North Carolina Department of Health and Human Services
Division of Public Health

Annual Report to the North Carolina Medical Society

September 2017

State of North Carolina
Roy Cooper, Governor
www.nc.gov

The North Carolina Department of Health and Human Services
Mandy Cohen, MD, MPH, Secretary

Elizabeth Cuervo Tilson, MD, MPH
State Health Director
Chief Medical Officer

www.ncdhhs.gov

Division of Public Health
Daniel Staley, Division Director
www.publichealth.nc.gov

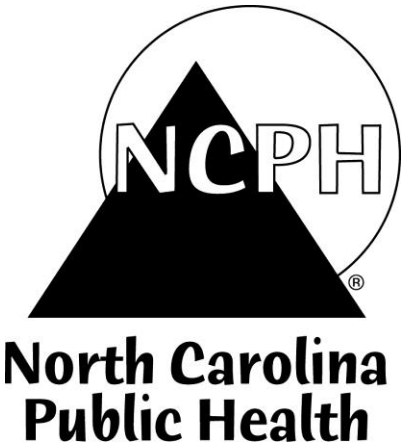

Table of Contents

Background

General Statute 130A.33 requires the State Health Director to submit an annual report on public health at the general session of the annual meeting of the North Carolina Medical Society (NCMS) held conjointly with the Commission for Public Health meeting. This report serves this statutory requirement and is structured around North Carolina's state health improvement plan, **Healthy North Carolina 2020**.

Healthy North Carolina 2020: The State's Health Improvement Plan

According to the 2016 edition of *America's Health Rankings,* North Carolina ranked No. 32 in the nation.[1]

The burden of premature morbidity and mortality reflected in our ranking highlights the need for improvements in population health. More than two-thirds of all deaths annually in North Carolina are attributed to chronic diseases and injuries.[2] The North Carolina State Center for Health Statistics has listed the top five causes of death in 2015 as cancer, heart disease, chronic lung disease, stroke and Alzheimer's disease.[3]

Based on the latest *America's Health Rankings* report (2016), North Carolina's challenges are high percentage of children in poverty, high prevalence of low birthweight and a high infant mortality rate. Our state's low prevalence of excessive drinking, high immunization rates among adolescents for Tdap (tetanus, diphtheria and pertussis) and high immunization coverage among children are noted as strengths.[4]

The burden of diseases related to modifiable behaviors in our state has been high.

- The annual economic costs associated with unhealthy lifestyles for businesses, which includes health care and lost work time, are estimated to be $5,711 per employee per year.[5]
- Problems caused by poor nutrition cost North Carolina an estimated $12 billion a year.[6]
- North Carolina's estimated annual costs from smoking are $8.05 billion. This includes direct medical costs from smoking at $3.81 billion each year (of which $931 million are Medicaid costs) and $4.24 billion in lost productivity.[7,8]

A practical approach to address North Carolina's health care challenges has been to attempt to prevent these problems from occurring in the first place. This statewide focus on prevention has been reflected in work by North Carolina's public health leaders, who began in 2008 to develop a vision and roadmap for focusing and improving public health efforts. Investing in prevention has been determined to save lives, reduce disability, and, in some cases, reduce health care costs as stated in the ***Prevention Action Plan for North Carolina***.[9] The ***Prevention Action Plan for North Carolina* (2009)** also recognized evidence-based strategies as an important mechanism to improve population health.

North Carolina used this prevention framework to establish our state's **Healthy North Carolina 2020 (Healthy NC 2020)** objectives, the most recent iteration of decennial health objectives our state has set beginning in 1990. The primary aim of this objective-setting process is to mobilize the state to achieve a common set of health objectives. Healthy People 2020 (www.healthypeople.gov) is a federal initiative with science-based, 10-year national objectives for improving the health of all Americans. **Healthy NC 2020** is a state health improvement plan with state specific, measurable objectives that were developed with the best available data and evidence. North Carolina's objectives are well aligned with federal objectives, though they were developed separately.

Healthy North Carolina 2020: A Better State of Health **(2011)** identified 40 objectives necessary to improve population health by 2020 and recommended the use of evidence-based strategies.[10] **Healthy NC 2020** was designed to address and improve our state's most pressing health priorities. These objectives provided a common set of health indicators that organizations and individuals across the state can work to improve, knowing their efforts are designed to lead to a healthier population. Each **Healthy NC 2020** objective included a discrete quantifiable target that has enabled us to monitor progress toward achieving our goals. Appendix A provides a list of the 40 objectives, our state's baseline, targets and most current measures, as well as national measures for comparison (when available and applicable).

Steps Taken by State and Non-State Entities to Meet Healthy NC 2020 Goals

The mission of the North Carolina Department of Health and Human Services (DHHS) Division of Public Health (DPH) is to promote and contribute to the highest possible level of health for all North Carolinians. North Carolina's public health system is an integrated network of partnerships among DPH and the state's 85 local health departments, as well as other divisions in DHHS, other state agencies, universities and non-governmental entities. DPH programs and services touch citizens' lives in all 100 counties. Improving the health of our citizens requires a coordinated approach with ownership by and accountability from governmental and non-governmental entities as well as individuals themselves.

Local health departments and their community health partners complete health assessments every three or four years and develop local community health improvement plans to address the health needs of their citizens. Review of the most current community health assessments and improvement plans for local health departments indicated a core of **Healthy NC 2020** objectives has been selected by most local health departments as their most pressing health problems.

All DPH's programs and services have supported improvements in health as measured by the 40 **Healthy NC 2020** objectives. The following is a representative though not exhaustive summary of programs and services addressing some of the **Healthy NC 2020** objectives most frequently selected by local communities as their most pressing health issues. Appendix B provides disaggregated data by county, when available, for selected **Healthy NC 2020** objectives.

Tobacco Use
Healthy NC 2020 Objectives

- *Decrease the percentage of adults who are current smokers*
- *Decrease the percentage of high school students reporting current use of any tobacco product*
- *Decrease the percentage of people exposed to secondhand smoke in the workplace in the past seven days*

Tobacco use remains the number one preventable cause of early death and disease (480,000 deaths each year, or one in five deaths) in the United States.[11] The 2014 Surgeon General's Report documents that for each death, there are 30 more people who are sick or disabled because of tobacco use. The Centers for Disease Control and Prevention (CDC) indicates that while U.S. adult cigarette smoking has declined, the use of emerging tobacco products (such as electronic cigarettes, hookahs and flavored little cigars) has increased.[12]

Tobacco use among North Carolina's youth has remained a major concern. North Carolina's high school smoking rate decreased from 27.3 percent in 2003 to 9.3 percent in 2015.[13] However, progress has been confounded by the growing popularity of unconventional tobacco products such as electronic cigarettes and hookahs. For the first time in a decade, overall tobacco use among high school students has increased.

- E-cigarette use among high school students has increased by 888 percent, from 1.7 percent (2011) to 16.8 percent (2015).[14]
- Use of any new tobacco product, including electronic cigarettes, hookah, and flavored little cigars, rose 27 percent between 2011 and 2015.[15]

There are many myths about these popular new and emerging products that may be responsible for the increased use. Facts presented in the 2016 Surgeon General's Report on E-Cigarette Use among Youth and Young Adults[16] dispel these myths:

- E-cigarette aerosol is NOT harmless water vapor. Studies have found nicotine, heavy metals, toxins and carcinogens in e-cigarettes and the aerosol.
- Nicotine is highly addictive. Because the adolescent brain is still developing, nicotine use during adolescence can disrupt the formation of brain circuits that control attention, learning and susceptibility to addiction.
- U.S. adolescents and young adults who had never smoked but used e-cigarettes at baseline were 8.3 times more likely to progress to cigarette smoking after one year than nonusers of e-cigarettes.
- Contrary to much of the promotional media about e-cigarettes, as currently being used, e-cigarettes are associated with significantly less quitting among smokers. Among high school students and young adults who use tobacco, more use both e-cigarettes and burned tobacco than use e-cigarettes alone.

The 2014 Surgeon General's Report "The Health Consequences of Smoking: 50 Years of Progress" has provided continued strong evidence for the health risks associated with exposure to tobacco smoke, including new evidence that secondhand smoke is causative for stroke. Secondhand smoke causes premature death and disease in children and adults who do not smoke, and there is no risk-free level of exposure to secondhand smoke.

- Workers in N.C. restaurants and bars have been protected by a state smoke-free law since 2010, and many government workers have been protected from secondhand smoke under local action. Private worksites are not smoke-free by law.
    - Those who work in blue collar jobs, those with lower incomes and African Americans are more likely to have been exposed to secondhand smoke.[17] In fact, a CDC study found that nearly seven in 10 African American children were exposed to secondhand smoke in the home, particularly in multi-unit housing that is not smoke-free.[18]

The **DHHS' DPH's Tobacco Prevention and Control Branch** has worked with organizations and communities to build support for evidence-based policies and programs.

- **QuitlineNC** enrollments have continued to increase as more tobacco users want to quit, and providers are increasingly referring to QuitlineNC. Insurers, employers and local governments can partner with QuitlineNC to provide comprehensive services through QuitlineNC for their members, employees or residents. According to the latest 2016 report by University of North Carolina's Tobacco Prevention and Evaluation Program, QuitlineNC's six month quit rate is at the highest it has ever been at the responder rate of 36 percent which is higher than the national average responder rate of 30.3 percent for FY 2015 as reported by the North American Quitline Consortium.[19]
- **Smoke-free and tobacco-free places** have become increasingly the norm. Local smoke-free and tobacco-free places increase healthy environments and support healthy behaviors, including preventing young people from starting to use tobacco products and helping tobacco users who want to quit.
    - **Local governments** have the authority to ban smoking and tobacco use in government buildings, on government grounds and in public places where the public is invited or permitted inside. An interactive map of such regulations in North Carolina can be found at the N.C. Tobacco Prevention and Control Branch website.
    - **Colleges and Community Colleges** have increasingly gone 100 percent tobacco-free. The Tobacco Prevention and Control Branch maintains updated lists of tobacco-free colleges on the Tobacco Free Colleges NC website.
- **North Carolina's multi-unit housing properties** have increasingly gone smoke-free to protect health and property and save money.
    - North Carolina became the second state in the nation to require smoke-free policies for multi-unit housing properties receiving tax credit funding.

- The U.S. Department of Housing and Urban Development released a final rule for smoke-free public housing that requires all public housing to be smoke-free indoors and within 25 feet of the building, including balconies and patios by July 30, 2018.[20]
- The **Greater Charlotte Apartment Association** launched a Smoke-Free Apartment Certification Program in April 2017. Within the first month, 32 apartment complexes have applied and others are interested in smoke-free policies. A summary along with the link to the Application can be found at www.greatercaa.org/?page=38.
- If patients need assistance for smoke-free multi-unit housing, go to: www.smokefreehousingnc.com.

- **Mental Health and Substance Abuse Treatment state facilities** have successfully implemented tobacco-free buildings and grounds policies and have provided tobacco cessation support to patients and staff. **DHHS' Divisions of Medical Assistance, State Operated Healthcare Facilities, Mental Health/Developmental Disabilities/ Substance Abuse Services** and **Public Health** have collaborated to make sure there is no wrong door for all tobacco users who want to quit, whether they are seen through medical or behavioral health clinics. These agencies have made tobacco cessation counseling along with U.S. Food and Drug Administration (FDA)-approved medications for tobacco treatment more readily available for tobacco users. The **N.C. DHHS** and **partners** have sponsored **Breathe Easy NC Coalition**, a statewide initiative to reduce tobacco use among behavioral health consumers and staff. Information about the Coalition can be found at http://breatheeasync.org.
- **DPH's Children and Youth Branch Maternal, Infant and Early Childhood Home Visiting (MIECHV) Program** has made progress on the Healthy NC 2020 objectives for tobacco use by implementing federally-funded, evidence-based home visiting **(Nurse-Family Partnership and Healthy Families America)** in 13 counties in North Carolina: Buncombe, Burke, Columbus, Durham, Edgecombe, Gaston, Halifax, Hertford, Mitchell, Nash, Northampton, Robeson and Yancey. Data for the most recent reporting period (FY 2014–2015) indicate that 50 percent of pregnant women using tobacco at program enrollment reduced their use of tobacco during pregnancy.
- The **Children and Youth Branch School Health Nursing Program** has reported that **school nurses** have provided educational programs on tobacco and substance abuse health counseling, which includes tobacco use. In addition, school nurses have served on the **School Health Advisory Committees** of their school districts and have provided support for keeping schools smoke and tobacco free.

What Medical Providers Can Do

- Provide 5A's (ask, advise, assess, assist and arrange) counseling and FDA-approved tobacco treatment medications, including dual therapy for those with strong addiction to nicotine for tobacco users who want to quit.
- Promote clinical referrals to QuitlineNC (1-800-QuitNow or 1-800-784-8669) through fax referral, secured email or an electronic health records system for tobacco users who want to quit.
- Educate patients and the public about the known health risks of secondhand and thirdhand smoke.
- Educate young people, parents, patients and the public about the known health risks for electronic cigarettes and secondhand aerosol. Health Provider Conversation Cards and Parent Tip Sheets are available on the Surgeon General's website at: https://e-cigarettes.surgeongeneral.gov/resources.html.

Physical Activity and Nutrition Healthy NC 2020 Objectives

- *Increase the percentage of high school students who are neither overweight nor obese*
- *Increase the percentage of adults meeting CDC Aerobic Recommendations*
  - The **DHHS' DPH's Community and Clinical Connections for Prevention and Health Branch's (CCCPH)** programs have helped to make communities, worksites and schools healthier places to live, earn and learn. These services have encouraged changes to policies and environments to help community members eat smart, move more and achieve a healthy weight. The following are examples of efforts undertaken in our state.
    - Walking has been increased in select communities through the support of wayfinding signage that directs pedestrians to points of interest and community services.
    - Partners across North Carolina have worked with small food store owners to make healthy food more accessible to all residents. Supportive nutrition environments and quality physical education and physical activity in schools have been created.
    - Workplace policies to encourage employees to be more active and to eat healthy have been created.
  - DPH has undertaken these activities with many state and local public health partners including the N.C. Departments of Natural and Cultural Resources, Transportation, Commerce, Agriculture and Public Instruction; Extension at N.C. State University; universities; local school districts and nonprofit organizations.

- To integrate the health needs of youth and adults with disabilities, the **N.C. Office on Disability and Health** in the **DPH's Children and Youth Branch** has worked with communities, schools and state and local public health partners to increase the accessibility of farmers' markets, open space and other health promotion environments, and to increase participation of students with disabilities in walking and biking to school programs.
- Through the **School Nursing Program** of the **Children and Youth Branch**, school nurses have provided health educational programs on physical activity and nutrition, including bone health, weight control and eating disorders. School nurses have created individualized health plans of care for students needing nursing interventions for eating disorders or obesity. These plans have been created in consultation with physicians, parents, students and school staff and specify specific interventions that are carried out with individual students during the school year.
- **School nurses** have provided health counseling for students with nutrition based issues (more than 19,000 nutrition health counseling sessions were provided to individual students in school year 2015–2016). In addition, school nurses have provided nursing case management for students with weight issues and as a result, during school year 2015–2016, 45 percent of students participating in case management had an improvement in their BMI, 71 percent improved their grades, 80 percent demonstrated improved knowledge of nutrition and 73 percent increased daily physical activity.

What Medical Providers Can Do

- Promote healthy eating to all patients and stress the importance of consistent exercise and daily physical activity.

Injury and Violence
Healthy NC 2020 Objectives

- *Reduce the unintentional poisoning mortality rate (per 100,000 population)*
- *Reduce the unintentional falls mortality rate (per 100,000 population)*

Injury and violence are the leading causes of death for those aged 1–64 years old and remain leading causes of preventable death in the United States.[21] If aggregated together, injury and violence would rank as the third-leading cause of death for North Carolinians in 2015.[22] Unintentional poisoning (which includes opioid overdose) became the leading cause of injury death in North Carolina during 2015 followed by unintentional motor vehicle crashes, fall injuries, firearm suicide and firearm assaults.

- **DHHS' DPH's Injury and Violence Prevention Branch** held a class of the **Injury Free NC Academy** on shared risk and protective factors to prevent intentional injuries.

The academy was funded through a five-year collaborative agreement by CDC's Core State Violence and Injury Prevention Program.

