

What Works for Third Grade Reading

NC Pathways to Grade-Level Reading Working Paper

Physical Health: Health and Development on Track, Beginning at Birth

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I. Pathways Measure of Success

Percentage of parents reporting their children's health is excellent or good.

II. Definitions

The following terms are referenced in this brief:

Adverse Childhood Experiences (ACES) refers to a set of experiences in the lives of young children including child abuse and neglect, parental substance use, mental illness and incarceration, family domestic violence, and the absence of a parent through divorce, death, or abandonment.ⁱ Extensive research has linked adverse childhood experiences to chronic health problems, risky health behaviors, and even death.ⁱⁱ

Asthma is a constriction of the body's airways that results in wheezing, coughing, chest pressure, and breathing difficulty.ⁱⁱⁱ

Bright Futures Guidelines (3rd Edition), produced by the American Academy of Pediatrics, outlines evidence-supported best practice standards for children's health care services in America.^{iv}

Developmental monitoring is the process by which medical professionals examine children as part of a well-child visit to identify signs of developmental delay or problems. This is also called developmental surveillance. Children with identified developmental problems are referred for further developmental screening.^v

Developmental screening is the part of a well-child visit when a medical professional works with a child to see if he or she is learning basic skills expected at various ages, or if there are delays. Developmental screening may be done by other professionals as well. The American Academy of Pediatrics' *Bright Futures Guidelines* recommends that all children be screened for developmental delays and disabilities during regular well-child doctor visits at nine months, 18 months and 24 or 30 months.^{vi}

EPSDT is the federal Early and Periodic Screening, Diagnosis and Treatment program for children in lower-income families who are covered by Medicaid.^{vii}

EPSDT periodicity schedule is the schedule of well-child visits included as part of the NC Health Check process and reimbursed by the federal government through the EPSDT program. The North Carolina schedule of well-child visits under EPSDT is the same as recommended by the federal program and the American Academy of Pediatrics' *Bright Futures Guidelines*.^{viii}

Health as defined by the World Health Organization is "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition."^{ix}

Health disparity is defined in Healthy People 2020 as "In the 2020 plan, a health disparity is a difference that is closely linked with social, economic, and/or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater obstacles to health based on their racial or ethnic group; religion; socioeconomic status; gender; age; mental health;

cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion.”^x

Health equity as defined by the American Public Health Association means that all individuals have the opportunity “attain their highest level of health.”^{xi} As defined by the Boston Public Health Commission, health equity means that “everyone has a fair opportunity to live a long, healthy life. It implies that health should not be compromised or disadvantaged because of an individual or population group’s race, gender, income, sexual orientation, neighborhood or other social conditions... It also requires that public health professionals look for solutions outside of the health care system, such as in the transportation or housing sectors, to improve opportunities for health in communities.”^{xii}

Healthy weight means having a Body Mass Index (BMI) below the 85th percentile and above the 5th percentile, accounting for age and gender. Children with a BMI at or above the 85th percentile and less than the 95th percentile are considered overweight. Children at or above the 95th percentile are obese.^{xiii}

High quality health care for infants and children includes regular well-baby and well-child preventive care check-ups, immunizations and oral health care,^{xiv} with accelerated well-visit schedules for more vulnerable children, such as children with special health care needs or children in the foster care system.^{xv}

IDEA is the federal Individuals with Disabilities Education Act. Under this federal law, all states must provide children with a free and appropriate public education. **Part C** defines the services that must be available for very young children, ages birth to three, diagnosed with atypical development. Services must be provided by qualified personnel and delivered in natural contexts at no cost to families (unless a state has established a sliding fee payment arrangement). Parents or a professional may refer a child for Early Intervention/IDEA Part C screening.^{xvi} The definition of conditions warranting IDEA Part C intervention and the allocation of funding for the delivery of these services is up to each state’s determination.^{xvii}

Lead exposure occurs when individuals encounter lead in their environment. Babies’ exposure can occur even before birth, if pregnant women are exposed to lead.^{xviii}

Malnutrition refers to both under-nutrition and over-nutrition. It has also been defined as the insufficient, excessive or imbalanced consumption of nutrients.^{xix} While malnutrition is most often viewed internationally as a health problem due to inadequate food,^{xx} within the United States malnutrition (that is, the absence of proper amounts of essential nutrients) reveals itself more often through unhealthy weight gain (i.e., overweight status or obesity)^{xxi} from eating inexpensive food that is high in calories but low in nutrition. Recent research suggests that smoking in pregnancy may contribute to early childhood obesity.^{xxii}

Medical home is defined by the national Patient-Centered Primary Care Collaborative as “a model or philosophy of primary care that is patient-centered, comprehensive, team-based, coordinated, accessible, and focused on quality and safety.” A medical home is not a place or a destination but “a model for achieving primary care excellence so that care is received in the right place, at the right time, and in the manner that best meets a patient’s needs.”^{xxiii}

Neonatal Abstinence Syndrome is a drug withdrawal condition that occurs among opioid-exposed infants shortly after birth. These babies may experience physical tremors, hyperactive reflexes, as well as vomiting, loose stools, and poor weight gain.^{xxiv}

Oral health has traditionally been defined as the absence of oral disease but has recently been redefined to include a person’s ability to smile, taste, speak, chew, and convey a wide of range of emotions through facial expressions without pain or discomfort.^{xxv}

Recess within a school context means regularly scheduled periods of unstructured activity as part of elementary school students’ days.^{xxvi}

Social determinants of health, as defined by Healthy People 2020, are conditions (including social, economic and physical) in the places where people live, work, learn, worship and age that impact on “health, functioning, and quality of life” outcomes and risks. Social determinants of health also include “patterns of social engagement and sense of security and well-being” that are impacted by where people live.^{xxvii} The importance of addressing Social Determinants of Health by building healthy social and physical environments is described by the CDC as “one of the four overarching goals for the decade.”^{xxviii}

Telehealth is defined by the federal Office of Rural Health Policy as “the use of electronic information and telecommunication technologies to support and promote long-distance clinical health care, patient and professional health-related education, public health and health administration.” Telehealth tools include the Internet, video conferencing, streaming media and “store-and-forward imaging.”^{xxix}

Toxic stress is defined by the Harvard Center on the Developing Child as “the strong, unrelieved activation of the body’s stress management system in the absence of protective adult support. Without caring adults to buffer children, the unrelenting stress caused by extreme poverty, neglect, abuse, or severe maternal depression can weaken the architecture of the developing brain, with long-term consequences for learning, behavior, and both physical and mental health.”^{xxx}

Trauma is defined by the federal Substance Abuse and Mental Health Administration as the result of “an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or life threatening and that has lasting adverse effects on the individual’s functioning and mental, physical, social, emotional, or spiritual well-being.”^{xxxi}

III. Physical Health: Why It Matters

Children’s overall development during the first eight years of life is strongly affected by their health, and experiences during this time are often hardwired into their brains and bodies, forming the foundation for all subsequent health and development.^{xxxii} Access to comprehensive, integrated, high-quality health care builds on a healthy birth. Regular health care can help prevent chronic, undiagnosed health issues, and manage chronic conditions, such as childhood diabetes and asthma, which are obstacles to learning.^{xxxiii} Good health helps ensure that children are successful learners from their earliest years, putting them on the pathway to becoming proficient readers—healthy children are more likely to be physically, cognitively, socially, and emotionally ready for kindergarten, attend school consistently, and benefit from high-quality learning environments.^{xxxiv} Key areas of children’s health that are known to impact third grade reading include:

Asthma. In America, one in 13 people has asthma, and it has become the leading chronic disease in childhood.^{xxxv} Asthma is a significant contributor to chronic school absences, limiting children’s full participation in the school experience.^{xxxvi} Children and adults who experience asthma have to go to the doctor more often and use emergency rooms more frequently than others.^{xxxvii} Asthma is more common in children than adults and in boys than girls. The asthma rate for African Americans is 47 percent higher than for non-African Americans.^{xxxviii} The conditions that contribute to asthma in early childhood are well-known and are more prevalent in low-income neighborhoods and communities, which are disproportionately populated by children and families of color.^{xxxix} In North Carolina, nearly eight percent of the state’s population experiences asthma.^{xl}

Early Weight Problems. Children who are obese are at greater risk for other health conditions including asthma, and may experience social-emotional challenges like being bullied and feeling socially isolated and depressed.^{xli}

Lead Exposure. Lead exposure, even at low levels, can impact reading readiness, cause learning disabilities, and lower school performance.^{xlii} The impact of lead exposure exists even accounting for race, income and other potentially relevant factors.^{xliii}

Nutrition. Maternal malnutrition during pregnancy can negatively impact fetal development as well as children’s health and development after birth and over time.^{xliiv} Malnutrition in young children can negatively impact both health and learning.^{xliv} Malnutrition can result in stunted growth and insufficient weight gain (based on age and cultural norms), or it can result in overweight or obesity.

Oral Health. Children with poor oral health are three times more likely to miss school due to dental pain. Among elementary and high schoolers living in families with low income, those who report having a toothache in the past six months are six times more likely to have a low grade-point average.^{xlvi} Nationally, four in ten children ages two to eight have untreated tooth decay,^{xlvii} and one in two Medicaid-enrolled children (52 percent) goes a full year without dental care.^{xlviii} Even when insurance status is accounted for, children of color and those living in families with low income are less likely to receive preventive dental care. Among African-American and Hispanic children between ages two and eight, the rate of tooth decay has been found to be twice that of non-Hispanic white children.^{xlix}

Physical Activity. Participation in moderate to vigorous physical activity has been found to improve physical and mental health among younger children, school-aged students and adults. Regular physical activity can assist in weight control, improve mental health, reduce the risk of cardiovascular disease and diabetes, and increase the likelihood of living longer.^l Among younger children, the benefits of physical activity include maintaining health weight, building strong bones and muscles, improving posture, balance, coordination, strength and self-confidence, reducing stress and promoting the development of social skills.^{li} The Centers for Disease Control and Prevention recommends that children be physically active for 60 minutes a day, including vigorous aerobic activity, muscle strengthening and bone strengthening activities.^{lii}

Prenatal Substance Exposure. Prenatal exposure to maternal smoking and use of alcohol, opioids and other drugs has been shown to effect children’s early development and elementary school performance. The impact of exposure in utero to these substances can vary by the level and duration of the exposure as well as to specific substance involved. In general, however, prenatal substance exposure can result in deficits in mathematics and reading comprehension, written expression, and emotional and behavioral challenges.^{liii}

Preventable Health Risks. Specific preventable and treatable health conditions can impact young children’s early education attendance, academic learning, and general school success. Experiencing unmitigated adversity in early childhood, compounded over time, can change the brain architecture and its stress response, greatly increasing the risks of long-term chronic diseases such as cardiovascular disease, diabetes, obesity, and alcoholism. Research across scientific disciplines reveals that reducing the amount and severity of ACEs can lead to reduced adult health problems.^{liv} Access to needed health services coupled with living in families and communities that support healthy outcomes all increase the chances of good health during childhood and throughout life.^{lv}

IV. Physical Health: Connections to Other Pathways Measures of Success

Just like the domains of child development, the Pathways Measures of Success are highly interconnected. The table and text below outline the measures that *influence or are influenced by* Physical Health.

Health and Development on Track, Beginning at Birth	Supported and Supportive Families and Communities	High Quality Birth-through-age-Eight Learning Environments with Regular Attendance
Healthy Birthweight	Formal and Informal Family Supports	High Quality Birth-through-age-Eight Early Care and Education
Early Intervention	Safe at Home	Promotion to Next Grade
Social-Emotional Health		Regular Attendance

Healthy Birthweight

Early physical health challenges, including vision and hearing problems, are not infrequent among children born at low birthweight.^{lvi} Both pre-term birth and low birthweight have been shown to contribute to longer-term health problems, which can impact school and life outcomes.^{lvii} Having no health insurance during childhood intensifies the lasting effects of being born with low birthweight.^{lviii}

Neonatal Drug Withdrawal. The physical health impacts of infant drug withdrawal, called Neonatal Abstinence Syndrome, include poor growth in the womb, premature birth, and birth defects.^{lix} The long-term impact of prenatal drug exposure is not known, because it is difficult to isolate the independent effects of the drugs and environmental and medical risk factors, including poverty and maternal use of prenatal care. Opioid-exposed infants tend to have rigid muscles, poor motor skills, decreased physical activity, shorter attention spans, and are less responsive to social cues.^{lx}

Early Intervention

Young children with certain health challenges, including genetic disorders, birth defects, and hearing loss, are eligible to receiving IDEA Part C early intervention services.^{lxi} These needs are often identified at regularly scheduled well-child visits.

