



N.C. Department of Health and
Human Services
Division of Public Health
Annual Report to the N.C. Medical Society
October 2012



The cover image is the new State Laboratory of Public Health and the Office of the Chief Medical Examiner facility, opening October 2012 (Julie Henry, photographer).



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

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Beverly Eaves Perdue, Governor
Albert A. Delia, Acting Secretary

Laura Gerald, MD, MPH
State Health Director

October 2012

Greetings:

It is my pleasure to present to the North Carolina Medical Society the 2012 Annual Report for the North Carolina Division of Public Health. Despite continued economic challenges and evolving health care and public health systems, this has been an extremely active and productive year in public health. State and local public health systems remain focused on a healthy North Carolina while adapting and strengthening public health through enhanced collaborations and improved efficiency and effectiveness.



Healthy North Carolina (HNC) 2020 is our blueprint for achieving health outcome goals and monitoring our progress. Though DPH is the state agency charged with leading the HNC 2020 effort, many organizations across diverse sectors are involved in the programs and services required to meet these goals. In addition, in order to ensure effectiveness, both state and local public health departments are increasing the implementation of evidence-based strategies by engaging in quality improvement initiatives and including those principles in all that we do.

This Annual Report highlights some of the DPH activities that are addressing the state's HNC 2020 health improvement goals. We have focused on those areas and initiatives that should be of particular interest to health professionals. Examples include: continued emphasis on preventable causes of death, particularly tobacco use and physical inactivity and unhealthy eating; concerns regarding infant mortality and immunization rates that are going in the wrong direction; continued surveillance and reporting of outbreaks; enhanced protection from foodborne disease; new challenges in mosquito-borne disease; opening of a new facility for the State Laboratory of Public Health and Office of the Chief Medical Examiner; impact of unintentional poisoning deaths and a description of the NCMS Opioid Reduction Task Force; and an update on the Community Transformation Grant Project and the partnership with Area Health Education Centers and community providers.

The Division of Public Health is working to protect and improve the health of North Carolinians. Our most pressing health concerns today are complex and require comprehensive solutions and sustained and focused attention to the needs of our most vulnerable and underserved populations. These solutions cannot be achieved by either public health or health care delivery systems alone. As you can see from the Report, there are many examples of and opportunities for collaborations and partnerships among public health and health care professionals in North Carolina. These collaborative efforts are critical if we are to attain our highest state of health and well-being.

Sincerely,

A handwritten signature in black ink, appearing to read "Laura I. Gerald".

Laura I. Gerald, MD, MPH



North Carolina Public Health
Working for a healthier and safer North Carolina
Everywhere. Everyday. Everybody.



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A Snapshot of Our State¹

Source: North Carolina Center for Health Statistics.

A Typical Day in North Carolina: Births 2011		
Category	Average Number	Year Total
Live Births	330	120,403
Births to Teens (Ages 10-14)	0	146
Births to Teens (Ages 15-19)	30	11,061
Low Birthweight Babies	30	10,885
Births to Unmarried Women	135	49,182

A Typical Day in North Carolina: Deaths 2011		
Category	Average Number	Year Total
Deaths	218	79,680
Unintentional Injury Deaths	12	4,239
Cancer Deaths	50	18,201
Homicides	1	519
Suicides	3	1,196
Infant Deaths (<1 year old)	2	866

¹ North Carolina Vital Facts, 2011. Available at: www.schs.state.nc.us/schs/vitalstats/2011/day.html.

Life Expectancy and Years of Potential Life Lost for North Carolinians

In 2011, the life expectancy at birth for North Carolinians was 78.2 years, compared with the U.S. average of 78.7 years.^{2,3} This is more than three years greater than the state's life expectancy at birth in 1990 and five years more than the life expectancy in 1980.^{4,5}

Cancer, heart disease, chronic lung disease, stroke and unintentional injuries (excluding motor vehicle) make up the top five causes of death in the state (see Table 1). In 2011, North Carolinians who died lost an average of 10 years of life due to early death; with accidental injuries (motor vehicle and other unintentional) resulting in the highest average years of life lost.

Table 1. 2011 North Carolina 10 Leading Causes of Death: Total Deaths and Years of Potential Life Lost *				
Rank	Cause	Total Deaths	Average Years of Life Lost	Total Years of Life Lost
1	Cancer	18,201	10.6	192,340
2	Heart disease	16,959	7.6	129,428
3	Chronic lower respiratory diseases	4,705	6.2	29,191
4	Stroke	4,290	5.6	24,082
5	Other unintentional injuries	2,996	23.2	69,582
6	Alzheimer's disease	2,820	0.9	2,427
7	Diabetes	2,276	10.4	23,648
8	Kidney diseases	1,705	6.7	11,384
9	Pneumonia & influenza	1,610	6.2	9,960
10	Motor vehicle injuries	1,243	36.9	45,949
Total Deaths — All Causes		79,680	10.4	832,222

*Based on average U.S. life expectancy of 78.7 years

² N.C. Division of Public Health, State Center for Health Statistics. North Carolina Death Certificate data files, 2011.

³ Murphy SL, Xu JQ, Kochanek KD. Deaths: Preliminary data for 2010. *National Vital Statistics Reports*. 2012;60(4). Hyattsville, MD: National Center for Health Statistics. Available at: www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_04.pdf.

⁴ N.C. Division of Public Health, State Center for Health Statistics. Life Expectancy: North Carolina 1990-1992, State-Level. Available at: www.schs.state.nc.us/schs/data/lifexpectancy/.

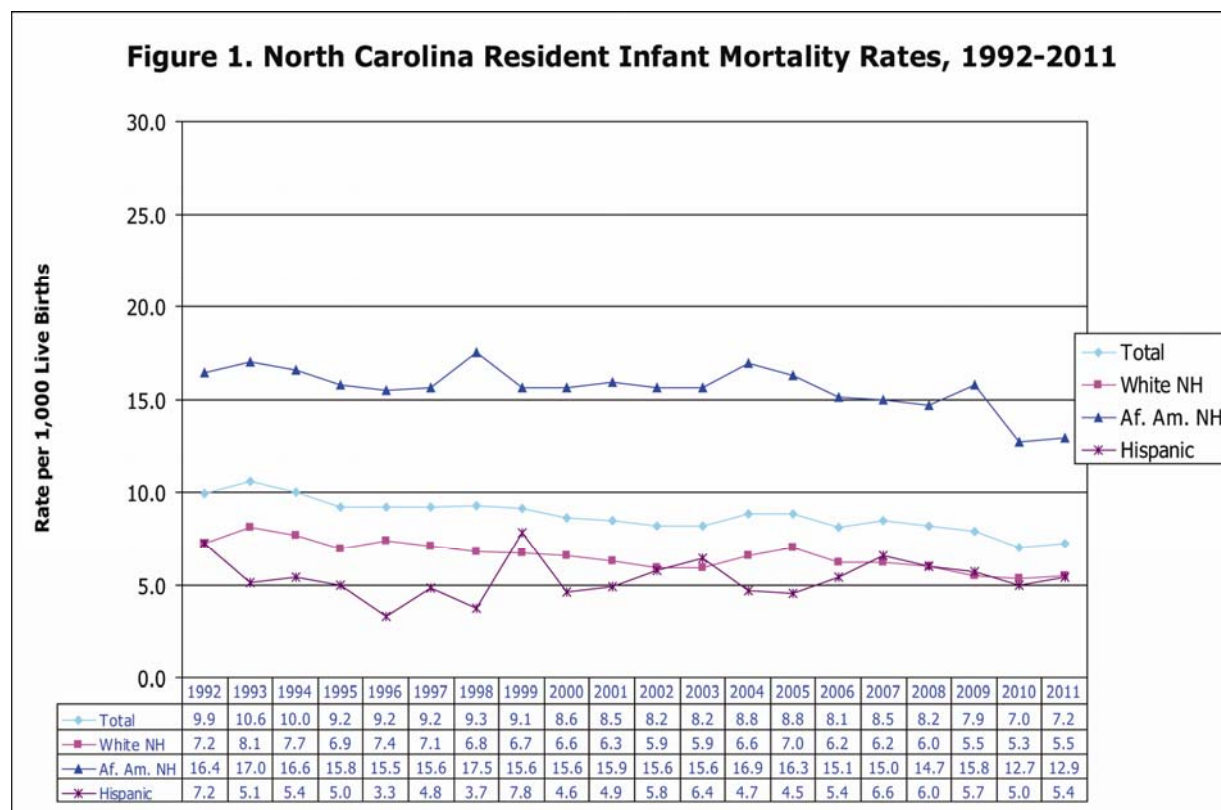
⁵ National Center for Health Statistics. U.S. Decennial Life Tables for 1979-81, Volume II, State Life Tables, No. 34, North Carolina. January 1986. DHHS Publication No. PHS-86-1151-34. Available at: www.cdc.gov/nchs/data/lifetables/life79ncacc.pdf.

Protecting and Improving Our Children's Health

Infant Mortality in North Carolina

North Carolina's overall infant mortality rate rose slightly in 2011, after falling to its lowest level in the state's history in 2010. The state's overall infant (<1 year old) mortality rate was 7.2 deaths per 1,000 live births in 2011 which represents an increase of 2.9 percent from the 2010 rate of 7.0. Over the past 20 years (see Figure 1), the infant death rate has fallen more than 27 percent.

In 2011, Non-Hispanic African Americans continued to experience infant mortality rates more than two times (2.35) higher than non-Hispanic whites; this disparity remains virtually unchanged from 2010 (2.40). African American women also continue to experience markedly higher rates of low birth weight babies (14.2%) than whites (7.5%).⁶



The 2011 Infant Mortality Report also shows that deaths attributed to Sudden Infant Death Syndrome (SIDS) continue to decrease from 53 deaths in children (<1 year old) in 2010 to 11 in 2011. Deaths from accidental suffocation also decreased from 13 in 2010 to 11 in 2011.

⁶ A county-by-county listing of final infant death rates and birth characteristics for 2011 is available at www.schs.state.nc.us/SCHS/deaths/ims/2011.

Immunization

Historically, as a state which provided vaccine universally to all children, regardless of insurance status, North Carolina ranked among the highest states for overall vaccination series coverage. Unfortunately, with the loss of universal funding, this is no longer the case. The 2011 National Immunization Survey (NIS) for children aged 19-35 months indicates that North Carolina’s children now tend to be vaccinated at a slightly lower rate than the national average for the majority of childhood vaccines and the overall vaccination series (see Table 2).