Unintentional Poisoning

According to the CDC, more people died from drug overdoses in 2014 than in any other year and the number of opioid overdose deaths quadrupled between 1999 and 2014.[23] In 2014, for every unintentional poisoning death among North Carolinians,[24] there were over 4 hospitalizations[25] and nearly 13 emergency department visits.[26] Unintentional medication and drug poisoning deaths increased 19 percent from 2014 to 2015 among North Carolina residents,[27] and unintentional opioid-related deaths have increased 77 percent from 2005 to 2015.[28]

The **Injury and Violence Prevention Branch** has worked with various organizations and communities to build support for and implement evidence-based policies and programs to prevent drug poisonings including opioid overdose.

- The Branch has supported the adoption and implementation of, and clarifications to, the **N.C. 911 Good Samaritan/Naloxone Access Laws** that provide limited immunity from prosecution for reporting drug and alcohol overdoses and provide increased access to naloxone—an antidote for opioid overdose. Increasing community access to naloxone enables those most likely to witness an overdose access to the tools and skills to potentially save a life in the event of an opioid overdose.
    - The Branch has advocated for and has facilitated passage of legislation enabling the State Health Director to sign a statewide standing order for naloxone, which has increased the public's ability to access naloxone through pharmacies. Since the law was passed in June 2016, over 1,300 **pharmacies** have signed on to dispense naloxone under the State Health Director's standing order. A resource website (www.naloxonesaves.org) was launched in collaboration with the **UNC Injury Prevention Research Center** to provide resource information for pharmacies and the public on naloxone and where to find a pharmacy selling naloxone.
    - Currently 152 **law enforcement agencies** in North Carolina carry naloxone and have been trained to respond, reporting over 400 overdose reversals.
    - **Community** education, training and distribution of naloxone has been supported by the Branch. Since August 2013, this effort has resulted in over 6,200 overdose reversals being reported.
- The Branch has initiated a contract with the **N.C. Hospital Association** to convene health system leaders to establish health system practices on appropriate opioid prescribing, including efforts to: ensure clinical education and oversight of appropriate prescribing practices; promote CDC and the **N.C. Medical Board's** safer prescribing guidelines; assess health system **Physician Drug Monitoring Program** registration and use policies; establish a voluntary **Opioid Stewardship Program;** identify barriers to implementing

health system safe opioid practices and policies; and assist with communication to reduce overdoses.

- **The Injury and Violence Prevention Branch** has secured four-year funding for policy, programmatic and surveillance strategies to prevent prescription drug overdose through the **CDC's Prescription Drug Overdose Prevention for States** cooperative agreement.
- The N.C. Prescription Drug Abuse Advisory Committee (PDAAC) has been established. It is a collaboration among public health, mental health, healthcare systems, law enforcement, regulatory boards, local health departments, community coalitions and others to plan, implement and evaluate comprehensive strategies to prevent drug overdose and treat opioid use disorders. Over 200 agencies, organizations and individuals participate in PDAAC work.
- The Branch has supported the securing of funding for **safe drug disposal** and for strengthening the **N.C. Controlled Substances Reporting System (CSRS)** in partnership with the **N.C. Child Fatality Task Force.**
- The Branch convened a two-day Opioid Misuse and Overdose Prevention Summit in June 2017 in partnership with the Division of Mental Health, Developmental Disabilities, and Substance Abuse Services.
- In March 2017, **DHHS Secretary Mandy Cohen** sent a letter to **prescribers** in the state requesting assistance in addressing the prescription drug overdose epidemic by taking the **Turn the Tide pledge** (http://turnthetiderx.org/#), becoming familiar with the **Centers for Disease Control and Prevention (CDC) prescribing guidelines** (www.cdc.gov/mmwr/volumes/65/rr/rr6501e1.htm) adopted by the North Carolina Medical Board, registering and using the state's **Controlled Substance Reporting System**, screening patients for opioid use disorder and connecting them with evidence-based treatments, and transforming perceptions about substance use disorder as a treatable chronic disease.
- **Syringe exchanges** were legalized in North Carolina in July 2016. The Branch took the lead in developing the reporting requirements under the law. Additionally, the Branch convened a **workgroup** to develop resources to assist exchanges in operations and best practices (resources are posted online at www.ncdhhs.gov/divisions/public-health/north-carolina-safer-syringe-initiative). There are currently 23 exchanges in the state operating in 20 counties.
- The Branch provided technical assistance in the development of the **Strengthen Opioid Misuse Prevention (STOP) Act** (approved and signed into law by Governor Roy Cooper, June 29, 2017). The bill incorporates the CDC's Prescribing Guidelines and Prescription Drug Abuse Report System recommendations.
- A new ***North Carolina Opioid Action Plan*** was developed in 2017 through a collaborative process with partners working on the opioid epidemic as part of the **Prescription Drug Abuse Advisory Committee (PDAAC)**. The intent of the ***North***

Carolina Opioid Action Plan has been to operationalize the strategic plan by identifying specific, tangible, achievable steps that will have the greatest impact on reducing the burden of death from the opioid epidemic.

- DHHS is a recipient of $31 million over two years to address the state's opioid crisis through the 21st Century Cures Act, State Targeted Response to the Opioid Crisis Grants. Funding will be used to expand prevention, treatment and recovery supports.
- The **Office of the Chief Medical Examiner (OCME)** has investigated all sudden and unexpected deaths in North Carolina, including all suspected drug-related deaths. The **OCME Toxicology Laboratory** has been accredited by the American Board of Forensic Toxicology (ABFT) and has performed toxicology testing on all drug-related deaths in North Carolina to assist the pathologist in determining cause and manner of death. The OCME Toxicology Laboratory has screened for more than 600 compounds, including prescription, over the counter and illicit drugs and other substances. As the number of drug deaths and novel compounds detected during screening have continued to increase, toxicology testing has increased by 25 percent and poisoning deaths (which include unintentional or intentional overdose of a drug or multiple drugs) have increased by 18 percent from 2014 to 2016. The 2016 data are considered provisional and the number of poisoning deaths may increase as cases are finalized.
    - Based on these provisional data, 74.6 percent of poisoning deaths in North Carolina in 2016 involved prescription or illicit opioids (i.e., buprenorphine, codeine, fentanyl, fentanyl analogues, heroin, hydrocodone, hydromorphone, loperamide, meperidine, methadone, mitragynine, morphine, oxycodone, oxymorphone, propoxyphene, tapentadol, tramadol, U-47700).
    - Of these deaths, 58.5 percent involved fentanyl, fentanyl analogues, and/or heroin, representing a significant increase from 37.7 percent in 2014 and 44.9 percent in 2015.

  The OCME has tracked the rise of illicit opioid-related deaths in North Carolina and has been committed to collaborating with various organizations to inform public health initiatives directed at reducing the impact of this problem.
- In response to the increase in deaths from synthetic fentanyl and fentanyl analogues in 2016, the Division of Public Health and the Attorney General's Office collaborated to incorporate the new fentanyl analogues under the state's Controlled Substances Law through Session Law 2017-115.

What Medical Providers Can Do

- Adhere to N.C. Board of Medicine and CDC prescribing guidelines for opioid prescribing and the treatment of chronic pain.
- Register and actively use the N.C. Controlled Substances Reporting System.
- Educate patients on the risks and benefits of analgesic opioids and on the availability of non-medication treatment alternatives when appropriate.
- Consider co-prescribing naloxone when prescribing high dose (>80 morphine milligram equivalents, or MME) analgesics.
- Educate patients and family members about the statewide standing order for naloxone.
- Screen pregnant women for substance abuse utilizing evidence-based screening questions.
- Screen patients' risk of addiction and refer to addiction treatment services when needed.

Unintentional Falls

In 2015, more than 1,125 N.C. residents died as a result of an unintentional fall, most over the age of 65.[29] More than one out of four senior citizens fall every year, and adults who fall once are two times more likely to fall again, thereby increasing their risk of injury and death.[30]

The **DHHS' DPH's Injury and Violence Prevention Branch** has participated in and supported initiatives to prevent the incidence of fall injuries. Such efforts have included:

- Staffed the **North Carolina Falls Prevention Coalition**, a collaboration that supports the dissemination and implementation of evidence-based programming to support healthy aging and prevent falls across North Carolina.
- Helped maintain the **Falls Prevention Hub** (http://healthyagingnc.com), a centralized point of entry online for falls and falls-risk activities and programs.
- Co-hosted two **Injury Free N.C. Falls Prevention Summits** (in 2014 and 2015) and a **Healthy Aging Summit** in 2017.

What Medical Providers Can Do

- Screen patients for fall risk and history.
- Review patients' medications for increased risk of falling.
- Encourage strength and balance training and physical activity to increase stability and endurance.
- Evaluate patients' vision and make referrals as necessary.
- Educate patients on strategies and resources to make home environments safer and reduce fall hazards.

Maternal and Infant Health Healthy NC 2020 Objectives

- *Reduce the infant mortality racial disparity between whites and African Americans*
- *Reduce the infant mortality rate (per 1,000 live births)*
- *Reduce the percentage of women who smoke during pregnancy*

DHHS released its collaborative **North Carolina Perinatal Health Strategic Plan** in March 2016 following a cooperative process to develop the plan in 2014 and 2015. This process included statewide private and public partners focused on addressing the health of families of reproductive age.

The following are **DHHS' DPH's programs** that have addressed maternal health, infant mortality or infant and child health.

- The **North Carolina Child Fatality Task Force** has continued its work to promote a package of programs that support healthy birth outcomes and promote wellness in the first year of life. Efforts have included promotion of preconception health, education in best safe sleep practices, improvements in hospital practice, and tobacco cessation and prevention programs. The Task Force has supported funding for the **You Quit Two Quit** perinatal tobacco use and cessation quality improvement initiative. Tobacco use during pregnancy is associated with increased risk of low birth weight, preterm birth and infant mortality[31] and nearly one in 10 babies in North Carolina are born to women reporting cigarette use during pregnancy.[32]
- **Community Focused Infant Mortality** has provided services for women and their infants with a specific focus on African American and Native American families. Services have included outreach; case management; health education before, during and after pregnancy to improve the chances of a healthy birth; and supportive services for women and their children after delivery. These programs have included **Baby Love Plus** and **Healthy Beginnings** and have been housed in **local health departments** and

community-based organizations across the state. Additional partners have included **The University of North Carolina at Greensboro** and **The University of North Carolina at Chapel Hill.**

- **Improving Community Outcomes for Maternal and Child Health (ICO4MCH)** has provided services for women and men of childbearing age and children ages birth to 5 with a comprehensive, multi-level initiative to address three aims: 1) improving birth outcomes; 2) reducing infant mortality and 3) improving the health status of children, ages birth to 5. Thirteen counties in North Carolina (Alleghany, Ashe, Avery, Cumberland, Durham, Hoke, Mecklenburg, Montgomery, Richmond, Robeson, Union, Watauga and Wilkes) are utilizing evidence-based strategies to address these aims. Evidence-based strategies have included: **long-acting reversible contraception (LARC), Tobacco Cessation and Counseling, Ten Steps for Successful Breastfeeding, Triple P (Positive Parenting Program), Family Connects Newborn Home Visiting Program** and **Clinical Efforts to Address Secondhand Smoke Exposure (CEASE).**
- **Maternal Health Services** has provided a wide range of maternal health services to encourage low-income pregnant women to begin early prenatal care and follow recommended perinatal care guidelines before and after giving birth. State and local public health partners in this effort have included **DHHS' Division of Medical Assistance, East Carolina University, The University of North Carolina at Chapel Hill, private universities** and **hospitals.**

The **Division of Public Health**, in partnership with the **Division of Medical Assistance** and **Community Care of North Carolina (CCNC)**, implements the Pregnancy Medical Home initiative, inclusive of Pregnancy Care Management (OBCM) services. The goal of the Pregnancy Medical Home (PMH) model is to improve the quality of maternity care, improve birth outcomes and reduce costs. A preterm birth prevention initiative, the PMH program seeks to reduce costs as a result of more babies being born at term or closer to full term, thereby requiring fewer costly healthcare interventions. The model engages obstetrical providers as Pregnancy Medical Homes and local health departments as providers of OBCM services. Pregnancy Care Management services are provided by nurses and social workers from local public health departments, and are embedded in the private provider offices as well as health department maternity clinics in an effort to support the medical team and the patient in carrying out the medical care plan and addressing social determinants of health.

- **Maternal Mortality Review (MMR)** legislation became effective December 2015. The nine-member MMR committee has been appointed and the full review began in September 2016. The committee's work has been driven by recommendations from the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) to reduce maternal mortality in North Carolina and throughout the country by encouraging the establishment of multidisciplinary maternal death reviews, resulting in the development of recommendations for the prevention of future deaths. Reviews have

been completed for the 2014 calendar year and a report is being developed to include potential recommendations for improvement.

- **Women's Health Public Education** has educated N.C. residents through maternal and child public education/information campaigns. Campaigns have highlighted information for women and men about the benefits of taking a daily dose of folic acid, preventing teen pregnancy, the importance of developing a reproductive life plan and preparing for a healthy pregnancy. Education has also included prenatal care, the consequences of early elective deliveries, safe sleep and reproductive life planning. State and local public health partners in this effort have included **DHHS' Division of Medical Assistance, health departments, hospitals** and **non-profit health organizations.**

- **DHHS' Division of Social Services (DSS), Division of Public Health (DPH), Division of Mental Health, Developmental Disabilities and Substance Abuse Services (DMH/DD/SAS),** along with the **NC Hospital Association** and other stakeholders have developed statewide policies and procedures effective August 1, 2017, in response to the Comprehensive Addiction and Recovery Act (CARA) of 2016 that amended provisions of the Child Abuse Prevention and Treatment Act (CAPTA) that are pertinent to infants with prenatal substance exposure. Health care providers involved in the delivery and care of infants affected by substance abuse, withdrawal symptoms or Fetal Alcohol Spectrum Disorder are required to notify the county child welfare agency upon identification based on DHHS definitions. Child welfare will go through intake procedures, develop a Plan of Safe Care referral to **Care Coordination for Children (CC4C) program** to provide the infant and family with supportive voluntary services. Safety will continue to be assessed through established procedures with child welfare agencies, but not all families will require child welfare intervention. In North Carolina, the intent in developing the required policies and procedures has been to support the infant and mother, increase access to treatment for all women with substance use disorders and their children, and not to penalize the mother or family.

- The Care Coordination for Children (CC4C) program is a population health care management program that is a partnership between **Division of Medical Assistance, Division of Public Health** and **Community Care of North Carolina (CCNC).** CC4C serves children, birth to age 5, with certain at-risk conditions, such as adverse life events or toxic stress (including foster care or out of home placement, neonatal exposure to substances or parental substance abuse, maternal depression or parental mental health concerns, domestic violence or abuse/neglect, homelessness, food insecurity, extreme poverty or community violence), children discharged from the neonatal intensive care unit, or children with special health care needs. The program focuses on connection to the medical home and medical care (when appropriate), barriers to care, social determinants of health, increasing resiliency and empowerment of the family, specialized assessment and screening to measure the needs and strengths of the family and build upon those identified needs and strengths, and referral and linkage to services.

- **State Genetics and Newborn Screening** and **Newborn Hearing Screening programs** have provided services to infants who are at risk for certain birth defects and genetic conditions. This has included congenital heart disorders, hearing loss, cystic fibrosis, sickle cell, and metabolic and other genetic disorders that put infants at risk for physical, emotional, social and cognitive or developmental disabilities. Genetic and hearing screening, diagnosis and intervention improve the quality of life and decrease infant morbidity and mortality. State and local partners in this effort have included the **State Laboratory of Public Health, public and private hospitals, medical centers, medical specialists, local health departments, midwives** and **private audiologists** across the state.
- The N.C. General Assembly expanded the **DHHS' Newborn Screening program** in 2015 to include screening for Severe Combined Immunodeficiency (SCID). Because of this legislation, the State Laboratory of Public Health began screening every neonate for the genetic mutation associated with SCID following the initial pilot. State and local partners in this effort have included **nonprofit agencies, hospitals** and **universities** across the state.
- **Evidence-based Home Visiting programs** have provided services to strengthen family parenting skills by developing common practice across providers working with children and families. These programs have helped develop a framework for a prevention partnership, establish an understanding of what constitutes viable family support activities, provide a framework to measure progress in addressing family needs and providing proven tools for building family strengths.
- The Children and Youth Branch has implemented Family Strengthening Initiatives including Nurse-Family Partnership (NFP) home visiting, Healthy Families America home visiting, Family Connects home visiting and Triple P (Positive Parenting Program). Triple P Online is available to all parents in North Carolina for both young children and teens. In addition, there are many Parents as Teachers and Early Head Start Home Based Option home visiting sites in North Carolina. Contact your local health department or local Smart Start Partnership for more information about options in your community.
- The **N.C. Infant-Toddler Program (ITP)** through the **Early Intervention Branch** provides services and supports for families and their infants and toddlers to age 3 with developmental disabilities or delays and certain established conditions. Services are provided in home and community settings to support the ability of parents and caregivers to help their children grow and develop.
- The **Nutrition Services Branch** has administered the **Special Supplemental Nutrition Program for Women, Infants and Children (WIC)** serving all 100 counties. WIC has been shown to yield better birth outcomes, increase breastfeeding rates, increase key nutrients in the diet, and help ensure adequate growth and development. The North Carolina WIC program will soon transition to **Electronic Benefit Transfer** or **eWIC**.