Well-child visit screenings recommended by the American Academy of Pediatrics for children from birth to age eight include body mass index (BMI), vision, hearing, developmental, autism, psychosocial/behavioral, blood lead, and oral health screenings.^{lxii} Nationally, the rate of developmental and behavioral screening has increased in children from birth to age five from 12 percent in 1999 to 91.4 percent in 2015. North Carolina leads the nation in the rate of developmental screening at Medicaid-funded EPSDT visits, as 84 percent of visits now include a standardized developmental screen.^{lxiii}

Social-Emotional Health

Emotional, social, and behavioral competence of young children is a strong predictor of academic performance in elementary school^{lxiv} and beyond, even affecting outcomes in adulthood.^{lxv} Physical health both impacts and is impacted by social-emotional health and development.^{lxvi} A chronic health condition increases a child's chances of having emotional or behavioral problems,^{lxvii} and social-emotional health issues like chronic anxiety can impact children's physical health.^{lxviii}

Formal and Informal Family Supports

Prenatal and Early Childhood Nutrition. A pregnant mother's health impacts the development of her baby in the womb. For low-income mothers, access to federal nutrition programs such as the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) can improve birth outcomes and the health of very young children.^{lxix}

Maternal Depression Treatment. Maternal depression can negatively impact the health of the mother and the developing child, directly and indirectly. Prenatal stress hormones like cortisol in the mother's body pass directly to the fetus through the placenta.^{lxx} Expectant mothers who are suffering from depression are more likely to have preterm births and engage in risk-taking behaviors, including substance use. Prenatal depression can impact a woman's ability to get to timely prenatal care. Postpartum depression impacts on a mother's ability to engage in positive parent-child interactions, through which a child's earliest brain development occurs.^{lxxi}

Safe at Home

Acts of physical abuse can result in immediate damage to a child's body and brain, including head trauma and impaired brain development. In addition, long term negative impacts can show up much later in life, including hypertension, diabetes, asthma, and obesity as well as cardiovascular, lung, and liver disease.^{lxxii} The physical consequences, such as damage to a child's growing brain, can have psychological implications, such as cognitive delays or emotional difficulties. Psychological problems often manifest as risk-taking behaviors. Depression and anxiety, for example, may make a person more likely to smoke, abuse alcohol or drugs, or overeat. High-risk behaviors, in turn, can lead to long-term physical health problems, such as sexually transmitted diseases, cancer, and obesity.^{lxxiii}

Exposure to adverse experiences as a young child (including abuse and neglect and family dysfunction) increases the likelihood of developmental delays early in life and increases the likelihood of chronic illness in adulthood.^{lxxiv} Adverse Childhood Experiences (ACEs) touch the lives of nearly one in two North Carolina children. In 2014, an estimated 12 percent of all children (through age 17) experienced three or more types of ACEs. In comparison, the national prevalence is 8 percent. Thirty-six percent of North Carolina's children experienced one or two types of ACEs.^{lxxv}

High Quality Birth-through-age-Eight Early Care and Education

High quality child care and early education settings provide daily opportunities for young children to exercise and engage in other opportunities that can improve their physical health and development through the formal inclusion of movement-based curriculum.^{lxxvi} Recess periods as part of elementary school students' school days promote children's cognitive processing skills, increase attention, and improve classroom performance. Similarly, recess improves school climate and provides younger children with opportunities to develop communication, negotiation, cooperation, coping and problem-solving skills.^{lxxvii}

Promotion to Next Grade

Good health is important for learning—chronic, untreated health conditions, like asthma, have been linked to decreased educational outcomes, partly because of school absence. A chronic health condition also increases a child's chances of repeating a grade.^{lxxviii}

Regular Attendance

Student health issues are leading contributors to children's absences. These health issues include physical, mental, behavioral, vision, dental, social, and emotional health issues and such chronic diseases as asthma.^{lxxix} Nationally, asthma is the leading cause of chronic absence among younger children.^{lxxx}

Many other factors impact children's physical health, including immunizations, well-child visits, and access to medical homes. These factors are not explored in-depth in this working paper but are included as measures in the Pathways Measures of Success Framework.

V. Context Matters: Building a Framework for Child, Family and Community Health

The following issues are important to consider when planning policy, practice and program strategies to address Physical Health.

In the face of current federal debate about changes in the US health care delivery system,^{lxxxii} states are wrestling with questions about what specific medical services to offer and how to pay for them. Equally important is the question of how to build a whole culture of health—how can North Carolina ensure that all children, families and individuals have the opportunity to be born healthy, grow up healthy, live in healthy and safe communities, and pass on opportunities for good health to their children?^{lxxxii}

National work has been done on creating frameworks to build a culture of health. The examples outlined below reframe the conversation to focus on prevention and early childhood, and they highlight the importance of social determinants of health and health equity. More details on each of these frameworks are available in the appendices.

Framework I: National Scientific Council on the Developing Child

In the view of the National Scientific Council on the Developing Child, lifelong health begins with the health of an expectant mother and is then largely influenced by the interaction of a child's genes^{lxxxiii} and

his or her experiences and environment in the earliest years of life.^{lxxxiv} Whether positive or negative, these early life experiences provide the foundation for health and well-being across the lifespan. The Council, writing in 2010, articulated a framework for lifelong health, depicted below, that is anchored in the “convergence of evidence from neuroscience, molecular biology, genomics, and advances in the behavioral and social sciences”^{lxxxv} and requires that policymakers, practitioners and program developers continue to refocus attention and investment toward very early childhood.

Because health outcomes are “profoundly influenced by a range of factors beyond children’s biological endowment and the medical care they receive,” the Council identifies a set of “policy levers for innovation” where attention and investment can advance healthy development in the early years and good health later in life.^{lxxxvi} These policy levers exist within the following sectors: public health, early care and education, child welfare, early intervention, family economic security, community development, primary health care, and the private sector.^{lxxxvii}

The Council also identified specific areas of policy change and innovation expected to promote early health, and buffer and remediate the negative health impacts of chronic adversity and toxic stress.

- **Support stable, responsive, nurturing parent-child relationships.** Evidence-informed programs include parenting education, parental leave and income supports, and home visiting.
- **Address the challenges of unsafe and unhealthy chemical, physical and built environments.** Evidence-informed practice and programs include assuring health and safety in early care and education settings and assuring that communities provide access to such physical features as sidewalks, bike paths and parks free from crime, and the regulation of such toxins as lead and tobacco exposure among young children.
- **Improve nutrition for parents and young children,** including access to supplemental nutrition programs and supports for breastfeeding.

While this framework does not use the terminology “social determinants of health,” it includes these factors within its levers of policy change, caregiver capacities and foundational elements.

These policy recommendations are summarized in greater detail in Appendix A, along with a note on where they are included in the other Pathways Measures of Success working papers.^{lxxxviii}

Framework II: Robert Wood Johnson Foundation *Commission to Build a Healthier America*

Building on the National Scientific Council’s framework, the Robert Wood Johnson Foundation hosted the Commission to Build a Healthier America. In 2014, the Commission issued its report, *Time to Act: Investing in the Health of Our Children and Communities*.^{lxxxix} In the view of the Commission, “To become healthier and reduce the growth of public and private spending on medical care, we must create a seismic shift in how we approach health and the actions we take. As a country, we need to expand our focus to address how to stay healthy in the first place.”^{xc}

The Commission offers three policy recommendations to reframe public discourse, service design, financing and public accountability.

- Health investment must increasingly support experiences and environments that build young children’s healthy growth and development. This means investing in families and communities.
- Efforts to revitalize neighborhoods must fully integrate health into the community development process.
- “Nonmedical factors” (social determinants of health) must be incorporated as part of health planning, health services delivery incentives and benchmarks for population health.

In addition, for each of these policy recommendations to result in system redesign and implementation, investment in innovation and performance accountability will be key.^{xcii} Further detail, including specific policy and practice examples, is provided in Appendix B.^{xcii}

Framework III: *Healthy People 2020*

The national *Healthy People 2020* framework reviews scientific knowledge every ten years and establishes national objectives aimed at improving the health of Americans. Benchmarks are monitored to promote collaboration, strengthen individuals’ healthy decision-making, and measure the results of prevention activities.^{xciii} Key activities include: identifying national improvement priorities, strengthening public knowledge of determinants of health, disease and disability, engaging stakeholders across sectors and identifying research, evaluation and data needs.^{xciv} Data for *Healthy People 2020* key indicators are updated annually and used to benchmark the nation’s progress.^{xcv}

Healthy People 2020 plans are created by every state.^{xcvi} *Healthy North Carolina People 2020: A Better State of Health*^{xcvii} was prepared under the guidance of the governor’s office through a collaborative process.^{xcviii} The work is hosted by the North Carolina Department of Health and Human Services. North Carolina ranks 31st among all states based on *Healthy People 2020* leading indicators.^{xcix}

Healthy People 2020 defines social determinants of health as conditions (including social, economic and physical) where people live, work, learn, worship and age that impact on “health, functioning, and quality of life” outcomes and risks. In addition to such place factors as high quality education, nutritious food, decent housing, reliable public transportation, clean water and non-polluted air,^c social determinants of health include “patterns of social engagement and sense of security and well-being.”^{ci}

Attention to health equity is a core element in the *Healthy People 2020* framework through the application of the social determinants framework.^{cii} The *Healthy People* process has focused on health equity since 2000, when a core goal was to “reduce disparities among Americans.” In 2010, the goal was strengthened from reducing disparities to eliminating them. In *Healthy People 2020*, the goal has been strengthened further, to achieve “health equity, eliminate disparities, and improve the health of all groups.”^{ciii} Health disparity data are available by state, race/ethnicity, gender, income and type of insurance. In general, healthy equity is a challenge for children and families of color and low-income families.^{civ}

Appendix C provides more information about the *Healthy People 2020* framework, including key indicators and social determinants of health. Quantitative objectives articulated for each factor and population data are available on the *Healthy People 2020* website.^{cv}

Framework IV: Robert Wood Johnson Foundation *Pathways to Health Equity*

This framework, from a 2017 Robert Wood Johnson Foundation report entitled *Communities In Action: Pathways to Health Equity*, was created by a multi-sector committee of national experts in public health, health care, civil rights, social science, education, research and business.^{cvi} The work and report were a part of a five-year, \$10 million grant to the National Academies of Science, Engineering and Medicine to seek solutions that promote health equity.^{cvi} After a year of work, the committee confirmed that health equity is “crucial for the well-being and vibrancy of communities” and that health inequities largely result from poverty, structural racism and discrimination. The committee found that health solutions should address at least one of the social determinants and should be “community-driven, multi-sectoral and evidence-informed.”^{cviii}

- **North Carolina Health Gaps, 2015.** *The North Carolina 2015 Health Gaps Report*,^{cix} created by the University of Wisconsin Population Health Institute and supported by the Robert Wood Johnson Foundation, analyzed ranked county data to determine where there were gaps between North Carolina state- and county-level data and other state or national data. The report then estimates how many North Carolina individuals would benefit if all residents in all counties had a “fair chance to be healthy.”

In this analysis, the report projects that there would be 325,000 fewer adult smokers, 292,000 fewer adults who are obese, 150,000 fewer people without health insurance, 58,000 fewer adults without work, 127,000 fewer children living at or below the Federal Poverty Level, and 130,000 fewer families without severe housing problems.^{cx} Policy levers, practices and programs with proven impacts on these gaps are presented in Appendix D.^{cx}

- **2016 North Carolina County Health Rankings Report.** Health status can vary dramatically within a state. The University of Wisconsin Population Health Institute, supported by the Robert Wood Johnson Foundation, publishes within-state county data.^{cxii} The *2016 North Carolina County Health Rankings Report*^{cxiii} provides county-by-county data on the following health factors, provided here with their weighted values:
 - Physical Environment (10%): Housing and transit, Air and water quality
 - Social and Economic (40%): Education, Employment, Income, Family and social support, Community safety
 - Clinical Care (20%): Access to care, Quality of care
 - Health Behaviors (30%): Tobacco use, Diet and exercise, Alcohol and drug use, Sexual activity

On a composite ranking based on the health factors above, the five highest ranked North Carolina counties are Orange (1), Wake (2), Union (3), Camden (4), and Chatham (5). Mecklenburg is #12. The five lowest ranked counties are Halifax (96), Edgecombe (97), Vance (98), Scotland (99), Robeson (100).^{cxiv}

Framework V: Robert Wood Johnson Foundation *Building a Culture of Health*

Working from a health equity and public accountability perspective, the Robert Wood Johnson Foundation has launched a movement to build a “culture of health” for all Americans. “The Framework is not a call for new, large-scale government programs. It is intended to leverage current resources, encourage innovative partnerships, and ultimately reduce national health care costs over time. It is meant to empower individuals, parents, and caregivers in making healthy choices, while fostering more equitable environments that help make those choices possible.”^{cxv}

The Foundation has identified four action areas it has determined to be essential to achieve a national culture of health, including:

- Make health a shared vision
- Foster cross-sector collaboration to improve well-being
- Create healthier, more equitable communities
- Strengthen integration of health services and systems

More information, including the drivers and action elements required to move forward on each action area, is included in Appendix E.

VI. Policy, Practice and Program Options that Support Children’s Physical Health and Development

The other Pathways working papers provide separate listings of science-informed and evidence-guided policies, practices and programs that can move the needle on the measures of success. Within children’s physical health, however, policies, practices and programs are closely intertwined and are therefore integrated below.

A North Carolina Framework for Health. *In the face of health policy challenges at the federal level, seek foundation support to create a North Carolina Framework for Health by drawing from the frameworks outlined above, with particular focus on Healthy North Carolina 2020 and the Robert Wood Johnson Foundation’s most recent work, the Building a Culture of Health Framework.*

Convene stakeholders from the NC Pathways to Grade-Level Reading initiative and from *Healthy North Carolina 2020* to review and coordinate policies, practices, programs and actions steps with the 2016 RWJF Culture of Health framework. Involve the Office of the Governor, North Carolina higher education faculty and researchers, the philanthropic sector and business to seek technical assistance and support from the national RWJF effort to align this work at the statewide level and within all North Carolina communities, over a phased-in period.

