North Carolina Public Health: Priming the Pump of Improved Health for All

Leah Devlin

The birth of public health is generally credited to a nineteenth-century London physician named John Snow. In 1854, during a particularly deadly outbreak of cholera, he located known cases of cholera on a map of the city. They appeared to be concentrated around a single public well.

Even though germ theory had not yet been developed, Dr. Snow reasoned that the water in the well was a likely source of the disease. He removed the handle from the pump and happily monitored a steady decline in cholera cases as a result. The science of epidemiology and the practice of public health were born.

Improving the Quality of Life for All People

The water pump still stands as an emblem of public health success. It is time for North Carolina to prime that pump by strengthening the state and local public health infrastructure to achieve greater health improvements for all the state's residents.

In North Carolina the public health mission is to promote and protect the highest-possible level of health for all residents. Public health also works to ensure that communities are healthy places in which to live. From that perspective it often has been said that the community is the "patient" in public health.

The core science of public health is epidemiology, the study of disease within populations. Public health also embraces biostatistics, health education, environmental protection, the practice of medicine, and the important concept of prevention.

The author is state health director in the Division of Public Health, North Carolina Department of Health and Human Services. Contact her at leah.devlin@ncmail.net.

Public Health's Ten Essential Services

I. Assessment

Monitor health status to identify and solve community health problems (e.g., community health profiles, vital statistics, and health status).

Diagnose and investigate health problems and health hazards in the community (e.g., epidemiologic surveillance systems and laboratory support).

II. Policy Development

Inform, educate, and empower people about health issues (e.g., health promotion and social marketing).

Mobilize community partnerships and action to identify and solve health problems (e.g., convening and facilitating community groups to promote health).

Develop policies and plans that support individual and community health efforts (e.g., leadership development and health system planning).

III. Assurance

Enforce laws and regulations that protect health and ensure safety (e.g., environmental health rules).

Link people to needed personal health services and ensure the provision of health care when otherwise unavailable (e.g., services that increase access to health care).

Assure competent public and personal health care workforce (e.g., education and training for health care providers).

Evaluate effectiveness, accessibility, and quality of personal and population-based health services (e.g., continuous evaluation of public health programs).

Research for new insights and innovative solutions to health problems (e.g., links with academic institutions and capacity for epidemiologic and economic analyses).

Source: Reprinted from Pub. Health Functions Steering Comm., Am. Pub. Health Ass'n, Public Health's Ten Essential Services (Washington, D.C.: the Association, July 1994), available at www.phppo.cdc.gov/nphpsp/10EssentialPHServices.asp.

North Carolina's public health system includes local public health agencies that serve every county in the state, the Division of Public Health (DPH) in the North Carolina Department of Health and Human Services, the Division of Environmental Health in the Department of Environment and Natural Resources, and a multitude of partners at the state, regional, and local levels. Notable among these partners are health care providers, the media, business, community-based organizations, schools, and the statewide network of community-based health improvement partnerships known as Healthy Carolinians (see the article on page 5).

The following three core functions define public health's work:

- Assessment of health status and health needs to guide planning and program development
- Policy development to enable the implementation of public health interventions
- Assurance that necessary public health services are available to everyone

These core functions have been clarified further with the identification of ten essential public health services (see the sidebar on this page). Every local health department in North Carolina provides these services to fulfill its mission of improved health for all people.

Implementing Public Health at the Local Level

Just like Dr. Snow's water pump, public health interventions play out at the community level. North Carolina is blessed with an extensive network of local public health agencies that serve all 100 counties. The local system is made even stronger through the oversight of local boards of health, which collectively bring more than 800 community volunteers to guide policy development for local health departments. Given county government's role in appointing these community leaders and its role in providing local funding, the role of county commissioners and county managers is critical.

Local health departments and their boards face enormous challenges daily. Proliferation of methamphetamine laboratories, shortages of flu vaccine, investigations of communicable diseases, and emergency responses to hurricanes capture headlines. However, these incidents mask the ongoing and extraordinarily high level of effort needed to sustain routine public health work, such as promotion of child health, inspection of restaurants, permitting of wells, prevention of West Nile virus, immunization of children, assistance with family planning, health education, and prevention of heart disease and stroke.

Local health departments also play a role in helping eliminate health disparities across populations. Minorities bear an undue burden of disease in North Carolina. This clearly is an unacceptable situation, requiring more innovative programs and services, greater cultural competency, increased outreach, and an ability to overcome language barriers. Also, it is important to recognize that the roots of poor health are in social and economic factors that result in fewer opportunities to engage in healthy behaviors and less access to critical health care services.

In addition to performing the types of community-based work just described, local health departments are a critical part of the state's safety net. In every county a mix of preventive health care services is provided: prenatal care, promotion of child health, assistance with family planning, prevention and treatment of sexually transmitted diseases, and immunization and nutrition programs for women and children. Some health departments also provide basic primary care.

Local health departments must be strong leaders, not only in caring for the

How Healthy Are North Carolinians?

North Carolina's governmental public health system, frequently in collaboration with local Healthy Carolinians Partnerships, is responsible for assessing the health of the state's residents and working to achieve the highest-possible level of health for all. It uses a variety of measures in this assessment, including rates of morbidity (illness) and mortality (death), personal and life-style risk factors (e.g., incidence of smoking and amount of physical activity), environmental risk factors (e.g., poverty levels and immunization rates), and health system factors (e.g., physicians per capita). Although it is not possible to predict whether current trends in these measures will continue, researchers can make informed estimates based on existing but limited information.[1]

North Carolina (and the nation as a whole but to a greater extent) is currently experiencing a downward trend in overall mortality (that is, in deaths due to all causes). This trend is likely to continue as advances in medical care and technology become more widely available and as prevention programs reach more residents at risk. Similarly, cancer mortality rates are expected to continue to decline in the foreseeable future, following a trend that started in the early 1990s. A dramatic downward trend in heart disease mortality has leveled off in the past few years, however, both in the state and nationwide. Following steady decline in the 1980s, North Carolina's rates for stroke mortality have leveled off since 2000, mirroring national trends. These types of leveling trends usually persist over time. Significant levels of health disparities are expected to continue into the foreseeable future in the area of chronic disease.

Consistent with national trends, North Carolina's percentage of adults who are obese has increased considerably over the past thirteen years. The obesity epidemic is expected to continue, although not at the same rate of increase as for the past ten years. In a related measure, diabetes mortality rates are expected to continue to increase, reflecting recent trends in the incidence of obesity among adults and children.

North Carolina's infant mortality rate has consistently been about 15 percent higher than that of the nation. Rates for North Carolina and the United States have experienced a leveling off in recent years after some dramatic decreases. This steadying of the rate is likely to continue, or the rate may even increase slightly. The national infant mortality rate increased in 2002 for the first time in forty years.

Adult North Carolinians have reported smoking at a significantly higher rate than American adults have. In 2003, for example, North Carolina adults reported smoking at a rate 12 percent higher than U.S. adults as a whole did. Adult smoking rates have held steady in North Carolina for the past ten years, although a slight decrease was reported in 2003.

Compared with the United States as a whole, North Carolina adults are more likely to perceive themselves as being in fair or poor health. The difference between the state and the nation has increased recently, with state residents reporting being in fair or poor health 17 percent more frequently than the nation as a whole in 2003. As the population ages, the developing trend of self-reported health being "fair" or "poor" is likely to continue.

