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Adolescent Health in North Carolina

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Tar Heel Footprints in Health Care

Recognizing unusual and often unsung contributions of individual citizens who have made health care for North Carolinians more accessible and of higher quality

Bronwyn Lucas, MPH ***An Advocate for Youth Empowerment***



Bronwyn Lucas, executive director of Youth Empowered Solutions (YES!), has spent her career as an advocate for youth empowerment. YES! is a nonprofit organization that collaborates with youths and adults to promote community change. Crucial to the YES! framework is the involvement of youths in creating responses to the challenges confronted by North Carolina children and adolescents. YES! hires young staff members on a part-time basis and draws on their problem-solving responsibilities to help build leadership and advocacy skills. YES! has three centers across North Carolina (one each in Asheville, Charlotte, and Raleigh) and sponsors prevention programs that target teen tobacco use, underage drinking, and youth obesity.

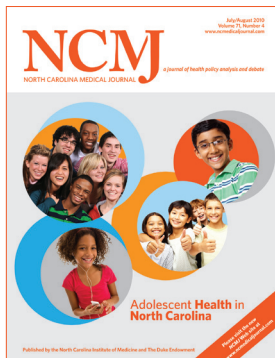
As executive director, Bronwyn works with young people on a daily basis, yielding strong relationships that foster mutual trust and respect. These interactions affirm her belief that young people—our future leaders—are vital to the problem-solving process. As Bronwyn notes, “In a cycle of learning, acting and inspiring others, [youths] create a force that ripples far beyond their own lives.”

Several distinguishing characteristics underpin Bronwyn’s success at YES! According to close friend and colleague Jeanne Dairaghi, Bronwyn “really understands that youth leaders will be the leaders of tomorrow and that they are already the leaders of today. It’s so vital to give youths the skills they need to explore and experience this type of leadership. Bronwyn has the passion and vision for youth empowerment. She’s the voice of empowerment not only for youths and adults who are making change in the community, but also for a whole movement that is so needed in North Carolina.” In addition to working with young emerging leaders, Bronwyn also partners with policymakers, legislators, and local coalitions to promote collaboration with and empowerment of youths.

Bronwyn’s personality is such that “she takes the message of youth empowerment to heart,” according to Dairaghi. “She applies it to work, to interactions with staff, and in her personal and family life. She has a sense of humor and is a great person to share ideas with because she is very receptive and has great insight. Bronwyn is really good at seeing not only the details but also the big picture and how to fit youth empowerment and advocacy into the pieces of the puzzle that make communities better.”

Bronwyn was born in Massachusetts and raised in Connecticut. She received an undergraduate degree from Amherst College in Massachusetts and a master of public health degree from the University of North Carolina at Chapel Hill. Before becoming the executive director of YES! in 2008, Bronwyn led the agency’s flagship program, Question Why Youth Empowerment, for eight years. She loves to travel and has spent time in Australia, New Zealand, Fiji, Nicaragua, El Salvador, and Ireland.

Contributed by Lindsey E. Haynes, MHA, a graduate student in the Department of Health Policy and Management, Gillings School of Global Public Health, University of North Carolina at Chapel Hill.



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Medical Care Costs for Diabetes Associated With Health Disparities Among Adult Medicaid Enrollees in North Carolina

Paul A. Buescher, PhD; J. Timothy Whitmire, PhD; Barbara Pullen-Smith, MPH

Abstract

Background: Health disparities for many diseases are large and long-standing in North Carolina and the nation. This study examines medical care costs for diabetes associated with health disparities among adults (age, ≥ 18 years) enrolled in Medicaid in North Carolina during state fiscal year (SFY) 2007-2008 (ie, July 1, 2007, through June 30, 2008).

Methods: North Carolina Medicaid paid claims and enrollment data were used to calculate the prevalence of and medical care expenditures for diabetes among adult Medicaid enrollees overall and by white, African American, and American Indian race. The impacts of racial and economic health disparities on medical care costs for diabetes were determined by first calculating the proportionate differences between the diabetes prevalence for whites, African Americans, and American Indians enrolled in Medicaid and the diabetes prevalence among all whites in North Carolina. Then it was assumed that medical care costs for white, African American, and American Indian Medicaid recipients could be reduced by the same proportion if the overall prevalence among whites was achieved.

Results: The diabetes prevalence among adult Medicaid enrollees was 15.7%, compared with 9.1% for all North Carolina adults. During SFY 2007-2008, the state Medicaid program in North Carolina spent \$525 million for diabetes-related medical care and prescription drugs among adults. An estimated \$225 million in diabetes-related expenditures could be saved each year by the North Carolina Medicaid program if both racial and economic disparities in the diabetes prevalence were eliminated.

Limitations: We did not have data on non-Medicaid paid health care expenditures for the Medicaid enrollees in our study. The costs of interventions to eliminate health disparities associated with diabetes are not included in the calculation of the potential savings.

Conclusions: The diabetes prevalence in the Medicaid population is much greater than that for all North Carolinians, and the Medicaid costs associated with this elevated prevalence are large. North Carolina health-policy makers and health-program managers should carefully evaluate investments in interventions to reduce these race- and economic-based differences in diabetes prevalence, which could potentially reduce Medicaid costs.

Keywords: health status disparities; minority health; diabetes mellitus; Medicaid; health care costs

For many diseases, health disparities between races are large and long-standing in North Carolina and the nation. For a few conditions, such as suicide and chronic lung disease, the mortality rate among white individuals is higher than that for African Americans and other minority groups. However, for many health conditions, minority groups have mortality rates that are much higher than those for whites. For example, unpublished data from the State Center for Health Statistics show that the age-adjusted death rate for stroke among African Americans in North Carolina is 1.5

times the rate among whites; among American Indians, it is 1.2 times the rate among whites. For chronic kidney disease, the age-adjusted death rate for African Americans is 2.5 times the rate for whites; for American Indians, it is 1.6 times the rate for whites. Infant death rates among African Americans and American Indians are approximately twice the rate among whites. Homicide death rates among African Americans and American Indians are approximately five times the rate for whites.

We use the term “disparities” in this article to refer to

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differences between minority racial groups and the majority white population and between the Medicaid population and the total population. The term “disparity” implies that the difference is based on a level of unfairness or injustice due primarily to modifiable forces, such as social, economic, or political factors. Not all differences are disparities; for example, differences in disease rates between age groups would not usually be considered disparities.

Disparities in health measures by race are due in part to socioeconomic differences among the racial groups. For example, 7.5% of white families, 25.2% of African American families, and 19.4% of American Indian families in North Carolina lived below the federal poverty line during 2004.¹ Socioeconomic disparities in health status are large and well documented, with people of lower income and education having much higher rates of mortality and other adverse health outcomes.^{2,3} However, some studies showed that racial differences persist even after analyses controlled for socioeconomic status. Factors such as racism and discrimination contribute to these differences.^{3,4}

The prevalence of diabetes has increased steadily in recent years, and it contributes to and complicates a number of other health conditions, such as cardiovascular disease and kidney disease. For diabetes, there are very large health disparities among minority racial groups. Unpublished 2003-2007 data from the State Center for Health Statistics show that, among persons whose primary cause of death was diabetes, the age-adjusted mortality rate was 20.5 deaths per 100,000 population for whites, compared with 53.1 deaths per 100,000 population for African Americans (ie, 2.6 times the rate for whites) and 50.2 deaths per 100,000 population for American Indians (ie, 2.4 times the rate for whites).

Respondents to the North Carolina Behavioral Risk Factor Surveillance System (BRFSS) telephone survey are representative of all adults (age, \geq 18 years) in North Carolina.⁵ The percentage of 2007 BRFSS respondents reporting that they had diabetes was 9.1%. The prevalence of diabetes was 8.5% for whites, compared with 13.7% for African Americans (ie, 1.6 times the prevalence for whites) and 12.8% for American Indians (ie, 1.5 times that for whites). Obesity is a key risk factor for diabetes. The 2007 BRFSS data revealed that the race-specific pattern of obesity among adults was similar to that for diabetes, with 38.9% of African Americans, 36.5% of American Indians, and 26.4% of whites reporting that they were obese.⁵

One likely reason that the racial disparity ratios for diabetes death rates (\sim 2.5) are larger than the disparity ratios for diabetes prevalence (\sim 1.5) is that there are race-based differences in the medical management of diabetes. People of minority race who have diabetes may access medical care less frequently than whites because of several factors, including lack of health insurance, residence in an area with fewer primary care physicians, barriers to transportation, and mistrust of the health care system. This could mean

that, among individuals with diabetes, persons of minority race enter primary care later and have less adequate diabetes management than do whites.⁶

There are strong arguments based on fairness and equity for eliminating or reducing health disparities. There has been much less attention given to the effects of health disparities on medical care costs. This study examines medical care costs for diabetes associated with health disparities among adult Medicaid enrollees in North Carolina during state fiscal year (SFY) 2007-2008 (ie, July 1, 2007, through June 30, 2008).

Methods

We selected 5.6 million diabetes-related paid claims for adults (age, \geq 18 years) during SFY 2007-2008 (of note, more than 75 million total Medicaid claims were paid during this period). We included all claims (eg, medical, hospital, outpatient, and home health claims) for which diabetes was identified using code 250 from the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) as either the primary or contributing diagnosis. We also included prescription drug claims for drugs used almost exclusively for the treatment of diabetes (ie, various types of antihyperglycemic medications).

Analyses of these data were performed for whites, African Americans, and American Indians and for total Medicaid enrollees. Hispanic ethnicity (defined as “yes” or “no”) is reported in addition to race in the Medicaid data set. Hispanics were not included as a separate category for our analyses, because data on Hispanic ethnicity were missing in approximately 20% of the Medicaid enrollment records and because the prevalence of diabetes among Hispanics in North Carolina was low (ie, 3.0%) during 2007.⁵ We included persons of Hispanic ethnicity in the total Medicaid enrollee category, as well as in one of the three racial groups if one of these races was reported at the time they enrolled in Medicaid. A total of 71% of adult Medicaid enrollees with Hispanic ethnicity were reported as having an unknown race, and 24% were reported as white.

Race is reported by the client at the time of enrollment in Medicaid. Race is self-reported by the respondent on the telephone when the BRFSS interview is conducted. The options for race were defined by the state Medicaid agency and by the North Carolina BRFSS survey program.

Because we wanted to determine the total cost incurred by the North Carolina Medicaid program for diabetes-related services, all paid claims were included, regardless of an individual’s length of enrollment during SFY 2007-2008 and their dual eligibility for Medicare.

The total cost for diabetes-related services, the unduplicated number of persons who received one or more diabetes-related services, and the average expenditure per adult with diabetes are presented for each of the three racial groups and for total Medicaid enrollees. The prevalence of diabetes in the adult Medicaid population overall and

by race is calculated by dividing the unduplicated number of persons who received one or more diabetes services by the unduplicated number of adults enrolled in Medicaid for one or more months during SFY 2007-2008. For example, of 812,717 total Medicaid enrollees during SFY 2007-2008, a total of 127,991 (15.7%) had a paid claim for a diabetes-related service during this period.

Statistically significant differences in the prevalence of diabetes were identified using a binomial difference of proportions test, and statistically significant differences in average expenditures were determined using a difference of means test. A *P* value of < .05 was considered to be statistically significant. All statistical tests were performed using SAS software.

