

North Carolina's Infant Mortality Problems Persist: Time for a Paradigm Shift

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Improvements over the past two decades in the medical care of women during pregnancy and of newborn infants have contributed to North Carolina's success in reducing its high infant mortality rate to an historic low. These efforts are to be applauded and they must be sustained. One of the largest remaining gaps, however, is the absence of significant initiatives that focus on improving a woman's health before she becomes pregnant. Future improvements in reducing rates of infant death or improving birth outcomes will depend upon a renewed sense of urgency to provide the best healthcare to pregnant women and their babies and a willingness to expand the current focus on improving pregnancies to improving the health and psychosocial well-being of *all* women of reproductive years.

Background

Infant mortality is the leading cause of child death, affecting close to 1,000 North Carolina babies and their families every year. While the state's rate is at an historical low (8.2 deaths/1,000 live births in 2002), North Carolina continues to post one of the highest rates in the nation (Table 1). Racial and ethnic disparities in infant death rates persist: African American babies have a two to three times greater rate of death than white babies (14.2/1,000 and 5.9/1,000, respectively, in 2002). Interestingly, Latino women in North Carolina, many of whom are newly arrived immigrants, have among the best birth outcomes at present. However, experience from other states suggests that the longer immigrants live in this country the more likely they are to experience infant loss. North Carolina currently has a window of opportunity to learn about and sustain the factors that lead to these healthy births. With the rapid growth of a young, Latino population, taking action now may serve to prevent a worsening of the state's infant mortality rate among this group in the future.

While death rates have declined over time, the major causes of infant death have remained fairly constant. North Carolina's babies, like those in other states, are most likely to die as a result of conditions related to prematurity and low-birth weight, congenital anomalies and Sudden Infant Death Syndrome (SIDS). Preterm birth, the leading correlate of newborn death, is increasing for *all groups* in North Carolina. Preterm birth affects more than 15,000 North Carolina babies annually, including one out of every eight white babies, and one out of six for African American babies (Table 1). Young African American women have worse health status (obesity, diet, exercise, exposure to disease) than young white women. Efforts to further reduce infant mortality should emphasize reduction in the glaring health disparities experienced by African Americans in North Carolina—especially children, teenagers, and women of child-bearing years. More than 10,000 babies are born with low-birth weight (less than 5.5 pounds), and more than 3,000 infants are born with birth defects each year in North Carolina causing death, illness, emotional trauma and great economic burden for families and the state.

Studies show that poor birth outcomes can be caused by a myriad of problems. Women with unintended pregnancies or closely spaced pregnancies, those who are under age 18 or older than 35, smokers, and those with high stress and limited resources all have a higher risk of having premature or low-birth weight babies.^{1 2 3}

North Carolina's Programs to Reduce Infant Mortality

North Carolina has a long-history of services and programs aimed at reducing the state's high infant mortality rates. Over the years, the state has expanded access to prenatal care and the

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Table 1.
Leading Causes of Infant Deaths (NC, US, Selected Years)

	Total		Non-Latino White		Non-Latino African-American		Non-Latino Native American		Latino	
	NC	US	NC	US	NC	US	NC	US	NC	US
Preterm births* (% live births)	13.2	11.8	11.4	10.6	18.3	17.6	14.1	12.8	11.6	11.4
Low-birth weight births* (% live births)	8.9	7.6	7.4	6.7	13.7	13.1	10.4	7.1	6.2	6.4
Infant Mortality** (deaths per 1,000 live births)	9.0	7.0	6.7	5.8	15.7	13.9	11.8	8.9	6.2	5.7
Deaths due to birth defects** (deaths per 1,000 live births)	.1591	.1413								
Deaths due to SIDS** (deaths per 1,000 live births)	.0844	.0677								
Deaths due to prematurity/low-birth weight** (deaths per 1,000 live births)	.1787	.1112								

* Data for 1999-2001. Numbers reflect percentage of live births.

** Data for 1998-2000. Numbers reflect deaths per 1,000 live births.

Source: March of Dimes Prematurity Website. Available at: http://peristats.modimes.org/statestep1.cfm?state_id=37 (accessed June 4, 2004).

