthweight is associated with a number of health conditions, starting with breathing difficulties early in life to the development of chronic diseases later in life.⁴

A recent study conducted by Carrie Townley Flores, Dr. Amy Gernstein, Dr. Ciaran S. Phibbs, and Dr. Lee M. Sanders from Stanford University found that children born between 32 and 36 weeks were associated with increased risk of low performance in mathematics and English language arts, and were impacted by chronic absenteeism and school suspension.⁵ Commonly referred to as a “negative cascade,” adverse birth outcomes can lead to chronic health conditions as children grow up, further impacting children’s ability to attend school and perform well academically.

A child’s health status at birth is critical for their growth and development later in life. Healy babies at birth have a basis for healthy development and growth. Yet, there are large racial disparities in birth outcomes in the United States. Nationally, Black infants have higher rates of preterm births, low birthweight, and infant mortality compared to White and Hispanic babies.⁶ As education entities in North Carolina seek to improve educational outcomes in a racially equitable way, the prenatal period is an important area of focus – starting with decreasing the infant mortality rate (IMR) in North Carolina.

North Carolina has a large gap in infant mortality by race and ethnicity

The IMR is the number of infant deaths per 1,000 live births.⁷ The IMR is an important indicator of the health and well-being of children.⁸ In the United States, this statistic provides insight into racial health disparities across the country. In 2018, North Carolina had the 13th highest IMR in the United States.⁹ A key driver of the IMR in North Carolina has been the large disparities in mortality rates by race and ethnicity. The IMR for

⁴ Neal Halfon and Miles Hochstein, “Life Course Health Development: An Integrated Framework for Developing Health, Policy, and Research,” *Milbank Quarterly* 80, no. 3 (September 2002): 433–79, <https://doi.org/10.1111/1468-0009.00019>.

⁵ Carrie Townley Flores et al., “Short-Term and Long-Term Educational Outcomes of Infants Born Moderately and Late Preterm,” *The Journal of Pediatrics*, January 2021, S0022347620315808, <https://doi.org/10.1016/j.jpeds.2020.12.070>.

⁶ Kim Keating, Patricia Cole, and Mollyrose Schaffner, “State of Babies Yearbook: 2020” (ZERO TO THREE, June 2020), <https://stateofbabies.org/wp-content/uploads/2020/06/State-of-Babies-2020-Overview-061820.pdf>.

⁷ Centers for Disease Control and Prevention (CDC), “Infant Mortality,” Reproductive Health, September 10, 2020, <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm>.

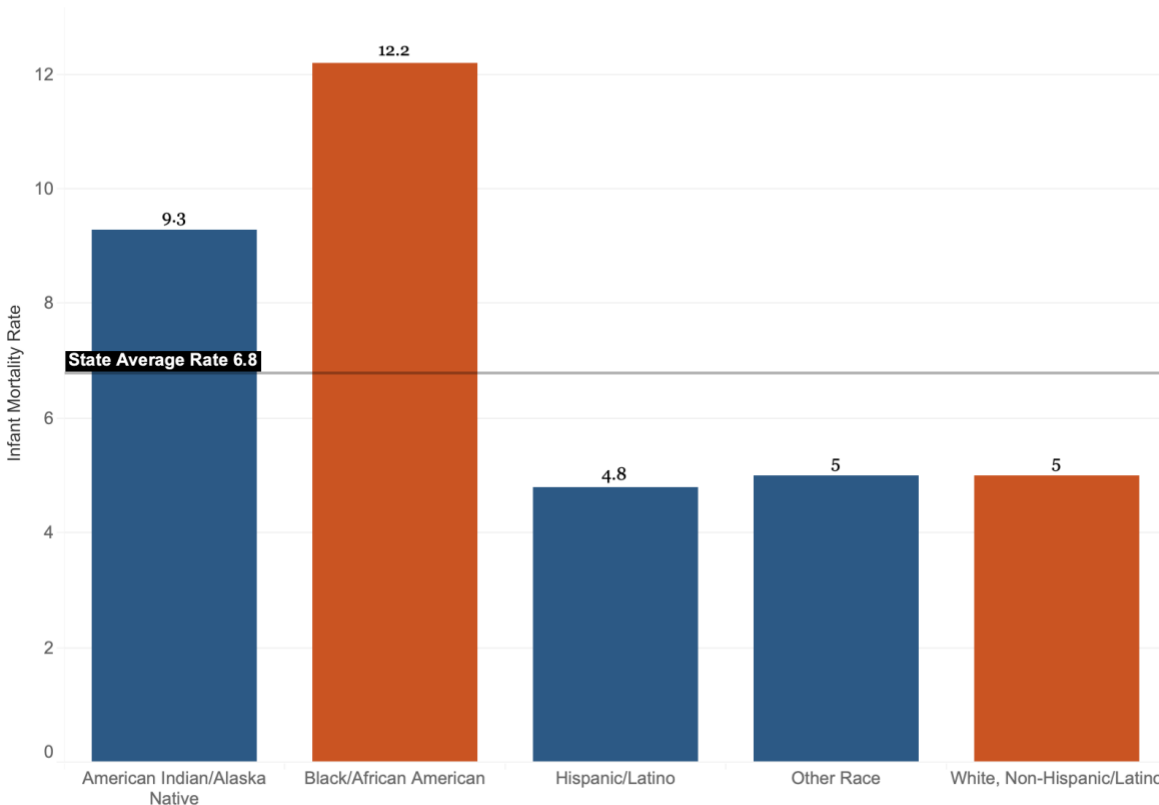
⁸ Association of Maternal & Child health Programs, “State Infant Mortality Toolkit,” n.d., <http://www.amchp.org/programsandtopics/data-assessment/InfantMortalityToolkit/Documents/Why%20Focus%20on%20IM.pdf>.

⁹ Centers for Disease Control and Prevention, “Stats of the States - Infant Mortality,” March 12, 2021, https://www.cdc.gov/nchs/pressroom/sosmap/infant_mortality_rates/infant_mortality.htm.

Black/African American babies is more than double the rate for White, Non-Hispanic babies, as shown in Figure 1 below.¹⁰

Figure 1. Infant Mortality Rates in North Carolina

The infant mortality rate for Black/African American babies is more than 2x the rate for White, Non-Hispanic babies and just under 2x the state average rate.



Source: NC Department of Health and Human Services (NCDHHS), “2018 Infant Mortality Statistics for North Carolina: Table 1,” October 21, 2019, <https://schs.dph.ncdhhs.gov/data/vital/ims/2018/#>.

Within North Carolina, county level data demonstrates the drastic differences in outcomes depending on where children live in the state. An important metric to review at the county level is the IMR disparity ratio. As defined by the Kids Count Data Center, the “Infant mortality rate disparity is the ratio of the Black infant mortality rate compared to the White infant mortality rate. For example, a value of 2.0 means that the Black babies are dying at twice the rate of White babies.”¹¹ In 2018, North Carolina’s average IMR

¹⁰ NC Department of Health and Human Services (NCDHHS), “2018 Infant Mortality Statistics for North Carolina: Table 1,” October 21, 2019, <https://schs.dph.ncdhhs.gov/data/vital/ims/2018/#>.

¹¹ Kids Count Data Center, “Infant Mortality Rate Disparity - Black vs. White,” accessed March 17, 2021, <https://datacenter.kidscount.org/data/tables/4514-infant-mortality-rate-disparity--black-vs-white>.

disparity rate was 2.44, meaning Black babies are dying on average at over twice the rate of White babies in the state.¹²

County-level IMR disparity ratios provide an insight into differences in birth outcomes at a more localized level. Of the 100 counties in North Carolina, 36 counties have a large enough sample size in infant deaths to allow for comparisons in the disparity ratio across counties. (Note: The remaining 64 counties have a small number of infant deaths when the data is disaggregated by race and ethnicity. As such, they cannot meaningfully be compared with counties that have more than 10 infant deaths using disaggregated data. The counties with a small number of infant deaths are located in the more rural areas of the state.) Of the 36 counties with a large enough sample size for comparison, all 36 counties have a disparity ratio, meaning Black babies are dying at a higher rate than White babies in each county. Additionally, 17 of the 36 counties have a disparity ratio that is above the state average of 2.44. See Figure 4 in Appendix 1 for a state map that displays a geographic breakdown of counties in North Carolina and their corresponding disparity ratio.