The pilot is planned to start in October 2017 followed by statewide implementation by region.

What Medical Providers Can Do

- Promote assessment, counseling and referral for preconception health issues such as reproductive life planning, health goals and healthy weight.
- Provide 17P treatment (Hydroxyprogesterone Caproate) to pregnant women who have had a prior preterm birth.
- Screen all pregnant and postpartum women for domestic violence, alcohol and substance use and refer for services as indicated.
- Notify child welfare agency upon identification of an infant affected by substance abuse, withdrawal symptoms or Fetal Alcohol Spectrum Disorder.
- Refer patients to WIC as appropriate.
- Promote breastfeeding through education and support.
- Promote delivery at a minimum of 39 weeks by eliminating early elective deliveries.
- Provide education on safe sleep practices including 1) back-to-sleep, 2) eliminating tobacco exposure, 3) eliminating bed sharing and 4) crib safety.
- Assess, counsel and refer pregnant and postpartum women for tobacco use using the 5 A's Method (ask, advise, assess, assist and arrange).
- Refer high-risk patients to case management and home-based visiting programs.

Sexually Transmitted Disease and Unintended Pregnancy Healthy NC 2020 Objective

- *Decrease the percentage of pregnancies that are unintended*
- *Reduce the rate of new HIV infection diagnoses (per 100,000 population)*

Unintended Pregnancy

DHHS' DPH has addressed unintended pregnancies through the following programs:

- **Teen Pregnancy Prevention Initiatives** have sought to prevent teen pregnancies by providing education and information on how to access health care services to teenagers as well as help current teenage parents prevent another unintended pregnancy. Services have been provided by **local health departments, community-based organizations, universities, schools** and **local departments of social services.** Two federal grants are

providing important additional funding for high-need, low-resourced communities to provide programs.

- Other Teen Pregnancy Prevention Initiatives partners have been **DHHS' Division of Social Services, SHIFT NC (Sexual Health Initiative for Teens;** formerly the Adolescent Pregnancy Prevention Campaign of North Carolina, or APPCNC**)** and **East Carolina University.**
- **DPH's Family Planning** program has provided family planning services and preventive care to low-income women and men by funding **local health departments**. The aim has been to decrease the number of unintended pregnancies and decrease the health problems associated with unintended pregnancies. State and local public health partners in this effort have included **DHHS' Divisions of Medical Assistance and Social Services** and **local social services offices.**
- DPH's Women's and Children's Health Section has continued to partner with DHHS' Division of Medical Assistance (DMA) and Community Care of North Carolina (CCNC) to prevent unintended pregnancy and has been involved in the Association of State and Territorial Health Officials (ASTHO) Increasing Access to Contraception Learning Community to promote the full range of contraception, including long-acting reversible contraception (LARC). DMA has begun work on rate adjustments for some contraceptive methods, in addition to other ongoing efforts.
- **DPH** and **DMA** have also partnered to join the **Centers for Disease Control and Prevention's (CDC) 6|18 Initiative,** which prioritizes six high-burden health conditions with 18 evidence-based interventions. North Carolina has selected three priority areas, one of which is to prevent unintended pregnancy (along with prevent and control diabetes and reduce tobacco use).
- The **Children and Youth Branch's Maternal, Infant and Early Childhood Home Visiting (MIECHV) Program** provides family strengthening services in 13 counties in North Carolina through **Nurse-Family Partnership** (Buncombe, Columbus, Edgecombe, Gaston, Halifax, Hertford, Nash, Northampton and Robeson) and **Healthy Families America** (Burke, Durham, Mitchell and Yancey) **home visiting programs.** A targeted program outcome has been for women to reduce subsequent pregnancies within one year of a child's birth. The most recent report for October 2014–September 2015 has indicated that 90 percent of women did not become pregnant again within one year of the child's birth.
- The **DPH's Children and Youth Branch's Innovative Approaches** initiative is working to incorporate sexual awareness resources for individuals with developmental disabilities into local primary care practices as well as local county school system curricula. These efforts address the Healthy People 2020 Goal of reducing the proportion of people with disabilities who report physical or program barriers to local health and wellness programs.

What Medical Providers Can Do

- For teen pregnancy prevention, ensure:
  - Teens are informed of all contraceptive and reproductive health services available, including long acting reversible contraception (LARC); and a referral is provided for any contraceptive or reproductive health services that are not available at the specific health center.
  - Teens' contraceptive and reproductive health needs are assessed at every visit.
  - Promotion of "Dual-protection": using a condom for Sexually Transmitted Infections and HIV prevention, and another effective birth control method for additional pregnancy prevention at the same time.
- For family planning services:
  - Provide counseling and education to assure that patients can choose their best contraceptive method for their individual circumstances. Use the tiered approach to contraceptive counseling by presenting the most effective methods before the less effective methods, with shared decision making.
  - Ask each family planning patient one question about their reproductive life plan: Would you like to become pregnant in the next 12 months? Based on the answer, contraceptive options and other important health considerations can then be discussed.
- Learn about the availability of home visiting and parenting programs in a patient's community and actively refer families to them.

Sexually Transmitted Disease — HIV Pre-Exposure Prophylaxis (PrEP)

Significant advances have occurred in both the treatment and prevention of HIV (human immunodeficiency virus) infection in recent years. It is now recommended for all patients to begin medication immediately after diagnosis with the goal of HIV viral suppression, because those who are virally suppressed are extremely unlikely to transmit the virus to others. PrEP has become a critical prevention tool; giving medication to HIV-negative individuals who are high risk for HIV acquisition can prevent infection. High-risk individuals include those who have multiple sexual partners, are sharing injection equipment, or are in a sexual relationship with an HIV-positive person who is not virally suppressed.

- As of December 31, 2015, the number of persons living with HIV in North Carolina was 33,388.
  - In 2015, 1,345 new diagnoses of HIV were reported; of these new infections, 1,336 occurred in the adult and adolescent population. This number is similar to previous years.

- People between 20 and 29 years old had the highest rates of newly diagnosed HIV in 2015. These comprised 40 percent of the newly diagnosed population.
- For adults and adolescents newly diagnosed with HIV in 2015, principal risk factors included men who have sex with men (MSM) (65.6% of total cases); heterosexual transmission risk (28.9%); injection drug use (IDU) (2.4%), and MSM/IDU (3.1%).

♦ N.C. DHHS has received HIV viral loads via electronic lab report for all persons living with HIV in North Carolina who are receiving laboratory services. These reports enable DHHS to determine who is in care and to identify patients that may have fallen out of care over time.

- When people have been determined to be out of care, a variety of attempts are made to contact them, return them to care and to discuss PrEP for their sexual partners.

What Medical Providers Can Do

♦ Review CDC guidelines related to PrEP at https://www.cdc.gov/hiv/basics/prep.html.

♦ Provide HIV testing for all patients between the ages of 13–64 at least once regardless of stated risk factors for infection.

♦ Screen high-risk individuals for HIV infection at least once per year and refer HIV-negative individuals for PrEP services.

♦ Refer all persons living with HIV to care.

Substance Abuse
Healthy NC 2020 Objectives

❖ *Reduce the percentage of high school students who had alcohol on one or more of the past 30 days*

❖ *Reduce the percentage of traffic crashes that are alcohol-related*

❖ *Reduce the percentage of individuals aged 12 years and older reporting any illicit drug use in the past 30 days*

♦ The **DHHS' DPH's Forensic Tests for Alcohol Branch** has worked to reduce deaths, injuries and health care costs related to impaired driving in North Carolina.

- The Branch has delivered comprehensive alcohol and drug training for **law enforcement officers** and **court personnel** to improve their ability to detect, apprehend and prosecute impaired drivers.
- The Branch has provided and maintained 403 evidential breath alcohol testing instruments statewide, used in training law enforcement officers and located at 182 stationary and seven mobile breath testing sites.

- The Branch has sought to procure funding for one new Breath Alcohol Testing (BAT) Mobile Unit, upgraded with the latest technology and safety equipment. BAT Mobile Units are used at Driving While Impaired (DWI) checking stations to deter impaired driving and promote the belief that DWI enforcement is likely to occur anywhere in the state at any time. A total of seven **BAT coordinators** have worked in assigned regions, participating in checking stations and building relationships and increasing support of the program within the community.
- In addition to participating in checking stations, BAT coordinators have continued to provide educational programs for community groups and schools, stressing the dangers of drinking and driving.
- Additional state and local public health partners in these efforts have included the N.C. Department of Public Safety/State Highway Patrol, N.C. Department of Transportation Division of Motor Vehicles/Governors Highway Safety Program, local law enforcement agencies and local health departments across the state.

♦ The **DHHS' DPH's Injury and Violence Prevention Branch** has monitored injury and violence trends in the state, including events associated with excessive alcohol use and prescription and drug overdose.

♦ The **N.C. Child Fatality Task Force** has addressed these Healthy NC 2020 objectives.

- The Task Force has supported funding for safe drug disposal, and for strengthening the controlled substances reporting system, both which help to prevent illicit drug use.
- The Task Force has continued to support increased access to the overdose reversal drug naloxone, stemming from the Good Samaritan legislation (2013) which provides limited immunity from prosecution for reporting overdoses and for the use of rescue drugs for opioid overdoses.

♦ The **N.C. Department of Transportation** has revised its five-year state highway safety plan. The plan includes updated impaired driving goals. The **Injury and Violence Prevention Branch** has been an active participant in the development of the plan and its impaired driving goals.

♦ The **DHHS' DPH's Children and Youth Branch** has funded 31 **School Health Centers** which provide primary and preventive medical care for adolescents. Imbedded in this care has been adolescent risk assessments with follow-up counseling and/or referral to reduce the students' risk for health problems caused by underage drinking, smoking, inadequate physical activity, dietary habits and overweight, intentional/unintentional injuries and unsafe reproductive health behaviors.

What Medical Providers Can Do

- Continue in their vital role in assessing patients for alcohol use and encouraging them to drink in moderation and to be safe when drinking.
- Encourage patients to always use front and rear seatbelts in all motor vehicles.
- Help establish and promote safe opioid prescribing guidelines by attending existing training for providers who prescribe controlled substances.
- Encourage and promote registration in and use of the N.C. Controlled Substance Reporting System (CSRS).
- Promote policies in their practices that create a comprehensive overdose prescription model (e.g., universal CSRS use, knowledge of treatment options and Emergency Department policies).

Mental Health
Healthy NC 2020 Objectives

- *Reduce the suicide rate (per 100,000 population)*
- *Decrease the average number of poor mental health days among adults in the past 30 days*
- *Reduce the rate of mental health-related visits to emergency departments (per 10,000 population)*

In 2015, suicide was the second leading cause of injury death.[33] The **DHHS' DPH's Injury and Violence Prevention Branch** has worked to reduce the rate of suicide in the state. The Branch:

- Developed the **2015 N.C. Suicide Prevention Plan** to empower all North Carolinians with the knowledge of actions they can take to prevent suicide.
- Created the **"It's OK 2 Ask"** campaign and website to promote suicide prevention trainings and crisis resources for youth suicide.
- Gathered comprehensive data on suicide in the DPH maintained **North Carolina Violent Death Reporting System (NC-VDRS).**
- Co-organized and led a cohort of 10 interdisciplinary teams through **Injury Free N.C. Academy** trainings to increase their capacity to plan, implement and evaluate suicide prevention strategies in their communities.
- Provided guidance to the **N.C. Child Fatality Task Force** that supported proposed mandated suicide awareness education of school staff with direct student contact.

To date, more than 36,370 citizens of North Carolina have been trained in **Mental Health First Aid (MHFA)** and more than 530 MHFA instructors have been trained since fall 2013. North Carolina leads the Southeast in the number of individuals trained and is ranked No. 7 nationally.

The **DHHS' Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMH/DD/SAS)** is currently in the planning phase to pilot MHFA for the higher education community and is planning to collaborate with the **N.C. Department of Public Instruction** to train staff within the public schools. The **DPH's Children and Youth Branch School Health Unit** has also trained school nurses across the state on **Youth Mental Health First Aid.**

What Medical Providers Can Do

- Screen patients for depression and/or other mental illnesses.
- Monitor patients' history and use of alcohol or drugs.
- Ask about family history of suicide or violence.
- Ask about patients' risk of suicide and access to lethal means, then make appropriate referrals when necessary.
- Assess the patient's medications and consequent vulnerability to depression.
- Educate staff, patients and family members about the signs and symptoms of suicide.
- Encourage staff, patients and family members to complete evidence-based suicide awareness education and early intervention training.

Oral Health
Healthy NC 2020 Objectives

- *Increase the percentage of children aged 1–5 years enrolled in Medicaid who received any dental service during the previous 12 months*
- *Decrease the average number of decayed, missing or filled teeth among kindergartners*
- *Decrease the percentage of adults who have had permanent teeth removed due to tooth decay or gum disease*
  - The **DHHS' DPH's Oral Health Section (OHS)** has convened a **Perinatal Oral Health Task Force** to address dental needs in North Carolina's pregnant population. Membership to the task force includes leaders and educators from both the state's **medical** and **dental schools, community providers**, as well as other programs in the Division of Public Health. Much progress has been made toward developing practice guidelines for our medical and dental providers to ensure women obtain better oral health during pregnancy.

- The OHS will soon pilot a program to increase the number of medical providers asking pregnant women about their oral health and referring those in need to dental providers for care.
- Many pregnant women with Medicaid are covered for dental services while they are pregnant. The goal for this program is to help women take advantage of this window of dental coverage.

- The OHS has early childhood medical-dental collaborations focused on preventing dental caries and finding dental homes for Medicaid-insured children. Recent changes in private dental insurance coverage in North Carolina have made this a particularly good time to focus on growth.
- The OHS has collaborated with the **DPH's Children and Youth Branch School Health Unit**, to provide dental screening for at-risk school age children. When children are discovered to have dental issues, they are referred for care.
  - With the assistance of **school nurses**, approximately 77 percent of children referred to school nurses for assistance secured dental care. More than 5,000 students received dental care because of OHS screening and school nursing following through with those referrals in assisting families to receive care. (2015–2016 Annual School Health Services Report).[34]
- The OHS has initiated a dialogue with those focusing on providing services and ensuring optimal care to patients with special health care needs. The OHS has hired a coordinator to develop and implement a new Special Care in Dentistry program which will center on supporting the oral health of those with intellectual and developmental disabilities and the frail elderly.

What Medical Providers Can Do

- Continue encouraging your patients to make oral health a priority as it is intimately related to overall health.
- Ask pregnant women and parents about their oral health and the oral health of their children.
- Refer patients needing oral treatment to partnering dentists or dental clinics in your community.

Infectious Disease and Foodborne Illness Healthy NC 2020 Objective

❖ *Increase the percentage of children aged 19–35 months who receive the recommended vaccines*

Immunizations

- The goal of the **DHHS' DPH's N.C. Immunization Branch (NCIB)** has been to reduce and ultimately eliminate vaccine preventable diseases by increasing and maintaining high immunization coverage levels. The NCIB has tracked trends in disease over time, monitored progress towards disease reduction and elimination goals, and served to educate healthcare providers and North Carolinians on appropriate and timely immunization.
- The NCIB has collaborated with **immunization partners in the public** and **private sectors** to promote evidence-based strategies proven reliable to increase immunization coverage levels and decrease morbidity and mortality.
    - The NCIB has conducted provider quality assurance and quality improvement visits to train **medical providers and their staff** to implement changes to improve immunization coverage in their practice. The National Immunization Survey (NIS) conducted by CDC's National Center for Immunization and Respiratory Diseases evaluates vaccine coverage among children 19–35 months who have received the combined seven-dose vaccine series (4:3:1:3*: 3:1:4) that is recommended by the **Advisory Committee on Immunization Practices (ACIP).**
    - The most recent NIS national coverage report indicated the national average was 72.2 percent and North Carolina's average was 76.4 percent.[35]
    - **School nurses** have worked with schools, parents and providers to assure that students are compliant with immunization laws and regulations and enter school healthy and ready to learn.
- Immunization information systems (IIS) or registries are confidential, population-based, computerized systems that record and consolidate immunization doses administered by participating providers to individuals residing within a geographic area.
    - The **N.C. Immunization Registry (NCIR)** has been a secure, web-based immunization system that serves as a clinical tool at the point of contact for medical providers to determine appropriate client vaccinations as well as an official certificate of immunization for all ages.
    - By providing complete and accurate information on which to base vaccination decisions, registries have been key tools for increasing and sustaining high vaccination coverage.
    - By consolidating vaccination records of children from multiple health-care providers, registries can identify children who are due or overdue for vaccinations, generate reminder and recall notices to ensure that children are vaccinated appropriately, and identify provider sites and geographic areas with low or lagging vaccination coverage levels.

