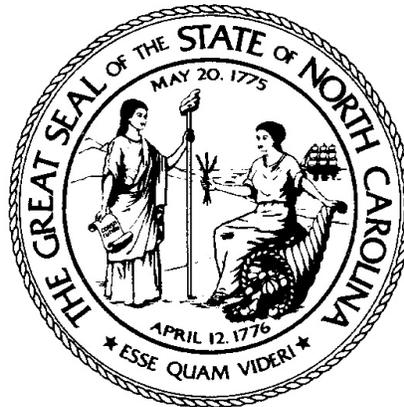


North Carolina Department of Health and Human Services
Division of Public Health

Annual Report to the North Carolina Medical Society

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State of North Carolina

Roy Cooper, Governor

www.nc.gov

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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 jointly with the Commission for Public Health. The NC Department of Health and Human Services (DHHS), Division of Public Health (DPH), and Dr. Elizabeth Tilson, State Health Director, are pleased to provide this report in fulfillment of this statutory requirement.

According to the 2018 edition of *America's Health Rankings*, North Carolina ranked No. 33 in the nation. <https://www.americashealthrankings.org/learn/reports/2018-annual-report>. This report highlights areas of improvement and successes, identifies areas that continue to need improvements, describes the priorities and plans for improving population health, and discusses emerging threats to the health of North Carolinians. The following statewide priorities, plans and metrics represent our plan to improve our health ranking for the upcoming year and, by doing so, we will ensure all North Carolinians have the opportunity for health.

STATEWIDE PRIORITIES, PLANS AND METRICS

Healthy North Carolina

One strategy for improving public and population health is to set a vision and road map for efforts and identify a set of health objectives to measure progress. The *Healthy North Carolina* framework, which is the state level version of the national Healthy People framework, seeks to do that and has set decennial health objectives for our state beginning in 1990. The most recent iteration of these objectives, *Healthy North Carolina 2020 (HNC 2020)* (<http://publichealth.nc.gov/hnc2020/docs/HNC2020-FINAL-March-revised.pdf>), was developed in 2010, and since then there has been variable progress on the objectives.

Areas where North Carolina has seen progress and improvement:

- overall life expectancy
- the percentage of individuals living in poverty
- high school graduation rates
- tobacco use among adults and pregnant women
- alcohol use by high school students
- alcohol-related traffic crashes
- new HIV infections
- dental visits in young children
- mortality due to cardiovascular disease and colorectal cancer

Areas where we have seen little to no change:

- obesity and overweight among our high school students and adults
- diabetes in adults
- dental disease
- unintended pregnancies

Areas in which there has been worsening of health status:

- chlamydia rates in young people age 15-24
- unintentional poisoning mortality, mostly likely reflecting the toll of the opioid epidemic
- the percent of people spending more than 30% of their income on housing
- the disparity in infant mortality between white and African American babies

Appendix A provides a list of all the 40 objectives outlined in *HNC 2020* and includes our state's baseline, targets and most current measures, as well as national measures for comparison (when available and applicable).

Building on the four previous decennial processes, *Healthy North Carolina 2030 (HNC 2030)* will serve as a foundation for North Carolina's population health improvement plan for the upcoming decade. DHHS DPH has been engaged in a year-long process to develop the *HNC 2030* population health indicators in partnership with the NC Institute of Medicine (NCIOM). Differing from past plans, the framework for *HNC 2030* will be underpinned by population health and health equity (<https://www.countyhealthrankings.org/what-is-health>).

- A population health approach considers the multiple drivers of health (medical and non-medical) that are intended to drive policy decisions and interventions that influence these factors.^{1,2}
- Health equity strives to provide everyone with a fair opportunity to be as healthy as possible.

Over a span of ten months, the development of *HNC 2030* reflects input from a 144-member steering committee, a task force, and four work groups. Members were chosen because of their subject matter expertise and with a deliberate intent to create culturally and ethnically diverse work groups representing state and local policy makers, agency officials, health professionals, insurers, business and non-profit agency community leaders, and consumer advocacy organizations. Additionally, eight community listening sessions occurred with 340 participants from 71 counties.

In all, participants selected (or recommended) 21 indicators that encompass health behavior, clinical care, social and economic factors, and the physical environment. Consideration in aligning *HNC 2030* with other statewide plans and initiatives was incorporated. These indicators will be officially released in January 2020 at the North Carolina Public Health Leaders' Conference.

NC Medicaid Transformation to Managed Care

DHHS is transitioning its Medicaid and NC Health Choice programs from a predominantly fee-

¹ Kindig DA, Asada Y, Booske B. A Population Health Framework for Setting National and State Health Goals. *JAMA*. 2008;299(17): 2081–2083. doi:10.1001/jama.299.17.2081.