Targeting interventions for mothers to improve birth outcomes

A baby's health at birth is impacted by its mother's health. As such, improving birth outcomes for babies during the prenatal period involves providing interventions for their mothers to improve birth outcomes. One important preventative health measure is ensuring mothers have access to prenatal care services. Access to timely prenatal care, initiated during the first trimester, can help reduce the risk of complications in pregnancy and help monitor the health status of mothers and their babies during prenatal development.¹³ However, even with access to timely prenatal care, Black women and their babies are still more likely to have adverse birth outcomes compared to their White counterparts. Additionally, there are racial disparities in access prenatal care services – Black, American Indian/Alaska Native, and Hispanic mothers are more likely than White mothers to receive late or no prenatal care.¹⁴

Prenatal care alone does not address the root cause of the racial disparities in birth outcomes in this country. Various studies have shown that even after accounting for external factors such as poverty status, neighborhood, and educational attainment, Black

¹² NC Department of Health and Human Services (NCDHHS), "2018 Infant Mortality Statistics for North Carolina: Table 3b," October 21, 2019, <https://schs.dph.ncdhhs.gov/data/vital/ims/2018/>.

¹³ National Institutes of Health, "What Is Prenatal Care and Why Is It Important?," <https://www.nichd.nih.gov/>, January 31, 2017, <https://www.nichd.nih.gov/health/topics/pregnancy/conditioninfo/prenatal-care>.

¹⁴ Joyce A. Martin et al., "Births: Final Data for 2018," *National Vital Statistics Reports* 68, no. 13 (November 27, 2019): 47.

women and their babies still have worse outcomes.¹⁵ Experiences of discrimination and racialized stress impact Black women in a myriad of ways. These experiences impact not only their health throughout their life course, but also their birth outcomes.¹⁶ Experiences of discrimination and racism during interactions with healthcare workers can lead to delayed prenatal care as well as heightened levels of stress during interactions with healthcare workers.¹⁷ Racism plays a significant role in birth outcomes; targeted interventions for Black mothers are essential to improve the health and well-being of Black babies. Additionally, the social determinants of health impact health disparities in birth – impacting the social and physical environments that individuals have access to and engage in.¹⁸

This study aimed to address the racial disparity in infant mortality in North Carolina to promote a more equitable place for birth outcomes for all mothers and improve outcomes for children born into the state. The research questions that drove this study include: **What has been done among education stakeholders in North Carolina to reduce the racial disparity in infant mortality? How can education stakeholders in North Carolina work towards reducing the racial disparity in infant mortality across the state?**

¹⁵ Kim Keating, Patricia Cole, and Mollyrose Schaffner, “State of Babies Yearbook: 2020” (ZERO TO THREE, June 2020), <https://stateofbabies.org/wp-content/uploads/2020/06/State-of-Babies-2020-Overview-061820.pdf>.

¹⁶ Imari Z. Smith et al., “Fighting at Birth: Eradicating the Black-White Infant Mortality Gap,” March 2018, <https://socialequity.duke.edu/wp-content/uploads/2019/12/Eradicating-Black-Infant-Mortality-March-2018.pdf>.

¹⁷ Jaime C. Slaughter-Acey et al., “Skin Tone Matters: Racial Microaggressions and Delayed Prenatal Care,” *American Journal of Preventive Medicine* 57, no. 3 (September 2019): 321–29, <https://doi.org/10.1016/j.amepre.2019.04.014>.

¹⁸ Brian L. Cole and Jonathan E. Fielding, “Health Impact Assessment: A Tool to Help Policy Makers Understand Health Beyond Health Care,” *Annual Review of Public Health* 28, no. 1 (April 2007): 393–412, <https://doi.org/10.1146/annurev.publhealth.28.083006.131942>.

2. The landscape among education stakeholders working to improve birth outcomes across North Carolina

As made evident in Section 1 of this report, birth outcomes and the health of babies at birth are important for children’s education. This link has become more apparent in North Carolina as early childhood groups have begun to incorporate improving birth outcomes in their work. While the organizations in this section are connected to the North Carolina Department of Health and Human Services (NCDHHS), they are education focused and have worked separately from public health efforts across the state with the same goal.

The North Carolina Early Childhood Action Council

The primary stakeholder working to improve outcomes for children in the prenatal period through educational attainment in 3rd grade is the North Carolina Early Childhood Action Council (NC ECAC). In August 2018, Governor Cooper signed Executive Order 49 to re-establish the North Carolina Early Childhood Advisory Council.¹⁹ The council worked in collaboration with NCDHHS and 350 stakeholders around the state to develop benchmarks for North Carolina to achieve by 2025.²⁰ Their efforts culminated in the creation of the North Carolina Early Childhood Action Plan (NC ECAP), released in February 2019. Moving forward, the NC ECAC’s role is to hold the state accountable in reaching the targets outlined in the NC ECAP.

The NC ECAP has targets to improve outcomes for children birth to age 8, ranging from the importance of widespread prenatal services to services that promote reading at grade level for elementary school students by 2025. The first goal of the NC ECAP is “babies across North Carolina from all backgrounds will have a healthy start in their first year of life.”²¹ This goal has a statewide target to decrease the infant mortality disparity ratio from 2.5 to 1.92 by 2025. The document indicates that in order to achieve this target, closing the insurance coverage gap and increasing access to healthcare providers is essential.

¹⁹ Governor Roy Cooper, “Executive Order NO. 49: Develop an Action Plan to Improve Early Childhood Outcomes,” August 28, 2018, <https://files.nc.gov/governor/documents/files/EO49%20-%20DEVELOP%20AN%20ACTION%20PLAN%20TO%20IMPROVE%20EARLY%20CHILDHOOD%20OUTCOMES.pdf>.

²⁰ NC Department of Health and Human Services (NCDHHS), “Early Childhood Action Plan,” accessed March 17, 2021, <https://www.ncdhhs.gov/about/department-initiatives/early-childhood/early-childhood-action-plan>.

²¹ The North Carolina Early Childhood Action Council, “NC Early Childhood Action Plan,” February 2019, <https://files.nc.gov/ncdhhs/ECAP-Report-FINAL-WEB-f.pdf>.

Anecdotal evidence from an interview with a council member uncovered the NC ECAC wants to move towards decreasing racial disparities in infant mortality in North Carolina as the foundation for improving outcomes for all children in the state. Yet, while the council included a target for decreasing the racial disparity, actionable steps have not been identified on how to decrease this disparity in practice. A close review of meeting minutes and documents from council meetings leading up to the creation of the NC ECAP indicated there were discussions of the impact of racism on birth outcomes. In developing the plan, there were presentations and conversations on how to reduce the infant mortality disparity ratio, the impact of racism in daily life that leads to stressors that negatively affect Black mother's health, and the impact of microaggressions in healthcare settings that have led to delayed prenatal care for Black mothers. However, the NC ECAP falls short in indicating how to reduce racial disparities in birth outcomes, focusing solely on access to prenatal care as a measure to move the state forward.

Other North Carolina education stakeholders

The NC ECAC is partnered with five other initiatives in the state focused on improving early childhood outcomes. Partners include: 1) the Commission on Access to Sound Basic Education, 2) the B-3 Interagency Council, 3) the Child Well-Being Transformation Council, 4) My Future NC Commission, and 5) NC Pathways to Grade-Level Reading. A separate search on education-focused organizations that work in the early childhood space and are looking to improve birth health outcomes for babies in North Carolina led me to this same list of stakeholders. A website and document review for each of these initiatives indicated that four of the five organizations have a focus on either after birth outcomes, such as through well-child visiting programs, or health outreach for children as they enter school. As they are not focused on the prenatal period, a detailed analysis of the work of each of these groups is not included in this report as it is out of the scope of this study.

The fifth initiative, NC Pathways to Grade-Reading Level, is a program under the North Carolina Early Childhood Foundation.²² This initiative aims to promote literacy and grade-level reading for children across North Carolina by 3rd grade. They have identified various measures from birth to age eight that are points of intervention to reach this goal – starting with promoting health and development for children at birth. NC Pathways identified the following five measures of success for the health and development of children at birth: healthy birth weight, physical health, social emotional health, oral health, and early intervention. The measure most relevant to this report is healthy birth weight, indicating “children who are born at a low birthweight are at higher risk for long-

²² “Pathways to Grade-Level Reading,” North Carolina Early Childhood Foundation, February 17, 2018, <https://buildthefoundation.org/initiative/pathways-to-grade-level-reading/>.

term illness or disability and more likely to be enrolled in special education classes or to repeat a grade.”²³ However, similar to the NC ECAC, NC Pathways has identified increasing access to health insurance and prenatal care and the pathways to promote healthy birth outcomes and does not go further to explore racial disparities in birth outcomes. Without targeted improvements to target racial disparities in birth outcomes, the gap will continue to grow in North Carolina.