Table 2. 2011 Comparison of Estimated Vaccine Coverage between North Carolina and Nation		
	Estimated Vaccine Coverage Percentage	
Vaccine	North Carolina	National Average
DTaP (4 doses)	81.3±7.5	84.6±1.0
Polio (3 doses)	93.5±5.0	93.9±0.6
MMR (1 dose)	92.3±5.1	91.6±0.8
Hib (3 dose - PS)*	93.0±5.3	94.2±0.6
Hepatitis B (3 doses)	90.8±5.3	91.1±0.7
Varicella (1 dose)	89.6±5.6	90.8±0.7
Pneumococcal (4 doses)**	84.5±7.1	84.4±1.0
Hepatitis A (2 doses)**	40.8±7.6	52.2±1.4
Rotavirus (3+ doses)**	70.5±7.6	67.3±1.3
Overall (4:3:1:0:3:1:4 series)***	73.3±7.7	73.6±1.2

* Availability of Hib vaccine was affected by a nationwide shortage from 2007 to 2009.
 ** Pneumococcal, Hepatitis A and Rotavirus vaccines are not required in North Carolina.
 *** The overall series (4 DTaP: 3 Polio: 1 MMR: 0 Hib: 3 Hep B: 1 Varicella: 4 Pneumococcal) does not take Hib vaccination coverage into account because of the nationwide shortage.

NIS data from 2009 ranked North Carolina fourth in the country for overall vaccination series coverage. This ranking represented the measure for the last year of the state’s universal vaccine program. In 2010, North Carolina’s ranking fell to 13th among the 50 states. In 2011, North Carolina’s ranking fell even further to 24th.

The Immunization Branch continues to oversee the federally-funded Vaccines for Children (VFC) Program in North Carolina. The state estimates that approximately 67 percent of children in North Carolina qualify for VFC and are being served by 1,300 public and private health care facilities that participate in the N.C. Immunization Program (NCIP). The North Carolina Immunization Registry (NCIR) is being utilized by 94 percent of program participants.

In fall 2011, the Immunization Branch conducted immunization awareness outreach through media campaigns focusing on immunizations through the lifespan, meningitis vaccination among college students and influenza prevention. The Immunization Branch plans to continue this campaign in the fall of 2012.

Early Intervention Services

Early Intervention (EI) for very young children with developmental disabilities or delays can improve the developmental trajectory for these children and support their families. North Carolina's EI efforts are supported through the U.S. Department of Education Office of Special Education Programs under the federal Part C of the Individuals with Disabilities Education Act, as well as through state appropriations and receipts for direct services. The EI program serves infants and toddlers to age 3 who have developmental disabilities or delays or established conditions that lead to developmental delay.

The EI program monitors and reports progress that enrolled children make each year as a result of receiving EI services in three outcomes areas: positive social-emotional skills, acquisition and use of knowledge and skills and use of appropriate behaviors to meet their needs.

Through its outreach efforts, North Carolina's EI program is serving an increasing number of eligible children in our state since 2000 (see Table 3).

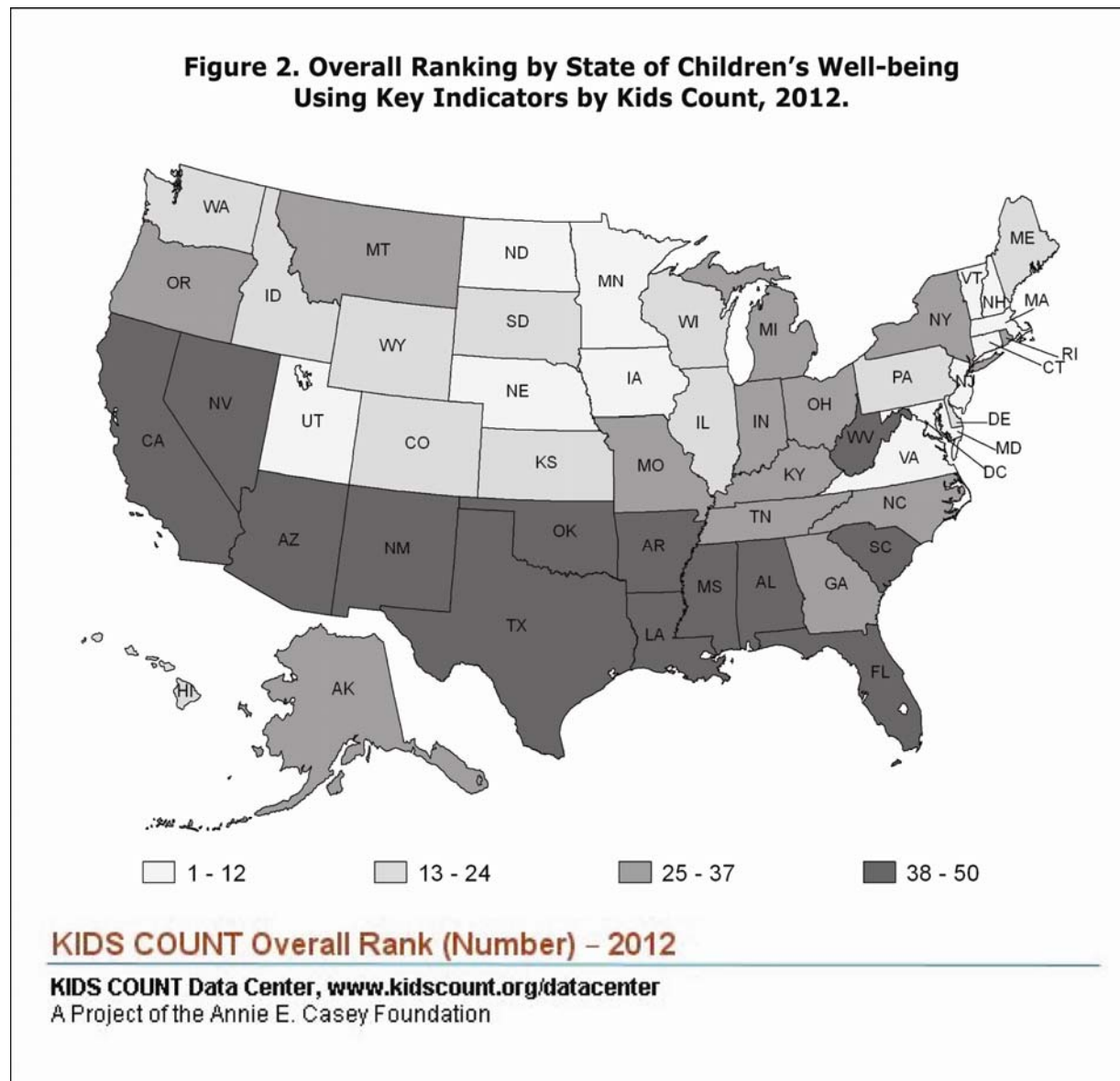
Table 3. Numbers of Infants and Toddlers Enrolled in the Early Intervention Program, and Percentage of North Carolina Population of Infants and Toddlers, by Fiscal Year

Fiscal Year	Infants and Toddlers Enrolled	Percent Enrolled, of N.C. Population of Infants and Toddlers
FY 2000-2001	8,287	2.4%
FY 2001-2002	9,144	2.7%
FY 2002-2003	10,503	3.0%
FY 2003-2004	10,826	3.1%
FY 2004-2005	12,430	3.7%
FY 2005-2006	15,160	4.4%
FY 2006-2007	15,048	4.3%
FY 2007-2008	15,869	4.3%
FY 2008-2009	17,606	4.6%
FY 2009-2010	18,271	4.7%
FY 2010-2011	19,523	5.4%

Many more children could benefit from the Early Intervention Program than are currently eligible. For example, non-enrolled infants and toddlers who are at greater risk due to conditions represented in the Kids Count data are likely candidates for preventive and intervention supports.

Kids Count Rankings

In 2012, North Carolina ranks 34 among the 50 states (1=best, 50=worst) for key indicators of children's well-being as measured by Kids Count (see Figure 2). In 2011, North Carolina ranked 38. The 10 measures included in the overall ranking are: (1) percent low birthweight babies; (2) infant mortality rate (<1 year old); (3) child death rate (ages 1-14); (4) rate of teen deaths (ages 15-19); (5) teen birth rate; (6) percent of children living with parents who do not have full-time, year-round employment; (7) percent of teens not in school and not high school graduates; (8) percent of teens not attending school and not working; (9) percent of children in poverty and (10) percent of children in single parent families.



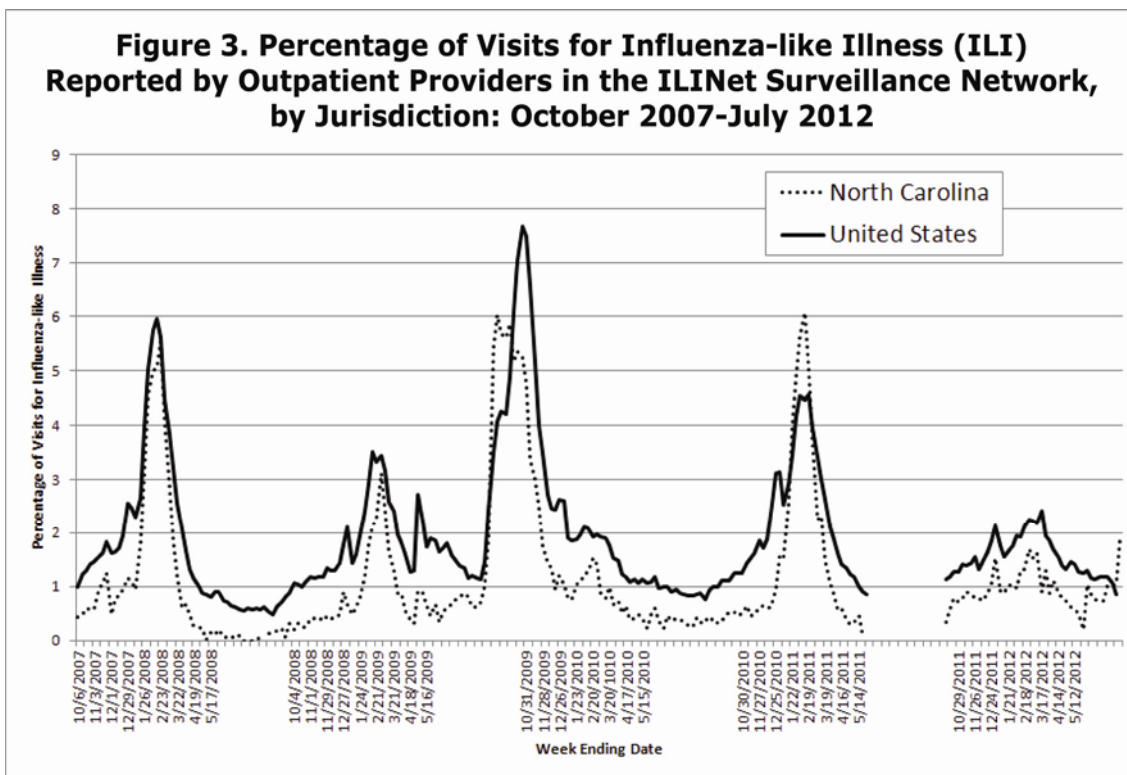
Source: <http://datacenter.kidscount.org/DataBook/2012/OnlineBooks/KIDSCOUNT2012DataBookFullReport.pdf>.