² Population Health Approach: The Organizing Framework. (2015, June 30). Retrieved from <http://cbpp-pcpe.phac-aspc.gc.ca/population-health-approach-organizing-framework/>.

for-service delivery system to managed care (Session Law 2015-245, as amended) - a move which represents the most significant change to either program since their inception.

The Medicaid Program is a powerful lever to improve population and public health, and, as such, DHHS's vision for managed care is to improve the health of North Carolinians by creating an integrated and well-coordinated system of care that addresses all drivers of health. Under NC's transformation plan, the majority of beneficiaries will enroll in a Medicaid Managed Care Standard Plan, an integrated managed care product that covers physical health, behavioral health, and pharmacy services and addresses social needs care. Enrollment in Standard Plans will be implemented on February 1, 2020. And in 2021, individuals with significant behavioral health disorders, intellectual and developmental disabilities (I/DD) and traumatic brain injuries will be enrolled into Behavioral Health I/DD Tailored Plans, which are focused on the needs of these populations.

Under Medicaid Managed Care, elements to improve population health and address the full factors that influence health include:

- Statewide quality plan that includes population and public health measures such as tobacco use, low birth weight, vaccination rates, and screening for and addressing un-met health related social needs.
- Care Management that will utilize a multi-disciplinary team including nurses, social workers, housing specialists, and legal specialists; will have competencies in trauma-informed care; and will consistently screen for and address un-met health related social needs.
- Consistent screening for and addressing social needs care.
- Advanced payment models and other financial levers that will provide flexibility to pay for whole person health.
- *Healthy Opportunities Pilots*, which present an unprecedented opportunity to test the impact of providing select, evidence-based non-medical interventions to higher-risk Medicaid Managed Care enrollees. Through October 2024, the Pilots will allow up to \$650 million in federal and state Medicaid funding to provide Pilot services related to housing, food, transportation and interpersonal safety and toxic stress that directly impact the health outcomes and health care costs of enrollees in two to four geographic areas of the State. After rigorous evaluation, DHHS will seek to systematically integrate Pilot services shown to be effective into North Carolina Medicaid Managed Care on an ongoing basis statewide.

DHHS is committed to providing the tools and resources needed to support providers, beneficiaries, local DSS and other stakeholders as they transition to Medicaid Managed Care and has launched a Provider Playbook and a County Playbook (<https://medicaid.ncdhhs.gov/providers/provider-playbook-medicare-managed-care>) to provide easy-to-access information.

For more information on Medicaid Transformation, please visit ncdhhs.gov/medicaid-transformation.

The Opioid Action Plan

The Opioid Epidemic is both a national and NC crisis. That epidemic has contributed to the worsening of our unintentional poisoning mortality rate in *Healthy North Carolina 2020*. In response, we released the first edition of our Opioid Action Plan in June 2017. It was developed with considerable input from community partners from across the state and included a multi-sector approach to addressing the crisis. Since its launch, action steps taken include, but are not limited to:

- Expended \$54 million in federal funding to treat 12,000+ people
- Increased Syringe Exchange Programs to serve over 5,000 people
- Trained 3,000+ providers on opioid prescribing and pain treatment
- Funded peer support specialists in emergency departments
- Launched a medical residency waiver training project
- Improved the Controlled Substance Reporting System
- Convened a Payers Council to align benefits coverage
- Funded 34 local organizations to implement action plan strategies
- Developed healthcare worker diversion prevention protocols
- Established an NC Opioid Research Consortium and Agenda