²³ “Shared Measures of Success to Put North Carolina’s Children on a Pathway to Grade-Level Reading,” North Carolina Early Childhood Foundation, March 2018, https://buildthefoundation.org/wp-content/uploads/2018/03/Measures-of-Success-Framework_FINAL.pdf.

3. Methods

To answer my policy questions, I utilized a mixed-methods research design. The first question involved a thorough program search and stakeholder analysis among education-oriented entities in North Carolina to understand their efforts around decreasing the gap in birth outcomes by race. The second question involved documenting lessons learned around decreasing infant mortality, with an emphasis on decreasing racial disparities, in other states that North Carolina can use as a model. As this project evolved, I included an additional program search and stakeholder analysis outside of education-oriented entities in North Carolina working on this issue. This additional layer of the research process informed the recommendations at the end of this report.

Case study site selection

According to the CDC, the leading causes of infant mortality in 2018 were birth defects, preterm birth and low birthweight, maternal pregnancy complications, sudden infant death syndrome, and injuries.²⁴ Preterm birth and low birthweight are often associated with one another. More often, preterm birth babies have low birthweights, yet low birthweight does not always mean the infant was born preterm. As such, I selected the measure of preterm birth weight to assess which states to use for the case study analysis.

I used two measures to select states for the case study site selection — a prematurity grade and a disparity ratio. A prematurity grade is scored based on the preterm birth rate in each state. Scores range from an A (meaning the state has a preterm birth rate of “less than or equal to 7.7 percent”) to an F (a “preterm birth rate greater than or equal to 11.5 percent”). The second measure, a disparity ratio, compares preterm birth rates by race and ethnicity. A disparity ratio of 1 would indicate that there is no disparity between groups.

The measures I used in my analysis were compiled by March of Dimes. March of Dimes, a national non-profit organization founded in the 1930s, is a leading non-profit that promotes the health and safety of mothers and babies.²⁵ The organization has conducted extensive research on maternal and infant health data. One data tool March of Dimes provides is a prenatal report card using natality data from the National Center for Health Statistics. Preterm birth rates are used to create the prematurity grade and the disparity ratio.

²⁴ Centers for Disease Control and Prevention (CDC), “Infant Mortality,” Reproductive Health, September 10, 2020, <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm>.

²⁵ “About Us,” March of Dimes, accessed March 17, 2021, <https://www.marchofdimes.org/mission/about-us.aspx>.

I pulled the preterm birth weight, prematurity grade, and disparity ratio for every state based on data from 2018. I then sorted the data by preterm birth rate, filtered for states with preterm birth rates of 8.9 percent and below (a B and above), and removed states that did not have a full representation of racial and ethnic categories in their disparity ratio.²⁶ The eight states with the best preterm birth outcomes are included in Table 1. (Note: 2019 birth data has been released since starting this project. I reviewed the updated data and as each state has had minimal changes, if any, to their preterm birth rates, I did not need to update my methodology.)

As I narrowed my focus to two states, based on the number of interviews that were feasible to complete for the scope of this study, it was important to select two that are geographically different and whose populations have racial and ethnic diversity. After comparing American Community Survey data to review the percent of the population that is Black and Hispanic in each state, I selected California and Massachusetts to use for my case study analysis.

Table 1. Preterm birth statistics among the states with the best outcomes

State	Preterm Birth Rate	Prematurity Grade	Preterm Birth Disparity Ratio
Oregon	7.8%	A-	1.18
Washington	8.3%	B+	1.28
New Hampshire	8.3%	B+	N/A
Vermont	8.5%	B+	N/A
Maine	8.6%	B	N/A
California	8.8%	B	1.28
Massachusetts	8.9%	B	1.19
Minnesota	8.9%	B	1.24

Source: Source: March of Dimes, “PeriStats,” Retrieved March 17, 2021, from <https://www.marchofdimes.org/peristats/Peristats.aspx>.

Literature reviews, stakeholder analyses, and qualitative interviews

Through this process, I reviewed literature on reducing infant mortality with an emphasis on reducing the racial disparity in infant mortality. This literature review led to an understanding of past and current efforts to reduce infant mortality across the United States, and within the three states of focus for this study. The literature search enabled

²⁶ New Hampshire, Vermont, and Maine have incomplete data for the preterm birth disparity ratios, as not all races/ethnicities were included to compute the ratio.

me to gain an understanding of practices that are effective as well as programs that have enhanced their efforts around this work.

In each state, I documented the key stakeholders around decreasing the IMR. Due to the scope of this study, I had the capacity to interview six stakeholders. Two stakeholders were identified in each state – from North Carolina, California, and Massachusetts – based on gaps in the information I found online and to allow for a deeper dive into program processes. All interviews were semi-structured, and interview questions were tailored for each interviewee. Interviews were conducted for 30-minutes to 1-hour via Zoom. Interviews were recorded, stored in a secure location, and transcribed via Otter.ai.

Prior to starting the interview process, I developed a deductive codebook of themes based on findings from the literature analysis and program reviews. Interviews were coded using NVivo, a qualitative data analysis computer software that Duke provides to students for free. I chose this software based on experience I have with previous qualitative work. Interview findings informed the recommendations included in this report. A list of interview respondents are included in Appendix 2.

4. Insights from California and Massachusetts

The narrative behind decreasing racial disparities in infant mortality in California and Massachusetts revolves around dismantling the blame on mothers and tackling the root cause of racial birth disparities. Both states highlight the importance of cultural sensitivity in prenatal care, providing continuous support for mothers during the prenatal period and after giving birth, addressing social determinants of health, and the importance of addressing racism to improve birth outcomes. Organizations that are focused on public health have primarily led this work in both states.

California

Overall, California has worked to steadily decrease the state-level IMR, with the California Department of Public Health leading initiatives on early access to prenatal education and health care, breastfeeding initiatives, and enhanced nutritional programs geared towards pregnant women and infants.²⁷ A public health initiative in the state, Let's Get Healthy California, has worked to track the state's progress in this area. Baseline data indicates the IMR for California in 2010 was 4.9.²⁸ While the state saw decreases in the IMR through 2017, down to a rate of 4.2, the IMR has remained stagnant at 4.2 with the most recent IMR data due to the racial disparities.²⁹

The racial disparities in IMR have become an enhanced area of focus as state leaders work to further decrease the IMR. Recent efforts in the state have focused on improving the tracking and transparency of IMR and maternal mortality data, addressing healthcare provider biases, and addressing health disparities through doula care. Efforts across the state are targeted at the county and community level where the disparities are the largest. While the IMR is largest for the American Indian/Native American population in California, addressing health disparities for this population has been a challenge due to lack of data and data misclassification.³⁰ Additionally, as the Black population is much larger than the American Indian/Native American population in California, the focus has

²⁷ Fran Kritz, "California's Infant Mortality Rate Reaches Record Low," *California Health Report*, January 14, 2014, <https://www.calhealthreport.org/2014/01/14/californias-infant-mortality-rate-reaches-record-low/>.

²⁸ Latesa Slone, "Reducing Infant Mortality," Let's Get Healthy California, accessed March 17, 2021, <https://letsgethealthy.ca.gov/goals/healthy-beginnings/reducing-infant-mortality/>.