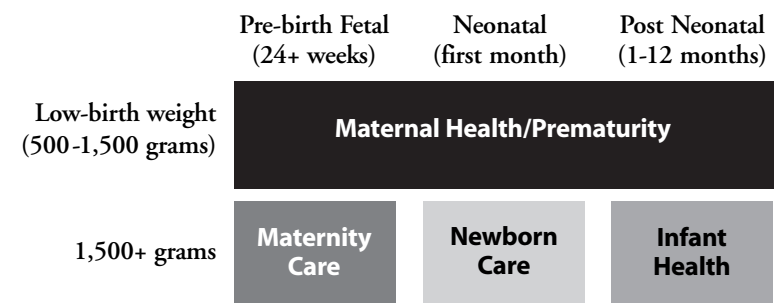
array of pre- and post-natal services available to pregnant women and infants, increased the state's outreach and education efforts, and expanded family planning services to reduce unwanted pregnancies (see pages 170 and 172). In addition, the state and local communities have helped launch targeted infant mortality campaigns aimed at high-risk groups or communities; and have created special programs aimed at reducing some of the causes of infant deaths. These efforts have helped contribute to a 35% reduction in the state's infant mortality rate since 1988 when provisional data from the Centers for Disease Control and Prevention listed North Carolina as having the worst infant mortality rate in the country. While these efforts have been critically important in reducing the state's infant mortality rate, there is a need to analyze existing data with new eyes to better pinpoint the underlying cause and specific patterns of risk that should be addressed, and therefore the appropriate timing of interventions that will have the most impact.

A New Way of Analyzing the Problem: Perinatal Periods of Risk (PPOR) Analysis

For more than a decade, the World Health Organization has used an analytic approach, the "Perinatal Periods of Risk Analysis" (PPOR) to analyze the cause of fetoinfant mortality, and to develop appropriate interventions.⁴ In 1997, the Centers for Disease Control and Prevention (CDC), City MatCH at the University of Nebraska Medical Center, the National March of Dimes Foundation, and the Health Resources and Services Administration/Maternal and Child Health Bureau created a partnership to test this model in the United States.

PPOR helps to "map" fetal and infant deaths into four distinct periods based on when the deaths occur and the birth weight of the baby or fetus at the time of death. The three categories for the age of death are broken into fetal deaths (24 weeks or

Figure 1.
Perinatal Periods of Risk Analysis

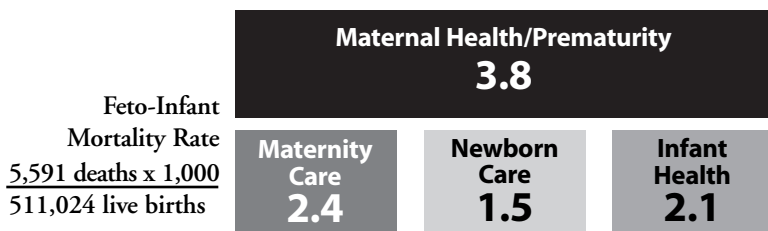


greater of gestation), neonatal deaths (within the first month after birth), and postneonatal (1-12 months of life). Birth weight is divided into two categories: low-birth weight (500-1,499 grams) or higher birth weight (1,500 + grams). Because of large reporting differences in vital records across geographic locations, fetal deaths are limited to those occurring after 24 weeks of gestation, and to those fetuses or infants weighing at least 500 grams at the time of death. This analysis creates four groups: maternal health/prematurity, maternity care, newborn care, and infant health (See Figure 1). The maternal health/prematurity category covers all low-birth weight fetoinfant deaths, regardless of whether the death occurs in the fetal, neonatal, or post-neonatal time period.

Deaths linked to maternal health/prematurity result from risk factors that are present before a woman becomes pregnant, such as a history of substance abuse, tobacco use, unstable

Figure 2.
Focus on Overall Infant Mortality by Periods in which Deaths Occur

North Carolina, All Races - 1997-2001



housing/family structure, effects of poverty and stress, or a recent previous delivery. These problems can be addressed by focusing on preconceptional health, unintended pregnancy, smoking, drug abuse, and specialized perinatal care.

Deaths in the maternity care period link to factors that are most prominent during pregnancy, like poor weight gain, infection and lack of prenatal care. Some of these deaths can be prevented by ensuring women have early and continuous prenatal care, referral of high-risk pregnancies and good medical management of women with diabetes, seizures, postmaturity or other medical problems. Deaths in the newborn care period are attributed to risks that occur during delivery and through the first month postpartum. Prevention of newborn deaths focuses on advanced neonatal care and treatment of congenital abnormalities. The final period, infant health, includes deaths that occur due to factors occurring after the first month of life through the end of the first year—factors such as injuries, SIDS, congenital anomalies and infections. These deaths can be addressed through SIDS risk-reduction activities, breast-feeding promotion, access to medical homes, and injury prevention. PPOR is more of an heuristic exercise to help clarify the relative risk of these different periods of time and each periods' contribution to the likelihood of perinatal death, and is a tool for examining whether programs are focused appropriately in timing and emphasis of their efforts.

With this in mind, feto-infant deaths can be "mapped" for a geographic area to identify which of the four periods are associated with the greatest mortality risk. Each cell includes the number of fetal or infant deaths that meet the age and weight criteria. For example, a death to an infant in the 26th week of gestation that was under 1,500 grams would be counted in the maternal health/prematurity cell.