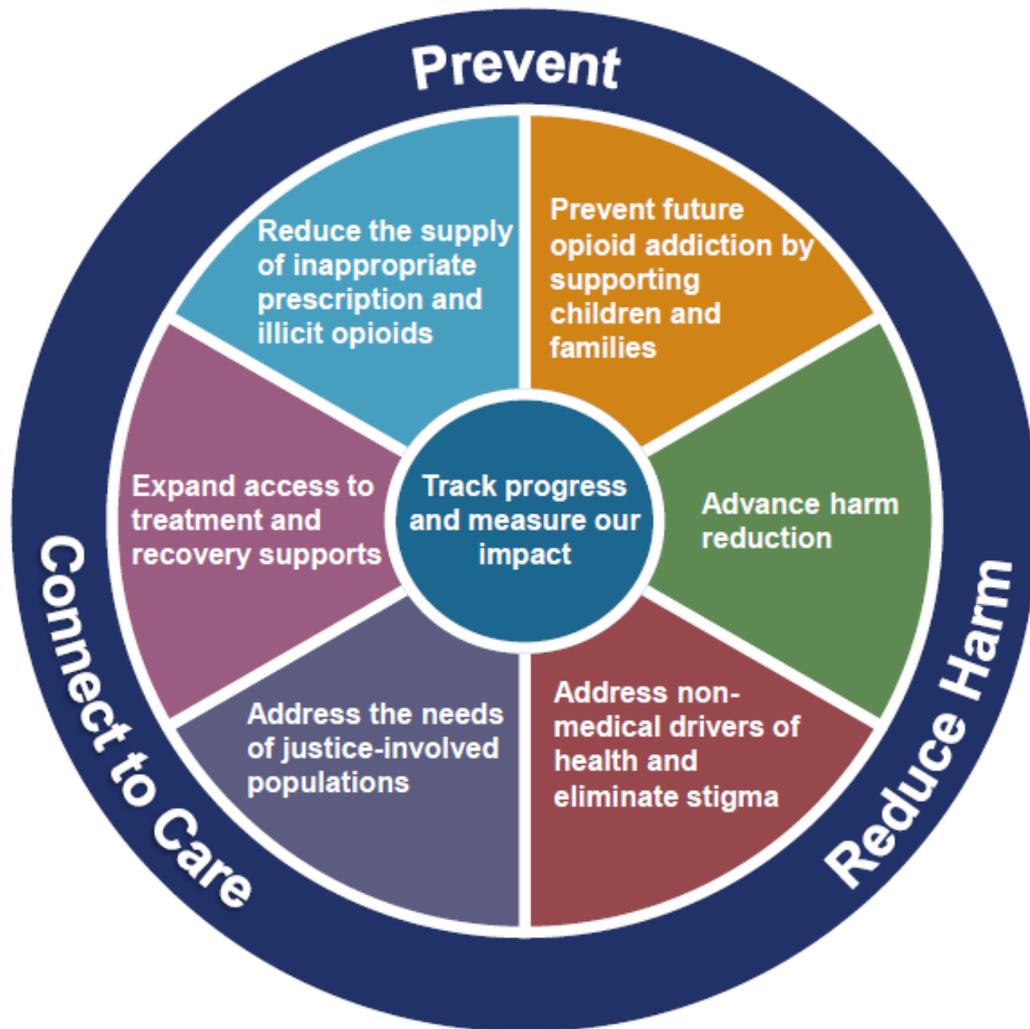
A data dashboard (<https://injuryfreenc.shinyapps.io/OpioidActionPlan/>) was developed to help to track and monitor the metrics in the Opioid Action Plan. From the launch of the plan in June 2017 to June 2019:

- Opioid dispensing decreased by 24 percent.
- Prescriptions for drugs used to treat opioid use disorders increased by 15 percent, and opioid use disorder treatment specifically for uninsured and Medicaid beneficiaries increased by 20 percent.
- There were nearly 10 percent fewer emergency department visits for opioid overdoses in 2018 than in 2017.
- For the first time in five years, the number of unintentional opioid-related overdose deaths among North Carolina residents has fallen. According to preliminary data, unintentional opioid-related overdose deaths decreased by 5 percent in 2018. By contrast, in 2017, deaths increased 34 percent from the year before.

The Opioid Action Plan metrics are updated quarterly. Providers can find the latest update <https://files.nc.gov/ncdhhs/NC-Opioid-Action-Plan-Metrics-Apr-2019.pdf>.

The second edition of this plan (referred to as Opioid Action Plan 2.0) was launched in June 2019. Our updated plan prioritizes:

- **Connection to Care:** Expanding access to treatment and recovery and addressing the needs of justice-involved persons at high risk of death
- **Prevention:** Reducing the supply of prescription and illicit opioids and addressing upstream risk factors by supporting children and families
- **Reducing Harm:** Advancing harm reduction strategies and addressing non-medical drivers of health and stigma



Opioid Action Plan 2.0 also includes local strategies that counties, coalitions and stakeholders can use to fight the opioid epidemic. <https://files.nc.gov/ncdhhs/Menu-of-Local-Actions-to-Prevent-Opioid-Overdose-in-NC-1.4.19.pdf>.

Perinatal Health Strategic Plan

In 2017, North Carolina's infant mortality rate of 7.1 deaths per 1000 live births was tied for 10th worst in the country, and our disparity ratio of 2.5 between black and white babies is persistent and has increased over the past 10 years.

The North Carolina Perinatal Health Strategic Plan was developed to include a focus on infant mortality, maternal health, maternal morbidity, and the health of men and women of childbearing age. In response to our state's perinatal health outcomes, the framework includes a focus on health equity and social determinants of health (SDOH).



This collaborative 12-point plan is divided into the following three goals:

- Improving Health Care for Women and Men
- Strengthening Families and Communities
- Addressing Social and Economic Inequities

The Perinatal Health Strategic Plan Team includes partners from around the state who are interested in improving perinatal health. This Team meets bimonthly to monitor and move the plan into action. The Team also operates with four workgroups – Community & Consumer Engagement, Communications, Data & Evaluation, and Policy. The plan can be accessed via <https://whb.ncpublichealth.com/phsp/>.