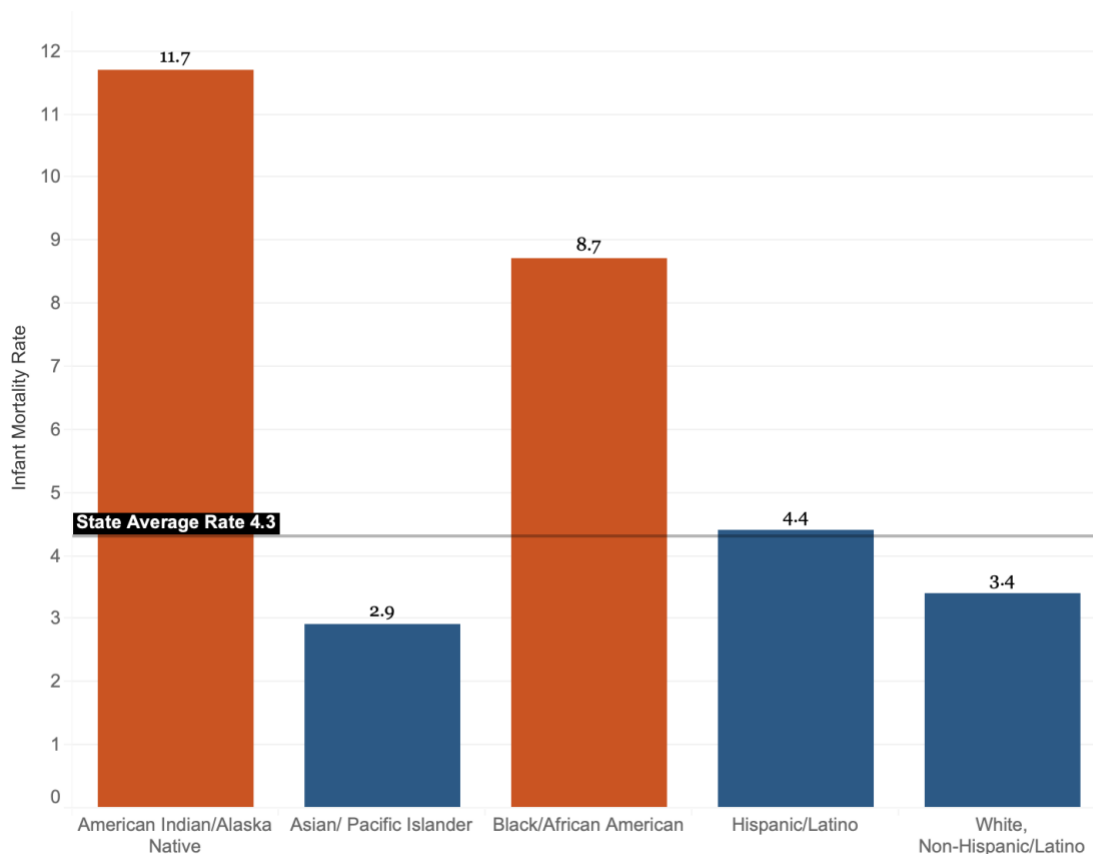
²⁹ Centers for Disease Control and Prevention, "Stats of the States - Infant Mortality," March 12, 2021, https://www.cdc.gov/nchs/pressroom/sosmap/infant_mortality_rates/infant_mortality.htm.

³⁰ Lucy Truschel and Cristina Novoa, "American Indian and Alaska Native Maternal and Infant Mortality: Challenges and Opportunities," Center for American Progress, July 9, 2018, <https://www.americanprogress.org/issues/early-childhood/news/2018/07/09/451344/american-indian-alaska-native-maternal-infant-mortality-challenges-opportunities/>.

been to decrease birth disparities for the Black population. The most recent infant mortality rates in California by race and ethnicity are included in Figure 2 below.

Figure 2. Infant Mortality Rates in California.

The infant mortality rates for the American Indian/Alaska Native and Black population were the largest for data from 2015-2017.



Source: National Center for Health Statistics, period linked birth/infant death data. Retrieved March 17, 2021, from www.marchofdimes.org/peristats.

My research and interviews in California yielded information on data collection efforts, doula programs, and implicit bias trainings in hospital settings. These efforts have taken place at the state level, through implementing legislation, and at the regional and county level through coordinated stakeholder efforts.

In 2019, California lawmakers passed Senate Bill 464, the California Dignity in Pregnancy and Childbirth Act.³¹ The purpose of this bill was to reduce pregnancy-related deaths among Black women and babies. Now that it has been signed into law, the legislation

³¹ Senator Holly Mitchell, “California Dignity in Pregnancy and Childbirth Act,” Senate Bill No. 464 (2019), https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201920200SB464.

enhances tracking of data on maternal mortality rates and requires implicit bias training for perinatal healthcare providers.

Data tracking and transparency alone will not rectify the racial disparity in adverse birth outcomes.³² However, it is an important starting point for accountability and taking action. The California Perinatal Quality Care Collaborative (CPQCC) has tracked perinatal data for over two decades, and has an extensive database tracking hospital data across the state.³³ CPQCC has been attributed to helping California reduce infant mortality, as their initiatives have enabled healthcare providers to better recognize preeclampsia. Preeclampsia is a complication in pregnancy that can lead to serious, and fatal, complications, yet is preventable. Black women have the highest risk of developing preeclampsia.³⁴ One of the first collaboratives of its kind, others states have developed quality care initiatives using the CPQCC as an example. With the passage of the California Dignity in Pregnancy and Childbirth Act, data tracking and transparency occur state-wide.

California has also explored using doula services to decrease birth health disparities, particularly among Medi-Cal beneficiaries in the state. Reducing health disparities for Medi-Cal beneficiaries has become an enhanced area of focus, as this group has been found to have less say in their birthing experience, worsening their birth outcomes.³⁵ Doula care in the prenatal period is linked to better birth outcomes, namely by decreasing the incidence of cesarean deliveries, preterm birth, and low birthweight.^{36,37} Doulas also provide a continuum of care for mothers, not only providing support during the prenatal period but in the postpartum period as well. Benefits of doula care in the postnatal period include increased breastfeeding rates and decreased postpartum depression rates.³⁸

³² Jamila Taylor et al., “Eliminating Racial Disparities in Maternal and Infant Mortality,” Center for American Progress, May 2, 2019, <https://www.americanprogress.org/issues/women/reports/2019/05/02/469186/eliminating-racial-disparities-maternal-infant-mortality/>.

³³ “Who We Are,” California Perinatal Quality Care Collaborative, accessed March 17, 2021, <https://www.cpqcc.org/about/who-we-are>.

³⁴ Mayo Clinic Staff, “Preeclampsia,” Mayo Clinic, accessed March 17, 2021, <https://www.mayoclinic.org/diseases-conditions/preeclampsia/symptoms-causes/syc-20355745>.

³⁵ Michelle Samuels, “Medicaid-Covered Mothers Have Less Say in Birthing Experience,” BU School of Public Health, July 27, 2020, <https://www.bu.edu/sph/news/articles/2020/medicaid-covered-mothers-have-less-say-in-birthing-experience/>.

³⁶ Kenneth J. Gruber, Susan H. Cupito, and Christina F. Dobson, “Impact of Doulas on Healthy Birth Outcomes,” *The Journal of Perinatal Education* 22, no. 1 (2013): 49–58, <https://doi.org/10.1891/1058-1243.22.1.49>.

³⁷ Katy B. Kozhimannil et al., “Modeling the Cost-Effectiveness of Doula Care Associated with Reductions in Preterm Birth and Cesarean Delivery,” *Birth* 43, no. 1 (January 14, 2016): 20–27, <https://doi.org/10.1111/birt.12218>.

³⁸ Amy Chen, Alexis Robles-Fradet, and Helen Arega, “Building A Successful Program For Medi-Cal Coverage For Doula Care: Findings From A Survey of Doulas in California” (National Health Law Program, May 2020), <https://healthlaw.org/wp-content/uploads/2020/05/NHeLP-DoulaCare-Print-Spreads-F.pdf>.

In the beginning of 2020, Assembly Bill (AB) 2258 was introduced in California to pilot a 3-year doula care program for Medi-Cal³⁹ beneficiaries in the counties with the largest birth disparities.⁴⁰ While the bill received support across California and passed unanimously, efforts to focus on COVID-19 relief led to the collapse of implementing the program.⁴¹ It is unclear at this time when this program will be reintroduced. Despite the collapse of AB 2258, the National Health Law Project released findings from a survey of doulas across California in mid-2020. Their findings include recommendations on ensuring an equitable and sustainable roll out of doula care to Medi-Cal beneficiaries in California.⁴² Their findings are applicable outside of California as well, as an increasing number of states introduce legislation on Medicaid coverage for doula care.

Throughout California, there are targeted programs to decrease the IMR at the county-level, with an enhanced focus on the counties with the largest racial infant mortality disparity ratios. In Los Angeles County, Black babies have an IMR three times larger than White babies, a 50 percent higher rate of preterm birth, and the maternal mortality rate for Black women is four times higher than White women.⁴³ The African American Infant and Maternal Mortality (AAIMM) Initiative is a leader in the effort to decrease racial differences in the IMR in Los Angeles County. Two programs that stood out during my review, which are both affiliated with AAIMM, were the Cherished Futures for Black Moms and Babies Program and the Black Infants and Families LA Doula Program.

The Cherished Futures for Black Moms and Babies Program

The Cherished Futures for Black Moms and Babies Program (Cherished Futures) is part of the Communities Lifting Communities initiative.⁴⁴ Launched in 2019 as a pilot program, Cherished Futures is aligned with all the public health initiatives in Los Angeles County. The collaborative also includes community members who provide input.

³⁹ Medi-Cal is California's Medicaid health care program.

⁴⁰ Assembly Member Reyes et al., "Doula Care: Medi-Cal Pilot Program," Assembly Bill 2258 (2020), https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201920200AB2258.