- By 2 years of age, over 20 percent of the children in the United States typically have seen more than one healthcare provider, resulting in scattered paper/electronic medical records.[36]
- The NCIR has replaced handwritten charting and electronic health record documentation for many providers administering immunizations in North Carolina. Through the NCIR, immunization providers may access recorded immunizations administered in North Carolina, regardless of where the immunizations were given.
- The NCIR has supported the activities and requirements for publicly purchased vaccines distributed to Vaccines for Children (VFC) Providers in North Carolina.
- The NCIR has promoted vaccine safety in public and private provider offices and can streamline the process of reporting vaccine adverse events when they occur.

♦ Meaningful Use (MU) is defined as using certified Electronic Health Records (EHR) technology in a meaningful manner (for example electronic prescribing) and ensuring the certified EHR technology is connected in a manner that provides for the electronic exchange of health information to improve the quality of care of patients.

- The Immunization Branch has opened the Meaningful Use Portal for Eligible Professionals (EPs) and Eligible Hospitals (EHs) to register their intent for Stage 2 Meaningful Use. As of July 2017, over 12,600 EPs and EHs had registered.
- The NCIB has worked with Provider EHR Vendor Hubs, Organization's Hubs and the North Carolina Health Information Exchange (HIE), NC HealthConnex on MU Stage 3 objectives to connect to the NCIR using web service applications.

♦ The NCIR has also been utilized for the routine assessment of immunization coverage levels and to assist in identifying vulnerable populations to prevent disease and in outbreak situations.

♦ A continuous quality-improvement program, known as **AFIX (Assessment, Feedback, Incentive, eXchange),** has been used to improve provider practices and raise immunization coverage rates.

- Improving immunization practices in provider settings has been one of the most effective methods of increasing immunization coverage.
- The role of the NCIB has been to oversee quality assurance of all immunization-related activities conducted by providers. Emphasis has been placed on populations at highest risk for under-immunization and disease.

What Medical Providers Can Do

- Establish and maintain a practice-wide commitment to communicating effectively about vaccines and maintaining high vaccination rates.
- Follow and keep staff up to date with current Advisory Committee for Immunization Practices (ACIP) recommendations for vaccinating children and adolescents.
- Make a strong recommendation to parents and supplement with vaccine educational materials.
- Maintain complete and up to date patient records and utilize reminder recall systems to decrease missed opportunities.
- Implement systems to evaluate patient vaccination status at each visit.
- Participate in Childhood and Adolescent AFIX visits from the N.C. Immunization Branch.
- Give parents a copy of the immunization record every time you vaccinate.
- Become a N.C. Immunization Registry user.

Measles and Mumps Infections

Measles and mumps are acute, viral vaccine-preventable diseases. The incidence of both diseases has significantly decreased since the measles-mumps-rubella (MMR) vaccine was licensed, but cases and outbreak still occur in North Carolina, often from the importation of cases by out-of-state travelers.

- The following are **DHHS' DPH's Communicable Disease Branch (CDB)** activities that have addressed cases and outbreaks of measles and mumps. The Branch:
  - Investigated suspected cases of measles and mumps, as well as contacts to cases, and recommended prevention and control measures as appropriate.
  - Provided onsite consultation and offered surge capacity to **local health departments** during outbreaks of measles and mumps.
  - Coordinated with the **State Laboratory of Public Health** to test clinical specimens collected from suspected cases.
  - Distributed guidance to North Carolina clinicians on reporting, testing and prevention when cases of measles and mumps were identified.
  - Conducted webinars and trainings for local health departments and other public health partners.
  - Published summary reports describing the number of cases and incidence rates of measles and mumps infections in North Carolina.

- Issued media alerts to promote public awareness and education.

What Medical Providers Can Do

- Recommend all children receive age-appropriate MMR vaccine and that adults born in 1957 or later without acceptable evidence of immunity receive at least one dose.
- Assure health care facility staff are appropriately vaccinated.
- Evaluate immune status, clinical presentation and travel history of patients with suspected cases of measles and mumps.
- Promptly report suspected cases to the local health department (do not wait for laboratory confirmation).
- Counsel travelers to endemic areas on the need to be up-do-date on immunizations before travel.
- Use evidence-based strategies to boost patient knowledge of immunizations

Chronic Disease
Healthy NC 2020 Objectives

- *Reduce the cardiovascular disease mortality rate (per 100,000 population)*
- *Decrease the percentage of adults with diabetes*
- *Reduce the colorectal cancer mortality rate (per 100,000 population)*

Cardiovascular Disease

This Healthy NC 2020 objective has been addressed by several different programs.

- The **DHHS' DPH's Community and Clinical Connections for Prevention and Health Branch (CCCPH)** has utilized a multipronged approach to address heart disease and stroke that encompasses policy, system and environmental changes. This approach has been guided by several programs including the legislatively appointed **Justus-Warren Heart Disease and Stroke Prevention Task Force (JWTF)** and the **CDC's** funded State Public Health Actions to Prevent and Control Diabetes, Heart Disease, Obesity and Associated Risk Factors and Promote School Health. The CCCPH has continued to partner with other stakeholders on shared cardiovascular goals and objectives.
- Many of the strategies have been reflected in the national **Million Hearts® campaign** to prevent one million heart attacks and strokes nationwide by 2017.
  - The focus has been on evidence-based practices to address the ABCS of cardiovascular prevention (**A**spirin therapy when appropriate; **B**lood pressure control [including sodium reduction]; **C**holesterol control; and **S**moking cessation).

- This work has recognized the important role of community (including lifestyle modification) and clinic-based programs and the need to link these programs in addressing population health.
- An additional focus area is the prevention and management of hypertension, a leading risk factor for heart disease and stroke. The CCCPH Branch in partnership with **Alliant Quality** has coordinated and convened North Carolina stakeholders to improve cardiac health and reduce cardiac healthcare disparities among North Carolinians**.**

What Medical Providers Can Do

- Use clinical decision-support systems which are computer-based information systems often incorporated within electronic medical records to assist evidence-based treatment approaches to implementing ABCS.
- Use a multi-disciplinary team-based care approach to improve cardiovascular health of patients whereby team members provide support, share responsibilities and complement the activities of the primary care provider.
- Use self-measured blood pressure monitoring interventions with clinical support, often in combination with the team-based care approach.
- Discuss weight, nutrition and physical activity with each patient.
- Counsel patients on smoking cessation.

Diabetes

- The **DHHS' DPH's Community and Clinical Connections for Prevention and Health Branch (CCCPH)** has facilitated diabetes prevention and management using a systematic approach that increases access to behavior management education and supports quality care for people who are at risk of and who have diabetes.
  - Diabetes self-management education has been a recognized strategy to improve quality of life, reduce diabetes' complications and reduce costs associated with diabetes care. The CCCPH Branch and the **N.C. Public Health Foundation** have supported **local health departments** and **health organizations** to offer North Carolinians with diabetes self-management education recognized by the American Diabetes Association and reimbursed by Medicare, Medicaid and private insurance.
  - While secondary prevention is important, primary diabetes prevention is vital to reducing the incidence of diabetes. The CCCPH Branch, along with a statewide group of stakeholders, has developed a diabetes prevention plan that includes activities to promote the awareness of pre-diabetes, to strategically locate diabetes prevention lifestyle programs, to facilitate referrals to such programs and to prepare for diabetes

prevention program sustainability. Providers can access the diabetesfreenc.com website for information regarding onsite and online diabetes prevention program classes.

- In 2016, the N.C. General Assembly established funding for the **N.C. Office of Minority Health and Health Disparities** to increase minority participation in diabetes prevention programs. These programs are identified as **Minority Diabetes Prevention Programs (MDPP).** MDPP is a statewide effort between **local health departments, local health care providers** and **community organizations** across North Carolina to keep people with prediabetes from developing type 2 diabetes and other health problems, such as stroke and heart disease. Each region works with multicounty collaboratives that engage, screen, and deliver the CDC lifestyle classes to its minority and at-risk communities. They operate along with onsite diabetes prevention programs (DPP) and the online diabetes prevention program, **Eat Smart, Move More, Prevent Diabetes (ESMMPD).**
- Promotion of quality diabetes care, particularly for the uninsured and underinsured, has been another focus of the CCCPH Branch. In conjunction with partners, CCCPH has distributed nationally-accepted clinical guidelines and has promoted team-based care and electronic health record use to meet meaningful use and quality standards. CCCPH also will develop trainings for providers about referral to evidenced-based, self-management programs.

- To increase access to diabetes screening opportunities, the **N.C. Office on Disability and Health** in the **DHHS' DPH's Children and Youth Branch** has worked with child health nurses, pediatricians and dental professionals to increase the accessibility of health care facilities, including local health departments. Improvements made have included purchase of more accessible exam tables and scales, as well as other simple environmental changes to promote access to care. Effective communication strategies for people with disabilities is being incorporated into accessibility reviews and the N.C. Office on Disability and Health is providing more comprehensive training for interested medical professionals.
- The **School Nursing Program** in the Children and Youth Branch has monitored and reported compliance with The Care of Students with Diabetes Act (2009 legislation). All public schools, including charter schools, have been required to provide diabetes care training to school staff when they have students with diabetes enrolled. **School nurses** also have provided Individual Health Plans for students with diabetes to assure they receive appropriate diabetes management while in school and in collaboration with their medical home.
  - For diabetic students who have received School Nurse Case Management (an evidence-informed model of school nursing case management), 85 percent have demonstrated improved ability to self-administer insulin, 70 percent have had

improved HgA1C, 70 percent have shown improved grades and 76 percent have had a decrease in school absences (2015–2016 School Health Services Report).[37]

What Medical Providers Can Do

- Increase referrals to the evidence-based Diabetes Self-Management programs and the Diabetes Prevention Lifestyle programs that are available across the state (contact the N.C. Division of Public Health for a list of referral sites).
- Conduct diabetes screenings for people who are 40 and older and who are overweight or obese and women who have had gestational diabetes.
- Conduct an internal accessibility assessment of your office to ensure easy access to screening and treatment service for people with disabilities.
- Become active on your local School Health Advisory Council to advance school health services and healthy school environments.

Colorectal Cancer

- The **N.C. Colorectal Cancer Roundtable (N.C. CRCRT)** is a state coalition of public, private and voluntary organizations and invited individuals dedicated to reducing the incidence of, and mortality from, colorectal cancer (CRC) in North Carolina, through coordinated leadership, strategic planning and advocacy. It was formed by **DHHS' DPH's Cancer Prevention and Control Branch** and **American Cancer Society (ACS),** in conjunction with the **Mecklenburg County Health Department.** There is also a **steering committee** composed of individuals, organizations, medical professionals and state agencies. The roundtable has over 100 members, supporting the national goal of reaching the 80 percent by 2018 for colorectal cancer screenings.
- Colorectal cancer is one of six cancers that has been and will continue to be the focus of the new North Carolina Comprehensive Cancer Control Plan 2014 through 2020. Consensus has been that, to prevent cancer, we must change behaviors around the risks of cancer through education and the adoption of healthy policies at home, work and in the community. The **N.C. DHHS** has led the effort by pledging to support the goal of having 80 percent of adults aged 50 and older screened for CRC by 2018.
    - With the N.C. CRCRT initiative and its associated task groups,70 organizations in our state have committed to partnering on the goal to address the incidence and mortality of CRC in North Carolina.
    - Three **task groups (Provider, System and Policy Improvement, or PSPI; Public Education and Outreach;** and **Access to Care)** have formed to move the initiative forward in North Carolina. Health disparities have been incorporated into the work of each task group. The PSPI Task Group connects **primary care physicians** and

gastroenterologists to consider screening options, billing/coding/reimbursement, how to reach uninsured populations, and patient navigation. They are developing a strategy for the state to have appropriate resources for colorectal cancer screening and treatment of uninsured populations of North Carolina citizens

- The Public Education and Outreach Task Group works closely with the **North Carolina Advisory Committee on Cancer Coordination and Control, Early Detection Subcommittee** for the North Carolina Comprehensive Cancer Control Plan to ensure a collaborative and complementary effort. The task group works to identify stakeholders in targeted areas and train them to provide educational information and conduct community initiatives around increasing colon cancer screening rates through educational awareness events.
- The Access to Care Task Group recognizes that there are many barriers for both uninsured and insured patients across North Carolina. This group brings together interested stakeholders across the state to identify these barriers and come up with solutions.
- Leaders from Medicaid, Blue Cross Blue Shield of North Carolina, Community Care of North Carolina, Area Health Education Centers, ACS, The University of North Carolina at Chapel Hill, the State Health Plan, the N.C. Community Health Center Association, the N.C. Society of Gastroenterologists, the N.C. Quality Improvement Organization, health systems, local health departments and others are included in this effort.

♦ An annual N.C. Colorectal Cancer Blue Kit Awareness Distribution Campaign has been initiated with local health departments and senior centers to promote prevention, early detection and treatments.

- Health promotion resources and public service announcements were provided to 70 local agency representatives in 2016 and resulted in approximately 26,605 Colorectal Cancer educational resources being distributed for local programs and services.
- Twenty-four local health departments have committed to incorporate a CRC strategy into their services, with at least six counties hosting a CRC awareness event.

What Medical Providers Can Do

♦ Help support this effort through collaborative efforts in the medical community to raise awareness, increase provider and public education, and seek funding and in-kind services for colorectal cancer screenings and follow-up treatment.

♦ Adopt the goal of reaching 80 percent Screened for Colorectal Cancer by 2018. Increase partnerships with health systems and community-based organizations to help promote and support prevention, early detection and access to care.

Other Key or Emerging Health Issues

Hepatitis C Virus

Hepatitis C virus (HCV) is a blood-borne virus most commonly transmitted through injection drug use. Although HCV infection can be acute and self-limiting, approximately 75 percent to 85 percent of infected individuals develop chronic disease. As of January 1, 2017, chronic hepatitis C cases have been reportable via electronic laboratory record (ELR).

- In 2016, 186 acute HCV cases were reported to the **DHHS' DPH's Communicable Disease Branch (CDB).**
  - Based on CDC national prevalence projections and United States census data, the CDB has estimated that 110,000 people (range: 80,000–150,000 people) in North Carolina are living with chronic HCV infection.
  - However, this might be an underestimation considering the nearly five-fold increase in the number of reported acute HCV infections in North Carolina since 2010.
  - Most individuals are unaware of their infection and have not received needed care and treatment.
- North Carolina has deployed its latest campaign to address HCV, **N.C. Hepatitis C: Test, Link, Cure (TLC).** The campaign was launched to combat the acute hepatitis C and injection drug use epidemics.
  - **N.C. Hepatitis C: Test, Link, Cure (TLC)** aims to establish new partnerships with **health care providers** and **stakeholders** in the state with a focus on hepatitis C screening, prevention education, and linkage to care and treatment.
  - Initial activities will be implemented through local health departments, community-based organizations, substance use disorder treatment centers, and federally qualified health centers in the western and southeast coastal regions of the state. The goal is to eventually advance the program statewide.
  - Starting May 1, 2017 hepatitis C testing for high risk uninsured individuals has been made available to all **85 Local Health Departments.** Testing is available through the Communicable Disease Branch in close collaboration with the **State Laboratory for Public Health (SLPH).**
- As of July 11, 2016, North Carolina law has allowed for the legal establishment of hypodermic syringe and needle exchange programs. These programs have been critical tools in addressing the health of people who use injecting drugs and in reducing the transmission of hepatitis C and HIV.
  - Twenty **Syringe Exchange Programs** are currently registered in the State of North Carolina, providing access to services in over 24 counties.