Early Childhood Action Plan

A key priority for DHHS is a focus on early childhood and the goal that all North Carolina children get a healthy start and develop to their fullest potential in safe and nurturing families, schools, and communities. To move this vision to action, DHHS spearheaded the development of a statewide Early Childhood Action Plan in February 2019. Following an executive order by Governor Roy Cooper, the plan creates a cohesive vision, sets benchmarks for impact by the year 2025, and establishes shared stakeholder accountability to achieve ten statewide goals for early childhood.

By 2025, DHHS envisions that all North Carolina’s young children from birth through age eight will be:

- **Healthy:** Children are healthy at birth and thrive in environments that support their optimal health and well-being.
- **Safe and Nurtured:** Children grow confident, resilient, and independent in safe, stable, and nurturing families, schools, and communities.
- **Learning and Ready to Succeed:** Children experience the conditions they need to build strong brain architecture and skills that support their success in school and in life.



Providers can read more about North Carolina’s focus on early childhood by visiting www.ncdhhs.gov/early-childhood. There you will find an interactive and publicly available data dashboard reports and updates on 50+ measures.

Healthy Opportunities

All North Carolinians deserve the opportunity for good health. Access to high-quality medical care is critical, but research shows up to 80 percent of a person's health is determined by social and environmental factors and the behaviors that emerge as a result. Through state and local partnerships, DHHS is creating a multi-faceted strategy to unite our communities and health care system to effectively deliver health, not just healthcare. Elements of this strategy include:

Standardized Screening: A multi-disciplinary Technical Advisory Group convened to develop a common set of screening identified need relating to food, housing, transportation, and interpersonal violence. Field testing of the screening questions in safety net clinical settings and telephonic care management showed high levels of acceptability, understandability, and comfort with the screening questions. The highest unmet need identified was food security with 40% of respondents reporting they experienced a period of food insecurity in the past 12 months.

NCCARE360: NCCARE360 is a statewide coordinated network that unites healthcare and human services organizations with a shared technology platform allowing for a coordinated, community-oriented, person-centered approach to delivering care in North Carolina. NCCARE360 allows providers to electronically connect those with identified needs to community resources and allow for a feedback loop on the outcome of that connection. This solution ensures accountability around services delivered, provides a “no wrong door” approach, closes the loop on every referral made, and reports on outcomes of that connection. NCCARE360 has the potential to touch the lives and improve the health of all North Carolinians, including the commercially insured, Medicare, Medicaid, uninsured, military and veteran populations. NCCARE360 is already live in many counties across the state with statewide implementation by the end of 2020.

Healthy Opportunities Pilots: As described more fully in the Medicaid Managed Care section, the *Healthy Opportunities Pilots* present an unprecedented opportunity to: (1) create a system to deliver health-related social needs services; (2) pay for health-related social needs services; and (3) rigorously test and evaluate the impact of providing select, evidence-based non-medical interventions to higher-risk Medicaid Managed Care enrollees.

More information on Healthy Opportunity initiatives can be found at:

<https://www.ncdhhs.gov/about/department-initiatives/healthy-opportunities>

EMERGING PUBLIC HEALTH ISSUES

North Carolina is dealing with several emerging public health issues. Chief among those issues are rising youth e-cigarette use, ensuring early identification of diabetes, addressing environmental contaminants, promoting childhood immunizations, ending the HIV epidemic, and ensuring the health of citizens post disasters (such as hurricanes).

Addressing the E-cigarette Epidemic Among Youth

After nearly two decades of success in lowering NC youth cigarette smoking rates to historic lows, progress is eroding due to what the US Surgeon General recently called “the e-cigarette epidemic among youth.”³

The 2017 NC Youth Tobacco Survey found e-cigarette use increased 894% between 2011 and 2017. E-cigarettes are the most commonly used tobacco product among youth, with 16.9% of high school students currently using them, and even more (23.3%) saying they plan to use them in the next year.

Most e-cigarettes contain nicotine, which is highly addictive and harmful to the developing brain. E-cigarette aerosol contains harmful substances, including nicotine, cancer-causing chemicals, volatile organic compounds, ultrafine particles, and flavorings that have been linked to lung disease and heavy metals.

Currently the Centers for Disease Control and Prevention (CDC) reports that the most popular e-cigarette among young people is JUUL, which is available in many flavors, is shaped like a USB flash drive, and contains as much nicotine as a pack of cigarettes. DPH is working aggressively across the state to effectively protect our kids from all forms of tobacco product use, including e-cigarettes.

It is recommended that health care providers ask about e-cigarettes and vaping when screening patients for tobacco product use; educate patients about the health risks of tobacco product use, including e-cigarettes for young people; and counsel youth and young adults to quit. Patients can utilize free cessation services through referrals to QuitlineNC at 1-800-QUIT-NOW.

