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NCIOM

North Carolina Institute of Medicine

# Healthy Moms, Healthy Babies:

## *Building a Risk-Appropriate Perinatal System of Care for North Carolina*

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*In partnership with* ***the Division of Public Health and the North Carolina Department of Health and Human Services***

The North Carolina Institute of Medicine's (NCIOM) Task Force on Developing a Perinatal System of Care was convened in January 2019 in partnership with the Division of Public Health and the North Carolina Department of Health and Human Services.

The Task Force was co-chaired by Walidah Karim, DNP, CNM, Certified Nurse Midwife at Cone Health Medical Group – Center for Women's Healthcare at Women's Hospital; Kelly Kimple, MD, MPH, FAAP, Section Chief for the North Carolina Department of Health and Human Services (NC DHSS), Division of Public Health – Women and Children's Health Section; M. Katherine Menard, MD, MPH, Professor, Vice Chair for Obstetrics and Director at the University of North Carolina (UNC) Maternal-Fetal Medicine; and LaToshia Rouse, Parent, Speaker and Parent Advisor for the Newborn Individualized Developmental Care and Assessment Program. Their leadership and experience were important to the success of the Task Force's work.

The NCIOM also wants to thank the members of the Task Force and Steering Committee who gave freely of their time and expertise to address this important topic. The Steering Committee members provided guidance and content, helped develop meeting agendas, and identified speakers. For the complete list of Task Force and Steering Committee members, please see Page 5 of this report.

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**AAP** – American Academy of Pediatrics

**ABD** – aged, blind, and/or disabled

**ACOG** – American College of Obstetricians and Gynecologists

**ACS** – American College of Surgeons

**ADA** – American's with Disabilities Act

**APRN** – advanced practice registered nurses

**ASRM** – American Society for Reproductive Medicine

**CC4C** – Care Coordination for Children

**CCNC** – Community Care of North Carolina

**CDC** – Centers for Disease Control and Prevention

**CDSA** – Children's Developmental Services Agencies

**CFTF** – Child Fatality Task Force

**CGBI** – Carolina Global Breastfeeding Institute

**CHIP** – Children's Health Insurance Program

**CMHRP** – Care Management for High-Risk Pregnant Women

**CMS** – Centers for Medicare and Medicaid Services

**CNM** – certified nurse-midwife

**FMLA** – Family and Medical Leave Act

**FPL** – federal poverty level

**ITP** – Infant-Toddler Program

**LHD** – local health department

**LOCATe** – Levels of Care Assessment Tool

**NCAC** – North Carolina Administrative Code

**NC DHHS** – North Carolina Department of Health and Human Services

**NC DHSR** – North Carolina Division of Health Services Regulation

**NC DPH** – North Carolina Division of Public Health

**NCGA** – North Carolina General Assembly

**NCHA** – North Carolina Healthcare Association

**NCIOM** – North Carolina Institute of Medicine

**NFP** – Nurse-Family Partnership

**NICU** – neonatal intensive care unit

**OBCM** – Pregnancy Care Management

**OB/GYN** – obstetrician/gynecologist

**PDA** – Pregnancy Discrimination Act

**PFAC** – patient and family advisory council

**PHP** – prepaid health plan

**PMH** – pregnancy medical home

**PMP** – pregnancy management program

**PNOC** – perinatal outreach coordinator

**QI** – quality improvement

**SMFM** – Society for Maternal-Fetal Medicine

**SMM** – severe maternal morbidity

**SNAP** – Supplemental Nutrition Assistance Program

**VBAC** – vaginal birth after cesarean

**VLBW** – very low birth weight

The health and well-being of North Carolina's mothers and infants determines the health of the next generation of North Carolinians. Unfortunately, North Carolina has not kept pace with the improvements in maternal and infant health that have occurred in most of the United States and other developed countries. Over the last 20 years, maternal mortality has been increasing steadily in the United States,[1] despite the fact that more than half of pregnancy-related deaths are preventable.[2] Infant mortality has been slowly improving over the past 20 years in North Carolina; however, infants in North Carolina are still more likely to die than those in 40 other states.[3] While maternal and infant outcomes need to be improved for all, women and infants of color are significantly more likely to have poor pregnancy and birth outcomes. African American infants are more likely to die in utero, be born preterm and low birth weight, and die in their first year of life than white infants, and African American women are 3 to 4 times more likely to die from pregnancy-related causes than their white peers.[4]

In 2016, the Women's Health Branch of the North Carolina Department of Health and Human Services (NC DHHS) released a 12-point Perinatal Health Strategic Plan to address infant mortality, maternal health, maternal morbidity and mortality, and the health status of women and men of child bearing age.[5] The plan was developed based on a framework of closing the black-white disparity gap in birth outcomes that is applicable to all populations.[6,7] The 12-point plan includes 3 overarching goals: improving health care for women and men, strengthening families and communities, and addressing social and economic inequities. Goal 3E called for North Carolina to "Ensure that pregnant women and high-risk infants have access to the risk appropriate level of care through a well-established regional perinatal system."[7] In response, Session Law 2018-93 tasked NC DHHS with studying seven issues surrounding the state's ability to provide women with timely and equitable access to high-quality, risk-appropriate maternal and neonatal care. The NCIOM Perinatal System of Care Task Force was convened, in partnership with the North Carolina Division of Public Health and NC DHHS, to respond to Session Law 2018-93 and Goal 3E of North Carolina's Perinatal Health Strategic Plan.

Improving outcomes for women and infants requires addressing all the barriers they face to achieving positive health outcomes; however, this task force was convened to address barriers to achieving optimal clinical care for women and infants. Therefore, the focus was on what can be done to improve outcomes by improving access to, and quality of, clinical care. Positive outcomes for women and infants can be increased through access to high-quality preconception (before pregnancy), prenatal (during pregnancy), labor and delivery, postnatal (after pregnancy), and interconception (between pregnancies) care. In considerations on how to improve clinical care, the stark differences in outcomes for women and infants of color led the task force to consider direct action to address the causes of these disparities. Therefore, while the task force developed recommendations to ensure that all women receive quality perinatal care, they spent considerable time exploring strategies that have been shown to improve outcomes for women and infants of color in particular.

## INPATIENT CARE LABOR AND DELIVERY

Maternal and neonatal levels of care designations for birthing centers and perinatal regionalization are nationally recognized, evidence-based strategies to improve maternal and perinatal outcomes. They improve outcomes, particularly infant mortality, by establishing coordinated systems among birthing facilities that provide different levels of maternal and neonatal care.[8,9] Such systems rely on the categorization of birthing facilities according to the services they offer to mothers and infants. Level I facilities meet the needs of women whose pregnancies are low-risk (>90% of births) and provide well-newborn nurseries for low-risk infants. As the level increases, so does the ability of the birthing facility to provide higher levels of specialized care and technology to care for mothers and infants with higher needs.[8,9] Perinatal regionalization builds on the levels of care designation by establishing systems that link lower level of care facilities to higher level of care facilities and guidelines for transfers between levels when mothers or infants need more specialized care.[8] Such systems work to coordinate care and ensure that pregnant women and infants are cared for in "risk-appropriate" settings. While North Carolina has a system for assessing birthing facilities' level of care for infants, the guidelines have not been updated since 1996 and do not match national best practice guidelines.

### RECOMMENDATION 2.1:
Adopt National Maternal and Infant Risk-Appropriate Level of Care Standards

One of the beneficial aspects of the national levels of care system is the availability of a tool that allows a facility to objectively assess its capabilities and determine its true level of care. Through a partnership led by the Centers for Disease Control and Prevention (CDC), the Levels of Care Assessment Tool, or LOCATe, was developed to standardize assessments done by participating facilities on their neonatal and maternal levels of care.[10]

### RECOMMENDATION 2.2:
Assess Levels of Care Utilizing the CDC LOCATe Tool

Under current North Carolina regulations, birthing facilities self-assess their neonatal level of care capabilities. To realize the full scope of advantages derived from implementing a regionalized perinatal system of care, the state should ensure birthing facilities are correctly identifying their level of care through external verifications.

### RECOMMENDATION 2.3:
Require External Verification of Birthing Facilities' Maternal and Neonatal Level of Care Designations

Under the uniform national guidelines for neonatal and maternal levels of care, Level IV facilities not only provide care, but also act as regional leaders by facilitating collaboration among facilities, quality improvement activities, and education.[8] For many years, North Carolina had a

[a] *§10A NCAC 13B .6203 (1996).*

regional support system facilitated by a neonatal and perinatal outreach coordinator in each region; however, funding for these positions ended in 2009.[11]

**RECOMMENDATION 2.4:**
Re-establish North Carolina's Perinatal and Neonatal Outreach Coordinator Program

Although national guidelines recommend establishing relationships among birthing facilities to facilitate a risk-appropriate regional perinatal system of care, such a system does not account for the fact that most maternal care is provided in outpatient clinics.[15] Just as women and infants will benefit as connections between birthing facilities providing different levels of care are improved and supported, they would also benefit from better connections between prenatal care providers, particularly among those providing low-risk prenatal care and those providing high-risk prenatal care or specialty care for pregnant women.

**RECOMMENDATION 2.5:**
Support Outpatient Risk-Appropriate Perinatal System of Care

## PRECONCEPTION, PRENATAL, AND POSTPARTUM CARE

Access to and receipt of quality preconception and prenatal care is a critical step to improving maternal and birth outcomes. Adequate preconception and prenatal care are leading strategies to reduce infant mortality and pregnancy-related deaths.[12,13] Additionally, access to high-quality, consistent prenatal care is required in order to provide early and ongoing risk assessments, which make up the cornerstone of developing a risk-appropriate perinatal system of care. While the regional model of care is intended to help ensure that women have access to a well-integrated, risk-appropriate perinatal system of care, there remain structural, financial, and cultural barriers to care that must be eliminated in order to improve outcomes for women and infants.[14] Access to care is particularly challenging for low income women and women that are undocumented immigrants.

**RECOMMENDATION 3.1:**
Expand Access to Health Care Services

Access to comprehensive prenatal care services is critical for women to have the healthiest pregnancy possible. Nonetheless, certain groups face disproportionate barriers to accessing these services. Undocumented women in North Carolina deliver more than 10,000 babies each year and typically use presumptive Medicaid eligibility for two months of prenatal services and emergency Medicaid for delivery. However, when ultrasounds, other diagnostic tests, or specialty consultations are recommended, many women have no ability to access these services. The Federal Government allows states to use a special Children's Health Insurance Program (CHIP) to cover prenatal care, labor, delivery, and the immediate post-partum period for undocumented immigrant women. These services are covered at the enhanced CHIP federal matching percentage, resulting in a net savings to North Carolina taxpayers.

**RECOMMENDATION 3.2:**
Expand Access to Comprehensive Prenatal Care for Women Ineligible for Medicaid

Although most prenatal care is provided through individual office visits between pregnant women and their providers, there are other models of care that have been shown to positively impact maternal and infant outcomes for women, particularly women of color. In many cases, these models supplement the clinical prenatal care experience and facilitate community support and patient learning in environments women may find more supportive. Similarly, childbirth education models increase positive outcomes by simplifying the birthing process and decreasing rates of cesarean sections and prolonged labor periods.[14]

**RECOMMENDATION 3.3:**
Extend Coverage for Group Prenatal Care and Doula Support

**RECOMMENDATION 3.4:**
Increase the Utilization and Completion Percentages of Childbirth Education Classes

While data shows that the number of prenatal care providers across the state has been increasing in recent years, access to maternity care varies across the state, with some areas having few or no prenatal care providers.[15] Women with low-risk pregnancies (>90% of pregnancies), meaning there are no complications or maternal or fetal factors that increase the risk of complications, can seek prenatal and labor and delivery care from many types of health care practitioners beyond gynecologists and obstetricians.[8] Ensuring women have access to prenatal care is critical to improving the health and well-being of mothers and infants. One strategy used by many states to increase the number of providers of low-risk maternal care is allowing full practice authority for certified nurse-midwives, which allows them to provide care as independent providers.

**RECOMMENDATION 3.5:**
Full Practice Authority for Certified Nurse-Midwives

While many women have mental health- and substance use-related needs during pregnancy, these needs may not be identified and adequately treated.[16–18] In North Carolina, most pregnant and postpartum women are screened for depression and substance use; however, services for those who screen positive vary widely.[19,20]

**RECOMMENDATION 3.6:**
Standardize Screening and Treatment for Perinatal Mental Health and Substance Use

**RECOMMENDATION 3.7:** Expand Perinatal Access to Mental Health Services

Efforts to improve health care typically focus on improving access to care and quality of care. Quality improvement (QI) activities involve analyzing current systems and processes for areas where changes could lead to

improved outcomes and can happen at the state, regional, payor, health care system, practice, and individual provider level. Although QI has become a standard part of health care over the past 30 years, QI efforts have not been widely used to address the disparities seen across health care measures.[3] The increase in maternal mortality in the United States, the slow rate of improvement in infant mortality, and the large disparities in outcomes for women and infants of color all point to the need for quality improvement efforts focused on perinatal care.

**RECOMMENDATION 4.1:**
Collect and Report Data on Maternal and Infant Outcomes by Race and Ethnicity

**RECOMMENDATION 4.2:**
Engage Insurers in Quality Improvement Efforts that Address Racial and Ethnic Disparities in Care

**RECOMMENDATION 4.3:**
Engage Birthing Facilities in Quality Improvement Efforts to Address Racial and Ethnic Disparities in Care

Because of the potential for improved health outcomes and patient satisfaction, patient and family engagement has emerged as a critical strategy for improving the performance of our health care system. Creating opportunities throughout health care organizations for patients and family members to influence decisions, such as through patient and family advisory councils, can help ensure health care organizations are meeting the needs of the communities they serve.

**RECOMMENDATION 4.4:**
Patient and Family Advisory Councils

**RECOMMENDATION 4.5:**
Align Perinatal Care Regional Maps with Medicaid Transformation Maps

## POSTPARTUM CARE

Improving maternal and infant outcomes does not end with delivery. While healthy birth outcomes are a critical step, they are not the end of the journey for women, infants, and families. Children who are born preterm, low birth weight, or with other health challenges often have lengthy neonatal intensive care unit (NICU) stays. Families with infants in the NICU often experience heightened stress and anxiety both during and after their infant's stay in the NICU.[21] Parent navigators can help parents understand how the NICU works, what to expect, and how to advocate for their infants, both in the hospital and after they go home. Parents who have worked with NICU parent navigators report lower levels of stress, depression, and anxiety; increased confidence and well-being; and feel more empowered to interact with and care for their infants.[22]

**RECOMMENDATION 5.1:**
Develop Parent Navigator Programs in Birthing Facilities

The weeks and months following birth are a critical period for families, setting the stage for long-term health and well-being. More than half of pregnancy-related maternal deaths occur after delivery, the majority of which are preventable.[23,24] However, many women go without health care after the 60-day postpartum period due to cost.[15]

**See Recommendation 3.1: Expand Access to Health Care Services**

## SUPPORT FOR PREGNANT WOMEN, INFANTS, AND THEIR FAMILIES

The health and well-being of women and infants begins in their families and communities, and is largely determined by the social and economic contexts in which they grow up, live, work, and age; the health behaviors that those contexts make easier or harder to perform[2]; and their physical environments. Community health workers can serve as vital members of a health care team to address health-related social needs.

**RECOMMENDATION 6.1:**
Use Community Health Workers to Support Pregnant Women in Their Communities

Workplace environments and activities have a tremendous impact on pregnant women and their infants. The availability of pregnancy and breastfeeding accommodations, paid family and sick leave, affordable childcare, and other benefits that support working mothers can improve health outcomes for women and babies.

**RECOMMENDATION 6.2:**
Implement Family-Friendly Workplace Policies

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The health and well-being of North Carolina's mothers and infants determines the health of the next generation of North Carolinians. Unfortunately, data show that many women and infants in North Carolina have poor health outcomes. While infant mortality has been slowly improving over the past 20 years in North Carolina to 6.8 deaths per 1,000 live births in 2018, infants in North Carolina are still more likely to die than those in 39 other states.[1,2] Conversely, over the last 20 years, maternal mortality has been increasing steadily in the United States, despite the fact that more than half of pregnancy-related deaths are preventable.[3]

While maternal and infant outcomes should be improved for all, women and infants of color are significantly more likely to have poor pregnancy and birth outcomes. African American infants have a 50% greater risk of dying in utero or being born preterm,[4] and are twice as likely to be born low birth weight and die in their first year of life than white infants in North Carolina.[5] Nationally, African American women are three to four times more likely to die from pregnancy-related causes than their white peers.[6]

Healthy moms are more likely to give birth to healthy infants and are less likely to face negative health outcomes themselves. Research has shown that clinical care accounts for approximately 20% of health outcomes, while factors outside of health care account for 80% of health outcomes.[7] The health and well-being of women and infants begins in their families and communities, and is largely determined by the social and economic contexts in which they grow up, live, work, and age; the health behaviors that those contexts make easier or harder to perform; and their physical environments.[8]

Improving outcomes for women and infants requires addressing all the barriers they face to achieving positive health outcomes; however, this task force was convened to specifically address barriers to achieving optimal *clinical care* for women and infants. Therefore, the focus was on what can be done to improve outcomes by improving access to and quality of risk-appropriate clinical care. Positive outcomes for women and infants can be increased through access to high quality preconception (before pregnancy), prenatal (during pregnancy), labor and delivery, postnatal (after pregnancy), and interconception (between pregnancies) care.

## MATERNAL AND INFANT MORTALITY AND MORBIDITY IN THE UNITED STATES

### INFANT MORTALITY

Infant mortality is not only an indicator of maternal and child health, it is often looked to as an indicator of the health of a community.[16] This is because many of the factors that influence rates of infant mortality reflect health equity in a community. These include maternal health and educational status, prenatal care, and social and economic factors of the child's family. Every day in North Carolina two infants die. North Carolina's infant mortality was 1.2 time higher than the United States rate in 2017.[a,1] The United States infant mortality rate is 1.7 times higher than that of other developed countries.[9] The United States, and North Carolina specifically, have struggled to keep pace with the improvements in maternal and infant health that have occurred in other developed countries. Research shows that much of the increase in infant mortality in the United States compared to European countries is due to high rates of preterm births (and the health complications that stem from babies being born before they have fully developed) and high rates of infant mortality after the first month of life.[10]

> *While infant mortality has been slowly improving over the past 20 years in North Carolina to 6.8 deaths per 1,000 live births in 2018, infants in North Carolina are still more likely to die than those in 39 other states.*

The primary predictors of infant health are gestational age at birth and birth weight, both of which have many contributing factors.[11] Babies born to mothers who smoked or who were heavy consumers of alcohol while pregnant have higher mortality rates in their first year due to direct effects of neonatal exposure and environmental risk factors.[12-13] Babies born to younger (under 20 years) and older (40-54 years) mothers have higher rates of infant death. Maternal obesity is also associated with increased risk for infant death.[14-15]

**FIGURE 1** Top Causes of Infant Mortality in North Carolina, 2018

1. **BIRTH DEFECTS**
2. **PRETERM BIRTH AND LOW BIRTH WEIGHT**
3. **MATERNAL PREGNANCY COMPLICATIONS**
4. **INFECTIONS**
5. **BIRTH COMPLICATIONS**

*Source: State Center for Health Statistics, Division of Public Health, North Carolina Department of Health and Human Services. Vital Statistics: Volume II—Leading Causes of Death, 2018.*

*a Infant mortality is defined as the death of an infant before his or her first birthday. Infant mortality is measured as the number of infant deaths for every 1,000 live births.*

North Carolina ties for 40th in the country for infant mortality.[1] One reason for this is the large disparity seen in infant mortality for babies born to African American women, who are 2.4 times more likely to die in the first year of life than babies born to white women.[17] Infant mortality and the black-white infant mortality disparity are among the state's Healthy North Carolina 2030 key health indicators which will help guide state efforts to improve health and well-being over the next decade (See Figure 2). Along with the large disparities related to race, disparities in infant mortality exist for babies born to women in poverty and those who are uninsured, factors that are often directly related. Women in poverty experience more challenging life circumstances; have lower educational attainment; are more likely to have limited access to adequate food, transportation, and housing; and are more likely to be uninsured than those not experiencing poverty. These factors result in a higher prevalence of poor health for this population. Women in poverty and those who are uninsured are also more likely to have limited access to health care services. Even though Medicaid covers prenatal care and births for low-income uninsured women, birth outcomes and subsequent infant mortality are not fully addressed by the care they receive during pregnancy because of the many social and health barriers these women face prior to becoming pregnant.[18]