- To further address HCV, the Communicable Disease Branch has partnered with the **State Laboratory of Public Health, local health departments, Duke University** and **The University of North Carolina at Chapel Hill:**
  - Worked to assure that screening and treatment for HCV are performed according to national standards.
  - Developed HCV treatment best-practice treatment algorithms and referral networks across North Carolina.
  - Established the **Carolina's Hepatitis Academic Mentorship Program (CHAMP)** with **Duke University** and **The University of North Carolina at Chapel Hill** which will allow providers to network with content experts from academic centers to build a hepatitis C provider care network in their region.
  - Increased health care provider understanding of current HCV testing and linkage to care recommendations through continuing medical education initiatives.
  - Increased screening and surveillance for populations at-risk for HCV infection.
  - Increased public knowledge of current HCV testing recommendations through public outreach campaigns.
  - Established collaborations to build resource networks for drug user health.
  - Discussed growing concern of perinatal hepatitis C infection.

What Medical Providers Can Do

- Review CDC guidelines for HCV testing, diagnosis and management at www.cdc.gov/hepatitis/hcv/hcvfaq.htm.
- Provide one-time HCV testing for adults born during 1945–1965 without prior ascertainment of HCV risk.
- Provide HCV testing to pregnant women who exhibit elevated risk for hepatitis C infection.
- Assess patients for vaccination for hepatitis A and B.
- For HCV-infected patients, provide a brief alcohol and injecting drug use screening and intervention, as clinically indicated, followed by referral to appropriate care and treatment services for HCV infection and related conditions, and to appropriate behavioral treatment and support including syringe services programs as needed.

Congenital Syphilis Infection

Early syphilis cases among women increased from 2012 to 2015, and congenital syphilis has also been increasing. There were 11 probable congenital syphilis cases (9.1 cases per 100,000 live births) reported in 2015, a 70 percent increase from 2014.

- **DHHS' DPH's Sexually Transmitted Diseases (STD) Prevention** activities have supported the prevention of congenital syphilis by increasing awareness, rapidly identifying infected women and assuring they and their sexual partners receive appropriate treatment.
- The following are **DHHS' DPH's Communicable Disease Branch (CDB)** activities that have addressed the increase in congenital syphilis infections. The Branch:
  - Conducted a quarterly review of all congenital syphilis cases to identify gaps in public health that are contributing to increased morbidity.
  - Made personal contact with **providers** and **local health department staff** to ensure that missed opportunities for prevention are recognized.
  - Released a statewide provider memorandum to increase awareness of the rise in congenital syphilis cases and outline specific actions that providers should take to prevent congenital syphilis infections.
  - Created a Congenital Syphilis Fact Sheet highlighting the issue and prevention steps that should be taken. This factsheet was disseminated to statewide public health partners and is readily available to the public on the Branch's website.
  - Delivered multiple presentations for community providers, local health departments and other key stakeholders on the statewide increase in congenital syphilis infections.

What Medical Providers Can Do

- Screen all pregnant women for syphilis, per the North Carolina Administrative Code 10A NCAC 41A .0204—at first prenatal visit, between 28–30 weeks gestation, and at delivery.
- Ensure the mother's syphilis serologic status is known prior to discharging the newborn from the hospital.
- Ensure all sexual partners of female syphilis patients are evaluated and empirically treated for syphilis.
- Assess the sexual health and risk behaviors of ALL pregnant women at every medical visit.
- Treat all pregnant females diagnosed with syphilis rapidly and per the CDC STD Treatment Guidelines.

Antimicrobial Resistance and Stewardship

Antimicrobial resistance is recognized as a growing concern globally and in North Carolina. New strains of resistant microorganisms are emerging and spreading, limiting our ability to use existing antibiotics effectively, increasing cost of health care and resulting in morbidity and mortality. CDC estimates that annually in the United States, approximately 2 million people are infected with multidrug resistant organisms (MDROs) and at least 23,000 people die as a result of these infections.[38] Exposure to antibiotics is the most important risk factor for emergence of antimicrobial resistance.

Antimicrobial stewardship refers to judicious use of antibiotics in healthcare. According to CDC, 20–50 percent of all antibiotics prescribed in U.S. acute care hospitals[39] and 30 percent of outpatient antibiotic prescriptions are unnecessary.[40,41] Evidence suggests that hospital based programs dedicated to improving antibiotic use, or Antibiotic Stewardship Programs, can help avoid misuse of antibiotics and related adverse effects. CDC recommends that these programs contain the following seven core elements: leadership, accountability, drug expertise, implementing recommended actions, tracking antibiotic use, reporting information to providers and educating clinicians.[42] National CDC survey data from 2015 reflects that currently 48.1 percent of all hospitals in U.S. have stewardship programs with all seven elements.[42] In North Carolina, approximately 67 percent acute care hospitals have stewardship programs.

- **DHHS' DPH's North Carolina Surveillance for Healthcare-Associated and Resistant Pathogens Patient Safety (N.C. SHARPPS) Program** has provided support to healthcare facilities in the state to eliminate preventable healthcare related infections including those related to antibiotic use (MDROs and *Clostridium difficile*).
- The **N.C. SHARPPS Program** has collaborated with its partners to create an **Antimicrobial Resistance and Antibiotic Stewardship (ARAS) subcommittee** of the **Healthcare-Associated Infections Advisory Group**. This subcommittee aims to incentivize stewardship program activities in healthcare facilities as well as encourage educational opportunities in antimicrobial stewardship.
- The N.C. SHARPPS Program has participated in the **CDC campaign GetSmart: Know When Antibiotics Work.** This campaign is focused at creating public and provider awareness regarding inappropriate antibiotic use. Through this initiative in 2016, **N.C. SHARPPS** has conducted four educational sessions and three exhibits detailing antibiotic stewardship to healthcare professionals, and has disseminated over 2,200 GetSmart educational materials to the general public and healthcare providers.
- The **N.C. SHARPPS Program** has concluded 18 months of sentinel surveillance and analyzed data to better understand the burden of Carbapenem Resistant Enterobacteriaceae (CRE) in North Carolina. Results from surveillance and an evaluation of the surveillance system are being used to guide recommendations for surveillance, reporting, and antimicrobial resistance prevention activities in North Carolina.

What Medical Providers Can Do

- Follow evidence-based guidelines for antibiotic use for common infections and avoid unnecessary antibiotic use.
- Optimize dosing and use the shortest effective duration of antibiotic therapy. Document indication, dose and duration on all orders.
- Review antibiotic use in the past 48–72 hours and reassess for de-escalation.
- Reduce use of antibiotics associated with a high risk of *Clostridium difficile,* for example clindamycin and fluoroquinolones.
- Educate patients about antimicrobial resistance and appropriate antibiotic use.

Child Maltreatment Prevention

- **DHHS' DPH's Children and Youth Branch** Triple P (Positive Parenting Program) has been implemented in 46 counties in North Carolina. In addition, Triple P Online (a set of eight modules for parents of younger children and a set of six modules for parents of teens) is available to all parents in North Carolina.
  - Triple P has developed a multi-level preventive intervention system of strategies to invoke personal responsibility in families.
  - Triple P has drawn on social learning, cognitive-behavior and development theory, as well as researching risk and protective factors associated with the development of social and behavioral problems in children.
  - As of December 2016, a total of 3,515 practitioners had been trained in Triple P, serving 31,134 caregivers and impacting 53,208 children.
- **DHHS' DPH's Women's and Children's Health Section** has worked with various organizations and communities to raise awareness and commitment to promote safe, stable, nurturing relationships and environments and build support for and implementation of evidence-based trauma-informed policies and programs to prevent children maltreatment.
  - The Women's and Children's Health Section has secured five-year funding from the CDC to address child maltreatment prevention.
  - In collaboration with various organization, the Women's and Children's Health Section has worked toward implementation of the collective statewide strategic plan for preventing child maltreatment and securing child and family well-being developed by the **2014 N.C. Institute of Medicine Essentials for Childhood Task Force**.
- **DHHS' DPH's Injury and Violence Prevention Branch,** in collaboration with the Women's and Children's Health Section co-organized and is leading a cohort of five

interdisciplinary teams through Injury Free N.C. Academy trainings to increase their capacity to implement, and evaluate evidence-based strategies which address shared risk and protective factors across multiple forms of violence (including child maltreatment) in their communities.

What Medical Providers Can Do

- Promote Triple P and Triple P Online for parents of children who present with behavioral health problems. Parents can be directed to the North Carolina Triple P for Parents website at www.triplep-parenting.net/nc-en/home.
- Train staff to provide Triple P as part of your client services.
- Screen for psychosocial risk and protective factors to identify children and families at greater risk for child maltreatment and those who may need additional resources as outlined by *Bright Futures.* Facilitate referrals to services when appropriate.
- Provide anticipatory guidance about developmental stages that may be stressful or serve as a trigger for child maltreatment.
- Encourage parents to use effective discipline techniques.
- Recognize signs and symptoms of maltreatment and report suspected maltreatment to local social services.

Disaster Preparedness for Vulnerable Populations

The **DHHS' DPH's Public Health Preparedness and Response Branch** has worked with **Local Health Departments** on community-wide planning for disasters caused by many hazards including extreme weather, communicable disease outbreaks, and contaminating incidents such as chemical spills. A person's **personal health care provider** is an important part of that planning. People with chronic medical illnesses are frequently the most vulnerable when natural disasters strike, especially those who are medically fragile, require personal assistance and/or use power dependent medical devices. Having a personal medical plan can be one of the many important resources in maintaining health and preventing acute and long-term deterioration in health status. Having a disaster plan for a practice site can avoid breaks in the continuity of care for this fragile population.

What Medical Providers Can Do

- For people with chronic illnesses who live or work in vulnerable locations:
  - Discuss plans with patients about medical service continuity and medication needs should there be an evacuation. Include resources such as readync.org and https://emergency.cdc.gov/preparedness/index.asp.
  - Discuss plans with medical service providers and durable medical good providers that your practice works most frequently with on what contingency plans are in place in a disaster.
- For people with power dependent medical devices:
  - Discuss plans with patients and caregivers on how to work with power companies and medical service providers should there be power outages.
  - Discuss plans with medical service providers that your practice works most frequently with on what contingency plans are in place.
- Within your practice, discuss your plans with staff for continuity of patient care in a local disaster.

Take-Home Lead Exposure

Adults who work with lead may inadvertently take lead dust home and expose household members. Lead exposure is particularly unsafe for pregnant woman and young children. This has become a growing problem in North Carolina. During 2012–2017, 50 children less than 6 years of age were identified in North Carolina with blood lead levels above the CDC national reference level (≥ 5 μg/dL) due to exposures resulting from a household member's occupation. Most of the adult household members connected with these cases worked in the manufacturing sector, mostly in battery manufacturing, battery reclamation, and lead oxide production.

- **DHHS' DPH's Occupational and Environmental Epidemiology Branch (OEEB)** has investigated three industries during 2015–2016 that were responsible for the majority of the elevated child blood lead levels. In two of the three industries, employers did not provide adequate means for workers to clean up at the end of the day.
- OEEB has partnered with the **DHHS' DPH's Childhood Lead Poisoning Prevention Program** to quickly identify child elevated blood lead levels from an occupational source and provide affected households with exposure prevention materials. In cases of high severity, OEEB works directly with employers to address take-home lead exposure.
- OEEB has partnered with the **DHHS' DPH's Women and Children's Health Section** to educate pregnant women with elevated blood lead levels on sources of lead exposure and

prevention using guidance outlined in CDC Guidelines for the Identification and Management of Lead Exposure in Pregnant and Lactating Women.

What Medical Providers Can Do

- Promote health in all phases of a patient's life, including the home and workplace.
- Incorporate a brief occupational and environmental history to assist in determining if the home or workplace is contributing to negative health outcomes.
- Refer to guidelines for evaluation and treatment of lead exposed adults (http://www.aoec.org/documents/positions/MMG_FINAL.pdf); children (http://nchealthyhomes.com/lead-poisoning/); and pregnant women (https://www.cdc.gov/nceh/lead/publications/leadandpregnancy2010.pdf).

Proposed or Planned Steps

North Carolina has prepared to take additional steps toward continuing to improve the health of our citizens. The programs highlighted in this report are ongoing and will be continued in efforts to meet the state's **Healthy NC 2020** objectives.

References

1. United Health Foundation. America's Health Rankings 2016 Edition—North Carolina. Available at: www.americashealthrankings.org/NC. Accessed May 16, 2017.
2. North Carolina Department of Health and Human Services, Division of Public Health, State Center for Health Statistics. North Carolina Detailed Mortality Statistics, 2015. Chronic disease deaths include: cancer, heart disease, stroke, hypertension, atherosclerosis, chronic lower respiratory disease, diabetes and nephrosis/nephrotic syndrome. Injury deaths include: suicide, homicide, motor vehicle accidents and all other unintentional injuries. Available at: www.schs.state.nc.us/data/vital/dms/2015.
3. North Carolina Department of Health and Human Services, Division of Public Health, State Center for Health Statistics. North Carolina Health Data Query System, Mortality Data: Leading Causes of Death, 2015—all ages. Available at: www.schs.state.nc.us/interactive/query/lcd/lcd.cfm.
4. United Health Foundation. America's Health Rankings 2016—North Carolina. Available at: www.americashealthrankings.org/NC. Accessed May 16, 2017.
5. NC Prevention Partners. 2015 NC Prevention Report Card: The State of Our Health and How We Can Get Better. Accessed June 2016.
6. NC Prevention Partners. 2015 NC Prevention Report Card: The State of Our Health and How We Can Get Better. Accessed June 2016.
7. Centers for Disease Control and Prevention, Best Practices for Comprehensive Tobacco Control Programs, 2014.
8. Centers for Disease Control and Prevention, Data Highlights 2006. *To make all cost data more comparable, they have been adjusted for inflation and updated to 2009 dollars.*

9. North Carolina Institute of Medicine, Task Force on Prevention. Prevention for the Health of North Carolina: Prevention Action Plan. Morrisville, NC: North Carolina Institute of Medicine; 2009. Available at: www.nciom.org/wp-content/uploads/NCIOM/projects/prevention/finalreport/PreventionReport-July2010.pdf.

10. North Carolina Institute of Medicine. Healthy North Carolina 2020: A Better State of Health. Morrisville, NC: North Carolina Institute of Medicine; 2011. Available at: http://publichealth.nc.gov/hnc2020/docs/HNC2020-FINAL-March-revised.pdf.

11. U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014. Available at: www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf.

12. Hu, S., et al. Tobacco product use among adults - United States, 2013–2014. MMWR Morbidity and Mortality Weekly Report 2016; Available at: http://dx.doi.org/10.15585/mmwr.mm6527a1.

13. North Carolina Department of Health and Human Services, Division of Public Health, Tobacco Prevention and Control Branch. North Carolina Youth Tobacco Survey 2015 Middle School and High School Fact Sheet. Available at: www.tobaccopreventionandcontrol.ncdhhs.gov/data/yts/docs/2015-NC-YTSFactSheet-WEBFINAL-v2.pdf.

14. North Carolina Department of Health and Human Services, Division of Public Health, Tobacco Prevention and Control Branch. North Carolina Youth Tobacco Survey 2015 Middle School and High School Fact Sheet. Available at: www.tobaccopreventionandcontrol.ncdhhs.gov/data/yts/docs/2015-NC-YTSFactSheet-WEBFINAL-v2.pdf.

15. North Carolina Department of Health and Human Services, Division of Public Health, Tobacco Prevention and Control Branch. North Carolina Youth Tobacco Survey 2015 Middle School and High School Fact Sheet. Available at: www.tobaccopreventionandcontrol.ncdhhs.gov/data/yts/docs/2015-NC-YTSFactSheet-WEBFINAL-v2.pdf.

16. U.S. Department of Health and Human Services. E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016. Available at: https://e-cigarettes.surgeongeneral.gov/documents/2016_SGR_Full_Report_non-508.pdf.

17. Ham DC, Przybeck T, Strickland JR, Luke DA, Bierut LJ, Evanoff BA. Occupation and Workplace Policies Predict Smoking Behaviors: Analysis of National Data from the Current Population Survey. Journal of Occupational and Environmental Medicine 2011;53(11):1337–45.

18. Centers for Disease Control and Prevention. "Vital Signs: Disparities in Nonsmokers' Exposure to Secondhand Smoke—United States 1999–2012." Morbidity and Mortality Weekly Report, 2015;64(Early Release):1–7. Available at: www.cdc.gov/mmwr/pdf/wk/mm64e0203a1.pdf.