Every year for the past twenty years, the United States has had a higher rate of new HIV/AIDS cases than North Carolina has had. However, the gap between the state and the national rates decreased recently as North Carolina experienced a 68 percent increase in the rate of cases from 1999 through 2003. It is unclear whether this increase will continue.

North Carolina has had a consistently higher rate of primary care physicians per capita than the nation as a whole. Since 1989, the rate has increased from 6.8 per 10,000 population to 8.6, a jump of 26 percent, surpassing the increase in the national rate. North Carolina continues to experience an increase in the number of physicians per 10,000 population, and this trend should continue at both the state and the national level.

From 1992 to 2000, the rate of North Carolina adults reporting no health insurance was typically lower than that of the United States. However, since 2001 the percentage of North Carolina adults reporting no health insurance has increased 51 percent (from 11.5 to 17.4 percent) and is now higher than the U.S. average. Lack of health insurance usually reflects socioeconomic trends. Because of erosion of employer-supported coverage, many North Carolinians have lost their health insurance in the past two years. Until there is a reversal in this trend, North Carolina will probably continue to have a greater percentage of uninsured than the nation.

For many years, North Carolina's poverty rates were close to those shown by the nation as a whole. However, during the last three years, the state's poverty rate has begun to climb, reflecting the loss of jobs in the textile industry. This increase pushed the state poverty rate to 25 percent above the national average in 2003. The increase will continue until there is a reversal in the state's economy.

This small sampling of health status measures underscores the urgency of the public health mission in North Carolina. Reversal of many of the negative trends will not occur quickly and will require significant investments in the infrastructure of the medical care and public health system.

Note

1. All data in this sidebar were provided by the State Center for Health Statistics. *See* www.schs.state.nc.us/SCHS/.

individuals in the community but also in bringing together the community as a whole to identify health problems and generate creative, collective strategies for health improvement.

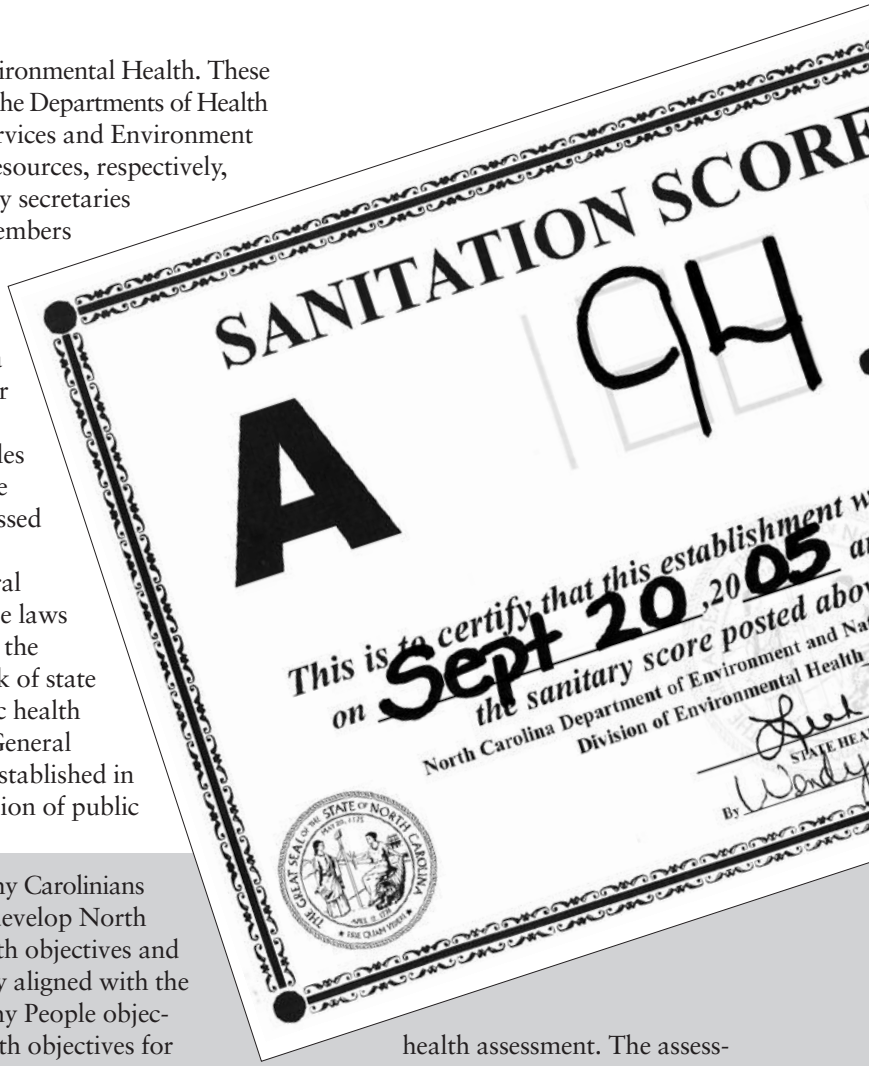
Most North Carolinians are willing to support public health measures with tax dollars.[1] Further, in a recent survey of the people who visited their local health department, 80 percent felt that the service they received was "very good" or "excellent."[2] A major new initiative to continue building on this quality is the development of an accreditation system for state and local health departments. North Carolina is a national leader in this effort to ensure that every county provides the ten essential public health services. In the beginning stages of this initiative, ten local health departments have become

fully accredited. (For more information on the accreditation program, see the article on page 12.)

In North Carolina, local health departments are funded by a mixture of county, state, and federal funds. Although the financial proportions vary by the size of the county, on a statewide basis, local support for public health constituted almost 80 percent of total local public health expenditures for fiscal year 2002–03.[3] Another 18 percent came from the federal government, which is a major funder of public health initiatives through direct grants. A small portion came from nongovernmental grants. About 0.5 percent came from state government in that year at the local level.

Implementing Public Health at the State Level

State-level public health largely comprises the efforts of the DPH and the Division of Environmental Health. These divisions are in the Departments of Health and Human Services and Environment and Natural Resources, respectively, which are led by secretaries who are key members of the governor's cabinet. The North Carolina Commission for Health Services provides the rules that support the related laws passed by the North Carolina General Assembly. These laws and rules guide the regulatory work of state and local public health agencies. The General Assembly has established in statute the mission of public



Healthy Carolinians: A Good Community Investment

Mary Bobbitt-Cooke

State and local governments are constantly trying to find ways to build partnerships between the public and private sectors in order to maximize community involvement and use limited resources more efficiently. Healthy Carolinians (HC), a network of public-private partnerships representing public health, hospitals, schools, churches, businesses, community members, and elected officials, is a unique example of how such partnerships can mobilize resources for improvement of community health.

North Carolina has addressed the national Healthy People objectives through HC, a statewide initiative.[1] The initiative started by executive order in 1991, when Governor James Martin established the Governor's Task Force on Health Objectives for the Year 2000, which later became the Governor's Task Force for Healthy Carolinians (GTF–HC), to develop North Carolina's health objectives and ensure that they aligned with the national Healthy People objectives.[2] The health objectives for North Carolina were published in 1992. The GTF–HC challenged all counties in North Carolina to mobilize community resources to address the problems defined in the state and national objectives. It believed that if communities determined their own health priorities, they would mobilize and address them.[3] This strategy resulted in HC, a network of community-based, public-private partnerships across North Carolina. The network places resources, decision making, and accountability where health is created and supported—in the community.