Health Insurance. *Maintain North Carolina’s high rate of insured children and increase health insurance coverage rates for parents.*

Children with health insurance are more likely to have regular preventive health care and other needed services, more likely to have a medical home, less likely to visit the emergency room, and less likely to have unmet health care needs.^{cxvi} Parental health insurance coverage has a positive effect on both children’s health insurance coverage and children’s access of needed health services.^{cxvii}

North Carolina’s public child and family health insurance coverage currently includes:

- Maternity coverage for pregnant women with household incomes up to 196 percent of the Federal Poverty Level (FPL)
- Coverage for children living in households with incomes up to 211 percent of FPL, through Medicaid or Health Choice (North Carolina’s Children’s Health Insurance Program, or CHIP)
- Coverage for parents with dependent children with a household income of up to 45 percent of FPL; for a family of three, income cannot exceed \$667 per month

- Coverage for family planning (the *Be Smart* program) for those with incomes up to 195 percent of FPL^{cxxviii}

In 2015, 96 percent of children in North Carolina were insured, with more than 40 percent of children insured through Medicaid and Health Choice (North Carolina’s Children’s Health Insurance Program, or CHIP). Parents are less likely to be insured than their children—in 2015, 20 percent of North Carolina children lived with a parent who was not covered by any health insurance.^{cxxix} In addition, nearly a quarter of insured adults do not have enough coverage or cannot make use of the insurance due to high co-pays and deductibles.^{cxxx}

In January 2017, an amendment to North Carolina’s 1115 waiver was submitted to the Centers for Medicare and Medicaid Services (CMS) to expand Medicaid by newly elected Governor Cooper. If the Governor’s plan is approved and implemented, 95 percent of the expansion cost will be paid by the federal government in 2018 and 2019. In 2020, the cost to the State of North Carolina would increase from five percent to ten percent but would never rise above that. The Governor requested that North Carolina hospitals pay the state’s portion.^{cxxxi}

As of June 2016, just under two million North Carolina residents were covered by Medicaid and CHIP. With expansion as envisioned by Governor Cooper, an additional 650,000 North Carolinians would be covered by Medicaid. Any reductions in Medicaid funding or elimination of CHIP at the federal level will increase the number of North Carolina children and parents who are uninsured.^{cxxxii}

Health Equity Impact Assessments. *Require agencies involved in community or county strategic planning for transportation, land use and housing development to link with public health agencies and identify potential health equity consequences of proposed actions.*

Regional planning efforts for such basic infrastructure elements of a community as its road systems, industrial and housing zoning, and parks and other “green spaces” can impact positively to promote community health or can impact negatively on it.^{cxxxiii} Strategies employed across the nation to address this issue include formal partnerships between community planning departments and their public health agency (e.g., in Riverside County, California), regional coordination among several county public health departments and city and rural planners (e.g., in King County, Washington) and urban partnerships between state health departments and metropolitan area planning councils (e.g., in Boston, Massachusetts).^{cxxxiv}

Social Determinants of Health. *Incorporate “nonmedical factors” into community health assessments, report on nonmedical factors as part of health benchmarking, and incentivize health care providers through the reimbursement process to address nonmedical factors that affect health.*

Nonmedical factors that affect health include employment status and access to adult education classes, educational attainment, financial resources, access to healthy food, zip code (which can be a strong predictor of health and longevity), family structure, access to social supports, transportation, and safe housing.^{cxxxv}

A study published in *Health Affairs* (November 2016) examined government spending in health and non-health sectors associated with improvements in county health rankings.^{cxxxvi} County jurisdictions with better health care outcomes spend larger proportions of their budgets on “community health care and public health, parks and recreation, sewerage, fire protection, and libraries... These areas of social

services expenditures have detectable, significant, and positive associations with population health, whether or not they primarily target health.^{cxxvii}

Effective Formal Supports for Low-Income Families. *In the face of budgetary challenges at the federal level, continue to maintain and strengthen a set of proven policies known to support the health and well-being of low-income families, and invest in health-economics research at the county and/or community level to determine the point of maximal health returns.*

The Pathways brief on *Formal and Informal Family Supports* includes the following policies supporting the health and well-being of low-income families:

- Refundable tax credits, including the Earned Income Tax Credit
- Pregnancy and parenting benefits, including family leave
- Health care insurance, including Medicaid
- Adult mental health screening and treatment, including for maternal depression and ACES
- Full-enrollment in North Carolina’s benefit programs
- Housing supports
- Access to quality child care for working parents
- Nutrition programs: WIC and SNAP.

Partnerships to Support Parent Knowledge, Skill and Engagement. *As a policy directive to all governmental agencies serving young children, their parents or other primary caregivers, require dissemination and outreach of family-friendly written resources or technology-based applications that help caregivers better understand their children’s health progress and needs, including the impact of ACEs on healthy development.*

The latest edition of *Bright Futures for Well-Child Care* (2013) was distributed to health practitioners and health systems professionals,^{cxxviii} but there is little evidence that parents and other primary caregivers are knowledgeable about its content and relevance to their children’s healthy growth and development. The Academy has created a suite of materials for families, accessible from its website, that could easily be included within regular paper or electronic transmissions to families. These resources include *Bright Futures Handouts* for each recommended well-child visit (by a child’s age),^{cxxix} a *Bright Futures Pocket Guide*^{cxxx} and a *Bright Futures Tool and Resource Kit*.^{cxxxi}

As an economic development strategy, engage with the higher education and technology business sector in North Carolina to develop other family-friendly written resources or technology-based applications that help parents and other primary caregivers of young children, including grandparents,^{cxxxii} learn what is recommended and find resources to address these needs.

Explore a partnership with Reach Out and Read to provide materials and experiences for parents as well as books for children during child well-care visits with their pediatricians.

Reach Out and Read is an evidence-based program used in primary care offices to promote early literacy. During children’s well-child visits, pediatricians encourage parents to read to their children, volunteers model shared book reading, and each child receives a new book appropriate to his or her age. Research reveals that participation in the program by low-income parents makes families more focused on reading, results in higher vocabulary scores among older children, and increases the amount

the family members read each week. Children ages six months to five years are eligible to participate in Reach Out and Read, and nationwide, 3.8 million children are served in 4,500 sites.^{cxxxiii} In North Carolina, Reach Out and Read is hosted at sites within 70 of the state's 100 counties.^{cxxxiv}

Universal Screening. *Ensure that all children are screened for common childhood delays and issues. Ensure maternal depression screening. Several key screening areas are highlighted below.*

- **Developmental Screening.** *Review county-by-county and disaggregated ABCD screening rates and expand investment in the ABCD developmental screening program to reach 100 percent of Medicaid-eligible children participating in EPSDT-recommended well-child visits.*

ABCD is a national developmental screening, prevention, and early intervention program model now operating in 27 states, led by the National Academy for State Health Policy and supported by The Commonwealth Fund.^{cxxxv} ABCD began in North Carolina in 2000. In North Carolina, ABCD has been expanded to include all 14 networks across the state supported by Community Care of North Carolina (CCNC).^{cxxxvi} In 2013, 40 North Carolina pediatric practices with a total of 239 medical providers participated in ABCD. Across these practices, just over 36,000 children were served; 57 percent of these children were covered by Medicaid.^{cxxxvii} North Carolina has been recognized for leading the nation in EPSDT services, with a rate of developmental screening at well-visits of 84 percent.^{cxxxviii} See the Pathways *Early Intervention* working paper for more.

Achieving universal developmental screening of all children at regular intervals during the years of early childhood will require that parents, as well as professionals, observe and track children's growth.^{cxxxix} Parents can access free tools and instruments with which to observe and keep track of young children's development. Some resources and examples include:

Bright Futures. The American Academy of Pediatrics has created several free online tools and apps for parents and other caregivers. These include a *Well-Child Visit Planner* available online and as a mobile phone app,^{cxl} a *Child Health Tracker*,^{cxli} a *Systems Checker*, an interactive online screen that uses a scroll-over interactive screen based on a child's body,^{cxlii} and an *ADHD Tracker*.^{cxliii} An introduction to these tools could be included in a Reach Out and Read Partnership as part of a well-child visit. This could be done by trained volunteers or pediatric office staff.

Ages & Stages. Family-friendly developmental tracking tools such as Ages & Stages (ASQ, 3rd edition) and Ages & Stages Social Emotional (ASQ-SE) are increasingly being made available to parents through public libraries, Early Head Start and Head Start programs, and local public health offices. When parents complete these questionnaires about their children's development, alone or with assistance, results are provided along with recommendations to support children's development and/or referrals for help and interventions.

In Connecticut, the statewide United Way provides free access to Ages & Stages and Ages & Stages-SE online or on paper so that parents can observe their children's progress, record growth and transmit the tool to the United Way to be scored and returned. This free service for parents is a core element in the state's Help Me Grow program and the CT Child Development Infoline.^{cxliv} A free version of ASQ is offered by Pennsylvania's Easter Seals "Make the First Five Count" program for both parents and child care providers.^{cxlv} In addition, Healthy Child Care Pennsylvania reports that many child care providers enrolled in its quality rating system are also using the ASQ in their programs.^{cxlvi}

- **Screening for Early Intervention Services.** *Expand eligibility for early intervention screening to include at-risk circumstances. Review North Carolina’s IDEA Part C eligibility criteria to assess the needs, cost and return on investment of widening eligibility for Early Intervention to include family nonmedical factors. Obtain and analyze child outcome and cost savings results from states with expanded eligibility parameters.*

Five states have adopted IDEA Part C eligibility criteria that include at-risk circumstances: Illinois, Massachusetts, New Hampshire, New Mexico, and West Virginia.^{cxlvii} North Carolina does not currently include an at-risk determination in its IDEA Part C eligibility guidelines. In 2015, just over 10,700 infants and toddlers were served through IDEA Part C in North Carolina, and in 2016-17, the agency applied for \$12.6 million to manage and deliver its services. See the Pathways *Early Intervention* working paper for more.

- **Screening for Hearing and Vision Problems.** *Ensure universal use of American Academy of Pediatrics and North Carolina Department of Health and Human Services protocols.*

The goal of universal hearing screening is detection of hearing loss in infants before three months of age, with appropriate intervention no later than six months of age. This practice is recommended both by the American Academy of Pediatrics and the North Carolina Department of Health and Human Services.^{cxlviii} The American Academy of Pediatrics recommends vision screening beginning at age three or four.

- **Lead Exposure Screening.** *Ensure the continued identification of elevated levels of early childhood lead exposure in communities with environmental risk factors. These factors include aging housing painted with lead paint, municipal water transmitted through lead pipes or from chemically compromised aquifers, and soil contaminated with lead from various sources.*

Young children are at greater risk from lead exposure than adults because their brains are developing quickly. Children living in poverty and children of color are disproportionately impacted. Lead exposure, even at low levels, can result in neurological damage, decreased IQ, ADHD, increased blood pressure, anemia, gastrointestinal issues, stunted growth, seizures, coma, and death.^{cxlix}

The Centers for Disease Control and Prevention currently funds 35 state and city health departments to conduct lead surveillance.^{cl} North Carolina is one of these sites. The CDC reports that, over the past three decades, blood lead levels in children have continued to decline, even in high risk areas.^{cli}

Although Medicaid pays for lead screening through its Early Periodic Screening, Diagnosis and Treatment (EPSDT) program, a recent study entitled *Unsafe at Any Age* found that only four in ten Medicaid-enrolled infants and toddlers had been tested.^{clii}

The American Academy of Pediatrics’ *Bright Future Guidelines* recommend universal lead screening for all children beginning at nine to 12 months, except where there is sufficient data to assure children in specific communities would not be at risk of exposure. A second screening is recommended at 24 months of age.^{cliii} The North Carolina Division of Public Health recommends universal blood lead testing at 12 months and again at 24 months of age (or at first contact between 25 and 72 months if the child has not been previously tested). At 12 and 24 months of age, all children enrolled in NC Health Check (Medicaid), Health Choice and WIC are required to receive blood lead screening.^{cliv} Lead testing for refugee children in North Carolina must be conducted earlier (beginning at 6 months) and continue

through 16 years of age (for older children entering the state) due to population-level elevated lead levels and the increased risk to malnourished children of negative outcomes from blood lead.^{clv}

North Carolina's Childhood Lead Poisoning Prevention Program coordinates childhood lead poisoning reduction efforts through early identification, surveillance, risk assessments, abatement, and monitoring.^{clvi} A coordinated approach to universal lead screening is required by local North Carolina Health Departments including all local primary care providers.^{clvii} However, federal grant funds have been reduced or have ended, including a \$300,000 grant from the federal Centers for Disease Control and Prevention for lead poisoning prevention activities,^{clviii} and local health departments continue to face funding challenges.^{clix}

Since 1995, North Carolina has made substantial progress in reducing lead exposure among young children. In 1995, seven percent of children between the ages of one to two years had elevated blood lead levels. In 2010, less than one-half of one percent were identified with elevated blood lead levels,^{clx} and in 2012 that number dropped to 0.2 percent.^{clxi} The science around the effects of blood lead has improved, and federal benchmarking for blood lead levels in children changed after 2012 to include all children with levels above 5 micrograms per deciliter ($\mu\text{g}/\text{dL}$) rather than only those above 10 $\mu\text{g}/\text{dL}$. In 2013, 1.5 percent of North Carolina one- and two-year-olds tested had high blood lead levels by the new standard. That number fell to 1.3 percent in 2014, the most recent data year.^{clxii}

- **Maternal Depression Screening.** Partner with North Carolina researchers to determine, once data becomes available, the extent to which mothers are being screened for prenatal and post-partum depression under a new 2016 Medicaid administrative policy. Conduct quarterly reviews of state and county administrative data to ensure that mothers with depression obtain access to timely, evidence-based intervention. Identify and report on health equity findings related to race/ethnicity and/or geographic disparities in screening and service delivery to mothers with post-partum depression.