⁴¹ Andrew DiAntonio, "California Doula Push Shifts Focus Due to COVID-19 Pandemic," National Health Law Program, April 30, 2020, <https://healthlaw.org/news/california-doula-push-shifts-focus-due-to-covid-19-pandemic/>.

⁴² Amy Chen, Alexis Robles-Fradet, and Helen Arega, "Building A Successful Program For Medi-Cal Coverage For Doula Care: Findings From A Survey of Doulas in California" (National Health Law Program, May 2020), <https://healthlaw.org/wp-content/uploads/2020/05/NHeLP-DoulaCare-Print-Spreads-F.pdf>.

⁴³ "Cherished Futures for Black Moms and Babies," Public Health Alliance of Southern California, July 2020, <https://phasocal.org/wp-content/uploads/2020/10/Cherished-Futures-for-Black-Moms-and-Babies-Overview-July-2020.pdf>.

⁴⁴ "Cherished Futures for Black Moms & Babies," Communities Lifting Communities, accessed March 17, 2021, <https://communities.hasc.org/cherished-futures>.

Cherished Futures works to address one of the root causes of birth inequities – systemic racism in healthcare.

The pilot program includes five hospitals in Los Angeles County. These hospitals were selected because they account for one-third of Black hospital births in the county. The initial phase of the hospital was to review birthing data, understanding rates of preeclampsia, and infant deaths, among other data points. Each hospital was then paired with a community advisor who were involved in birth equity work in Los Angeles County. This pairing allowed the program to bridge the divide between clinical settings and community members and stakeholders.

In 2020, the program launched its capacity-building year. Various trainings were delivered to the hospitals on topics such as implicit bias, quality improvement tools, social determinants of health, etc. Throughout the year, each hospital developed an implementation plan that aligned with their individual capacity and resources. While two hospitals need to drop out of the pilot due to COVID-19, the remaining three programs launched their interventions in February 2021.

“We know that in order to create systems change, we have to include an entire system and bring them to the table to have these conversations, to talk about where the barriers lie, where the gaps lie, and where the opportunities are. But to co-collaborate, to make sure we’re addressing continual care that is based on equity for all. And in particular, for black birthing mothers and black birthing people.”

– Karen Ochoa, Project Manager of Communities Lifting Communities

Now that implementation has launched, program administrators are working towards developing an evaluation plan. While the program is too new to have defined and evaluated measures of success at this time, project manager Karen Ochoa spoke to the importance of the capacity-building year and how the trainings have already worked to break down system bias among healthcare workers in the program hospitals.⁴⁵ This is a similar program as to what will now be developed across California after the passage of the California Dignity in Pregnancy and Childbirth Act.

⁴⁵ Karen Ochoa, Interview with Arianna Fischer, Cherished Futures Program Discussion, Zoom, February 17, 2021.

The Black Infants and Families LA Doula Program

The Black Infants and Families LA Doula Program was launched as a pilot program in 2019 with the mission of decreasing negative birth outcomes, specifically preterm birth rates, among Black women in Los Angeles County. While the initial pilot period was only going to be offered in one area of the county with the highest rates of infant and maternal mortality, due to COVID-19 the pilot expanded to all Black expectant mothers who wanted to participate. The pilot expanded due to the anticipated heightened level of stress that mothers would be experiencing in the pandemic, aiming to provide a system of support during these times.

“We know prenatal care is important. We know culturally congruent support is important. So that’s why this program is for Black folks and the doulas are all Black... Sometimes you need someone who looks like you in this very intimate space.”

– Michelle Sanders, Doula Project Coordinator

This doula program aims to offer continual care to the mothers it serves, from pregnancy to post-partum. The program pairs Black doulas with Black birthing people in Los Angeles County, free of charge. Doulas provide three prenatal visits, continuous labor support, three postpartum visits, and lactation support.⁴⁶ The holistic nature of the program has been extremely important because it provides continued support to mothers. Post-partum, mothers are screened for perinatal mood disorders, such as depression and anxiety, and connected with community health resources if needed.

The pilot has served 378 Black mothers. While the program is still in progress – of the 378 mothers included in the pilot, 200 have given birth – they have seen successful results that demonstrate access to a doula is beneficial for Black mothers. As of February 2021, rough numbers that demonstrate success include a 90 percent full-term birth rate and an 89 percent breast feeding uptake rate. Of all the clients who have given birth, three infant losses have occurred.⁴⁷

This program is another piece of the AAIMM Initiative. As such, they work closely with partners across the county, such as Cherished Futures, to address the many factors that need to be addressed to decrease Black infant mortality. Everyone is at the table, from

⁴⁶ “Doulas,” Black Infants and Families Los Angeles, accessed March 17, 2021, <https://www.blackinfantsandfamilies.org/doulas>.

⁴⁷ Michelle Sanders, Interview with Arianna Fischer, Black Infants & Families LA Doula Program Discussion, Zoom, February 26, 2021.

community members, to community organizations, to healthcare providers, working towards the same goal. Moving forward, the program hopes to integrate doula care with Medi-Cal and other health plans in California, as well as inmates in the state.

Massachusetts

Massachusetts is a leader in healthcare in the United States. In 2006, the state reformed its healthcare system to move towards universal healthcare coverage.⁴⁸ This healthcare reform set Massachusetts ahead of other states, prior to the passage of the Affordable Care Act four years later that aimed to expand healthcare access nationwide. While coverage gaps exist today, Massachusetts has maintained one of the lowest rates of uninsured residents nationwide and has been the lead on patient safety initiatives nationwide.^{49,50} America's Health Rankings ranks Massachusetts as the healthiest state for women and children.⁵¹

Despite successes in the healthcare system in Massachusetts, racial disparities in health outcomes remain. In Massachusetts, the Black and Hispanic populations have the highest rates of infant mortality. The largest difference is between Black and White babies; Black babies in Massachusetts have an IMR that is over double the IMR for White babies. The most recent infant mortality rates in Massachusetts by race and ethnicity are included in Figure 3 below.

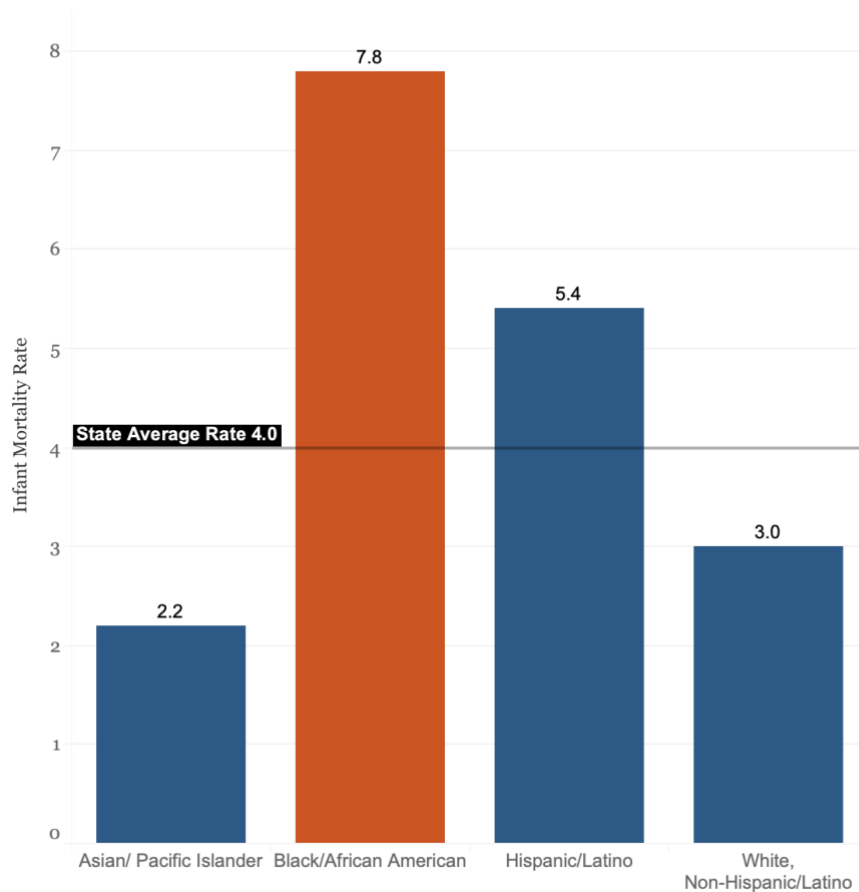
⁴⁸ John Holahan and Linda Blumberg, "Massachusetts Health Care Reform: A Look At The Issues: Independent Analysts Assess the Massachusetts Reform and Its Potential for Success and Replication Elsewhere.," *Health Affairs* 25, no. Suppl1 (January 2006): W432–43, <https://doi.org/10.1377/hlthaff.25.w432>.