To date, the GTF–HC has certified seventy-four HC Partnerships, representing eighty-three counties (see Figure 1). Currently, ten more counties are working toward certification.[4] Most HC Partnerships are county based; six cover multiple counties.

The HC Partnerships identify and prioritize health issues. They start with committed leadership that guides a comprehensive, collaborative community health assessment. The assessment drives planning and the mobilization of community assets. This process brings together community health and safety interests and programs to develop a common agenda that is endorsed by county leaders. North Carolina Health Objectives for 2010 serve as targets for county-level prioritization.

Over the past dozen years, the HC Partnerships have accomplished the following:

- Increased resources for primary care clinics, dental clinics, and pharmaceutical support programs to under- and uninsured North Carolinians
- Identified resources for adolescent health clinics and school nurses
- Mobilized resources to build walking paths, bicycling trails, and recreation centers and supported progressive physical education policies at schools
- Developed and implemented community-based health promotion programs and advocated for policies

The author is director, Office of Healthy Carolinians/Health Education, in the North Carolina Division of Public Health. Contact her at mary.bobbitt-cooke@ncmail.net.

health and the essential services. Its role in creating strong public health policy and providing critical funding for services that focus on prevention of and early intervention in health diseases and conditions is vitally important to North Carolinians.

State-level public health works to support local implementation of public health programs in a variety of ways: obtaining federal funds through grants and contracts, overseeing distribution and management of federal and state funds, providing technical assistance in program implementation, ensuring quality through Medicaid reviews, offering training in a variety of disciplines, and more. In addition, state-level public health directly provides the State Medical Examiner services, the State Center for Health Statistics research, the Central Cancer Registry, and the Birth Defects Registry. The DPH also records all the births and the deaths through its Vital Records Program, and it issues related legal documents.

Through the Children's Developmental Evaluation Centers, the DPH provides direct services to children with developmental needs (for example, nurturing and emotional support, adequate nutrition, and intellectual stimulation). Also, it manages the statewide effort in early intervention services.

Numerous state-level task forces and coalitions mandated by the legislature or commissioned by the governor receive staff support from the DPH: the Child Fatality Task Force, the Heart Disease and Stroke Prevention Task Force, and the Governor's Task Force for Healthy Carolinians, to name just a few. In addition, state-level public health administers about $40 million in the direct purchase of care, ranging from drugs for people living with HIV to services for children with special needs.

Finally, the DPH maintains critical linkages to the Centers for Disease Control and Prevention and other federal agencies to provide additional capacity or technical assistance in times of crisis. State-level partnerships with the Departments of Environment and Natural Resources, Crime Control and Public Safety, and Agriculture and Consumer Services also are critical in supporting the health of communities. Further, the state and local public health efforts complement each other and provide synergy to achieve the maximum impact of improved health for all.

Strengthening Public Health's Infrastructure

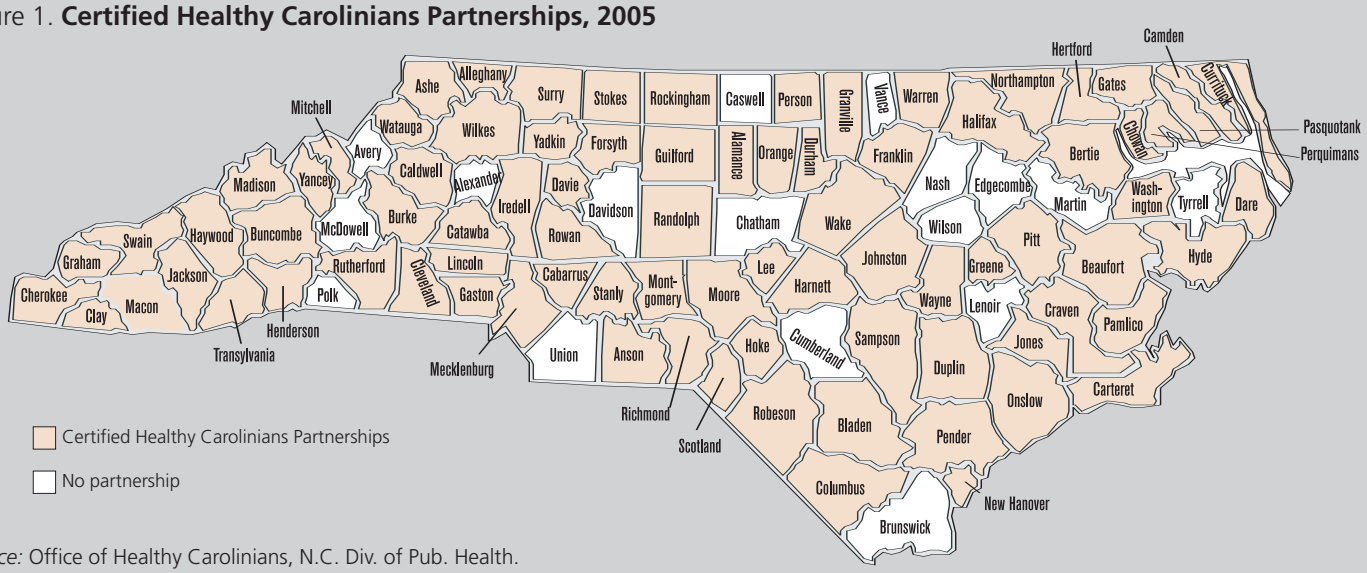
Since September 11, 2001, public health leaders across the country have been challenged with an intriguing question: How can the country's "wake-up call" on preparedness translate into adequate support for the nation's other critical community health. Also, funding from federal agencies (e.g., the Department of the Interior and the Department of Health and Human Services) has flowed into communities across the state. The partnerships have been awarded small grants from chronic disease and health promotion programs in the North Carolina Department of Health and Human Services, Division of Public Health (DPH), and from other community-oriented programs in various state agencies. The Office of Healthy Carolinians in the

at schools, worksites, and public places that reduce smoking and improve nutrition choices

- Created the Sewer and Water Assistance Program to provide funding that helps low-income people install or repair water or sewer systems
- Addressed chronic diseases through diabetes clinics accessible to populations at risk; community-wide, multilevel programs to address blood pressure and cholesterol problems; and extensive cancer prevention education and screening
- Responded to needs of older adults at the community level through support for parish nursing programs

Although the results of the HC Partnerships are positive, the funding has been irregular. Much of it is from local governments and foundations. The Kate B. Reynolds Charitable Trust and the Duke Endowment have generously supported these local efforts to improve

Figure 1. **Certified Healthy Carolinians Partnerships, 2005**



Source: Office of Healthy Carolinians, N.C. Div. of Pub. Health.

public health needs? In other words, how can public health leaders and policy makers "prime the public health pump" to achieve improved health for all—and not just in times of terrorist threat or disaster.

In the aftermath of September 11, when the federal government stepped in with significant new funding for emergency preparedness and response, many in the public health community hoped that policy makers also might give public health's other essential core infrastructure much-needed attention and resources. However, many states, including North Carolina, fell on hard economic times, and public health infrastructure struggled, along with other important public needs.