Surveillance

Seasonal Influenza

Influenza (flu) continues to be a major cause of illness and death for North Carolinians. During the 2010-11 flu season, 10 pediatric deaths were attributable to an influenza-associated illness. The value of national influenza surveillance systems was demonstrated by the early detection of the pandemic H1N1 strain in 2009 and more recently by the detection of influenza A H3N2 variant (H3N2v) outbreaks associated with swine contact. In response to H3N2v outbreaks, the Division of Public Health (DPH) has taken steps to enhance outpatient, hospital-based, and laboratory surveillance systems and to provide relevant information to providers and the public.

As during previous years, DPH will continue to provide updated surveillance data throughout the flu season so that doctors and the public have access to information about the types of flu viruses that are circulating, when flu activity has begun in their area and other information needed to make informed decisions about influenza treatment and prevention. As shown in Figure 3 below, the timing and intensity of influenza activity in the state can vary greatly from year to year.



Updated influenza information and guidance for the public and providers can be found at www.flu.nc.gov.

Infections in Health Care Settings

One out of every 20 patients hospitalized in the United States will develop a healthcare-associated infection (HAI) while receiving treatment for other conditions. These 1.7 million infections result in 99,000 deaths each year and cost our health care system \$28 to \$33 billion annually.

The North Carolina HAI Prevention Program was formed within the Communicable Disease Branch in 2009–10 to protect North Carolinians from these devastating infections. The HAI Prevention Program has four main objectives:

1. To conduct statewide surveillance for HAIs
2. To provide useful, unbiased information to health care providers and consumers
3. To promote and coordinate prevention efforts
4. To respond to outbreaks in health care settings

Since January 2012, all N.C. hospitals have been required by law to report data to the state regarding:

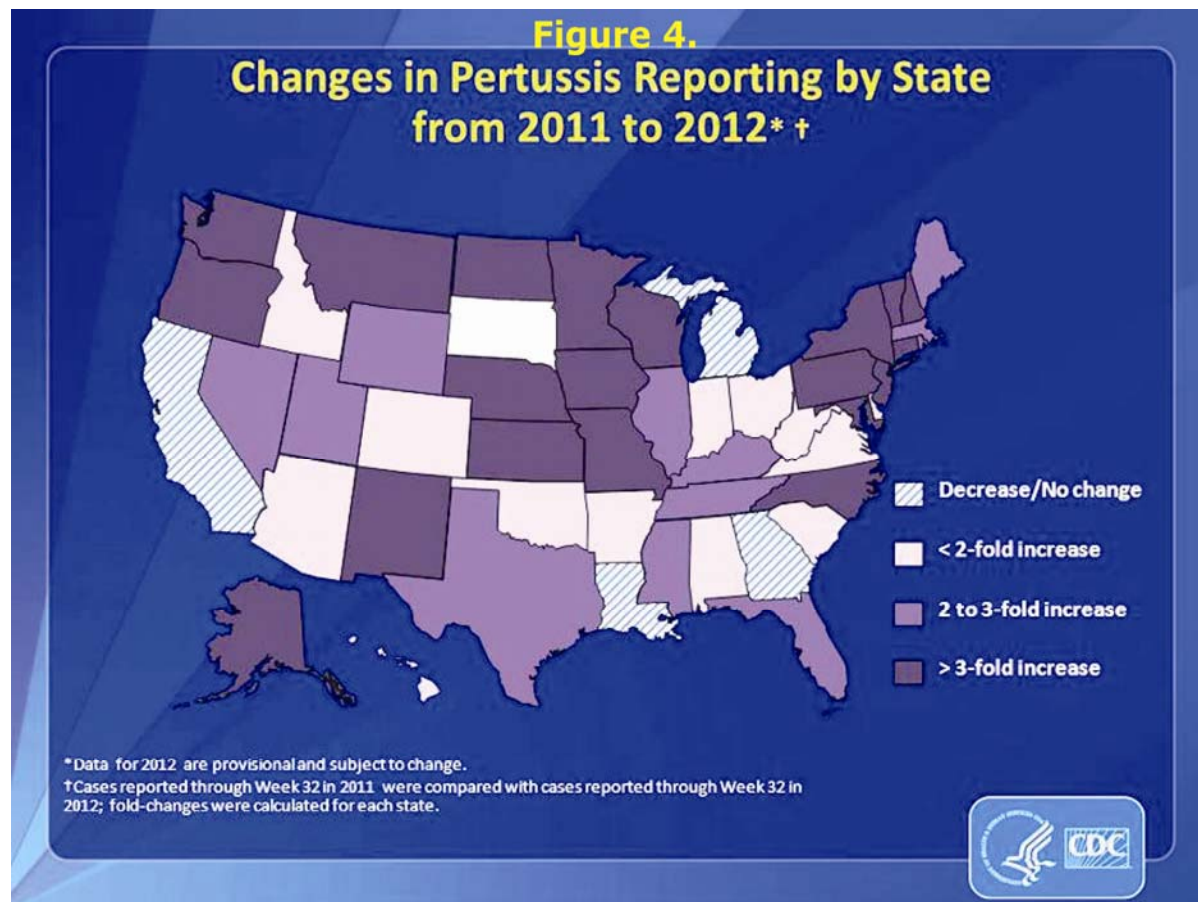
- Surgical site infections following colon surgeries and abdominal hysterectomies, and
- Central line-associated bloodstream infections and catheter-associated urinary tract infections in intensive care units.

A report detailing methods for HAI surveillance will be released in October with quarterly reports containing hospital-specific data on each of these HAIs to begin in 2013.

The HAI Prevention Program has continued to work with the North Carolina Center for Hospital Quality and Patient Safety and other partners on collaborative prevention efforts to reduce central line-associated bloodstream infections. Additionally, the HAI Prevention Program has collaborated with partners to assess the prevalence of carbapenem-resistant enterobacteriaceae in the state and to engage with long-term care facilities in HAI prevention efforts. Recent experience with blood-borne pathogen outbreaks in health care settings has led North Carolina to become one of three states participating in the Centers for Disease Control and Prevention's (CDC) One & Only Campaign. The campaign seeks to raise awareness among healthcare providers and patients about safe injection practices, focusing on the principle of "one needle, one syringe, only one time." The HAI Prevention Program has been collaborating with partners in our state to spread campaign messages and materials throughout North Carolina.

Pertussis

Pertussis (*Bordetella pertussis*) cases are on the rise in North Carolina and across the country. The number of pertussis cases identified in North Carolina during the first half of 2012 was more than three times greater than the number identified during the same period in 2011 (see Figure 4). Although much of this increase was attributable to a large outbreak in Alamance County, cases have been reported from all regions of the state.



Recently, children aged 7–10 have constituted a growing proportion of nationally reported cases—30 percent in 2012. This highlights the challenges of waning immunity following the childhood series and the importance of the Tdap booster. This year, an increase in the number of cases reported among infants (most at risk for severe illness and death) has been observed.

The North Carolina Immunization Program has taken steps to increase access to Tdap vaccine for adults and adolescents. Although coverage with Tdap has improved in North Carolina thanks to a sixth grade entry requirement (78% among adolescents aged 13–17 during 2011), coverage among adults remains low. DPH also continues to work with local health departments and providers statewide to ensure that cases are appropriately diagnosed and rapidly reported so that control measures can be put in place to prevent additional cases and outbreaks.

Hepatitis C

An estimated 150,000 North Carolinians are chronically infected with the hepatitis C virus (HCV), the majority of who are unaware of their infection. Progressive liver damage caused by chronic HCV infection is the leading indication for orthotopic liver transplantations in the United States. Unfortunately, the silent nature of this infection results in many HCV-positive individuals being diagnosed late in the course of their disease when harm reduction counseling and medical therapies are less likely to be effective. In light of recent advances in the efficacy of HCV treatment regimens, identifying infected individuals early in the course of their disease and linking them to care will significantly reduce HCV-associated morbidity and mortality.

In August 2012, CDC expanded its HCV testing recommendations to include the one-time HCV screening of all persons born during 1945 to 1965, regardless of known exposure risk histories. This new recommendation stems from national data showing that 45 percent of HCV-infected individuals report no known risk of exposure AND persons born during 1945-65 (“baby boomers”) account for three-quarters of chronic HCV infections in the United States.