The cost of racial health disparities incurred by the North Carolina Medicaid program was calculated by comparing the actual diabetes-related expenditures for African Americans and American Indians enrolled in Medicaid to the expenditures that they would have had if they had the same diabetes prevalence as whites enrolled in Medicaid. It was assumed that diabetes-associated medical care expenditures would be reduced by the same proportions as the prevalences. Finally, Medicaid cost savings were calculated on the assumption that, if racial and economic disparities were eliminated, the diabetes prevalence for whites, African Americans, and American Indians enrolled in Medicaid (a predominantly low-income population) could be reduced to the diabetes prevalence for all whites in North Carolina.

Results

During SFY 2007-2008, the Medicaid program in North Carolina spent \$524,569,000 for diabetes-related medical care and prescription drugs among adults. A total of 127,991 (15.7%) of 812,727 adult Medicaid enrollees had a diabetes-related paid claim during this fiscal year. The average amount spent for diabetes-related care per adult with diabetes was \$4,098. Table 1 shows these data for the total adult Medicaid population and for the three racial groups of interest.

As shown in Table 1, a total of 17.5% of African American adults enrolled in Medicaid had a diabetes-related paid

claim, compared with 15.0% of American Indians and 14.6% of whites enrolled in Medicaid. Of note, the prevalence of diabetes among whites enrolled in Medicaid was 1.7 times the prevalence among all whites in North Carolina (14.6% vs 8.5%).⁵ This indicates a large socioeconomic disparity, since the Medicaid population in North Carolina has, on average, much lower income than the overall population. The diabetes prevalences for African Americans and American Indians enrolled in Medicaid were approximately 1.2 times the overall prevalences for these groups (13.7% and 12.8%, respectively) in North Carolina during 2007.⁵ The average annual Medicaid expenditure per adult with diabetes was similar for each of the three racial groups, ranging from \$4,027 to \$4,214 (*P* = not significant).

Additional data show that, overall, the largest categories of Medicaid expenditures for diabetes are skilled and intermediate nursing care (30% of all expenditures), physician and other medical services (29%), hospital services (21%), outpatient-clinic services (8%), prescription drugs (6%), and home health care (4%). Of the 127,991 Medicaid enrollees with diabetes, 3% were aged 18-24 years, 18% were aged 25-44 years, 40% were aged 45-64 years, and 39% were aged 65 years or older. Of the claims with a diagnosis of diabetes, 80% had diabetes listed as the primary diagnosis, and 20% had diabetes listed as a contributing condition but another condition specified as the primary diagnosis.

The impact of racial health disparities on medical care costs was determined by first calculating the proportionate differences between the diabetes prevalence for African Americans and American Indians enrolled in Medicaid (ie, 17.5% and 15.0%, respectively) and the diabetes prevalence among whites enrolled in Medicaid (ie, 14.6%). Then it was assumed that the medical care expenditures for African Americans and American Indians could be reduced by the same proportions if the prevalence among whites was achieved. Reducing the African American Medicaid diabetes prevalence rate from 17.5% to 14.6% (relative decrease, 16.6%) would save the North Carolina Medicaid program \$38,782,000 per year in diabetes-related expenditures. Reducing the American Indian Medicaid diabetes prevalence from 15.0% to 14.6% (relative decrease, 2.7%) would save

Table 1.
Diabetes Prevalence and Related Expenditures for Adults Enrolled in the North Carolina Medicaid Program During State Fiscal Year 2007-2008, by Race

Characteristic	White (N = 406,227)	African American (N = 317,313)	American Indian (N = 12,836)	Any race (N = 812,717)
Diabetes prevalence, % (no. of adults)	14.6 (59,238)	17.5 ^a (55,437)	15.0 (1,921)	15.7 (127,991)
Total diabetes-related expenditures, \$	243,657,000	233,625,000	7,735,000	524,569,000
Expenditures per case, \$	4,113	4,214	4,027	4,098

a. *P* < .05, compared with the prevalence among white Medicaid enrollees.

the North Carolina Medicaid program another \$209,000 annually in diabetes-related expenditures. The total projected savings of nearly \$40 million annually is based on the assumption that racial gaps in diabetes prevalence within the Medicaid population could be eliminated.

However, we have seen that, in North Carolina, the white Medicaid population (a low-income group) has a high prevalence of diabetes (14.6%), compared with that of the overall white population (8.5%). If we assume that racial and economic disparities were eliminated and, thus, that all groups had a diabetes prevalence of 8.5%, the potential savings for the North Carolina Medicaid program are much greater (Table 2).

The disparity in diabetes prevalence between American Indians and the overall white population is large, but since American Indians are a relatively small population in North Carolina, the projected savings from eliminating this disparity are relatively small. Nevertheless, these calculations suggest that, if racial and economic disparities in diabetes prevalence were eliminated and white, African American, and American Indian recipients of Medicaid achieved the diabetes prevalence observed for all whites, the North Carolina Medicaid program could save \$225 million per year in diabetes-related expenditures.

Discussion

This study illustrates the high costs associated with diabetes in the North Carolina Medicaid population and the amount of money that could be saved by the North Carolina Medicaid program if racial and economic disparities associated with diabetes were eliminated. Our findings present a cost-savings case for eliminating or reducing these disparities that complements the moral case for their elimination.⁷ However, it is important to note that we do not underestimate the difficulties involved in achieving reduced diabetes rates. Health disparities are deep-seated in the fabric of American society and have been very resistant to change. Substantial resources would need to be invested to improve the socioeconomic status of minority and indigent groups as

a means to reducing diabetes rates. There has been insufficient investment in developing targeted, long-term interventions designed to eliminate health disparities.

Some health care programs have been effective in preventing diabetes in high-risk populations. The Diabetes Prevention Program is an intensive lifestyle intervention and preventive medication program that can delay or prevent the development of diabetes in a cost-effective manner.^{8,9} Also, a recent study concluded that the Racial and Ethnic Approaches to Community Health (REACH) project in Charlotte, North Carolina, improved several risk factors for diabetes in an African American community and, thus, has the potential to reduce health disparities.¹⁰ However, because such programs are expensive, a large amount of funding would be needed to ensure that implementation is broad enough to substantially reduce diabetes prevalence at the state level.

Although the primary purpose of this article is to estimate the costs incurred by the Medicaid program in North Carolina for diabetes cases attributable to racial and economic disparities, the net savings from eliminating health disparities should also be considered. Calculation of the net savings involves subtracting the cost of the programs and interventions required to eliminate the disparities from the savings associated with eliminating the disparities. In addition, deaths from diabetes that were averted because of these interventions would likely result in later medical care costs for diseases associated with older age; such costs would be very difficult to quantify but should also be estimated and subtracted from the overall savings to present a more accurate picture of the net savings. Together, these calculations would yield a "business case" for eliminating health disparities.¹¹

A diabetes prevalence of 15.7% for North Carolina adults enrolled in Medicaid was calculated from paid claims and enrollment data. This figure is similar to (and not statistically significantly different from) the prevalence of 14.3% reported by Medicaid enrollees who responded to the 2007 BRFSS telephone survey, but it is much higher than the prevalence of 9.1% reported by all 2007 BRFSS respondents.⁵

Table 2.
Potential Annual Savings to the North Carolina Medicaid Program in Diabetes-Related Expenditures After Elimination of Racial and Economic Disparities, by Race

Variable	White	African American	American Indian	Total
Diabetes prevalence among Medicaid enrollees, %	14.6	17.5	15.0	...
Result if target is achieved				
Proportionate reduction, %	41.8	51.4	43.3	...
Overall savings, \$	101,849,000	120,083,000	3,349,000	225,281,000

Note. Values are projected on the basis of data from state fiscal year 2007-2008. Potential savings are based on achieving the target prevalence of 8.5% estimated for all white North Carolina adults during 2007.⁵

The much higher diabetes rate in the Medicaid population is not entirely a reflection of socioeconomic disparities. Although many people qualify for Medicaid because their annual household income is very low, others become eligible for Medicaid because expenses due to treatment for and medical complications from diabetes (or another chronic condition) compel them to “spend down” their financial resources.

Our use of prescription medications to help identify people with diabetes may have yielded some false-positive findings, since medications such as metformin are increasingly used to treat conditions other than diabetes. However, few people with a drug claim did not also have a diagnosis claim. By using the prescription drug claims plus claims with an ICD-9-CM code of 250, we identified 127,991 people with diabetes. Exclusion of prescription drug claims from the analysis identified 125,473 people with diabetes.

The diabetes prevalence of 8.5% observed for all whites in the state is not a goal for the overall population; rather, it is just a relative point of comparison for this study. In fact, because the diabetes prevalence among whites in North Carolina increased from 5.9% in 2000 to 8.5% in 2007, there is certainly room for improvement in this group, as well.

A study of North Carolina children born in 1992 showed that Medicaid expenditures for African American children were significantly less than expenditures for white children, after adjustment for other variables.¹² This difference was attributed to factors such as community shortages of health care professionals who accept Medicaid patients and racial discrimination among health care professionals.¹² The present analysis did not show that the two minority groups had lower average expenditures than those for whites. Rather, our results show that, once there is a diagnosis of diabetes, annual Medicaid expenditures per person are approximately the same for each racial group.

Because we wanted to determine the total cost incurred by the North Carolina Medicaid program for diabetes-related services, all paid claims were included, regardless of an individual's length of Medicaid enrollment during SFY 2007-2008 or their dual eligibility for Medicare. Therefore, we do not have complete information about health care costs for all people in our study. Of the 39% of people (approximately 50,000) who had diabetes and were 65 years of age or older, most were dually eligible for Medicare. For this group, Medicaid pays only a small portion of medical care costs, with the exception of nursing care. As a result, the average costs presented here are lower than the actual average cost per person.

Missing data on race may have affected the results presented here. For SFY 2007-2008, a total of 8.6% of the 5.6 million paid claims used for this analysis had missing information on race. These records were used in the total Medicaid data shown in Table 1 but could not be assigned to one of the three racial groups evaluated.

Racial and economic disparities associated with diabetes clearly result in increased medical care expenditures for minority and low-income groups. Our results suggest that, if these disparities could be eliminated, the North Carolina Medicaid program could save \$225 million per year in diabetes-related expenditures (minus the cost of the programs required to eliminate the disparities). One could ask how much of a reduction in diabetes disparities is realistic. At least in the short term, it is probably more feasible to reduce rather than eliminate racial and economic disparities in diabetes. Still, closing the gap in diabetes prevalence by half between all whites in the state and the three Medicaid racial groups could result in savings to the North Carolina Medicaid program of more than \$100 million per year in diabetes-related expenditures.

For an estimated 40% of people with diabetes in the United States, the disease is undiagnosed.¹³ Therefore, the expenditures shown in this study underestimate the true cost of diabetes in the Medicaid population of North Carolina, since they are based only on diagnosed cases.¹⁴

Health disparities result in large part from entrenched social and economic inequities that will be difficult to change. In light of the rapidly rising prevalence of obesity in North Carolina and the nation, reducing the prevalence of diabetes among Medicaid enrollees and racial minority groups is a big challenge. In addition to improving the socioeconomic status for these groups, there is a need for comprehensive and targeted health care strategies, including prevention, screening, and early detection. A comprehensive approach must focus on interventions at the individual, community, and policy levels.

In addition, improvements in disease management are needed. For example, recent diabetes-management initiatives have been successful in the Community Care of North Carolina (CCNC) enhanced primary care program for Medicaid recipients. These CCNC initiatives can prevent complications and comorbidities associated with diabetes, avoid some hospitalizations, and, thus, help reduce medical care costs for all racial groups.^{15,16} **NCMJ**

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Views About Secondhand Smoke and Smoke-Free Policies Among North Carolina Restaurant Owners Before Passage of a Law to Prohibit Smoking

Laura A. Linnan, ScD, CHES; Bryan J. Weiner, PhD; J. Michael Bowling, PhD; Erin M. Bunger, MPH

Abstract

Background: This study examined the knowledge, attitudes, and beliefs about secondhand smoke and smoke-free policies among North Carolina restaurant owners and managers before passage of House Bill 2, which prohibited smoking in most restaurants and bars.