So, what does this analysis look like for North Carolina? There were 5,591 feto-infant deaths in North Carolina between 1997-2001 that met the age and weight thresholds. This yields a feto-infant mortality rate of 9.8 deaths for every 1,000 live births. More than a third of the feto-infant deaths fall into the maternal health/prematurity cell

with risks attributable primarily to maternal factors (see Figure 2).

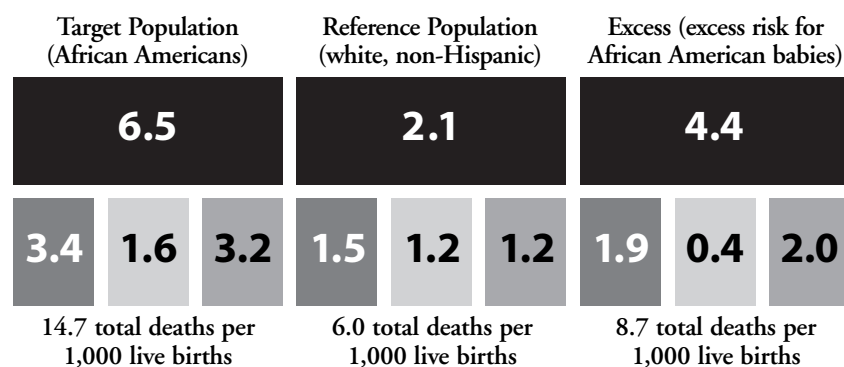
This same analysis can be used to compare rates across different subpopulations. For example, PPOR can be used to compare a high-risk group with a reference group of women expected to have better birth outcomes. Because we know that we have a high infant mortality rate among African-Americans in North Carolina, we can use the PPOR analysis to compare feto-infant birth outcomes of African Americans with a reference group of white, non-Hispanic women, over the age of 20, with greater than a high school education.⁵ The difference between

the reference and target population risks is the excess risk that exists. This excess risk must be addressed if all members of the local community are to have equal access and opportunity to optimize their health and if there is to be further progress in reducing overall infant mortality rates.

The feto-infant mortality for African American births is extremely high; at 14.7 deaths per 1,000 live births it is more than double that of whites (6.0 per 1,000). It also shows that, for the target population, almost half of the deaths are related to maternal health/prematurity (6.5 of the 14.7 deaths per 1,000 live births). Interestingly, the feto-infant deaths attributed to maternity care and those related to infant health are not as high as those associated the maternal health/prematurity, but at 3.4 and 3.2 per 1,000, respectively, these risks must still be addressed. One surprise that the data show is the extremely *low* rates of excess death attributable to the newborn period (0.4 per 1000). This tells us that African American babies in North Carolina have mortality rates associated with newborn care that are comparable to those among whites. This is cause for celebration, but also a signal that our efforts to address the problem of infant-mortality in North Carolina need a new and targeted approach.

To summarize, this PPOR review tells us that the most prominent period of excess risk for mothers and babies in North Carolina, especially African Americans, is the stage where the majority of the excess risk occurs (4.4 of the 8.7 or

Figure 3.
Excess Feto-Infant Mortality for African Americans in North Carolina 1997-2001



51%) and calls attention to the importance of factors related to the general health of women in childbearing ages. Efforts to improve this situation would direct our attention to the pre-conceptional period, or the health of women of childbearing ages before they become pregnant or between pregnancies.

This analysis also highlights North Carolina's current strengths and recent accomplishments in newborn care as it relates to infant mortality prevention. Intensive care nurseries and hospitals are doing an excellent job caring for sick neonates and transferring at-risk infants to appropriate facilities. The state's medical technology, expertise, and infrastructure are strong and have had demonstrable success. It is important that this system be maintained, particularly through regionalization, to ensure that tiny and sick babies are born in facilities with the personnel and resources to manage their complex care. Moderate numbers for the maternity care and infant health periods likely also reflect the impact of the many public health and community-based programs already in place that serve pregnant and parenting women.

Women's Health Status in North Carolina

So how does the health of North Carolina's women measure up? The NC Program for Women's Health Research, a collaborative program of the UNC School of Medicine, the UNC School of Public Health and the Cecil G. Sheps Center for Health Services Research, produces an annual North Carolina Women's Health Report Card.⁶ The purpose of the report card is to allow the state to chart progress and problems on a large number of women's health indicators. Grades are given based on the percentage change from previous years and/or how satisfactory the current measure of each health indicator is.

As in previous years, the 2003 Women's Health Report Card documented that the state of women's health in North Carolina has much room for improvement. Data show that 45% of all live births were the outcome of unintended pregnancies (66% for African Americans) and that almost 16% of all women received late (after the first trimester) or no prenatal care. There were three cases of HIV/AIDS per 100,000 white women and 54 cases per 100,000 African American women; 248 sexually transmitted disease cases (syphilis, gonorrhea, chlamydia) per 100,000 white women and 2,522 per 100,000 for African American women.