## MATERNAL MORTALITY

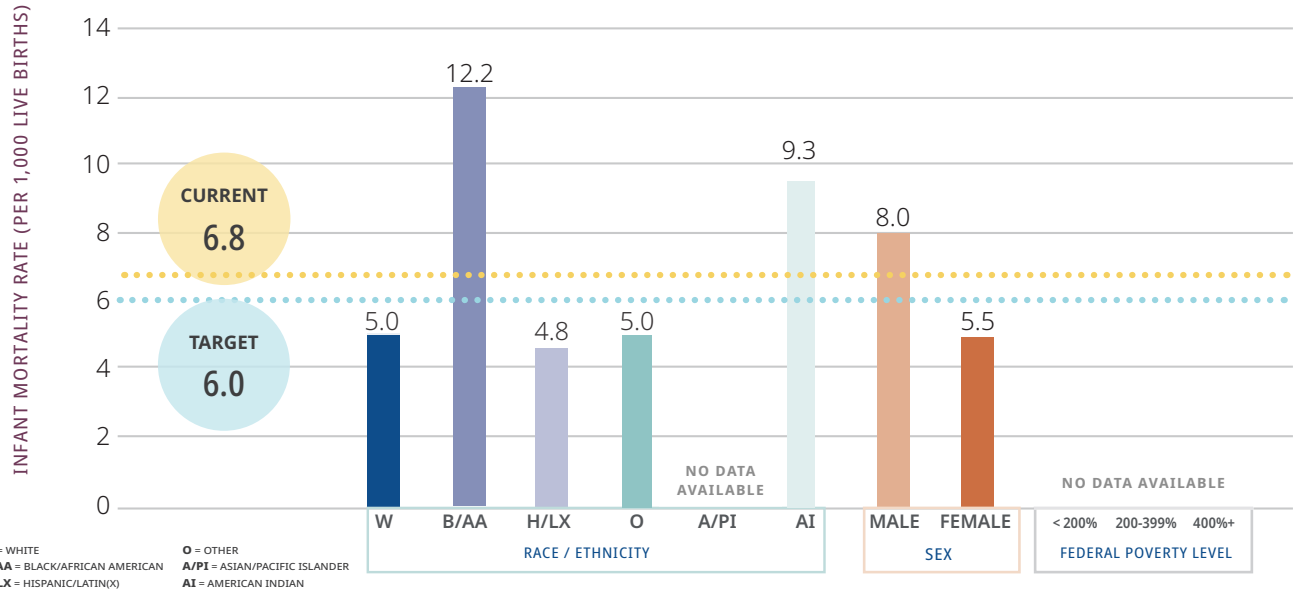
Over the last 20 years, maternal mortality and pregnancy-related deaths have been increasing in the United States, despite the fact that more than half of pregnancy-related deaths are preventable.[b,19] Rates of maternal mortality in the United States are three times greater than those of European countries. When ranked among 184 countries, the US ranks 46th in the company of Kazakhstan, Uruguay, and Oman.[20] From 2013-2017, the United States maternal mortality rate was 29.6 maternal deaths per 100,000 births, which equates to approximately 1,100 deaths per year.[21] In North Carolina in the same time period, there were 27.6 deaths per 100,000 births, which would equate to approximately 33 maternal deaths in 2017.[21] While North Carolina's maternal death rate is slightly better than the US average, 35 countries around the world have rates below 10 maternal deaths per 100,000 births.[20]

> *Over the last 20 years, maternal mortality and pregnancy-related deaths have been increasing in the United States, despite the fact that more than half of pregnancy-related deaths are preventable.*

## MATERNAL MORBIDITY

For every woman who dies of pregnancy-related causes, an estimated 20 or 30 others experience acute or chronic morbidity.[22,23] The causes of maternal morbidity are complex and numerous, and therefore are difficult to accurately measure and define.[23] Maternal morbidity can be non-life threatening, or highly dangerous. Severe maternal morbidity (SMM) has been defined as having one or more life-threatening complications of pregnancy during the pregnancy or within 42 days of the end of pregnancy.[24] Rates of SMM have been on the rise, likely due to increases in maternal age, pre-pregnancy obesity, preexisting medical conditions, and cesarean deliveries.[25]

**FIGURE 2** Infant mortality rates across populations in North Carolina and distance to 2030 target,




*b Maternal mortality rates include both maternal death and pregnancy-related deaths. Maternal death is the death of a woman while pregnant or within 42 days of the end of of pregnancy, regardless of the duration of pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. The number of maternal deaths per 100,000 live births is known as the maternal mortality rate. Pregnancy-related deaths includes deaths during pregnancy or within one year of the end of pregnancy from a pregnancy complication or the aggravation of an unrelated condition by the physiologic effects of pregnancy.*

*For every woman who dies of pregnancy-related causes, an estimated 20 or 30 others experience acute or chronic morbidity.*

Pregnancy complications are health problems that occur before or during pregnancy that impact the mother's and/or baby's health. Complications include anemia, blood pressure related issues such as preeclampsia, placental abruption, and gestational diabetes.[26] These conditions, coupled with maternal age, lifestyle factors, weight, preexisting health problems, and other factors can make a pregnancy high-risk.[27] Due to the increased likelihood of problems during pregnancy, women deemed high-risk often require specialized care to attend to threats to maternal and fetal well-being.[27,28]

## DISPARITIES IN MATERNAL AND INFANT OUTCOMES

The overall rates of maternal and infant mortality in North Carolina mask significant racial disparities. Infants born to African American and American Indian women are 2.4 and 1.9 times, respectively, more likely to die in the first year of life than babies born to white women.[17] Maternal mortality rates in the United States are more than three times higher for African American women than non-Hispanic white women and twice as high for American Indian women.[33]

In 2016, nearly a third of pregnant women in North Carolina did not receive prenatal care in their first trimester.[c,48,49] Those who did not receive care are disproportionately women of color.[d,41,42] African American infants are more likely than other infants to be born low birth weight when compared to all other races and ethnicities.[50] As the largest cause for infant mortality in North Carolina, prematurity and low birth weight accounted for 19.6% of infant deaths in 2017.[51] African American infants are most likely to die due to prematurity and low birth weight (See Table 1).[51]

**TABLE 1** Infant Deaths Caused by Prematurity and Low Birthweight, North Carolina, 2017

| RACE/ETHNICITY | INFANT DEATH CAUSED BY PREMATURITY AND LOW BIRTHWEIGHT |
|---|---|
| AFRICAN AMERICAN, NON-HISPANIC | 25.5% |
| HISPANIC | 22.6% |
| OTHER, NON-HISPANIC | 20.5% |
| AMERICAN INDIAN | 15.0% |
| WHITE, NON-HISPANIC | 12.3% |

*Source: North Carolina State Center for Health Statistics. North Carolina Infant Mortality Report: 2017 Infant Deaths by Cause of Death.*

While there is a tendency to attribute racial and ethnic disparities to differences in behaviors or risk factors, such factors do not account for the significantly increased risk for poor outcomes borne by women and infants of color. Even for women of color who attain a higher socioeconomic status, pregnancy-related outcomes are worse than those for white women at lower socioeconomic levels.[46] On top of the "weathering" that African American women's bodies experience through the stress of discrimination, research shows that African Americans who increase their socioeconomic status may face an increase in these negative health effects through increased experiences of acute discrimination as they work and live in predominately non-Hispanic white environments.[47]

*Even for women of color who attain a higher socioeconomic status, pregnancy-related outcomes are worse than those for white women at lower socioeconomic levels.*

Pregnant women of color have a greater chance of poor outcomes due to the drivers of health and increased social needs that communities of color are more likely to face, barriers in accessing health care, and the disparate treatment of women of color in health care settings.[34] The root cause of the health disparities seen in populations of color is the historical and continued structural and individual racism faced by these populations that has resulted in inequitable opportunities for healthy lives. Structural racism refers to the way public policies, institutional practices, cultural representations, and other social norms interact to generate and reinforce inequities among racial and ethnic groups.[8,35] Just as the exposure to chronic stress can negatively impair the health and well-being of children, the health and well-being of people of color living in the United States is negatively impacted by exposure to chronic high levels of stress. Data indicate that the experience of being a person of color in the United States exacts a physical price, a price that is highest for African American women.[36] The social, economic, and health impacts of structural racism on populations of color are numerous, including unemployment, fewer educational resources, housing and education policies that restrict access, harsher punishments in schools and the judicial system, intergenerational poverty, and the accumulated stress of discrimination regardless of socioeconomic status.[36]

*The root cause of the health disparities seen in populations of color is the historical and continued structural and individual racism faced by these populations that has resulted in inequitable opportunities for healthy lives.*

*c Prenatal care utilization is measured through the Kotelchuck Index, which gathers data from state birth certificate records. Specifically, the index records the month of an initial prenatal care visit, the number of prenatal care visits that an expectant mother has, and the gestational age of the baby at delivery.*

*d African American women, Hispanic women, and American Indian women are less likely to receive early prenatal care than their white counterparts (61.4%, 58.0%, and 61.8% respectively compared to 75.8% in the white population).*

Studies show that implicit bias in health care delivery may prevent African American women from receiving sufficient patient education in the prenatal period about risks to maternal and fetal health[37] and may also contribute to African American women's increased risk of life-threatening conditions such as preeclampsia and postpartum hemorrhage.[38–40] Women of color are less likely to receive early prenatal care and may not have access to the same breadth of pregnancy-support programs as their white counterparts.[41,42] This may be attributable to implicit bias in health care and the lower availability of and/or barriers to access to ancillary prenatal care services such as child birth education, mental health care, oral health care, and breastfeeding support in under-resourced communities of color.[37] Women of color are also more likely to live in communities that have fewer educational resources and employment opportunities due to historical segregation through housing and education policies. These socioeconomic factors have a direct impact on birth outcomes and maternal and infant mortality and contribute to the disparate birth outcomes we continue to see for women and babies of color[37]

Additionally, the historic injustices of segregated hospitals, unethical research practices (e.g. Tuskegee syphilis study), and eugenics (e.g. forced sterilization) have resulted in a lack of trust in health care institutions in many communities of color. Today, we see an underrepresentation of many minority groups in the health professions[43] and lower quality of care for people of color (e.g. receiving less information from health care providers, less cancer screening and vaccinations in adults, and more challenges getting appointments and care quickly).[44,45] These examples begin to illustrate the widespread social, economic, and health impacts of structural racism on populations of color.

## ECONOMIC IMPACT OF MATERNAL AND INFANT MORTALITY AND MORBIDITY

Research on the cost of maternal mortality and morbidity is limited. However, recent findings suggest that the cost of a high-risk pregnancy is more than double the costs associated with a normal pregnancy.[29] Preeclampsia alone costs hospital systems over $1 billion annually.[30] A study of the cost of gestational hypertensive disorders in California found that pregnancy-related hypertensive disorders added $226 million over one year, with $106 million borne by the state's Medicaid program.[31] In addition to the costs borne by hospitals and state governments, women and their families directly incur high costs of treatment for these conditions, which may be compounded by lost time from work. The cost of a preterm birth is estimated to be $51,600/birth,[32] or approximately $615 million per year in North Carolina, including medical care (beyond what would be expended for a full-term birth), early intervention services, special education services, and lost household and labor market productivity. [f]

## THE TASK FORCE ON DEVELOPING A PERINATAL SYSTEM OF CARE

The Child Fatality Task Force (CFTF)[g] proposed a study bill to the North Carolina General Assembly (NCGA) to develop a risk-appropriate perinatal system of care in the state. Signed into law in June 2017, Session Law 2018-93 tasked the North Carolina Division of Health and Human Services (NC DHHS) with studying seven issues surrounding the state's ability to provide women with timely and equitable access to high-quality, risk-appropriate maternal and neonatal care:

1. The complexity levels of care currently being provided by all delivering hospitals in caring for birth mothers and newborns;
2. How current systems of referral and transport to different facilities and specialty providers based on patient risk are being managed;
3. Disparities in access to risk-appropriate maternal and hospital care;
4. Service gaps;
5. Issues that impact the ability to most appropriately match patient need with provider skill;
6. Recommendations for actionable steps that can be taken in North Carolina to best ensure that pregnant women receive quality prenatal care and that mothers and newborns are cared for in a facility that can meet their specific clinical needs; and
7. Any other issues the Department deems relevant to this study. [h]

In 2016, the Women's Health Branch of NC DHHS, in collaboration with its many partners, released a 12-point Perinatal Health Strategic Plan to address infant mortality, maternal health, maternal morbidity and mortality, and the health status of women and men of child bearing age.[52] The plan was developed based on a framework of closing the black-white disparity gap in birth outcomes that proved to be applicable to all populations.[37,53] The 12-point plan includes three overarching goals: improving health care for women and men, strengthening families and communities, and addressing social and economic inequities. This task force was also charged with studying goal 3E of the plan, which states:

**Goal 3E:** Ensure that pregnant women and high-risk infants have access to the risk-appropriate level of care through a well-established regional perinatal system.

- Decrease the percent of Very Low Birth Weight (VLBW) and high-risk babies who are born at Level 1 and Level 2 hospitals.
- Define, identify, and promote centers of excellence for vaginal birth after cesarean (VBAC).
- Assess the levels of neonatal and maternity care services for hospitals using the consensus recommendations of the American Academy of Pediatrics (AAP), the American College of Obstetricians and Gynecologists (ACOG), and the Society for Maternal-Fetal Medicine (SMFM).
    - North Carolina's current criteria for assessing the levels of neonatal and maternity care services for hospitals are outdated and do not reflect current best practices.[53]

*f North Carolina Institute of Medicine Calculation using data from the State Center for Health Statistics. Number of preterm births in North Carolina in 2017= 9.93% of all births preterm (US average) * 120,099 births in North Carolina Cost of preterm births = Number of preterm births in NC (11,925) * $51,600/preterm birth = $615,372,864 includes medical care, early intervention services, special education services, and lost household and labor market productivity.*

*g The Child Fatality Task Force is a North Carolina General Assembly study commission that examines the causes of child death and makes recommendations to the governor and General Assembly.*

*h 2018-93 NC Sess Laws. HB 741*

The NCIOM Task Force on Developing a Perinatal System of Care was convened in partnership with the North Carolina Division of Public Health and NC DHHS to respond to Session Law 2018-93 and Goal 3E of North Carolina's Perinatal Health Strategic Plan. This task force met a total of 11 times throughout 2018-2019 and developed actionable and evidence-based recommendations outlining a process for implementing a regionalized and risk-appropriate perinatal system of care in the state. Additionally, the task force crafted recommendations that aim to use a regionalized and risk-appropriate perinatal system of care approach as a tool for decreasing the number of infant and maternal mortality and morbidity occurrences in the state, and the subsequent disparities that lie within them.

In developing their approach to the charge laid before them, task force members determined that direct action is required to address the stark differences in outcomes for women and infants of color and the causes of these disparities. Research has shown that preconception and prenatal factors contribute significantly to the increased risk of poor outcomes for women of color.[54] Therefore, while the task force developed recommendations to ensure that all women receive quality perinatal care, they spent considerable time exploring strategies that have been shown to improve outcomes for women and infants of color. Given the charge to develop a risk-appropriate perinatal system of care, the task force focused on evidence-based clinical care strategies to address the high preterm birth and low birth weight rates among African American and American Indian women in North Carolina. The task force members also determined that, although their primary focus was on improving clinical care, non-clinical drivers of health have such a profound impact on maternal and infant outcomes that they would be remiss to not to acknowledge them. Therefore, the task force also explored ways to address women's health-related needs that can impact maternal and infant morbidity and mortality.

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*Maternal and neonatal levels of care designations for birthing centers and perinatal regionalization are nationally recognized, evidence-based strategies to improve maternal and perinatal outcomes.*

## INTRODUCTION

Maternal and neonatal levels of care designations for birthing centers and perinatal regionalization are nationally recognized, evidence-based strategies to improve maternal and perinatal outcomes. They improve outcomes, particularly infant mortality, by establishing coordinated systems among birthing facilities that provide different levels of maternal and neonatal care (See Appendix C and E for details on levels of care). Such systems rely on the categorization of birthing facilities according to the services they offer to mothers and infants, with Level I facilities providing care for low-risk pregnant women and well-newborn nurseries for low-risk infants. As the level increases, so does the ability of the birthing facility to provide more specialized care and technology to care for mothers and infants with higher needs. Perinatal regionalization builds on the levels of care designation by establishing systems that link lower level facilities to higher level facilities and guidelines for transfers between levels when mothers or infants need more specialized care. Such systems work to coordinate care and ensure that pregnant women and infants are cared for in "risk-appropriate" settings. While North Carolina has a system for assessing birthing facilities' level of care for infants, the guidelines were established in 1996[i] and do not match national best practice guidelines. Further, North Carolina does not have a system for assessing birthing facilities' maternal level of care. North Carolina has had perinatal regions since they were first promoted as a best practice in the 1970s, but the regions vary widely in the amount of coordination, outreach, education, and training they offer, with most regions having little formal support to improve maternal and infant outcomes.[1]

## ESTABLISHING UNIFORM AND NATIONALLY ACCEPTED GUIDELINES FOR NEONATAL AND MATERNAL LEVELS OF CARE

### HISTORY

In a 1976 March of Dimes Committee on Perinatal Health report entitled *Toward Improving the Outcome of Pregnancy*, the concept of level of care was introduced to designate a birthing facility's capability to provide care and also its ability to work within a regionalized system of care.[2] The latter designation is exemplified by the expectation that all lower level of care birthing facilities have rehearsed transfer of care patterns in place with nearby facilities in case a patient requires a higher level of care.[3] The levels of care system was built on a framework where risk assessment is a standard part of prenatal care. Since some adverse pregnancy outcomes will occur in low-risk pregnancies all providers should have the skills needed to identify and manage unexpected problems, and all women and infants should receive high quality care, regardless of the level of care needed.[4] Nationally, since the release of the March of Dimes report, states have had various responses to regionalizing neonatal and maternal care.

Most of the work on perinatal regionalization and levels of care has focused on infant care and preventing infant mortality; even in the context of maternal transfer requirements to risk-appropriate levels of care, the underlying rationale for such transfers was generally to ensure better neonatal outcomes.[2] This singular focus on infant outcomes may have contributed to the lack of attention to negative health outcomes for pregnant women, particularly the striking disparities in the maternal mortality and morbidity rates between white women and women of color.

*In recent years, however, models of risk-appropriate regional perinatal systems of care have been expanded to include maternal levels of care, in addition to neonatal levels of care.*

In recent years, however, models of risk-appropriate regional perinatal systems of care have been expanded to include maternal levels of care, in addition to neonatal levels of care. This idea, outlined and endorsed by the American College of Obstetricians and Gynecologists (ACOG) and the Society for Maternal-Fetal Medicine (SMFM) for maternal levels of care, and by the American Academy of Pediatrics (AAP) for neonatal levels of care, puts a system in place for birthing facilities to determine their level of maternal and/or neonatal care based on uniform and nationally accepted criteria. These national standards emphasize regionalization of care to foster collaboration among facilities—including the sharing of data to improve outcomes and educational opportunities among facilities within the specified region to compensate for varying resources.

*i 10A NCAC 13B .4305*

The AAP and ACOG in partnership with the Society for Maternal-Fetal Medicine (ACOG/SMFM), each developed a set of nationally recognized and uniform guidelines for levels of neonatal and maternal care, respectively to provide a standardized method of defining neonatal and maternal levels of care. These guidelines serve as best practices for establishing, coordinating, and implementing regionalized and risk-appropriate perinatal care.[5,6]

*A regional perinatal system of care improves coordination of care and improves outcomes by moving high-risk births to high-volume, highly specialized birthing facilities, thereby reducing infant mortality and unnecessary duplication of expensive services.*

## CURRENT RISK-APPROPRIATE REGIONAL PERINATAL SYSTEM OF CARE GUIDELINES

The AAP and ACOG/SMFM guidelines for neonatal and maternal care, correspondingly, range from Level I (least complex) to Level IV (most complex).[5,6] Implementing uniform and nationally accepted level of care guidelines presents many advantages for birthing facilities and others providing care to women and infants. The goal of instituting standardized levels of care and regionalization is to reduce maternal and infant mortality and morbidity. Developing a risk-appropriate regional perinatal system of care "enhances the ability of women to give birth safely in their communities while providing support for circumstances when higher level resources are needed."[5] A risk-appropriate regional perinatal system of care "ensures access to care for all patients of a given population (usually based on geography); identifies risks early and directs patients to facilities best able to provide necessary care; provides linkage to appropriate levels of care; ensures adherence to standards of care, continuity, and comprehensiveness; and promotes efficient use of resources."[4] A regional perinatal system of care improves coordination of care and improves outcomes by moving high-risk births to high-volume, highly specialized birthing facilities, thereby reducing infant mortality and unnecessary duplication of expensive services.[4]

By establishing and aligning separate but congruent maternal and neonatal levels of care, birthing facilities are able to more efficiently assess whether they have the capabilities to provide risk-appropriate care for the mother and/or baby, or if transfer(s) to a higher level of care is needed. Doing so also provides additional benefits for rural states by reinforcing the need to keep lower level of care birthing facilities providing risk-appropriate care open as they provide, in many areas, the only local option for labor and delivery. In North Carolina there are 35 counties that do not have any providers or facilities delivering babies.[7] Additionally, while the overarching goal for a regionalized perinatal system of care is to have infants and mothers who have higher risk factors born and treated at higher level of care facilities, low- to moderate-risk mothers and infants experience better outcomes if they are able to stay in their communities where their support systems are located.