Screen, Test, and Refer North Carolinians to Help Prevent Diabetes

As evidenced by the *HNC 2020* data in Appendix A, diabetes rates among adults in NC have not improved in recent years and new strategies need to be employed. DPH is now hosting **diabetesfreenc.com**, a portal for CDC-recognized Diabetes Prevention Programs (DPPs) throughout North Carolina. DPPs are evidence-based year-long programs led by a trained lifestyle coach that provide a group learning environment. The lifestyle coach helps participants

³ Centers for Disease Control and Prevention, Surgeon General’s Advisory on E-cigarette Use Among Youth. Available at https://www.cdc.gov/tobacco/basic_information/e-cigarettes/surgeon-general-advisory/index.html. Accessed September 19, 2019.

develop strategies for healthy eating and physical activity and connects participants with others working on similar goals to prevent type 2 diabetes. DPPs are offered to North Carolinians in both in-person and online formats with various start dates and times.

In conjunction with DPPs, a new service is now being offered by DPH, called the DPP Navigator. DPP Navigators are available to locate DPPs to coordinate enrollment for participants throughout the state. DPP Navigators also receive and coordinate referrals from health care providers, practice referral coordinators, and community-based organizations. DPP Navigators provide bi-directional feedback to referring providers and organizations to include participant enrollment and program completion status.

DPP Navigators are available to assist and receive referrals Monday through Friday from 7am to 7pm via phone 1.844.328.0021; Fax 1.866.336.2329; email: dpreferral@dhhs.nc.gov, and NCCARE360.org. To learn more about the DPP Navigator and to make a referral, contact thenavigator@diabetesfreenc.com.

DHHS also sponsors, through the Office of Minority Health and Health Disparities, the Minority Diabetes Prevention Program, which focuses on preventing prediabetes in our state's minority populations.

Emerging Contaminants

The recent identification of the chemical GenX in the lower Cape Fear River has highlighted a growing awareness of emerging contaminants in our environment. According to the U.S. Environmental Protection Agency, an “emerging contaminant” is a chemical or material that is characterized by a perceived, potential, or real threat to human health or the environment or by a lack of published health standards.

GenX is a member of a class of compounds known as per- and polyfluoroalkyl substances, or PFAS. PFAS are manmade chemicals that are used in some firefighting materials and may be used for many other purposes, including keeping food from sticking to cookware, making sofas and carpets resistant to stains, making clothes and mattresses more waterproof, and making some food packaging resistant to grease absorption. Scientists know very little about the potential health effects from exposure to most of these types of compounds. Health effects linked to elevated exposure to two specific PFAS (PFOA, PFOS) include high cholesterol, thyroid effects, preeclampsia, and certain types of cancer.

DPH's actions in response to detection of PFAS in our environment have included:

- Deriving a North Carolina provisional drinking water health goal for GenX based on the available toxicology literature.
- Reviewing cancer and birth defect incidence rates to determine whether areas in the lower Cape Fear region differ from the state rate.
- Providing outreach to the affected communities, including developing factsheets, participating in community meetings, and providing individual consultations.
- Completing a small investigation with CDC to look for PFAS in blood and urine from 30 residents who live near a PFAS manufacturing plant.

- Working with researchers, other state agencies, and local health departments to address residents' concerns and reduce exposure to these harmful compounds.

More information about these and other actions is available at https://epi.dph.ncdhhs.gov/oe/a_z/genx.html. Providers can connect to DPH's medical consultant for specific questions about occupational and environmental exposures at 919-707-5900.

Immunizations and Measles

Overall vaccination rates among children entering kindergarten in North Carolina remain high (97%) and, while there has been some fluctuation over the past 10 years, complete immunization rates for children 19-35 months has remained approximately 70%. There are, however, certain local areas in the state with lower vaccination rates. These areas and their lower immunization rates are being followed closely as the threat of vaccine preventable diseases is present.

One notable vaccine preventable disease that poses a threat is measles. There have been more measles cases reported nationally in 2019 than in any year since 1992, primarily because of unvaccinated travelers returning to close-knit communities with low measles vaccination rates. Because of successful vaccine campaigns, measles was declared eliminated (meaning the absence of continuous disease transmission for greater than 12 months) from the United States in 2000 and from the Americas in 2002. Since measles elimination, measles cases continue to occur in the United States because of unvaccinated travelers returning from areas with active measles transmission.

No cases of measles have been identified in North Carolina during the first half of 2019. The last measles cases reported in North Carolina occurred in 2018 and were the result of an unvaccinated traveler returning from Europe, who spread the disease to other members of the household.