The new testing recommendation is meant to augment, not replace, the CDC’s original testing guidelines which recommend routine HCV testing of individuals with known risk factors, including:

- A history of injection drug use
- Persons ever on chronic hemodialysis
- Recipients of transfusions or organ transplantations before July 1992
- Recipients of clotting factor concentrates produced prior to 1987
- Health care workers exposed to HCV-infected blood
- Children born to HCV-positive women
- HIV-infected individuals

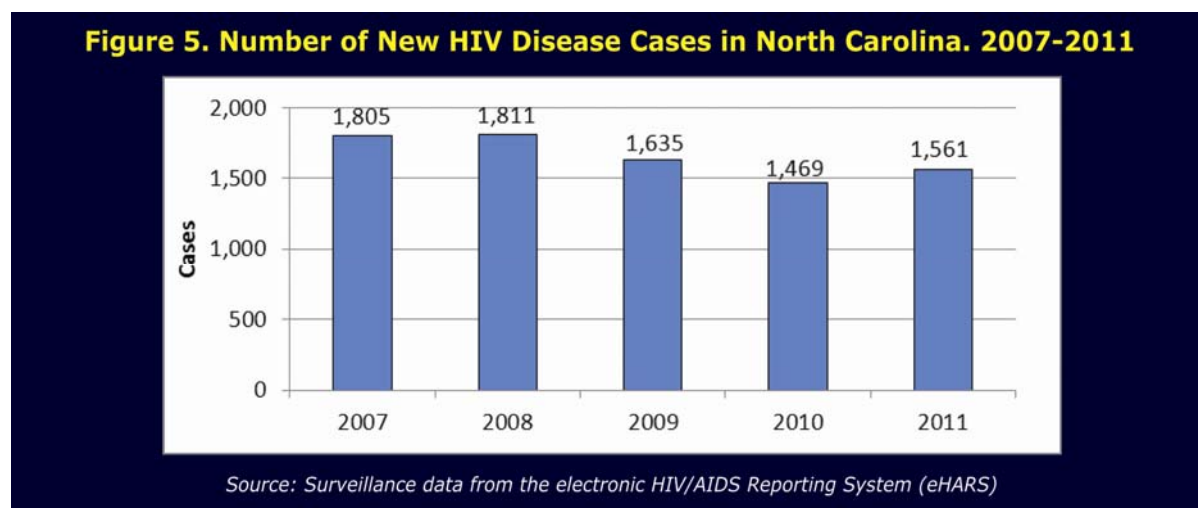
Health care providers should consider Hepatitis C screening among all high risk persons.

DPH is also working to improve surveillance of chronic HCV infection and is in the early stages of implementing Electronic Laboratory Reporting of HCV-positive test results from hospitals and laboratories throughout the state.

HIV Prevention and Care Strategy

After 30 years of the HIV/AIDS epidemic, we have reached an exciting period with a great deal of hope. The 2010 National HIV/AIDS Strategy (NHAS) cited three critical strategies for the control and treatment: (1) reducing the number of new infections, (2) increasing access to care and therefore improving health outcomes and (3) reducing health disparities and inequalities. DPH intends to accomplish these goals through a three-pronged statewide approach to: (1) identify new cases of HIV early (testing); (2) link newly identified HIV-positive individuals into care and treatment programs (linkage) and (3) keep HIV-positive individuals in care and treatment (retention).

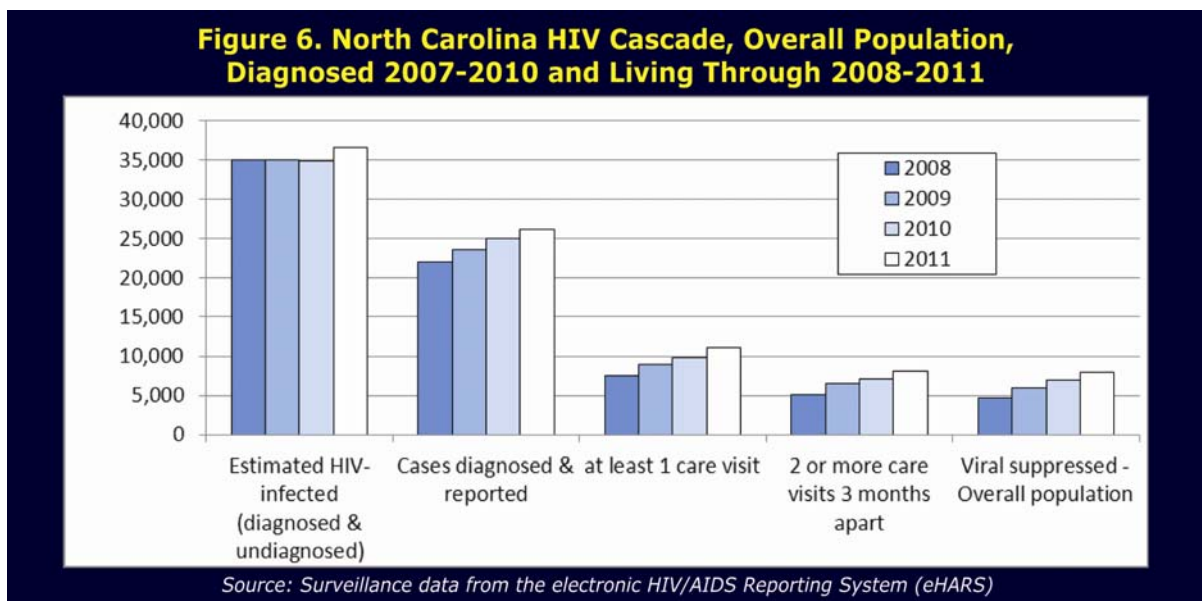
1) Testing: Using CDC guidance, DPH has worked to standardize and expand HIV testing. Comprehensive HIV testing is now provided statewide in jails, substance abuse centers and in non-traditional community venues. The result has been a dramatic increase in the number of HIV tests performed. In 2006, the State Laboratory of Public Health processed 144,000 HIV tests; by the end of 2010, an estimated 250,000 HIV tests were processed, a 73 percent increase. Despite a slight increase in 2011, expanded and targeted testing coupled with enhanced linkage and care efforts begun in late 2006 has contributed to an 18 percent decline in new HIV cases in 2009 and 2010 (Figure 5). The Unit is also investigating methods to identify the nearly 7,000 people in North Carolina who are unaware they are HIV positive. Of particular emphasis is addressing racial disparities; while blacks make up approximately 22 percent of the population, they account for nearly 65 percent of prevalent cases.



2) Linkage: In 2012 more than 6,800 people without access to medication were being served through the AIDS Drug Assistance Program (ADAP). Access to medication continues to be critical to the survival of HIV patients. In 2011, University of North Carolina at Chapel Hill researchers found that when HIV-positive people take their anti-retrovirals as prescribed, they are 96 percent less likely to transmit virus to others, as well as live longer, healthier lives. Retaining clients in care is an individual and a public health intervention, and early treatment can have a major impact on the spread of HIV disease.

- 3) Retention:** Several efforts are underway to assure that clients are retained in care:
- a four-year national initiative involves implementation of bridge counseling and data sharing;
 - Disease Intervention Specialist (DIS) staff provide face-to-face notification to diagnosed individuals and their partners, assuring referrals to first care;
 - regional networks of care follow up on missed appointments and secure transportation; and
 - a newly awarded Care and Prevention in the United States (CAPUS) grant promises to address the health inequities among minority populations and develop interventions to overcome barriers to staying in care.

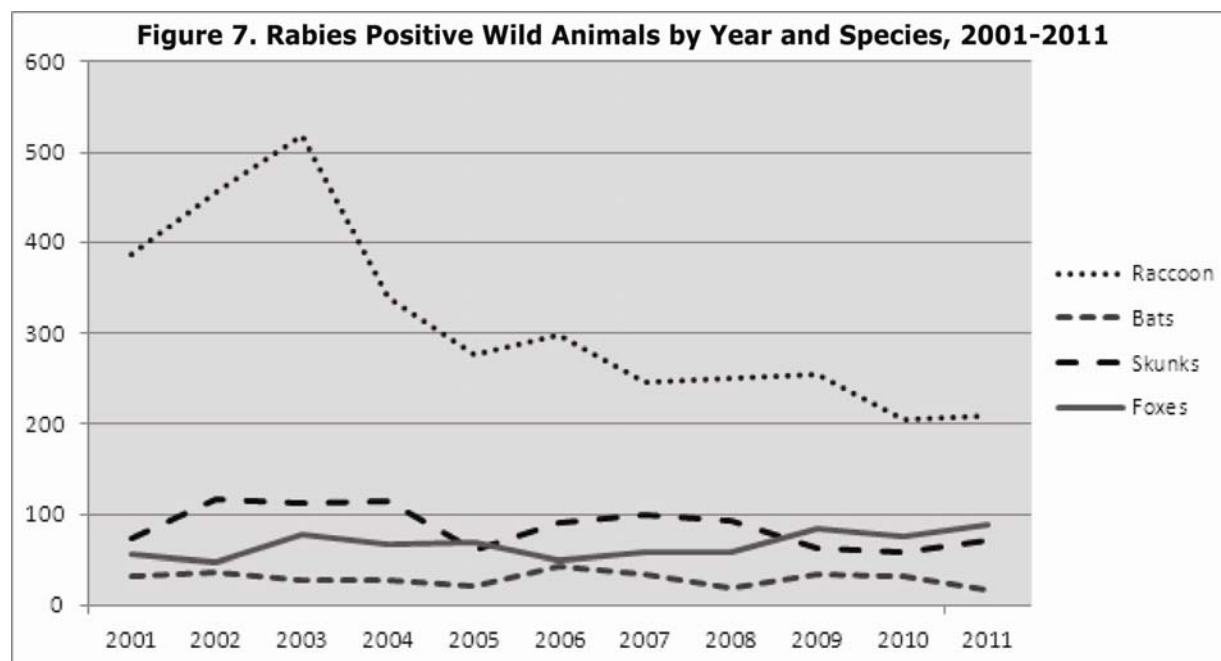
Following HIV cases from infection, through care, to viral suppression is both an individual and public health outcome goal as shown in the North Carolina HIV Cascade from 2008-11 (see Figure 6).



In the 21st century the most important tool we have to control the epidemic may lie in assuring that those people diagnosed with HIV disease have a suppressed viral load. By adhering to medication regimens, these clients can achieve an undetectable level of HIV, reduce poor health outcomes and nearly eliminate transmission to others through sexual contact or needle sharing.

Rabies

In 2011, 3,951 animals were submitted to the North Carolina State Laboratory of Public Health for rabies testing. Among 3,899 animals tested, 429 (11%) were rabies virus positive. Importantly, each animal submission represents one or more potential human and/or domestic animal exposures to rabies. In 2011, 91 percent of positive rabies results were from wild animals. Consistent with previous years, raccoons were the most common followed by foxes, skunk and bats (see Figure 7).