Women's health in North Carolina received an "F" for its high rate of binge drinking among women (4.5%), high percentage of women with diabetes (6.7%), high percentage of women who are obese (23%), and high percentage of women with high blood pressure (28.9%). Indicators for African American women are even higher than those listed here. Additionally, 23% of women in North Carolina smoke (almost 14% during pregnancy), and there were 3,883 hospitalizations per 100,000 women for substance abuse or mental health diagnoses.

Research has shown that women who begin their pregnancies either underweight or overweight, with high blood pressure or diabetes, women who drink, smoke, have mental health problems, or sexually transmitted diseases are at greater risk for poor birth

outcomes. The NC Women's Health Report Card clearly documents that North Carolina's women, especially its African American women, have not achieved the health status they need (as reflected by their scores) for achieving healthy birth outcomes. This report card underscores the conclusions reached by the PPOR model. Prenatal care, neonate care and infant health are important, but ultimately the ability to achieve and sustain improved birth outcomes will coincide with improved health status and increased access to care for women before they become pregnant or between pregnancies.

Time for a Paradigm Shift

In light of consistently falling short of the standards set by most other states in the nation, as well as the racial disparity and increasing rates of premature birth seen in North Carolina, there is a clear need to expand our perspective by adding a strong and effective intervention to improve the health of all women of childbearing age, especially young women. Research to find more effective evidence-based prevention strategies should be supported while the sound knowledge we now have provides a basis for the design of reasonable and promising health programs to reduce the burdens of unhealthy lifestyles.

Prenatal care has improved pregnancy outcomes in many ways. However, it has not been shown to be effective in reducing the incidence of premature births.⁷ One possible reason for such a failure is that the causes of prematurity are predominately related to a woman's general health, social, environmental, and emotional circumstances.⁷⁻¹¹ In order to reduce the incidence of prematurity, it is reasonable to assume that it will be necessary to address those circumstances before, as well as during, pregnancy. Thus, it is time to reshape the focus of infant mortality reduction efforts. In addition to images of pregnant women and mothers holding newborns, the faces of all women of reproductive age should be part of the picture. A *life course* approach—that acknowledges the cumulative effects of risks and stressors over decades and even generations—should be considered in this new perspective.

To shift to this paradigm a number of things must happen. First and foremost our schools, the healthcare system and community agencies need to help all women, and especially the young, to gain understanding and motivation for healthier lifestyles. There needs to be increased access to and coverage for women's wellness services in many venues. These services need to be comprehensive, widely available, personally tailored, user-friendly and rewarding, and employ a bio-psychosocial approach. Reproductive health measures need to include other health indicators such as oral health, diabetes, blood pressure, smoking status and exposure to secondhand smoke, drug use, nutritional status, domestic violence, levels of stress and coping strategies, and mental health status.

Women must be educated about the need for these services and a demand created. Services should be designed to provide such rewards for participation that recruitment occurs naturally and continuation of participation is sought. Further, providers will require training on topics related to preconceptional or

interconceptional health and the need for wellness visits. A screening tool adapted for women's life cycles could be used to help a woman and her provider track her health over her life course. More research will be required and must be conducted outside of the clinical setting and no longer limited to prenatal patients in a medical context. Studies must be designed to incorporate psychosocial, environmental and biological contexts of women's situations to understand multi-level effects. They must also be designed to take place within communities and families.

North Carolina's current initiatives focusing on smoking cessation, folic acid supplementation and family planning should be expanded and instituted statewide. Improving our

delivery of these messages to targeted audiences and expanding our reach on these three factors alone will have an impact on the health of future children. In addition, the NC Department of Health and Human Services' focus on reducing health disparities is one that should be embraced widely. Within the mosaic of issues that are part of infant health, it is time that attention be paid to the pieces which represent maternal health and maternal well-being.

Women who are healthy are a vital component of North Carolina's future, whether they are pregnant or not. It's time to make the investment, to assure the health of women, and to have a long-term, positive impact on the health of newborns. **NCMJ**

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Programs and Policies to Address the Problem of Infant Mortality: A Long History

Reducing infant mortality has been on North Carolina's agenda for several decades, albeit with varying levels of intensity and funding. Concerted efforts to prevent infant death began in 1972 when Governor Robert Scott created the Maternal and Infant Health Task Force to determine why North Carolina had such high infant mortality rates. Subsequent groups, including a statewide Perinatal Council (late 1970s to late 1980s) and Governor James Martin's Governor's Commission on the Reduction of Infant Mortality (1989-1995), addressed the same issue and championed legislation and policies, mobilized local coalitions and funded community-based organizations to address this problem. The NC General Assembly also played a leadership role in the fight to reduce North Carolina's infant mortality rate. Between 1990-1994, Senator Russell Walker and Representative David Diamont introduced a four-year infant mortality reduction campaign that helped create or expand many of the existing programs aimed at reducing infant mortality. Subsequently, the NC General Assembly has continued to support legislation and/or funding to address this issue.