⁴⁹ Louise Norris, "Massachusetts Health Insurance," *Healthinsurance.Org* (blog), February 3, 2021, <https://www.healthinsurance.org/massachusetts/>.

⁵⁰ "Massachusetts Recognized as a National Leader in Advancing the Use of Health Information Technology," Massachusetts eHealth Institute, April 1, 2013, <https://mehi.masstech.org/news/massachusetts-recognized-national-leader-advancing-use-health-information-technology>.

⁵¹ America's Health Rankings analysis of CDC WONDER Online Database, Linked Birth/Infant Death files, United Health Foundation, AmericasHealthRankings.org, accessed March 17, 2021, https://www.americashealthrankings.org/explore/health-of-women-and-children/measure/IMR_MCH/state/ALL.

Figure 3. Infant Mortality Rates in Massachusetts.
The infant mortality rate for the Black population was the largest for data form 2015-2017.



Source: National Center for Health Statistics, period linked birth/infant death data. Retrieved March 17, 2021, from www.marchofdimes.org/peristats. Note: The American Indian/Alaska Native population is missing from this data source due to a small sample size.

My research and interviews in Massachusetts yielded information on quality improvement strategies in hospitals, home visiting programs, and addressing the social determinants of health for Black mothers. These efforts are taking place at the state level, through state-wide hospital improvement initiatives, and at the regional and local level through coordinated stakeholder efforts.

To address the racial disparities in the IMR, Massachusetts has convened and coordinated multiple clinical improvement initiatives for women and infants in the state. One statewide initiative, Perinatal-Neonatal Quality Improvement Network of Massachusetts, is a joint initiative led by the Massachusetts Perinatal Quality Collaborative and the Neonatal Quality Improvement Collaborative of Massachusetts. This collaboration began with the goal of addressing racism in clinical care in Massachusetts. They have worked to increase data transparency across the state regarding infant and maternal outcomes, enable sharing best practices between hospitals across the state, and ultimately reduce

health disparities in birth outcomes.⁵² In 2020, the collaborative’s efforts largely revolved around implementing explicit and implicit bias and trauma-informed care trainings in hospitals across the state.⁵³

There has also been an effort to expand doula coverage to Medicaid beneficiaries in Massachusetts. Introduced in the 2019-2020 legislative session, House Bill 1182 proposed providing doula coverage for this population in order to increase physical and emotional support to mothers during the prenatal and postpartum periods.⁵⁴ When COVID-19 hit, the bill was stalled. Massachusetts state legislatures have yet to take further action to re-introduce this bill at this time.

Outside of clinical care, other state initiatives that have shown success are focused on the social and economic factors that mothers live in. The Boston Public Health Commission (BPHC) published results from data between 2001 and 2012 that documented Boston has closed the gap in the Black and White IMR.⁵⁵ The BPHC attributed this reduction to the following: 1) the enhancement of ongoing case management in Boston, connecting women to services and supports that they need such as housing and food resources in the prenatal and postpartum periods; 2) facilitating peer support among expectant mothers, through women’s circles and prenatal support groups; and 3) enhancing collaboration with perinatal providers for women at risk of preterm birth. Additionally, a leading program in Boston that has shown to be success is the Healthy Start program, explored in detail below.

Initiatives that have targeted decreasing the IMR racial disparities and promoting healthy birth outcomes in Massachusetts has led to its reduction in adverse birth outcomes. Two programs at the local level that stood out during my review of Massachusetts include the Boston Healthy Start Initiative and the Thom Anne Sullivan Center’s pregnancy home visiting program, an affiliate of the Maternal/Child Health Task Force in Lowell, Massachusetts.

⁵² “About Us,” The Perinatal-Neonatal Quality Improvement Network of Massachusetts, accessed March 17, 2021, <https://www.pnqinma.org/about-us>.

⁵³ “PNQIN’s Statement on Racial Inequities,” The Perinatal-Neonatal Quality Improvement Network of Massachusetts, June 8, 2020, https://b21a2104-8467-430f-9b8f-1e89273454a5.filesusr.com/ugd/10d14e_62114e7d30484231baf013bbc4bb408f.pdf.

⁵⁴ Representative Liz Miranda and Representative Lindsay N. Sabadosa, “An Act Relative to Medicaid Coverage for Doula Service,” House Bill No. 1182, accessed March 17, 2021, <https://malegislature.gov/Bills/191/H1182>.

⁵⁵ Research and Evaluation Office and Child, Adolescent and Family Health Bureau, Boston Public Health Commission, “Closing the Gap,” August 2014, https://www.bphc.org/healthdata/other-reports/Documents/IMR%20Report_29Aug14_final.pdf.

The Boston Healthy Start Initiative

The Boston Healthy Start Initiative is a community support model that works to address the social determinants of health for Black expectant mothers in Boston. Starting in 1991, the program was one of the first funded sites through the Health Resources & Services Administration’s Healthy Start Grant programs. Healthy Start is one of the earliest programs to address high infant mortality rates in the United States.⁵⁶ All Healthy Start programs provide ongoing support to mothers, from pregnancy to post-partum.

While the city of Boston overall has seen decreases in gaps of racial birth outcomes over time, disparities remain within the city. Healthy Start in Boston is operated through community health centers that are located in zip codes with the highest birth disparities for Black women in the city – demonstrating the importance of disaggregating data and operating such a program at the local level.

The health centers recruit a family partner, a member from the community that leads case management and family navigation. Family partners are critical to the program as they provide support to the mothers enrolled in the program and monitor their social determinants of health, connect them with resources as needed, and help empower women to take control of their pregnancies.

Outside of individual support, Healthy Start strives for systematic changes. The program convenes Community Action Networks (CANs) to convene members from the community. CANs advocate for policy changes at the community level. Boston’s CAN has convened an extensive network of volunteers that have advocated for various policies relating to the social determinants of health, from instituting a fetal and infant

“CAN members are taking action to advocate for changes in policies and systems to address these inequities... We believe we can make a change so that all residents can have healthy pregnancies, healthy babies, and healthy families.”

– Boston CAN Member

Source: “Community Action Network,” Boston Public Health Commission, accessed March 17, 2021, <https://www.bphc.org/whatwecando/childrens-health/boston-healthy-start-initiative/Pages/Community-Action-Network.aspx>.

⁵⁶ Johannie G. Escarne et al., “Introduction to the Special Issue on Healthy Start,” *Maternal and Child Health Journal* 21, no. S1 (December 2017): 1–3, <https://doi.org/10.1007/s10995-017-2404-y>.

mortality review board to addressing affordable housing.⁵⁷

While the Boston Healthy Start Initiative has received continued federal funding for the past 30 years, the initiative's current efforts are to enhance data tracking. HRSA's benchmark measures include reducing the infant mortality rate, increasing access to timely prenatal care, and removing barriers to healthcare access.⁵⁸ An outside evaluator has been brought in for the first time to help the program implement a data tracking and monitoring system to better understand the progress of this program. Conducted by a team of evaluators at Child Trends, the goal of the evaluation is to better pinpoint the effectiveness of the Boston Healthy Start Initiative in each of these three metrics.⁵⁹

The Thom Anne Sullivan Center's Pregnancy Home Visiting Program

The Thom Anne Sullivan Center conducts home visits for expectant mothers in Lowell who are in need of support, free of charge. While there are no specific requirements to benefit from the program services, outside of being pregnant, the program primarily serves low-income mothers. Program participants are racially diverse and large proportions of the participants have historically been immigrants.

The home visiting is operated by community health workers (CHWs). When an expectant mother enrolls in the program, the CHW completes a comprehensive health assessment intake that addresses the social determinants of health. This assessment enables the CHWs to identify supports that the mother might need, from housing to mental health support, and is used on an ongoing basis to monitor mother's needs during and after pregnancy.

Staff from the Thom Anne Sullivan Center are also part of the Maternal/Child Health Task Force in Lowell, a larger movement to decrease racial disparities in birth outcomes in the city. This task force convenes representatives from across the region to improve maternal and child health and are currently working on expanding education regarding implicit bias in healthcare settings.⁶⁰ Together, these stakeholders are also working to bridge the divide between public health and education-focused programs in the city through their coordination with Lowell's Early Childhood Advisory Council.

⁵⁷ "Community Action Network," Boston Public Health Commission, accessed March 17, 2021, <https://www.bphc.org/whatwedo/childrens-health/boston-healthy-start-initiative/Pages/Community-Action-Network.aspx>.