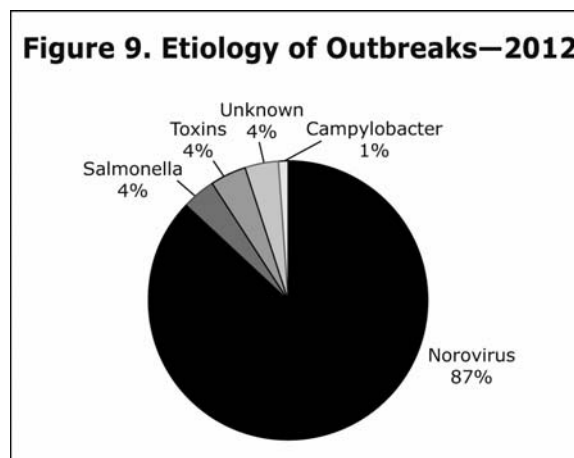
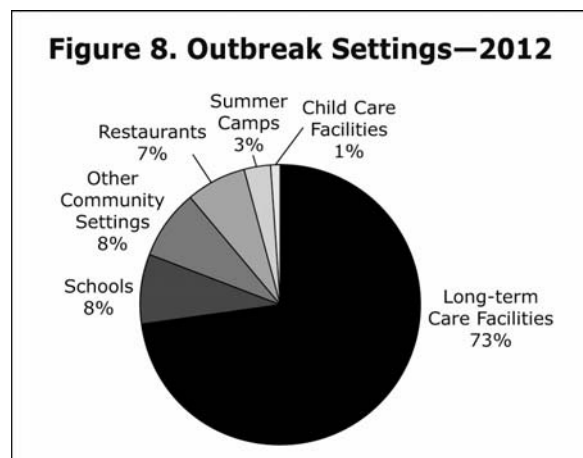
DPH public health veterinarians and staff provided consultation to more than 3,000 clinicians, local health departments and citizens during 2011 for rabies exposures and post-exposure prophylaxis. In 2011, bat infestations in the home and public setting were particularly problematic.

In the first eight months of 2012, several major investigations (at two hospitals, two low income apartment complexes, a childcare center and one university) resulted in more than 65 persons receiving rabies Post Exposure Prophylaxis. Local health departments and DPH can provide assistance to clinicians for patients in these settings. Guidance material is available for health departments and health care providers at:

<http://epi.publichealth.nc.gov/cd/diseases/rabies.html>.

Foodborne and Enteric Diseases

CDC estimates that each year roughly one in six Americans (or 48 million people) become ill, 128,000 are hospitalized, and 3,000 die of foodborne diseases. During 2011, more than 2,500 *Salmonella*, nearly 1,000 *Campylobacter* and about 150 Shiga-toxin producing *E. coli* confirmed and probable infections were reported to DPH. Likewise, more than 85 foodborne and enteric disease outbreaks were investigated. The majority of these outbreaks, caused by norovirus, were in the long-term care setting (see Figures 8 and 9). However, several high profile foodborne disease outbreaks were investigated.



In October 2011, 25 persons became infected with *E. coli* O157:H7 after visiting animal exhibits at the North Carolina State Fair. Subsequently, a public-private task force recommended increased physical distance between visitors and animals at the fair to reduce the future risk of disease transmission.

During February-May 2012 a large outbreak of *Salmonella paratyphi B* infections occurred in western North Carolina associated with a locally produced unpasteurized tempeh product. Eighty-nine persons became infected after eating in restaurants where the product was being served.

During the winter of 2011 to 2012, more than 60 norovirus outbreaks were investigated by local health departments. While the majority were in long-term care settings, many of these outbreaks involved food vehicles in restaurants, schools and child-care facilities. Although individual cases are not reportable, outbreaks of norovirus are, and they require diligent infection control efforts to control. The norovirus outbreak toolkit is available at: <http://epi.publichealth.nc.gov/cd/diseases/norovirus.html>.

Physician Reports of Communicable Disease

North Carolina has a mandatory reporting system for communicable diseases surveillance primarily based on physician and laboratory reporting. The list of reportable diseases is in the Administrative Code rule 10A NCAC 41a .0101. Modifications to the list are approved by the Commission for Public Health. Physicians in North Carolina are required by law to report these diseases and conditions to the local health department directors:

§ 130A-135. Physicians to report.

A physician licensed to practice medicine who has reason to suspect that a person about whom the physician has been consulted professionally has a communicable disease or communicable condition declared by the Commission to be reported, shall report information required by the Commission to the local health director of the county or district in which the physician is consulted.

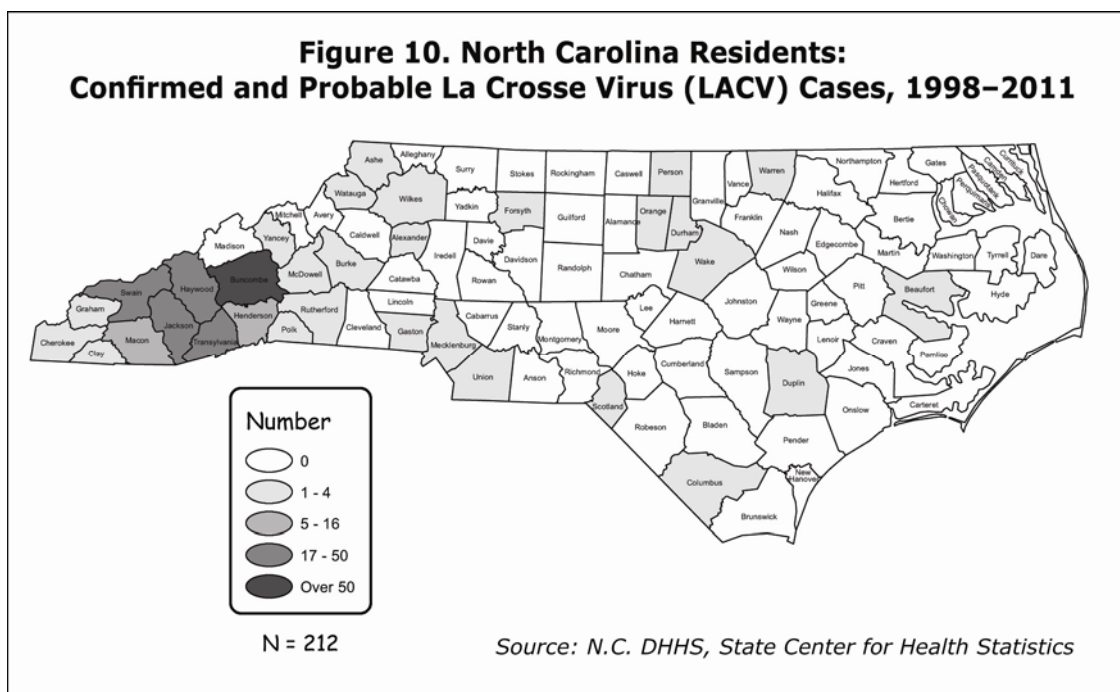
DPH created a program to assist local health department staff with surveillance and reporting of communicable diseases. The Technical Assistance and Training Program (TATP) is staffed by five nurse epidemiologists who function as regional consultants to the state's 85 local health departments. The nurse epidemiologists work collaboratively with a team of medical epidemiologists in the Communicable Disease Branch to strengthen the capacity of local staff who investigate disease reports.

The TATP program (1) promotes best practices for communicable disease programs, (2) enhances web-based resources and training opportunities, (3) responds to disease surveillance needs at the local health department, (4) assists with service integration to better serve the community and (5) provides direct on-site assistance to local health department staff during outbreaks of disease.

For more information about the Communicable Disease Branch's reporting in North Carolina, please visit our web page: <http://epi.publichealth.nc.gov/cd/> and select **Health Care Providers**. The N.C. Communicable Disease Manual is available at: <http://epi.publichealth.nc.gov/cd/lhds/manuals/cd/toc.html>.

Arboviral Diseases

While 2012 has been a record year for reported cases of West Nile Virus (WNV) nationally, only five WNV cases (two deaths) have been reported in North Carolina. Neuroinvasive disease due to La Crosse virus (LACV) is the most common mosquito-borne disease reported in the state. During 1998 to 2011 approximately 75 percent of the 212 confirmed and probable LACV cases were among residents of a seven county region in western North Carolina (see Figure 10).



Only neuroinvasive forms of arboviral infections are reportable in North Carolina. Neuroinvasive LACV disease can present with symptoms similar to infection with enterovirus and herpes simplex virus. IgM Antibody Capture ELISA (MAC-ELISA) provides rapid diagnosis. LACV and WNV cases are most commonly reported in the late summer with onset of illness typically occurring in September. The majority of LACV cases occur in children 14 years of age or less. In contrast, the majority of WNV cases occur in persons aged 60 or more. DPH data on mosquito-borne diseases are posted at: <http://epi.publichealth.nc.gov/cd/diseases/arbo.html>.

Arboviral testing for LACV, as well as Eastern equine encephalitis (EEE), WNV, and St. Louis encephalitis (SLE) is available at the State Laboratory of Public Health at no charge: <http://slph.state.nc.us/virology-serology/arbovirus.asp>.

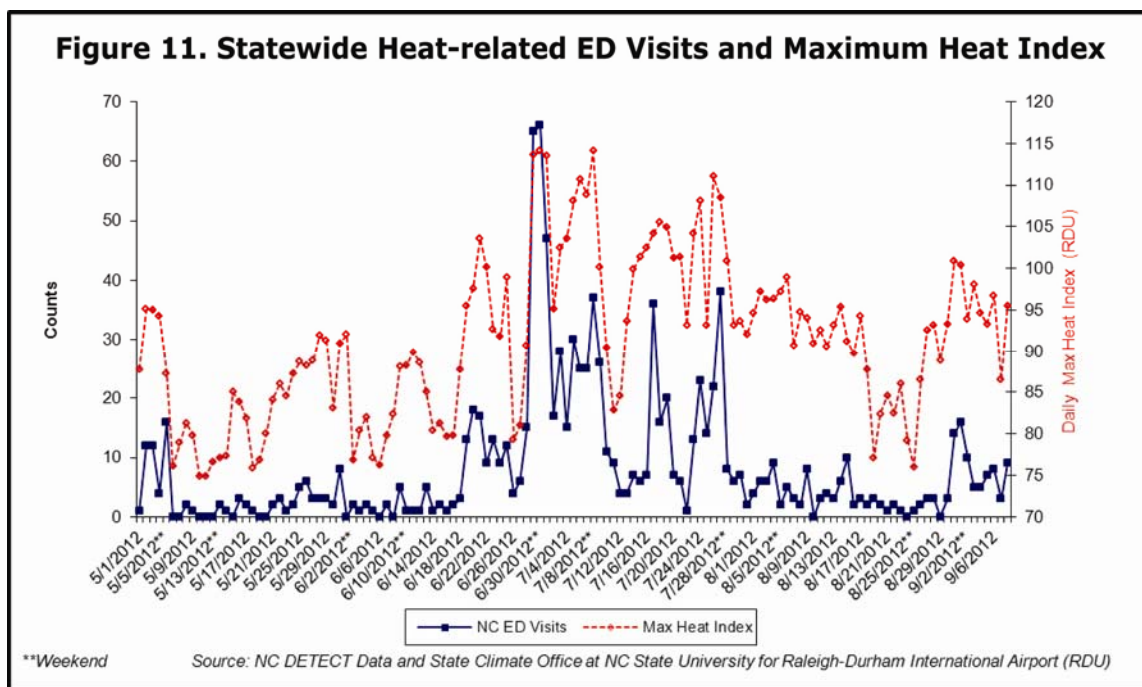
Prevention of arboviral illness focuses on reduction or elimination of known mosquito breeding sites, but the healthcare provider's role in educating persons on the utilization of personal protective equipment (e.g., repellent with DEET, protective clothing, and avoidance of peak biting hours) is equally important. Recommendations are available at: <http://epi.publichealth.nc.gov/cd/diseases/arbo.html>.