Private foundations and organizations such as: the March of Dimes, the Kate B. Reynolds Charitable Trust, The Duke Endowment, and the North Carolina Healthy Start Foundation have also played pivotal roles in helping raise awareness about infant mortality and in supporting programs and research. At the local level, partnerships have developed between the business community, the faith community, local organizations, and coalitions to address the specific needs in the community, to strengthen networks and referrals that serve a common public and to fill gaps in services.

Over the years, efforts to reduce North Carolina's high infant mortality rate have focused on family planning and adolescent pregnancy prevention; improving the quality, comprehensiveness and accessibility of prenatal care; interventions that target particular populations or areas of the state; and interventions targeting specific risk factors or causes of infant

deaths. These statewide and local efforts have lead to a 35% reduction in the state's infant mortality rates since 1988 when the state trailed the rest of the nation. However, recent budget cuts could jeopardize the progress that has been made.

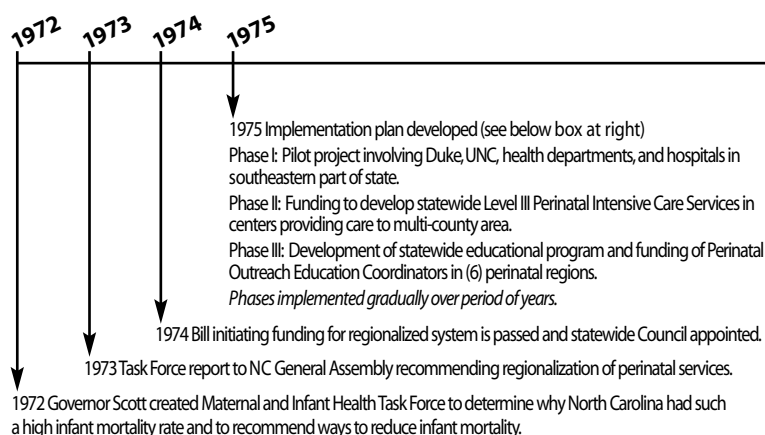
Family Planning and Adolescent Pregnancy Prevention Programs

Pregnancies that are planned by women who are physically, emotionally, socially, and financially ready are more likely to produce healthy babies. Unfortunately, almost half of all pregnancies in North Carolina and in the nation are unintended—often with serious consequences for the babies, women, families, communities, and the state. Family planning services are offered across the state through local health departments and physicians in private practice.

In 1999, the NC General Assembly mandated that insurers provide contraceptive coverage in their private health insurance plans. Women who are on Medicaid also have access to family planning services, and others can access services through local public health departments or community agencies. Nonetheless, there are many women who still lack access to family planning services. The NC General Assembly authorized the NC Department of Health and Human Services to seek a Medicaid waiver to extend family planning services to women and men (ages 19-55) with incomes below 185% of the federal poverty guidelines (See Holliday article, pages 170-172).¹ If implemented, this initiative will provide North Carolina's families with improved access to the services they need to lengthen the intervals between pregnancies (birth spacing), to reduce the likelihood of unintended pregnancies and subsequent abortions, and ultimately to improve the outcomes of subsequent pregnancies once they occur.

In addition, state funding over the years has supported specific programs to reduce adolescent pregnancies, including

A Very Brief Historical Sketch of Perinatal Care in North Carolina



PERINATAL PLAN DEVELOPMENT

Mission: To reduce infant mortality and morbidity in NC by developing a statewide voluntary, cooperative, multilevel regionalized system for inpatient and outpatient perinatal healthcare, emphasizing medical, psychosocial, and financial aspects of patients' needs. The goals are listed below.

- 1) Develop (6) Perinatal regions, each will have an active regional committee composed of multi-disciplines.
- 2) Describe and designate hospitals into one of three types.
- 3) Recruit the participation of health departments to provide routine screening of pregnant women and infants. Some will establish high-risk clinics.
- 4) Appoint a Perinatal Statewide Education Committee.
- 5) Manual "Regionalized Perinatal Health Care Program" published.