⁵⁸ "Healthy Start," Text, Maternal and Child Health Bureau, October 3, 2016, <https://mchb.hrsa.gov/maternal-child-health-initiatives/healthy-start>.

⁵⁹ Sarah Crowne, Interview with Arianna Fischer, Boston Healthy Start Initiative Program Discussion, Zoom, February 24, 2021.

⁶⁰ Tami Marshall, Interview with Arianna Fischer, Thom Anne Sullivan Center and Maternal/Child Health Task Force Program Discussion, Zoom, March 4, 2021.

5. Progress on addressing adverse birth outcomes in the public health space in North Carolina

This section of the report highlights interventions in the public health space in North Carolina aimed at decreasing the IMR. In the public health space, the work extends beyond advocating for closing the health insurance gap and expanding access to prenatal care. Statewide, there is clear recognition in North Carolina that the IMR is extremely high in the state and that efforts are needed to decrease the disparity ratio that exists between Black and White babies. While this section does not provide a detailed account of every program in North Carolina working to decrease the IMR, it does provide insight into federally and state-funded programs that are operated at the local level and have shown some degree of progress and/or innovation in their efforts.

CenteringPregnancy is a national program that has an extensive presence in North Carolina. With 27 sites across the state, the CenteringPregnancy program is a group prenatal care model that takes mothers out of clinical settings and enables them to interact with other expectant mothers through a series of ten group sessions. A 2019 study tested the effectiveness of group prenatal care, finding such programs significantly reduced mothers' chances of preterm birth and low birthweight for their babies. The study's conclusion specified that the CenteringPregnancy program is an effective model.⁶¹ Mothers who participate in CenteringPregnancy programs may also have improved mental health outcomes post-partum.⁶² Ultimately, CenteringPregnancy programs build a sense of community and support among expectant mothers and empowers mothers to play an active role in their health, enabling them to recognize pregnancy warning signs such as preeclampsia and proactively seek care when needed.⁶³

At the state level, the Women's Health Branch of NCDHHS has various programs targeting improvements for women's health and reducing infant deaths. One program, Healthy Beginnings, is the lead program targeted at reducing the IMR for minority babies in the state. With roughly a dozen sites across North Carolina, Maternal and Child Health block grants from the federal government are distributed to NCDHHS, who in turn

⁶¹ Amy H. Crockett et al., "Effects of a Multi-Site Expansion of Group Prenatal Care on Birth Outcomes," *Maternal and Child Health Journal* 23, no. 10 (October 2019): 1424–33, <https://doi.org/10.1007/s10995-019-02795-4>.

⁶² Ingunn Benediktsson et al., "Comparing CenteringPregnancy® to Standard Prenatal Care plus Prenatal Education," *BMC Pregnancy and Childbirth* 13, no. S1 (January 2013): S5, <https://doi.org/10.1186/1471-2393-13-S1-S5>.

⁶³ Cristina Novoa, "Ensuring Healthy Births Through Prenatal Support," Center for American Progress, January 31, 2020, <https://www.americanprogress.org/issues/early-childhood/reports/2020/01/31/479930/ensuring-healthy-births-prenatal-support/>.

provides grants to local community health departments.⁶⁴ The program provides support to women during pregnancy and up to two years post-delivery. Services include education and support programs, social worker support to connect to community resources, and support group meetings for mothers. One site in Pitt County, NC has seen slight decreases in the IMR for Black babies and decreases in the disparity ratio during the span of their program.⁶⁵

In 2019, the Women’s Health Branch of NCDHHS was awarded a Maternal Health Innovation grant to address maternal morbidity and mortality in North Carolina. The first program of its kind in North Carolina, the Community Health Worker (CHW)-Doula pilot program provides women with two sources of support during and after their pregnancy at no cost. CHWs and doulas are recruited from the community the pilot is in to provide culturally competent care. The role of the CHW is to address the social determinants of health for women enrolled in the program, connecting women to resources they may need at any time during the program. Women receive additional support through the dual-nature of the program. As many women of color do not have access to a doula, this program aims to break that barrier. The doulas in this program take on various roles, such as supporting women in their prenatal care visits, acting as a support system for expectant mothers, and facilitating small groups of women in a peer support network during and after their pregnancy.

Funded for three years, the CHW-Doula pilot program selected New Hanover as their first operating site in 2020. At the time of the interview to learn more about this program in February 2021, an initial evaluation was in the process of being conducted but was not complete yet. If the evaluation yields positive results for the pilot, next steps include advocating for the program to be offered to Medicaid beneficiaries in North Carolina. In February 2021, the pilot was accepting applications for their second site and hoped to continue to expand to other regions of North Carolina in the future.⁶⁶ Recent legislation may have laid the groundwork for such an expansion. In May of 2020, three North Carolina Senators – Senators Murdock, Waddell, and Marcus – introduced Senate Bill 732 to create doula services for Medicaid beneficiaries.⁶⁷ While the bill did not move in

⁶⁴ “North Carolina: Maternal and Child Health Block Grant 2020,” Association of Maternal & Child Health Programs, accessed March 17, 2021, <http://www.amchp.org/Policy-Advocacy/MCHAdvocacy/2020%20State%20Profiles/North%20Carolina%202020%20FINAL.pdf>.

⁶⁵ Taylor Knopf, “Healthy Beginnings Program Helps Moms and Babies Succeed,” North Carolina Health News, April 3, 2018, <https://www.northcarolinahealthnews.org/2018/04/03/healthy-beginnings-program-helps-moms-and-babies-succeed/>.

⁶⁶ Shelby Weeks, Interview with Arianna Fischer, CHW-Doula Pilot Program Discussion, Zoom, February 4, 2021.

⁶⁷ Senator Murdock, Senator Waddell, and Senator Marcus, “Create Medicaid Access to Doula Services,” Senate Bill 732 (2020), <https://www.ncleg.gov/BillLookup/2019/S732>.

the 2019-2020 legislative session, Senator Murdock has indicated a continued interest to push this bill forward with bipartisan support in future legislative sessions.⁶⁸

At the local level, federal funding through the Maternal and Child Health Bureau and the Health Resources and Services Administration of the United States Department of Health and Human Services has enabled Healthy Start programs in North Carolina. The program provides case management, health education programs, and support to expectant mothers and mothers post-partum. Two programs have been operating in Robeson County through the University of North Carolina (UNC) at Pembroke and Robeson Health Care Corporation.^{69,70} Robeson County saw decreases in the county's IMR from 2014 to 2016. However, with the effects of hurricanes Matthew and Florence, the IMR rose again. A recent \$5 million grant, awarded in 2019, will consolidate both locations in hopes to coordinate and amplify their impact in the county.⁷¹

While not all programs referenced above have clear evaluation results at this time, important efforts are occurring across the state of North Carolina to improve birth outcomes for all babies born in the state. Continued operations for these programs and others like it can move the needle forward in addressing adverse birth outcomes in North Carolina, particularly for Black mothers and their children.

⁶⁸ Dawn Baumgartner Vaughan and Lucille Sherman, "Black Women and Girls Would Get More Power and Protections in New NC Bills," Raleigh News & Observer, May 27, 2020, <https://www.newsobserver.com/news/politics-government/article243024851.html>.

⁶⁹ "Healthy Start CORPS," The University of North Carolina at Pembroke, accessed March 17, 2021, <https://www.uncp.edu/academics/academic-resources/office-regional-initiatives/community-outreach/healthy-start-corps>.

⁷⁰ "Healthy Start Program," Robeson Health Care Corporation, accessed March 17, 2021, <https://www.rhcchealth.org/copy-of-healthy-start-initiative-1>.

⁷¹ "Healthy Start Awarded \$5.4 Million Grant," The University of North Carolina at Pembroke, April 2, 2019, <https://www.uncp.edu/news/healthy-start-awarded-54-million-grant>.

6. Recommendations

Education stakeholders in North Carolina have become increasingly focused on improving early childhood outcomes for children across the state. Their efforts include targets for children beginning in the prenatal or birth period through third grade educational progress. However, efforts among these stakeholders that focus on the prenatal period have been minimal and often focus strictly on improving access to health insurance for the mother as a means of increasing access to timely prenatal care. In order to meaningfully improve birth outcomes for children in the state, particularly for Black infants, and improve life-long outcomes for children, the following recommendations are actionable steps that my client, the North Carolina Public Education Task Force (NCPETF), should consider taking.