Heat-related Illness

During the summer, DPH monitors hospital emergency department (ED) visits for heat-related illness (e.g., heat exhaustion, heat stroke). Weekly reports are available at:

www.publichealth.nc.gov/chronicdiseaseandinjury/heat.htm.

From May 1 to Aug. 26, 2012, approximately 3,090 heat-related visits were identified. ED visits for heat-related illness are correlated with the daily maximum heat index (temperature and humidity, see Figure 11). Heat indices over 100 are typically associated with an increase in ED visits. Interestingly, a spike in ED visits in late spring and early summer has been noted and may be associated with a lack of acclimation to the heat.

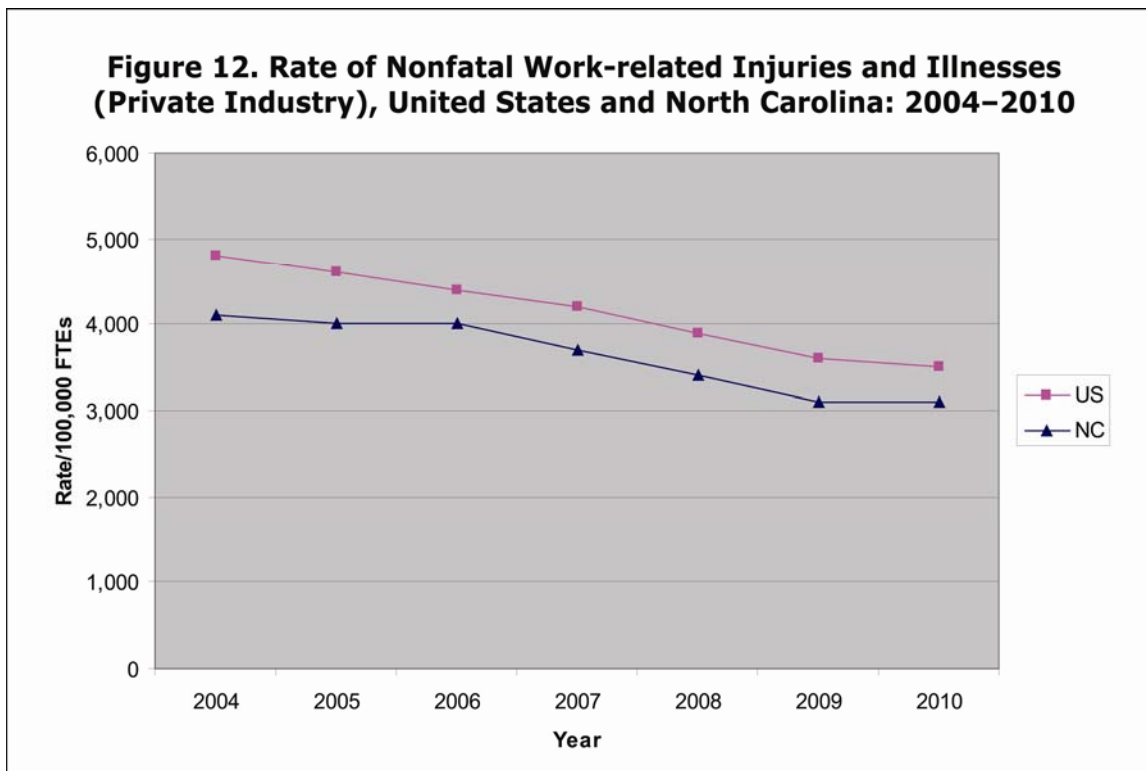


The majority of heat-related illnesses were among 25-64 year old males typically engaged in outdoor work or play. During late June 2012, a heat wave with heat indices reaching 113°F hit central North Carolina. During the three-day event, 431 ED visits, mostly among males, were observed. Importantly, ED-based surveillance has shown that about 27 percent of ED patients older than 65 years are admitted to the hospital.

Occupational Health

The workplace can be a “high-risk” environment because it contains a variety of health hazards and most adults spend a large proportion of their day at work. Work-related injury and illness can result in disability, lost wages and changes in the quality of life.

During 2004-10, reported rates of nonfatal occupational injury and illness in North Carolina decreased from 4,100 to 3,100 per 100,000 full time equivalent (FTE) workers; representing a 24 percent decrease since 2004 (see Figure 12). North Carolina rates have remained consistently lower than the national averages.



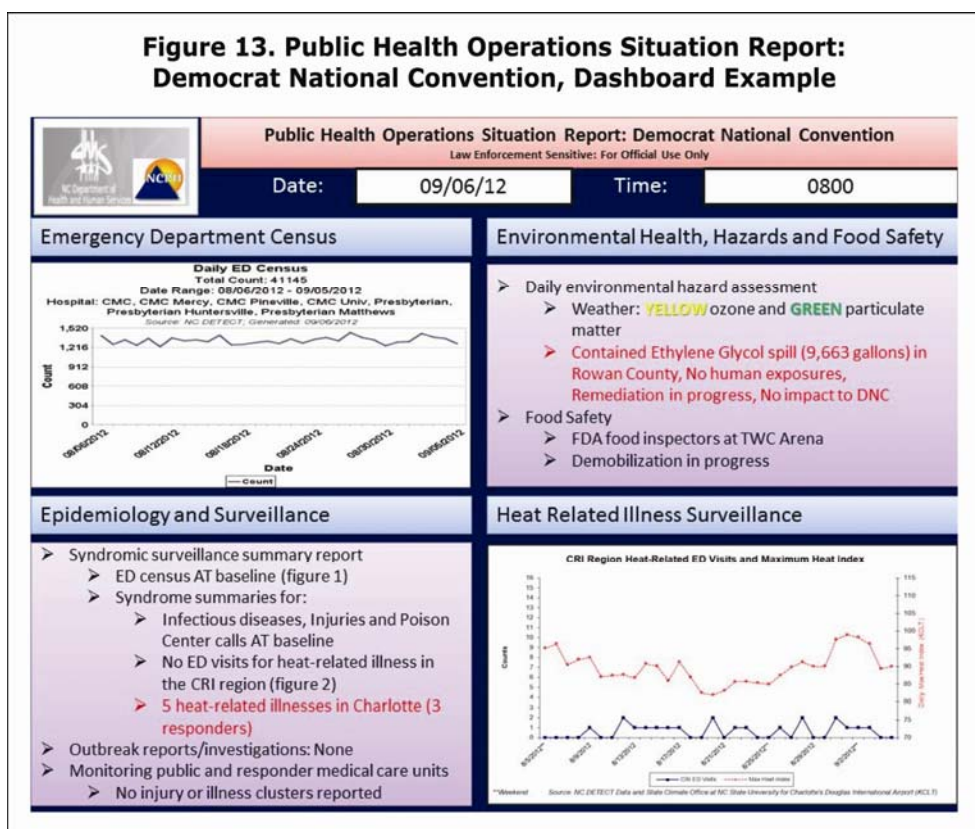
From 2004 to 2010, North Carolina’s fatal work-related injuries also experienced a significant decline from 4.8 to 3.5 per 100,000 FTEs; representing a 27 percent decrease. In 2010, agriculture, forestry, fishing and hunting had the highest work-related fatality rate among all industry sectors, followed by transportation/utilities and construction.

Strong regulatory programs and improvements in workplace safety by employers and workers may account for decreases in morbidity and mortality; however, economic factors may also provide explanation for the decrease. Counseling patients about following worker safety guidelines will help to protect the safety of workers and decrease injury and illness rates in North Carolina.

Public Health Preparedness

In March 2012, CDC published new Preparedness Capabilities guidance for state and local agencies. The 15 capabilities and their 114 priority elements provide the first ever comprehensive roadmap for public health preparedness programs nationwide. Using these capabilities, DPH performed a system-wide assessment of its current preparedness status. Local health departments and branches with DPH completed the year-long process in May 2012. The gaps that were identified are being used to prioritize strategic investments for the next four years.

The 2012 Democrat National Convention (DNC) served as an important test to our preparedness infrastructure. More than 20 sub-committees including the Health and Medical developed, exercised and implemented their plans for this event. Preparation included plans for increased food and lodging inspections, enhanced epidemiologic surveillance, medical countermeasure distribution and mobile deployment of the Public Health Coordinating Center. Environmental Health inspectors along with Mecklenburg County and U.S. Food and Drug Administration (FDA) inspectors performed over 100 inspections daily and implemented numerous corrective actions per day in order to prevent food-borne illness. Enhanced human and environmental health surveillance was integrated into a dashboard (see Figure 13).



The DNC event demonstrated both effective exercising of the CDC preparedness capabilities and successful collaboration between health care providers and public health practitioners to ensure a safe event.

State Laboratory of Public Health/Office of the Chief Medical Examiner



The Autopsy Suite in the Office of the Chief Medical Examiner (Julie Henry, photographer)

The new State Laboratory of Public Health and Office of the Chief Medical Examiner (OCME) has been in the planning stages since 2004 and will become operational in late 2012. The new facility allows for enhanced efficiencies and work flow, in addition to increasing the capacity for growth for both programs. The new building has a total of 220,000 square feet, replacing considerably smaller and outdated facilities.

The State Laboratory of Public Health will be able to increase its capacity to perform medical and environmental laboratory services (testing, consultation and training) for public and private health providers, more efficiently conduct laboratory-based surveillance and more effectively respond to public health crises. Likewise, the OCME will triple its capacity to conduct autopsies which will facilitate the investigation of deaths of a suspicious, unusual or unnatural nature and will be essential for responding in the event of a mass fatality event.