STATEWIDE PERINATAL COUNCIL

Discuss and address issues related to perinatal care. Special interest group and committees formed to:

- Study preterm labor - "White Paper" on preterm labor developed.
- Develop "Guidelines for Perinatal Care"
- Develop a Statewide Perinatal Professional Educational Plan
- Appoint a Perinatal Statewide Education Committee

the competitive Adolescent Pregnancy Prevention Program, Targeted Adolescent Pregnancy Prevention Program, the Adolescent Parenting Program and the Adolescent Pregnancy Prevention Coalition of North Carolina. (The state's adolescent pregnancy prevention programs are now under one combined program using TANF funds for teen pregnancy prevention.) Through these concerted efforts, teen pregnancy rates have declined in North Carolina to their lowest since the mid-1980s, thereby reducing the number of high-risk pregnancies, impacting overall infant mortality, and giving more teens a better chance to succeed in life. Funding for these projects, with demonstrated results, has come under attack in recent years due to the state's financial situation.

Improving the Quality, Comprehensiveness, and Accessibility of Prenatal Care

North Carolina ranks sixth in the nation for its excellent track record in ensuring that pregnant women get early and continuous prenatal care.² Statewide programs include the Baby Love Program (Medicaid for Pregnant Women), which provides prenatal care and care coordination to pregnant women who are at or below 185% of the Federal Poverty Level (FPL); high-risk maternity clinics, a regionalized Perinatal Referral System; the Perinatal Outreach Education and Training program; prevention and treatment programs for sexually transmitted diseases and HIV/AIDS; residential Perinatal Substance Abuse Treatment Programs; Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); the NC Family Health Resource Line (1-800-FOR-BABY / 1-800-367-2229)—a statewide, toll-free, bilingual information and referral line; and the bilingual First Step Campaign coordinated by the North Carolina Healthy Start Foundation, which distributes free educational materials statewide. These services provide information to pregnant women and help link them with available resources, provide prenatal care in an appropriate setting, address known risk factors, and offer educational opportunities and resources to healthcare providers. Recent budget cuts have threatened some of these critical mainstays of prenatal care and infant mortality prevention (for example, the 2004 NC General

Assembly considered proposals to cut the number of pregnant women eligible for Medicaid by reducing the income eligibility criteria). These cuts threaten the state's previous progress in improving the health of pregnant women and babies.

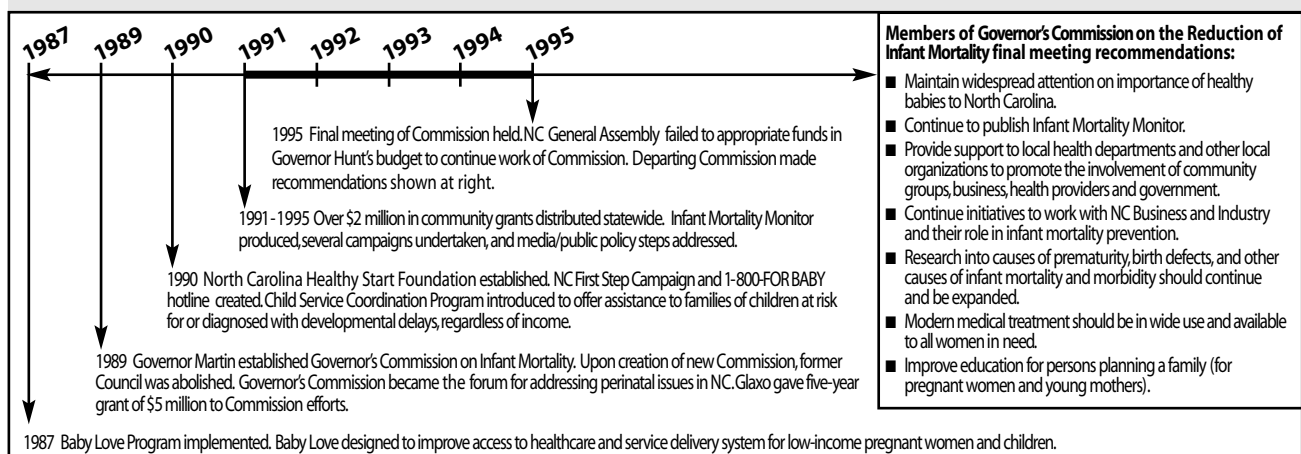
Targeted Interventions Based on Population and Geography

Infant mortality rates vary in North Carolina based on geography, race, and income. A number of unique initiatives in the state address special populations at high risk. The state-funded Healthy Beginnings Program (formerly the Minority Infant Mortality Reduction Program) provides 15 multi-year grants to local organizations that address unique issues in their communities, and the Targeted Infant Mortality Reduction Projects provide funding to eight local health departments to address factors in their community related to reducing infant death. In addition, the federal Maternal and Child Health Branch, US Department of Health and Human Services funds the NC Healthy Start *Baby Love Plus* and the UNC Pembroke *Healthy Start Corps* projects, which are used to coordinate four regional consortia in 17 counties (Triad, Eastern, Southeastern and Northeastern regions). These consortia provide outreach and other services to pregnant and postpartum women such as peer support, transportation, and enhanced case management.