19. North Carolina Department of Health and Human Services, Division of Public Health. Tobacco Prevention and Control Branch QuitlineNC Seven Month Follow-Up Summary Report, Fiscal Year 2015–2016. Chapel Hill: University of North Carolina at Chapel Hill, School of Medicine, Department of Family Medicine, 2016.

20. U.S. Department of Housing and Urban Development. Instituting Smoke-free Public Housing. November 28, 2016. Available at: https://www.federalregister.gov/documents/2016/12/05/2016-28986/instituting-smoke-free-public-housing.

21. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS). (2005) Available at: www.cdc.gov/injury/wisqars. Accessed June 29, 2017.

22. North Carolina Department of Health and Human Services, Division of Public Health, North Carolina State Center for Health Statistics. North Carolina Vital Statistics, Volume 2: Leading Causes of Death, 2015. Available at: www.schs.state.nc.us/data/vital.cfm.

23. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention. "Understanding the Epidemic." Available at: https://www.cdc.gov/drugoverdose/epidemic. Accessed June 29, 2017.

24. North Carolina Department of Health and Human Services, Division of Public Health, Injury and Violence Prevention Branch. Unintentional poisoning deaths by county: N.C. residents, 1999–2015. Available at: www.injuryfreenc.ncdhhs.gov/DataSurveillance/poisoning/UnintentionalPoisoningDeathsbyCounty-1999-2015.pdf.

25. North Carolina Department of Health and Human Services, Division of Public Health, Injury and Violence Prevention Branch. Unintentional poisoning hospitalizations by county: N.C. residents, 2004–2014. Available at: www.injuryfreenc.ncdhhs.gov/DataSurveillance/poisoning/HOSP-1-PoisoningsbyUnintentionalandCounty-2004-2014.pdf.

26. North Carolina Department of Health and Human Services, Division of Public Health, Injury and Violence Prevention Branch. Unintentional poisoning ED visits by county: N.C. residents, 2008–2014. Available at: www.injuryfreenc.ncdhhs.gov/DataSurveillance/poisoning/UnintentionalPoisoningEDVisitsbyCounty-2008-2014.pdf.

27. North Carolina Department of Health and Human Services, Division of Public Health, Injury and Violence Prevention Branch. Unintentional medication and drug poisoning deaths by county: N.C. residents, 1999–2015. Available at: www.injuryfreenc.ncdhhs.gov/DataSurveillance/poisoning/UnintentionalMedicationandDrugPoisoningDeathsbyCounty-1999-2015.pdf.

28. North Carolina Department of Health and Human Services, Division of Public Health, Injury and Violence Prevention Branch. Unintentional opiate poisoning deaths by county: N.C. residents, 1999–2015. Available at: www.injuryfreenc.ncdhhs.gov/DataSurveillance/poisoning/UnintentionalOpiatePoisoningDeathsbyCounty-1999-2015.pdf.

29. North Carolina Department of Health and Human Services, Division of Public Health, Chronic Disease and Injury Section, Injury Epidemiology and Surveillance Unit. Vital Statistics Data, 2015. Analyses conducted by Injury Epidemiology and Surveillance Unit based on State Center for Health Statistics Vital Statistics data files, 2015.

30. Centers for Disease Control and Prevention, Home and Recreational Safety. Important Facts about Falls. (2017) Available at: https://www.cdc.gov/homeandrecreationalsafety/falls/adultfalls.html. Accessed June 29, 2017.

31. U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014. Available at: www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf.

32. North Carolina Department of Health and Human Services, Division of Public Health, State Center for Health Statistics. 2015 North Carolina Vital Statistics, Volume 1. Available at: www.schs.state.nc.us/data/vital/volume1/2015/nc.html.

33. North Carolina Department of Health and Human Services, Division of Public Health, Chronic Disease and Injury Section, Injury Epidemiology and Surveillance Unit. Leading Causes of Injury Deaths 2015. Analyses conducted by Injury Epidemiology and Surveillance Unit based on State Center for Health Statistics death certificate data file, 2015.

34. North Carolina Department of Health and Human Services, Division of Public Health, Women's and Children's Health Section, Children and Youth Branch, School Health Unit. North Carolina Annual School Health Services Report, 2015–16.

35. Hill HA, Elam-Evans LD, Yankey D, Singleton JA, Dietz V. Vaccination Coverage Among Children Aged 19–35 Months—United States, 2015. Morbidity and Mortality Weekly Report 2016;65: 1065–1071. Available at: http://dx.doi.org/10.15585/mmwr.mm6539a4.

36. Hill HA, Elam-Evans LD, Yankey D, Singleton JA, Dietz V. Vaccination Coverage Among Children Aged 19–35 Months—United States, 2015. Morbidity and Mortality Weekly Report 2016; 65:1065–1071. Available at: http://dx.doi.org/10.15585/mmwr.mm6539a4.

37. North Carolina Department of Health and Human Services, Division of Public Health, Women's and Children's Health Section, Children and Youth Branch, School Health Unit. North Carolina Annual School Health Services Report, 2015–16.

38. Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, Division of Healthcare Quality Promotion. Antibiotic Resistance Threats in the United States, 2013. Available at: https://www.cdc.gov/drugresistance/threat-report-2013/index.html. Accessed June 29, 2017.

39. Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, Division of Healthcare Quality Promotion. Core Elements of Hospital Antibiotic Stewardship Programs. Available at: https://www.cdc.gov/getsmart/healthcare/implementation/core-elements.html. Accessed June 29, 2017.

40. Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, Division of Healthcare Quality Promotion. Facts about Antibiotic Resistance. Available at: https://www.cdc.gov/getsmart/community/about/fast-facts.html. Accessed June 29, 2017.

41. Fleming-Dutra, K., et al. (2016). Prevalence of Inappropriate Antibiotic Prescriptions Among US Ambulatory Care Visits, 2010-2011. Journal of the American Medical Association. 315(17):1864–1873.

42. Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, Division of Healthcare Quality Promotion. Core Elements of Hospital Antibiotic Stewardship Programs. Available at: https://www.cdc.gov/getsmart/healthcare/implementation/core-elements.html. Accessed June 29, 2017.

Appendix A: Healthy North Carolina 2020 Objectives Compared to North Carolina Goals* and the United States

*The State Goal is the Healthy North Carolina 2020 target as established in 2011.

	North Carolina Baseline	North Carolina Current	State Goal	United States
Tobacco Use				
Decrease the percentage of adults who are current smokers	21.8% (2011)	19.0% (2015)	13.0%	17.5% (2015)
Decrease the percentage of high school students reporting current use of any tobacco product	25.8% (2009)	27.5% (2015)	15.0%	31.4% (2015)
Decrease the percentage of people exposed to secondhand smoke in the workplace in the past seven days	9.2% (2011)	8.3% (2015)	0%	Not available
Physical Activity and Nutrition				
Increase the percentage of high school students who are neither overweight nor obese	72.0% (2009)	67.7% (2015)	79.2%	70.1% (2015)
Increase the percentage of adults meeting CDC Aerobic Recommendations	46.8% (2011)	48.1% (2015)	60.6%	50.7% (2015)
Increase the percentage of adults who consume fruit one or more times per day.	59.2% (2011)	56.7% (2015)	69.7%	60.3% (2015)
Increase the percentage of adults who consume vegetables one or more times per day.	78.1% (2011)	78.4% (2015)	84.7%	77.9% (2015)
Injury and Violence				
Reduce the unintentional poisoning mortality rate (per 100,000 population)	11.0 (2008)	14.5 (2015)	9.9	14.8 (2015)
Reduce the unintentional falls mortality rate (per 100,000 population)	8.1 (2008)	10.6 (2015)	5.3	9.0 (2015)
Reduce the homicide rate (per 100,000 population)	7.5 (2008)	6.1 (2015)	6.7	5.7 (2015)
Maternal and Infant Health				
Reduce the infant mortality racial disparity between whites and African Americans	2.45 (2008)	2.35 (2015)	1.92	2.24 (2014)
Reduce the infant mortality rate (per 1,000 live births)	8.2 (2008)	7.3 (2015)	6.3	5.9 (2015)
Reduce the percentage of women who smoke during pregnancy[3]	10.9% (2011)	9.3% (2015)	6.8%	Not available
Sexually Transmitted Disease and Unintended Pregnancy				
Decrease the percentage of pregnancies that are unintended	39.8% (2007)	42.7% (2011)	30.9%	Not available
Reduce the percentage of positive results among individuals aged 15 to 24 tested for chlamydia	9.7% (2009)	10.5% (2015)	8.7%	Not available
Reduce the rate of new HIV infection diagnoses (per 100,000 population)	24.7 (2008)	13.4 (2015)	22.2	12.3 (2015)
Substance Abuse				
Reduce the percentage of high school students who had alcohol on one or more of the past 30 days	35.0% (2009)	29.2% (2015)	26.4%	32.8% (2015)
Reduce the percentage of traffic crashes that are alcohol-related	5.7% (2008)	4.6% (2015)	4.7%	Not available
Reduce the percentage of individuals aged 12 years and older reporting any illicit drug use in the past 30 days	7.8% (2007–08)	8.6% (2013–14)	6.6%	9.8% (2013–14)

Mental Health				
Reduce the suicide rate (per 100,000 population)	12.4 (2008)	13.4 (2015)	8.3	13.3 (2015)
Decrease the average number of poor mental health days among adults in the past 30 days	3.7 (2011)	3.7 (2015)	2.8	Not available
Reduce the rate of mental health-related visits to emergency departments (per 10,000 population)	92.0 (2008)	104.5 (2012)	82.8	Not available
Oral Health				
Increase the percentage of children aged 1–5 years enrolled in Medicaid who received any dental service during the previous 12 months	46.9% (2008)	59.3% (2015)	56.4%	45.2% (2015)
Decrease the average number of decayed, missing or filled teeth among kindergartners	1.5 (2008–09)	1.6 (2014–15)	1.1	Not available
Decrease the percentage of adults who have had permanent teeth removed due to tooth decay or gum disease	48.3% (2012)	49.1% (2014)	38.4%	43.4% (2014)
Environmental Health				
Increase the percentage of air monitor sites meeting the current ozone standard of 0.075 ppm	62.5% (2007–09)	100% (2012–14)	100.0%	Not available
Increase the percentage of the population being served by community water systems (CWS) with no maximum contaminant level violations (among persons on CWS)	92.2% (2009)	95.3% (2015)	95.0%	91.1% (2015)
Reduce the mortality rate from work-related injuries (per 100,000 equivalent full-time workers)	3.9 (2008)	3.4 (2015)	3.5	3.4 (2015)
Infectious Disease and Foodborne Illness				
Increase the percentage of children aged 19–35 months who receive the recommended vaccines	77.3% (2007)	80.0% (2015)	91.3%	75.1% (2015)
Reduce the pneumonia and influenza mortality rate (per 100,000 population)	19.5 (2008)	18.7 (2015)	13.5	15.2 (2015)
Decrease the average number of critical violations per restaurant/food stand	6.1 (2009)	6.5 (2011)	5.5	Not available
Social Determinants of Health				
Decrease the percentage of individuals living in poverty	16.9% (2009)	16.4% (2015)	12.5%	14.7% (2015)
Increase the four-year high school graduation rate	71.8% (2008–09)	85.9% (2015–16)	94.6%	83% (2014–15)
Decrease the percentage of people spending more than 30 percent of their income on rental housing	41.8% (2008)	44.9% (2015)	36.1%	46.8% (2015)
Chronic Disease				
Reduce the cardiovascular disease mortality rate (per 100,000 population)	256.6 (2008)	222.1 (2015)	161.5	221.5 (2015)
Decrease the percentage of adults with diabetes	10.9% (2011)	10.7% (2015)	8.6%	9.9% (2015)
Reduce the colorectal cancer mortality rate (per 100,000 population)	15.7 (2008)	14.2 (2015)	10.1	14.0 (2015)

Cross-cutting				
Increase average life expectancy (years)	77.5 (2008)	78.0 (2015)	79.5	78.8 (2015)
Increase the percentage of adults reporting good, very good or excellent health	80.4% (2011)	80.8% (2015)	90.1%	83.6% (2015)
Reduce the percentage of non-elderly uninsured individuals (aged less than 65 years)	20.4% (2009)	16.7% (2015)	8.0%	10.5% (2015)
Increase the percentage of adults who are neither overweight nor obese[1]	34.9% (2011)	34.2% (2015)	38.1%	34.5% (2015)

Appendix B: Additional County/Regional Data for Selected Healthy North Carolina 2020 Objectives

Note: All data tables in Appendix B are the most recent available as of June 9, 2017.

Percentage of North Carolina Adults Who Are Current Smokers by Region for the North Carolina Association of Local Health Directors and the Area Health Education Centers—BRFSS Survey Results, 2015

	Percent	C.I. (95%)*
North Carolina	19.0	17.8–20.3
North Carolina Association of Local Health Directors		
Region 1 and 2	21.2	17.7–25.2
Region 3	24.3	20.0–29.1
Region 4	17.4	14.8–20.2
Region 5	17.3	14.3–20.8
Region 6	20.8	16.8–25.4
Region 7	15.6	13.0–18.6
Region 8	18.2	14.9–22.0
Region 9 and 10	23.4	19.4–27.9
Area Health Education Centers		
Mountain AHEC	18.5	15.0–22.5
Northwest	22.3	19.1–26.0
Charlotte	18.3	15.5–21.5
Greensboro	18.6	15.0–22.8
Southern Regional	19.5	15.9–23.6
Southeast	16.6	12.5–21.8
Wake	13.5	11.2–16.1
Area L and Eastern	24.8	21.4–28.6

Current smoking prevalence represents the percent of survey respondents who report that they currently smoke "every day" or "most days" and have smoked at least 100 cigarettes in their lifetime.

* C.I. (95%) = Confidence Interval (at 95% probability level).

North Carolina Association of Local Health Directors

Region 1: Cherokee, Clay, Graham, Haywood, Jackson, Macon, Swain, Transylvania

Region 2: Buncombe, Burke, Caldwell, Cleveland, Henderson, Madison, Rutherford-Polk-McDowell, Yancey-Mitchell-Avery

Region 3: Davidson, Davie, Forsyth, Stokes, Surry, Watauga-Ashe-Alleghany, Wilkes, Yadkin

Region 4: Alexander, Cabarrus, Catawba, Gaston, Iredell, Lincoln Mecklenburg, Rowan, Stanly, Union

Region 5: Alamance, Caswell, Chatham, Durham, Guilford, Orange, Person, Randolph, Rockingham

Region 6: Anson, Cumberland, Harnett, Hoke, Lee, Montgomery, Moore, Richmond, Scotland

Region 7: Edgecombe, Franklin, Granville-Vance, Halifax, Johnston, Nash, Wake, Warren, Wilson

Region 8: Bladen, Brunswick, Columbus, Duplin, New Hanover, Onslow, Pender, Robeson, Sampson

Region 9: Bertie, Currituck, Dare, Hertford-Gates, Hyde, Martin-Tyrell-Washington, Northampton, Pasquotank-Perquimans-Camden-Chowan

Region 10: Beaufort, Carteret, Craven, Greene, Jones, Lenoir, Pamlico, Pitt, Wayne

Area Health Education Centers

Mountain: Buncombe, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania, Yancey

Northwest: Alexander, Alleghany, Ashe, Avery, Burke, Caldwell, Catawba, Davidson, Davie, Forsyth, Iredell, Rowan, Stokes, Surry, Watauga, Wilkes, Yadkin

Charlotte: Anson, Cabarrus, Cleveland, Gaston, Lincoln, Mecklenburg, Stanly, Union

Greensboro: Alamance, Caswell, Chatham, Guilford, Montgomery, Orange, Randolph, Rockingham

Southern Regional: Bladen, Cumberland, Harnett, Hoke, Moore, Richmond, Robeson, Sampson, Scotland

Southeast: Brunswick, Columbus, Duplin, Pender, New Hanover

Wake: Durham, Franklin, Granville, Johnston, Lee, Person, Vance, Wake, Warren

Area L: Edgecombe, Halifax, Nash, Northampton, Wilson

Eastern: Beaufort, Bertie, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Greene, Hertford, Hyde, Jones, Lenoir, Martin, Onslow, Pamlico, Pasquotank, Perquimans, Pitt, Tyrrell, Washington, Wayne

Data Source: Behavioral Risk Factor Surveillance System, State Center for Health Statistics.