Because research has shown that maternal depression following the birth of a child can negatively impact parent-child interactions and children's early development,^{clxiii} funding screening for post-partum depression is an important policy issue. All women experience hormonal changes during pregnancy and after birth and among low-income women living with chronic stress, as many as one in two experience clinically-diagnosable depression.^{clxiv} "In fact, more women will suffer from postpartum depression and related illnesses in a year than the combined number of new cases for men *and* women of tuberculosis, leukemia, multiple sclerosis, Parkinson's disease, Alzheimer's disease, lupus, and epilepsy."^{clxv}

In North Carolina, women participating in the Pregnancy Medical Home initiative receive prenatal and postpartum depression screenings. These screenings must be covered by insurers at no cost to patients. As part of the Pregnancy Medical Home initiative, Community Care of North Carolina (CNCC) requires all contracted providers to use a standardized risk screening assessment, including for depression, to identify patients at high risk for pre-term birth. This screening could also identify women with high adverse childhood experiences (ACEs) scores.^{clxvi} Of the 14 CCNC network practices, eight screen for postpartum depression. The screening process also focuses on helping parents to understand the processes of early child development.^{clxvii}

The North Carolina Health Check Program supports early identification of risk for post-partum maternal depression during EPSDT visits in the child's first year and refers mothers to services as appropriate.^{clxviii} In July 2016, North Carolina Medicaid began to reimburse providers for up to four maternal depression

risk screens administered to mothers during the infant’s first year postpartum.^{clxix} The first round of data collection on that project is expected in 2017.

Access to Effective Treatment. *Screening is critical, but it is only the first step to ensuring health. Referral to services and access to high quality services is also essential. States can craft legislative, administrative and/or financial supports for treatment of chronic health conditions (oral health, asthma, malnutrition and obesity, and lead exposure) among North Carolina’s younger children. A few key treatment areas are highlight below.*

- **Maternal Depression Treatment.** *Review administrative data on payments for maternal depression screening and for subsequent treatment services to ensure that Medicaid-enrolled mothers receive treatment, and to identify population and geographic gaps in service.*

Cognitive Behavior Therapy (CBT) is a type of mental health treatment with strong evidence of effectiveness in helping individuals to change how they act, feel, think, and deal with problems. Hundreds of studies have shown CBT to be effective for substance use and smoking disorders, depression and anxiety, and post-traumatic stress disorders. CBT therapists focus on the current situation and its solution over a multi-session period.^{clxx} *Moving Beyond Depression* is a CBT-based program that works with two-generation home visiting programs to provide clinical maternal depression treatment.^{clxxi} For more information, see the *Early Intervention, Parent-Child Interaction, and Formal and Informal Family Support Pathways* working papers.

- **Treatment for Tooth Decay.** *Identify administrative data available through the North Carolina Into the Mouths of Babes program to determine where gaps exist in access to treatment of tooth decay in young children, and the reasons for those gaps. Expansion of the North Carolina Dental Home program could address these gaps.*

In 2013, the American Academy of Pediatric Dentistry (AAPD) published results of a review of the nation’s “tooth decay epidemic.” The Academy has identified a gap between what parents and caregivers know about early tooth decay and their use of dental services for their young children. The Academy analyses also found that “too few” dentists see children through Medicaid and that the use of “dental homes” needs to be expanded.^{clxxii}

The Oral Health Section within the North Carolina Department of Health and Human Services works with public and private organizations to support the expansion of comprehensive dental care to low-income families. The department is a partner in the successful *Into the Mouths of Babes (IMB)*^{clxxiii} oral screening and fluoride program (see below) and is currently developing an *Into the Mouths of Moms* pilot to co-locate medical and dental care for pregnant mothers at public health centers. Research has shown that having four or more oral screening visits reduced both dental office visits and hospitalizations for dental caries.^{clxxiv}

The *North Carolina Dental Home* program, a pilot in Craven, Jones, and Pamlico counties, could be expanded.^{clxxv} In this program, dentists and physicians work together to provide dental care for Medicaid-enrolled children ages birth to three years. Expansion of this pilot could build upon a recent federal grant to improve partnerships between dentists and physicians.

- **Treatment for Asthma.** *Link student absence data from Local Education Authorities (LEAs) with administrative data on Medicaid-enrolled children to identify trends in the prevalence of asthma*

by population group and geography. Prepare annual reports as part of the North Carolina Asthma Plan.

Asthma is a significant contributor to chronic school absences, limiting children's full participation in the school experience.^{clxxvi} In North Carolina, nearly eight percent of the state's population experiences asthma.^{clxxvii} Nearly one in five North Carolina children experience asthma.^{clxxviii} While asthma can be reliably diagnosed beginning at age five, lung function tests are not accurate before that age.^{clxxix}

The *North Carolina Asthma Plan, 2013-2018*^{clxxx} has four goals, including:

- Reduce asthma-related health disparities through increased surveillance and resource access.
- Improve health care service delivery through implementation of best practices and clinical guidelines.
- Decrease asthma-related early education and K-12 school absences through systems change.
- Increase community involvement and environmental awareness through an expansion of evidence-based initiatives.^{clxxxi}

The North Carolina Department of Health and Human Services provides training in managing asthma for school nurses and other elementary and middle school staff, coaches, parents, and child care providers.^{clxxxii}

- ***Malnutrition and Obesity Treatment.*** *As part of the North Carolina Shape NC program, track and report on the changes in the prevalence of young children experiencing overweight or obesity. Where data reveal a high prevalence of obesity or an increase in prevalence, work with parents, pediatricians, early childhood and public health programs to address factors contributing to these trends.*

More than one third of Americans are overweight or obese.^{clxxxiii} In a recent sample of North Carolina children, one in three was found to be overweight. The prevalence of obesity is consistently higher among black and Hispanic children than among children of other races and ethnicities.^{clxxxiv}

Maternal malnutrition during pregnancy can negatively impact fetal development as well as children's health and development after birth and over time.^{clxxxv} Malnutrition in young children negatively impacts both health and learning.^{clxxxvi} Nearly one in three of the state's children are overweight or obese, and significant health disparities exist in obesity prevalence.^{clxxxvii}

Supported by the Robert Wood Johnson Foundation, the North Carolina Department of Health and Human Services partners with the Alliance for a Healthier Generation to engage with 1,000 schools serving over 663,000 students through the Alliance's Healthy Schools Project. Over the past decade, 125 schools have been awarded the National Healthy Schools Award. Thirty-one out-of-school time programs are also partners.^{clxxxviii}

Shape NC: Healthy Starts for Young Children is a multi-year initiative that works with child care providers to increase the number of the state's children who enter school at a healthy weight. Sponsored by the Blue Cross and Blue Shield of North Carolina Foundation, Smart Start and the North Carolina Partnership for Children, Phase I of this initiative engaged with communities in 27 of the state's 100 counties to reach over 1,000 young children. Phase II expanded the program to 213 child care centers reaching over 10,000 children.^{clxxxix} Phase I results are promising, as centers nearly doubled the number of best practices adopted, with significant increases in active play, decreases in screen time, and increases in healthy food offered two or more times a day and outdoor play. Evaluation reveals that the percent of children with healthy weight has been gradually increasing.^{clxc}

In August of 2016, Smart Start announced receipt of a four-year \$4 million grant award from the federal Social Innovation Fund to continue and expand this work. These funds are matched on a one-to-one basis by private funds. In 2017, community-based organizations will serve young children living at or below 200 percent of the Federal Poverty Level with multi-year grants of \$100,000 or more.^{cxci} In February 2017, Wake County Smart Start and the Down East Partnership for Children received multi-year funding to increase the number of young children entering kindergarten at a healthy weight.^{cxcii}

School-Based Health Interventions. *There are options for delivering health services to children while they are in school. Children do best when they have regular preventive care in a medical home, a function school-based health clinics can fulfill. A few key areas of school-based health intervention are outlined below.*

- **School-Based Telehealth Programs.** *North Carolina’s rural school-based telehealth program has been identified as a national model. It operates in 33 counties and could be taken to scale across the state.*

The roots of school-based telehealth programs go back to the 1996 Institute of Medicine’s report, *Telemedicine: A Guide to Assessing Telecommunications for Health Care.*^{cxci} As interest in telemedicine grew over the past 15 years, the U.S. Health Resources and Service Administration (HRSA) convened a working session and published, in 2012, *The Role of Telehealth in an Evolving Health Care Environment: Workshop Summary.* This report confirms the robust base of evidence for the effectiveness of telemedicine approaches across a variety of illnesses and contexts.^{cxci}

School-based telehealth services in North Carolina were piloted in three rural schools and have expanded to 33 schools in four counties as of 2017. My HealtheSchools is now recognized as a national model.^{cxv} The service uses “high-definition videoconferencing with specially equipped stethoscopes and cameras so that centrally located health care providers can examine students at multiple schools without traveling.” Common and chronic health problems can be addressed (e.g., ear or stomach aches, and medication management) as well as well-child checkups and sports physicals. With parental permission, any student may use the service, with payment covered by both public and private insurance companies.^{cxvi}

In North Carolina, My HealtheSchools was launched in Mitchell and Yancey counties (three schools) in 2011. In 2015, the Duke Endowment provided funds to expand into McDowell county, allowing the whole program to reach about 8,000 students in 22 rural schools.^{cxvii} Other funders now include the BlueCross/BlueShield North Carolina Foundation, the Kate B Reynolds Charitable Trust, and federal grants from the Rural Utility Service Distance Learning and Telemedicine Equipment fund and the Health Resources and Services Administration.^{cxviii}

A 2015 review of the research literature on outcomes of school-based telehealth services reveals improved effectiveness in the treatment of chronic health conditions, such as asthma and ADHD, improved coordination among parents, schools and health care providers, reduced school absences, greater satisfaction with health education, and demonstrable cost-effectiveness.^{cxix}

California has adopted a telemedicine approach to school-based dental care in which state law authorizes registered dental hygienists and assistants to conduct dental imaging and provide treatment. Payment is provided through California’s Medicaid program for both the school-based dental home process and dentists who participate in tele-dentistry.^{cc}

- **Recess and Physical Activity.** *Ensure access to and reporting on the delivery of recess, physical activity and physical education across North Carolina’s birth through third grade early learning continuum.*

During the early elementary school years, recess provides the opportunity and context for cognitive and emotional development, the development of social skills, and the advancement of physical health and skills. It is especially important given the rising numbers of young children who are overweight or obese. Formal physical education is a complement to recess, not a substitute for it.^{ccii}

America’s educational system at the K-12 level is currently experiencing an increase in hours spent in large group, teacher-lead learning, with a reduction in time allocated for physical activity and recess.^{ccii} In North Carolina, state education policy requires that, in addition to physical education, schools schedule at least 30 minutes of recess for K-8 students each day, which cannot be denied as a form of punishment.^{cciii}

- **School Nurses and School Health Clinics.** *Support North Carolina Local Education Authorities (LEAs) to increase the number of school health clinics in K-8 schools and to increase the number of school nurses to achieve recommended nurse to student ratios.*

The American Academy of Pediatrics recently recommended that every school in the nation employ at least one full-time nurse^{cciv} to address student episodic and chronic health needs, ensure a strong connection with each student’s medical home, conduct emergency preparedness, and provide ongoing health education and surveillance.^{ccv} North Carolina employs more than 1,200 registered nurses who each serve an average of 1,112 students, across the state’s 115 school districts.^{ccvi} That means each nurse sees nearly 50 percent more students than the federal recommendation of one nurse for every 750 students.^{ccvii}

Recent efforts to increase the number of schools that have a full-time nurse have been led by NC Parents Advocating for School Health^{ccviii} and the NC School-Based Health Alliance.^{ccix} The presence of school nurses has been shown to reduce student absenteeism and address other health problems such as asthma and obesity.^{ccx}

There are 96 school-based health clinics now operating in North Carolina, covering 26 of the state’s 100 counties. Of the 96, 20 are sited in elementary schools, one additional program offers dental-only services in an elementary school, and there are 23 additional elementary school-based telehealth programs. The elementary school telehealth programs are in Burke, McDowell, Mitchell and Yancey counties. A recent fact sheet prepared by the California School-Based Health Alliance summarized research on school health clinic outcomes, including improved access to care, the prevention of diabetes and management of asthma, the promotion of positive oral, behavioral and reproductive health, improved student attendance and behavior, a reduction in dropouts, and improved school climate.^{ccxi}

Appendix A. National Scientific Council on the Developing Child: Lifelong Health Policy Levers

Text is cited directly from the source document.