Methods: A random sample of North Carolina restaurants was selected to participate. A 15-minute telephone survey was completed by 523 restaurant owners and managers (one per participating restaurant) who spoke English and operated a restaurant that had seating for guests and was not a corporate headquarters for a restaurant chain (response rate, 36.7%). Bivariable analyses using χ^2 tests of association were conducted. Multivariable modeling with logistic regression was used to examine relationships among several predictor variables and current smoking policies at participating restaurants, support among owners and managers for a statewide ban on smoking in restaurants, and beliefs among owners and managers about the economic impact of smoke-free policies.

Results: Restaurant owners and managers were aware that secondhand smoke causes cancer and asthma (79% and 73% of respondents, respectively) but were less aware that it causes heart attacks (56%). Sixty-six percent of restaurants did not permit any smoking indoors. Sixty percent of owners and managers supported a statewide smoke-free law. Owners and managers who were current smokers, those who worked at a restaurant with an employee smoking prevalence of more than 25%, and those who worked in a restaurant without a 100% smoke-free policy were significantly less likely to support a statewide law requiring smoke-free public places. Only owner and manager smoking status and no current smoke-free indoor policy were significant independent predictors of the belief that instituting a smoke-free policy would have negative economic consequences for the restaurant.

Limitations: Although participating establishments were a representative sample of North Carolina restaurants, an overall survey response rate of 36.7% limits the generalizability of these findings.

Conclusions: Most North Carolina restaurant owners and managers in our sample had a smoke-free indoor policy and supported a law to make public places smoke-free. Results were used to strengthen interventions that create a safe and healthy environment for restaurant employees and customers, in anticipation of passage of House Bill 2.

Keywords: secondhand smoke; smoking policy; smoking restrictions; restaurant

Cigarette smoking is the leading cause of premature mortality and morbidity and is harmful not only to those who smoke but also to those exposed to secondhand smoke.^{1,2}

Smoke-free policies that restrict smoking reduce exposure to secondhand smoke.^{3,4} Restrictive and smoke-free policies are also associated with reduced daily consumption of cigarettes^{4,5} and increased attempts to quit smoking.⁵

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Policies that limit smoking also increase smoking-cessation rate.^{4,5}

Although some progress has been made in North Carolina to increase smoke-free environments in government buildings and in schools and universities,^{6,7} residents remain at risk for exposure to secondhand smoke at work and in most public places. A recent survey of North Carolina business owners and managers revealed that having a statewide law making all public places smoke-free was the biggest motivation to implement a smoke-free policy in their establishment.⁸ However, restaurant and bar owners were not specifically included in that survey. Nationally, at least 25 states have enacted comprehensive laws prohibiting smoking in public places and workplaces, including restaurants and bars.⁹ Unfortunately, two previous attempts to enact this legislation in North Carolina were opposed by the North Carolina Hospitality and Restaurant Association, yet few data were available to understand the views held by independent restaurant owners about this issue. This study explores North Carolina restaurant owners' and managers' knowledge, attitudes, and beliefs about smoking, secondhand smoke, and smoke-free policies, to gain insights into how best to work with them to create safe and healthy environments for their employees and customers. It is important to note that this study was conducted before the passage of House Bill 2 (HB 2), which made most North Carolina restaurants and bars smoke-free.¹⁰

Methods

Study sample and data collection. Restaurants were selected using a two-step process from a frame of all restaurants in the state provided by the Tobacco Prevention and Control Branch of the North Carolina Division of Public Health (NC DPH). A sample of 3,500 North Carolina restaurants was selected from the frame and matched to a national white pages database provided by Marketing Systems Group.¹¹ A total of 2,834 restaurants had telephone numbers that were specified in the NC DPH file or that matched numbers from the white pages file. This study is based on a simple random sample of these 2,834 restaurants.

Restaurants were contacted via telephone for a 15-minute interview about smoking-related topics between October 2008 and the first week of January 2009. Restaurants were screened by interviewers, and those that had English-speaking owners and managers, had seating for guests, and were not a corporate headquarters were eligible for survey participation. One owner or manager per eligible restaurant was recruited for questionnaire completion. Interviewers used a computer-assisted telephone interviewing approach. A copy of the survey is available from L.A.L. by request.

The study was approved by the University of North Carolina at Chapel Hill institutional review board. All participants provided verbal consent before completing the survey.

Analysis. Data were converted to an SAS data set (version 9.2 [SAS Institute]) and cleaned before analysis. Bivariable

analyses using χ^2 tests of association were conducted to understand the relationship between restaurants with and those without a 100% smoke-free policy. Multivariable modeling with logistic regression was used to examine relationships between the following three outcome variables: restaurant smoking policy at the time of survey completion, support for a statewide ban on smoking in restaurants and public places, and beliefs about the negative economic consequences of smoke-free policies. The following hypothesized predictor variables were included: smoking status of the owner or manager (current smoker, former or ex-smoker, or never smoker), smoking prevalence among restaurant employees (high, > 25%; or low, \leq 25%), liquor license (yes or no), total tobacco production in the restaurant's home county (none, 0 lbs; low, \leq 555,000 lbs; medium, 555,001-3,925,000 lbs; or high, > 3,925,000 lbs), per capita income in the restaurant's home county (first quartile, < \$35,890; second quartile, \$35,890-\$40,423; third quartile, \$40,424-\$46,125; or fourth quartile, > \$46,126), restaurant policy banning smoking indoors (yes or no), and restaurant size (small, < 25 seats; or large, \geq 25 seats). Selections of "Refused to Answer" and "Don't Know" were set to missing in bivariable and multivariable analyses.

Results

Characteristics of respondents and restaurants. Of 2,834 restaurants with telephone numbers available, 1,892 were contacted up to 10 times by interviewers. Of these, 465 were excluded because they did not meet eligibility criteria ($n=431$) or provide screening information ($n=34$). The survey response rate was 36.7% (523 of 1,427). Respondents at approximately one-third of the restaurants were owners and two-thirds were managers (Table 1). Length of time as an owner or manager varied widely (range, 1-49 years), with a median duration of 3 years. Most respondents (62%) were men. Forty-five percent of respondents were classified as never smokers, 24% were classified as former or ex-smokers, and 31% were classified as current smokers.

Twelve percent of restaurants had less than 25 seats, 21% had 25 to 49 seats, 34% had 50 to 99 seats, and 34% had 100 or more seats. Thirty-six percent had a license to sell liquor. Fifteen percent of restaurants belonged to the North Carolina Restaurant and Lodging Association, 68% did not belong, and 17% did not know their membership status (data not shown). Thirty-six percent were located in counties with no tobacco production, 14% were in counties with low production, 22% were in counties with medium production, and 28% were in counties with high production. Sixty-six percent of restaurants had policies that banned smoking indoors, 24% permitted smoking indoors only in designated areas, 6% permitted smoking anywhere indoors, and 3% had no policy about smoking indoors.

Knowledge and opinions about smoke and smoking. Nearly all owners and managers believed the effects of secondhand smoke were somewhat harmful (32%) or very

harmful (61%) (data not shown); 3% believed that smoking was not harmful (data not shown). Owners and managers of restaurants that permitted smoking were significantly less likely than those of restaurants that did not permit smoking to believe that secondhand smoke is very harmful (53% vs 70%; $P < .001$). Most owners and managers also recognized that secondhand smoke causes cancer (79% agreed or strongly agreed) and asthma (73% agreed or strongly

agreed) but were less knowledgeable about the effects of secondhand smoke on heart attacks (56% agreed or strongly agreed) (Table 2).

Nearly all respondents agreed or strongly agreed that employers have a responsibility to protect workers from exposure to occupational hazards (99%) and to encourage employees to make healthy lifestyle choices (81%), whereas 47% agreed or strongly agreed that employee health habits are a matter of personal choice (Table 2).

Beliefs about smoking policy and its consequences.

Owners and managers of restaurants with liquor licenses were less likely than those without liquor licenses to report that smoking was not allowed anywhere indoors (51% vs 75%; $P < .001$). Respondents who never smoked were more likely than former smokers and current smokers to report that smoking was not allowed anywhere indoors (74% vs 69% and 51%, respectively; $P < .001$ for both comparisons). Restaurants with a higher prevalence of smoking among employees were less likely than those with a lower prevalence to have a smoke-free policy (56% vs 74%; $P < .001$).

Owners and managers believed that smoke-free policies were effective in protecting customers and employees (Table 2). Nearly all (93%) agreed or strongly agreed that smoke-free policies limit exposure to secondhand smoke, but only 30% believed that smoke-free policies help people quit smoking.

A majority (60%) of owners and managers supported a statewide law making public places smoke-free (data not shown). Owners and managers who never smoked were significantly more likely than former and current smokers to support a statewide law making public places smoke-free (81% vs 65% and 32%, respectively; $P < .001$ for both comparisons). Owners and managers of restaurants with a low prevalence of employee smoking were more likely than those with a high prevalence to support a statewide law to make public places smoke-free (73% vs 51%; $P < .001$). Not surprisingly, owners and managers of smoke-free restaurants were significantly more likely to support a statewide law making public places smoke-free than were those at restaurants that permitted smoking (71% vs 44%; $P < .001$).

Additional bivariable results indicated

Table 1.
Characteristics of Respondents and Their Restaurants

Characteristic	Value
Respondents	
Organizational role, proportion (%)	
Owner	178/523 (34)
Manager	327/523 (63)
Other	18/523 (3)
Sex, proportion (%)	
Male	292/471 (62)
Female	179/471 (38)
Smoking status, proportion (%)	
Never smoked	207/461 (45)
Former smoker	109/461 (24)
Current smoker	145/461 (31)
Restaurants	
Employees	
Full-time	
Proportion (%)	510/1,017 (50)
Median (range)	5 (0-99)
Part-time	
Proportion (%)	507/1,017 (50)
Median (range)	7 (0-90)
Employee smoking prevalence, proportion (%)	
≤ 25%	241/469 (51)
> 25%	228/469 (49)
Indoor smoking policy,^a proportion (%)	
Allowed everywhere	32/504 (6)
Allowed in designated areas	122/504 (24)
Not allowed	334/504 (66)
No policy	16/504 (3)
County^b	
Per capita income, \$, median (range)	41,579 (27,241-57,846)
Tobacco production, ×1000 lbs, median (range)	550 (0-22,370)

a. Percentages do not sum to 100% because of rounding.

b. Data are for the county in which the restaurant is located

Table 2.
Respondents' Knowledge and Beliefs about Secondhand Smoke and Smoke-Free Policies

Item ^a	Percentage of respondents			
	Agree/ strongly agree	Disagree/ strongly disagree	Refuse to answer	Don't know
Secondhand smoke causes lung cancer ^b (n=471)	79	13	1	6
Secondhand smoke causes heart attacks (n=471)	56	27	1	16
Secondhand smoke causes asthma (n=471)	73	15	1	11
Employer responsible for protecting employees from occupational hazards (n=515)	99	0	0	1
Employer responsible for encouraging employees to make healthy lifestyle choices (n=512)	81	16	2	1
Employee health habits are a personal choice (n=511)	47	46	3	4
Smoke-free policies help people quit (n=500)	30	67	1	2
Smoke-free policies limit customer exposure to secondhand smoke ^b (n=499)	93	4	1	1
Smoke-free policies limit employee exposure to secondhand smoke (n=499)	93	6	0	1

a. The text is identical to that used in the survey.

b. Percentages do not sum to 100% because of rounding.

that owner and manager smoking status, employee smoking prevalence, current smoking policy, and total county tobacco production were associated with beliefs that restaurants with smoke-free policies suffer negative economic consequences because of these policies. For example, owners and managers who currently smoke were more likely than former smokers and never smokers to agree or strongly agree that smoke-free policies have negative economic consequences for restaurants (53% vs 30% and 38%, respectively; $P < .01$ for both comparisons). Likewise, owners or managers of restaurants that permitted indoor smoking were more likely than owners and managers of smoke-free restaurants to strongly agree that there would be negative economic consequences of going smoke-free (14% vs 7%; $P < .001$). The belief that smoke-free policies have negative economic consequences was not statistically significantly associated with restaurant size, liquor license, county per capita income, or respondents' organizational role.