Additionally, AAP and ACOG/SMFM guidelines expand upon the basic requirements of neonatal and maternal birthing facilities to have certain capabilities and provider types. Both maternal and neonatal guidelines define their highest level of care facilities as regional perinatal centers (Level III/Level IV). Regional perinatal centers are tasked with establishing rehearsed transfer (and back-transfer [j]) patterns between lower and higher level of care facilities in their region, leading quality improvement efforts, sharing data to improve outcomes, and providing education outreach to facilities in their region.[5,6]

## MATERNAL AND NEONATAL LEVELS OF CARE IN NORTH CAROLINA

North Carolina hospital licensure rules, located in the North Carolina Administrative Code (NCAC), define and guide perinatal services in the state. During pregnancy, obstetric and neonatal services are terms used to describe care given to the mother and newborn, respectively. Required capabilities for maternal care in North Carolina birthing facilities are defined in the NCAC as "any normal or high-risk services provided by an acute care hospital (birthing facility) to the mother and/or fetus during pregnancy, labor, delivery, and to the mother after delivery."[k] Currently North Carolina does not have a level of care system for assessing birthing facilities' capabilities to care for pregnant and delivering women. In contrast, required capabilities for neonatal care in North Carolina birthing facilities are described in a "levels of care" design. Each level outlines the necessary and minimum capabilities a birthing facility must have in order to apply and operate under that level of care. North Carolina levels of neonatal care range in order from lower to higher level capabilities with all birthing facilities having the option to be designated as Level I, Level II, Level III, or Level IV facilities. However, the guidelines were established in 1996[l] and do not match national best practice guidelines. (See Appendix D and E for North Carolina Levels of Care and national standards.) To ensure birthing facilities at each level of care are meeting current best practices, the state should adopt the uniform and nationally recognized standards for neonatal and maternal levels of care developed by the AAP and ACOG/SMFM. Therefore, the task force recommends:

### RECOMMENDATION 2.1

#### Adopt National Maternal and Infant Risk-Appropriate Level of Care Standards

a. The North Carolina Division of Health Services Regulation (NC DHSR) should work with the Division of Public Health to review and update:

   1. North Carolina Administrative Code 10A NCAC 13B .4301-04 (maternal services) to reflect the uniform, nationally recognized, and evidence-based guidelines for regionalized and risk-appropriate maternal levels of care offered by ACOG/SMFM;

*j Back-transfer is the process of transferring mother and/or baby back to a lower level of care facility once specialized care needs are reduced.*

*k "Acute care facilities" and "birthing facilities" will be used interchangeably throughout this report, as will "level of neonatal care" and "level of neonatal service."*

*l 10A NCAC 13B .4305*

2. North Carolina Administrative Code 10A NCAC 13B .4305-08 (neonatal services) to reflect the uniform, nationally recognized, and evidence-based guidelines for regionalized and risk-appropriate neonatal levels of care offered by the AAP. The NC DHSR should ensure that these rule updates do not conflict with other North Carolina Administrative Codes. If there are conflicting rules, they should be included in and mirror this update;

b. The Medical Care Commission should approve updates to North Carolina Administrative Code 10A NCAC 13B .4301-08; and

c. Once the rulemaking process is complete, the NC DHSR should update the hospital licensure form to include a section that will allow for all facilities submitting the form to indicate their highest level of maternal care services available.

## IMPLEMENTING NATIONAL MATERNAL AND INFANT RISK-APPROPRIATE LEVEL OF CARE STANDARDS

One of the beneficial aspects of the AAP and ACOG/SMFM levels of care system is the availability of a tool that allows a facility to objectively assess its capabilities and determine its true level of care. Through a partnership led by the Centers for Disease Control and Prevention (CDC), the Levels of Care Assessment Tool, or LOCATe, was developed to standardize assessments done by participating facilities on their neonatal and maternal levels of care according to AAP and ACOG/SMFM guidelines. While this tool was neither designed nor recommended to be regulatory in nature, it does offer a standardized tool to develop a baseline of birthing facilities' current and actual capabilities to provide risk-appropriate care.[8] Further, because this tool allows birthing facilities to assess both neonatal and maternal levels of care, it continues to reinforce the thinking about these two categories of care as separate but complementary.

*The Levels of Care Assessment Tool, or LOCATe, was developed to standardize assessments done by participating facilities on their neonatal and maternal levels of care according to AAP and ACOG/SMFM guidelines.*

While use of the CDC LOCATe tool can be done by birthing facility staff, data has shown if the right teams are not in place to perform the assessment, the results will vary in accuracy.[9] North Carolina utilizes federal Maternal and Child Health Block Grant funding to support the Perinatal/Neonatal Outreach Coordinator program, which funds perinatal outreach coordinators (PNOCs) at two North Carolina regional perinatal care birthing facilities (see PNOC section on Page 23). One of the PNOCs' main goals in their first year was to receive training on utilization of the LOCATe tool and help birthing facilities in their region assess what levels of care they are providing according to the national level of care standards. In the pilot program, the PNOCs found inconsistencies in the data birthing facilities were reporting as their (self-designated) levels of care and the levels of care identified when the LOCATe tool was used in partnership with a PNOC and a team of birthing facility personnel. The PNOCs reported that they experienced difficulties in obtaining the correct inputs for assessments because they needed to coordinate with multiple personnel to gather all the necessary information. Adjusting to this situation, the PNOCs started requesting in their introductory email that the birthing facility identify an assessment team comprised of at least one OB provider, neonatal provider, OB manager, neonatal manager, and data manager. They found that this group of personnel was necessary to gather all the information needed for an accurate level of care assessment. Since the pairing of the CDC LOCATe tool with a robust assessment team produced more accurate assessments, the task force recommends:

### RECOMMENDATION 2.2:

### Form Multi-Disciplinary Assessment Teams to Utilize CDC LOCATe Tool

The North Carolina Healthcare Association should encourage its members to establish maternal and neonatal level of care "assessment teams." These teams should:

a. Utilize the Centers for Disease Control and Prevention LOCATe tool as an assessment measure to establish their self-identified maternal and neonatal levels of care;

b. If applicable, work with their designated perinatal and neonatal outreach coordinator(s) to conduct and review the facility's levels of care established through self-assessment; and

c. If North Carolina Administrative Code 10A NCAC 13B .4305 has been updated, report their findings to birthing facility personnel responsible for filling out the annually required hospital licensure form.

## EXTERNAL VERIFICATION TO ENSURE QUALITY AND RISK-APPROPRIATE CARE

Under current North Carolina regulations, birthing facilities self-assess their neonatal level of care capabilities, and NC DHSR approves or denies the birthing facility application. NC DHSR does not currently verify the capabilities of birthing facilities. In 2015 Texas mandated external verification of birthing facilities' self-assessment of the levels of care they are able to provide as part of their work to reduce maternal and infant mortality and morbidity. In order to verify that birthing facilities can provide the level of care they say they can through self-assessment, the AAP and ACOG/SMFM have created a process that includes an external survey team to verify birthing facilities' level of care. In Texas, the AAP external verification team found that 30-40% of birthing facilities that self-designated their neonatal intensive care unit (NICU) did not meet the criteria for that level according to AAP standards.[9] In interviews with staff at facilities with incorrect level of care designations, key clinical personnel varied in their understanding of the level of care their facility could provide.[9] The AAP formed a task force consisting of neonatologists and experienced nurses and created a formal NICU external verification program modeled off of the American College of Surgeons' (ACS) trauma center and children's surgery verification tools.[9]

*The AAP external verification program is equipped to review Level II – Level IV NICUs, with a survey team consisting of experienced and credentialed neonatologists, neonatal nurses, and pediatric surgeons who are in active practice.*

The AAP external verification program is equipped to review Level II – Level IV NICUs, with a survey team consisting of experienced and credentialed neonatologists, neonatal nurses, and pediatric surgeons who are in active practice.[10] Free from any conflict of interest with the facility they are verifying, survey teams also receive training by the AAP leadership team before they are qualified to perform verifications.[10] There are currently 3 steps in the AAP NICU external verification process: 1) Submitting a preliminary application which includes the facility's desired level of care; 2) Completing a pre-review questionnaire; and 3) Hosting the survey team on-site for a visit and verification.[10] Step 2 in this process serves a very important role as this questionnaire provides the AAP with a "Program Plan consisting of a NICU profile and code requirements."[11] A NICU profile provides the AAP with identifying information for that specific facility, including its capabilities and personnel. By offering this information, the process is more effective, and it ensures the surveyors selected have the appropriate clinical experience to perform in the surveying capacity and are free from conflicts of interest.[10] Providing code requirements beforehand also contributes to the efficiency of this process by giving the surveyors a benchmark of the facility's code requirements and its ability to comply with them. In the short time it has been performing these verifications, the AAP has found that requiring facilities to complete a program plan has been highly beneficial in terms of fostering multidisciplinary care collaboration.[9] Additionally, just completing the program plan itself can assist birthing facilities in identifying gaps and/or a lack of resources that they do not know exist, as it requires facilities and hospital leadership to seek out the right personnel to identify all components of their NICU programs.[9]

ACOG/SMFM also led a partnership including the CDC, the National Perinatal Information Center, the Arizona Perinatal Trust, and clinicians representing the American Academy of Family Physicians, the American College of Nurse-Midwives, and the Association of Women's Health, Obstetric, and Neonatal Nurses to develop an external verification program that certifies that a facility's maternal level of care is in alignment with ACOG/SMFM guidelines. This program, inspired by the Texas law[m] requiring Level II – Level IV maternal level of care facilities to have a survey prior to applying for state licensure and qualifying to receive Medicaid reimbursement funds, focuses on collaboration to improve maternal outcomes.[12] A team comprised of members from a variety of relevant professional associations was tasked with developing this program, and to ensure it could be tailored to specific needs they "pilot-tested the verification program with hospitals that were geographically and demographically diverse and had different maternal services."[12,n] This program also offers a free confidential consultation service for any identified concerns.[13] As this Texas law is not scheduled to take effect until August 31, 2020, there are currently no outcome data available to report.

What distinguishes the AAP and ACOG/SMFM level of care guidelines from other level of care guidelines for birthing facilities is the tools they make available to objectively assess and externally verify a facility's actual level of care. To realize the full scope of advantages derived from implementing a regionalized perinatal system of care, the state should ensure birthing facilities are correctly identifying their level of care through external verifications. Therefore, the task force recommends:

### RECOMMENDATION 2.3:

#### Require External Verification of Birthing Facilities' Maternal and Neonatal Level of Care Designations

The North Carolina General Assembly should implement legislation requiring:

a. External verification every 3 years by staff as designated by the North Carolina Division of Health Services Regulation, for any birthing facility in North Carolina that self-identifies as providing Level I maternal or neonatal care;

b. External verification every 3 years by staff as designated by the North Carolina Division of Health Services Regulation, of facilities that have self-identified as maternal and/or neonatal Level II, Level III, and Level IV facilities.

    1. External Neonatal Levels of Care Verification should be conducted by the American Academy of Pediatrics NICU Verification Program.

    2. External maternal care Level II, III, or IV verification should be conducted by the American College of Obstetricians and Gynecologists/Society for Maternal-Fetal Medicine Levels of Maternal Care verification program.

## SUPPORT NEEDED TO FACILITATE A RISK-APPROPRIATE REGIONAL PERINATAL SYSTEM OF CARE

Under the AAP and ACOG/SMFM uniform guidelines for neonatal and maternal levels of care, Level IV facilities not only provide care, but also act as regional leaders. Under the AAP guidelines, a Level IV regional NICU must facilitate transport and provide outreach education.[2] Under the ACOG/SMFM guidelines, a Level IV Regional Perinatal Health Care Center must provide perinatal system leadership, defined as "facilitation of collaboration with facilities in the region, analysis and review of outcome and quality data, provision of outreach education, and assistance with quality improvement."[5] This type of leadership and support is critical to a well-functioning regional perinatal system of care.

*Under the AAP and ACOG/SMFM uniform guidelines for neonatal and maternal levels of care, Level IV facilities not only provide care, but also act as regional leaders.*

*m Tex. Admin Code §133.201-§133.210 (2018)*

*n Including: The Centers for Disease Control and Prevention; the National Perinatal Information Center; the Arizona Perinatal Trust; and clinicians representing the American Academy of Family Physicians, the American College of Nurse-Midwives, and the Association of Women's Health, Obstetric, and Neonatal Nurses.*

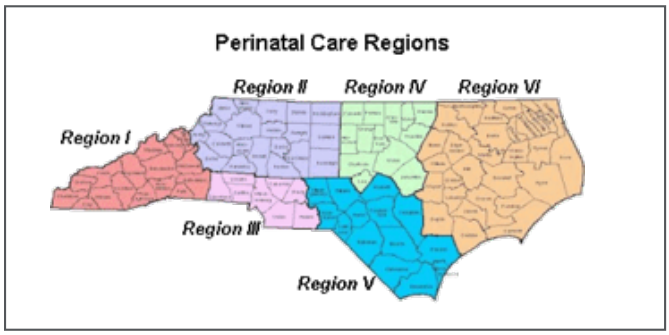
*North Carolina was one of the first states to develop a regional system of perinatal care in the mid-1970s after state perinatal regionalization was recommended in the March of Dimes Toward Improving the Outcome of Pregnancy report.*

North Carolina was one of the first states to develop a regional system of perinatal care in the mid-1970s after state perinatal regionalization was recommended in the March of Dimes Toward Improving the Outcome of Pregnancy report, a joint effort with ACOG, the American Medical Association, AAP, and the American Academy of Family Physicians.[14] In the beginning, perinatal regionalization was supported with funding from the North Carolina General Assembly.[15] From 1975-1980, funding for a pilot region was approximately $750,000 per year with approximately one-third of funding supporting professional education and organized systems communication, such as the work of a regional perinatal care program manager.[15]

Between 1975 to the early 2000s, this funding evolved into specific state appropriations to DPH that went to competitive grant funding that supported one neonatal and one perinatal person in each region to connect resources through education and training.[16] The grant funding came from state appropriations to North Carolina Division of Public Health (NC DPH), which then awarded competitive grants to one regional perinatal center in each of North Carolina's 6 perinatal regions. The grant supported the employment of a nurse to act as the outreach, education, and training coordinator, offered travel reimbursement for outreach coordinators, provided some financial support to hospital physicians who did education and training, and supported quarterly regional morbidity/mortality review conferences. The hospital receiving the grant donated space for the coordinator and regional education activities. The outreach coordinators provided a connection between public health efforts to improve women's health and hospitals caring for pregnant women and infants.

In the late 2000s, state funding for perinatal and neonatal outreach, education, and training coordinators was lost.[16] Without this staff to coordinate efforts for the region, most perinatal regions in North Carolina no longer have regional coordination, education, and training.[16] Although some hospitals, such as Vidant EastCare, have implemented communication centers for transfer, and other organizations, including North Carolina Area Health Education Centers and the Perinatal Quality Collaboration of North Carolina, have stepped in to provide some training, North Carolina has lost the formal system that once supported perinatal regionalization and a risk-appropriate system of care.[16]

The NC DPH currently funds two perinatal outreach coordinators (PNOCs), using funds from the state's federal Maternal and Child Health Block Grant at regional perinatal care birthing facilities in perinatal care regions IV and VI.[17] The goal of this program is to improve maternal and neonatal outcomes. One strategy being used is assessing each birthing facility's levels of neonatal and maternal care by using the CDC LOCATe tool.[18] Moving forward, the PNOCs will continue to perform this assessment duty as well as develop the necessary relationships between regional perinatal centers and all referring health care centers located within their designated region (and those outside of the state borders that patients are referred/transferred to). One goal of building these relationships is to ensure continuity of rehearsed transfer protocols and streamlined processes with the health care facilities in their designated region by working with their regional perinatal center's assessment team. Additionally, PNOCs will also develop and facilitate regional perinatal centers' responsibilities to provide perinatal and neonatal leadership, including the creation of a tool to monitor outcomes from referral and transport cases to utilize when providing quality improvement and other training to all facilities in the region.




*North Carolina's two regional perinatal outreach coordinators are one example of the support needed to implement the type of risk-appropriate regional perinatal system of care advocated for in the AAP and ACOG/SMFM uniform guidelines for neonatal and maternal levels of care.*

North Carolina's two regional PNOCs are one example of the support needed to implement the type of risk-appropriate regional perinatal system of care advocated for in the AAP and ACOG/SMFM uniform guidelines for neonatal and maternal levels of care. Perinatal and neonatal outreach coordinators perform 3 essential functions to facilitate the application of these guidelines: (1) Implementing a process to determine risk-appropriate levels of maternal and neonatal care; (2) Promoting the development of a proactive integration of risk-appropriate antepartum, intrapartum, and postpartum care; and (3) Educating providers on the latest evidence-based information to provide risk-appropriate care during antepartum, intrapartum, and postpartum periods.

To ensure birthing facilities in North Carolina are adequately coordinated and supported, regional perinatal health care centers and NICUs need the personnel to implement the education, outreach, and training components of their responsibilities as regional centers. Although this work originates from specific health facilities, the benefits are shared by all birthing facilities in the region and support the work and goals of NC DHHS; therefore, the task force recommends:

### RECOMMENDATION 2.4:

#### Re-establish North Carolina's Perinatal and Neonatal Outreach Coordinator Program

a. Funding for at least one perinatal and one neonatal outreach coordinator per regional perinatal center and one program coordinator should be provided by:

    1. The North Carolina General Assembly should allocate $1.25 million in recurring state appropriations to support half the cost of up to 10 perinatal and 10 neonatal outreach coordinator and roles;

    2. Regional perinatal centers should cover half the cost of their own perinatal and neonatal outreach coordinator positions so they can fulfill the duties of regional perinatal health care centers and neonatal intensive care units referred to by American College of Obstetricians and Gynecologists/ Society for Maternal-Fetal Medicine maternal level of care guidelines and American Academy of Pediatrics neonatal level of care guidelines.

b. The North Carolina Division of Public Health should administer state funding for perinatal and neonatal regional outreach coordinator positions, including outlining the duties and responsibilities of perinatal and neonatal regional outreach coordinator positions receiving state funding. Duties and responsibilities should include:

    1. Developing and fostering relationships between all referring health care centers located in their region.

    2. Working with health care center evaluation teams in their designated region to identify the most appropriate self-identified level of neonatal and maternal care.

    3. Developing management procedures and systems of referral for transport and back-transport to different facilities within their region.

    4. Developing relationships with all birthing facilities in their region to ensure they are best meeting quality, performance, and best practice standards outlined in North Carolina Administrative Code 10A NCAC 13B .4301-08 (when updated).

    5. Attending quarterly with all regional perinatal and neonatal coordinators to discuss lessons learned, best practices (i.e. relationship development), etc.

c. The North Carolina Healthcare Association should support perinatal and neonatal outreach coordinators by facilitating shared learnings, relationship development, and coordination among facilities by region.

## FACILITATING AN OUTPATIENT RISK-APPROPRIATE PERINATAL SYSTEM OF CARE

Although national guidelines recommend establishing relationships among birthing facilities to facilitate a risk-appropriate regional perinatal system of care, such a system does not account for the fact that most maternal care is provided in outpatient clinics.[8] While many prenatal care providers are linked to a local hospital where they have delivery privileges, this does not mean they are well connected with hospital and regional quality-improvement efforts. Just as women and infants will benefit as connections between birthing facilities providing different levels of care are improved and supported, they would also benefit from better connections between prenatal care providers, particularly between those providing low-risk prenatal care and those providing high-risk prenatal care or specialty care for pregnant women. Such connections will support the provision of risk-appropriate care throughout pregnancy. Focusing Regional Perinatal Health Care Center and NICU efforts only on birthing facilities limits the ability to improve outcomes for women and infants. Because much of the care provided to pregnant women occurs outside of birthing facilities, Regional Perinatal Health Care Centers and NICUs should support outreach and coordination among outpatient prenatal care providers; therefore, the task force recommends:

### RECOMMENDATION 2.5:

#### Support Outpatient Risk-Appropriate Perinatal System of Care

Regional Perinatal and Neonatal Outreach Coordinators, or staff from Regional Perinatal Health Care Centers and neonatal intensive care units, should engage with outpatient prenatal care providers to develop pathways to risk-appropriate outpatient care. Strategic partners in this work include, but are not limited to, the following: the North Carolina Division of Public Health, the North Carolina Medical Society, the North Carolina Healthcare Association, North Carolina private insurers and Prepaid Health Plans, and appropriate North Carolina health care professional associations. Methods of ensuring risk-appropriateness should include:

a. Appropriate risk assessment and risk selection across settings for perinatal care;

b. Written collaboration agreements to ensure timely, seamless transitions to higher levels of perinatal care when needed; and

c. Ready access to consultation when higher levels of care are needed.