DPH has been preparing for measles in North Carolina by:

- Providing guidance to clinicians and local health departments to identify populations at risk for measles and implement outbreak prevention strategies
- Working with Vaccine for Children (VFC) physicians and local health departments to ensure adequate vaccine supply through the North Carolina Immunization Program
- Coordinating with the North Carolina State Laboratory of Public Health to provide guidance on measles testing and specimen collection and perform testing for suspected cases
- Developing a measles toolkit for use in the event of a measles case
- Participating in a Measles outbreak tabletop exercise with state and federal stakeholders

Providers can contact their local county health department if they suspect a patient has measles. Providers should encourage measles vaccination for all children beginning at 1 year of age; consider measles vaccination for children 6-11 months of age traveling to areas with ongoing measles transmission; and ensure all clinic and hospital staff have documented immunity to

measles (i.e. two doses of MMR vaccine, laboratory confirmed history of disease, or positive measles IgG titer).

Ending the HIV Epidemic

An area of notable improvement demonstrated by the *HNC 2020* metrics is the decrease in the rate of new HIV diagnosis. Recent advances in HIV treatment and prevention have given us the tools needed to not only further decrease that rate, but to conceivably end the HIV epidemic in the coming decade. These tools include treatment as prevention (TasP), pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP). Achieving this goal will require coordination and strong partnerships between public health officials, physicians, advocates, academic institutions, community leaders, and people living with HIV.

Work on an Ending the Epidemic plan for North Carolina (“EtE North Carolina”) began in 2018. In January 2019, the federal government announced a “getting to zero” plan to eliminate HIV across the United States by 2030 with a focus on selected jurisdictions. Mecklenburg County was the only jurisdiction selected in North Carolina.

EtE North Carolina is an initiative guided by a diverse steering committee from across the state. In June 2019, the DPH, in partnership with the North Carolina AIDS Action Network (NCAAN), began convening meetings across the state to seek input from people living with HIV, those at risk, providers, local public health, and concerned residents. These meetings are providing insight into the best strategies for reducing HIV transmission and linking people to care and viral suppression, with emphasis on interventions that will fit diverse communities and address stigma and social determinants of health. Implementation of EtE North Carolina is anticipated to begin by 2020.

To assist in these statewide efforts, providers can educate all patients about the risk of HIV and the importance of viral suppression for those living with HIV; test each patient once (regardless of history); engage in a sexual health history and test as needed, according to CDC guidelines; and educate at risk patients about PrEP and prescribe PrEP as appropriate.

Climate Change

The American Public Health Association (APHA) has declared climate change "one of the greatest threats to health America has ever faced - it's a true public health emergency". APHA further states: "Climate change exacerbates health inequities, disproportionately harming the most vulnerable among us..."

By mid-century, North Carolina is expected to experience temperatures above 95°F approximately 20 to 40 days per year in most of the state, compared with about 10 days per year today. The most vulnerable residents – children, older adults, those living with existing medical conditions, low-income earners and individuals working outdoors will be most at risk. Increases in earth-warming air pollutants (e.g., CO₂), coupled with warmer temperatures, aggravate asthma and other respiratory conditions.

The global impact of climate change will be felt in North Carolina with sea level rise, increased coastal flooding, contaminated estuaries and aquifers, wild fires, increases in vector-borne and communicable diseases. World-wide crop shortages will intensify civil unrest, famine and displacement of millions.

At their 2019 Annual Meeting, the American Medical Association adopted policy to ensure physicians and physicians-in-training have a basic knowledge of the science of climate change and an awareness of the associated health risks.

On October 29, 2018, Governor Roy Cooper signed Executive Order No. 80 (EO 80), North Carolina's Commitment to Address Climate Change and Transition to a Clean Energy Economy and established the North Carolina Climate Change Interagency Council.

EO 80 sets three targets for North Carolina:

- Reduce statewide greenhouse gas emissions to 40 % below 2005 levels by 2025
- Increase registered, zero-emission vehicles (ZEVs) in North Carolina to at least 80,000 by 2025; and
- Reduce energy consumption in state-owned buildings by 40 percent from 2002-2003 levels by 2025

The window of time to halt rising temperatures is closing. Health professionals can be a powerful voice to support efforts to hasten the transition to alternative energy sources, pollution reduction, sustainable nutrition and land use practices. The New England Journal of Medicine recognizes the following opportunities for health professionals:

- Become familiar with and educate patients regarding climate change-related health conditions and risks
- Promote resilient and sustainable healthcare systems
- Protect vulnerable patients
- Advocate for reducing earth warming air pollutants
- Minimize personal contributions to earth warming air pollutants

Public Health Preparedness – Disaster Response

The Public Health Preparedness and Response program is an important component of NC's statewide emergency and disaster response activities. Hurricane Florence's devastating impact on North Carolina necessitated a prolonged and coordinated response engaging all areas of public health along with a wide network of community partners to help ensure the public's health and safety before, during, and after the storm. Selected public health actions during this response are highlighted below:

- Through strategic coordination between DPH representatives on the State Emergency Response Team (SERT), leaders across the division and local health departments brought resolution to critical issues such as rapid transport (utilizing State Highway Patrol and Civil Air Patrol) of metabolic formula, tetanus vaccines, newborn screening samples,

drinking water screening kits, and other vital State Laboratory of Public Health specimens when all regular means of transport for these items was unavailable.