Protecting Our Citizens—Environmental Health

The former Department of Environment and Natural Resources Division of Environmental Health continues to integrate into DPH following legislative reorganization in 2011. As a result of this reorganization and funding reductions, pest management statewide surveillance, consultation and management activities for vector borne diseases were eliminated.

The Environmental Health (EH) Section in DPH continues to provide programs for private wells, on-site wastewater disposal, food, lodging and institutions, public swimming pools, tattoo parlors, education and training, children’s lead prevention and daycare inspections. Environmental Health also staffs the state’s Well Contractor’s Certification Commission and assists in its program activities.

The primary mission of EH is to provide technical consultations, training and authorizations to local health department environmental health specialists. These local specialists are authorized by the Department, through the EH Section, to enforce rules adopted by the Public Health Commission and the Environmental Management Commission.

The Division of Public Health’s Health Hazards Control Unit was transferred to the EH Section, as its activities more closely align with EH functions. These programs provide contractor training and certification, consultation, inspections and enforcement activities around lead and asbestos hazards across the state.

In June 2012, Layton Long, former health director with the Davidson County Health Department, came on board as the new EH Section chief following the retirement of Terry Pierce.

In spite of the many challenges created by reorganization, budgetary loses and statutory changes, program staffs of the Environmental Health Section have continued to implement program requirements.

Food Code

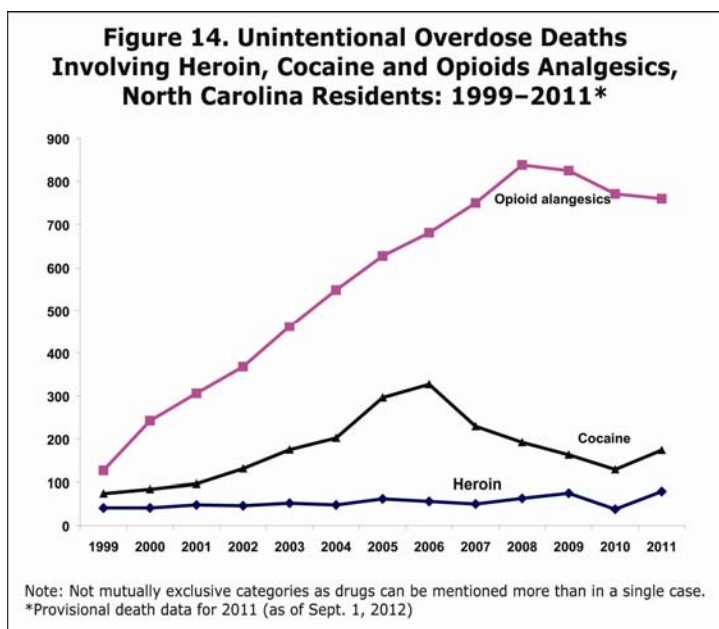
On Sept. 1, 2012, DPH implemented new food protection rules in North Carolina. Adoption of the U.S. Food and Drug Administration’s Food Code marks the most comprehensive change in North Carolina’s food safety rules in over 30 years. The Food Code establishes practical, science-based standards for mitigating risk factors known to cause foodborne illness. Food Code adoption and implementation is important for achieving uniform national food safety standards and for enhancing the efficiency and effectiveness of protecting public health in North Carolina.

Reducing the Impact of Injuries and Chronic Diseases

Painkillers

An epidemic of unintentional poisoning deaths continues to plague North Carolina. Since 1999, the number of deaths has increased by more than 300 percent (from 297 to 1,140 in 2011). The vast majority of these deaths are medication-related. Deaths happen when people misuse or abuse these drugs, and, in some cases, the medication is fatal when used as directed. Increases in opioid analgesic deaths involving drugs such as methadone, oxycodone and hydrocodone have increased dramatically. Opioids are involved in more drug deaths than cocaine and heroin combined.

Who dies? Historically, white men between the ages of 35 and 54 have accounted for the vast majority of opioids analgesic deaths. Although hospitalizations and emergency department visits for unintentional poisonings are virtually equal between males and females, in 2010 more males (61%) died than females (39%). See Figure 14.



The good news is that there are promising approaches for prevention. A community-based intervention in Wilkes County, Project Lazarus, has reported impressive results. Wilkes had one of the highest unintentional poisoning death rates in the country in 2008 with 31 deaths, but by 2011 Wilkes was down to only nine deaths. Community Care of North Carolina's Chronic Pain Initiative is expanding the reach of the Lazarus program throughout the state using its existing regional networks.

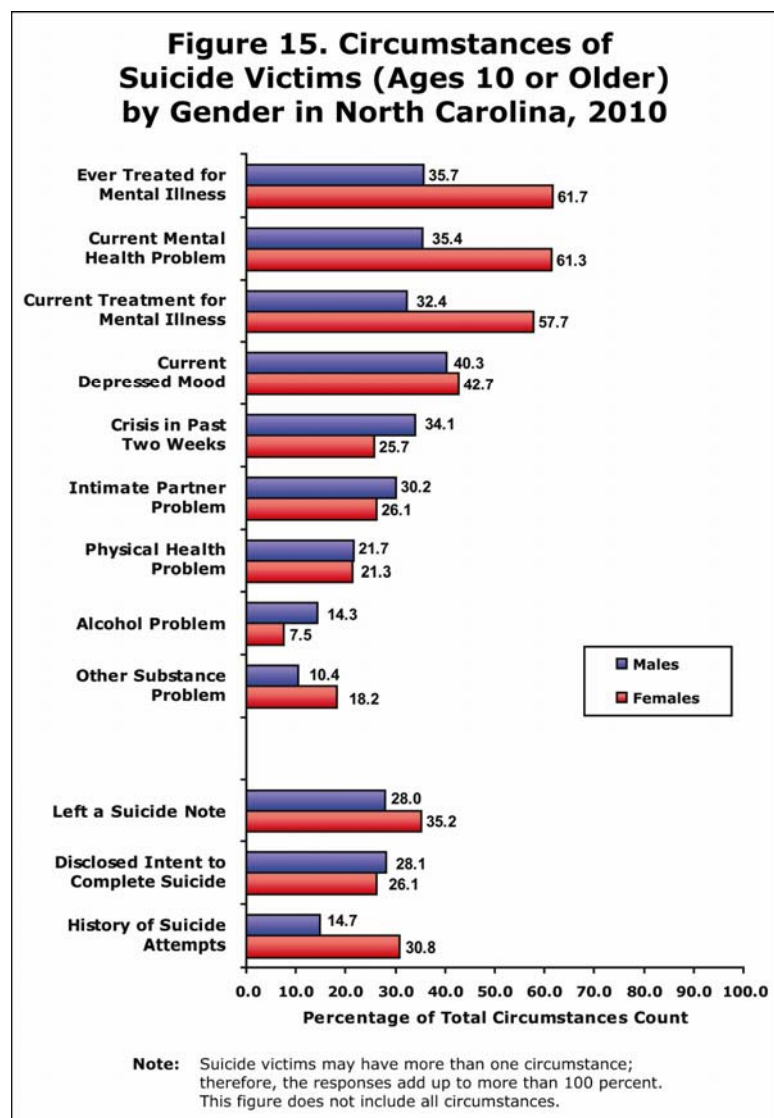
In 2007, North Carolina launched the Controlled Substance Reporting

System to help providers assess risks for their patients and identify unusual patterns of prescription drug use. Currently, only about 28 percent of all prescribers are using the system. Work is needed to encourage physicians to use the system as a regular part of their clinical practices.

DPH plays a key role in providing surveillance and coordinating a public health response. The N.C. State Advisory Council on Poisonings has convened a workgroup of key agencies and organizations committed to reducing drug overdose deaths. In 2012, the N.C. Medical Society created the Opioid Reduction Task Force that has also begun to examine and address this issue. This is a complex issue with many players involved, from prescribing doctors and pharmacies, to researchers and law enforcement. For successful prevention, coordination of programs, data collection and evaluation efforts are needed.

Suicide and the North Carolina-Violent Death Reporting System (NC-VDRS)

Suicides outnumber homicides in North Carolina—a little known fact that can mean suicide prevention gets fewer resources than other types of violent death. Fortunately, DPH is funded by the Substance Abuse and Mental Health Services Administration for youth suicide prevention. The program follows a gatekeeper model where individuals who come into contact with youth (teachers, peers, coaches, counselors, facility staff, etc.) are trained to recognize the signs and symptoms of suicide and know what to do to help. The N.C. Department of Public Instruction and the DHHS Division of Mental Health, Developmental Disabilities and Substance Abuse Services are key partners in the program. Based on the state’s strategic plan for suicide prevention, *Saving Tomorrows Today*, suicide prevention efforts in the state have been steadily increasing. From an initial focus on school-aged youth, the program has expanded to college-aged youth, military and lesbian, gay, bisexual and transgender (LGBT) populations. A recent N.C. Institute of Medicine Task Force has recently examined the issue of suicide, calling for renewed action.



The need for high quality data is critical when targeting intervention programs as well as to understand the magnitude of the problem. NC-VDRS is a CDC-funded statewide surveillance system that collects detailed information on deaths that occur in North Carolina as a result of violence: homicide, suicide, unintentional firearm deaths, legal intervention and deaths for which intent could not be determined. NC-VDRS is a multi-source system that gathers information from death certificates, medical examiner reports and law enforcement reports. The goal of this system is to aid researchers, legislators and community interest groups in the development of public health prevention strategies to reduce violent deaths.

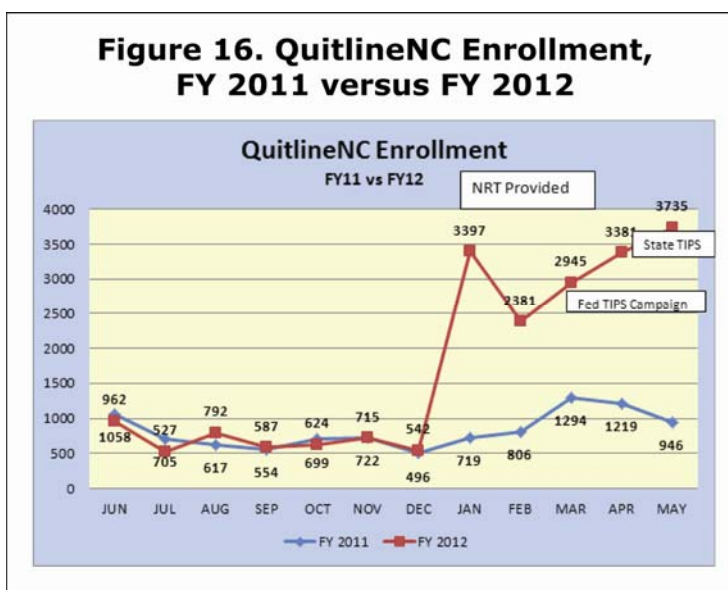
Understanding the precipitating circumstances (see Figure 15) of suicide can provide vital information for prevention and targeting at risk populations.