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## INTRODUCTION

Increasing access to and receipt of quality prenatal care is a critical step to improving maternal and birth outcomes. Responding to this need, the Task Force on Risk-Appropriate Perinatal System of Care was charged with developing "recommendations for actionable steps that can be taken in North Carolina to best ensure that pregnant women receive quality prenatal care." The previous chapter provided recommendations about how to strengthen North Carolina's organization of perinatal health, with a particular focus on care provided in hospitals and the regional model of organization that has been endorsed by the American Academy of Pediatrics (AAP) and the American College of Obstetricians and Gynecologists (ACOG).[1] While the regional model of care is intended to help ensure that women have access to a well-integrated, risk-appropriate perinatal system of care, there remain structural, financial, and cultural barriers to care that must be eliminated in order to improve outcomes for women and infants.[1] This chapter addresses some of those barriers and provides recommendations to ensure that more women have access to care.

In North Carolina more than 800 infants and 33 mothers die each year.[2,3] For every woman who dies of pregnancy-related causes, an estimated 20 or 30 others suffer acute or chronic morbidities.[4] Preterm births and low birth weight are the leading causes of infant mortality in North Carolina. Adequate preconception and prenatal care are leading strategies to reduce infant mortality.[5] Similarly, more than 60% of pregnancy-related deaths have been found to be preventable and high-quality care before, during, and after pregnancy is one of the leading strategies for reducing maternal mortality.[6–8] Access to high-quality, consistent prenatal care is required in order to provide early and ongoing risk assessments, which are the cornerstone of developing a risk-appropriate perinatal system of care.

*A study of pregnancy-related deaths in North Carolina found that one in five maternal deaths were due to a lack of preconception care.*

## PRECONCEPTION CARE

A study of pregnancy-related deaths in North Carolina found that one in five maternal deaths were due to a lack of preconception care.[9] The American College of Obstetricians and Gynecologists (ACOG) and the American Society for Reproductive Medicine (ASRM) specifically recommend that care begin before pregnancy because "many chronic medical conditions such as diabetes, hypertension, psychiatric illness, and thyroid disease have implications for pregnancy outcomes and should be optimally managed before pregnancy."[10] The goal of well-care for women is to optimize their health, manage existing medical conditions, and counsel women about maintaining a healthy lifestyle, all of which improve outcomes for women and their infants if they become pregnant.[10] Additionally, health care visits for women of childbearing age provide an opportunity to ask women if they intend to get pregnant and provide counseling on how to maximize their opportunity for a healthy pregnancy if they do. Proper management of preexisting medical conditions (e.g., diabetes, asthma, high blood pressure) prior to pregnancy can reduce the chances of pregnancy-related complications.[10] Babies born to women who have received preconception health care are less likely to be born early (preterm), have low birth weight, or have birth defects or other disabling conditions.[11] In furtherance of their recommendation, ACOG supports basic health care coverage, including preconception care, for all women.[12]

In 2017, 80% of pregnant women in North Carolina reported having health insurance before they got pregnant.[o,13] The nearly one-in-five pregnant women who were without health insurance when they got pregnant[13] were less likely to receive the kind of routine well-care that optimizes outcomes for women and infants. Nationally, many states have increased health care coverage by expanding eligibility for Medicaid, the government-run program that provides health care coverage for eligible low-income residents.[14] Using the Medicaid expansion option and other provisions of the Affordable Care Act (ACA) of 2010, many states have reduced their uninsured rates from greater than 20% to less than 10%.[14] Medicaid covers many maternal, infant, and child preventive and routine medical care services. A study of infant mortality comparing states that expanded Medicaid eligibility and those that did not showed a significant decrease in infant mortality in expansion states. Expansion states demonstrated an average infant mortality decline from 2014 to 2016 of 5.9 per 1,000 live births while non-expansion states showed a slight increase from 6.4 per 1,000 to 6.5 per 1,000.[15] Declines of African American infant mortality rates were greatest, substantially reducing the disparity rate in Medicaid expansion states.[15] This could translate into 47 fewer infant deaths per year if North Carolina chooses to expand Medicaid.

A recent study of maternal mortality shows similar patterns. Expansion states showed a reduction in maternal mortality of 7.0 maternal deaths per 100,000 births in expansion states compared to non-expansion states. This difference is much more dramatic among African American mothers, with a difference of 16.3 fewer deaths per 100,000.[16] In North Carolina, Medicaid expansion would cover 400,000-600,000 residents, many of

o *Fifty percent reported being covered by private insurance prior to pregnancy, 24% by Medicaid, NC Health Choice or Medicaid for Pregnant Women, 9% by military health insurance or other health insurance.*

whom are women of childbearing age. Approximately 90% of the cost of expansion is borne by the federal government, with the state responsible for the remaining cost. Proposed legislation in the North Carolina General Assembly would cover the majority of state costs through hospital assessments.[14]

Access to and use of health care services before pregnancy can improve the health and well-being of mothers and improve birth outcomes for both women and infants, therefore, the task force recommends:

**RECOMMENDATION 3.1:**

Expand Access to Health Care Services

The North Carolina General Assembly should increase access to and utilization of health care services for uninsured residents.

*In North Carolina, approximately one in eight pregnant women did not receive early prenatal care services in 2018.*

## PRENATAL CARE

Prenatal care (care during pregnancy) is a critical component of the care provided to ensure the health and well-being of expectant mothers and their babies, particularly during the first trimester. Infants of mothers who do not receive prenatal care are more likely to face negative health outcomes, such as low birth weight and fetal death.[17] In North Carolina, approximately one in eight pregnant women did not receive early prenatal care services in 2018.[18]

The goals of prenatal care are to optimize the health of the woman and fetus, assess accurate gestational age, manage existing medical conditions, and counsel women about pregnancy and childbirth. For mothers, these visits are an invaluable opportunity for testing for hypertension, gestational diabetes, and other chronic conditions that put pregnant women at risk.[19] Prenatal care also provides an opportunity for substance use and behavioral health screenings and screening for social determinants of health such as stable housing and adequate food. These screenings facilitate treatment or referral for specialist care, and also ensure that pregnant women are connected to medical and social support systems designed to help them navigate their pregnancy safely and healthily.[19] In the absence of these services, women are at increased risk of life-threatening conditions such as preeclampsia and postpartum hemorrhage.[20–22] Additionally, without the risk assessments performed during prenatal care visits, a risk-appropriate system of perinatal care is not possible.[1]

Once a woman is pregnant, prenatal care should begin as soon as possible, ideally with the first visit occurring during the first trimester.[19] The United States Department of Health and Human Service's Office on Women's Health recommends monthly prenatal visits for the first and second trimester, and biweekly to weekly visits in the third trimester depending on the health of the mother.[23] Routine visits throughout the pregnancy ensure that the health and well-being of the mother and fetus are monitored, expectant mothers are screened for adverse conditions affecting pregnancy, and existing medical conditions are controlled.[24] Regular prenatal care can reduce the risk of pregnancy complications and reduce fetuses' and infants' risk for complications.[24]

Many types of health care practitioners provide prenatal care. In addition to obstetricians, women can seek prenatal care from family medicine doctors, nurse practitioners, certified nurse-midwives, and physician assistants. Services from these providers can be sought either in private clinics, hospital-based clinics, community health centers, or local health departments (LHDs).

### PAYING FOR PRENATAL CARE

Since the enactment of the ACA, prenatal care is covered by all ACA-compliant employer-sponsored and individual health insurance plans. In North Carolina, 49% of pregnant women report having private health insurance, military health insurance, or some other type of health insurance.[25] Another 44% percent of women report that Medicaid covered the cost of their prenatal care. The remaining 7% report having no insurance coverage for prenatal care,[25] but most of these women will have their delivery covered by emergency Medicaid.[26]

*Medicaid covers over half of all births in North Carolina (55%).*

### MEDICAID FOR PREGNANT WOMEN

Medicaid covers over half of all births in North Carolina (55%).[27] Medicaid is financed jointly by federal and state governments and administered by the state, which gives the state a lot of control over the care provided to women enrolled in the system. Therefore, many state efforts to improve birth outcomes have focused on improving outcomes for women enrolled in Medicaid.

North Carolina's Medicaid for Pregnant Women program provides health care coverage from prenatal care through the end of the month during which the 60th day postpartum falls. Eligible women are those whose family income is less than 201% of the federal poverty level (e.g. approximately $34,000 for a single pregnant woman or $51,700 for a pregnant woman in a family of three[p]). Medicaid for Pregnant Women covers prenatal care, delivery, oral health care (until delivery), postpartum care, childbirth classes, and services to treat conditions that may complicate pregnancy.[28]

*p For the purposes of Medicaid for Pregnant Women, the unborn child is counted in the family size.*

Access to comprehensive prenatal care services is critical for women to have the healthiest pregnancy possible. Nonetheless, certain groups face disproportionate barriers to accessing these services. Undocumented women in North Carolina deliver more than 10,000 babies each year and typically use presumptive Medicaid eligibility for two months of prenatal services and emergency Medicaid for delivery.[29] These services are covered at the standard federal match (67%) percentage. Most women are able to receive some prenatal care at a health department, community health center, or a hospital-based clinic. However, when ultrasounds, other diagnostic tests, or specialty consultations are recommended, many women have no ability to access these services. The Federal Government allows states to use a special Children's Health Insurance Program (CHIP) to cover prenatal care, labor, delivery, and the immediate postpartum period for undocumented immigrant women. These services are covered at the enhanced CHIP federal matching percentage (currently 88%, scheduled to return to 77% in fiscal year 2021) resulting in a net savings to North Carolina taxpayers. Sixteen states across the country have chosen to use this option,[30] and one evaluation has shown that women covered under this option have lower rates of extremely low birth weight infants (1.55/1,000) and infant deaths (1.04/1,000).[31] Babies born to women covered by this program were also more likely to receive recommended screenings and immunizations.[31] Therefore, the task force recommends:

**RECOMMENDATION 3.2:**

Expand Access to Comprehensive Prenatal Care for Women Ineligible for Medicaid

The North Carolina General Assembly should expand access to comprehensive prenatal care for women ineligible for Medicaid.

## PREGNANCY MEDICAL HOMES

In 2011, North Carolina launched the first statewide Pregnancy Medical Home (PMH) program in the country, under the Community Care of North Carolina (CCNC) model. CCNC was developed in 1998 to link Medicaid's higher risk beneficiaries to a primary care medical home, while also improving the quality of care and controlling costs.[32] Under the CCNC model, providers must meet certain requirements and in exchange, primary care providers receive $2.50 per member per month for care management activities for Medicaid and NC Health Choice beneficiaries, and $5.00 per member per month for aged, blind, and/or disabled (ABD) Medicaid beneficiaries.[32]

*[The Pregnancy Medical Home program] supports prenatal care providers with the goals of increasing access to prenatal care, improving the quality of care, and improving maternal and infant health outcomes with the primary goal of preventing preterm births.*

CCNC operates the PMH program in partnership with the North Carolina Division of Health Benefits and Division of Public Health. PMH supports prenatal care providers with the goals of increasing access to prenatal care, improving the quality of care, and improving maternal and infant health outcomes with the primary goal of preventing preterm births. PMH includes an obstetrical team consisting of one or more physician champions and at least one nurse coordinator, who is the primary point of contact for the PMH program in each local CCNC network. This program currently reaches most prenatal providers in the state and works to coordinate prenatal and postpartum services for pregnant women enrolled in Medicaid to improve quality of care during pregnancy.[33]

For pregnant women considered to be at high risk, there currently exists a roster of programs, such as the Pregnancy Care Management (OBCM) program, that are designed to meet care needs and improve maternal and infant health outcomes. The current model pairs an obstetric care manager with prenatal providers to manage high-risk needs of pregnant women, many of which are complicated by social drivers of health.[34] This goal is achieved through a standardized risk screening form, a centralized documentation system, and partnerships with providers, public health nurses, and medical consultants. Care managers serve patients over the phone or in person at private provider offices, LHDs, hospitals, and home settings.[34] Their duties can include reviewing pregnancy plans with patients, coordinating patient care across all providers, coordinating additional services, providing referrals, and responding to patient concerns.[34]

Providers receive several benefits from participating in the PMH program. Benefits include financial incentives for completing risk screenings and performing the postpartum office visit, coordination and support from care managers, and access to practice-specific process and outcome data.[35] In order to join the PMH program, providers must agree to participate in, coordinate, and complete various duties.[q,35] Provider compliance ensures PMHs remain outcome-driven and can monitor for specific performance standards.[36]

## MEDICAID TRANSFORMATION

Medicaid transformation was enacted in 2015 by the state General Assembly under Session Law 2015-245 and was to be implemented beginning in February of 2020. Implementation is currently suspended pending passage of new funding and program authority.[37] The law directed NC DHHS to convert Medicaid and NC Health Choice Programs from a fee-for-service model of care to a managed care model.[r] Under the new managed care model, the state has contracted with insurance companies, known as Prepaid Health Plans (PHPs), to provide health benefits and services for a fixed, or capitated rate per enrollee.[38] The managed care model is distinct from the fee-for-service model, in which providers are compensated based on the number of services they provide.

*q To qualify as a PMH, a practice must guarantee that no elective deliveries will occur before 39 weeks and must strive to keep the rate of cesarean sections at 20% or lower among women who are nulliparous (have not given birth or have given birth to a baby who is stillborn or not able to survive outside the womb). Additionally, the practices must conduct risk screenings at initial appointments for all Medicaid patients, establish a plan of care with the case managers from the LHD, and must provide patients with progesterone. If a practice meets these criteria, it is eligible to contract with CCNC and become a certified PMH.*

*r 2015-245 NC Sess Laws 245, HB 372 (2015).*

North Carolina's new managed care model will have several key principles: access to appropriate care management and services for unmet health and social care needs, involvement of multidisciplinary teams, local care management, and access to timely and complete health information.[s,39]

Under Medicaid transformation, pregnant women are one of the populations slated to be moved to managed care upon implementation. Medicaid beneficiaries will be able to choose a PHP from the options available in the region of the state in which they live. If a beneficiary does not make a choice, he or she will be assigned to a prepaid health plan based on region, primary care provider, and other considerations.[40]

### *Pregnancy Management Program (PMP)*

The pregnancy management program (PMP) is the program designed for pregnant woman enrolled in PHPs.[40] The program is to be administered as a partnership between PHPs and local maternity care service providers.[39] The requirements for the PMP will be the same as those for the Pregnancy Medical Home, with the exclusion of the "opt-in" process for Medicaid enrollees. The removal of the "opt-in" process means eligible women will automatically be enrolled in the program, without having to sign up. Providers will receive incentive payments for adopting a standardized risk-screening tool to identify high-risk pregnancies and coordinating care and outreach efforts.[39] Contracted PHPs will be held accountable for decreasing the primary cesarean delivery rate, monitoring and reporting on quality measures, and ensuring comprehensive postpartum visits within 56 days of delivery.[39]

### *Care Management for High-Risk Pregnant Women (CMHRP)*

After Medicaid transformation to managed care, women will be referred to the CMHRP program based on the results of the standardized risk-screening tool, administered at their initial PMP visit.[41] Women deemed to be "high risk" per the tool who join the CMHRP program will receive more rigorous case management services coordinated and provided by LHDs. This program requires PHPs to abide by a series of standard program requirements that are aligned with those of the OBCM program.[41] Activities include patient outreach, identification and engagement, assessment and risk stratification, and deployment of interventions. LHDs will be responsible for collecting and reporting process and quality outcome measures for high-risk pregnancies.[41]

## PRENATAL CARE SERVICES AND SUPPORTS

Although most prenatal care is provided through individual office visits between pregnant women and their providers, there are other models of care that have been shown to positively impact maternal and infant outcomes for women, particularly women of color. In many cases, these models supplement the clinical prenatal care experience and facilitate community support and patient learning in environments women may find more supportive.

Group prenatal care is an evidence-based programmatic strategy designed to build community support for expectant mothers. In North Carolina, many practitioners and organizations providing prenatal care utilize the CenteringPregnancy® program.[t] When women join the program, they are grouped with others with similar due dates.[42] Throughout pregnancy, group members meet regularly, and receive education about the prenatal, delivery, and postpartum experience and are encouraged to ask questions.[42] During meetings, women are seen individually by the provider for their clinical check.[42] Due to its structure, group prenatal care is not feasible in all settings where prenatal care is provided, particularly those with a low volume of births (less than 300 per year).[43] However, in settings that can meet the staffing and volume requirements, group prenatal care offers an alternative to traditional care that provides an increased level of social support for participants. Nationwide, group prenatal care programs have been shown to increase women's knowledge about labor and delivery and satisfaction with care and may improve other birth outcomes.[44–46] Group prenatal care has been shown to significantly lower the rate of preterm births for African American women and improve outcomes for subpopulations of high-risk pregnant women.[46–48]

> *Group prenatal care has been shown to significantly lower the rate of preterm births for African American women and improve outcomes for subpopulations of high-risk pregnant women.*

Doulas are professionals trained to provide supportive services before, during, and after childbirth.[49] Although doulas are shown to increase positive birth outcomes for all women, they are particularly effective for women facing negative outcomes derived from racial disparities.[49,50] Studies have shown that doulas can help reduce high-risk factors for mothers and babies, such as preterm and low birth weight, prolonged labor, and operative vaginal and cesarean section deliveries.[49-48]

Given these benefits, in 2013, the Centers for Medicare and Medicaid Services Expert Panel on Improving Maternal and Infant Health Outcomes in Medicaid/CHIP recommended Medicaid provide coverage of "continuous doula support during labor"[51] in its recommendations. Nationwide, only a few states (e.g. Minnesota, Oregon, Indiana, and New Jersey) include doula services as a covered benefit in their state Medicaid programs.[52,53] Bills proposing to cover doula services within state Medicaid programs have been proposed in many states.[53] In addition to a lack of coverage for doulas, doulas are not licensed in the state of North Carolina, so there are no uniform standards around training, certification, and how doulas function as part of the perinatal team. Uniform standards are needed if doula services are added as covered services under health insurance policies to ensure that women are receiving high-quality care.

The National Academies of Medicine recommends that payment systems be structured to enhance available services that have been linked to

*s During the transition, the names of existing programs for pregnant women and at-risk children are changing to distinguish between the fee-for-service and managed care program schemas. Under the fee-for-service framework, the available services are Care Coordination for Children, Pregnancy Medical Home, and Obstetric Care Management. Post-transformation, the programs will become Care Management for At-Risk Children, the Pregnancy Management Program, and Care Management for High-Risk Pregnancy, respectively.*

*t A similar model has been developed by the March of Dimes.*

improvements in clinical outcomes for minority patients and to encourage the implementation of multidisciplinary care teams.[54] Group prenatal care and doula support have been shown to have a positive impact on outcomes for all women, and women of color in particular. Therefore, the task force recommends:

**RECOMMENDATION 3.3:**

Extend Coverage for Group Prenatal Care and Doula Support

a. Private insurers and prepaid health plans in North Carolina should develop coverage policies to include or incentivize group prenatal care and doula support as part of value-based payments, enhanced reimbursements, or as value-added services.

b. The Division of Health Benefits, in collaboration with the Division of Public Health and the Office of Rural Health, should develop a Medicaid clinical policy to define "certified doulas." This definition should include training, certification, and supervision requirements for certified doulas.

## COMPREHENSIVE CHILDBIRTH EDUCATION

Childbirth education provides expectant mothers and their families with information about maternal and fetal health during pregnancy, after childbirth, and in the postpartum period. The Perinatal Health Strategic Plan developed in North Carolina has set a goal of providing evidence-based and culturally competent educational support to improve health literacy among pregnant women and their families around labor and breastfeeding practices.[55] Studies have shown that childbirth education models increase positive outcomes by simplifying the birthing process and decreasing rates of cesarean sections and prolonged labor periods.[55] These strategies also contribute to improved support and comfort of mothers, particularly during labor.[55] Therefore, the task force recommends:

**RECOMMENDATION 3.4:**

Increase the Utilization and Completion Percentages of Childbirth Education Classes

a. To increase attendance in childbirth education classes, North Carolina private insurers and prepaid health plans should offer:

   1. Information and resources to their members on the benefits of enrolling and completing a childbirth education class during pregnancy.