Council Policy Areas	Council Policy and Program Examples (Pathways Brief)
Strengthening stable, responsive, nurturing relationships between parents and their young children.	<ul style="list-style-type: none"> • Parenting education (See <i>Parent & Child Interactions</i>) • Home visiting (See <i>Parent & Child Interactions; Safe at Home</i>) • Parental leave (See <i>Formal & Informal Family Supports</i>) • Income supports (See <i>Formal & Informal Family Supports</i>) • Expanded professional development for early care and education providers (See <i>B-3rd Grade Early Education</i>)
Assuring that young children grow up in “safe and supportive chemical, physical and built environments.”	<ul style="list-style-type: none"> • Health & safety in early care and education (See <i>B-3rd Grade Early Education</i>) • Physical features of a community, such as access to sidewalks, bicycle paths and green space safe from crime, and neighborhood resources like grocery stores that sell more than snacks. (See <i>Physical Health</i>) • Laws and safety regulations for commercial products • Regulation of chemical environments, e.g. lead and tobacco smoke exposure. (See <i>Low Birth Weight; Physical Health</i>)
Promoting “sound and appropriate nutrition.” ^{ccxii}	<ul style="list-style-type: none"> • Special Supplemental Nutrition Program for Women and Children, i.e. WIC (See <i>Formal and Informal Family Supports</i>) • Support for breastfeeding among working mothers.

Appendix B. **Robert Wood Johnson Foundation Policy Levers and Practice Examples to Promote Healthy Families and Communities**

Text is cited directly from the source document.

RWJF Policy Recommendation	Specific Practice Examples
<p>Make investing in America’s youngest children a high priority. This will require a significant shift in spending priorities and major new initiatives to ensure that families and communities build a strong foundation in the early years for a lifetime of good health.</p>	<ul style="list-style-type: none"> • Create stronger quality standards for early childhood development programs, link funding to program quality, and guarantee access by funding enrollment for all low-income children under age 5 in programs meeting these standards by 2025 (See <i>B-3rd Grade Early Education</i> brief) • Help parents who struggle to provide healthy, nurturing experiences for their children. (See <i>Formal & Informal Family Supports</i>; <i>Parent-Child Interactions</i> briefs) • Invest in research and innovation. Evaluation research will ensure that all early childhood programs are based on the best available evidence. Innovation will catalyze the design and testing of new intervention strategies to achieve substantially greater impacts than current best practices.
<p>Fundamentally change how we revitalize neighborhoods, fully integrating health into community development.</p>	<ul style="list-style-type: none"> • Support and speed the integration of finance, health, and community development to revitalize neighborhoods and improve health. (See this brief) • Establish incentives and performance measures to spur collaborative approaches to building healthy communities. • Replicate promising, integrated models for creating more resilient, healthier communities. Invest in innovation.
<p>The nation must take a much more health-focused approach to health care financing and delivery. Broaden the mindset, mission, and incentives for health professionals and health care institutions beyond treating illness to helping people lead healthy lives.</p>	<ul style="list-style-type: none"> • Adopt new health “vital signs” to assess nonmedical indicators for health. Examples include: Employment status, Financial resources, Access to healthy food, Access to adult education classes, Educational attainment, ZIP code (which can be a strong predictor of health and longevity), Family structure, Access to social supports, Transportation, Safe housing. (See this brief) • Create incentives tied to reimbursement for health professionals and health care institutions to address nonmedical factors that affect health. • Incorporate nonmedical health measures into community health needs assessments.

Appendix C. Healthy People 2020

Leading Indicators with National Population-Level Data

The chart below summarizes the status of each of the *Healthy People 2020* leading indicators. Most of the leading indicators have a primary relationship with young children’s health, impact parental caregiving capacity and parent-young child interactions, or influence young children’s healthy development.

Healthy People 2020 Leading Indicators with National Population-Level Data: 2020 Target over Baseline Year			
Met or Exceeded	Improving	Little or No Detectable Change	Getting Worse
Air quality Homicide reduction Infant deaths Preterm births Adult physical activity Adolescent alcohol or illicit drug use Adolescent smoking Young children second-hand smoke	On-time high school graduation Persons with health insurance Adult colorectal cancer screening Adult hypertension Knowledge of HIV status Young child vaccinations Injury deaths Adult smoking	Persons with usual primary care provider Persons with diabetes Sexually active females with reproductive health care Adult obesity Child obesity Vegetable intake Adult binge drinking	Suicide Adolescent depressive episodes Child, adolescent and adult dental care

Social Determinants of Health Categories and Factors

Economic Stability	Poverty Employment Food security Housing stability
Education	High school graduation Higher education enrollment Language and literacy Early childhood education & development
Social and Community	Social cohesion Civic participation Discrimination Incarceration
Health and Healthcare	Access to health care Access to primary care Health literacy
Neighborhood and Built Environments	Access to healthy foods Quality of housing Crime and violence Environmental conditions

Appendix D. **2015 North Carolina Gap Report: Evidence-Informed Policy, Practice and Program Levers to Impact County-Based Need Gaps and Improve Health Outcomes**^{ccxiii}

Text is cited directly from the source document. Linked items take the reader to specific evidence.

2015 North Carolina Gap Report: Policy, Practice and Program Levers	
Gap Area	Evidence-informed Policy, Practice and Program Levers
<p>Reduce adult smoking</p> <p>Note: This could also impact on early childhood asthma.</p>	<p>Proactive tobacco quit-lines. Deliver phone-based behavioral counseling and follow-up for tobacco users who want to quit</p> <p>Smoke-free policies for indoor areas. Implement private sector rules or public sector regulations that prohibit smoking or restrict it to designated areas</p> <p>Tobacco marketing. Limit the pricing, flavoring, placement, or promotion of tobacco products via regulation</p> <p>Tobacco pricing. Increase tobacco per unit prices through taxes or point-of-sale fees</p>
<p>Reduce sexually transmitted disease. Note this could also reduce unplanned pregnancies and increase birth spacing, factors that contribute to low-weight births</p>	<p>Condom availability programs. Provide condoms free of charge or at a reduced cost in community and school-based settings</p> <p>Partner counseling and referral services. Link individuals diagnosed with sexually transmitted infections to medical and social services and identify and inform sex or needle sharing partners and help them seek testing and care</p> <p>School-based reproductive health clinics. Provide middle and high school students with onsite reproductive health care services, such as counseling, contraception, and testing</p> <p>Sexual education: comprehensive risk reduction programs. Offer information via school- or community-based programs about contraception and protection against sexually transmitted infections</p>
<p>Increase access to care among uninsured people.</p>	<p>Federally qualified health centers. Increase support for non-profit health care organizations that receive federal funding and deliver comprehensive care to uninsured, underinsured, and vulnerable patients regardless of ability to pay</p> <p>Health insurance enrollment outreach and support. Provide health insurance outreach and support to assist individuals whose employers do not offer affordable coverage, who are self-employed, or who are unemployed</p>
<p>Increase educational opportunities that result in high school graduation</p>	<p>Community schools. Combine academics, physical health, mental health, and social service resources for students and families through partnerships with community organizations</p> <p>Dropout prevention programs. Provide services such as remedial education, vocational training, case management, health care, and transportation assistance, to help students complete high school</p> <p>Targeted truancy interventions. Support interventions that provide at-risk students and families with resources to improve self-esteem, social skills, discipline, and unmet needs to increase school attendance</p> <p>Universal pre-kindergarten (pre-K). Provide pre-K education to all 4-year-olds, regardless of family income</p>

<p>Increase employment supports</p>	<p><u>Unemployment insurance</u>. Extend or raise the compensation provided to eligible, unemployed workers looking for jobs</p> <p><u>Vocational training for adults</u>. Support acquisition of job-specific skills through education, certification programs, or on-the-job training</p>
<p>Improve family income to reduce child poverty</p>	<p><u>Earned income tax credits</u>. Look for ways to expand various earned income tax credits for low to moderate income working individuals and families</p> <p><u>Funding for child care subsidy</u>. Increase financial assistance to working parents or parents attending school to pay for center-based or certified in-home child care</p> <p><u>Living wage laws</u>. Establish locally or state mandated wages that are higher than federal minimum wage levels</p> <p><u>Paid family leave</u>. Provide employees with paid time off for circumstances such as a recent birth or adoption, a parent or spouse with a serious medical condition, or a sick child</p>
<p>Increase access to family and social supports for children in single-parent households</p>	<p><u>Early childhood home visiting programs</u>. Provide parents with information, support, and/or training regarding child health, development, and care from prenatal stages through early childhood via trained home visitors</p> <p><u>Extracurricular activities</u>. Support organized social, academic, or physical activities for school-aged youth outside of the school day</p>

Appendix E. **Robert Wood Johnson Foundation Building a Culture of Health Action Areas, Drivers and Action Elements**

Building a Culture of Health: Robert Wood Johnson Foundation	
Action Area	Drivers and action elements
Make health a shared vision	<p>Mindset and expectations</p> <ul style="list-style-type: none"> • Value on health interdependence • Value on well-being • Public discussion on health promotion and well-being <p>Sense of Community</p> <ul style="list-style-type: none"> • Sense of community • Social support <p>Civic Engagement</p> <ul style="list-style-type: none"> • Voter participation • Volunteer engagement
Foster cross-sector collaboration to improve well-being	<p>Number and quality of partnerships</p> <ul style="list-style-type: none"> • Local health department collaboration • Opportunities to improve health for youth at schools • Business support for workplace health promotion and Culture of Health <p>Investment in cross-sector collaboration</p> <ul style="list-style-type: none"> • U.S. corporate giving • Federal allocation for health investments related to nutrition, and indoor and outdoor physical activity <p>Policies that promote collaboration</p> <ul style="list-style-type: none"> • Community relations and policing • Youth exposure to advertising for healthy and unhealthy food and beverage products • Climate adaptation and mitigation • Health in all policies (support for working families)
Create healthier, more equitable communities	<p>Build environments/ Physical conditions</p> <ul style="list-style-type: none"> • Housing affordability • Access to healthy foods • Youth safety <p>Social and economic environment</p> <ul style="list-style-type: none"> • Residential segregation • Early childhood education • Public libraries <p>Policy and governance</p> <ul style="list-style-type: none"> • Complete Streets policies • Air quality
Strengthen integration of	<p>Access to care</p> <ul style="list-style-type: none"> • Access to public health • Access to stable health insurance • Access to mental health services

health services and systems	<ul style="list-style-type: none">• Routine dental care Consumer experience and quality <ul style="list-style-type: none">• Consumer experience• Population covered by an Accountable Care Organization Balance and integration <ul style="list-style-type: none">• Electronic medical record linkages• Hospital partnerships• Practice laws for nurse practitioners• Social spending relative to health expenditure
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- ⁱ Aces Too High News. (n.d.). *Got Your ACE Score?* Retrieved January 10, 2017 from <https://acestoohigh.com/got-your-ace-score/>
- ⁱⁱ Centers for Disease Control and Prevention. (n.d.). *Violence Prevention: About Adverse Childhood Experiences*. Retrieved February 17, 2017 from https://www.cdc.gov/violenceprevention/acestudy/about_ace.html
- ⁱⁱⁱ Asthma and Allergy Foundation of America. (n.d.). *Asthma Facts and Figures*. Retrieved January 21, 2017 <http://www.aafa.org/page/asthma-facts.aspx>
- ^{iv} American Academy of Pediatrics. (2016). *Bright Futures Guidelines*. Retrieved from <https://brightfutures.aap.org/Pages/default.aspx>
- ^v Centers for Disease Control and Prevention. (2017). *Developmental Monitoring and Screening*. Retrieved January 28, 2017 from <https://www.cdc.gov/ncbddd/childdevelopment/screening.html>
- ^{vi} American Academy of Pediatrics, *Bright Futures Guidelines*, op cit.
- ^{vii} *Early and Periodic Screening, Diagnosis and Treatment*. (n.d.). Retrieved April 3, 2017 from <https://www.medicaid.gov/medicaid/benefits/epsdt/index.html>
- ^{viii} North Carolina Department of Health and Human Services. (2016). *N.C. Health Check Program Guide 2016*. Retrieved from https://ncdma.s3.amazonaws.com/s3fs-public/Health_Check_Program_Guide_2016_10.pdf
- ^{ix} World Health Organization. (n.d.). *About WHO: Principles*. Retrieved March 24, 2017 from <http://www.who.int/about/mission/en/>
- ^x Healthy People. (n.d.). *Disparities*. Retrieved from <https://www.healthypeople.gov/2020/about/foundation-health-measures/Disparities>
- ^{xi} American Public Health Association. (n.d.). *Health Equity*. Retrieved March 24, 2017 from <https://www.apha.org/topics-and-issues/health-equity>
- ^{xii} Boston Public Health Commission. (n.d.). *What is Health Equity?* Retrieved March 24, 2017 from <http://www.bphc.org/whatwedo/health-equity-social-justice/what-is-health-equity/Pages/what-is-health-equity.aspx>
- ^{xiii} Centers for Disease Control and Prevention. (2017). *Childhood Obesity Facts*. Retrieved November 10, 2017 from <https://www.cdc.gov/healthyschools/obesity/facts.htm>
- ^{xiv} Schorr, L. B. & Marchand, V. (2007). *Pathway to Children Ready for School and Succeeding at Third Grade*. Retrieved from <http://first5shasta.org/wp-content/uploads/2013/07/PathwayFramework9-07.pdf> and Child Trends. (2013). *The Research Base for a Birth through Eight State Policy Framework*. Retrieved from <http://www.childtrends.org/wp-content/uploads/2013/10/2013-42AllianceBirthto81.pdf>
- ^{xv} American Academy of Pediatrics' Healthy Foster Care America Project. (n.d.) *Health Care Standards*. Retrieved from <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/healthy-foster-care-america/Pages/Health-Care-Standards.aspx>
- ^{xvi} Special Education Guide. (n.d.). *The Steps in Early Intervention (IDEA Part C)*. Retrieved January 31, 2017 from <http://www.specialeducationguide.com/early-intervention/steps-in-early-intervention-idea-part-c/>
- ^{xvii} The Early Childhood Technical Assistance Center. (2015). *States' and territories' definitions of/criteria for IDEA Part C eligibility*. Retrieved from http://ectacenter.org/~pdfs/topics/earlyid/partc_elig_table.pdf. Information on each state is provided in this matrix of IDEA Part C eligibility criteria along with links to individual state programs.
- ^{xviii} Mayo Clinic. (2015). *Lead exposure: Tips to protect your child*. Retrieved January 30, 2017 from <http://www.mayoclinic.org/diseases-conditions/lead-poisoning/in-depth/lead-exposure/art-20044627>
- ^{xix} Nordqvst, C. (2016, January 13). Malnutrition: Causes, Symptoms and Treatments. *Medical News Today*. Retrieved from <http://www.medicalnewstoday.com/articles/179316.php>
- ^{xx} Weisstaub, G., Araya, M., Hill, A. & Uauy, R. (2008). Childhood Malnutrition: Prevention and Control at the National Level. In *Nutrition in Pediatrics* (Chapter 14). Retrieved from http://static.abbottnutrition.com/cms-prod/anh.org/img/Childhood_Malnutrition_Prevention_Control_National_Level.pdf
- ^{xxi} Tzioumis, E. & Adair, L. (2015). Childhood Dual Burden of Under- and Over-Nutrition in Low- and Middle-Income Countries: A Critical Review. *Food and Nutrition Bulletin*, 35(2), 230-243. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4313560/>