In the aftermath of September 11, when the federal government stepped in with significant new funding for emergency preparedness and response, many in the public health community hoped that policy makers also might give public health's other essential core infrastructure much-needed attention and resources.

Although the DPH sustained budget reductions of more than $27 million in fiscal years 1999–2000 through 2004–05, there have been significant public health achievements in more recent times. In the past two years in particular, the General Assembly has provided additional resources for school health nurses, AIDS drug assistance, multicounty collaboratives called "incubators," early intervention services, and targeted efforts to eliminate the burden of health disparities in minority populations. It also has provided funding for accreditation of local health departments—a significant step forward in investing in the public health infrastructure. Further, it has passed important new health legislation related to a number of issues, including methamphetamine, petting zoos, bioterrorism, and smoke-free environments.

Sustaining this progress is incredibly important. During the twentieth century, average life expectancy in the United States increased by about 50 percent, from 50 years of age in 1900 to about 75 in 2000. Of course, not all segments of the population enjoy the increased life span equally. This fact underscores the persistent and important public health challenge of eliminating health disparities. Most of the credit for increased life expectancy during the twentieth century must go to public health efforts in improved environmen-

DPH supports these community partnerships by providing technical support, consultation, and training.

Each year from 2001 to 2003, the General Assembly appropriated limited funding to support the HC Partnerships, but these funds were not ongoing.[5] The 2005 General Assembly has appropriated $500,000 for HC. Most continuing support comes from local public health agencies and hospitals through their budgets, dedicated staff, and in-kind contributions.

The HC Partnerships have served as a bridge between hospitals and other health and human service agencies in the community. Thirty-five percent of them are hospital based, and 45 percent, public health department based. The remaining 20 percent stand alone or are associated with another community organization. Hospitals and local public health agencies have committed leadership, resources, and influence that are critical in community health improvement. Communities benefit when health care agencies and practitioners join with other private and not-for-profit agencies and community members to address health issues.

Although every partnership is different, two case studies demonstrate the essential roles that the HC Partnerships play in planning, coordination, communication, collaboration, and resource development to address significant health issues and improve quality of life at the community level. The case studies illustrate how the HC Partnerships can help advance the three core functions of public health: assessment, policy development, and assurance.[6]

One significant initiative, which brought together the health department, schools, and the hospital, was the establishment of school-based health centers in four middle schools and four high schools in the county.

Cleveland County: Alliance for Health

The Alliance for Health is a not-for-profit organization that is closely involved with the Cleveland County Health Department. It is housed in the health department, and its coordinator is a contract employee. The alliance was founded in 1996 and became a certified HC Partnership in 1998. It serves as a forum for coordinating the efforts of local agencies and dedicated volunteers, ensuring that resources are used effectively and have the greatest impact. Since it began, the alliance has assisted its partners in implementing more than sixty initiatives and has brought more than $2 million to Cleveland County in grants and awards.

In 2000 the alliance conducted a community health assessment in collaboration with the local health department. It determined that child health, specifically access to health care, was a high priority. Its objective was to increase the number of accessible locations where children and youth, newborn through eighteen years of age, could receive comprehensive medical and dental preventive services.

The alliance collaborated in putting several strategies into action. One significant initiative, which brought together the health department, schools, and the hospital, was the establishment of school-based health centers in four middle schools and four high schools in the county. The alliance assisted in the planning and the coordination that brought these school-based health centers to Cleveland County Schools. Start-up funds for this initiative came

tal sanitation (through such measures as better handling of solid waste and assurance of safer drinking water) and enhanced control and prevention of infectious diseases (through such measures as more inoculations, improved surveillance, and better education).

There have been many advances in the science of prevention, among them new health information, innovative health screenings, new immunizations, better understanding of disease transmission, more sophisticated laboratory technology, and better built environments to promote healthy behaviors.

These advances can translate into enormous public health improvements. That is critical because the needs also are enormous. In national rankings North Carolina stands in the lower third or the lower half on almost every health outcome, from infant mortality to infectious disease to chronic disease.[4] (For trends in and projections on these and other health measures, see the sidebar on page 4.) When North Carolina's health problems are so dire and the opportunities at hand are so potent, when local and state health departments stand poised but not as battle-ready as needed, strengthening the public health infrastructure becomes a critically important investment for every person living in North Carolina.

Over the past fifteen years, North Carolina has made numerous attempts to strengthen its public health infrastructure. In 2004 the North Carolina Public Health Task Force was created and charged with recommending ways of improving the quality and the accountability of the state and local public health system, improving health outcomes, and eliminating health disparities. The task force issued its final report, the *North Carolina Public Health Improvement Plan*, after a process that was unique for two reasons.[5] First, the plan was written by an extremely diverse group of stakeholders from all significant public health constituencies. The fifty-six-member body included state and local health officials, members of the General Assembly, county commissioners, board of health members, physicians, and lay partners.

Second, the task force generated and invited public debate to develop the plan's recommendations, in a way that no other commissions and task forces have done. Each of the six working committees of the task force (Accreditation, Accountability, Structure and Organization, Workforce Development, Planning and Outcomes, and Finance) developed interim recommendations. Members of the task force then went out into the community and held three regional town meetings to present these interim recommendations and listen to public comment on them. Public comment via e-mail also was solicited.

from public and private sources: health departments, schools, hospital foundations, the BellSouth Foundation, and the Duke Endowment. Today the effort is supported through receipts (Child Health Insurance Program, Medicaid, and other third-party insurance) and funding from public health, schools, and the hospital. The current annual operating budget for the eight centers is approximately $725,000, which does not include significant in-kind donations made at each site, such as space and utilities.

The results of these school-based health centers are impressive and demonstrate the value of this initiative. Of the 8,600-plus students in the eight middle and high schools, 3,352 (39 percent) were seen at the schools' health centers during the 2003–04 school year. Combined, these students made 11,971 medical visits to the health centers during that school year. They sought medical help for various conditions or needs, including allergies, asthma, diabetes, headaches, sprains, accidental injuries, and physical examinations to participate in sports. At the four middle school centers, health professionals managed more than 8,000 prescription medicines, such as insulin for diabetics.

During each visit the children who were seen at the centers were asked in a survey, "If there wasn't a health center at your school, where would you go to get help?" Of the 11,971 visitors, 49.7 percent said that they would not get any care, 31.7 percent said that they would go to their doctor, 2.2 percent said that they would go to the hospital emergency room, and the remainder didn't know. The visitors also were asked, "If there wasn't a health center at your school, would you stay at school or leave school and go home?" Seventy-two percent indicated that they would stay at school even though they were sick, and 28 percent said that they would go home. Because these schools have health centers, 92 percent of the students received care and returned to class; only 8 percent were too sick to stay at school and went home.

These survey results strongly support the conclusion that the school-based health centers help children by increasing their access to health care and al-

A school nurse works in one of the school-based health centers that were initiated by Cleveland County's Healthy Carolinians Partnership.

HC Partnerships

Implementing North Carolina's *Public Health Improvement Plan*

The *North Carolina Public Health Improvement Plan* was presented to the General Assembly in October 2004. Its eighteen recommendations addressed both chronic infrastructure needs ($32 million) and gaps in critical services ($40 million).