   2. Incentives, such as reimbursement of registration fees up to current market rate to their members who complete, in entirety, childbirth education classes.

b. North Carolina private insurers and prepaid health plans should advise providers in their regions on any incentive programs they develop for childbirth education classes.

c. The North Carolina Division of Public Health should develop a list of educators who have completed state-approved trainings, noting those available with Spanish speaking providers.

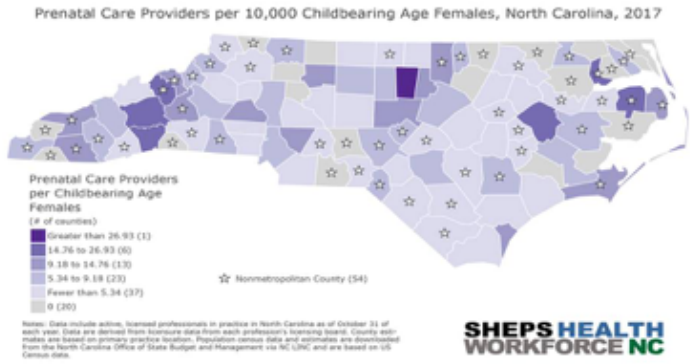
*Although some women do develop complications that necessitate a higher level of care and support during delivery, the majority of low-risk pregnancies result in births that require minimal or no medical intervention.*

## ENSURE WIDESPREAD AVAILABILITY OF PERINATAL HEALTH SERVICES BY INCREASING ACCESS TO LOW-RISK PRENATAL CARE PROVIDERS

Most pregnant women experience low-risk pregnancies, meaning there are no complications or maternal or fetal factors that increase the risk of complications.[u] Although some women do develop complications that necessitate a higher level of care and support during delivery, the majority of low-risk pregnancies result in births that require minimal or no medical intervention.[56] Women with low-risk pregnancies can seek prenatal and labor and delivery care from many types of health care practitioners beyond OB/GYNs. Family physicians, nurse practitioners, physician assistants, and certified nurse-midwives also provide perinatal care either in private clinics and other settings.

While data show that the number of prenatal care providers across the state has been increasing in recent years, access to low-risk maternity care varies across the state.[57] Eighty percent of North Carolina counties have an OB/GYN, family medicine doctor, physician assistant, or certified nurse-midwife who is designated as a prenatal care provider.[57] For Medicaid patients seeking prenatal care, there is at least one certified pregnancy medical home in 95 out of North Carolina's 100 counties.[v,w] PMHs may be private practices or LHDs and may house a variety of providers.[58] However, prenatal care providers in North Carolina are concentrated in metropolitan areas and women living in rural communities often have to travel longer distances to reach providers (**Figure 3**).

**FIGURE 3** Prenatal Care is Not Available Locally for Many Women in North Carolina




For those counties that have a pregnancy medical home but no registered prenatal care provider, care is likely provided by a nurse practitioner.[57] Unfortunately, available data on prenatal care providers is derived from licensure data that does not include nurse practitioners.

In the face of provider distribution barriers, ensuring women have access to prenatal care is critical to improving the health and well-being of mothers and infants. In North Carolina, one of the primary strategies

*u The use of risk-screening tools, as within the Pregnancy Management Program, ensures that women who have higher risk pregnancies receive the appropriate level of care and support during their pregnancy.*

*v There is currently no pregnancy medical home in Graham, Clay, Mitchell, Jones, and Hyde counties.*

*w DeBerry, Kimberly. Perinatal Health Unit Manager, NC DHHS. Written (email) communication. April 29, 2019.*

to encourage providers to work in underserved communities has been educational loan forgiveness.[59] These programs, funded jointly by federal and state governments, are designed to decrease economic burdens and incentivize providers to move to communities with poor provider access.[59] Another strategy used in other states is full practice authority for certified nurse-midwives.

### CERTIFIED NURSE MIDWIVES

In North Carolina, certified nurse-midwives (CNMs) are required to have a practice agreement with a supervising physician to attend births and deliver babies without permission from a supervising physician.[x] This limitation on independent practice may add cost and administrative burden to the practice of a CNM.[60] Furthermore, it may limit location of practice if no supervising physician is willing or available.[60] Some opponents of full practice authority argue that the practice of medicine should be performed by teams and that a physician should always be a member of the team.[61] Further, some physicians have raised concerns that newly trained CNMs may lack sufficient experience for full practice authority.[62]

> *The research literature shows excellent birth outcomes among patients cared for by CNMs, outcomes that are equivalent or superior to care provided by physicians.*

The research literature shows excellent birth outcomes among patients cared for by CNMs, outcomes that are equivalent or superior to care provided by physicians.[62] However, in some cases, the conclusions from this literature are limited by self-selection of healthier patients. There is no literature to support worse outcomes among patients cared for by CNMs. In states that have full practice authority, there has been no deterioration of birth outcomes.[62] There is some literature to support that advanced practice registered nurses (APRNs) in states that have granted them full practice authority may be more likely to practice in rural areas.[62] There is no current evidence that full practice authority will increase the practice of CNMs in rural communities.[62]

The task force recognized that all prenatal and intrapartum care providers should work as part of a system with clearly identified and rehearsed referral and transfer patterns. Two members of the Task force voted against this recommendation in its current form, endorsing full practice authority for CNMs only in the context of an integrated system of care for all women. However, the remainder of the task force voted for the recommendation as stated below. The task force recognized the high quality of care provided by CNMs in North Carolina and across the country as part of a larger system of care and the potential of CNMs to increase access to risk-appropriate care, and therefore recommends:

**RECOMMENDATION 3.5:**
Full Practice Authority for Certified Nurse-Midwives

The North Carolina General Assembly should pass laws supporting full practice authority of certified nurse-midwives.

## SPECIALTY CARE DURING PREGNANCY

Many pregnant women have no health care concerns outside of those that can be addressed by their prenatal care provider. Others, however, have chronic health conditions that require additional care during pregnancy or develop complications that require the care and supervision of a specialist. Women with chronic conditions such as autoimmune diseases, obesity, high blood pressure, mental health conditions, or substance use may need to see specialists in addition to their prenatal care provider. Women who develop complications during pregnancy such as gestational diabetes, preeclampsia, and preterm labor often need more specialized prenatal care, typically provided by a maternal fetal medicine specialist. Access to specialty care for those with health care needs in addition to prenatal care is largely determined by insurance provider and specialist availability. In some regions of North Carolina, access to specialists is quite robust, while in other regions it can be quite difficult to access specialty care.

In a review of maternity referrals by one health department, they estimated that patients keep less than 25% of referral appointments. The most common barriers reported were financial constraints, transportation, and language.[63] They found that many local specialist offices require large up-front fees for self-pay patients and others do not accept Presumptive Medicaid (Medicaid coverage that pays for prenatal care services during the application processing period).[63] When patients encounter such barriers and are unable to keep specialist appointments, the ability to provide risk-appropriate care is compromised, increasing the chance of poor outcomes.

> *In some regions of North Carolina, access to specialists is quite robust, while in other regions it can be quite difficult to access specialty care.*

### SUBSTANCE USE SERVICES

Alcohol and tobacco use are prevalent among women of reproductive age, with women reporting widespread use in the three months before they got pregnant (53% and 19%, respectively), and many women do not abstain during pregnancy, with 1 in 10 women reporting using alcohol and/or cigarettes in the last three months of pregnancy.[64] National data show that 6% of pregnant women use illicit drugs.[64] Use of alcohol, tobacco, and illicit drugs can have serious negative effects for both pregnant women and their infants including congenital anomalies, low birth weight, preterm birth, and infant mortality.[65] Furthermore, while many women abstain during pregnancy, relapse rates are high postpartum, which can impair parent-child bonding and the quality of care provided.[65]

x §21 NCAC 33.0104: Physician supervision

*The American Academy of Pediatrics, the American Public Health Association, and other national organizations advocate for non-punitive access to comprehensive substance use treatment for women who are pregnant or parenting.*

Substance use is a chronic disease that requires ongoing, comprehensive management for sustained recovery. Substance use treatment can be complicated by the demands and stresses of pregnancy and parenting. The American Academy of Pediatrics, the American Public Health Association, and other national organizations advocate for non-punitive access to comprehensive substance use treatment for women who are pregnant or parenting.[66] North Carolina has a long history of providing this type of treatment for women through the North Carolina Perinatal and Maternal Substance Use and CASAWORKS for Families initiatives, which include 25 evidence-based treatment programs in 13 counties across the state.[65] In Western North Carolina, Project CARA is providing integrated comprehensive substance use treatment and perinatal care in 19 rural counties.[67] This type of model aims to increase women's participation in both prenatal care and substance use treatment by providing both types of treatment in each visit.

In 2015, CCNC, the care management provider for Medicaid prior to transformation, developed guidelines on the "Management of Substance Use in Pregnancy."[68] These guidelines detail best practices, including how to screen patients using a uniform screening tool and steps to follow when a patient screens positive. Details include follow-up information, what to include in an in-depth assessment, brief intervention instructions, how prenatal care visits should be supplemented, and how to connect patients with a behavioral health provider or substance abuse treatment program when necessary. The North Carolina Perinatal Substance Use Project supports providers through a consultation line, training and technical assistance, and the maintenance of a weekly bed availability list.[69] North Carolina has also developed a "Substance Affected Infant Policy" that outlines what steps should be taken if an infant is identified as being "substance affected," including the development of an Infant Plan of Safe Care and referral to care coordination services that can provide further services and supports to the infant and parents.[70] While North Carolina has taken many steps to ensure that guidelines are in place for treating perinatal substance use, those guidelines are not yet universally understood and followed.

*While many women have mental health needs during pregnancy, over half of these women are not identified and most do not get treatment.*

## MENTAL HEALTH SERVICES

Depression is the most common mental health need during the perinatal period with 10-20% of pregnant women being affected by prenatal and/or postpartum depression.[71] When more minor episodes of depression and anxiety are included prevalence rises to 25-50%.[71] Maternal depression contributes to poor birth outcomes, delayed cognitive and socioemotional development for infants, and suicide, one of the leading causes of maternal morbidity.[71] While many women have mental health needs during pregnancy, over half of these women are not identified and most do not get treatment.[71] In North Carolina, most pregnant and postpartum women are screened for depression, however, unlike with substance use, there are no uniform guidelines on what services should be provided to women who screen positive. The National Perinatal Association, in partnership with Mental Health America and other organizations, recommends routine screening and training and education of health care professionals in perinatal mental health and how to make referrals.[72]

While uniform screening and referral guidelines such as those developed by CCNC for substance use are a critical first step, such guidelines must be widely shared and providers educated in order for them to have a meaningful impact. Therefore, the task force recommends:

### RECOMMENDATION 3.6:

Standardize Screening and Treatment for Perinatal Mental Health and Substance Use

a. Regional Perinatal Centers and Health Professional Associations for Prenatal Care Providers should educate providers on the Pregnancy Medical Home Substance Use Guidelines.

b. The Medicaid Advisory Board and pre-paid health plans should convene a working group tasked with developing Pregnancy Medical Home Clinical Pathway Guidelines for Perinatal Mood and Anxiety Disorders.

The NC Maternal Mental Health MATTERS project is working to improve and develop systems for screening, assessment, referral to services, and treatment for perinatal women. The NC MATTERS grant has two main objectives:

1. Enhance systems for screening, assessment, and treatment of behavioral health disorders in pregnant and postpartum women.[73]
2. Support local providers through training and in the integration of maternal mental health into primary care practice.[73]

The NC MATTERS project has multiple components to achieve these objectives, including educating and training perinatal providers, operating a consultation line staffed by perinatal mental health specialists who will provide case consultation and support to perinatal providers, and providing telehealth services for patients with higher needs who need assessments or treatment but live in areas without such resources.[73] The NC MATTERS project is targeting 15 counties over the five-year grant period (2019-2023).[73]

North Carolina struggles to provide risk-appropriate care to perinatal women with mental health needs. The NC MATTERS project is piloting developing a coordinated system for providing mental health services to perinatal women, particularly those in rural areas with fewer local mental health resources. This model, if proven effective, could help meet the needs of pregnant and postpartum women across the state. Therefore, the task force recommends:

**RECOMMENDATION 3.7:**

Expand Perinatal Access to Mental Health Services

The North Carolina Division of Public Health should review metrics and outcome data for the NC MATTERS grant. If found to be effective, then the North Carolina Department of Health and Human Services in collaboration with its partners should develop a plan to scale these efforts to other regions in the state.

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## INTRODUCTION

Efforts to improve health care typically focus on improving access to care and quality of care. Quality improvement (QI) activities "consist of systematic and continuous actions that lead to measurable improvement in health care services and the health status of targeted patient groups."[1] QI work involves analyzing current systems and processes for areas where changes could lead to improved outcomes. QI work can happen at the state, regional, payor, health care system, practice, and individual provider level. The increase in maternal mortality in the United States, the slow rate of improvement in infant mortality, and the large disparities in outcomes for women and infants of color all point to the need for quality improvement efforts focused on perinatal care.

*A review by the North Carolina Maternal Mortality Review Committee found almost half of deaths of pregnant African American women and one-third of those among white women were preventable.*

### QUALITY IMPROVEMENT TO STANDARDIZE TREATMENT PROTOCOL TO REDUCE DISPARITIES IN OUTCOMES

A review by the North Carolina Maternal Mortality Review Committee found almost half of deaths of pregnant African American women and one-third of those among white women were preventable. Of those pregnancy-related deaths in North Carolina that could have been prevented, 53% were due to medical care falling below the expected standard of care and 10% to non-optimal organization of the health care system (**see Chapter 3**).[2] Although QI has become a standard part of health care over the past thirty years, QI efforts have not been widely used to address the disparities seen across health care measures.[3] One reason for this is the lack of data routinely stratified by race/ethnicity. Data play a critical role in quality improvement efforts—if there are no data to show a quality of care problem exists, there cannot be a QI effort to direct improvement.

Data collection and monitoring are crucial steps to understanding and eliminating disparities in care.[4] Currently, the state requires reporting of race/ethnicity within vital records, which include births and deaths. Additionally, under Medicaid transformation efforts to promote equitable health outcomes, the Prepaid Health Plans (PHPs) will be required to report quality data by age, race/ethnicity, gender, primary language, long-term services and supports needs status, disability status, geography, and service region.[5] Subsequent QI efforts must include these data. The availability of such data is necessary for any efforts to improve the large disparities in maternal and infant outcomes seen in North Carolina; therefore, the task force recommends:

**RECOMMENDATION 4.1:**

Collect and Report Data on Maternal and Infant Outcomes by Race and Ethnicity

Health insurance companies, health care systems, and health care providers should collect and review data on maternal and infant outcomes using the same race/ethnicity, gender, disability status, and geography categories as required of Prepaid Health Plans under the Stratified Reporting Elements.[5] Findings from this data should direct quality improvement efforts.

QI activities can be used to address preventable maternal and infant mortality and morbidity.[6] While QI activities in maternal and infant care could focus on any aspect of perinatal care, the large disparities in outcomes for women of color, particularly African American and American Indian women, point to the need for QI work specifically focused on reducing disparities in maternal and infant outcomes for these populations.

As part of the Medicaid transformation plan, the North Carolina Department of Health and Human Services (NC DHHS) has built quality improvement requirements into the PHP contracts. As part of quality requirements, PHPs will be required to report on the following perinatal measures by provider[5]:

- frequency of prenatal care,
- timeliness of prenatal care,
- utilization of postpartum care,
- percentage of low birth weight births, and
- percentage of pregnant smokers receiving appropriate screening/ treatment for smoking.

NC DHHS will monitor PHP and provider quality performance using these measures. NC DHHS will develop optimal performance levels for each quality measure to help identify high-performing PHPs and providers and target PHP quality improvement efforts.[5] PHPs will be expected to make progress toward meeting priority measure benchmarks annually. Beginning in the third contract year, PHPs will be held financially accountable for performance on a subset of "withhold measures" as determined by NC DHHS.[5] Currently, "Prenatal and Postpartum Care" and "Live Births Weighing Less than 1,500 or 2,500 Grams" are among the proposed initial withhold measures.[5]

PHPs will be required to report quality data by subcategories including race/ethnicity to ensure that improvements in quality are equitably distributed. PHPs will also be required to participate in quality improvement efforts to reduce disparities. When financial accountability goes into effect in the third contract year, PHPs will be held accountable for equitable improvements on withhold measures. A public disparities report will be produced annually, detailing progress and providing PHPs' stratified quality performance measures.[5]

The proposed quality improvement plan under Medicaid transformation to hold PHPs accountable for quality improvement with a focus on ensuring equitable improvements and a reduction in disparities meets the National Academies of Medicine recommendations on systemic strategies to address racial and ethnic disparities.[4] These efforts should go a long way toward focusing quality improvement efforts on the maternal and infant disparities in outcomes among those enrolled in Medicaid PHPs. Similar efforts should be made to address disparities among those enrolled in other health insurance plans; therefore, the task force recommends:

### RECOMMENDATION 4.2:

Engage Insurers in Quality Improvement Efforts that Address Racial and Ethnic Disparities in Care

a. The North Carolina Division of Health Benefits within the Department of Health and Human Services should prioritize encouraging Prepaid Health Plans to:
    1. Focus on reducing maternal and infant mortality and morbidity as part of their outcomes-based continuous quality improvement process with a particular focus on equity in maternal and infant outcomes; and
    2. Use the Division of Health Benefit's Medicaid Quality Measures "Prenatal and Postpartum Care" and "Live Births Weighing Less than 1,500 or 2,500 Grams" as withhold measures in the Prepaid Health Plan contracts beginning in the second year of contracting.
b. The Division of Health Benefits should also focus on reducing maternal and infant mortality and morbidity for those who will remain in Medicaid Direct by focusing on reporting of maternal and infant quality indicators by race/ethnicity and engaging in quality improvement initiatives with providers.
c. Private health insurers should:
    1. Analyze maternal and infant mortality and morbidity by race/ethnicity and other categories to determine if and where disparities in outcomes exist;
    2. Develop quality improvement plans for reducing disparities in maternal and infant mortality and morbidity; and
    3. Develop value-based payment plans and other payment models that hold providers accountable for reducing disparities in maternal and infant mortality and morbidity.

*While quality improvement efforts by insurance companies will trickle down to providers, health care facilities and providers can and should proactively engage in efforts to reduce disparities in maternal and infant outcomes.*

Quality improvement efforts to improve outcomes are also needed at the facility and provider level. While quality improvement efforts by insurance companies will trickle down to providers, health care facilities and providers can and should proactively engage in efforts to reduce disparities in maternal and infant outcomes. This can be done first by collecting data (**see Recommendation 4.1**), and then by developing QI activities to address any disparities.

The Carolina Global Breastfeeding Institute (CGBI)'s ENRICH Carolinas project is a QI project focused on reducing disparities in maternity and infant care.[7] ENRICH focuses on maternity practices that support breastfeeding and safe infant feeding. Robust data collection using qualitative and quantitative process and outcome measures, with data by race and ethnicity, is the foundation of their work. CGBI provides technical assistance and training to providers in hospitals and prenatal care settings on how to implement evidence-based practices by focusing on implicit and explicit bias observed in each setting.[7] CGBI also provides training on equity for hospital staff through learning collaborative meetings and webinars.[7] CGBI's comprehensive approach to quality improvement with a focus on reducing racial and ethnic disparities is funded by The Duke Endowment and aims to reach all birthing hospitals in North Carolina by 2023. Although the ENRICH project does not address all aspects of care, it provides a means to introduce all birthing facilities to the use of QI to address disparities in care. Using QI activities to explicitly address disparities in maternal and infant outcomes is critical to reducing disparities; therefore, the task force recommends:

### RECOMMENDATION 4.3:

Engage Birthing Facilities in Quality Improvement Efforts to Address Racial and Ethnic Disparities in Care

a. The North Carolina Healthcare Association should promote the existing ENRICH Carolinas technical assistance and training program and encourage maternity care and birthing facilities to participate.
b. Maternity care and birthing hospitals should go through the ENRICH Carolinas technical assistance and training program to improve maternal and infant care and address differences in care provided based on race/ethnicity.

*Because of the potential for improved health outcomes and patient satisfaction, patient and family engagement has emerged as a critical strategy for improving the performance of our health care systems.*

## INCLUDE COMMUNITY MEMBERS IN PLANNING

Implementing patient and family engagement strategies has led to fewer hospital-acquired infections, reduced medical errors, reduced serious safety events, and increased patient satisfaction scores.[9–11] Because of the potential for improved health outcomes and patient satisfaction, patient and family engagement has emerged as a critical strategy for improving the performance of our health care systems. There are many ways health care organizations can integrate patient and family perspectives and

experiences into their governance structure and organizational decision-making. Creating opportunities throughout health care organizations for patients and family members to influence decisions can help ensure health care organizations are meeting the needs of the communities they serve. Creating a diverse patient and family advisory council (PFAC) is one strategy to ensure the needs and concerns of patients and families are heard and used to inform decision-making. PFACs are teams of patients and families working with providers and staff to provide opportunities to engage patient perspectives in the planning, implementation, and evaluation of health care services and programs.