-
- ^{xxii} Smart Start. (2017). *Smoking in Pregnancy May Lead to Childhood Obesity*. Retrieved from <http://www.smartstart.org/smoking-in-pregnancy-may-lead-to-childhood-obesity/>
- ^{xxiii} Patient-Centered Primary Care Collaborative. (n.d.). *Defining the Medical Home*. Retrieved March 24, 2017 from <https://www.pcpcc.org/about/medical-home>
- ^{xxiv} Barfield, W. (2016). *The Problem of Neonatal Abstinence Syndrome*. Retrieved from <https://www.cdc.gov/cdcgrandrounds/pdf/archives/2016/august2016.pdf>
- ^{xxv} Mouth Healthy: Oral Health, American Dental Association. (n.d.). *Oral Health*. Retrieved January 30, 2017 from <http://www.mouthhealthy.org/en/az-topics/o/oral-health>
- ^{xxvi} Education Commission of the States. (2016). *Recess Policies*. Retrieved from <http://www.ecs.org/ec-content/uploads/SIRRecess.pdf>
- ^{xxvii} Healthy People 2020. (2017). *Social Determinants of Health*. Retrieved from <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>
- ^{xxviii} Centers for Disease Control and Prevention. (2017). *Social Determinants of Health: Know What Affects Health*. Retrieved March 24, 2017 from <https://www.cdc.gov/socialdeterminants/>
- ^{xxix} Health Resources and Service Administration's Federal Office of Rural Health Policy. (n.d.). *Telehealth Programs*. Retrieved on April 7, 2017 from <https://www.hrsa.gov/ruralhealth/telehealth/>
- ^{xxx} Center on the Developing Child. (n.d.). *Toxic Stress Derails Health Development*. Retrieved from <http://developingchild.harvard.edu/resources/toxic-stress-derails-healthy-development/>
- ^{xxxi} Substance Abuse and Mental Health Administration's Trauma and Justice Strategic Initiative. (2014). *SAMHSA's Concept of Trauma and Guidance for a Trauma-Informed Approach*. Retrieved from <http://store.samhsa.gov/shin/content/SMA14-4884/SMA14-4884.pdf>
- ^{xxxii} Facts for Life. (n.d.). *Child Development and Early Learning*. Retrieved January 30, 2017 from <http://www.factsforlifeglobal.org/03/>
- ^{xxxiii} Georgia Family Connection Partnership. (2015). *Building the Path to Reading Proficiency: Addressing Early Childhood in Georgia*. Retrieved from <https://www.greatstartgeorgia.org/sites/default/files/readingproficiency.pdf> and Schorr, *Pathway to Children*, op cit.
- ^{xxxiv} Head Start, U.S. Department of Health and Human Services. (2016). *Physical Development and Health*. Retrieved January 30, 2017 from https://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/elof/pd_health.html
- ^{xxxv} Asthma and Allergy Foundation of America, *Asthma Facts and Figures*, op cit.
- ^{xxxvi} Asthma and Allergy Foundation of America, *Asthma Facts and Figures*, op cit.
- ^{xxxvii} National Center for Health Statistics. (2012). *Trends in Asthma Prevalence, Health Care Use, and Mortality in the United States, 2001–2010*. Retrieved March 24, 2017 from <https://www.cdc.gov/nchs/products/databriefs/db94.htm>
- ^{xxxviii} Asthma and Allergy Foundation of America, *Asthma Facts and Figures*, op cit.
- ^{xxxix} Brown, P., Morello-Frosch, R. & Zavestocki, S. (eds). (2011). *Asthma in Health and Social Policy*. In *Contested Illnesses: Citizens, Science, and Health Social Movements*. Retrieved from <http://www.ucpress.edu/book.php?isbn=9780520270213>
- ^{xl} Centers for Disease Control and Prevention. (2017). *Most Recent Asthma State or Territory Data: North Carolina*. Retrieved from https://www.cdc.gov/asthma/most_recent_data_states.htm
- ^{xli} Centers for Disease Control and Prevention, *Childhood Obesity Facts*, op cit.
- ^{xlii} National Center for Healthy Housing. (n.d.). *Issue Brief: Childhood Lead Exposure and Educational Outcomes*. Retrieved January 30, 2017 from http://www.nchh.org/portals/0/contents/childhood_lead_exposure.pdf
- ^{xliiii} National Center for Healthy Housing, *Childhood Lead Exposure*, op cit.
- ^{xliiv} Slayton, R. (2015). *Malnutrition in Pregnancy*. Retrieved March 15, 2017 from <http://www.livestrong.com/article/492523-malnutrition-in-pregnancy/>
- ^{xlv} Chulack, A. (2016, September 11). *The Importance of Nutrition in Early Childhood Development*. *Novak Djokovic Foundation Blog*. Retrieved March 15, 2017 from <https://novakdjokovicfoundation.org/importance-nutrition-early-childhood-development/>
- ^{xlvi} Holt, K. & Barzel, R. (2013). *Oral Health and Learning: When Children's Oral Health Suffers So Does Their Ability to Learn*. (p. 2). Retrieved January 30, 2017 from <https://www.mchoralhealth.org/PDFs/learningfactsheet.pdf>

-
- ^{xlvi} The North Carolina Institute of Medicine. (2013). *The North Carolina Oral Health Action Plan for Children Enrolled in Medicaid and NC Health Choice*. Retrieved from http://www.nciom.org/wp-content/uploads/2013/07/ChildPrevOralHealthWeb_062813.pdf
- ^{xlviii} Holt, *Oral Health and Learning*, op cit.
- ^{xlix} Dye, B. A., Thomson-Evans, G., Xianfen, L., & Iafolla, T. J. (2015). *Dental Caries and Sealant Prevalence in Children and Adolescents in the United States, 2011-2012*. Retrieved from <http://www.cdc.gov/nchs/data/databriefs/db191.pdf>
- ⁱ Centers for Disease Control and Prevention. (2015). *Physical Activity and Health*. Retrieved March 13, 2017 from <https://www.cdc.gov/physicalactivity/basics/pa-health/index.htm#ImproveMentalHealth>
- ⁱⁱ Healthy Kids. (n.d.). *Physical Activity*. Retrieved March 13, 2017 from <https://www.healthykids.nsw.gov.au/teachers-childcare/physical-activity.aspx>
- ⁱⁱⁱ Centers for Disease Control and Prevention. (2015). *How much physical activity do children need?* Retrieved March 13, 2017 from <https://www.cdc.gov/physicalactivity/basics/children/>
- ^{liii} Telford, E. (2012). *Impact on Prenatal Substance Exposure on Children and Adolescents*. Retrieved from http://www.cffutures.org/files/B4_ImpactOfPrenatalSubstanceExposureOnChildrenAndAdolescents.pdf
- ^{liv} Shonkoff, J.P., Boyce, W.T., McEwen, B.S. (2009). Neuroscience, Molecular Biology, and the Childhood Roots of Health Disparities: Building a New Framework for Health Promotion and Disease Prevention. *JAMA*, 301(21), 2252-2257.
- ^{lv} The Build Initiative. (n.d.). *Health, Mental Health & Nutrition*. Retrieved January 30, 2017 from <http://www.buildinitiative.org/TheIssues/HealthMentalHealthNutrition.aspx>
- ^{lvi} Center for Parent Information and Resources. (2014). *Overview of Early Intervention*. Retrieved from <http://www.parentcenterhub.org/repository/ei-overview/>
- ^{lvii} Schorr, L., *Pathway to Children Ready for School and Succeeding at Third Grade*, 2007. <http://first5shasta.org/wp-content/uploads/2013/07/PathwayFramework9-07.pdf>
- ^{lviii} University of Michigan, *Born to lose: How birth weight affects adult health and success*, 2007. <http://ns.umich.edu/new/releases/5882-born-to-lose-how-birth-weight-affects-adult-health-and-success>
- ^{lix} Logan, B. A., Brown, M. S., & Hayes, M. J. (2013). Neonatal Abstinence Syndrome: Treatment and Pediatric Outcomes. *Clinical Obstetrics and Gynecology*, 56(1), 186-192. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3589586/>
- ^{lx} Logan, Neonatal Abstinence Syndrome, op cit.
- ^{lxi} Center for Parent Information and Resources, *Overview of Early Intervention*, op cit.
- ^{lxii} American Academy of Pediatrics. (2014). *Policy Statement: 2014 recommendations for Pediatric Preventive Health Care*. Retrieved from <http://pediatrics.aappublications.org/content/pediatrics/133/3/568.full.pdf>
- ^{lxiii} Zero To Three. (2016). *North Carolina Medicaid Requires Developmental Screening in Health Settings*. Retrieved from <https://www.zerotothree.org/resources/863-north-carolina-medicaid-requires-developmental-screening-in-health-settings>
- ^{lxiv} Zero to Three. (2010). *Early Experiences Matter Policy Guide*. Retrieved from <https://www.zerotothree.org/resources/119-early-experiences-matter-policy-guide>
- ^{lxv} Child Trends, *The Research Base for a Birth through Age Eight*, op cit.
- ^{lxvi} National Research Council and Institute of Medicine. (2004) *Children's Health, The Nation's Wealth: Assessing and Improving Child Health*. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK92206/>
- ^{lxvii} Georgia Family Connection Partnership, *Building a Path to Reading Proficiency*, 2015. <https://www.greatstartgeorgia.org/sites/default/files/readingproficiency.pdf>
- ^{lxviii} National Scientific Council on the Developing Child. (2010). *Persistent Fear and Anxiety Can Affect Young Children's Learning and Development*. Retrieved from <http://46y5eh11fhgw3ve3ytpwxt9r.wpengine.netdna-cdn.com/wp-content/uploads/2010/05/Persistent-Fear-and-Anxiety-Can-Affect-Young-Childrens-Learning-and-Development.pdf>
- ^{lxix} National Scientific Council on the Developing Child. (2010). *The Foundations of Lifelong Health Are Built in Early Childhood*. Retrieved from <http://developingchild.harvard.edu/wp-content/uploads/2010/05/Foundations-of-Lifelong-Health.pdf>