The General Assembly has taken action in 2004 and 2005 to implement some of the plan's recommendations. It has approved significant new funding for school health, HIV/AIDS drugs, accreditation of local health departments, incubators, early intervention services, and elimination of the enormous health disparities in North Carolina. Also, the DPH went ahead with plans to establish an Office of Public Health Accountability. Further, planning is under way to replace the State Laboratory for Public Health and the North Carolina Medical Examiner's Office, both of which are completely outdated and inadequate facilities for the demands placed on them by today's public health challenges.

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Applauding the Incredibles

The public health system and community, and the elected officials who support it, can take pride in a series of accomplishments in recent years that can fairly be called "incredible."

Impact of the task force's report. The continued impact of the work of the North Carolina Public Health Task Force 2004 is a welcome reminder of the quality of its recommendations and testimony to the powers of collaboration. The excellence of its *Public Health Improvement Plan* can be credited not only to the task force members and staff, who pursued their important work over eighteen months, but also to the many people across North Carolina who contributed their personal time and energy to the ongoing deliberations. The report is a public document in the best sense of the term. That it was written so well in the midst of a lengthy fiscal crisis speaks volumes about the dedication of the public health community and those who work to support it.

National recognition. In 2004, North Carolina's efforts to build a stronger system for emergency preparedness and response were recognized nationally. The Trust for America's Health report, a highly regarded assessment of emergency

lowing them to stay in school and learn. The results also demonstrate that the school-based health centers are helping the community by ensuring that health care is provided in an efficient, cost-effective method: students are using the centers rather than the emergency room at the hospital.

Another example of success enjoyed by the Alliance for Health is the outcome of local efforts to encourage the school board to adopt a 100 percent tobacco-free campus policy for schools. The local health department took the lead in bringing the proposal to the school board. The alliance, through its diverse membership, advocated for passage of this policy by making telephone calls, writing letters to the editor, and personally contacting school board members. The policy was adopted and became effective July 1, 2005.[7]

Pitt County: Pitt Partners for Health

Pitt Partners for Health is one of the oldest HC Partnerships. Since its inception in 1994, it has actively pursued a variety of initiatives to improve health in Pitt County. In 1996, in collaboration with the Pitt County Memorial Hospital, the Pitt County Health Department, and the Brody School of Medicine, Pitt Partners conducted an intensive health survey of 1,000 representative households across the county. From the findings, it concluded that the county's diabetes rate was 50 percent higher than that of the rest of the state and that the death rate from diabetes was significantly higher among the African-American population in the county than among whites and other racial or ethnic groups. At the time, diabetes was the fourth-leading cause of death in Pitt County.

Pitt Partners coordinated planning and implementation of the Reducing Risk with Community and Churches through Assessment, Referral, and Education Project (CARE), which works with African-American churches in the county to facilitate diabetes education,

Livingstone Baptist Church, part of Pitt County's Healthy Carolinians Partnership, received the Blackmon leadership award for its efforts to eliminate disparities in health care among racial and ethnic groups.

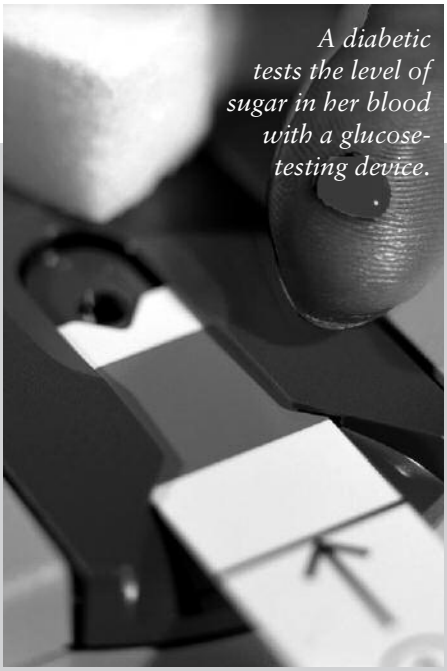
HC Partnerships

preparedness, ranked North Carolina number 1 in the country (with Florida).[6] At the time of the report, 81 percent of North Carolina's local health departments had a dedicated bioterrorism planner on staff, and 90 percent had completed an assessment of the preparedness of their workforce. The state also had opened new regional public health laboratories, established a bioterrorism Biosafety Level III lab, and deployed the North Carolina Hospital Emergency Surveillance System. North Carolinians everywhere are safer as a result.

Response to hurricane damage. During 2004, Hurricanes Ivan and Frances brought extensive damage to the western part of the state. There were eleven deaths reported, 120 homes lost, and an additional 16,234 homes damaged. North Carolina's newly developed regional surveillance teams (established with federal emergency-preparedness funding made available after September 11, 2001) conducted a series of rapid needs assessments to enable the fair and efficient distribution of relief during this serious crisis. The public health response to these hurricanes, as well as those in the past, exemplifies how effective public health can be with adequate resources.

Handling of disease outbreaks. Serious outbreaks of communicable diseases occurred in 2004. An *E. coli* outbreak of more than 100 cases was attributed to exposure to contaminated animals at the 2004 State Fair. A number of children still remain on dialysis from their infection. A Legionella outbreak linked to a contaminated ventilation system in a mountain community resulted in two deaths. The state also experienced, for the first time in a decade, person-to-person transmission of measles. In all these cases, the public health response was swift and effective.

The state always has struggled to battle sexually transmitted diseases but has made significant progress in recent years with syphilis and HIV. In 1999, North Carolina had the fourth-highest rate of syphilis infection in the nation. As a result of a targeted effort in the communities most affected, the state's rate of syphilis infection has fallen by 79 percent. In the HIV/AIDS arena, progressive action by the General Assembly allowed the state to eliminate the waiting list for HIV/AIDS drugs and enroll 800 new patients to receive these lifesaving medications. Also, the State Laboratory for Public Health announced a new method of testing for acute HIV infection that will lead to earlier diagnosis and treatment. This is the first test of its kind in the country, symbolic of the work of this important, nationally regarded facility.



A diabetic tests the level of sugar in her blood with a glucose-testing device.

screening, and treatment for the African-American community. CARE began in the Pitt County Health Department with broad-based input and support from the community. Pitt Partners received $900,000 from the Pitt Memorial Hospital Foundation to initiate the project.

After CARE was established, the management, funding, and leadership gradually were transferred to the Cornerstone Missionary Baptist Church, an African-American church in Greenville. CARE then was expanded to include twelve more African-American churches and one support group representing several other churches. CARE provided each church center with educational material, blood pressure cuffs, scales, file cabinets, and other resources to help its parishioners. During the first few years, more than 2,500 people were screened for diabetes, the majority of them African Americans. Of those screened, 60 percent were identified as being at risk. People without a personal physician were linked with primary care doctors. Fifty lay health advisers from the churches were trained to maintain a church-based support group. An Indigent Care Fund was established to pay for medications for disadvantaged people with diabetes.

The diabetes mortality rate in the county has decreased, moving diabetes from the fourth-leading cause of death to the fifth (for the changes in Pitt County's death rate from diabetes 1999–2002, as compared with North Carolina's, see Table 1).