Although most hospitals in North Carolina have PFACs, a general PFAC for the hospital as a whole will likely have limited focus on the experiences and needs of women and infants in labor and delivery and NICUs. Therefore, the task force recommends:

### RECOMMENDATION 4.4:

#### Engage Patient and Family Advisory Councils

a. Facilities that provide perinatal services, including maternity care hospitals, birthing centers, and provider clinics, should have patient and family advisory councils, or patient and advisory teams designed to promote patient and family partnerships, provide guidance on improving the consumer experience, and inform service delivery and quality improvement during the perinatal period and beyond. Perinatal patient and family advisors or advocates can also support clinical teams at hospitals or other care settings by advising or serving on teams that advise on matters including, but not limited to: patient and provider relationships, institutional review, quality improvement initiatives, and patient education on safety and quality matters to the extent allowed by state and federal law.

b. Patient and family advisory councils, or patient and family advisory teams, should have representation that reflects the diversity of families served, such as payors, ages, languages, races and ethnicities, birth experiences, and geography and engagement from facility leadership.

## STANDARDIZING REGIONS IN NORTH CAROLINA

One of the barriers many partners working to improve outcomes in North Carolina face is geographic. Various state programs follow inconsistent regional areas that impede working together. For example, counties are grouped into ten regions for local health departments, nine regions for Area Health Education Centers, six perinatal care regions, and four service regions for Local Management Entity – Managed Care Organizations. As part of Medicaid transformation, the state also developed six Medicaid regions. These regions are closely aligned with the six perinatal care regions. While there are a handful of counties that are not the same, the regions are quite similar. Because Medicaid will be a huge driver of data collection and analysis, and PHPs are expected to engage in regional quality improvement efforts around maternal and infant outcomes, the task force recommends:

### RECOMMENDATION 4.5:

#### Align Perinatal Care Regional Maps with Medicaid Transformation Maps

The North Carolina Division of Public Health should align Perinatal Care Regions with North Carolina Medicaid Transformation Regions to ensure continuity between efforts by Regional Perinatal Health Care Centers and neonatal intensive care units and Prepaid Health Plans.

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*The weeks and months following a birth are a critical period for families, setting the stage for long-term health and well-being.*

## INTRODUCTION

Improving maternal and infant outcomes does not end with delivery. While healthy birth outcomes are a critical step, they are not the end of the journey for women, infants, and families. The weeks and months following a birth are a critical period for families, setting the stage for long-term health and well-being. During the postpartum period, women experience physical, social, and psychological changes, all while recovering from childbirth, adjusting to changing hormones, and learning to care for their newborns.[1] Most women in the United States must navigate this period with little medical support. More than half of pregnancy-related maternal deaths, the majority of which are preventable, occur after delivery.[2,3] Current policies and standards ignore the many challenging health needs of postpartum women. In contrast, most infants, whether born early, with health concerns, or healthy full-term, receive a lot of medical care in the first year of life. While such care provides health benefits, the leading causes of infant mortality, birth defects, preterm birth, and low birth weight are best prevented by improving and addressing women's health prior to and during pregnancy.[4]

### POSTPARTUM SUPPORT FOR FAMILIES WITH INFANTS IN THE NICU

Children who are born preterm, low birth weight, or with other health challenges often have lengthy neonatal intensive care unit (NICU) stays. Mothers whose infants are in the NICU are discharged from the hospital after a typical stay and then must adjust to being at home while their infants are still in the hospital. Families must juggle the demands of mothers' postpartum health needs, work schedules, other children, and the needs of their infants in the NICU. For families whose infants are in a NICU far from home, transportation is an added challenge. These challenges are added to the concerns parents have about the health and well-being of their infant who is in need of intensive care.

Families with infants in the NICU often experience heightened stress and anxiety both during and after their infant's stay in the NICU.[5] Mothers and fathers with infants in the NICU are more likely to experience depression and post-traumatic stress disorder.[6] NICU care is centered on the infant needing care; however, parents and infants are a family unit and the psychosocial needs of the parents are critical to family function and infant well-being.[5] Parental psychological distress can impair the parent-infant bond. Providing psychosocial support to parents with children in the NICU can improve parent functioning and their ability to care for their infant.[7] In 2015, the National Perinatal Association released recommendations on the provision of comprehensive psychosocial support services for parents whose infants require care in NICUs.[8] Their recommendations include: "(a) family-centered developmental care by the health-care staff, (b) active parent-to-parent support within the NICU and (c) ready availability of services provided by mental health professionals.[8]" This task force supports these recommendations, but chose to focus on the active parent-to-parent support within the NICU.

Parent-to-parent support refers to programs that train mothers who have had infants in the NICU to provide peer support/parent mentoring for parents with infants in the NICU. Trained peer support specialists become navigators for parents new to the NICU. Parent navigators come from a place of shared experience and are able to provide a level of support and empathy to parents that differs from that of members of their infants' medical care team. Parent navigators can help parents understand how the NICU works, what to expect, and how to advocate for their infants, both in the hospital and after they go home. Parents who have worked with NICU parent navigators report lower levels of stress, depression, and anxiety, increased confidence and well-being, and feel more empowered to interact with and care for their infants.[9]

*Parent navigators come from a place of shared experience and are able to provide a level of support and empathy to parents that differs from that of members of their infants' medical care team.*

Parent navigator programs have been shown to improve parents' psychosocial well-being and improve parent-infant interactions. Therefore, the task force recommends:

### RECOMMENDATION 5.1:

Develop Parent Navigator Programs in Birthing Facilities

Neonatal intensive care units should develop parent navigator programs to provide navigation and peer support to parents of infants receiving care. Parent navigator programs should:

a. Focus on how to support families who have extended stays in the hospital and infants who spend a significant amount of time in the neonatal intensive care unit.

b. Ensure parent navigators are persons with relevant lived experience in caring for an infant in the neonatal intensive care unit.

## POSTPARTUM HEALTH CARE FOR WOMEN

Traditionally, postpartum care for mothers is limited to a single postpartum visit at six weeks after birth. In 2018, in response to the high rates of severe maternal morbidity and mortality in the United States compared to the rest of the world's industrialized nations, the American College of Obstetricians and Gynecologists issued new guidelines on how to optimize postpartum care over the twelve weeks after birth.[y] They propose that all women see their obstetric care provider to receive a blood pressure check in the first three to ten days after birth, with mothers who are at higher risk receiving additional follow-up within the first three weeks. The initial assessment should be followed up with ongoing care as needed. For example, for women who develop pregnancy-related health concerns, such as gestational diabetes, gestational hypertension, and postpartum depression, significant ongoing care is needed. Many new mothers face health concerns related to childbirth and breastfeeding that require treatment and/or support.[10] Care for women with chronic medical conditions and/or lasting pregnancy complications should be coordinated between their maternity care provider and primary medical home. All women should receive a comprehensive postpartum visit no later than twelve weeks after a birth.[1]

> *All women should receive a comprehensive postpartum visit no later than twelve weeks after a birth.*

Health challenges from pregnancy and childbirth often persist for up to a year postpartum. In North Carolina most pregnant women have health care coverage (93%), but for those covered by Medicaid for Pregnant Women (44%)[11], coverage ends sixty days postpartum. Many women who qualify for Medicaid for Pregnant Women due to having a family income below 201% of the federal poverty level (FPL) ($42,600 for a family of three) do not qualify for Medicaid after the sixty days postpartum coverage ends. In North Carolina, parents of dependent children are eligible for Medicaid if their family income falls below 42% of the FPL ($8,960 for a family of three).[12] A lack of adequate postpartum care is associated with early cessation of breastfeeding, short intervals between pregnancies, untreated depression and anxiety, and higher rates of preterm birth and infant mortality for subsequent pregnancies.[13] Therefore, for almost half of women giving birth, access to health care during a crucial period for their health and that of their children is often severely restricted due to the financial barrier of not having health insurance.

The Centers for Medicare and Medicaid Services requires all states to cover Medicaid for Pregnant women for sixty days postpartum. States can extend coverage if they choose. States that have expanded Medicaid to serve residents with family incomes up to 138% of the FPL have lower rates of uninsured postpartum women than those that have not expanded Medicaid eligibility.[12] In those states, women who had perinatal coverage through Medicaid for Pregnant Women either roll into the general Medicaid population or are eligible for subsidies to make health care coverage more affordable through their state health insurance marketplaces.[12] In non-expansion states, including North Carolina, women whose incomes fall between 42%-100% FPL do not qualify for Medicaid outside of pregnancy, which typically means they go without health insurance due to cost. Currently no non-expansion states have extended Medicaid for Pregnant Women beyond sixty days postpartum, however, several states are considering extending postpartum Medicaid coverage to twelve months postpartum.[12]

Postpartum maternal death is largely preventable with appropriate care; however, many women go without health care after the sixty-day postpartum period due to cost. Given the importance of medical support for women for an extended postpartum period, the t**ask force recommends expanding women's access to health care coverage (see Recommendation 3.1).**

## HOME VISITING PROGRAMS

Having a new baby in the home is an adjustment for every family. Babies require continuous care in the months following birth at the same time that mothers need care and support to recover from childbirth. Many families do not have strong social support networks that can assist them as they adjust to a new baby in the house. One in ten postpartum mothers in North Carolina report they do not have someone to talk to, to help them when they are tired or frustrated with their baby, or to help if they are not well.[14] Ensuring families have support as they learn to care for their infant can improve parent and child well-being.[15]

> *One in ten postpartum mothers in North Carolina report they do not have someone to talk to, to help them when they are tired or frustrated with their baby, or to help if they are not well.*

*y The recommendations have also been endorsed by the Academy of Breastfeeding Medicine, the American College of Nurse-Midwives, the National Association of Nurse Practitioners in Women's Health, the Society for Academic Specialists in General Obstetrics and Gynecology, and the Society for Maternal-Fetal Medicine.*

*Participation in home visiting programs can also reduce parental stress, improve families' economic self-sufficiency, and decrease medical costs for families.*

Home visiting programs offer support to parents as they are learning to care for their infant and adjusting to the challenges and responsibilities of parenting. Home visiting programs, which generally focus on home visits to expecting and new parents to assess maternal and child health and provide medical, parenting, and social support, have been shown to improve infant and maternal health for participating families.[16] Participation in home visiting programs can also reduce parental stress, improve families' economic self-sufficiency, and decrease medical costs for families.[16] In addition, evidence-based early home visiting programs show a financial return on investment; some programs report a return of up to $5.70 for every $1 invested to serve the highest-risk families.[17]

Nurse-Family Partnership (NFP) is a highly successful, evidence-based home visiting model currently implemented in 25 North Carolina counties.[18] NFP serves women in poverty pregnant with their first child, from pregnancy until their child turns two. NFP services aim to improve pregnancy, child health, and developmental outcomes; improve family economic self-sufficiency; and address intergenerational poverty.[z] Recent analyses have shown that NFP services resulted in lower Medicaid and Supplemental Nutrition Assistance Program (SNAP) enrollment, with a reduction of 8.5% in Medicaid costs from birth to age eighteen and a reduction of 9.6% in SNAP from birth to age twelve.[17]

A similar program, Family Connects (originally known as Durham Connects), was established in 2008 as a universal home visiting program to improve child health outcomes and prevent child maltreatment. Family Connects serves all parents of newborn babies, regardless of income, with no-cost postpartum home visits (typically between one and four family visits).[19,20] Family Connects provides a much briefer, and less costly, intervention than NFP. Benefits of participating in Family Connects include improved maternal mental health, 50% reductions in child emergency care, and higher-quality parenting behaviors.[20,21] Family Connects also reports cost savings of $3.02 in emergency medical care costs for each $1 invested.[20] Family Connects currently operates in Durham, Forsyth, and Guilford counties in North Carolina, as well as in counties in nine other states.[22]

In July 2018, NC Medicaid launched two pilot home visiting initiatives using Medicaid funds. The Cleveland County pilot uses the Nurse-Family Partnership model and Johnston County uses a hybrid model focused on high-risk pregnancies. The North Carolina Department of Health and Human Services has estimated the per-visit cost to Medicaid at $83.72, for a total projected expense in Cleveland County of $251,160, and $92,090 in Johnston County. Results of the pilot will be reported back to the North Carolina legislature.[23]

North Carolina Medicaid will also be providing coverage of home visiting programs and services through the Healthy Opportunities pilot program in two to four regions. The goal of these pilots is to assess improvements in health and reductions in cost from using Medicaid resources to invest in evidence-based interventions to address unmet social care needs.[24] A recent study by researchers at the Jordan Institute for Families at the University of North Carolina at Chapel Hill assessed the current landscape and developed a comprehensive assessment of North Carolina home visiting programs. The assessment included recommendations for a statewide home visiting leadership structure and strategic plan, to include new funding streams, support of the home visiting workforce, continued assessment of community capacity for specific models, and improved service coordination.[25]

In early 2019, a group of early childhood experts, home visiting program staff, state agency representatives, and others, under the joint leadership of NC Partnership for Children, Jordan Institute for Families, North Carolina Department of Health and Human Services' Division of Public Health, and early childhood philanthropy leaders, convened to develop a statewide plan that addresses recommendations from the Jordan Institute study and creates a family-centered home visiting system that can scale up services equitably across the state.[26]

## BENEFITS OF HOME VISITING FOR SPECIAL POPULATIONS

Home visiting and other care coordinating systems can also provide valuable services for high-need infants and their families after the infant has been discharged from the NICU. For these families, conventional stresses of childbirth may be magnified by economic and resource hardships that make coordination of continuing care for the infant particularly difficult.[5] Although the infant may be stable enough to be discharged from hospital care, many high-need infants continue to require additional services into childhood to support healthy growth and development.[27]

*North Carolina's Medicaid program, which serves more than 50% of infants, provides care management for infants transitioning out of the NICU through the Care Coordination for Children (CC4C) program.*

*z Written communication, April Harley, Executive Director, NC Nurse-Family Partnership, to Michelle Ries, NCIOM, September 5, 2019*

### SUPPORTING YOUNG CHILDREN WITH SPECIAL HEALTH NEEDS

Children who spend time in the NICU are discharged once their health has been stabilized and they can safely be cared for at home. While many of these children go on to thrive without additional supports, many others continue to have health challenges after they are released to go home from the NICU. North Carolina's Medicaid program, which serves more than 50% of infants, provides care management for infants transitioning out of the NICU through the Care Coordination for Children (CC4C) program. A partnership between Community Care of North Carolina, the North Carolina Division of Public Health, and the North Carolina Division of Medical Assistance, CC4C is a care management program for children from birth to age five who meet specific risk criteria: special health care needs (chronic physical, developmental, behavioral, or emotional conditions that require services beyond usual child needs); exposure to severe stress in early childhood (including chronic neglect, physical or emotional abuse, severe maternal depression, parental substance abuse, extreme poverty, or exposure to violence); children in foster care; and children in neonatal intensive care transitioning to community care. CC4C services are provided by care managers who work with children's medical providers to coordinate care and care transitions.[28] CC4C program metrics include increasing the number of infants referred to early intervention services, increasing the number of children with special health needs enrolled in a medical home, and increasing the number of children in foster care enrolled in a medical home. CC4C performance metrics include reductions in the rates of hospital admissions/readmissions and emergency department visits, and increasing the number of NICU graduates who have their first medical home visit within one month of discharge. [29] Under Medicaid Managed Care, many aspects of CC4C will continue under the new title of Care Management for At-Risk Children.

In addition to care management through CC4C, many infants with special needs receive services through North Carolina's Children's Developmental Services Agencies (CDSAs). CDSAs work with local service providers to connect young children with special needs to local resources. Across the state, there are sixteen CDSAs and each works with local service providers to connect to services available through the NC Infant-Toddler Program (ITP).[30] These services include early intervention supports to children up to age three who have developmental disabilities or delays, including evaluations/assessments, family counseling, assistive technology, medical/nursing services, social work, occupational and/or physical therapy, and others.[31] Evaluation and service coordination are available to families at no cost, and other services are on a sliding fee scale and can be covered by Medicaid or private insurance. Families are not denied needed services if unable to pay. Once a child turns three or service goals are met, the CDSA service coordinator develops a transition plan for ongoing services. However, CDSA reach is limited by funding and array of available professionals, which is not adequate to reach all children and families that qualify for services. Data from ITP show that North Carolina lags behind the national average in percentage of children served (NC 2.88% vs US 3.26%).[32] For those families who are unable to access CDSA benefits, important services still remain out of reach due to financial barriers.

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## SOCIAL DRIVERS OF PERINATAL HEALTH OUTCOMES

Efforts to improve perinatal health outcomes have typically focused on the health care system as the driver of maternal and infant health. However, perinatal health outcomes often have as much to do with the conditions in which women and babies live, work, and age as the medical care they receive. These conditions, or drivers of health[aa], involve social and economic factors, the physical environment, and the health behaviors that are influenced by these conditions.[1] Drivers of health include childhood experiences, employment and income, educational attainment, access to heathy foods and safe spaces for physical activity, exposure to community and interpersonal violence, and experiences of racism and discrimination. These factors combine to affect health outcomes (e.g., morbidity, mortality, life expectancy), as well as the types of health behaviors in which individuals engage. In turn, those health behaviors also influence health outcomes. For example, people with higher incomes and more years of education have more opportunities to live in a healthy and safe environment. These individuals have, on average, longer life expectancies and better overall health outcomes than individuals with fewer years of education, lower incomes, and less safe neighborhoods.

Drivers of health can either limit or facilitate opportunities to engage in healthy activities and behaviors. Health behaviors—actions that are either beneficial or detrimental to one's health—are reflective of the effects that the drivers of health can have on individual opportunities to make healthy choices. So, those who lack access to grocery stores that sell fresh fruits and vegetables may not be able to prepare healthy meals. Those who live in neighborhoods that experience violence or that have fewer resources may not have outdoor recreational facilities where they can exercise and may therefore have low physical activity. Consequently, individuals living within these circumstances tend to have higher rates of obesity, diabetes, and heart disease.[2]

Many state and industry leaders are recognizing the need to understand and address the drivers of health that may affect the health of women and babies and impact perinatal health outcomes. The American College of Obstetricians and Gynecologists published an opinion in January 2018 on the need to address the drivers of health in the delivery of reproductive health care. They call on OB/GYNs and other health care providers to:

- **"Inquire about and document social and structural determinants of health that may influence a patient's health and use of health care such as access to stable housing, access to food and safe drinking water, utility needs, safety in the home and community, immigration status, and employment conditions.**
- **Maximize referrals to social services to help improve patients' abilities to fulfill these needs.**
- **Provide access to interpreter services for all patient interactions when patient language is not the clinician's language.**
- **Acknowledge that race, institutionalized racism, and other forms of discrimination serve as social determinants of health.**
- **Recognize that stereotyping patients based on presumed cultural beliefs can negatively affect patient interactions, especially when patients' behaviors are attributed solely to individual choices without recognizing the role of social and structural factors."[3]**

At the state level, the North Carolina Perinatal Health Strategic Plan focuses on infant mortality and maternal health, morbidity, and mortality. Among the plan's strategies and action steps are multiple points related to the drivers of health that impact women and families, including:

- **Investing in Community Building – including addressing transportation infrastructure, developing environments that can support healthy living, and creating opportunities for earning a livable wage;**
- **Closing the Education Gap – including increasing access to higher education, increasing high school graduation rates, and expanding the racial and gender diversity of school administrators, faculty, and staff;**
- **Reducing Poverty Among Families – including supporting legislation for a livable wage and standardizing poverty reduction strategies;**
- **Undoing Racism – including incorporating equity in the delivery of health care, promoting training about institutional and structural racism, and changing policies to address institutional and structural racism.[4]**

## NORTH CAROLINA SYSTEMS TO SCREEN FOR AND ADDRESSING HEALTH-RELATED SOCIAL NEEDS

The North Carolina Department of Health and Human Services (NC DHHS) is taking steps to incorporate and address challenges related to the drivers of health into the care of all patients in the state. NC DHHS has developed a set of standardized screening questions to assess the health-related social needs of individuals in four domains including food, housing/utilities, transportation, and interpersonal safety.[5] This set of questions, developed by a group of stakeholders representing public health, health care, and sectors related to health-related social needs, incorporates tested and standardized items from existing screening tools (e.g., the Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences [PRAPARE], Health Leads, and items standardized for use in multiple tools). There are nine questions across the four domains, as well as three optional questions about the nature of the needs and whether help is wanted to address those needs.[5]

*aa Drivers of health are also called determinants of health or social determinants of health.*

NC DHHS also has developed a list of optional screening domains and questions covering community safety, housing quality, health care/medicine, mental health/substance use, family/social supports, child care, emotional wellness/stress, education, health literacy/communication/language/culture, employment, income, immigration, legal/correctional, and secondary assessments of housing needs and intimate partner violence.[5] These serve as optional items for individual providers or organizations to include in their screening protocols based on the populations they serve. NC DHHS intends for health care providers, payers, and human services organizations across the state to incorporate the standardized screening questions into their work with patients and community members.[5] Prepaid health plans providing managed care to individuals enrolled in Medicaid in North Carolina will be required to complete the screening questions to assess individuals for needs.