- ^{lxx} Davis, E. P. & Sandman, C. A. (2010). The Timing of Prenatal Exposure to Maternal Cortisol and Psychosocial Stress is Associated with Human Infant Cognitive Development. *Child Development*, 81(1), 131-148. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2846100/>
- ^{lxxi} Schmit, S., Golden, O., & Beardslee, W. (2014). *Maternal Depression: Why It Matters to an Anti-Poverty Agenda for Parents and Children*. Retrieved from <http://www.clasp.org/resources-and-publications/publication-1/Maternal-Depression-and-Poverty-Brief-1.pdf>
- ^{lxxii} Child Welfare Information Gateway. (2013). *Long-Term Consequences of Child Abuse and Neglect*. Retrieved from https://www.childwelfare.gov/pubpdfs/long_term_consequences.pdf
- ^{lxxiii} Child Welfare Information Gateway, *Long-Term Consequences*, op cit.
- ^{lxxiv} Gruendel, J. (2015). *Rethinking the Governance of Early Childhood Systems*, Institute for Child Success. Retrieved from <https://www.instituteforchildsuccess.org/publication/rethinking-governance-early-childhood-systems/>
- ^{lxxv} Gruendel, *Rethinking the Governance*, op cit.
- ^{lxxvi} Spark. (2011, July 9). The Importance of Early Childhood Activity. Retrieved from <http://www.sparkpe.org/blog/the-importance-of-early-childhood-activity/>
- ^{lxxvii} American Academy of Pediatrics, *The Crucial Role of Recess in School*, op cit
- ^{lxxviii} Georgia Family Connection Partnership. (2015). *Building a Path to Reading Proficiency*. Retrieved from <https://www.greatstartgeorgia.org/sites/default/files/readingproficiency.pdf>
- ^{lxxix} National Collaborative on Education and Health. (2015). *Brief on Chronic Absenteeism and School Health*. Retrieved from <http://www.attendanceworks.org/wordpress/wp-content/uploads/2011/03/Chronic-Absenteeism-and-School-Health-Brief-1.pdf>
- ^{lxxx} Asthma and Allergy Foundation of America, *Asthma Facts and Figures*, op cit.
- ^{lxxxi} Knowledge@Wharton. (2017, February 21). Public Policy: The Republican Health Care Plan: Do the Promises Add Up? Retrieved from <http://knowledge.wharton.upenn.edu/article/republican-health-care-plan-promises-add/>
- ^{lxxxii} Robert Wood Johnson Foundation. (2014). *Time to Act: Investing in the Health of Our Children and Communities*. Retrieved from <http://www.rwjf.org/content/dam/farm/reports/reports/2014/rwjf409002#page=62>
- ^{lxxxiii} Center on the Developing Child. (2010). *Early Experiences Can Alter Gene Expression and Affect Long-Term Development*. Retrieved from <http://developingchild.harvard.edu/resources/early-experiences-can-alter-gene-expression-and-affect-long-term-development/>
- ^{lxxxiv} National Scientific Council on the Developing Child, *The Foundations of Lifelong Health are Built in Early Childhood*, op cit.
- ^{lxxxv} National Scientific Council on the Developing Child, *The Foundations of Lifelong Health are Built in Early Childhood*, op cit., p. 2
- ^{lxxxvi} National Scientific Council on the Developing Child, *The Foundations of Lifelong Health are Built in Early Childhood*, op cit., p. 5
- ^{lxxxvii} National Scientific Council on the Developing Child, *The Foundations of Lifelong Health are Built in Early Childhood*, op cit., p.13, 15-16
- ^{lxxxviii} National Scientific Council on the Developing Child, *The Foundations of Lifelong Health are Built in Early Childhood*, op cit.
- ^{lxxxix} Robert Wood Johnson Foundation, *Time to Act*, op cit.
- ^{xc} Robert Wood Johnson Foundation, *Time to Act*, op cit., p. 7
- ^{xc} Robert Wood Johnson Foundation, *Time to Act*, op cit., p. 7
- ^{xcii} Robert Wood Johnson Foundation, *Time to Act*, op cit., p. 7
- ^{xciii} Healthy People. (n.d.). *About Healthy People*. Retrieved March 24, 2017 from <https://www.healthypeople.gov/2020/About-Healthy-People>
- ^{xciv} Healthy People, *About Healthy People*, op cit.
- ^{xcv} Healthy People 2020. (n.d.). *Midcourse Review: Progress made toward targets for Leading Health Indicators*. Retrieved from <https://www.healthypeople.gov/2020/data-search/midcourse-review/lhi>
- ^{xcvi} Healthy People. (n.d.). *State and Territorial Healthy People Plans*. Retrieved March 24, 2017 from <https://www.healthypeople.gov/2020/healthy-people-in-action/State-and-Territorial-Healthy-People-Plans>
- ^{xcvii} North Carolina Department of Health and Human Services. (2011). *Healthy North Carolina 2020: A Better State of Health*. Retrieved from <http://publichealth.nc.gov/hnc2020/docs/HNC2020-FINAL-March-revised.pdf>

-
- ^{xcviii} North Carolina Department of Health and Human Services. (n.d.). *Healthy North Carolina 2020: A Better State of Health*. Retrieved from <http://publichealth.nc.gov/hnc2020/>
- ^{xcix} North Carolina Department of Health and Human Services, *Healthy North Carolina 2020*, op cit.
- ^c Healthy People, *Disparities*, op cit.
- ^{ci} Healthy People, *Social Determinants of Health*, op cit.
- ^{cii} Healthy People, *Social Determinants of Health*, op cit.
- ^{ciii} Healthy People, *Disparities*, op cit.
- ^{civ} Healthy People. (n.d.). *Early and Middle Childhood: North Carolina Disparity Data*. Retrieved from <https://www.healthypeople.gov/2020/data-search/Search-the-Data#sld=37;age=533;hdisp=1>
- ^{cv} Healthy People, *Social Determinants of Health*, op cit.
- ^{cvi} National Academies of Science, Engineering and Medicine. (2017). *Communities in Action: Pathways to Health Equity*. Retrieved from <http://nationalacademies.org/hmd/reports/2017/communities-in-action-pathways-to-health-equity.aspx>
- ^{cvi} Robert Wood Johnson Foundation. (2017). *Communities in Action: Pathways to Health Equity*. Retrieved from <http://www.rwjf.org/en/library/research/2017/01/communities-in-action--pathways-to-health-equity.html>
- ^{cvi} Robert Wood Johnson Foundation, *Communities in Action*, op cit.
- ^{cix} Robert Wood Johnson Foundation. (2015). *County Health Rankings and Roadmaps: North Carolina Health Gaps Report*. Retrieved from <http://www.countyhealthrankings.org/health-gaps/north-carolina>
- ^{cx} Robert Wood Johnson Foundation, *North Carolina Health Gaps*, op cit.
- ^{cx} Robert Wood Johnson Foundation, *North Carolina Health Gaps*, op cit.
- ^{cxii} University of Wisconsin Population Research Institute, *Home Page*, op cit.
- ^{cxiii} Robert Wood Johnson Foundation. (2016). *County Health Rankings and Roadmaps: 2016 County Health Rankings North Carolina*. Retrieved from http://www.countyhealthrankings.org/sites/default/files/state/downloads/CHR2016_NC.pdf
- ^{cxiv} Robert Wood Johnson Foundation, *County Health Rankings and Roadmaps*, op cit.
- ^{cxv} Robert Wood Johnson. (2016). *From Vision to Action: A Framework and Measures to Build a Culture of Health*. Retrieved from http://www.rwjf.org/content/dam/COH/RWJ000_COH-Update_CoH_Report_1b.pdf
- ^{cxvi} Zero to Three. (2009). *Early Experiences Matter: A Guide to Improved Policies for Infants and Toddlers*. Retrieved from http://main.zerotothree.org/site/DocServer/Policy_Guide.pdf?docID=8401 and Child Trends. (2013). *The Research Base for a Birth through Eight State Policy Framework*. Retrieved from <http://www.childtrends.org/wp-content/uploads/2013/10/2013-42AllianceBirthto81.pdf>
- ^{cxvii} George Washington University School of Health Policy and Health Services. (2007). *Parental Health Insurance Coverage as Child Health Policy: Evidence from the Literature*. Retrieved from: http://publichealth.gwu.edu/departments/healthpolicy/CHPR/downloads/Parental_Health_Insurance_Report.pdf
- ^{cxviii} North Carolina Medicaid, Health Insurance.Org, undated. Retrieved January 22, 2017 <https://www.healthinsurance.org/north-carolina-medicaid/>
- ^{cxix} KidsCount Data Center, Annie E Casey Foundation, *Children who have a parent with no health insurance*. Retrieved July 14, 2017 from <http://datacenter.kidscount.org/data#NC>
- ^{cxix} Commonwealth Fund. (2014). *Biennial Health Insurance Survey*. Retrieved July 14, 2017 from <http://www.commonwealthfund.org/publications/issue-briefs/2015/may/problem-of-underinsurance>
- ^{cxxi} North Carolina Medicaid, op cit.
- ^{cxvii} KidsCount Data Center, Annie E Casey Foundation, *Children who have health insurance by health insurance type*. Retrieved July 11, 2017 from <http://datacenter.kidscount.org/data#NC>
- ^{cxviii} Rubin, V. (2015). *Regional Planning for Health Equity*. Retrieved March 31, 2017 from http://www.policylink.org/sites/default/files/Regional-Planning-for-Health-Equity_FINAL.pdf
- ^{cxvii} Rubin, V. *Regional Planning for Health Equity*, op cit.
- ^{cxv} Robert Wood Johnson Foundation, *Time to Act*, op cit.
- ^{cxvii} McCullough, J.M. & Leider, J.P. (2016). Government Spending in Health and Nonhealth Sectors Associated with Improvement in County Health Rankings. *Health Affairs*, 35(11), 2037-2043. Retrieved from <http://content.healthaffairs.org/content/35/11/2037.full?ijkey=h25LrWseHQgsw&keytype=ref&siteid=healthaff>
- ^{cxvii} McCullough & Leider, *Government Spending in Health and Nonhealth Sectors*, op cit.

-
- ^{cxxviii} Foy, J.M. (2013). Implementing Bright Futures Guidelines for Well-Child Care in North Carolina. *North Carolina Medical Journal*, 74(1), p. 29. Retrieved from http://classic.ncmedicaljournal.com/wp-content/uploads/2012/10/NCMJ_74-1_Final.pdf
- ^{cxxix} American Academy for Pediatrics. (n.d.). *Bright Futures: Resources for Families*. Retrieved March 13, 2017 from <https://brightfutures.aap.org/families/Pages/Resources-for-Families.aspx>
- ^{cxxxx} Impact on Health and Wellness. (2012). *Bright Futures Family Pocket Guide: Raising Healthy Infants, Children, and Adolescents – 2nd Edition*. Retrieved from <http://www.fv-impact.org/publications/pocket-guide/>
- ^{cxvxi} American Academy of Pediatrics. (n.d.). *Bright Futures Tool and Resource Kit*. Retrieved March 13, 2017 from <https://brightfutures.aap.org/materials-and-tools/tool-and-resource-kit/Pages/default.aspx>
- ^{cxvxi} *Grandparents Raising Grandchildren: Trend Analysis*. (n.d.). Retrieved from <https://www.ces.ncsu.edu/depts/fcs/pdfs/GRG.pdf>
- ^{cxvxi} Reach Out and Read. (n.d.). *About Us: Mission and Model*. Retrieved from <http://www.reachoutandread.org/about-us/mission-and-model/>
- ^{cxvxi} North Carolina counties where Reach Out and Read programs operate: Alamance, Alexander, Anson, Beaufort, Bertie, Buncombe, Burke, Cabarrus, Caldwell, Carteret, Catawba, Chatham, Chowan, Clay, Cleveland, Columbus, Craven, Cumberland, Dare, Davidson, Davie, Duplin, Durham, Edgecombe, Forsyth, Franklin, Gaston, Graham, Granville, Guilford, Haywood, Henderson, Hartford, Hoke, Hyde, Iredell, Jackson, Johnston, Lee, Lenoir, Madison, McDowell, Mecklenburg, Moore, Nash, New Hanover, Onslow, Orange, Pamlico, Perquimans, Pitt, Randolph, Richmond, Robeson, Rockingham, Rowan, Scotland, Surrey, Swain, Transylvania, Wake, Warren, Washington, Watauga, Wayne, Wilkes, Wilson, and Yadkin.
- ^{cxvxi} The Commonwealth Fund. (n.d.). *Archived: State Health Policy and Practices*. Retrieved from <http://www.commonwealthfund.org/grants-and-fellowships/programs/archived-programs/state-health-policy-and-practices>
- ^{cxvxi} Community Care of North Carolina. (n.d.). *Assuring Better Child Health and Development*. Retrieved November 8, 2016 from <https://www.communitycarenc.org/population-management/medical-home/ABCD/>
- ^{cxvxi} Smart Start. (n.d.). *Advancing Child Health*. Retrieved January 28, 2017 from <http://www.smartstart.org/advancing-child-health/>
- ^{cxvxi} Zero to Three. (2016). *North Carolina Medicaid requires developmental screening in health settings*. Retrieved from <https://www.zerotothree.org/resources/863-north-carolina-medicaid-requires-developmental-screening-in-health-settings>
- ^{cxvxi} Office of Planning, Research and Evaluation & Child Trends. (2014). *Early Childhood Developmental Screening: A Compendium of Measures for Children Ages Birth to Five*. Retrieved from https://www.acf.hhs.gov/sites/default/files/opre/compendium_2013_508_compliant_final_2_5_2014.pdf
- ^{cxli} The Child and Adolescent Health Measurement Initiative and Oregon Health and Science University (n.d.). *Well-Child Visit Planner*. Retrieved March 13, 2017 from <http://www.wellvisitplanner.org/>
- ^{cxli} American Academy of Pediatrics. (2013). *Child Health Tracker*. Retrieved from <https://itunes.apple.com/us/app/child-health-tracker-from/id664576969?ls=1&mt=8>
- ^{cxlii} American Academy of Pediatrics. (n.d.). *KidsDoc Symptom Checker*. (n.d.). Retrieved March 13, 2017 from <https://www.healthychildren.org/english/tips-tools/symptom-checker/Pages/default.aspx>
- ^{cxliii} American Academy of Pediatrics. (2012). *ADHD Tracker*. Retrieved March 13, 2017 from <https://itunes.apple.com/us/app/adhd-tracker-1.0/id553571938?ls=1&mt=8>
- ^{cxliv} Connecticut 2-1-1 Child Development Infoline. (2017). *Ages and Stages*. Retrieved March 22, 2017 from <http://cdi.211ct.org/program/ages-and-stages/>
- ^{cxlv} Easter Seals of Pennsylvania. (2017). *Make the First Five Count*. Retrieved from http://www.easterseals.com/mtffc/?referrer=http://es.easterseals.com/site/PageNavigator/ntlc10_mffc_homepageasq.html
- ^{cxlvi} Healthy Child Care Pennsylvania Early Childhood Education Linkage System. (n.d.). *ASQ Developmental Screening Free Online Tool*. Retrieved March 22, 2017 from <http://www.ecels-healthychildcarepa.org/publications/health-capsules/item/339-asq-developmental-screening-free-online-tool>
- ^{cxlvii} The Early Childhood Technical Assistance Center, *States' and territories' definitions*, op cit.