In Pitt County the 1999 death rate from diabetes was 32.1 per 100,000 people. In 2002 the rate was 24.7 per 100,000, a 21.3 percent decrease. For the same period, there was only a slight decrease in the diabetes death rate statewide. The burden of the disease has decreased as high-risk people have improved their ability to control the disease.

Currently, CARE does not have funds to continue screening. The lack of funds may change the progress that Pitt County has made since 1996. However, twenty lay health advisers are working at all the

Table 1. **Diabetes Death Rate: Comparison of Pitt County with North Carolina, 1999–2002**

Year	Pitt County Rate/100,000	North Carolina Rate/100,000
1999	32.1	26.8
2000	29.0	25.7
2001	21.5	26.6
2002	24.7	26.5

Source: N.C. State Ctr. for Health Statistics, 2 North Carolina Vital Statistics, Leading Causes of Death—1999, 2000, 2001, and 2002 (Raleigh: NCSCHS, 2000, 2001, 2002, 2003), available at www.schs.state.nc.us/SCHS/data/vitalstats.cfm.

church sites, providing support and education to diabetics. In 2004 the GTF–HC awarded the first Charles Blackmon Leadership Award for the Elimination of Health Disparities to Cornerstone Baptist Ministries for the progress it has made in responding to the diabetes health problems in the African-American communities of Pitt County.

Conclusion

As these two case studies demonstrate, when there is a strong vision for improvement in community health, combined with committed leadership, coordination, and collaboration, great things can happen.

Healthy Carolinians is an important strategy for addressing public health issues. The HC Partnerships work well to bridge gaps between state and local resources. For example, by working through the HC Partnerships, state public health programs have access to multiple local agencies and a diverse group of committed residents who will adapt the public health programs as well as enhance and expand them with additional resources. The DPH has a rich history of working shoulder to shoulder with the HC Partnerships on childhood obesity, physical activity, diabetes control, cardiovascular health, cancer prevention and control, tobacco control, and injury prevention. Healthy Carolinians Partnerships are an important component of North Carolina's public health infrastructure. They translate state goals into concrete local action; mobilize local resources across business, not-for-profit, and government sectors; and help communities respond to new health challenges.

Notes

1. The national Healthy People objectives are published in U.S. Dep't of Health and Human Services, Healthy People 2010 (Washington D.C.: U.S. Government Printing Office, 2000).

2. U.S. Dep't of Health and Human Services, Healthy People 2010 (Washington D.C.: U.S. Government Printing Office, 2000). In 1991, Governor James Martin issued Executive Order No. 148, which established the Governor's Task Force on Health Objectives for the Year 2000. Shortly after Governor James B. Hunt took office in 1994, he extended the life of the task force through Executive Order No. 56. In 1999, in Executive Order No. 147, Governor Hunt changed the name of the task force to the Governor's Task Force for Healthy Carolinians, revised the membership, and directed it to establish the 2010 health objectives for North Carolina. In 2002, newly elected Governor Michael Easley issued Executive Order No. 13, which extended the life of the task force until the present.

3. Report of the Governor's Task Force on Health Objectives for the Year 2000 (Raleigh: Nov. 1992).

4. Healthy Carolinians Partnerships are certified every four years by the GTF–HC. Standards for certification can be found on the HC website, at www.HealthyCarolinians.org.

5. The General Assembly appropriated $1 million for HC ($10,000 per county) in fiscal years 2000–01 and 2001–02. In fiscal year 2002–03, it appropriated $750,000 ($7,500 per county). The 2005 General Assembly has appropriated $500,000 for HC.

6. The Institute of Medicine, in its landmark publication *The Future of Public Health* (Washington, D.C.: National Academy Press, 1988), articulated a set of core functions for public health: assessment of health status and health needs to guide planning and program development; policy development to enable the implementation of public health interventions and assure that communities are healthy; and assurance that necessary health services, both personal and public, are available to everyone.

7. Information about the county's 100 percent tobacco-free schools policy can be found at www.clevelandcountyschools.org (follow "Tobacco Free Schools" hyperlink) (last visited July 13, 2005).

Reduction of unwanted pregnancies. North Carolina's efforts to reduce unintended pregnancies were given a boost in 2004 with the approval of the federal family planning waiver. Newly expanded family planning services now will become available to women aged 19–55 and men aged 19–60 at or below 185 percent of the federal poverty level. It is estimated that this program will save $38 million during the first five years alone and help avert almost 7,500 unintended pregnancies. This effort to make certain that babies are born into families who are planning for them is a critical strategy in lowering the state's infant mortality rate, which crept up in 2004.

Improving success in school. New funding has provided for an additional 195 school nurses for North Carolina's public schools and for 100 nurse and social worker "child and family teams." The state's inadequate ratio of nurses to students has been a chronic problem and, for many students, has contributed to a lower level of academic achievement. The new funding, based on task force recommendations, resulted in twenty-four counties meeting the nationally recommended nurse-student ratio of 1:750 in 2004. This is an important step in safeguarding the health of the state's children and thus the state's future. North Carolina's Early Intervention Program, which serves children with developmental delays or at risk for them, completed its transition to public health in 2004. Together these two developments will contribute to higher levels of student readiness and academic performance.

Accomplishments in chronic disease control and prevention. Several notable accomplishments were made in this area:

- Implementation of the Violent Death Reporting System
- Release of the statewide Genomics Plan
- Initial development of an Acute Stroke Registry prototype
- Release of the suicide prevention guide, *Saving Tomorrows Today*
- Release of Food and Physical Activity Standards for North Carolina schools

Additionally, more than half of the state's 115 local public school systems now are completely tobacco-free, thanks in large part to funding from the North Carolina Health and Wellness Trust Fund.

New rules governing public health. The regulatory authority of North Carolina's public health system is an important underpinning of the many programs and services that the system provides. Last year the North Carolina Commission for Health Services undertook a variety of measures to strengthen public health:

- Adoption of a new set of rules establishing decontamination

The North Carolina Institute for Public Health

Edward L. Baker

The North Carolina public health system has changed significantly over the last several years in response to challenges at the national, regional, and state levels. Public recognition of the need for a strong public health infrastructure following September 11, 2001, and the anthrax attacks the same year resulted in much-needed improvements in information systems, laboratories, epidemiology, workforce training, and communication capacity. In fact, a 2004 survey by the Trust for America's Health ranked North Carolina as one of the top states in the nation in level of public health preparedness.[1]

Despite substantial progress, many challenges remain, both nationally and in North Carolina. The North Carolina Institute for Public Health (NCIPH), the service and outreach arm of the top-ranked School of Public Health at the University of North Carolina (UNC) at Chapel Hill, is actively engaged with the state's public health community in several important new initiatives to address the challenges by improving the state's public health infrastructure. Specifically, NCIPH is involved in (1) evaluating and educating the public health workforce; (2) administering a pilot accreditation program intended to bolster organizational capacity at the state and local levels; and (3) coordinating cross-county collaborations among local public health agencies through the Public Health Incubators Initiative.

The author is director of the North Carolina Institute for Public Health. Contact him at ed_baker@unc.edu.

Public Health Workforce

A study recently completed by NCIPH revealed that 49 percent of North Carolina's public health workforce is forty-five years of age and older.[2] Within the next five years, up to 25 percent of the workforce will retire, leaving the ranks depleted. They will be particularly depleted of people with the experience and the institutional knowledge to lead the response to public health threats and emergencies.