Once individuals have been screened for health-related social needs, it is important to have a plan in place for helping them find resources to meet those needs. To address this issue, NC DHHS is supporting the development and implementation of a web-based resource platform called NCCARE360.[6] It is intended to initially serve as a web-based portal to connect all types of organizations, from large health care systems and insurers to human services organizations and individual human service providers. As implementation progresses, it is anticipated that interfaces will be made with other information technology platforms (e.g., electronic health records, human services software, NC HealthConnex). The platform will integrate NC DHHS's standardized screening questions, a robust statewide resource directory, and a referral and outcome tracking platform. With the goal of a coordinated, no-wrong-door-style approach, individuals and organizations will be able to access information about community resources. Individuals can even start the referral process on their own.[6] The platform can help payers, providers, and organizations address clients' health-related social needs, communicate with one another, and may help consolidate coordination efforts. For example, a pregnant woman who screens positive for food insecurity may be connected with the local WIC program, if she is eligible, and other local food resources.[6]

## ROLE OF COMMUNITY HEALTH WORKERS IN ADDRESSING HEALTH-RELATED SOCIAL NEEDS

Some professionals working in health care and community health settings are particularly well-equipped and skilled at understanding health-related social needs. In particular, community health workers can serve as vital members of a health care team to address these issues. The American Public Health Association defines community health workers as "frontline public health worker[s] who [are] trusted member[s] of and/or [have] an unusually close understanding of the community served. This trusting relationship enables the worker to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery."[7] Other terms for this role include community health liaison, lay health advisor, and promotora.[8] Community health workers commonly come from the same communities they serve and share similar ethnicity, life experience, socioeconomic status, and language.[8] Their personal background can often gain them trust with the community and the individuals they serve, making them effective interprofessional care team members, particularly when addressing health-related social needs.

Community health workers can help to improve perinatal health outcomes in many ways. An evaluation of multiple state approaches to incorporating community health workers into maternal and child health found that these professionals can improve outcomes by:

- **"Educating women about breastfeeding, childbirth, safe sleep, injury prevention, and other developmentally-appropriate topics.**
- **Providing referrals and connecting women and families with local health and human services, childcare, and prenatal and postnatal care providers.**
- **Providing home or office visits during pregnancy and after babies are born to help mothers and babies stay healthy.**
- **Developing rapport with and acting as liaisons between families and health care providers.**
- **Screening for infant and toddler developmental delays, prenatal and postnatal depression, and behavioral and other risk factors.**
- **Helping individuals understand and adhere to provider recommendations and helping them utilize health care coverage appropriately and effectively.**
- **Helping individuals navigate health insurance options and enroll in Medicaid or private plans."[9]**

Over several years, NC DHHS investigated the status of the community health workforce in North Carolina through the Community Health Worker Initiative. In May 2018, the Initiative's final report was published, outlining three primary recommendations.[10] These recommendations stated that community health workers should have:

1. **Defined roles and responsibilities regardless of the setting they operate in,**
2. **Core competencies and curriculum integral to their professional education, and**
3. **Certification requirements and processes to help standardize training and increase professional credibility.[10]**

In order to guide the process for accomplishing these goals, the Initiative recommended the creation of a North Carolina Community Health Worker Certification and Accreditation Board.

Because of the vital role community health workers could have in improving perinatal health outcomes in North Carolina, the task force recommends:

### RECOMMENDATION 6.1:

### Use Community Health Workers to Support Pregnant Women in Their Communities

The North Carolina Division of Public Health – Women's and Children's Health Section should partner with the Community Health Worker Initiative in the Office of Rural Health to develop strategies by which community health workers could contribute to the goal of reducing infant and maternal

mortality in North Carolina. Additionally, the Women's and Children's Health Section should require programs that receive funding from Women's and Children's Health Section for community health workers to adopt the standards set forth in the Community Health Workers in North Carolina: Creating an Infrastructure for Sustainability plan.

## EMPLOYER SUPPORTS FOR PREGNANT WOMEN AND WORKING MOTHERS

The majority of women in the United States work outside the home, with 71.5% of women with children under age 18 working or looking for work in 2018.[11] A study from 2008 showed that 66% of women worked while they were pregnant.[11] The American College of Obstetricians and Gynecologists published an opinion in April 2018 stating, "Working during pregnancy is generally safe. For those in high-risk occupations or with medically complicated pregnancies, work accommodations often can allow for continued safe employment."[12] Workplace activities like lifting large or many loads during the day, standing for long periods of time, shift work, and exposure to loud noises and chemicals have been shown to increase risks to women and babies including low birth weight, preterm birth, and prenatal environments that can impact infant health.[13–15]

Federal and state laws provide some protections for women's health and their job security while they are pregnant and for a short period after. These include the Pregnancy Discrimination Act (PDA), Americans with Disabilities Act (ADA), and the Family and Medical Leave Act (FMLA). Protections provided by this legislation include:

- **PDA – This law provides overall protections from employer discrimination based on pregnancy status, intention to become pregnant, and illness related to pregnancy, including decisions about hiring, firing, and pay. Employers who provide accommodations such as changes to job duties or leave for temporarily disabled workers must also do so for employees who are pregnant. Accommodations could include things like altered break or work schedules, permission to sit or stand, and elimination of marginal job functions.[16,17]**
- **ADA – This law can help women with pregnancy-related medical conditions like cervical insufficiency, anemia, sciatica, preeclampsia, gestational diabetes, or depression to qualify for workplace accommodations if the condition substantially limits one or more life activity or bodily function.[16]**
- **FMLA – This law entitles eligible employees[bb] of covered employers[cc] to take up to twelve weeks of unpaid leave for certain family and medical reasons, such as birth of a child or caring for a family member with a serious health condition. Individuals' positions are legally protected for twelve work weeks within a twelve-month period. Employers are not required to provide payment during the employee's leave.[16]**

North Carolina law does not provide additional protections to residents who are pregnant or have given birth, although the state's Equal Employment Practice Act[dd] calls for similar protections for pregnant women's employment as the federal PDA. For many state employees working for state agencies under the governor's oversight, paid parental leave went into effect September 1, 2019, by Executive Order No. 95. This allows for women who are state employees (some agencies are exempt or have opted out) who give birth to receive eight weeks of paid parental leave and other employees who have adopted, are fostering, or have a newborn to take four weeks of paid parental leave.[18]

Research into family medical leave has shown that paid leave can improve outcomes for both women and babies, such as decreased infant mortality and child abuse and improved physical and mental maternal health.[19–21] Unpaid leave does not show the same improvements in health outcomes. Employment can also impact a mother's opportunities to continue to feed her baby breast milk. Breastfeeding has many benefits for infants and mothers, including reduction of childhood asthma, obesity, ear and respiratory infections, sudden infant death syndrome, and gastrointestinal infections.[22] For mothers, breastfeeding can lower a woman's risk of high blood pressure, type 2 diabetes, and ovarian and breast cancer.[22] In North Carolina, a 2017 survey found that 86.2% of women initiated breastfeeding after a birth.[23] Of these women, 22.5% said they stopped breastfeeding because they returned to work.[24] Among those who never initiated breastfeeding, 17% said the reason was because they had to return to work.[25] Employers are required to provide basic accommodations for breastfeeding mothers under the federal Break Time for Nursing Mothers law, including time and a private space other than a bathroom for a woman to pump breast milk.[26]

In addition to paid family leave, paid sick leave is important to promote the health of women, infants, and families. People who have paid sick leave are much more likely to be able to recover from illness, prevent the spread of illness, and receive important preventive care for themselves or their children.[27,28] There are no federal or North Carolina state policies requiring all employers to offer paid sick leave.[29] Although 71% of private industry workers have access to paid leave, this access varies widely by wage category, with only 45% of people in the lowest wage quartile having access to paid sick leave.[30]

Along with multiple recommendations around the drivers of health, the North Carolina Perinatal Strategic Plan also made recommendations related to workplace accommodations and family leave policies.[4] These include:

- **Creating and expanding paid parental and sick leave policies**
- **Increasing access to affordable childcare**
- **Increasing supports for breastfeeding**
- **Creating safe work and incarceration environments for women[4]**

Because of the impact that workplace environments and activities have on pregnant women and the potential improvements in health outcomes for women and babies from paid family leave, the task force recommends:

### RECOMMENDATION 6.2:

#### Implement Family-Friendly Workplace Policies

North Carolina employers, including the state, should provide pregnancy accommodations such as paid family and medical leave, paid sick days, and pregnancy and breastfeeding accommodations.

*bb Eligible employees include those who work for a covered employer, have done so for at least twelve months, have at least 1,250 hours in the last twelve months, and works at a location where the employer has at least fifty employees within seventy-five miles*

*cc A covered employer is a private-sector employer with fifty or more employees in twenty or more workweeks of the calendar year, all public agencies, and all public and private schools.*

*dd NC 6.S. 143-422.2 Equal Employment Practice Act*

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In recent years, North Carolina has seen steadily rising rates of maternal mortality and ranks among the bottom 10 states for annual infant mortality rates. As troubling as these statistics are, outcomes are even starker for women of color and their children who face mortality rates far higher than those of their white counterparts.

Reversing these trends and improving outcomes for mothers and babies requires systemic strategies that involve both clinical, and non-clinical interventions. Increasing access to high-quality preconception and prenatal care and specialist services ensures that women receive the care they need for healthy pregnancies and have the opportunity to be screened for health complications and connected to necessary services to address those complications (**see Chapter 3**). Establishing a maternal levels of care system that parallels preexisting structures for neonatal care lays the groundwork for clinical systems to be able to adapt and facilitate special treatment for women facing high risk pregnancies (**see Chapter 2**). Quality improvement efforts that incorporate community input and standardize care delivery help identify and target disparities in health care access **(see Chapter 4**).

Services and supports targeted to the postpartum period straddle the clinical and non-clinical spheres to smooth the transition from pregnancy and delivery to motherhood. These initiatives ensure that mothers and their babies continue to receive necessary health care services and social supports within the hospital if they need to remain under NICU care, or after they leave the hospital to return home (**see Chapter 5**). Finally, programs that address drivers of health provide support for all steps in the perinatal process—filling gaps to support the well-being of women and their babies (**see Chapter 6**).

The recommendations of the Task Force on Risk Appropriate Perinatal Systems of care are designed to push the state forward to reduce maternal and infant mortality and morbidity and specifically address existing racial disparities in these outcomes across the state. These recommendations call on the state government, health care providers, health professional and trade organizations, health care payors, and other stakeholders to support the development of a regionalized and risk-appropriate perinatal system of care that addresses both clinical and non-clinical health needs of mothers and their babies and work toward a healthier future for all North Carolinians.

## CHAPTER 2: DEVELOPING A RISK-APPROPRIATE REGIONAL PERINATAL SYSTEM OF CARE

### RECOMMENDATION 2.1

#### Adopt National Maternal and Infant Risk-Appropriate Level of Care Standards

a. The North Carolina Division of Health Services Regulation (NC DHSR) should work with the Division of Public Health to review and update:

   1. North Carolina Administrative Code 10A NCAC 13B .4301-04 (maternal services) to reflect the uniform, nationally recognized, and evidence-based guidelines for regionalized and risk-appropriate maternal levels of care offered by ACOG/SMFM;

   2. North Carolina Administrative Code 10A NCAC 13B .4305-08 (neonatal services) to reflect the uniform, nationally recognized, and evidence-based guidelines for regionalized and risk-appropriate neonatal levels of care offered by the AAP. The NC DHSR should ensure that these rule updates do not conflict with other North Carolina Administrative Codes. If there are conflicting rules, they should be included in and mirror this update;

b. The Medical Care Commission should approve updates to North Carolina Administrative Code 10A NCAC 13B .4301-08; and

c. Once the rulemaking process is complete, the NC DHSR should update the hospital licensure form to include a section that will allow for all facilities submitting the form to indicate their highest level of maternal care services available.

### RECOMMENDATION 2.2:

#### Form Multi-Disciplinary Assessment Teams to Utilize CDC LOCATe Tool

The North Carolina Healthcare Association should encourage its members to establish maternal and neonatal level of care "assessment teams." These teams should:

a. Utilize the Centers for Disease Control and Prevention LOCATe tool as an assessment measure to establish their self-identified maternal and neonatal levels of care;

b. If applicable, work with their designated perinatal and neonatal outreach coordinator(s) to conduct and review the facility's levels of care established through self-assessment;

c. If North Carolina Administrative Code 10A NCAC 13B .4305 has been updated, report their findings to birthing facility personnel responsible for filling out the annually required hospital licensure form.

### RECOMMENDATION 2.3:

#### Require External Verification of Birthing Facilities' Maternal and Neonatal Level of Care Designations

The North Carolina General Assembly should implement legislation requiring:

a. External verification every 3 years by staff as designated by the North Carolina Division of Health Services Regulation, for any birthing facility in North Carolina that self-identifies as providing Level I maternal or neonatal care;

b. External verification every 3 years by staff as designated by the North Carolina Division of Health Services Regulation, of facilities that have self-identified as maternal and/or neonatal Level II, Level III, and Level IV facilities.

   1. External Neonatal Levels of Care Verification should be conducted by the American Academy of Pediatrics NICU Verification Program.

c. External maternal care Level II, III, or IV verification should be conducted by the American College of Obstetricians and Gynecologists/Society for Maternal-Fetal Medicine Levels of Maternal Care verification program.

### RECOMMENDATION 2.4:

#### Re-establish North Carolina's Perinatal and Neonatal Outreach Coordinator Program

a. Funding for at least one perinatal and one neonatal outreach coordinator per regional perinatal center and one program coordinator should be provided by:

   1. The North Carolina General Assembly should allocate $1.25 million in recurring state appropriations to support half the cost of up to 10 perinatal and 10 neonatal outreach coordinator and roles;

   2. Regional perinatal centers should cover half the cost of their own perinatal and neonatal outreach coordinator positions so they can fulfill the duties of regional perinatal health care centers and neonatal intensive care units referred to by American College of Obstetricians and Gynecologists/Society for Maternal-Fetal Medicine maternal level of care guidelines and American Academy of Pediatrics neonatal level of care guidelines.

b. The North Carolina Division of Public Health should administer state funding for perinatal and neonatal regional outreach coordinator positions, including outlining the duties and responsibilities of perinatal and neonatal regional outreach coordinator positions receiving state funding. Duties and responsibilities should include:

   1. Developing and fostering relationships between all referring health care centers located in their region.

   2. Working with health care center evaluation teams in their designated region to identify the most appropriate self-identified level of neonatal and maternal care.

   3. Developing management procedures and systems of referral for transport and back-transport to different facilities within their region.

   4. Developing relationships with all birthing facilities in their region to ensure they are best meeting quality, performance, and best practice standards outlined in North Carolina Administrative Code 10A NCAC 13B .4301-08 (when updated).

   5. Attending quarterly with all regional perinatal and neonatal coordinators to discuss lessons learned, best practices (i.e. relationship development), etc.

c. The North Carolina Healthcare Association should support perinatal and neonatal outreach coordinators by facilitating shared learnings, relationship development, and coordination among facilities by region.

### RECOMMENDATION 2.5:

#### Support Outpatient Risk-Appropriate Perinatal System of Care

Regional Perinatal and Neonatal Outreach Coordinators, or staff from Regional Perinatal Health Care Centers and neonatal intensive care units, should engage with outpatient prenatal care providers to develop pathways to risk-appropriate outpatient care. Strategic partners in this work include, but are not limited to, the following: the North Carolina Division of Public Health, the North Carolina Medical Society, the North Carolina Healthcare Association, North Carolina private insurers and Prepaid Health Plans, and appropriate North Carolina health care professional associations. Methods of ensuring risk-appropriateness should include:

a. Appropriate risk assessment and risk selection across settings for perinatal care;

b. Written collaboration agreements to ensure timely, seamless transitions to higher levels of perinatal care when needed; and

c. Ready access to consultation when higher levels of care are needed.

## CHAPTER 3: PRECONCEPTION AND PRENATAL CARE

### RECOMMENDATION 3.1:
Expand Access to Health Care Services

The North Carolina General Assembly should increase access to and utilization of health care services for uninsured residents.

### RECOMMENDATION 3.2:
Expand Access to Comprehensive Prenatal Care for Women Ineligible for Medicaid

The North Carolina General Assembly should expand access to comprehensive prenatal care for women ineligible for Medicaid.

### RECOMMENDATION 3.3:
Extend Coverage for Group Prenatal Care and Doula Support

a. Private insurers and prepaid health plans in North Carolina should develop coverage policies to include or incentivize group prenatal care and doula support as part of value-based payments, enhanced reimbursements, or as value-added services.

b. The Division of Health Benefits, in collaboration with the Division of Public Health and the Office of Rural Health, should develop a Medicaid clinical policy to define "certified doulas." This definition should include training, certification, and supervision requirements for certified doulas.

### RECOMMENDATION 3.4:
Increase the Utilization and Completion Percentages of Childbirth Education Classes

a. To increase attendance in childbirth education classes, North Carolina private insurers and prepaid health plans should offer:

    1. Information and resources to their members on the benefits of enrolling and completing a childbirth education class during pregnancy.

    2. Incentives, such as reimbursement of registration fees up to current market rate to their members who complete, in entirety, childbirth education classes.

b. North Carolina private insurers and prepaid health plans should advise providers in their regions on any incentive programs they develop for childbirth education classes.

c. The North Carolina Division of Public Health should develop a list of educators who have completed state-approved trainings, noting those available with Spanish speaking providers.

### RECOMMENDATION 3.5:
Full Practice Authority for Certified Nurse-Midwives

The North Carolina General Assembly should pass laws supporting full practice authority of certified nurse-midwives.

### RECOMMENDATION 3.6:
Standardize Screening and Treatment for Perinatal Mental Health and Substance Use

a. Regional Perinatal Centers and Health Professional Associations for Prenatal Care Providers should educate providers on the Pregnancy Medical Home Substance Use Guidelines.

b. The Medicaid Advisory Board and pre-paid health plans should convene a working group tasked with developing Pregnancy Medical Home Clinical Pathway Guidelines for Perinatal Mood and Anxiety Disorders.

### RECOMMENDATION 3.7:
Expand Perinatal Access to Mental Health Services

The North Carolina Division of Public Health should review metrics and outcome data for the NC MATTERS grant. If found to be effective, then the North Carolina Department of Health and Human Services in collaboration with its partners should develop a plan to scale these efforts to other regions in the state.

## CHAPTER 4: QUALITY IMPROVEMENT NEEDED TO ACHIEVE A RISK- APPROPRIATE PERINATAL SYSTEM OF CARE

### RECOMMENDATION 4.1:
Collect and Report Data on Maternal and Infant Outcomes by Race and Ethnicity

Health insurance companies, health care systems, and health care providers should collect and review data on maternal and infant outcomes using the same race/ethnicity, gender, disability status, and geography categories as required of Prepaid Health Plans under the Stratified Reporting Elements.[5] Findings from this data should direct quality improvement efforts.

### RECOMMENDATION 4.2:
Engage Insurers in Quality Improvement Efforts that Address Racial and Ethnic Disparities in Care

a. The North Carolina Division of Health Benefits within the Department of Health and Human Services should prioritize encouraging Prepaid Health Plans to:

    1. Focus on reducing maternal and infant mortality and morbidity as part of their outcomes-based continuous quality improvement process with a particular focus on equity in maternal and infant outcomes; and

    2. Use the Division of Health Benefit's Medicaid Quality Measures "Prenatal and Postpartum Care" and "Live Births Weighing Less than 1,500 or 2,500 Grams" as withhold measures in the Prepaid Health Plan contracts beginning in the second year of contracting.

b. The Division of Health Benefits should also focus on reducing maternal and infant mortality and morbidity for those who will remain in Medicaid Direct by focusing on reporting of maternal and infant quality indicators by race/ethnicity and engaging in quality improvement initiatives with providers

c. Private health insurers should:

    1. Analyze maternal and infant mortality and morbidity by race/ethnicity and other categories to determine if and where disparities in outcomes exist;

    2. Develop quality improvement plans for reducing disparities in maternal and infant mortality and morbidity; and

    3. Develop value-based payment plans and other payment models that hold providers accountable for reducing disparities in maternal and infant mortality and morbidity.