Owners and managers also differed in their views about whether restaurants that instituted smoke-free policies experienced an increase in the number of individuals patronizing the restaurant. Those who currently smoked were more likely than former smokers and never smokers to disagree or strongly disagree that smoke-free policies increase customer patronage (51% vs 36% and 24%, respectively; $P < .001$ for both comparisons). Owners or managers of restaurants with a high employee smoking prevalence were more likely than owners and managers of restaurants with

a low employee smoking prevalence to disagree or strongly disagree that smoke-free policies increase customer patronage (44% vs 27%; $P < .001$). Owners and managers of restaurants with liquor licenses were significantly more likely than those of restaurants without liquor licenses to disagree or strongly disagree that smoke-free policies increase customer patronage (45% vs 30%; $P < .05$).

Multivariable analyses. We modeled the relationships of key predictor variables from the bivariable analyses and our reading of the relevant scientific literature to better understand factors associated with three specific outcomes of interest: current smoking policy, support for a statewide ban on smoking, and beliefs about the negative economic consequences of smoke-free policies on restaurants.

Table 3 summarizes results of modeling to predict smoking policy status. After statistical control for restaurant size, liquor license, employee smoking prevalence, county per capita income, county tobacco production, and organizational role of respondents, analyses revealed that owners and managers who never smoked were 2.53 (95% confidence interval [CI], 1.55-4.16) times as likely as those who were current smokers to report having a smoke-free policy indoors. Owners and managers of restaurants with a low employee smoking prevalence were 1.78 (95% CI, 1.15-2.76) times as likely as those at restaurants with a high employee smoking prevalence to report having a smoke-free policy indoors. Restaurants with a liquor license were 0.26 (95% CI, 0.17-0.42) times as likely as restaurants without a liquor

license to have a smoke-free policy indoors. The odds of having an indoor smoke-free policy among restaurants in counties with low (odds ratio [OR], 2.37 [95% CI, 1.42-3.96]) or medium (OR, 2.31 [95% CI, 1.25-4.25]) tobacco production were more than twice the odds for restaurants in counties with high tobacco production. The odds of having an indoor smoke-free policy among restaurants in the first (OR, 0.46 [95% CI, 0.25-0.88]), second (OR, 0.52 [95% CI, 0.28-0.97]), and third (OR, 0.48 [95% CI, 0.25-0.91]) quartile of county per capita income were approximately half the odds for restaurants in the fourth quartile (ie, counties with the greatest per capita income). After statistical control for other factors, organizational role and restaurant size were not independent predictors of having a 100% smoke-free policy.

The model used to predict support for a statewide ban on smoking revealed some similar patterns in our sample (data not shown). Specifically, after statistical control for other factors in the model, the odds of support for a statewide law making public places smoke-free among owners and managers who were never smokers were nearly seven times the odds for current smokers (OR, 6.95 [95% CI, 4.11-11.75]). Likewise, former smokers were more than three times as likely as current smokers to support a statewide law making public places smoke-free (OR, 3.23 [95% CI, 1.78-5.85]).

Owners and managers of restaurants with a low employee smoking prevalence were 1.72 (95% CI, 1.09-2.73) times as likely to support a statewide law making public places smoke-free, compared with those at restaurants with a high employee smoking prevalence. Owners and managers of restaurants with a smoke-free indoor policy were 2.47 (95% CI, 1.52-4.01) times as likely as those at restaurants without such a policy to support a statewide law. After statistical control for other factors, organizational role, restaurant size, liquor license possession, and county tobacco production were not independent predictors of support for a statewide smoke-free policy.

Table 4 summarizes results of models that evaluated owner and manager beliefs about possible negative economic consequences among restaurants after implementation of a smoke-free policy. After statistical control for all other factors in the model, only smoking status among owners and managers and current smoking policy among restaurants emerged as statistically significant independent predictors of the belief that instituting a smoke-free policy would have negative economic consequences for the restaurant. In this study, owners and managers who were former smokers were half as likely as those who were current smokers to agree or strongly agree that restaurants with smoke-free policies would suffer negative economic consequences

(OR, 0.52 [95% CI, 0.29-0.91]). Likewise, owners and managers of restaurants with a smoke-free indoor policy were half as likely as those at restaurants without a smoke-free indoor policy to agree or strongly agree that restaurants with smoke-free policies would suffer negative economic consequences (OR, 0.47 [95% CI, 0.30-0.74]). Organizational role, restaurant size, liquor license possession, employee smoking prevalence, county per capital income, and county tobacco production were not statistically significant independent predictors of beliefs about the negative economic consequences of instituting a smoke-free policy.

Discussion

We assessed the knowledge, attitudes, and beliefs of North Carolina restaurant owners and managers about smoking, secondhand smoke, and support for a 100% smoke-free policy for public places, including restaurants. This survey was conducted immediately before the introduction of HB 2, a statewide law that made most North Carolina restaurants and bars smoke-free. Specifically, we wanted to summarize the opinions

Table 3.
Characteristics Associated With the Presence of an Indoor Smoke-Free Policy

Characteristic	OR (95% CI)
Respondents	
Owner	0.70 (0.45-1.09)
Never smoked	2.53 (1.55-4.16)
Former smoker	2.50 (1.38-4.52)
Restaurants	
Large size (≥ 25 seats)	0.81 (0.40-1.68)
Low employee smoking prevalence ($\leq 25\%$)	1.78 (1.15-2.76)
Liquor license	0.26 (0.17-0.42)
Tobacco production^a	
Low (1 to $\leq 1.55 \times 10^5$ lbs)	2.37 (1.42-3.96)
Medium (> 1.55 to 3.935×10^5 lbs)	2.31 (1.25-4.25)
Per capita-income quartile^a	
First ($< \$35,890$)	0.46 (0.25-0.88)
Second ($\$35,890$ - $\$40,423$)	0.52 (0.28-0.97)
Third ($\$40,424$ - $\$46,125$)	0.48 (0.25-0.91)

Note. Data are for 465 restaurant owners and managers. Responses were dichotomized as "smoke-free policy indoors" and "no smoke-free policy indoors." CI, confidence interval; OR, odds ratio.

a. Data are for the county in which the restaurant is located. See Methods for additional information

and concerns of restaurant owners and managers about enactment of a statewide law to prohibit smoking in public places and to clarify how to best work collaboratively with this group to create a safe, healthy, and smoke-free environment for their customers and employees should a new law be enacted.

Analyses revealed that restaurant owners and managers from our sample were generally knowledgeable about the health risks of smoking and secondhand smoke, although their knowledge was somewhat lower than that specified in a recently published study by Colgan and colleagues⁸ involving persons who owned businesses other than restaurants and bars in North Carolina. Thus, it is worthwhile to continue efforts to educate restaurant owners and managers about the negative health impact of secondhand smoke. In addition, although nearly all respondents to our survey agreed or strongly agreed that employers had a responsibility to protect workers from exposures to occupational hazards, they appeared to have limited knowledge about the status of secondhand smoke as a class A carcinogen, which characterizes it as a deadly occupational pollutant.

Most owners and managers in this study agreed or strongly agreed that employers have a responsibility to encourage their employees to make healthy lifestyle choices.

If employers believe they have a responsibility to limit exposure to hazardous substances and encourage healthy lifestyle choices among their employees, it is clear that they should implement measures to limit exposure to secondhand smoke and help decrease the prevalence of smoking in this group. It may be useful to focus attention on the negative impact of secondhand smoke (as opposed to focusing only on the smoker) and to be clear that secondhand smoke contains deadly levels of carcinogens that employees should not be exposed to at work. Moreover, if smoking is permitted, exposure levels among full-time restaurant employees are likely to be high. Given that adverse health consequences are associated with smoking and exposure to secondhand smoke and that 40% of owners and managers reported that they provide health insurance to their full-time employees, these negative health impacts will have consequences for the bottom line of these businesses. On average, annual medical expenditures for people who currently use or previously used tobacco are 14%-20% higher than expenditures for people who never used tobacco.¹² In addition, workers who do not smoke and are exposed to secondhand smoke at the workplace are nearly 40% more likely to visit a physician.¹³

Most owners and managers in our sample agreed that

smoke-free policies limit employee and customer exposure to secondhand smoke. Yet survey respondents were more skeptical that smoke-free policies help people quit smoking. Interventions that correct misperceptions about the beneficial affect of smoke-free policies on smoking-cessation attempts and successes may be an important strategy for getting owners and managers to support restrictive policies and refer smokers to cessation programs.

Despite beliefs that smoke-free policies have positive benefits for health, 35% of owners and managers in our sample permitted indoor smoking, and 40% thought that smoke-free restaurants experience negative economic consequences. This is slightly lower than the percentage observed by Colgan and colleagues,⁸ who found that 53% of North Carolina business owners believed that smoke-free policies would result in a loss of business. Evidence clearly suggests that restaurants and bars with a smoke-free policy do not experience negative economic consequences,^{3,14} and some in fact have reported an increase in patronage.¹⁵ Nonsmokers represent 70%-80% of the adult population in North Carolina, and nonsmokers clearly favor smoke-free

Table 4.
Characteristics Associated With the Belief That a Smoke-Free Policy Has Negative Economic Consequences for Restaurants

Characteristic	OR (95% CI)
Respondents	
Owner	0.95 (0.63-1.45)
Never smoked	0.66 (0.42-1.06)
Former smoker	0.52 (0.29-0.91)
Restaurants	
Indoor smoke-free policy	0.47 (0.30-0.74)
Large size (≥ 25 seats)	0.57 (0.30-1.06)
Low employee smoking prevalence ($\leq 25\%$)	0.94 (0.62-1.43)
Liquor license	0.77 (0.49-1.20)
Tobacco production ^a	
Low (1 to $\leq 1.55 \times 10^5$ lbs)	0.72 (0.45-1.17)
Medium (> 1.55 to 3.935×10^5 lbs)	
Per capita-income quartile ^a	0.96 (0.54-1.70)
First ($< \$35,890$)	0.98 (0.55-1.75)
Second ($\$35,890$ - $\$40,423$)	1.06 (0.61-1.85)
Third ($\$40,424$ - $\$46,125$)	0.72 (0.40-1.31)

Note. Data are for 450 restaurant owners and managers. Responses were dichotomized as "agree/strongly agree" and "disagree/strongly disagree." The y-intercept was 3.78. CI, confidence interval; OR, odds ratio.

a. Data are for the county in which the restaurant is located. See Methods for additional information.

restaurants. In addition to the potential for increased patronage, there are fewer cleaning and insurance costs associated with settings where smoke is not allowed. Thus, any potential negative economic consequences are likely to be offset by these positive consequences.