Beyond the aging of the workforce, public health professionals are leaving because the pay in public health has not kept up with that in other fields in which they can find employment. Particularly at the state level and below, and more conspicuously in North Carolina and other southern states than in other parts of the country, epidemiologists, biostatisticians, and others trained in public health, as well as nurses and other health care professionals, can find more remunerative positions in hospitals, private industry, academia, and research than they can in public health.

A possible contributor to the underpayment of public health practitioners is the relatively low level of formal training among them. A landmark report in 2002 from the Institute of Medicine spotlighted that many who work in public health lack the formal training needed for the complex tasks they face daily.[3] According to the Centers for Disease Control and Prevention (CDC), 78 percent of the nation's public health officials lack advanced training, and more than 50 percent have no basic health training at all.[4] In North Carolina the numbers are similar.[5]

NCIPH offers public health workers a wide range of continuing and executive education programs. For example, NCIPH houses the nation's largest office of continuing education located in a school of public health. Further, it is in-

standards for illegal methamphetamine laboratories

- Major revision of the on-site sewage rules related to identification of soil wetness conditions
- Adoption of a new set of rules governing the sanitation of primitive camps
- Major revision of the on-site sewage rules related to innovative sewage systems
- Adoption of rules to establish a reporting system for syndromic surveillance, for use by hospital emergency rooms[7]

Looking at the Road Ahead

Recent progress in strengthening the infrastructure of North Carolina's public health system is a good start, but much is yet to be accomplished.

To realize the potential benefits of accreditation, North Carolina must continue to refine the system and work to achieve accreditation of all local health departments as well as the state Division of Public Health.

A crisis has emerged in the public health workforce in terms of recruiting new young professionals into public health as well as training and retaining the current workforce in today's highly competitive workplace market. In addition, many state and local staff are approaching retirement. Affordable, practical solutions that can be implemented in a timely manner need to be articulated and put into place. The *Public Health Improvement Plan* recommends scholarships and internships as a good start. North Carolina is fortunate to have a premier School of Public Health and its Institute for Public Health as a major partner, not only in addressing workforce issues but also in accrediting local health departments, supporting regional collaborations, and undertaking many other ventures.

The General Assembly has recognized the promise of regional collaboration among health departments, and North Carolina's new group of incubators is making good progress on a variety of common issues. The progress of these incubators must be monitored closely so that the state can capitalize on the economies of scale that they will surely realize and the best practices that they will certainly identify. (For more information on the incubators, see the article on page 12.)

Major work still needs to be done in community health assessment, a core public health function. DPH's Office of Healthy Carolinians continues to be a critical effort to engage communities in identifying the most important health issues and bringing all of the partners together to improve health outcomes (for more information on

volved in five major management and leadership initiatives: the national Public Health Leadership Institute, the Emerging Leaders program, the PREVENT (Preventing Violence through Education, Networking, and Technical Assistance) initiative, the Management Academy for Public Health, and the Southeast Public Health Leadership Institute. In addition, through the North Carolina Center for Public Health Preparedness, also housed at NCIPH, a wealth of online training materials has been developed, providing the workforce with job-relevant, state-of-the art training and educational opportunities.

Clearly, more can and should be done to continue to build the knowledge and the skills of frontline public health workers as they seek to address the threats to community health, both now and in the decades ahead. Partnerships between these practitioners and academic colleagues hold promise for addressing future challenges.

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Organizational Capacity

Unlike other health institutions and other public-sector institutions, local and state public health agencies have lacked formal performance standards and accreditation processes. Recently, along with a range of national partners, the CDC has led the creation of national public health performance standards for state and local public health systems and for public health governing bodies. Now that these standards exist, a few states are creating formal systems of agency assessment and accreditation.

The national standards were developed to guide state and local public health organizations as they seek to define and deliver essential public health services. Essential services are processes used in public health to prevent epidemics, injuries, and environmental hazards; promote healthy behaviors; respond to disasters; and ensure quality and accessibility of health services.

North Carolina is in the vanguard of the national movement to establish accreditation systems for public health agencies. A pilot project to develop policies and procedures for local health agency accreditation is now under way through a partnership between NCIPH, the State Division of Public Health, and local health directors. To date, ten local health agencies have successfully completed the accreditation process, which consists of agency self-assessments, peer site visits, and review and action by an accreditation board. Those completing the process have identified a wide range of benefits to their organizations' functioning, including some examples of revenue enhancement. In August 2005 the North Carolina General Assembly made the accreditation program permanent and provided funding for ongoing operations.[6]

Improvement of Collaboration among Local Health Agencies

Public health practice in North Carolina has a strong tradition of local autonomy. The state's eighty-five local health agencies often act as autonomous entities providing health services to one or more counties.

the work of this office, see the article on page 5). For maximum health impact, this community-based work should be expanded on.

In the area of critical service gaps, the state must continue to build comprehensive school health programs. Its plan to achieve the 1:750 nurse-student ratio will help address unmet health needs of children and ultimately improve their success in school. The North Carolina State Board of Education has been an outstanding leader by requiring thirty minutes of daily physical activity by fall 2006. In addition, tremendous opportunities lie ahead in developing innovative school health policies in nutrition, physical activity, and tobacco use, and a stronger health education curriculum.

Stemming a growing epidemic of HIV infection and AIDS also will require additional resources and creative strategies such as needle exchange and support of community-based minority organizations and faith organizations. HIV/AIDS represents North Carolina's greatest health disparity, with minorities being affected nine times more than whites. The number of new infections has increased for the third year in a row, and currently more than 15,000 people in North Carolina are living with HIV/AIDS.

Strategies to prevent chronic diseases, the leading causes of death and disability in North Carolina and the nation, remain critically underfunded. New funds could be directed toward prevention of tobacco use, promotion of physical activity, and improvement of nutrition.

Also, injuries represent the leading cause of years of life lost, and many injuries can be entirely prevented.

Immunizations continue to be the foundation of preventive health strategies in North Carolina. The universal vaccine program and the public-private partnership with the medical community remain critical components of immunization efforts. However, the cost of new vaccines for meningitis, pertussis, pneumococcal disease, and other diseases is challenging North Carolina's ability to provide them for all children.