Tobacco Prevention and Control

The preventable burden of tobacco use. Tobacco use continues to be the leading preventable cause of death, disease and disability in North Carolina and the nation. It is responsible for 11,900 deaths in North Carolina each year; and for each death, there are 20 more North Carolinians who are sick or disabled due to smoking. Secondhand smoke is a serious health risk. There is also a significant economic burden of tobacco use in North Carolina—more than \$2.46 billion a year in medical costs and another \$288 million a year from medical costs from illnesses due to secondhand smoke exposure.

Protecting people from secondhand smoke. North Carolina’s success in passing the first smoke-free restaurant and bars law continues, with 83 percent of voters in favor of the law. There was a 21 percent decline in weekly Emergency Department visits from Acute Myocardial Infarction in 2010.

Helping tobacco users who want to quit. Demand for help is high; more than 60 percent of N.C. smokers made a serious but failed attempt to quit smoking in 2010. North Carolina’s investment in tobacco cessation via QuitlineNC demonstrated the need for this evidence-based tobacco cessation service, especially in 2012 when nicotine replacement therapy was provided through QuitlineNC (see Figure 16). In addition there has been a tremendous increase in physicians and clinics utilizing this service through fax referral with the number of fax referrals climbing steadily up from 348 in FY 07-08 to 4,491 in FY 2011-12.



Preventing teen tobacco use.

North Carolina’s “Tobacco Reality Unfiltered—TRU” program was instrumental in reducing youth tobacco use to historic lows. Since 2003, middle school smoking dropped by 55 percent from 9.3 percent to 4.2 percent in 2011, and high school smoking decreased by 43 percent from 27.3 percent to 15.5 percent. About 10,000 N.C. children start middle school each year; continued efforts to reach this population will be needed to sustain this progress in decreasing teen tobacco use in our state.

Challenging work to sustain progress. Maintaining the progress made in tobacco prevention and cessation efforts in our state will be difficult. The investment in evidence-based tobacco use prevention and cessation was cut from \$17.3 million in 2011-12 to \$2.7 million in non-recurring federal block grant funds in 2012-13.

References Available on Request.

North Carolina's "Into the Mouths of Babes" Program

Thanks to a partnership with primary care medical professionals, North Carolina is now a national model for providing oral preventive care to high risk infants and toddlers. Tooth decay, the most common chronic childhood disease, affects 40 percent of children by the time they enter kindergarten. The N.C. Oral Health Section provides training and support to medical professionals in private practice, residency programs, health departments and federally-funded facilities in an effort to reduce this preventable disease. These trained medical professionals provide an oral evaluation, fluoride varnish application, parent counseling and a dental referral as needed for young Medicaid-insured children at well child visits. In 2011, over 135,500 of the preventive procedures were provided to N.C. children up to age 3¹/₂. And data show it works: children receiving oral preventive services have a 49 percent reduction in dental treatment in the first year and a half of life, and fewer hospitalizations before 6 years of age.

Community Water Fluoridation

Science supports community water fluoridation as a safe and effective tool in preventing tooth decay. This method of fluoride delivery benefits all of the people in a community. A person's income and ability to get routine dental care are not barriers. All residents of a community can enjoy fluoride's protective benefits just by drinking tap water and consuming foods and beverages prepared with it. Also, community water fluoridation is the least expensive way to deliver the benefits of fluoride to all members of a community. CDC states that every dollar invested in fluoridation yields a \$38 savings in treatment costs. Eighty-seven percent of North Carolina residents served by a community water system are drinking fluoridated water.

North Carolina Community Transformation Grant Project

DPH was awarded a Community Transformation Grant (CTG) for five years (October 2011-September 2016) to help communities make healthy living easier in North Carolina. DPH will work with state and local partners to implement strategies with emphasis on health equity that support tobacco free living, active living, healthy eating and access to evidence-based clinical preventive services. A primary emphasis of these efforts is placed on reaching populations experiencing the greatest burden of chronic disease. This will require improving access to healthy living opportunities for all North Carolinians including racial and ethnic minorities, those of low socioeconomic status and individuals living in rural areas.

The CTG Project is organized on a regional basis to maximize its reach across the state. DPH has funded 10 multi-county collaboratives, each with a lead health department that has assumed responsibility for coordinating efforts and providing the infrastructure for the funding. These lead health departments administer annual funding and are charged with developing a regional plan informed by a regional leadership team, called a Community Transformation Collaborative, to implement the following strategies. This includes increasing:

- smoke-free local government buildings and indoor public places
- tobacco-free government grounds, including parks and recreational areas
- smoke-free housing in public housing, affordable multi-unit housing and other market-rate housing
- 100 percent tobacco-free community colleges, state and private university and college campuses
- new or revised comprehensive plans that include health considerations
- joint use agreements that increase access to physical activity opportunities
- small retail stores offering and promoting healthier food and beverage options
- new or enhanced farmers' markets, mobile markets and farm stands
- health care practices that implement quality improvement systems regarding hypertension; cholesterol; tobacco and weight management prevention, screening, treatment and referral.

In addition to funding local health departments to lead regional efforts, CTG funds are allocated to regional Area Health Education Centers (AHEC) to assist primary care practices in making systems changes that enhance the clinical management of patients with high blood pressure and high cholesterol and who use tobacco. North Carolina Community Care Networks (N3CN), the statewide umbrella organization that supports clinical care improvement initiatives for Medicaid and other underserved populations, will play an important role in engaging primary care practices in the initiative as well as assessing the impact of the changes on the patient population.

Staff housed in the lead health departments will work with AHEC staff to increase referrals for individuals identified with high blood pressure, high cholesterol and tobacco use by identifying and recommending providers to utilize existing community resources with their patient population. Regional AHEC staff will participate on the Community Transformation Collaboratives and provide a critical link between the community and clinical interventions.

Funding for Public Health

Revenue and Expenditures

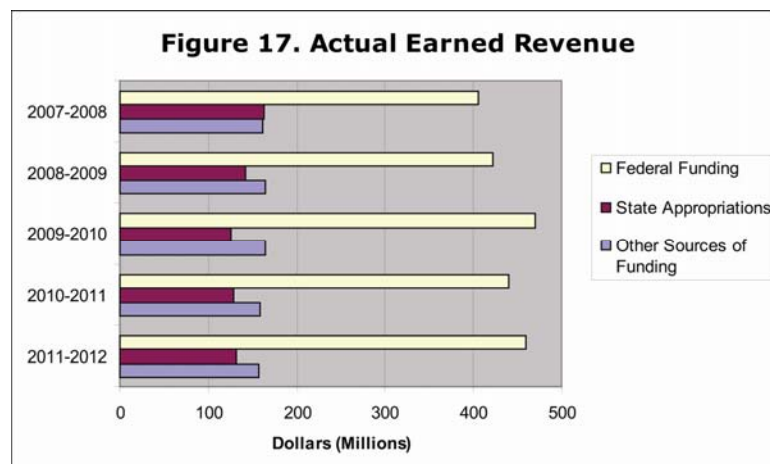


Figure 17 shows Actual Earned Revenue for the past five budget years. In the 2011-12 fiscal year, the total funding for DPH was \$747,847,319.

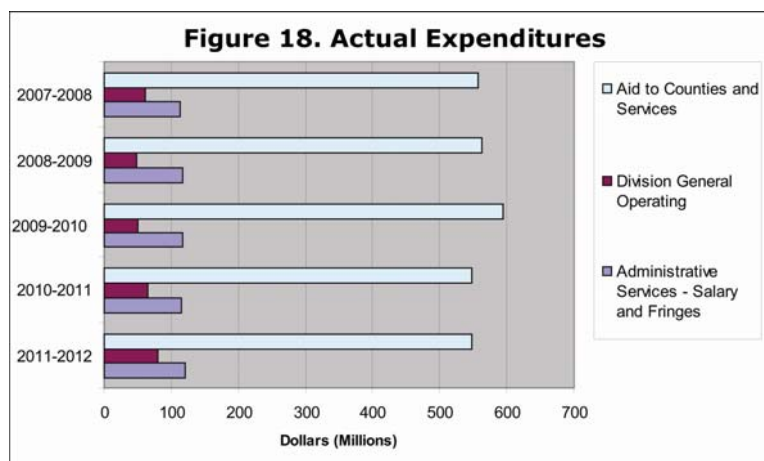
Federal sources are responsible for the majority of funding for the Division, up from \$440 million (60.4%) in 2010-11 to \$459 million (61.4%) in 2011-12.

State funding was also up slightly during 2011-12. The total state appropriation was \$132 million in 2011-12, up from \$129 million the previous year. The state appropriation represented 17.7 percent of the Division’s total funding in 2011-12.

Other sources of funding comprised 20.9 percent of the Division’s funding in 2011-12; totaling approximately \$157 million. Some examples of these funding sources include private grants, fees, rebates, transfers from other agencies, and permits.

Figure 18 shows the Actual Expenditures of the DPH for the past five fiscal years, broken down into three categories.

Aid-to-county and services represents the largest expenditure area for the division (73.2%). These expenditures totaled \$547 million in 2011-12 and include drug expenses and WIC food expenses, as well as local health department funding.



Division General Operating comprises 10.7 percent of the Division’s budget. In 2011-12, operating expenditures were \$80 million. This category includes expenditures (e.g., legal services, supplies, equipment, employee travel, repairs, telephone and insurance.)

Administrative Services—Salary and Fringes—includes salary, social security and retirement for all employees in the Division of Public Health. Staff includes those who provide direct client services as well as those who work in program areas, contracts and budgeting. In 2011-12, this category totaled approximately \$121 million or 16.1 percent of expenditures.

STATE OF NORTH CAROLINA

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