- DPH staff worked to ensure the safe deployment of over 100 public health nurses to shelters, utilizing nurses from across the state and around the country. Specific efforts have been made to address the acute need for nurses during shelter operations in future responses. Naloxone was made available in shelters to prevent opioid overdoses.
- DPH staff performed surveillance for a variety of health outcomes before, during and after the storm and shared surveillance information widely. A robust surveillance infrastructure was able to rapidly identify and investigate over 40 deaths, 35 chemical exposures, 2 disease outbreaks, and numerous syndromic surveillance signals. Staff also monitored for illnesses in general population shelters, quickly investigated suspect cases, and provided shelter managers and public health nurses with infection control and reporting guidance.
- Continuity of medication and nutrition services was ensured, particularly in areas of providing pediatric formula, increasing options for residents to receive medications at alternate locations, and early release of WIC funds.
- Public health coordinated with other response agencies to rapidly communicate health education, worker safety, and urgent public health information to diverse response groups and the community.
- DPH staff monitored and supported local health department's continuity of operations for counties affected by the hurricane. This included providing counties with technical assistance, support, and resources for mosquito abatement.

For patients with chronic conditions who live and work in vulnerable locations, providers can discuss plans with them about medical service continuity and medication needs should there be an evacuation. Some available resources are readync.org and <https://emergency.cdc.gov/preparedness/index.asp>.

For patients with power dependent medical devices, providers can discuss plans with them and their caregivers regarding how to work with power companies and medical service providers in the event of power outages.

Childhood Lead Exposure

The North Carolina Childhood Lead Poisoning Prevention Program (CLPPP) coordinates clinical and environmental services to eliminate childhood lead poisoning. Blood lead testing is recommended for all NC children and required for Medicaid children at ages 1 and 2 years. In 2017, the testing rate among all NC children at those ages was 54.9%, and among Medicaid children at those ages was 76.7%. CLPPP continues to work to increase these testing rates. The percent of NC children ages 1-2 years old with initial elevated blood lead levels (≥ 5 micrograms/deciliter) decreased to 3.1% during 2010-2014.

Building on strategies that have reduced blood lead levels in children, the CLPPP is expanding environmental testing to prioritize water outlets used for drinking and food preparation in child care centers. Under this policy, all tap water outlets used for drinking or food preparation will be sampled following a protocol recommended by the Environmental Protection Agency (EPA) for

training, testing and taking action. Test results with levels exceeding EPA guidelines will require follow up to isolate the source of contamination and, if needed, a plan of remediation.

In August 2019, the NC Commission for Public Health adopted a proposed rule amendment that requires child care centers to periodically test for lead in water from outlets used for drinking and food preparation and to mitigate if testing reveals lead concentrations above the lead hazard level.

Additional priority will be given to educating stakeholders on sources of lead exposure in food additives, hobbies, occupations, do-it-yourself home renovations and children's products. CLPPP has continued outreach to medical providers to increase awareness that prenatal testing for lead exposure and home investigations for elevated blood lead levels is now provided by State and local health programs and is covered under Medicaid services.

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	Status	State Goal	United States
Tobacco Use					
Decrease the percentage of adults who are current smokers	21.8% (2011)	17.4% (2018)	Improving	13.0%	16.1% (2018)
Decrease the percentage of high school students reporting current use of any tobacco product	25.8% (2009)	28.8% (2017)	Little or no detectable change	15.0%	19.6% (2017)
Decrease the percentage of people exposed to secondhand smoke in the workplace in the past seven days	9.2% (2011)	9.6% (2018)	Little or no detectable change	0%	Not available
Physical Activity and Nutrition					
Increase the percentage of high school students who are neither overweight nor obese	72.0% (2009)	69.1% (2017)	Little or no detectable change	79.2%	69.6% (2017)
Increase the percentage of adults meeting CDC Aerobic Recommendations	46.8% (2011)	49.2% (2017)	Little or no detectable change	60.6%	50.6% (2017)
Increase the percentage of adults who consume fruit one or more times per day.	59.2% (2011)	62.6% (2017)	Little or no detectable change	69.7%	63.4% (2017)
Increase the percentage of adults who consume vegetables one or more times per day.	78.1% (2011)	84.4% (2017)	Improving	84.7%	82.0% (2017)
Injury and Violence					
Reduce the unintentional poisoning mortality rate (per 100,000 population)	11.0 (2008)	23.5 (2017)	Getting worse	9.9	20.1 (2017)
Reduce the unintentional falls mortality rate (per 100,000 population)	8.1 (2008)	11.2 (2017)	Getting worse	5.3	9.4 (2017)
Reduce the homicide rate (per 100,000 population)	7.5 (2008)	7.0 (2017)	Little or no detectable change	6.7	6.2 (2017)
Maternal and Infant Health					
Reduce the infant mortality racial disparity between whites and African Americans	2.45 (2008)	2.50 (2017)	Getting worse	1.92	2.56 (2017)
Reduce the infant mortality rate (per 1,000 live births)	8.2 (2008)	7.1 (2017)	Improving	6.3	5.8 (2017)
Reduce the percentage of women who smoke during pregnancy	10.9% (2011)	8.7% (2017)	Improving	6.8%	6.9% (2017)
Sexually Transmitted Disease and Unintended Pregnancy					
Decrease the percentage of pregnancies that are unintended	34.7% (2012)	32.2% (2016)	Little or no detectable change	31.2%	Not available
Reduce the percentage of positive results among individuals aged 15 to 24 tested for chlamydia	9.7% (2009)	11.5% (2017)	Getting worse	8.7%	Not available
Reduce the rate of new HIV infection diagnoses (per 100,000 population)	24.7 (2008)	12.8 (2017)	Target met	22.2	11.8 (2017)