Other programs initiated in the past addressed inequities between prenatal services available in rural and urban regions of the state. Both the Nurse-Midwifery Project and the Rural Obstetrical Care Incentive Program increased rural women's access to quality prenatal care by bringing medical providers to underserved areas; however, these programs were eliminated in prior years' budget cuts.

Targeted Interventions Based on Risk Factors and Causes of Infant Death

North Carolina strategically addresses certain causes of infant death, including SIDS, prevention of birth defects, and risks associated with low-birth weight. For example, the North Carolina Back To Sleep Campaign is a public-private partnership aimed at reducing Sudden Infant Death Syndrome (SIDS),



the third leading cause of infant death. This statewide, public education campaign, coordinated by the North Carolina Healthy Start Foundation and the state's SIDS Program, helps to promote behaviors before, during, and after pregnancy that reduce the risk of SIDS. As a result, SIDS deaths have decreased 36% in North Carolina since 1995. A new state law, effective December 1, 2003, should help further reduce SIDS deaths in childcare facilities. The law mandates that: babies under the age of 12 months who are cared for in licensed childcare facilities be placed to sleep on their backs, facilities have written safe sleep policies, and all childcare providers receive state approved training.

The prevention of birth defects, the second leading cause of infant death, is addressed in several ways. Pregnant women receive Maternal Serum Alpha-Fetoprotein screening to detect birth defects in utero and genetic counseling services are offered to families before and during pregnancy to assess their genetic risks and/or to receive counseling about a detected condition. The NC Birth Defects Monitoring Program records detailed information about all infants born with birth defects. Not only does this provide critical information for health monitoring and research, the program has a mechanism to refer affected children to Child Service Coordinators as needed. Utilizing a primary prevention strategy, the interagency NC Folic Acid Council works to decrease North Carolina's high rate of neural tube defects through: a statewide public education campaign to encourage women to take a daily multivitamin with folic acid, professional education, a statewide college campus outreach project, and focused initiatives in the western and eastern parts of the state. The Fetal Alcohol Syndrome Coalition addresses prenatal alcohol consumption, the leading cause of mental retardation. Perinatal Substance Abuse Treatment Programs provide gender-specific, in-patient treatment for pregnant women or women with young children. Since the mid-1990s the NC Family Health Resource Line has served as a bed locator service for healthcare providers who need referrals for their pregnant patients or patients with young children.

Smoking during pregnancy is the single most preventable cause of low-birth weight, yet North Carolina women smoke at a rate that is greater than the national average (13.2% versus 12.0% in 2001). The statewide Women and Tobacco

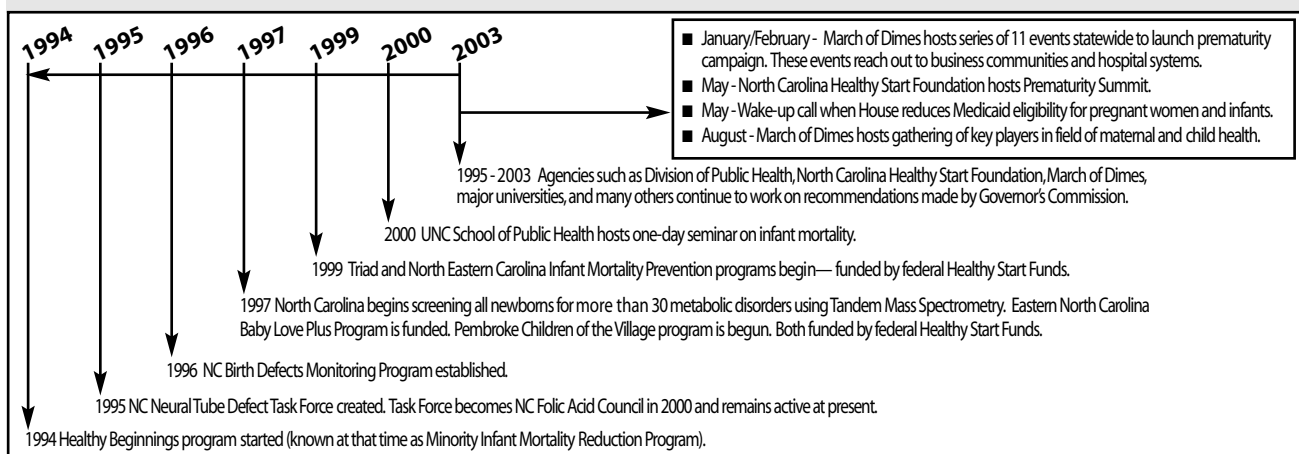
Coalition for Health has evolved over the years and now plays an important role in promoting smoking cessation for women of reproductive years. North Carolina's "Guide for Counseling Women Who Smoke" has been a national model for health-care providers since 1996. Trainings have been institutionalized and are now available for public and private providers through *QuitNow NC* and the state's Perinatal Outreach and Education Trainers.