- ◆ **Establish a partnership with the North Carolina Early Childhood Action Council (NC ECAC) to discuss the insights included in this report and coordinate ongoing efforts to decrease racial birth disparities.** The NC ECAC is the primary education stakeholder working on improving outcomes for children from birth through 3rd grade in North Carolina. Approaching the council and discussing ongoing operations can provide a space for the NCPETF to get more involved in early childhood across North Carolina. Additionally, promoting the lessons documented in this report in discussions with other stakeholders can help improve racial birth disparities in a meaningful way.
- ◆ **Form a multi-sector partnership between education and public health stakeholders and advocacy groups in the state to address adverse birth outcomes.** There is currently a divide between public health and education stakeholders working on improving birth outcomes in North Carolina. With the information included in this report, the NCPETF should urge the NC ECAC to include public health officials in the council's sessions moving forward, namely program leads for the programs documented in Section 5, as a starting point. Alternatively, the NCPETF may choose to fill this gap on its own, if members have the capacity to convene both education and public health stakeholders for continued discussions around this topic and taking action moving forward.
- ◆ **Extend goals for reducing the racial disparity in birth outcomes beyond prenatal care by advocating for access to expanded doula services in the state.** Access to timely prenatal care alone will not solve the racial disparity in birth outcomes for Black mothers and their babies. The lessons learned from the California and Massachusetts case studies include the importance of practices that promote peer support (such as group prenatal care outside of a clinical setting) and individual support (such as doulas or CHWs). The NCPETF can become a thought leader in North

Carolina in improving birth outcomes, based on the information included in this report, elevating the conversation around improving birth outcomes. The CHW-Doula pilot program is an innovative program that the NCPETF can collaborate with and provide support to. Collaboration may take the form of helping the program to advertise to counties interested in applying for the program in the future, or advocating for an extended pilot period to thoroughly test evaluate the pilot program.

The following recommendations revolve around legislation that is needed in North Carolina to improve birth outcomes in the state. While the NCPETF may not be able to be directly involved in pushing these pieces of legislation forward, task force members can become advocates for this legislation in the future. Additionally, these recommendations should be included in conversations around improving birth outcomes moving forward.

- ◆ **Provide doula support to Medicaid beneficiaries.** Senate Bill 732 was introduced in North Carolina's 2019-2020 legislative session to provide doula support to Medicaid beneficiaries. Other states across the nation have taken similar strides to provide such services to Medicaid beneficiaries to improve birth outcomes. Potential programs that can help support such legislation in North Carolina may depend on evidence of evaluation of such programs elsewhere. If the 3-year doula care pilot program for Medi-Cal beneficiaries is carried out post-pandemic in California, this is one program to learn from and support evidence for how a similar program could improve outcomes in North Carolina.
- ◆ **Address systemic racism in healthcare.** A root cause of racial birth disparities is racism. Conversations around combatting systemic racism in North Carolina need to be advocated for, such as the importance of implicit bias trainings in healthcare settings as a starting point. Senate Bill 362 – The North Carolina Momnibus Act – was introduced on April 6, 2021 and addresses this need. If passed, one piece of this act would require NCDHHS to develop an evidence-based implicit bias training program for perinatal care healthcare providers in the state. Immediate advocacy efforts should be taken in support of this bill by all stakeholders working to improve early childhood outcomes in North Carolina.

Across all recommendations, it is crucial to target improvements at the county or local level. While a target for decreasing the state's average infant mortality disparity ratio is important, targeted improvements at the county or local level are essential to address where the largest disparities exist and monitor progress on a smaller scale.

7. Conclusion

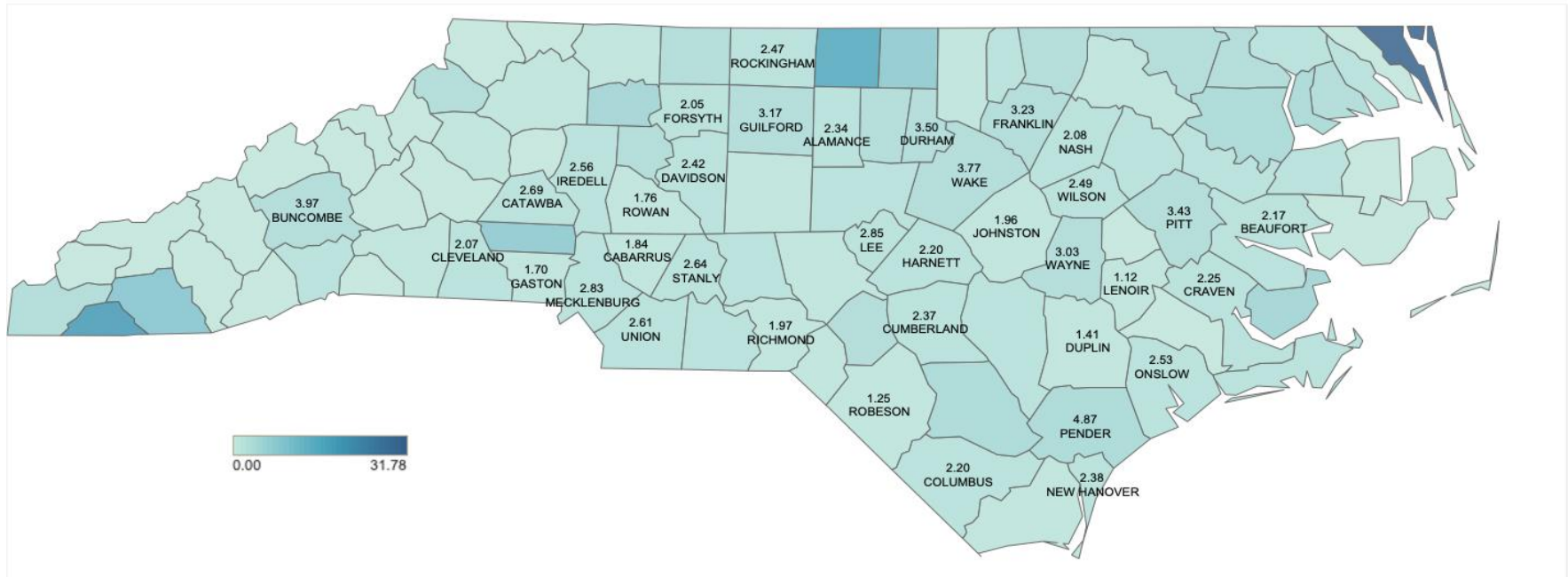
Education stakeholders focusing on early childhood in North Carolina need to focus on the prenatal period as a starting point for improving outcomes for children in the state. A child's health at birth provides a foundation for growth and development. North Carolina falls behind other states in providing a healthy foundation for babies due to the large IMR in the state. When looking at who is disproportionately impacted by infant mortality in North Carolina, Black babies have much higher rates than White babies. Without addressing the racial disparities in infant mortality, babies will continue to enter the world vulnerable in North Carolina and lag in achieving milestones for early childhood outcomes.

Targeted interventions are needed to improve outcomes for Black mothers and their infants in the state. Efforts to reduce pregnancy-related complications can help decrease adverse birth outcomes and set children in North Carolina on a more equitable path as they develop and grow. The prenatal period is not just a concern for public health practitioners – health at birth affects all aspects of a child's life, including performance in school and educational attainment. As such, education stakeholders across North Carolina must consider interventions in this critical period to bring about educational equity in the state.

Appendix 1

Figure 4. Infant Mortality Disparity Ratios by County.

The racial disparity ratios drastically differ by county across North Carolina. The 36 counties with large enough infant deaths for comparison across counties are labeled with the county's disparity ratio on the map.



Source: NC Department of Health and Human Services (NCDHHS), "2018 Infant Mortality Statistics for North Carolina: Table 3b," October 21, 2019, <https://schs.dph.ncdhhs.gov/data/vital/ims/2018/#>.

Appendix 2

Table 2. Interview Participants

State Affiliation	Name of Interviewee	Organization/Title within Organization
California	Karen Ochoa	Communities Lifting Communities, Project Manager
California	Michelle Sanders	Division of Maternal, Child, and Adolescent Health at the Los Angeles County Department of Public Health, Doula Project Coordinator
Massachusetts	Dr. Sarah Crowne	Child Trends, Senior Research Scientist, Principal Investigator and Project Director of the Evaluation of the Boston Healthy Start Initiative
Massachusetts	Tami Marshall	Lowell Maternal/Child Health Task Force, Task Force Chair; Thom Anne Sullivan Center, Program Coordinator of the Pregnancy & Newborn Support program
North Carolina	Dr. Kristi Snuggs	Division of Child Development and Early Education at NCDHHS, Interim Director; North Carolina Early Childhood Action Council, Council Member
North Carolina	Shelby Weeks	Women's Health Branch of the North Carolina Division of Public Health, Preconception Health and Family Support Unit Manager, Operating the CHW-Doula Pilot Program