In this study, owners and managers who were current smokers and those who managed or owned restaurants with a high percentage of employees who smoked were less likely to have an indoor smoke-free policy and were less likely to support a statewide law making public places smoke-free. Moreover, restaurant owners and managers had a smoking prevalence (30%) that was significantly higher than that among US adults (20.6%).¹⁶ Smoking status among business owners has previously been found to be an important predictor of the smoking policy at their workplace,¹⁷ and when an owner or manager smokes, they may choose not to adopt, support implementation of, or enforce a restrictive smoking policy.¹⁸ Thus, it appears critically important to promote the availability of free or low-cost smoking-cessation programs and resources among owners and managers and their employees who smoke. By reducing the prevalence of smoking among business owners, it may increase their motivation to create, support, and maintain a smoke-free work environment.

Gingiss and colleagues¹⁹ reported that restaurants with bars were less likely than those without bars to have restrictive smoking policies. In our study, restaurants with a liquor license were also significantly less likely than restaurants without a liquor license to have a smoke-free indoor policy in place. In multivariable models that controlled for owner and manager smoking status, seating capacity, employee smoking prevalence, county tobacco production, per capita county income, and liquor license possession were not significant independent predictors of support for a statewide law to make public places smoke-free, nor was a belief that restaurants with smoke-free policies would suffer negative economic consequences. Thus, although possession of a liquor license was negatively associated with the presence of a smoke-free indoor policy, support for a statewide law to make public places smoke-free was not significantly diminished among restaurants with a liquor license.

Overall, 60% of restaurant owners and managers in our sample favored a statewide law to make public places smoke-free. However, those who smoked, those at restaurants with a high employee smoking prevalence, and those at restaurants with no restrictions on smoking were less supportive of a statewide law for smoke-free public policies. Owners and managers who smoked and those at restaurants with a higher employee smoking prevalence were also more likely to believe there are negative economic consequences to restaurants that institute a 100% smoke-free policy. Now that the new law has passed, it will be essential to identify and praise owners and managers who quit, who help their employees quit, and who report the cost-savings associated with implementing the new policy, to encourage

similar actions among other owners and managers.

There are a number of reasons why these data are useful beyond the historical perspective they provide on the period leading up to passage of HB 2. First, to ensure effective implementation and enforcement of the new law, it is useful to engage owners and managers in the process. These timely data provide an opportunity to start conversations with a representative sample of restaurant managers and owners and record their views about smoking policy. Second, these survey results can serve as a benchmark to monitor changes in the opinions and beliefs among owners and managers if similar questions are re-administered at follow-up time points. Third, these data give health department officials at the state and local levels unique insights about how to intervene with restaurant and bar owners to bring about smooth implementation of HB 2 and about how to anticipate potential problems during this process. For example, use of media campaigns or local outreach efforts to share success stories of owners and managers who have already gone smoke-free via would be extremely beneficial. Health educators from local health departments who will be responsible for monitoring and enforcement of HB 2 could be engaged in efforts to assist owners and managers with resources to educate their employees and customers about the new law and to provide referrals to cessation opportunities. An emphasis on providing businesses with information about potential cost savings associated with instituting a smoke-free policy change is essential. The best overall quit rates are observed when smoke-free policies are combined with other comprehensive tobacco-control efforts, such as educational campaigns, cessation programs, and increases in tobacco prices and/or taxes.²⁰

North Carolina has lagged behind other states in efforts to help smokers quit, both in taxing tobacco products and in enacting policies that restrict smoking in all public places. As recently as 2009, North Carolina received an *F* in three categories from a national rating program on state tobacco control programs: tobacco prevention and control spending, smoke-free air, and cigarette tax. The state received a *C* in the final category, cessation coverage.²¹ Some excellent progress has been made toward restricting smoking in state government buildings, hospitals, universities,^{6,7} and public schools.²¹ After years of tobacco production and industry influence, it is heartening that North Carolina is making needed progress on many indicators of tobacco control and prevention. Passage of HB 2 as a smoke-free policy for public places is an important step, yet these survey results can help ensure that strategies are in place for the successful implementation, monitoring, and enforcement of this new law.

This study's strengths include its thoughtful design and careful sampling procedures; its timeliness, given the introduction of HB 2; its unique set of questions examining the knowledge, beliefs, and attitudes about secondhand smoke and smoke-free policies held by restaurant owners and managers; and its ability to gather new knowledge about percep-

tions of secondhand smoke and smoke-free policies as an occupational exposure. This study also had several weaknesses. First, it is possible that some restaurants were not included in the list provided by the NC DPH. Although this list is updated regularly, very new businesses may not have been included. Second, the relatively low survey response rate (36.7%) limits the generalizability of these results, and we have little information about nonrespondents to this survey. Thus, we may have responses from a select group of restaurant owners and managers who are generally in favor of a smoke-free policy. To explore this potential limitation further, we conducted a one-sample goodness-of-fit test to compare the percent distributions across the six North Carolina area codes (Charlotte area codes 704 and 980 were combined) among restaurants in the frame and restaurants that participated in the study; area codes were chosen because they occupy distinct geographic regions across the state. The distribution of responding restaurants was not significantly different from that of all restaurants in the frame ($P = .40$), which provides assurance about the generalizability of findings for participating restaurants. Third, we collected self-reported data on indoor smoking policy and smoking prevalence among respondents and their employees. Because public perception of smoking is becoming increasingly negative, self-reported smoking prevalence may be underestimated, and support for a law that makes public places smoke-free may be overestimated. Finally, this survey was administered at a single point in time. Thus, we must limit interpretation of our data to avoid drawing causal conclusions.

Findings from this survey should also be useful to individuals advocating for 100% smoke-free public places. Results

will also benefit collaborative efforts involving interested members of the public health and restaurant industry to ensure that HB 2 is successfully implemented and enforced. Survey results may also help inform public policy experts in other tobacco-growing states (as well as a broader national audience) who are trying to create a healthy and safe environment for employees and customers via policy and educational interventions. Moreover, this type of survey work may be an important first step toward understanding how to best develop health-promoting partnerships between public health agencies and local businesses. Given the obesity epidemic in the United States and the fact that employer-based health insurance pays for a large percentage of employee health care costs, gathering data on the opinions and beliefs of business owners and managers may provide critical insights about how to develop these partnerships, advocate for public and organizational policy changes, and identify leverage points for interventions that will improve the health of employees and communities. **NCMJ**

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HEALTH REFORM FOR NORTH CAROLINA

Making Health Care Reform Work

Barbara Morales Burke

The health care reform laws enacted as the Patient Protection and Affordable Care Act (ACA) and the Health Care and Education Reconciliation Act of 2010 will have widespread and in some cases seismic impacts that will unfold and evolve over more than a decade. This new legislation will transform the health insurance industry, and its impact will be felt by citizens, state governments, and every organization involved in the health care delivery system.

Now that health care reform is law, it is in the interests of all health insurers and organizations and professionals that provide health care (hereafter, “providers”) to navigate through the changes and make sure the law works for all North Carolinians. It took decades for our current health care payment system to develop and evolve, and it will take some time to move in a new direction that addresses costs, improves quality, and benefits patients. But even with the changes brought on by the ACA, the system is not sustainable. Doing nothing is not an option.

This commentary discusses the factors leading to our current health insurance system, how the ACA might affect that system, the role of medical costs in driving up health insurance premiums, and the need for everyone in the health care system to work together in order to fulfill the letter and spirit of health care reform and overcome some of the challenges to achieving sustainable reform.

Blue Cross and Blue Shield of North Carolina (BCBSNC), a not-for-profit insurer, has worked for years to reform the health care system in North Carolina through initiatives that encourage improved quality and efficiency from providers. But the ACA requires substantial new insurance reforms in the future, and much more progress in improving our health care system must be made to support these reforms.

BCBSNC believes that, going forward, real reform can only be successful if there is collaboration among stakeholders from across the health care spectrum, including insurers, physicians, hospitals, pharmaceutical companies, employers, patients, and others. To that end, BCBSNC is already having conversations with leaders from around North Carolina to lower costs and ensure that health care reform works in our state. This collaboration is occurring in many forms. Some will be creative arrangements within BCBSNC’s provider network, but significant collaboration must occur across the wide range of stakeholders in the public and private sectors.

Factors Affecting Premiums

One critical requirement of health care reform—covering all applicants without regard to health or other risk factors—is familiar territory for BCBSNC, for most plans that are part of the Blue Cross Blue Shield system, and for other older nonprofit and not-for-profit health plans. Understanding where BCBSNC came from and how its rating practices evolved can help put certain aspects of health care reform in perspective.

Effects of rating and underwriting. BSBCNC got its start in 1933 selling prepaid hospital plans designed to help the lower and working classes. Later, publicly held, for-profit insurance companies began to sell health plans in North Carolina. These new entrants introduced underwriting and rating to health insurance, which had long been mainstays of other insurance types.

Practices such as charging lower premiums for people at low risk for need of health care services, refusing to cover people with the highest risk, excluding coverage for people with preexisting adverse health conditions, and segmenting the book of business on the basis of individual, small-group, and large-group markets were used to make coverage more affordable for *most* people. Of course, as insurance

became more affordable for most people, it became more costly or even unavailable for people who were not in good health.

Over time, not-for-profit companies, such as BCBSNC, and nonprofit companies found they had to adopt the practices of for-profit insurers, resulting in a movement from *prepaid* health products to health insurance. The primary motivation for the change was to compete for healthy customers, who were attracted to the low premiums that for-profit insurers could offer. But even higher-risk individuals benefited because practices that encourage healthy people to buy into the insurance pool lower the average claim cost and help contain premium growth for everyone. Insurers with more customers can negotiate more-favorable payment rates with health care providers and spread the cost of administrative expenses.

But no insurer gains when premiums increase because of spiraling health care costs. Nor do consumers gain. As health care costs rose over the years, especially over the past decade, the cost to people in poor health increased. When premiums rise, healthier individuals are more likely to leave the market, adding to the number of uninsured individuals and raising the average cost of coverage. This is known as a “rate spiral.”

Health care reform represents a new social policy. In enacting health care reform, the American people—through their federal legislative representatives—rejected the de facto social policy that current insurance practices embody, which is to keep rates as low as possible for the largest number of individuals and to accept the consequence that some individuals will pay higher premiums or be denied health insurance. Beginning in 2014, federal law will reduce the spread between premiums charged, and no one will be turned down for health insurance. BCBSNC and the insurance industry in general indicated early in the health reform debate that such a system could be workable if everyone was required to have insurance. An individual mandate would enlarge and diversify the risk pool, thereby spreading costs throughout the population. Although the income-based premium subsidies for some individuals and the tax credits for certain small employers will mask the effect for some groups, implementation of this new policy means that some insured people will pay a higher premium than before so that other people can pay less than before—which heightens the importance of a strong coverage requirement.

Premiums: what drives them, and how are they addressed by health care reform? Premium increases and benefit changes are more visible than medical cost increases, because people with insurance are shielded from seeing the rise in actual medical costs. Employers, families, and governments have struggled to keep up with rising premiums. Since 1999, average family premiums have increased by 131%, compared with a 38% increase in wages during the same period.¹ Premium growth, especially the size of premium increases at the individual level, will continue to receive a lot of attention because many people will judge the success of health care reform on the basis of the affordability of premiums.