	North Carolina Baseline	North Carolina Current		State Goal	United States
Substance Abuse					
Reduce the percentage of high school students who had alcohol on one or more of the past 30 days	35.0% (2009)	26.5% (2017)	Improving	26.4%	29.8% (2017)
Reduce the percentage of traffic crashes that are alcohol-related	5.7% (2008)	4.1% (2017)	Target met	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)	9.8% (2016–17)	Little or no detectable change	6.6%	10.9% (2016–17)
Mental Health					
Reduce the suicide rate (per 100,000 population)	12.4 (2008)	14.5 (2017)	Getting worse	8.3	14.0 (2017)
Decrease the average number of poor mental health days among adults in the past 30 days	3.7 (2011)	3.9 (2018)	Little or no detectable change	2.8	Not available
Reduce the rate of mental health-related visits to emergency departments (per 10,000 population)	92.0 (2008)	103.3 (2014)	Getting worse	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)	60.4% (2016)	Target met	56.4%	46.5% (2016)
Decrease the average number of decayed, missing or filled teeth among kindergartners	1.5 (2008–09)	1.6 (2015-16)	Little or no detectable change	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)	45.5% (2018)	Little or no detectable change	38.4%	41.3% (2018)
Environmental Health					
Increase the percentage of air monitor sites meeting the current ozone standard of 0.075 ppm	62.5% (2007–09)	100% (2014–16)	Target met	100%	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)	96.3% (2016)	Target met	95.0%	91% (2016)
Reduce the mortality rate from work-related injuries (per 100,000 equivalent full-time workers)	3.9 (2008)	3.9 (2017)	Little or no detectable change	3.5	3.5 (2017)
Infectious Disease and Foodborne Illness					
Increase the percentage of children aged 19–35 months who receive the recommended vaccines	77.3% (2007)	70.9% (2017)	Little or no detectable change	91.3%	70.4% (2017)
Reduce the pneumonia and influenza mortality rate (per 100,000 population)	19.5 (2008)	18.0 (2017)	Improving	13.5	14.3 (2017)
Decrease the average number of risk factor violations per inspection	2.8 (2014)	3.0 (2017)	Little or no detectable change	2.6	Not available

	North Carolina Baseline	North Carolina Current	Status	State Goal	United States
Social Determinants of Health					
Decrease the percentage of individuals living in poverty	16.9% (2009)	14.7% (2017)	Improving	12.5%	13.4% (2017)
Increase the four-year high school graduation rate	71.8% (2008–09)	86.3% (2017–18)	Improving	94.6%	84.0% (2015-16)
Decrease the percentage of people spending more than 30 percent of their income on rental housing	41.8% (2008)	42.4% (2017)	Little or no detectable change	36.1%	46.0 (2017)
Chronic Disease					
Reduce the cardiovascular disease mortality rate (per 100,000 population)	256.6 (2008)	220.2 (2017)	Improving	161.5	218.1 (2017)
Decrease the percentage of adults with diabetes	10.9% (2011)	12.5% (2018)	Little or no detectable change	8.6%	10.9% (2018)
Reduce the colorectal cancer mortality rate (per 100,000 population)	15.7 (2008)	12.8 (2017)	Improving	10.1	13.5 (2017)
Cross-cutting					
Increase average life expectancy (years)	77.5 (2008)	77.6 (2017)	Little or no detectable change	79.5	78.6 (2016)
Increase the percentage of adults reporting good, very good or excellent health	80.4% (2011)	80.9% (2018)	Little or no detectable change	90.1%	82.7% (2018)
Reduce the percentage of non-elderly uninsured individuals (aged less than 65 years)	20.4% (2009)	12.6% (2017)	Improving	8.0%	10.2% (2017)
Increase the percentage of adults who are neither overweight nor obese	34.9% (2011)	32.0% (2018)	Little or no detectable change	38.1%	33.4% (2018)