-
- ^{cxlviii} North Carolina Department of Health and Human Services. (2014). *Why Do Newborns and Young Children Need Hearing Screening?* Retrieved from <http://www.ncnewbornhearing.org/files/OutreachArticle-PA-EditsBorderTagline-42414.pdf>
- ^{cxlix} National Center for Healthy Housing, *Childhood Lead Exposure*, op cit.
- ^{cl} Centers for Disease Control and Prevention. (2016). *Lead: Learn More About CDC's Childhood Lead Poisoning Data*. Retrieved from <https://www.cdc.gov/nceh/lead/data/learnmore.htm>
- ^{cli} Centers for Disease Control and Prevention, *Lead: Learn More About CDC's Childhood Lead*, op cit.
- ^{clii} Schneyer, J. & Pell, M.B. (2016). *Unsafe at Any Level: Millions of American children missing early lead tests*. Retrieved from <http://www.reuters.com/investigates/special-report/lead-poisoning-testing-gaps/>
- ^{cliii} Bright Futures. (2016). *Recommendations for Preventive Pediatric Health Care*. Retrieved from https://www.aap.org/en-us/documents/periodicity_schedule.pdf
- ^{cliv} North Carolina Department of Health and Human Services, *North Carolina Lead Testing and Follow Up Manual*, op cit., p 6
- ^{clv} North Carolina Department of Health and Human Services, *North Carolina Lead Testing and Follow Up Manual*, op cit.
- ^{clvi} North Carolina Health and Human Services. (n.d.). *Children's Environmental Health*. Retrieved February 14, 2017 from <http://ehs.ncpublichealth.com/hhccehb/cehu/index.htm>
- ^{clvii} North Carolina Department of Health and Human Services, *North Carolina Lead Testing and Follow Up Manual*, op cit., p. 6
- ^{clviii} Centers for Disease Control and Prevention. (2017). *Lead, North Carolina*. Retrieved from <https://www.cdc.gov/nceh/lead/programs/nc.htm>
- ^{clix} *North Carolina Health News*, Lead Poisoning Remains a Problem Even as Incidence Drops, op cit.
- ^{clx} Isenhower, W. (2014, 21 January). Lead Poisoning Remains Problem Even as Incidence Drops. *North Carolina Health News*. Retrieved from <http://www.northcarolinahealthnews.org/2014/01/21/lead-poisoning-remains-problem-even-as-incidence-drops/>
- ^{clxi} North Carolina Blood Lead Surveillance Data. (2012). North Carolina Division of Public Health, NC Department of Health and Human Services.
- ^{clxii} North Carolina Blood Lead Surveillance Data. (2013) (2014). North Carolina Division of Public Health, NC Department of Health and Human Services.
- ^{clxiii} Schmit, S., Golden, O., & Beardslee, W. (2014). *Maternal Depression: Why It Matters to an Anti-Poverty Agenda for Parents and Children*. Retrieved from <http://www.clasp.org/resources-and-publications/publication-1/Maternal-Depression-and-Poverty-Brief-1.pdf>
- ^{clxiv} Schmit et al, *Maternal Depression: Why It Matters to an Anti-Poverty Agenda for Parents and Children*, op cit.
- ^{clxv} Postpartum Progress. (n.d.) *The Statistics*. Retrieved March 25, 2017 from <http://postpartumprogress.org/the-facts-about-postpartum-depression/>
- ^{clxvi} North Carolina Institute of Medicine. (2012). Prevention. In *Growing Up Well: Supporting Young Children's Social-Emotional Development and Mental Health in North Carolina* (Chapter 14, p. 70-71). Retrieved from <http://www.nciom.org/wp-content/uploads/2012/08/Chapter-41.pdf>
- ^{clxvii} Zero to Three, *North Carolina Medicaid requires*, op cit.
- ^{clxviii} North Carolina Department of Health and Human Services, *N.C. Health Check Program Guide*, op cit.
- ^{clxix} "CMS directs use of CPT code 99420 (Health Risk Screen), one (1) unit per administration, with EP modifier when billing for this service. When conducted as part of a comprehensive Health Check Early Periodic Screening visit, this screen may be billed to the infant's Medicaid coverage. Providers should carefully review this Program Guide's section on *General Guidance on Use of Structured Screening Tools* and follow all documentation requirements." NC Department of Health and Human Services, *NC Health Check Program Guide*, op cit., p. 43
- ^{clxx} Hofmann, S. G., Asnaani, A., & Fang, A. (2012). The Efficacy of Cognitive Behavioral Therapy: A Review of Meta-analyses. *Cognitive Therapy and Research*, 36(5), 427-440. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3584580/>
- ^{clxxi} Johnson K., Ammerman, R.T., & Van Ginkel, J.B. (2014). *Moving Beyond Depression. An Effective Program to Treat Maternal Depression in Home Visiting: Opportunities for States*. Retrieved from http://fhop.ucsf.edu/sites/fhop.ucsf.edu/files/custom_download/MBD%20white%20paper.pdf

- clxxii American Academy of Pediatric Dentistry. (2013). *The State of Little Teeth*. Retrieved from http://www.aapd.org/assets/1/7/State_of_Little_Teeth_Final.pdf
- clxxiii NC Department of Health and Human Services. (n.d.) *Into the Mouths of Babes/Connecting the Docs*. Retrieved March 9, 2017 from <https://www2.ncdhhs.gov/dph/oralhealth/partners/IMB.htm>
- clxxiv NC Department of Health and Human Services, *Into the Mouths of Babes*, op cit.
- clxxv NC Department of Health and Human Services. (n.d). *Carolina Dental Home Program*. Retrieved March 9, 2017 from <https://www2.ncdhhs.gov/dph/oralhealth/partners/CarolinaDentalHome.htm>
- clxxvi Asthma and Allergy Foundation of America, *Asthma Facts and Figures: Research*, op cit.
- clxxvii Centers for Disease Control and Prevention. (2017). *Most Recent Asthma State or Territory Data: North Carolina*. Retrieved from https://www.cdc.gov/asthma/most_recent_data_states.htm
- clxxviii North Carolina Department of Health and Human Services, Chronic Disease and Injury Section. (2017). *North Carolina Asthma Plan (2013-2018)*. Retrieved from <http://www.asthma.ncdhhs.gov/docs/NorthCarolinaAsthmaPlan-2013-2018.pdf>
- clxxix Mayo Clinic. (2016). *Childhood Asthma*. Retrieved January 21, 2017 <http://www.mayoclinic.org/diseases-conditions/childhood-asthma/diagnosis-treatment/diagnosis/dxc-20193120>
- clxxx North Carolina Department of Health and Human Services, *North Carolina Asthma Plan*, op cit.
- clxxxi North Carolina Department of Health and Human Services, *North Carolina Asthma Plan*, op cit., p. 10
- clxxxii North Carolina Department of Health and Human Services. (n.d.). *Asthma Program Initiatives*. Retrieved March 26, 2017 from <http://www.asthma.ncdhhs.gov/initiatives.htm>
- clxxxiii Centers for Disease Control and Prevention. (2016). *Prevalence of Childhood Obesity in the United States, 2011-2014*. Retrieved November 12, 2016 from <https://www.cdc.gov/obesity/data/childhood.html>
- clxxxiv Skinner, A. C., Perrin, E. M., & Skelton, J. A. (2016). Prevalence of obesity and severe obesity in US children, 1999-2014. *Obesity*, 24(5), 1116-1123. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1002/oby.21497/full>
- clxxxv Slayton, R. (2015). *Malnutrition in Pregnancy*. Retrieved March 15, 2017 from <http://www.livestrong.com/article/492523-malnutrition-in-pregnancy/>
- clxxxvi Chulack, A. (2016, 11 September). The Importance of Nutrition in Early Childhood Development. Retrieved March 15, 2017 from <https://novakdjokovicfoundation.org/importance-nutrition-early-childhood-development/>
- clxxxvii Alliance for a Healthier Generation. (n.d.). *North Carolina*. Retrieved March 26, 2017 from https://www.healthiergeneration.org/about_childhood_obesity/in_your_state/north_carolina/
- clxxxviii Alliance for a Healthier Generation, *North Carolina*, op cit.
- clxxxix Smart Start. (n.d.). *What is Shape NC?* Retrieved from <http://www.smartstart.org/shape-nc-home/>
- cx c Smart Start. (2017). *Shape NC Results*. Retrieved from <http://www.smartstart.org/shape-nc-home/shape-nc-results/>
- cxci Smart Start. (2016, 16 August). Smart Start Receives New Federal Grant to Fight Early Childhood Obesity. Retrieved from <http://www.smartstart.org/smart-start-receives-new-federal-grant-to-fight-early-childhood-obesity/>
- cxcii Smart Start. (2017, 24 February). Local Grant Recipients Awarded Federal Funds to Ensure Children Start Kindergarten Healthy. Retrieved from <http://www.smartstart.org/two-local-partnerships-receive-federal-shapenc-grant/>
- cxciiii Institute of Medicine. (1996). *Telemedicine: A Guide to Assessing Telecommunications for Health Care*. Retrieved April 7, 2017 from <https://www.ncbi.nlm.nih.gov/pubmed/20845554>
- cxciiv Lustig, T. (2012). *The Role of Telehealth in an Evolving Health Care Environment: Workshop Summary*. Retrieved from <http://www.nationalacademies.org/hmd/Reports/2012/The-Role-of-Telehealth-in-an-Evolving-Health-Care-Environment.aspx>
- cxci v Rath, D. (2017, February 1). N.C. School-Based Telehealth Program Grows Into National Model. *Healthcare Informatics*. Retrieved April 7, 2017 from <https://www.healthcare-informatics.com/article/telemedicine/nc-school-based-telehealth-program-grows-national-model>
- cxci vi HealtheSchools. (n.d.). Retrieved April 7, 2017 from <http://crhi.org/MY-Health-e-Schools/index.html>
- cxci vii Sisk, T. (2015, January 21). School-based Telehealth: A New Approach to Improved Outcomes in Rural NC Counties. *North Carolina Health News*. Retrieved from <http://www.northcarolinahealthnews.org/2015/01/21/school-based-telehealth-a-new-approach-to-improved-outcomes-in-rural-nc-counties/>

-
- ^{cxviii} AMD Global Telemedicine. (n.d.). *School-Based Telemedicine Webinar*. Retrieved April 7, 2017 from <http://www.amdtelemedicine.com/telemedicine-resources/documents/School-BasedTelemedicineWebinarQASessionSummary.pdf>
- ^{cxix} Reynolds, C. & Maughan, E. (2014). Telehealth in the School Setting: An Integrative Review. *The School Health Journal*. Retrieved from <http://journals.sagepub.com/doi/full/10.1177/1059840514540534>
- ^{cc} White, R. (2014, February 12). Taking Dentistry to the Patients Who Need It Most. *Children's Health Matters*, *Annenberg Center for Health Journalism*. Retrieved from <https://www.centerforhealthjournalism.org/2014/02/11/taking-dentistry-patients-who-need-it-most>
- ^{cci} American Academy of Pediatrics, *The Crucial Role of Recess in School*, op cit.
- ^{ccii} American Academy of Pediatrics, *The Crucial Role of Recess in School*, op cit.
- ^{cciii} Education Commission of the States, *Recess Policies*, op cit.
- ^{cciv} American Academy of Pediatrics. (2016). *AAP Policy Statement Recommends Full Time Nurse in Every School*. Retrieved from <https://www.aap.org/en-us/about-the-aap/aap-press-room/pages/AAP-Policy-Statement-Recommends-Full-Time-Nurse-in-Every-School.aspx>
- ^{ccv} American Academy of Pediatrics. (2016). *Role of the School Nurse in Providing School Health Services*. Retrieved from <http://pediatrics.aappublications.org/content/early/2016/05/19/peds.2016-0852>
- ^{ccvi} NC Department of Health and Human Services. (n.d.). *About Us: School Nurses*. Retrieved February 14, 2017 <https://www2.ncdhhs.gov/dph/wch/aboutus/schoolnurses.htm>
- ^{ccviii} *NC Parents Advocating for School Health*. (n.d.). Retrieved February 14, 2017 <http://ncpash.weebly.com/>
- ^{ccix} School-Based Health Alliance. (n.d.). *State Affiliates*. Retrieved on March 26, 2017 from <http://www.sbh4all.org/about/state-affiliates/state-affiliate-contacts/#NC>
- ^{ccx} Michael, S., Merlo, C., Basch, C. Wentzel, K. & Wechsler, H. (2015). *Critical Connections: Health and Academics*. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/josh.12309/full>
- ^{ccxi} California School-Based Health Alliance. (2015). *School-Based Health Centers: Proven Results*. Retrieved from <https://www.schoolhealthcenters.org/wp-content/uploads/2015/01/CSHA-SBHC-Proven-Results-2014.pdf>
- ^{ccxii} National Scientific Council on the Developing Child, *The Foundations of Lifelong Health are Built in Early Childhood*, op cit., pp. 13,15-16
- ^{ccxiii} Robert Wood Johnson Foundation, *County Health Rankings and Roadmaps*, op cit.