Some people attempt to compare growth in premiums with the rate of medical inflation and conclude that any premium increase above medical inflation is evidence of a problem with insurance rates. However, this simple comparison does not take into account the complexity and number of premium drivers, many of which are summarized in Table 1. Of note, although several of these factors interact with each other, the interactions are not strictly additive.

The ACA contains provisions designed to address unreasonable increases in premiums in several ways. The secretary of the US Department of Health and Human Services is required to work with states to establish an annual review of unreasonable rate increases, to monitor premium increases, and to award grants to state insurance regulators to review their state’s rates.² In North Carolina and many other states, current law holds that premiums must be adequate, must not be excessive, must not be unfairly discriminatory, and must bear a reasonable relationship to the benefits covered. The North Carolina Department of Insurance must review and approve insurers’ individual rates before the rates can be used. Regulation of small-group and large-group plans varies for initial and renewal rates and by type of carrier. Rates and rate revisions for hospital and medical-service corporations (of which BCBSNC is one) are subject to the highest level of regulation.^{3,4}

The ACA also requires a definition of the phrase “unreasonable premium increase,” which may change the rate-review work performed by state insurance regulators. BCBSNC believes that strong, actuarially based regulation of premiums is critical to avoid unreasonable rate increases and to ensure that neither

Table 1.
Important Drivers of Health Insurance Premiums

Driver	Remarks
Price per service	Practitioners and health care organizations may set higher prices for health services and products.
Health services utilization	Emergence of new technologies and changes in treatment patterns are important factors.
Demographic characteristics of the insured pool	Age and sex are important factors.
Leveraging	Leveraging affects the relationship between member cost-sharing (ie, deductibles, coinsurance, and copayments) and total cost of a service. For example, if the average cost of a primary care office visit increases but the office visit copayment remains unchanged, the difference is accounted for by an increase in premiums.
Selection criteria for inclusion in the insured pool	Selection criteria affect the relative mix of healthy and unhealthy individuals within a pool.
Additional benefits	Adding benefits increases the premium. Benefit reductions are sometimes used to mitigate premium increases.
Regulatory requirements	Requirements may include benefit mandates and can affect other terms of coverage or insurer operations.
Baseline adjustments	Adjustments account for differences between estimated and actual experience for the past period by increasing or decreasing rates for the future period. They are made one time rather than on a continuing basis.

political considerations nor concern over public perception (apart from consumer fairness) lead to rates that are inadequate and jeopardize the financial solvency of an insurer.

BCBSNC also believes that ACA implementation will likely accelerate rather than suppress the rate of premium increases. The most significant impact will be on the selection and demographic characteristics of the insured pool, particularly in the individual and small-group markets. Several factors will likely contribute to accelerated premium increases. First, gender rating will be prohibited. Females of childbearing age will pay less in the future, but males in the same age range, who typically have lower utilization rates, will pay more. Males in later life will pay less in the future, but women at the same stage of life will pay more. Second, age rating will be limited to a ratio of three to one. As a result, the negative impact of age on rates will be less for older adults than it is today, but young adults who are typically healthy will receive a smaller discount than they do today. Third, rating based on health conditions will be prohibited. Individuals with health conditions will no longer be charged a higher rate, but people with no health conditions will not receive a discounted rate.

The bottom line is that younger, healthier people will be charged more for coverage, whereas older, less healthy people will be charged less. If young individuals react to these higher premiums by declining insurance (at least until they need it), then the average per-person cost of the insured pool will increase. The requirement that insurers sell coverage on a guaranteed issue basis, without waiting periods for coverage of preexisting medical conditions, will intensify the likelihood that rates for young, healthy people will increase. New taxes on insurers to help pay for reform, which goes into effect in 2014, will add to the premium pressures,^a as will new benefits required under law.

a. Under the ACA and the Health Care and Education Reconciliation Act of 2010, insurers will be assessed a tax that is based on their share of covered lives. Nationally, insurers will be assessed \$8 billion in 2014. The amount of the assessment will grow to \$14.3 billion by 2018 and will be indexed thereafter.

The ACA aims to counter these forces by requiring individuals to have coverage (subject to an annual financial penalty) and by offering income-based premium assistance. For many young adults, the annual penalty (calculated in 2014 as the greater of \$95 or 1% of household income and in 2016 as the greater of \$695 or 2.5% of household income) will be less than the cost of insurance, even for those whose premium is subsidized. Thus, the individual mandate under the ACA is not nearly strong enough to ensure that everyone buys and keeps coverage.

The ACA's new limits on cost-sharing, elimination of annual and lifetime benefit maximums, and new standards for "essential benefits" (ie, the services and conditions that must be covered, as well as the share of expected, fully covered medical costs paid by the plan) will drive premium increases through increased utilization, increased benefits, and an undercutting of the ability to leverage out-of-pocket costs against rising charges for care. All of these provisions can be viewed as more protective of people with insurance, but they will come at a cost.

As premiums rise, the cost of care goes largely unaddressed. National data show that the majority (\$0.87) of the health insurance premium dollar goes toward paying for covered medical care, with the balance split between profits (\$0.03) and administrative costs (\$0.10), including government taxes and fees.⁵ BCBSNC data from 2009 show that it spent nearly 87% of the average premium dollar on medical care.⁶ Although this medical loss ratio is not uniform across all market segments because of differences in cost structures (eg, administrative costs run higher for nongroup policies than they do for group policies), the mathematical truth is that increased medical care spending per insured individual is the main driver of premium increases.

Increased medical costs threaten access to affordable health insurance coverage and to medical care. Health reform legislation begins to make strides in improving our health system, but it does not control the rising cost of health care delivery. BCBSNC applauds the establishment of pilot and demonstration projects to improve quality, the creation of an independent payment advisory board (IPAB), and the funding of comparative effectiveness research, but the outcomes of these efforts are unknown, and we believe they do not go far enough to address rising costs.

The ACA includes provisions for the testing of new payment models, which have the potential to reduce costs. However, because many of these models will be implemented on a pilot basis, often without a clear path to expanded or permanent use, the Congressional Budget Office generally does not consider them to be money-saving efforts.⁷ Although future actions by Congress and the US Department of Health and Human Services based on findings from these pilot projects may reduce costs, such savings cannot be counted on.

An IPAB was set up to oversee health care system costs by establishing target growth rates for Medicare and ensuring that expenditures stay within these limits. The IPAB will also make general recommendations to Congress on how to control health care costs.⁸ The Congressional Budget Office concluded that the IPAB will reduce Medicare spending by \$28 billion during 2010-2019, with significant savings continuing beyond 2019.⁷ However, a report from the Centers for Medicare and Medicaid Services actuary questioned whether this goal was achievable and expressed concern that providers would have difficulty remaining profitable and might leave the Medicare network.⁹

The ACA also included \$3 billion for comparative effectiveness research and the creation of a new entity—the Patient-Centered Outcomes Research Institute—to oversee the program. BCBSNC supports comparative effectiveness research as a tool for improving health outcomes, which in general also promotes increased cost savings, and the quality of care. However, restrictions are placed on the use of published findings of comparative effectiveness research as the sole basis for denying coverage of items or services under Medicare.¹⁰ Therefore, the effect on future health care costs nationwide is uncertain.

The Massachusetts experiment: increased coverage, little cost control, and rising premiums. The experience in Massachusetts provides a cautionary tale against implementing health reform without controlling underlying medical costs. Massachusetts, which historically had a low percentage of uninsured people in the general population, has had the lowest percentage of uninsured individuals in the nation since the enactment of major health reform legislation in 2006. A survey conducted in Fall 2009 revealed that

95.2% of people aged 18 to 64 years were insured. This value was virtually unchanged from 2008 and represented an increase since 2006, when 87.5% reported having health insurance during a survey conducted before the state's health insurance mandate was implemented.¹¹

Despite the passage of health reform legislation, the state has struggled with rising health care costs. During 2006-2008, the average price of a family insurance premium in Massachusetts increased by more than 12%, and premiums increased by approximately 10% statewide.¹² In 2008, Massachusetts was among the top four states in terms of highest average employer-based family premiums.¹³ Overall health care spending rose by 23% during 2005-2007. The state's per capita average is approximately 33% higher than the national average, although some of the difference may be attributed to the high cost of living in the state.¹⁴ A 2010 report from the Massachusetts attorney general indicated that price increases, not increases in use, caused most of the accretion in health care costs during 2004-2008.¹⁵

Additionally, it has been reported that Massachusetts residents are buying coverage for short periods and incurring high medical bills while they are covered. One insurer, Harvard Pilgrim, discovered that, during a 12-month period, approximately 40% of people who bought an individual plan left after less than five months. While these individuals were covered, they incurred an average of \$2,400 in monthly medical bills, or six times the plan's projections.¹⁶ In 2009, Blue Cross and Blue Shield of Massachusetts (BCBSMA) had 936 people sign up for coverage for three months or less, and each individual had claims of more than \$1,000 per month while in the plan. This value is more than four times the average claim for BCBSMA consumers who buy coverage on their own and retain it. The typical monthly premium for these short-term members was \$400, but their average claim exceeded \$2,200 per month. BCBSMA reports that the problem was even worse in 2008 and resulted in millions of dollars of costs during 2008-2009.¹⁷

In response to concerns about the effects that short-term retainment of health insurance have on premiums, the Division of Insurance (DOI) in the Massachusetts Office of Consumer and Business Affairs contracted with Oliver Wyman Actuarial Consulting to study individual health coverage before and after the July 2007 merger of small-group and nongroup health insurance markets.¹⁸ The study had several notable findings. First, the number of individuals who purchased and retained insurance for only a short period increased. Between 2006 and 2008, the percentage of persons who purchased insurance and terminated the policy within 12 months increased by 75% (from 13.8% in 2006 to 24.2% in 2008), and the number who purchased insurance and terminated the policy within 6 months increased by 390%. Second, the number of individuals who had high-cost medical conditions, which drive up average claims costs, and terminated their coverage within six months increased by 249% (from 364 in 2006 to 1,272 in 2008). Third, the number of healthy individuals, whose departure from the insurance rolls is accompanied by removal of their premiums from the pool, increased by over 400% (from 3,145 in 2006 to 15,991 in 2008).

The study also found that the merger led to a greater than expected increase in premiums for small groups. Calculations performed before the merger projected that small-group rates would increase by 1.0% to 1.5% after the merger. However, calculations performed after the merger revealed that, after adjustment for higher premiums paid by individual subscribers because of factors such as group size and age, the per-carrier cost increased by 2.6% (range, -4.3% to 5.9% per carrier). Moreover, the study revealed that adverse selection added 0.5% to 1.5% to the cost of the merged market, prompting the consultant group to recommend that the state strengthen the mandate in order to reduce adverse selection.

The difficulties with high rates experienced by small employers in particular led Governor Deval Patrick to direct the state insurance commissioner to issue an emergency regulation in February 2010 requiring insurers to file proposed changes in small business premiums with the DOI. This regulation allows the commissioner to review and disapprove rates that are excessive or unreasonable in relation to the benefit provided.¹⁹ In April, the DOI rejected 235 of 272 rate increases submitted by insurers, primarily because of insufficient justification for reimbursing providers at the increased rates and because the increases exceeded the medical consumer price index.²⁰ Six insurers filed a lawsuit seeking to reinstate their proposed increases but were instructed to exhaust administrative appeals with the DOI. The first ruling on appeal issued by the agency overturned its earlier decision to freeze the rates of the appealing insurer, on the grounds that proof of valid reason for providing different reimbursement rates to different providers was given. The hearing officers also determined that medical inflation is an unacceptable barometer for

increases because it is a “backward-looking measure of past expenses and does not measure or forecast future costs.”²¹ The remaining appeals were pending at the time of writing, and decisions were expected in the late summer of 2010. Insurers are concerned with financial stability related to selling policies at a loss. Bills introduced by Senate President Therese Murray²² and by Governor Patrick²³ would both place a cap on increases in insurers’ base premiums and establish requirements regarding increases in payments to providers, although neither has passed the House of Representatives.