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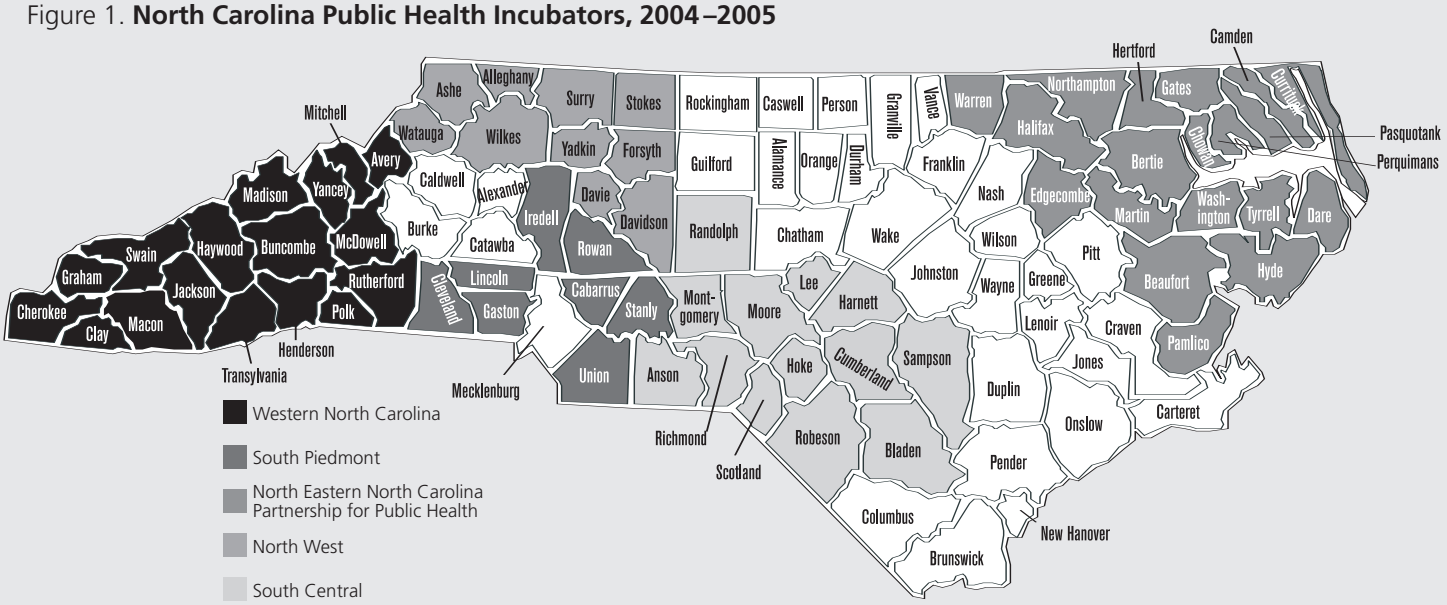
One way in which North Carolina is attempting to support these local agencies is through the Public Health Incubators Initiative, which is designed to encourage cross-county collaborations. In 2003 the North Carolina General Assembly authorized the creation of innovative partnerships for design and delivery of public health services. Modeled after business incubators, which foster local collaboration and innovation around economic development, public health incubators foster more effective and efficient allocation of resources for public health. NCIPH acts as the coordinator for this program, providing consultation and technical assistance in response to locally identified needs.

The public health incubators grew out of the North Eastern North Carolina Partnership for Public Health, which has demonstrated the efficacy of such a partnership. Since its inception in 1999, participants in the partnership have shared and secured funds, undertaken several joint initiatives, and hired a central staff that serves all partnership health departments. Economies of scale, an audience that attracts funding agencies, and collaboration on a common set of public health priorities have served the partnership well.

Figure 1. **North Carolina Public Health Incubators, 2004–2005**



Source: N.C. Inst. for Pub. Health.

Conclusion

North Carolina is fortunate to have a public health system that is well led by public health professionals valued by the community. The state's public health partnerships are truly extraordinary. These critical liaisons with agriculture, law enforcement, other health care providers, schools, foundations, businesses, community-based organizations, and sister human services agencies cannot be taken for granted. They have to be nurtured and strengthened in the years ahead. The government's public health infrastructure requires renewal and reinvestment to sustain these partnerships and to achieve improved health outcomes for all people living in North Carolina. Dr. Snow's pump—the state and local public health infrastructure—must be primed. It must be strengthened with sustainable resources to ensure North Carolina's improved health in the coming years.

The futures of the public health system and the public's health in North Carolina are closely linked. Resources necessary to sustain an adequate public health system should be considered an investment, not an expense. The investment needs to be an adequate one, and sustained long enough for North Carolina's residents to realize the benefits. The stakes are too high to do otherwise. As Thomas Jefferson once said, "Without health, there is no happiness." Dr. Snow in 1845 would probably have agreed with him, and so do North Carolinians in 2005.

Notes

1. N.C. State Ctr. for Health Statistics, A Survey of Public Health Knowledge, Attitudes and Behavior in North Carolina (Raleigh: NCSCHS, Oct. 2001).
2. *Id.*
3. Lisa Hollowell, Public Health Fiscal Analyst, Fiscal Research Div., N.C. General Assembly, "North Carolina Department of Health and Human Services, Division of Public Health," PowerPoint presentation (Mar. 2005), available from Hollowell, at lisah@ncleg.net.
4. *North Carolina,* in United Health Foundation, America's Health: State Health Rankings (2004 ed. Minnetonka, Minn.: the Foundation, 2005), available at www.unitedhealthfoundation.org/shr2004/states/NorthCarolina.html.
5. Pub. Health Task Force, N.C. Div. of Pub. Health, North Carolina Public Health Improvement Plan (Raleigh: NCDPH, Jan. 15, 2005), available at www.ncpublichealth.com/taskforce/taskforce.htm.
6. Trust for America's Health, Ready or Not? Protecting the Public's Health in the Age of Bioterrorism (Washington, D.C.: the Trust, 2004).
7. In times of emergency, hospitals and the public health system are overwhelmed with calls from the "worried well," people who may not actually be at risk but are concerned and need information. "Syndromic surveillance" is a newly implemented automated system that helps callers find the right resources for their concerns.

Relying on lessons learned from the partnership, these newly created public health incubators (see Figure 1) have moved ahead quickly, formally establishing governance structures, identifying strategic directions, and conducting baseline public health assessments. Target health problems include diabetes, health disparities among racial and ethnic groups, illness in people who are elderly, and other urgent concerns identified in community health assessments. Although the incubators cannot fully address all the large and complex issues facing the state, they are an important step in enhancing local capacity to meet serious public health challenges.

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Conclusion

NCIPH provides a unique resource to the state in execution and management of these and other major programs, facilitating access to services designed to improve delivery of essential public health services at the local level. The pioneering academic-practice partnerships build on decades of interaction between the UNC School of Public Health and the North Carolina practice community and serve as models for the rest of the nation. Through such efforts, NCIPH is realizing its mission, "Serving our state, leading the nation."

Notes

1. Trust for America's Health, Ready or Not? Protecting the Public's Health in the Age of Bioterrorism (Washington, D.C.: the Trust, 2004).
2. North Carolina Institute for Public Health, A Report on the Public Health Workforce of North Carolina (Chapel Hill: NCIPH, 2004), available at www.sph.unc.edu/nccphp/wfds_assess_rpts/Statewide.pdf.
3. Institute of Medicine, Who Will Keep the Public Healthy? Educating Public Health Professionals for the 21st Century (Washington, D.C.: National Academy Press, 2003).
4. *Id.*
5. *See* NCIPH, Report on the Public Health Workforce.
6. Act of Aug. 8, 2005, SL 2005-369 (establishing a Local Health Department Accreditation Board in the North Carolina Institute for Public Health, requiring the Commission for Health Services to develop rules governing accreditation, and requiring all local health departments to become accredited); Appropriations Act, SL 2005-276 (allocating money to the Department of Health and Human Services). The detailed allocation of $700,000 for accreditation appears in the Joint Conference Committee Report on the Continuation, Expansion and Capital Budgets (Raleigh: Fiscal Research Div., N.C. General Assembly, Sept. 8, 2005), the unofficial version of which is available at www.ncga.state.nc.us.