Percentage of North Carolina Women Smoking During Pregnancy, 2015

County	Percentage
State Total	9.3
Alamance	11.4
Alexander	19.0
Alleghany	24.0
Anson	13.9
Ashe	12.6
Avery	15.0
Beaufort	16.7
Bertie	10.1
Bladen	19.7
Brunswick	13.8
Buncombe	5.2
Burke	17.4
Cabarrus	8.5
Caldwell	19.4
Camden	12.2
Carteret	16.7
Caswell	11.5
Catawba	16.0
Chatham	3.8
Cherokee	18.5
Chowan	10.8
Clay	25.3
Cleveland	21.3
Columbus	20.0
Craven	10.3
Cumberland	9.7
Currituck	10.0
Dare	8.9
Davidson	15.8
Davie	9.0
Duplin	8.4
Durham	4.5
Edgecombe	17.2
Forsyth	5.4
Franklin	10.2
Gaston	17.8
Gates	10.1
Graham	32.5
Granville	10.8
Greene	13.8
Guilford	5.9
Halifax	13.8
Harnett	9.5
Haywood	15.1
Henderson	9.4
Hertford	13.4
Hoke	9.2
Hyde	12.2
Iredell	11.2
Jackson	19.0
Johnston	8.3
Jones	11.1
Lee	12.9
Lenoir	16.7
Lincoln	15.9
McDowell	18.8
Macon	18.6
Madison	12.0
Martin	15.8
Mecklenburg	3.3
Mitchell	25.8
Montgomery	16.5
Moore	11.2
Nash	12.7
New Hanover	8.6
Northampton	15.8
Onslow	6.6
Orange	3.3
Pamlico	25.0
Pasquotank	10.1
Pender	11.7
Perquimans	6.3
Person	14.1
Pitt	10.1
Polk	15.7
Randolph	14.2
Richmond	24.4
Robeson	17.7
Rockingham	14.7
Rowan	15.7
Rutherford	21.7
Sampson	12.0
Scotland	18.1
Stanly	16.1
Stokes	14.1
Surry	25.3
Swain	25.1
Transylvania	9.5
Tyrrell	17.9
Union	7.1
Vance	14.6
Wake	2.8
Warren	12.9
Washington	14.3
Watauga	10.7
Wayne	10.4
Wilkes	19.5
Wilson	8.9
Yadkin	13.0
Yancey	17.6

Data Source: Vital Statistics, State Center for Health Statistics.

Percentage of North Carolina Adults Who Are Overweight or Obese* by Region for the North Carolina Association of Local Health Directors and the Area Health Education Centers—BRFSS Survey Results, 2015

	Percent	C.I. (95%)**
North Carolina	65.8	64.3–67.3
North Carolina Association of Local Health Directors		
Region 1 and 2	63.2	58.9–67.3
Region 3	69.6	64.6–74.1
Region 4	64.7	61.3–68.0
Region 5	63.6	59.4–67.6
Region 6	72.4	67.4–76.9
Region 7	64.0	60.1–67.7
Region 8	66.9	62.2–71.3
Region 9 and 10	68.5	63.8–72.9
Area Health Education Centers		
Mountain AHEC	61.9	57.2–66.3
Northwest	67.6	63.8–71.2
Charlotte	65.0	61.2–68.6
Greensboro	65.6	60.8–70.2
Southern Regional	71.1	66.4–75.4
Southeast	66.9	60.6–72.7
Wake	61.8	58.1–65.4
Area L and Eastern	69.0	65.1–72.7

* Body mass index is computed as weight in kilograms divided by height in meters squared :(kg/m2). Underweight=BMI less than 18.5, Recommended Range=BMI 18.5 to 24.9, Overweight=BMI 25.0 to 29.9 and Obese=BMI 30 or greater.

** C.I. (95%) = Confidence Interval (at 95% probability level).

North Carolina Association of Local Health Directors

Region 1: Cherokee, Clay, Graham, Haywood, Jackson, Macon, Swain, Transylvania

Region 2: Buncombe, Burke, Caldwell, Cleveland, Henderson, Madison, Rutherford-Polk-McDowell, Yancey-Mitchell-Avery

Region 3: Davidson, Davie, Forsyth, Stokes, Surry, Watauga-Ashe-Alleghany, Wilkes, Yadkin

Region 4: Alexander, Cabarrus, Catawba, Gaston, Iredell, Lincoln Mecklenburg, Rowan, Stanly, Union

Region 5: Alamance, Caswell, Chatham, Durham, Guilford, Orange, Person, Randolph, Rockingham

Region 6: Anson, Cumberland, Harnett, Hoke, Lee, Montgomery, Moore, Richmond, Scotland

Region 7: Edgecombe, Franklin, Granville-Vance, Halifax, Johnston, Nash, Wake, Warren, Wilson

Region 8: Bladen, Brunswick, Columbus, Duplin, New Hanover, Onslow, Pender, Robeson, Sampson

Region 9: Bertie, Currituck, Dare, Hertford-Gates, Hyde, Martin-Tyrell-Washington, Northampton, Pasquotank-Perquimans-Camden-Chowan

Region 10: Beaufort, Carteret, Craven, Greene, Jones, Lenoir, Pamlico, Pitt, Wayne

Area Health Education Centers

Mountain: Buncombe, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania, Yancey

Northwest: Alexander, Alleghany, Ashe, Avery, Burke, Caldwell, Catawba, Davidson, Davie, Forsyth, Iredell, Rowan, Stokes, Surry, Watauga, Wilkes, Yadkin

Charlotte: Anson, Cabarrus, Cleveland, Gaston, Lincoln, Mecklenburg, Stanly, Union

Greensboro: Alamance, Caswell, Chatham, Guilford, Montgomery, Orange, Randolph, Rockingham

Southern Regional: Bladen, Cumberland, Harnett, Hoke, Moore, Richmond, Robeson, Sampson, Scotland

Southeast: Brunswick, Columbus, Duplin, Pender, New Hanover

Wake: Durham, Franklin, Granville, Johnston, Lee, Person, Vance, Wake, Warren

Area L: Edgecombe, Halifax, Nash, Northampton, Wilson

Eastern: Beaufort, Bertie, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Greene, Hertford, Hyde, Jones, Lenoir, Martin, Onslow, Pamlico, Pasquotank, Perquimans, Pitt, Tyrrell, Washington, Wayne

Data Source: Behavioral Risk Factor Surveillance System, State Center for Health Statistics.

Percentage of North Carolina Adults Reporting Good, Very Good or Excellent Health by Region for the North Carolina Association of Local Health Directors and the Area Health Education Centers—BRFSS Survey Results, 2015

	Percent	C.I. (95%)**
North Carolina	80.8	79.6–81.9
North Carolina Association of Local Health Directors		
Region 1 and 2	76.9	73.4–80.1
Region 3	76.2	71.9–80.1
Region 4	82.3	79.6–84.7
Region 5	84.2	81.2–86.8
Region 6	80.2	76.1–83.8
Region 7	84.0	81.1–86.6
Region 8	79.8	76.1–83.1
Region 9 and 10	76.3	72.6–79.7
Area Health Education Centers		
Mountain AHEC	77.4	73.5–80.8
Northwest	77.4	74.1–80.3
Charlotte	82.2	79.2–84.8
Greensboro	82.6	78.9–85.8
Southern Regional	78.2	74.2–81.7
Southeast	83.3	78.5–87.2
Wake	86.7	84.2–88.9
Area L and Eastern	76.1	72.9–79.0

* C.I. (95%) = Confidence Interval (at 95% probability level).

North Carolina Association of Local Health Directors

Region 1: Cherokee, Clay, Graham, Haywood, Jackson, Macon, Swain, Transylvania

Region 2: Buncombe, Burke, Caldwell, Cleveland, Henderson, Madison, Rutherford-Polk-McDowell, Yancey-Mitchell-Avery

Region 3: Davidson, Davie, Forsyth, Stokes, Surry, Watauga-Ashe-Alleghany, Wilkes, Yadkin

Region 4: Alexander, Cabarrus, Catawba, Gaston, Iredell, Lincoln Mecklenburg, Rowan, Stanly, Union

Region 5: Alamance, Caswell, Chatham, Durham, Guilford, Orange, Person, Randolph, Rockingham

Region 6: Anson, Cumberland, Harnett, Hoke, Lee, Montgomery, Moore, Richmond, Scotland

Region 7: Edgecombe, Franklin, Granville-Vance, Halifax, Johnston, Nash, Wake, Warren, Wilson

Region 8: Bladen, Brunswick, Columbus, Duplin, New Hanover, Onslow, Pender, Robeson, Sampson

Region 9: Bertie, Currituck, Dare, Hertford-Gates, Hyde, Martin-Tyrell-Washington, Northampton, Pasquotank-Perquimans-Camden-Chowan

Region 10: Beaufort, Carteret, Craven, Greene, Jones, Lenoir, Pamlico, Pitt, Wayne

Area Health Education Centers

Mountain: Buncombe, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania, Yancey

Northwest: Alexander, Alleghany, Ashe, Avery, Burke, Caldwell, Catawba, Davidson, Davie, Forsyth, Iredell, Rowan, Stokes, Surry, Watauga, Wilkes, Yadkin

Charlotte: Anson, Cabarrus, Cleveland, Gaston, Lincoln, Mecklenburg, Stanly, Union

Greensboro: Alamance, Caswell, Chatham, Guilford, Montgomery, Orange, Randolph, Rockingham

Southern Regional: Bladen, Cumberland, Harnett, Hoke, Moore, Richmond, Robeson, Sampson, Scotland

Southeast: Brunswick, Columbus, Duplin, Pender, New Hanover

Wake: Durham, Franklin, Granville, Johnston, Lee, Person, Vance, Wake, Warren

Area L: Edgecombe, Halifax, Nash, Northampton, Wilson

Eastern: Beaufort, Bertie, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Greene, Hertford, Hyde, Jones, Lenoir, Martin, Onslow, Pamlico, Pasquotank, Perquimans, Pitt, Tyrrell, Washington, Wayne

Data Source: Behavioral Risk Factor Surveillance System, State Center for Health Statistics.

North Carolina Infant Mortality Rate (per 1,000 Live Births) by County of Residence, 2011–2015

Residence	Infant Deaths	Infant Mortality Rate
State Total	4,325	7.2
Alamance	77	8.8
Alexander	7	4.0
Alleghany	1	2.1
Anson	16	12.7
Ashe	7	6.0
Avery	8	11.5
Beaufort	28	11.6
Bertie	11	12.2
Bladen	17	9.5
Brunswick	32	6.1
Buncombe	82	6.3
Burke	30	6.9
Cabarrus	64	5.5
Caldwell	34	8.5
Camden	1	2.2
Carteret	22	7.1
Caswell	8	7.6
Catawba	55	6.2
Chatham	30	9.6
Cherokee	11	10.1
Chowan	8	10.3
Clay	3	7.3
Cleveland	49	9.1
Columbus	29	9.3
Craven	54	7.0
Cumberland	250	8.8
Currituck	8	6.6
Dare	9	5.0
Davidson	63	7.3
Davie	12	6.3
Duplin	30	7.9
Durham	151	7.0
Edgecombe	28	8.7
Forsyth	190	8.4
Franklin	30	8.8
Gaston	96	7.6
Gates	2	3.8
Graham	1	2.2
Granville	23	8.3
Greene	6	5.6
Guilford	241	7.9
Halifax	33	11.4
Harnett	76	8.3
Haywood	17	6.0
Henderson	27	5.1
Hertford	21	17.8
Hoke	31	6.5
Hyde	5	20.4
Iredell	64	7.2
Jackson	15	7.8
Johnston	72	6.4
Jones	5	10.0
Lee	35	8.9
Lenoir	23	7.0
Lincoln	23	5.9
McDowell	16	7.0
Macon	12	7.1
Madison	9	9.0
Martin	5	4.1
Mecklenburg	422	6.0
Mitchell	1	1.4
Montgomery	18	11.2
Moore	25	5.0
Nash	43	8.0
New Hanover	41	3.6
Northampton	8	8.8
Onslow	156	7.2
Orange	31	5.0
Pamlico	6	13.6
Pasquotank	15	6.1
Pender	21	6.9
Perquimans	3	4.7
Person	17	8.3
Pitt	116	10.8
Polk	3	4.3
Randolph	51	6.4
Richmond	27	9.9
Robeson	106	11.5
Rockingham	46	9.9
Rowan	54	6.9
Rutherford	25	7.4
Sampson	32	7.6
Scotland	25	11.2
Stanly	22	6.7
Stokes	13	6.5
Surry	24	6.3
Swain	11	10.8
Transylvania	9	6.6
Tyrrell	2	9.7
Union	63	5.3
Vance	22	7.8
Wake	373	5.9
Warren	9	9.9
Washington	3	4.7
Watauga	7	3.9
Wayne	65	7.6
Wilkes	32	9.4
Wilson	45	9.4
Yadkin	14	7.2
Yancey	6	7.0

Note: Rates based on less than 10 deaths are unreliable and should be interpreted with caution.

Data Source: Vital Statistics, State Center for Health Statistics.

North Carolina Infant Mortality Racial Disparity between Whites and African Americans by County of Residence, 2011–2015

	White, Non-Hispanic		African American, Non-Hispanic		
Residence	Infant Deaths	Infant Mortality Rate	Infant Deaths	Infant Mortality Rate	Disparity Ratio
State	1,834	5.5	1,851	12.9	2.35
Alamance	35	7.2	32	17.0	2.36
Alexander	5	3.3	1	12.5	3.79
Alleghany	0	0.0	0	0.0	0.00
Anson	4	8.6	10	13.8	1.60
Ashe	6	5.7	0	0.0	0.00
Avery	6	9.9	0	0.0	0.00
Beaufort	14	11.0	12	15.8	1.44
Bertie	0	0.0	11	17.5	*
Bladen	6	7.4	7	10.5	1.42
Brunswick	26	6.5	6	8.9	1.37
Buncombe	56	5.5	18	17.0	3.09
Burke	23	7.0	2	9.7	1.39
Cabarrus	34	4.8	20	10.0	2.08
Caldwell	30	8.8	1	4.8	0.55
Camden	1	2.6	0	0.0	0.00
Carteret	17	6.6	2	10.9	1.65
Caswell	2	3.0	6	20.3	6.77
Catawba	29	5.0	16	17.1	3.42
Chatham	15	8.2	5	14.0	1.71
Cherokee	7	7.3	0	0.0	0.00
Chowan	2	5.2	5	14.9	2.87
Clay	2	5.4	1	500.0	92.59
Cleveland	19	5.2	29	21.1	4.06
Columbus	10	6.1	12	11.4	1.87
Craven	34	6.8	16	10.7	1.57
Cumberland	84	6.3	131	13.3	2.11
Currituck	5	4.7	0	0.0	0.00
Dare	6	4.2	0	0.0	0.00
Davidson	40	6.2	16	18.2	2.94
Davie	11	7.2	1	8.8	1.22
Duplin	16	10.8	11	12.9	1.19
Durham	32	3.9	100	13.9	3.56
Edgecombe	7	8.1	21	10.0	1.23
Forsyth	70	6.6	81	12.4	1.88
Franklin	16	7.9	14	15.4	1.95
Gaston	52	6.0	41	17.1	2.85
Gates	1	2.7	1	6.8	2.52
Graham	1	2.7	0	0.0	0.00
Granville	12	7.8	7	8.2	1.05
Greene	2	4.7	4	11.1	2.36

North Carolina Infant Mortality Racial Disparity between Whites and African Americans by County of Residence, 2011–2015