Massachusetts has also seen considerable support for annual global payments rather than fee-for-service payments to providers, which could result in such a change in the future.²⁴ However, plans to file legislation to change the system have recently stalled because of “the logistical and political complexity of changing a system that has been in place for decades,” according to Senator Murray.²⁵ If these challenges can be overcome, and if reimbursement methods are implemented that reward providers on the basis of improvements in quality and better health outcomes rather than in quantity of care, a significant step toward controlling costs would be taken.

Promoting Health, Controlling Costs, and Improving Quality in North Carolina

During the health care reform debate, BCBSNC advocated for building on the private health insurance system that is already in place. One reason for taking this position is that private insurers have been particularly active in promoting the health of their customers, health care quality, and cost-effectiveness. But it is clear that much more must be done to make health reform work.

No single segment of the state’s health care system—insurer, employer, physician, hospital, or pharmaceutical company—can stem rising costs alone. Instead, a cooperative effort that focuses on reducing medical costs offers the best opportunity to improve the system in North Carolina.

BCBSNC is eager to collaborate with providers to stem the tide of increasing medical costs. This is consistent with BCBSNC’s efforts to address costs. For example, BCBSNC already works with providers to develop methods of encouraging high-quality, efficient medical care, and in addition, BCBSNC works with business customers to design products that encourage value-based decisions. Over the years, BCBSNC also looked internally to slow the growth of its own administrative costs. BCBSNC recently announced plans to actually reduce administrative costs by 20% by the end of 2013.²⁶

As stated above, the current system, even with the new reforms, is not sustainable. BCBSNC believes that it is up to the company and the providers to work together to address rising medical expenses and give employers an affordable health insurance option, for BCBSNC also believes that employer-based coverage will always be more rewarding for its providers and customers than government-run coverage.

Provider incentives for quality can improve health. Paying for quality care is not a new concept. Three years ago, BCBSNC initiated the Bridges to Excellence pilot program, which provided financial rewards and recognition to physicians who met national standards for quality. During the pilot’s three-year run, BCBSNC paid more than \$4.2 million to over 190 primary care physicians. The results of the program were encouraging for patients of Bridges to Excellence physicians (BCBSNC, unpublished data).²⁷ First, patients of participating physicians spent less on health care than patients of other physicians. Second, they were 34% less likely to visit the emergency department and 24% less likely to see a specialist, compared with other patients. Third, among patients with diabetes, those receiving treatment by participating physicians were more likely than those treated by other physicians to have a good blood pressure reading (defined as 130/80 mm Hg or better).

In October 2009, BCBSNC built on the success of the Bridges to Excellence program by launching the Blue Quality Physician Program for primary care physicians, including family medicine physicians, internists, pediatricians, obstetricians, and gynecologists, who generally are not affiliated with large hospital systems or academic medical centers. Similar to the Bridges to Excellence effort, this program offers higher reimbursement levels to practitioners who meet standards for quality.

Provider payment is not the only avenue. Patient involvement in their health care is a necessary component of a comprehensive effort to improve health and address medical costs. In 2009, BCBSNC again offered its free generic medication program to reduce the out-of-pocket expenses for prescriptions and help its customers remain compliant with their prescription drug therapy. Customers who qualified had

no copayments for generic medications obtained from January through June, saving them more than \$15 million (BCBSNC, unpublished data). As a result, the number of prescriptions filled for generic drugs rose more than 6%, and patients were 3% more likely to fill their prescription and take their medicine.

Care-associated information technology is a key enabler of improved quality and a reformed health care delivery system. In 2006, BCBSNC was the first insurer in North Carolina to actively support and promote the use of electronic prescriptions. The program has grown rapidly in popularity, with over 2,000 physicians using the system and 87% of pharmacies accepting electronic prescriptions at present. Since 2006, more than 4 million electronic prescriptions have been written, each saving about \$250 per physician per month because of increased use of generic drugs and avoidance of unnecessary or inappropriate prescriptions (BCBSNC, unpublished data).

Ensuring good health and providing quality care are critical to the success of health care reform. Healthier people not only live longer, happier lives, but they spend less on health care. When BCBSNC delivers effective, innovative programs to improve its members' health, and when individuals take personal responsibility for a healthier lifestyle, BCBSNC can hold down premiums so more people can afford to purchase quality coverage. By paying physicians and hospitals for providing high-quality care, not just more care, we help ensure that every dollar spent goes to work improving health. All of these programs have been shown to work, but for health reform to be effective, much more needs to be done.

Conclusion

The passage of the health care reform bill signals a massive shift in how health coverage is delivered, bringing everyone into the risk pool and covering millions more Americans. Although BCBSNC holds that the current individual mandate to have insurance is not nearly strong enough, it is still a new paradigm far different from the current system, in which costs and risks can be shifted from one population to another. BCBSNC also believes that the ACA did not take sufficient steps to address medical costs, despite including provisions that will raise premiums. Although the current bill is not ideal, BCBSNC strongly supports it as a step in the right direction, even as the company recognizes that more revisions are likely as elements of the law are implemented. Failure is not an option. All stakeholders must redouble their efforts to hold down costs so we can be successful.

In a sense, BCBSNC is going back to its roots in covering everyone regardless of their health status. BCBSNC has always had an interest in good health, lower costs, and the best quality care. These objectives allow BCBSNC to offer better products at lower prices. Now, with passage of health care reform legislation, everyone shares this interest. The way forward to realizing the dream of accessible and affordable health care for all is for insurers, providers, citizens, and government officials to collaborate to promote health, control costs, and improve the quality of care. **NCMJ**

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POLICY FORUM

Adolescent Health in North Carolina

Introduction

One in six North Carolinians are entering, in the midst of, or emerging from adolescence. Although the term “adolescent” is often considered to be synonymous with “teenager,” an age range of 10 to 20 years is widely held by experts to be a more appropriate interval defining this developmental stage, owing to differences in the times of onset and completion of puberty, the most important transformation during adolescence.

Most young people will begin adulthood in good health, equipped with the social and intellectual skills necessary to make invaluable contributions in many areas of society. Although all youths will confront myriad challenges as they work toward building this skill set, for some the challenges will prove insurmountable, adversely affecting their physical and psychological development.

The approach to preventing or mitigating adverse health-related events in young people has long been piecemeal, mainly targeting one or a handful of risk factors in a single setting. Although well-intentioned, the effectiveness of these focused programs is often limited because the behaviors and conditions they target have multiple causes. Problems such as unplanned pregnancy, overweight and obesity, and violent behavior among adolescents arise from disparate pressures—both internal and external—in a variety of settings, and their prevention requires an understanding of the factors in distinct social contexts (eg, family, school, and community) that foster the emergence of risk factors for risky behavior and substandard health.

Measures that focus solely on prevention are themselves limited. Studies have shown that, in a population of youths exposed to the same risk factors, some will and some will not experience poor development and health. These findings suggest that some circumstances and behaviors that occur simultaneously with exposure to risk factors might confer protection against adverse health-related events. Indeed, programs that protect young people by strengthening their relationships with family, schools, and the community, cultivating their interests and skills, and facilitating their empowerment have proven to be important components of successful strategies to ensure adolescents’ healthy development.

The point of departure for the policy forum of this issue of the *NCMJ* is the 2009 report by the North Carolina Institute of Medicine (NCIOM) Task Force on Adolescent Health (available at: http://www.nciom.org/projects/adolescent/adolescent_report.shtml), funded by The Duke Endowment. The NCIOM task force framed their mission in terms of the healthy youth development paradigm, which emphasizes the creation of evidence-based programs and policies that cultivate the growth of protective factors—connect- edness, skills, and empowerment—that reduce the prevalence of risk factors and promote the creation of protective factors among North Carolina youths.

In the policy forum of this issue of the *NCMJ*, clinical specialists, front-line public health professionals, and two closely involved stakeholders—a parent and an adolescent—build on the task force’s efforts by sharing their unique perspectives on how to improve the health of North Carolina young people and, in so doing, increase our youths’ chances for healthy, industrious, and fulfilling lives as adults. We invite you to review and reflect on the views expressed in these commentaries, and we welcome continued discussion of this importance topic in the correspondence section of future issues of the *NCMJ*.

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Developing Healthy, Happy, and Productive Young Adults: The North Carolina Metamorphosis Project and the NCIOM Task Force on Adolescent Health

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The health and well-being of adolescents has a tremendous impact on the overall health of North Carolinians: the youths of today are tomorrow's workforce, parents, teachers, and leaders. Ensuring that youths find a way to successfully navigate adolescence is of critical importance not only to their health and well-being but also to the economic growth of our state. Unfortunately, data show that far too many of our youths are not as healthy as they could be. For example, a survey conducted in 2009 revealed that over one-half of high school students were not as physically active as they should be, over one-third used alcohol in the past 30 days, and approximately one-fifth felt they were "alone in life."¹ Although North Carolina has a long history of investing in the health and well-being of its children, less has been done to ensure that its adolescents develop into healthy, productive adults.

The North Carolina Institute of Medicine (NCIOM) Task Force on Adolescent Health

The North Carolina Multidisciplinary Adolescent Research Consortium and Coalition for Health (NC MARCH) recognized the need for a more coordinated plan to address the health and well-being of adolescents. With funding from The Duke Endowment, NC MARCH created the North Carolina Metamorphosis Project (NCMP) to study ways to improve the health and well-being of the state's adolescent population. The NCMP is a collaborative effort by the University of North Carolina at Chapel Hill (UNC-CH) School of Medicine and Gillings School of Global Public Health, NC MARCH, the NCIOM, the North Carolina Division of Public Health, and Action for Children North Carolina. The NCMP consists of three distinct projects: an adolescent health

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Howard Lee is the former chairman of the state board of education and the executive director of the North Carolina Education Cabinet.

Pam Silberman, JD, DrPH, is president and CEO of the North Carolina Institute of Medicine.

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Mark Holmes, PhD, was vice president of the North Carolina Institute of Medicine and is an assistant professor at the Gillings School of Global Public Health at the University of North Carolina at Chapel Hill.

portrait, a survey of parents, and a task force on adolescent health (the portrait and the survey findings are available at: <http://www.med.unc.edu/ncmp>). The NCMP asked the NCIOM to convene the task force.

The NCIOM Task Force on Adolescent Health was cochaired by Steve Cline, DDS, MPH, former deputy state health director, Division of Public Health, North Carolina Department of Health and Human Services (NC DHHS), and assistant secretary for health information technology, NC DHHS; Carol Ford, MD, original principal investigator, NCMP, and past associate professor, School of Medicine and Gillings School of Global Public Health, UNC-CH; and Howard Lee, executive director, North Carolina Education Cabinet. There were 38 other members of the Task Force, which met 12 times from May 2008 through September 2009. A list of task force and steering committee members appears at the end of the text.

The task force made 32 recommendations in its report²; 10 were deemed especially important and were designated as priority recommendations. Priority recommendations are presented here in bold.

Focus on Developing Youths

Adolescence is a time of rapid change that involves dramatic shifts in physical, cognitive, and emotional development. Additionally, adolescents' social relationships are in constant flux as they work to develop a sense of their role in the world. External influences, including peers, parents, educators, clinicians, and community members, help drive the transition from childhood to adulthood. In the policy forum of this issue, Daniel Krowchuk³ discusses adolescent development and transition.