The state also has 12 Level-Three Neonatal Intensive Care Nurseries, which are equipped to care for North Carolina's sickest babies. The Neonatal Transport Program, annual cross-hospital provider conferences, and Neonatal Outreach Educators and Trainers are some of the ways the state addresses prematurity and other birth related problems once they have happened.

In addition, North Carolina leads the nation in newborn screening services that are offered to all babies born in the state. It was the first state to use tandem mass spectrometry—an innovation in newborn screening. North Carolina screens for every disorder including hearing (with the exception of biotinidase³) allowing for early detection and treatment of a variety of lethal and potentially debilitating conditions.

Even within the programs described above, and using current proven best practice strategies, there is room for improvement. More pregnant women need to get early prenatal care and to be screened and treated for infections. All pregnant women should be taught the signs and symptoms of preterm labor. More healthcare providers need to be trained, reimbursed and willing to talk with their pregnant patients about alcohol, tobacco and other drugs, and to provide counseling and follow-up services. All new parents should be advised to place their children to sleep on their backs. Additional mental health services are needed and public awareness must be raised about North Carolina's "Safe Surrender" law, which allows a new mother, unable or unwilling to care for her baby, to surrender a young infant (up to seven days old) to a responsible adult and not face criminal charges.

There is no doubt that focusing on pregnancy and neonatal care has improved North Carolina's birth outcomes. Current services and programs are vital to maintaining the hard-earned progress that has been made on behalf of the women and infants of this state.



North Carolina is Moving in the Right Direction

North Carolina continues to post improving infant mortality rates. The rates have fallen to 8.2 per 1,000 live births in 2002. While we continue to rank near the bottom in national comparison, we are slowly moving in the right direction.

The number of babies lost to SIDS continues to decline and the number of babies born with birth defects, particularly those of the brain and spine, continues to decline.

Adolescent pregnancy is at an all time low for North Carolina. Many more women are receiving early and adequate prenatal care.

In Our Favor

1. Major medical centers, universities, and pharmaceutical companies are doing cutting edge research on the topic of prematurity and maternal and infant health. These not only benefit the larger population, but they have the potential to make the latest medical treatment options available to North Carolina's women and infants. They also hold a wealth of information about their study populations.
2. There is strong leadership in the arena of smoking cessation—particularly for youth and pregnant women. This includes having Smoke Free Families leadership in North Carolina, the QuitNow NC campaign supported by NC Prevention Partners and many others, the Women and Tobacco Cessation for Health (WATCH) committee, and award-winning products such as the *Guide for Counseling Women Who Smoke*—a self-help guide for healthcare providers who want handbooks to help pregnant women quit and to reduce second hand smoke exposure. The state has access to national quit lines with one available specifically for pregnant women—and plans to start such a line just for women in North Carolina. The National American College of Obstetricians and Gynecologists (ACOG) organization has supported a strong partnership with North Carolina and is bringing important resources and connections to the table. A number of groups have supported innovative smoking cessation grants across the state. The NC DHHS Division of Public Health has a position dedicated to this issue and the perinatal outreach educators and trainers consider smoking cessation a cornerstone issue.
3. Non-profits such as the March of Dimes and North Carolina Healthy Start Foundation are strong and collaborative players in North Carolina. Through grassroots outreach and excellent education products, these and other agencies build on their strengths to make an impact.
4. The state has a very strong Folic Acid Campaign and a very strong Back To Sleep Campaign.
5. The Division of Public Health's Women's and Children's Health Section is well respected and organized—it manages a host of excellent programs and services.
6. The state receives significant funding from the Federal Healthy Start Initiative (Health Resources and Services Administration/Maternal and Child Health Bureau).
7. The State Center for Health Statistics has a number of key data collection tools, including the NC Birth Defects Monitoring Program (recently funded by the Centers for Disease Control and Prevention as a Center of Excellence), Pregnancy Risk Assessment Monitoring System (PRAMS), and Behavioral Risk Factor Surveillance System (BRFSS). The Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill is an active partner in data organization and evaluation.
8. Healthcare professions in neonatology and maternal/fetal medicine have begun to meet jointly on issues of relevance to both groups.

REFERENCES

- 1 Holliday, JL. Expanding Medicaid Income Eligibility for Family Planning: An Opportunity to Improve Reproductive Outcomes and Lower Medicaid Costs. *North Carolina Medical Journal* 65(3) 2004.
- 2 March of Dimes. Perinatal Profiles: Statistics for Monitoring State Maternal and Infant Health. North Carolina. 2003
- 3 Biotinidase Deficiency is caused by the lack of an enzyme called biotinidase. This disorder can lead to seizures, developmental delay, eczema, and hearing loss.