	White, Non-Hispanic		African American, Non-Hispanic		
Residence	Infant Deaths	Infant Mortality Rate	Infant Deaths	Infant Mortality Rate	Disparity Ratio
Guilford	65	5.3	144	11.8	2.23
Halifax	5	5.5	28	16.2	2.95
Harnett	40	7.1	28	15.3	2.15
Haywood	15	5.8	1	23.3	4.02
Henderson	22	5.4	0	0.0	0.00
Hertford	5	15.5	16	20.2	1.30
Hoke	11	4.7	12	10.4	2.21
Hyde	3	17.2	2	48.8	2.84
Iredell	31	4.9	27	21.0	4.29
Jackson	11	7.9	0	0.0	0.00
Johnston	40	5.8	16	9.3	1.60
Jones	0	0.0	4	29.0	*
Lee	14	7.4	14	17.3	2.34
Lenoir	8	6.1	15	9.9	1.62
Lincoln	14	4.3	7	32.4	7.53
McDowell	14	7.1	0	0.0	0.00
Macon	12	8.8	0	0.0	0.00
Madison	9	9.4	0	0.0	0.00
Martin	0	0.0	5	8.9	*
Mecklenburg	114	4.0	224	9.9	2.48
Mitchell	1	1.6	0	0.0	0.00
Montgomery	5	6.4	9	28.3	4.42
Moore	11	3.1	8	9.7	3.13
Nash	8	3.6	32	13.3	3.69
New Hanover	22	2.9	15	7.0	2.41
Northampton	1	3.6	7	12.0	3.33
Onslow	88	5.8	41	15.0	2.59
Orange	14	3.8	11	12.1	3.18
Pamlico	4	12.2	2	27.0	2.21
Pasquotank	3	2.3	12	12.6	5.48
Pender	7	3.3	12	25.0	7.58
Perquimans	3	6.4	0	0.0	0.00
Person	3	2.3	14	23.6	10.26
Pitt	34	6.8	74	16.7	2.46
Polk	2	3.4	0	0.0	0.00
Randolph	37	6.5	4	7.7	1.18
Richmond	9	6.5	17	18.1	2.78
Robeson	20	11.7	32	15.0	1.28
Rockingham	23	7.2	21	22.6	3.14
Rowan	34	6.6	18	12.7	1.92
Rutherford	18	6.6	4	10.0	1.52

North Carolina Infant Mortality Racial Disparity between Whites and African Americans by County of Residence, 2011–2015

	White, Non-Hispanic		African American, Non-Hispanic		
Residence	Infant Deaths	Infant Mortality Rate	Infant Deaths	Infant Mortality Rate	Disparity Ratio
Sampson	11	6.8	16	16.1	2.37
Scotland	8	10.8	14	13.5	1.25
Stanly	10	4.0	12	24.0	6.00
Stokes	13	7.1	0	0.0	0.00
Surry	19	6.6	1	7.1	1.08
Swain	4	7.5	0	0.0	0.00
Transylvania	8	6.8	1	17.5	2.57
Tyrrell	1	8.8	0	0.0	0.00
Union	21	2.8	23	13.9	4.96
Vance	4	4.8	15	9.4	1.96
Wake	135	4.0	173	12.2	3.05
Warren	3	10.8	6	11.3	1.05
Washington	0	0.0	3	8.2	*
Watauga	5	3.2	2	64.5	20.16
Wayne	24	6.0	36	13.0	2.17
Wilkes	25	8.9	2	13.8	1.55
Wilson	9	5.2	30	14.4	2.77
Yadkin	10	6.8	1	16.7	2.46
Yancey	6	8.1	0	0.0	0.00

* Disparity exists, however, ratio cannot be calculated because there were zero infant deaths to non-Hispanic whites.

Note: Rates based on less than 10 deaths are unreliable and should be interpreted with caution.

Data Source: Vital Statistics, State Center for Health Statistics.

North Carolina Pneumonia and Influenza Mortality Rate (per 100,000 Population) by County of Residence, 2011–2015

Residence	Age-Adjusted* Death Rate
State Total	17.8
Alamance	15.5
Alexander	18.8
Alleghany	**
Anson	16.6
Ashe	22.7
Avery	31.5
Beaufort	11.4
Bertie	**
Bladen	15.7
Brunswick	11.6
Buncombe	15.8
Burke	21.8
Cabarrus	25.4
Caldwell	25.2
Camden	**
Carteret	14.8
Caswell	21.2
Catawba	21.9
Chatham	12.0
Cherokee	14.8
Chowan	**
Clay	**
Cleveland	28.2
Columbus	19.6
Craven	15.9
Cumberland	20.3
Currituck	96.3
Dare	48.6
Davidson	20.9
Davie	20.3
Duplin	16.8
Durham	14.2
Edgecombe	18.5
Forsyth	19.7
Franklin	20.9
Gaston	29.2
Gates	**
Graham	**
Granville	13.3
Greene	**
Guilford	15.5
Halifax	18.5
Harnett	14.4
Haywood	19.6
Henderson	16.8
Hertford	13.8
Hoke	17.1
Hyde	**
Iredell	21.6
Jackson	16.5
Johnston	15.1
Jones	**
Lee	17.9
Lenoir	18.5
Lincoln	17.6
McDowell	20.8
Macon	14.9
Madison	24.0
Martin	14.3
Mecklenburg	15.2
Mitchell	20.0
Montgomery	23.4
Moore	12.7
Nash	24.5
New Hanover	11.2
Northampton	13.5
Onslow	13.9
Orange	11.6
Pamlico	**
Pasquotank	19.4
Pender	14.9
Perquimans	23.2
Person	23.2
Pitt	10.1
Polk	15.4
Randolph	19.1
Richmond	12.7
Robeson	14.0
Rockingham	31.0
Rowan	32.4
Rutherford	17.0
Sampson	15.0
Scotland	13.8
Stanly	22.9
Stokes	23.3
Surry	22.0
Swain	26.6
Transylvania	12.9
Tyrrell	**
Union	17.9
Vance	28.3
Wake	10.7
Warren	20.7
Washington	**
Watauga	14.3
Wayne	12.8
Wilkes	32.0
Wilson	20.0
Yadkin	26.2
Yancey	20.5

* An age-adjusted death rate is a death rate that controls for the effects of differences in population age distributions.

** Death rates with a small number (<50) of deaths in the numerator should be interpreted with caution.

Data Source: Vital Statistics, State Center for Health Statistics.

North Carolina Traffic Crashes That Are Alcohol-Related By County of Crash, 2015

County	Percentage
State Total	4.6
Alamance	5.0
Alexander	3.4
Alleghany	6.7
Anson	6.0
Ashe	4.5
Avery	6.7
Beaufort	5.9
Bertie	5.9
Bladen	5.2
Brunswick	4.4
Buncombe	4.1
Burke	5.4
Cabarrus	3.5
Caldwell	4.6
Camden	9.0
Carteret	5.3
Caswell	9.8
Catawba	4.0
Chatham	5.5
Cherokee	7.3
Chowan	5.8
Clay	8.8
Cleveland	4.0
Columbus	4.0
Craven	4.9
Cumberland	3.8
Currituck	9.6
Dare	4.7
Davidson	5.4
Davie	6.0
Duplin	5.1
Durham	3.0
Edgecombe	7.7
Forsyth	3.9
Franklin	6.0
Gaston	4.8
Gates	8.2
Graham	2.0
Granville	5.8
Greene	6.1
Guilford	4.9
Halifax	5.6
Harnett	7.1
Haywood	7.1
Henderson	5.4
Hertford	7.2
Hoke	6.0
Hyde	6.2
Iredell	4.5
Jackson	7.6
Johnston	5.5
Jones	4.9
Lee	4.3
Lenoir	5.5
Lincoln	5.5
McDowell	3.8
Macon	6.9
Madison	8.0
Martin	4.8
Mecklenburg	3.6
Mitchell	5.8
Montgomery	6.4
Moore	4.2
Nash	5.8
New Hanover	4.7
Northampton	5.1
Onslow	5.8
Orange	5.3
Pamlico	8.1
Pasquotank	4.0
Pender	5.3
Perquimans	5.3
Person	5.2
Pitt	4.5
Polk	5.4
Randolph	4.8
Richmond	5.8
Robeson	6.6
Rockingham	5.8
Rowan	4.9
Rutherford	4.4
Sampson	6.0
Scotland	5.1
Stanly	4.3
Stokes	7.5
Surry	5.8
Swain	6.5
Transylvania	7.8
Tyrrell	5.3
Union	4.7
Vance	5.8
Wake	3.6
Warren	8.3
Washington	3.3
Watauga	5.5
Wayne	6.1
Wilkes	4.4
Wilson	4.7
Yadkin	6.1
Yancey	4.8

Data Source: Highway Safety Research Center, University of North Carolina at Chapel Hill.

North Carolina Cardiovascular Disease Mortality Rate (per 100,000 Population) by County of Residence, 2011–2015

Residence	Age-Adjusted* Death Rate
State Total	221.9
Alamance	223.7
Alexander	196.7
Alleghany	202.7
Anson	304.7
Ashe	216.5
Avery	206.7
Beaufort	254.2
Bertie	254.2
Bladen	308.7
Brunswick	212.3
Buncombe	194.9
Burke	249.6
Cabarrus	216.0
Caldwell	257.9
Camden	232.1
Carteret	221.4
Caswell	218.3
Catawba	240.0
Chatham	155.1
Cherokee	262.1
Chowan	249.0
Clay	184.9
Cleveland	279.2
Columbus	346.8
Craven	222.5
Cumberland	253.7
Currituck	247.2
Dare	204.2
Davidson	249.7
Davie	193.5
Duplin	235.4
Durham	184.2
Edgecombe	307.2
Forsyth	203.3
Franklin	220.0
Gaston	254.9
Gates	241.2
Graham	259.1
Granville	200.9
Greene	249.1
Guilford	198.1
Halifax	270.3
Harnett	257.3
Haywood	243.0
Henderson	188.9
Hertford	259.2
Hoke	257.6
Hyde	231.1
Iredell	239.3
Jackson	191.5
Johnston	259.2
Jones	279.6
Lee	246.4
Lenoir	288.3
Lincoln	256.8
McDowell	243.4
Macon	208.8
Madison	246.1
Martin	306.8
Mecklenburg	182.5
Mitchell	229.7
Montgomery	206.9
Moore	175.6
Nash	250.7
New Hanover	219.1
Northampton	226.2
Onslow	217.8
Orange	160.2
Pamlico	229.0
Pasquotank	302.0
Pender	208.1
Perquimans	248.0
Person	245.8
Pitt	233.6
Polk	165.7
Randolph	244.0
Richmond	331.7
Robeson	281.7
Rockingham	256.6
Rowan	256.0
Rutherford	282.2
Sampson	245.7
Scotland	277.6
Stanly	285.2
Stokes	242.3
Surry	226.0
Swain	274.4
Transylvania	171.8
Tyrrell	239.4
Union	216.0
Vance	256.9
Wake	181.1
Warren	230.4
Washington	285.7
Watauga	171.9
Wayne	239.9
Wilkes	210.6
Wilson	240.9
Yadkin	258.7
Yancey	218.0

* An age-adjusted death rate is a death rate that controls for the effects of differences in population age distributions.

Data Source: Vital Statistics, State Center for Health Statistics.

Percentage of North Carolina Adults with Diabetes by Region for the North Carolina Association of Local Health Directors and the Area Health Education Centers—BRFSS Survey Results, 2015

	Percent	C.I. (95%)*
North Carolina	10.7	9.9–11.5
North Carolina. Association of Local Health Directors		
Region 1 and 2	10.3	8.2–12.7
Region 3	10.2	8.0–13.0
Region 4	10.6	8.9–12.5
Region 5	9.2	7.2–11.7
Region 6	10.7	8.2–13.8
Region 7	9.2	7.4–11.4
Region 8	12.6	10.1–15.7
Region 9 and 10	15.0	12.5–17.9
Area Health Education Centers		
Mountain AHEC	8.9	7.0–11.3
Northwest	13.5	11.5–15.8
Charlotte	10.5	8.7–12.6
Greensboro	11.3	9.2–13.9
Southern Regional	13.1	10.4–16.4
Southeast	12.8	10.1–16.1
Wake	7.5	6.0– 9.4
Area L and Eastern	10.6	8.8–12.7

Current diabetes prevalence represents the percentage of survey respondents who report "yes" to the survey question: "Has a doctor, nurse, or other health professional EVER told you that you had diabetes?"

* C.I. (95%) = Confidence Interval (at 95% probability level).

North Carolina Association of Local Health Directors

Region 1: Cherokee, Clay, Graham, Haywood, Jackson, Macon, Swain, Transylvania

Region 2: Buncombe, Burke, Caldwell, Cleveland, Henderson, Madison, Rutherford-Polk-McDowell, Yancey-Mitchell-Avery

Region 3: Davidson, Davie, Forsyth, Stokes, Surry, Watauga-Ashe-Alleghany, Wilkes, Yadkin

Region 4: Alexander, Cabarrus, Catawba, Gaston, Iredell, Lincoln Mecklenburg, Rowan, Stanly, Union

Region 5: Alamance, Caswell, Chatham, Durham, Guilford, Orange, Person, Randolph, Rockingham

Region 6: Anson, Cumberland, Harnett, Hoke, Lee, Montgomery, Moore, Richmond, Scotland

Region 7: Edgecombe, Franklin, Granville-Vance, Halifax, Johnston, Nash, Wake, Warren, Wilson

Region 8: Bladen, Brunswick, Columbus, Duplin, New Hanover, Onslow, Pender, Robeson, Sampson

Region 9: Bertie, Currituck, Dare, Hertford-Gates, Hyde, Martin-Tyrell-Washington, Northampton, Pasquotank-Perquimans-Camden-Chowan

Region 10: Beaufort, Carteret, Craven, Greene, Jones, Lenoir, Pamlico, Pitt, Wayne

Area Health Education Centers

Mountain: Buncombe, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania, Yancey

Northwest: Alexander, Alleghany, Ashe, Avery, Burke, Caldwell, Catawba, Davidson, Davie, Forsyth, Iredell, Rowan, Stokes, Surry, Watauga, Wilkes, Yadkin

Charlotte: Anson, Cabarrus, Cleveland, Gaston, Lincoln, Mecklenburg, Stanly, Union

Greensboro: Alamance, Caswell, Chatham, Guilford, Montgomery, Orange, Randolph, Rockingham

Southern Regional: Bladen, Cumberland, Harnett, Hoke, Moore, Richmond, Robeson, Sampson, Scotland

Southeast: Brunswick, Columbus, Duplin, Pender, New Hanover

Wake: Durham, Franklin, Granville, Johnston, Lee, Person, Vance, Wake, Warren

Area L: Edgecombe, Halifax, Nash, Northampton, Wilson

Eastern: Beaufort, Bertie, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Greene, Hertford, Hyde, Jones, Lenoir, Martin, Onslow, Pamlico, Pasquotank, Perquimans, Pitt, Tyrrell, Washington, Wayne

Data Source: Behavioral Risk Factor Surveillance System, State Center for Health Statistics.

North Carolina Life Expectancies at Birth by County of Residence, 2013–2015

Residence	Life Expectancy at Birth
State Total	78.0
Alamance	77.4
Alexander	78.2
Alleghany	78.3
Anson	74.6
Ashe	77.6
Avery	79.2
Beaufort	75.9
Bertie	76.4
Bladen	74.9
Brunswick	78.7
Buncombe	78.9
Burke	76.4
Cabarrus	78.2
Caldwell	75.5
Camden	79.9
Carteret	78.7
Caswell	77.3
Catawba	76.5
Chatham	82.3
Cherokee	76.0
Chowan	77.2
Clay	78.4
Cleveland	74.9
Columbus	73.9
Craven	77.5
Cumberland	76.5
Currituck	77.9
Dare	80.1
Davidson	76.3
Davie	78.6
Duplin	78.0
Durham	79.8
Edgecombe	75.0
Forsyth	78.3
Franklin	77.9
Gaston	75.7
Gates	79.1
Graham	77.6
Granville	78.2
Greene	77.6
Guilford	78.9
Halifax	74.9
Harnett	76.6
Haywood	78.1
Henderson	79.0
Hertford	76.6
Hoke	77.5
Hyde	78.9
Iredell	77.5
Jackson	78.8
Johnston	78.1
Jones	77.6
Lee	77.0
Lenoir	75.0
Lincoln	77.4
McDowell	76.4
Macon	78.4
Madison	77.5
Martin	75.7
Mecklenburg	80.3
Mitchell	76.8
Montgomery	77.7
Moore	79.8
Nash	76.4
New Hanover	79.5
Northampton	76.5
Onslow	77.8
Orange	81.7
Pamlico	76.6
Pasquotank	77.3
Pender	78.3
Perquimans	78.6
Person	77.0
Pitt	78.1
Polk	79.5
Randolph	76.9
Richmond	74.5
Robeson	73.8
Rockingham	75.8
Rowan	75.3
Rutherford	75.1
Sampson	75.9
Scotland	75.8
Stanly	76.5
Stokes	77.2
Surry	76.9
Swain	74.0
Transylvania	80.7
Tyrrell	78.5
Union	79.6
Vance	74.9
Wake	81.6
Warren	77.7
Washington	77.6
Watauga	81.4
Wayne	77.5
Wilkes	76.3
Wilson	76.9
Yadkin	76.2
Yancey	78.4

Life expectancy is the average number of additional years that an infant born between 2013–2015 would be expected to live if current mortality conditions remained constant throughout his or her lifetime.

Data Source: Vital Statistics, State Center for Health Statistics.