### RECOMMENDATION 4.3:

#### Engage Birthing Facilities in Quality Improvement Efforts to Address Racial and Ethnic Disparities in Care

a. The North Carolina Healthcare Association should promote the existing ENRICH Carolinas technical assistance and training program and encourage maternity care and birthing facilities to participate.

b. Maternity care and birthing hospitals should go through the ENRICH Carolinas technical assistance and training program to improve maternal and infant care and address differences in care provided based on race/ethnicity.

### RECOMMENDATION 4.4:

#### Engage Patient and Family Advisory Councils

a. Facilities that provide perinatal services, including maternity care hospitals, birthing centers, and provider clinics, should have patient and family advisory councils, or patient and advisory teams designed to promote patient and family partnerships, provide guidance on improving the consumer experience, and inform service delivery and quality improvement during the perinatal period and beyond. Perinatal patient and family advisors or advocates can also support clinical teams at hospitals or other care settings by advising or serving on teams that advise on matters including, but not limited to: patient and provider relationships, institutional review, quality improvement initiatives, and patient education on safety and quality matters to the extent allowed by state and federal law.

b. Patient and family advisory councils, or patient and family advisory teams, should have representation that reflects the diversity of families served, such as payors, ages, languages, races and ethnicities, birth experiences, and geography and engagement from facility leadership.

### RECOMMENDATION 4.5:

#### Align Perinatal Care Regional Maps with Medicaid Transformation Maps

The North Carolina Division of Public Health should align Perinatal Care Regions with North Carolina Medicaid Transformation Regions to ensure continuity between efforts by Regional Perinatal Health Care Centers and neonatal intensive care units and Prepaid Health Plans.

## CHAPTER 5: POSTPARTUM SERVICES AND SUPPORTS

### RECOMMENDATION 5.1:

#### Develop Parent Navigator Programs in Birthing Facilities

Neonatal intensive care units should develop parent navigator programs to provide navigation and peer support to parents of infants receiving care. Parent navigator programs should:

a. Focus on how to support families who have extended stays in the hospital and infants who spend a significant amount of time in the neonatal intensive care unit.

b. Ensure parent navigators are persons with relevant lived experience in caring for an infant in the neonatal intensive care unit.

## CHAPTER 6: SUPPORT FOR PREGNANT WOMEN, INFANTS, AND THEIR FAMILIES

### RECOMMENDATION 6.1:

#### Use Community Health Workers to Support Pregnant Women in Their Communities

The North Carolina Division of Public Health – Women's and Children's Health Section should partner with the Community Health Worker Initiative in the Office of Rural Health to develop strategies by which community health workers could contribute to the goal of reducing infant and maternal mortality in North Carolina. Additionally, the Women's and Children's Health Section should require programs that receive funding from Women's and Children's Health Section for community health workers to adopt the standards set forth in the Community Health Workers in North Carolina: Creating an Infrastructure for Sustainability plan.

### RECOMMENDATION 6.2:

#### Implement Family-Friendly Workplace Policies

North Carolina employers, including the state, should provide pregnancy accommodations such as paid family and medical leave, paid sick days, and pregnancy and breastfeeding accommodations.

| | RESPONSIBLE AGENCY/ORGANIZATION | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **RECOMMENDATIONS** | **North Carolina Division of Health Services Regulation (NC DHSR)** | **Division of Public Health** | **Division of Health Benefits** | **Office of Rural Health** | **North Carolina General Assembly** | **Regional Perinatal Centers** | **Private Health Insurers** | **Prepaid Health Plans** | **Health Care Providers** | **Health Professional and Trade Organizations** | **Other** |
| **Recommendation 2.1:** Adopt National Maternal and Infant Risk-Appropriate Level of Care Standards | X | X | | | | | | | | | Medical Care Commission |
| **Recommendation 2.2:** Form Multi-Disciplinary Assessment Teams to Utilize CDC LOCATe Tool | | | | | | | | | | NCHA | |
| **Recommendation 2.3:** Require External Verification of Birthing Facilities' Maternal and Neonatal Level of Care Designations | | | | | X | | | | | | |
| **Recommendation 2.4:** Re-establish North Carolina's Perinatal and Neonatal Outreach Coordinator Program | | X | | | X | X | | | | NCHA | |
| **Recommendation 2.5:** Support Outpatient Risk-Appropriate Perinatal System of Care | | | | | | X | | | NICUs | | Regional Perinatal Coordinators, Neonatal Outreach Coordinators |
| **Recommendation 3.1:** Expand Access to Health Care Services | | | | | X | | | | | | |
| **Recommendation 3.2:** Expand Access to Comprehensive Prenatal Care for Women Ineligible for Medicaid | | | | | X | | | | | | |
| **Recommendation 3.3:** Extend Coverage for Group Prenatal Care and Doula Support | | X | X | X | | | X | X | | | |
| **Recommendation 3.4:** Increase the Utilization and Completion Percentages of Childbirth Education Classes | | X | | | | | X | X | | | |
| **Recommendation 3.5:** Full Practice Authority for Certified Nurse-Midwives | | | | | X | | | | | | |
| **Recommendation 3.6:** Standardize Screening and Treatment for Perinatal Mental Health and Substance Use | | | | | | X | | X | | Health Professional Associations for Prenatal Care Providers | Medicaid Advisory Board |
| **Recommendation 3.7:** Expand Perinatal Access to Mental Health Services | X | X | | | | | | | | | |
| **Recommendation 4.1:** Collect and Report Data on Maternal and Infant Outcomes by Race and Ethnicity | | | | | | | X | | X | | Health Care Systems |
| **Recommendation 4.2:** Engage Insurers in Quality Improvement Efforts that Address Racial and Ethnic Disparities in Care | | | X | | | | X | | | | |
| **Recommendation 4.3:** Engage Birthing Facilities in Quality Improvement Efforts to Address Racial and Ethnic Disparities in Care | | | | | | | | | Maternity Care and Birthing Hospitals | NCHA | |
| **Recommendation 4.4:** Engage Patient and Family Advisory Councils | | | | | | | | | Facilities that provide perinatal services | | |
| **Recommendation 4.5:** Align Perinatal Care Regional Maps with Medicaid Transformation maps | | X | | | | | | | | | |
| **Recommendation 5.1:** Develop Parent Navigator Programs in Birthing Facilities | | | | | | | | | NICUs | | |
| **Recommendation 6.1:** Use Community Health Workers to Support Pregnant Women in Their Communities | | Women's and Children's Health Section | | Community Health Worker Initiative | | | | | | | |
| **Recommendation 6.2:** Implement Family-Friendly Workplace Policies | | | | | | | | | | | North Carolina employers |

*NCHA = North Carolina Healthcare Association, NICU = Neonatal Intensive Care Unit*

| LEVEL OF CARE | CAPABILITIES | PROVIDER TYPES[a] |
|---|---|---|
| **LEVEL I**<br>Well newborn nursery | • Provide neonatal resuscitation at every delivery<br>• Evaluate and provide postnatal care to stable term newborn infants<br>• Stabilize and provide care for infants born 35–37 wk gestation who remain physiologically stable<br>• Stabilize newborn infants who are ill and those born at <35 wk gestation until transfer to a higher level of care | Pediatricians, family physicians, nurse practitioners, and other advanced practice registered nurses |
| **LEVEL II**<br>Special care nursery | Level I capabilities plus:<br>• Provide care for infants born ≥32 wk gestation and weighing ≥1500 g who have physiologic immaturity or who are moderately ill with problems that are expected to resolve rapidly and are not anticipated to need subspecialty services on an urgent basis<br>• Provide care for infants convalescing after intensive care<br>• Provide mechanical ventilation for brief duration (<24 h) or continuous positive airway pressure or both<br>• Stabilize infants born before 32 wk gestation and weighing less than 1500 g until transfer to a neonatal intensive care facility | Level I health care prividers plus:<br>Pediatric hospitalists, neonatologist, and neonatal nurse practitioners. |
| **LEVEL III**<br>NICU | Level II capabilities plus:<br>• Provide sustained life support<br>• Provide comprehensive care for infants born <32 wks gestation and weighing <1500 g and infants born at all gestational ages and birth weights with critical illness<br>• Provide prompt and readily available access to a full range of pediatric medical subspecialists, pediatric surgical specialists, pediatric anesthesiologists, and pediatric opthalmologists<br>• Provide a full range of respiratory support that may include conventional and/or high-frequency ventilation and inhaled nitric oxide<br>• Perform advanced imaging, with interpretation on an urgent basis, including computed tomography, MRI, and echocardiography | Level II health care prividers plus:<br>Pediatric medical subspecialists[b], pediatric anesthesiologists[b], pediatric surgeons, and pediatric opthalmologists[b]. |
| **LEVEL III**<br>Regional NICU | Level III capabilities plus:<br>• Located within an institution with the capability to provide surgical repair of complex congenital or acquired conditions<br>• Maintain a full range of pediatric medical subspecialists, pediatric surgical subspecialists, and pediatric anesthesiologists at the site<br>• Facilitate transport and provide outreach education | Level III health care prividers plus:<br>Pediatric surgical subspecialists |

*a Includes all providers with relevant experience, training, and demonstrated competence.*

*b At the site or at a closely related institution by prearranged consultative agreement.*

## 10A NCAC 13B .4305 ORGANIZATION OF NEONATAL SERVICES

(a) The governing body shall approve the scope of all neonatal services and the facility shall classify its capability in providing a range of neonatal services using the following criteria:

**(1) LEVEL I:** Full-term and pre-term neonates that are stable without complications. This may include, small for gestational age or large for gestational age neonates.

**(2) LEVEL II:** Neonates or infants that are stable without complications but require special care and frequent feedings; infants of any weight who no longer require Level III or LEVEL IV neonatal services, but who still require more nursing hours than normal infant. This may include infants who require close observation in a licensed acute care bed

**(3) LEVEL III:** Neonates or infants that are high-risk, small (or approximately 32 and less than 36 completed weeks of gestational age) but otherwise healthy, or sick with a moderate degree of illness that are admitted from within the hospital or transferred from another facility requiring intermediate care services for sick infants, but not requiring intensive care. The beds in this level may serve as a "step-down" unit from Level IV. Level III neonates or infants require less constant nursing care, but care does not exclude respiratory support.

**(4) LEVEL IV** (Neonatal Intensive Care Services): High-risk, medically unstable or critically ill neonates approximately under 32 weeks of gestational age, or infants, requiring constant nursing care or supervision not limited to continuous cardiopulmonary or respiratory support, complicated surgical procedures, or other intensive supportive interventions.

(b) The facility shall provide for the availability of equipment, supplies, and clinical support services.

(c) The medical and nursing staff shall develop and approve policies and procedures for the provision of all neonatal services.

*History Note:* *Authority G.S. 131E-79;*
*Eff. January 1, 1996;*
*Temporary Amendment Eff. March 15, 2002;*
*Amended Eff. April 1, 2003.*

## ACCREDITED BIRTH CENTER

### DEFINITION

Care for low-risk women with uncomplicated singleton term vertex pregnancies who are expected to have an uncomplicated birth

### CAPABILITIES AND HEALTH CARE PROVIDERS

- Refer to birthcenters.org for American Association of Birth Centers' Standards for Birth Centers.

## LEVEL I (BASIC CARE)

### DEFINITION

Care of low- to moderate-risk pregnancies with ability to detect, stabilize, and initiate management of unanticipated maternal–fetal or neonatal problems that occur during the antepartum, intrapartum, or postpartum period until the patient can be transferred to a facility at which specialty maternal care is available

### CAPABILITIES

- Capability and equipment to provide low-risk and appropriate moderate-risk maternal care and a readiness at all times to initiate emergency procedures to meet unexpected needs of women and newborns within the center. This includes:
    - ability to begin emergency cesarean delivery within a time interval that best incorporates maternal and fetal risks and benefits.
    - limited obstetric ultrasonography with interpretation readily available at all times.†
    - support services readily available at all times†, including laboratory testing and blood bank.
    - capability to implement patient safety bundles ‡ for common causes of preventable maternal morbidity, such as management of maternal venous thromboembolism, obstetric hemorrhage, and maternal severe hypertension in pregnancy.§
    - ability at all times† to initiate massive transfusion protocol, with process to obtain more blood and component therapy as needed.
- Stabilization and the ability to facilitate transport to a higher-level hospital when necessary. This includes
    - risk identification and determination of conditions necessitating consultation, referral, and transfer.
    - a mechanism and procedure for transfer/transport to a higher-level hospital available at all times.†
    - a reliable, accurate, and comprehensive communication system between participating hospitals, hospital personnel, and transport teams.
- Ability, in collaboration with higher-level facility partners, to initiate and sustain education and quality improvement programs to maximize patient safety.

### HEALTH CARE PROVIDERS

- Every birth attended by at least one qualified birthing professional (midwife‖, family physician, or obgyn) and an appropriately trained and qualified RN with level-appropriate competencies as demonstrated by nursing competency documentation.
- Physician with privileges to perform emergency cesarean delivery readily available at all times.†
- Primary maternal care providers, including midwives‖, family physicians, or ob-gyns readily available at all times.†
- Appropriately trained and qualified RNs with level-appropriate competencies as demonstrated by nursing competency documentation readily available at all times.†
- Nursing leadership has level-appropriate formal training and experience in maternal care.
- Anesthesia providers, such as anesthesiologists, nurse anesthetists, or anesthesiologist assistants working with an anesthesiologist,¶ for labor analgesia and surgical anesthesia readily available at all times.†

## LEVEL II (SPECIALTY CARE)

### DEFINITION

Level I facility plus care of appropriate moderate- to high-risk antepartum, intrapartum, or postpartum conditions

### CAPABILITIES

Level I facility capabilities plus

- Computed tomography scan, magnetic resonance imaging, nonobstetric ultrasound imaging, and maternal echocardiography with interpretation readily available daily (at all times not required).
- Standard obstetric ultrasound imaging with interpretation readily available at all times.†

### HEALTH CARE PROVIDERS

Level I facility health care providers plus

- Ob-gyn readily available at all times.†
    - Based upon available resources and facility determination of the most appropriate staffing, it may be acceptable for a family physician with obstetric fellowship training or equivalent training and skills in obstetrics, and with surgical skill and privileges to perform cesarean delivery to meet the criteria for being readily available at all times.
- Physician obstetric leadership is a board-certified# ob-gyn with experience in obstetric care.
    - Based upon available resources and facility determination of the most appropriate staffing, it may be acceptable for such leader to be board certified in another specialty with privileges and expertise in obstetric care including with surgical skill and privileges to perform cesarean delivery.
- An MFM readily available at all times† for consultation onsite, by phone, or by telemedicine, as needed.
- Anesthesiologist readily available at all times.†
- Internal or family medicine physicians and general surgeons readily available at all times† for obstetric patients.

## LEVEL III (SUBSPECIALTY CARE)

### DEFINITION

Level II facility plus care of more complex maternal medical conditions, obstetric complications, and fetal conditions

### CAPABILITIES

Level II facility capabilities plus

- In-house availability of all blood components.
- Computed tomography scan, magnetic resonance imaging, maternal echocardiography, and nonobstetric ultrasound imaging services and interpretation readily available at all times.†
- Specialized obstetric ultrasound and fetal assessment, including Doppler studies, with interpretation readily available at all times.†
- Basic interventional radiology (capable of performing uterine artery embolization) readily available at all times.†
- Appropriate equipment and personnel physically present at all times** onsite to ventilate and monitor women in labor and delivery until they can be safely transferred to the ICU.
- Onsite medical and surgical ICUs that accept pregnant women and women in the postpartum period. The ICUs have adult critical care providers physically present at all times.** An MFM is readily available at all times‡ to actively communicate or consult for all obstetric patients in the ICU.
- Documented mechanism to facilitate and accept maternal transfers/transports.
- Provide outreach education and patient transfer feedback to level I and II designated facilities to address maternal care quality issues.
- Provide perinatal system leadership if acting as a regional center (for example, in areas where level IV facilities are not available) (see Level IV).

## LEVEL III (SUBSPECIALTY CARE)

*CONTINUED*

### HEALTH CARE PROVIDERS

Level II health care providers plus

- Nursing leaders and adequate number of RNs who have special training and experience in the management of women with complex and critical maternal illnesses and obstetric complications
- Board-certified[#] ob-gyn physically present** at all times
- An MFM with inpatient privileges readily available at all times,[†] either onsite, by phone, or by telemedicine. Timing of need to be onsite is directed by urgency of clinical situation. However, MFM must be able to be onsite to provide direct care within 24 hours.
- Director of maternal–fetal medicine service is a board-certified MFM.
- Director of obstetric service is a board-certified ob-gyn or MFM.
- Board-certified anesthesiologist[#] physically present** at all times.
- Director of obstetric anesthesia services is board-certified anesthesiologist with obstetric anesthesia fellowship training or experience in obstetric anesthesia.
- Full complement of subspecialists, such as subspecialists in critical care, general surgery, infectious disease, hematology, cardiology, nephrology, neurology, gastroenterology, internal medicine, behavioral health, and neonatology, readily available for inpatient consultation at all times.[†]

## LEVEL IV (REGIONAL PERINATAL HEALTH CARE CENTERS)

### DEFINITION

Level III facility plus on-site medical and surgical care of the most complex maternal conditions and critically ill pregnant women and fetuses throughout antepartum, intrapartum, and postpartum care

### CAPABILITIES

Level III facility capabilities plus

- On-site medical and surgical care of complex maternal conditions with the availability of critical care unit or ICU beds.
- On-site ICU care for obstetric patients with primary or co-management by maternal–fetal medicine team. Co-management includes at least daily rounds by an MFM with interaction with the ICU team and other subspecialists with daily documentation. In some settings, the ICU is in an adjoining or connected building, which is acceptable as long as maternal–fetal medicine care is as noted above. If the woman must be transported by ambulance to the ICU, this is not considered onsite.
- Perinatal system leadership, including facilitation of collaboration with facilities in the region, analysis and review of system perinatal outcome and quality data, provision of outreach education and assistance with quality improvement as needed.

### HEALTH CARE PROVIDERS

Level III health care providers plus

- Maternal–fetal medicine care team with expertise to manage highly complex, critically ill, or unstable maternal patients. A board-certified MFM attending with full inpatient privileges is readily available at all times[†] for consultation and management. This includes co-management of ICU-admitted obstetric patients.
- Nursing Service Line leadership with advanced degree and national certification.
- Continuous availability of adequate numbers of RNs who have experience in the care of women with complex medical illnesses and obstetric complications with close collaboration between critical care nurses and obstetric nurses with expertise in caring for critically ill women.
- Board-certified anesthesiologist with obstetric anesthesia fellowship training or experience in obstetric anesthesia physically present at all times.**
- At least one of the following adult subspecialties readily available at all times for consultation and treatment as needed onsite: neurosurgery, cardiac surgery, or transplant. If the facility does not have all three subspecialties available, there should be a process in place to transfer women to a facility that can provide the needed service.

*Abbreviations: CMs, certified midwives; CNMs, certified nurse–midwives; ICU, intensive care unit; MFM, maternal–fetal medicine subspecialists; ob-gyns, obstetrician– gynecologists; RNs, registered nurses.*

** These guidelines are limited to maternal needs. Consideration of fetal or neonatal needs and the appropriate level of care should occur following existing guidelines. In fact, levels of maternal care and levels of neonatal care may not match within facilities. Additionally, these are guidelines, and local issues will affect systems of implementation for regionalized maternal care, perinatal care, or both.*

*† Readily available at all times: the specific person should be available 24 hours a day, 7 days a week for consultation and assistance, and able to be physically present onsite within a time frame that incorporates maternal and fetal or neonatal risks and benefits with the provision of care. Further defining this time frame should be individualized by facilities and regions, with input from their obstetric care providers. If referring to the availability of a service, the service should be available 24 hours a day, 7 days a week unless otherwise specified.*

*‡ Available at https://safehealthcareforeverywoman.org/patient-safety-bundles.*

*§ See also Emergent therapy for acute-onset, severe hypertension during pregnancy and the postpartum period. ACOG Committee Opinion No. 767. American College of Obstetricians and Gynecologists. Obstet Gynecol 2019;133:e174–80.*

*‖ Midwives who meet International Confederation of Midwives standards, such as certified nurse–midwives (CNMs) and certified midwives (CMs), and who are legally recognized to practice within the jurisdiction of the state.*

*¶ Scope of practice for nurse anesthetists and anesthesiologist assistants may vary by state.*

*# Also includes physicians who have completed residency training and are eligible for board certification according to applicable board policies.*

*** Physically present at all times: the specific person should be onsite in the location where the perinatal care is provided, 24 hours a day, 7 days a week.*