Traditionally, efforts to improve the health and well-being of youths have focused on preventing harmful behaviors. However, preventing harmful behaviors is only part of the equation to ensure that adolescents are prepared for adulthood. In preparing for adulthood, youths must also receive the support, relationships, experiences, resources, and opportunities necessary to become healthy, successful adults. Just as parents focus on preventing harmful behaviors and providing support, so too must educators, health care professionals, policymakers, and others who influence youth development. We must work to reduce risky behaviors, identify the resources that adolescents need to succeed, and ensure that all adolescents have those resources. Reframing the way we think about and how we address adolescent health issues is the key to developing a successful approach. If we are to improve the health and well-being of our youths, we must view young people as resources to be developed, rather than as problems to be solved.⁴ In this issue of the *NCMJ*, Michael Resnick⁵ discusses why this paradigm shift toward youth development is critical to improving the health and well-being of our young people.

The task force embraced this approach as they worked to develop a roadmap for improving the health and well-

being of North Carolina's youths. Instead of focusing solely on *prevention*, the task force also looked at ways to *invest* in young people so they can *develop* the skills and attributes needed to become productive adults. Everyday hundreds of thousands of North Carolina adolescents are trying to make the right choices; the task force identified strategies to support adolescents in making decisions to support their best aspirations.

When thinking about youths as resources to be developed, it is critical to identify what parents and policymakers hope for North Carolina youths and what they hope for themselves. When parents talk about their dreams for their children, they do not say "I want my child to be smoke free, substance free, and mentally healthy." Instead, they express hope that their children will be healthy and happy with a

If we are to improve the health and well-being of our youth, we must view young people as resources to be developed, rather than as problems to be solved.

family and a successful career. Policymakers must do the same by envisioning their goals for young North Carolinians and putting in place the services and support that can help youths reach these goals. This work should be done with input from parents and youths themselves. In this issue, Dale Galloway⁶ discusses the importance of parent involvement in improving the health and well-being of all children in the community, Lee Storrow⁷ shares his perspective on why it is important that policies about youths are not made without their input, and Kristen Ito and Jane Brown⁸ explore ways to use new media to involve youths in their own care.

For the well-being of our state, it is important that adolescents are well-prepared for the challenges of adulthood and become healthy, productive members of society by entering the workforce, forming families, raising children, and becoming tomorrow's leaders. To do these things well in the 21st century requires that youths are not only healthy but also well-educated and prepared for life's challenges. The task force recognized the importance of health and education in the current and future well-being of youths and worked

to identify the investments needed to improve outcomes in both areas.

Strengthening Adolescent Health Care

Adolescence is typically a time of robust physical health. Findings from a national survey conducted in 2007 revealed that individuals aged 10 to 20 years had lower average annual health care costs, with fewer admissions to the hospital, visits to the emergency department, and visits to a physician's office than people in other age groups.⁹ Youths who are healthy are more likely to be successful in school. There is mounting evidence that students who have nutritionally sound diets, are physically active, spend time in stress-reducing environments, avoid risky behaviors, have beneficial school connections, and experience nurturing relationships with adults have improved school attendance, behave better in class, and perform better on standardized tests.¹⁰ The greatest threats to the health and well-being of adolescents are the choices they make about health-compromising behaviors. Adolescents are no longer at risk for the adverse health conditions associated with early childhood and have not begun to experience the declines in health seen during adulthood. However, death and disability rates double between the time students leave elementary school and enter the workforce, primarily because of an increase in the frequency of risk-taking behaviors.¹¹ Health-compromising decisions made during adolescence can have both short-term and long-term effects on health. Similarly, many of the behaviors and health habits that affect lifelong health trajectories are established during adolescence.

Adolescents need support—at home, at school, in clinics, and in the community—to help them develop the skills and knowledge needed for their health to flourish now and into adulthood. Regular preventive check-ups and counseling can help ensure that adolescents develop patterns of behavior that will favorably influence lifelong trajectories of health and provide opportunities for early diagnosis and intervention when problems emerge. In this issue, Carolyn Sexton and colleagues¹² explain how the new Adolescent Health Check package from the North Carolina Division of Medical Assistance will help improve the quality of adolescent health. In addition to improving clinical care in traditional delivery models, supporting and expanding health services are important strategies for ensuring that more adolescents have access to health care. **Therefore, the task force recommended that North Carolina strengthen and expand school-based and school-linked health services in middle and high schools.** Steve North and Constance Parker¹³ discuss school-based and school-linked health centers, their implementation in North Carolina, and what can be done to strengthen and expand successful models in our state.

Improving Educational Outcomes

A high school diploma was once a means to a better job, but today a high school diploma is a prerequisite for success in

the job market.¹⁴ The future success of North Carolina's economy depends on the presence of a well-educated populace. However, approximately 30% of North Carolina high school students each year do not graduate.¹⁵ In North Carolina, each class of dropouts is estimated to lose more than \$10 billion in lifetime earnings.¹⁶ Although the loss of income has an enormous impact on the lives of these individuals and their families, it is also felt by the state and communities. The economic and social costs of high school dropouts are staggering. In addition to lost tax revenue from lower earnings, states with a less educated populace have more difficulty attracting business investments and spend more on social programs and crime prevention.

In addition to improving individuals' economic prospects, research increasingly shows that education and health outcomes are tightly intertwined with success in school. People with more years of education are more likely to live longer, healthier lives.¹⁷ Therefore, targeted investments in the public education system of North Carolina have the potential to improve academic performance and increase education duration, yielding a more educated workforce, enhanced economic development, and improved long-term health outcomes. **Therefore, the task force recommended that North Carolina strengthen and expand efforts to support and further the academic achievement of middle and high school students, with the goal of increasing the high school graduation rate.**

Preparing Youths for Adulthood

In addition to needing health care and a high quality education, youths need to learn healthy behaviors and continue them into adulthood. As they transition from childhood to adulthood, adolescents increasingly make decisions that affect their current and future health. During adolescence, youths need guidance and education about the importance of healthy behavior, the impact of various decisions on their health, and the steps they can take to ensure better health today and in the future. Parents and clinicians are two sources of this information, and schools are a third. To ensure that, as part of the North Carolina Division of Public Instruction's stated mission, our students are prepared for life in the 21st century, schools must provide students with the knowledge and skills needed to become healthy, responsible adults.

The North Carolina Healthy Schools partnership between the Department of Public Instruction and the NC DHHS promotes the union of health and learning in public schools, using a coordinated school health approach.¹⁸ The partnership is funded by the Centers for Disease Control and Prevention (CDC) to provide a coordinated and integrated approach to improving the health and well-being of our schools and students that, in turn, improves academic achievement.

The CDC has identified eight critical elements that should be included in a coordinated school health approach:

health education, physical education, health services, nutrition services, mental and behavioral health services, healthy school environment, health promotion for staff, and family and community involvement.¹⁹ Research has shown that well-executed components of the coordinated school health approach have a beneficial effect on students' chances for academic success.²⁰ Supporting and strengthening the Healthy Schools partnership is critical to improving health programs, policies, and services in schools. **Therefore, the task force recommended that the state ensure implementation of the coordinated school health approach and expansion of the North Carolina Healthy Schools partnership to include a local healthy schools coordinator in each local education agency.**

The Broader Context of Youth Development

Research shows that the social contexts in which adolescents are embedded heavily influence their decisions. The task force used a socioecological model of the influences on the health and well-being of young people that recognizes that youths are influenced by personal preferences; family, friends, and peers; health care professionals; the broader community in which they live, attend school, and work; and public policies (Figure 1).

The relationships in the socioecological model are multi-directional; each level influences the other levels. For example, youths influence and are influenced by their friends and peers. Many individuals, working together, can influence public policies, and public policies can have a strong influence on the community and environment. As a result of this interconnectedness, interventions and strategies that address multiple levels are generally the most effective.²¹ To maximize effectiveness, public health interventions should be offered at all levels of the socioecological model (ie, schools, communities, and clinical settings), target people who interact with youths (eg, families and peers), and be reinforced through supportive public policies

Improving Program Quality

The task force sought to identify policies, programs, and services that have the greatest likelihood of producing good health outcomes, either through improvements in health-promoting behaviors or reductions in risk factors. The task force recommended the use, when possible, of evidence-based strategies. Strategies are considered to be evidence based if they have been scientifically proven to improve specific health outcomes and healthy

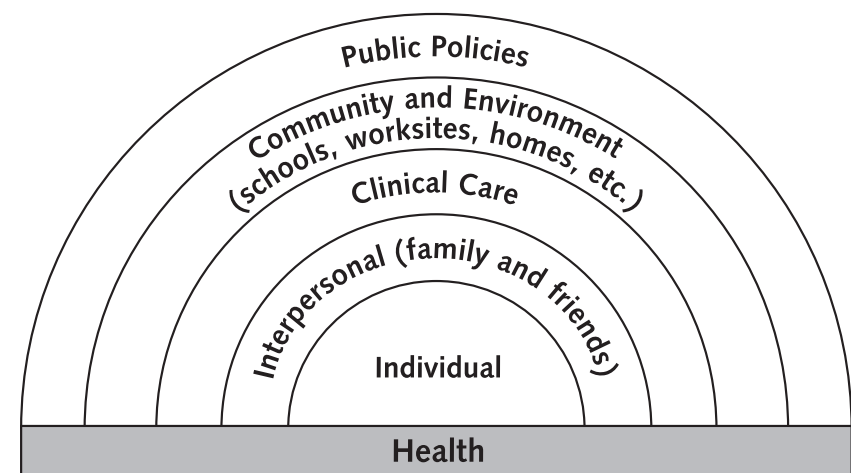
development across multiple adolescent populations. Given the current economic climate, in which funding is limited, investment in strategies that are supported by strong evidence is, in general, a more efficient use of funds. **Therefore, the task force recommended that the North Carolina agencies involved in funding adolescent health initiatives place a priority on supporting evidence-based programs that address behaviors across multiple domains and that account for the racial, ethnic, cultural, geographic, and economic diversity of the population being served.**

In this issue of the *NCMJ*, Lewis Margolis and colleagues²² discuss key components of evidence-based programs, and Michelle Hughes²³ summarizes the role of implementation support in ensuring their quality delivery. Representative Susan Fisher²⁴ reviews the importance of stakeholder involvement and cost in the development of legislation that supports program implementation, and Lindsey Haynes and Anne Hardison²⁵ explore the challenges of implementing evidence-based programs in real-world settings.

Reducing Health Compromising Behaviors

In addition to ensuring that young people are healthy and well educated, which are protective against poor outcomes, the task force considered strategies to reduce factors that place youths at risk for adverse health. As discussed above, the greatest threats to the health and well-being of adolescents are the choices they make about health-compromising behaviors such as smoking, drinking, and committing acts of violence. The task force used the work of the CDC to identify health-compromising behaviors prevalent among adolescents. In setting the Healthy People 2010 goals, the CDC identified 21 critical health objectives for adolescents and young adults.²⁶ The task force worked to identify strate-

Figure 1.
Socioecological Model of Health



Note. Adapted by the North Carolina Institute of Medicine Task Force on Adolescent Health¹ from the original by Glanz and colleagues.²¹

gies to reduce risks for each of the health areas identified by the CDC, including unintentional injury, substance use and abuse, mental health, violence, sexual health, and chronic illness.

Preventing Unintentional Injuries

Unintentional injuries are the leading cause of death and disability for North Carolina youths aged 10 to 20 years.^{27,28} The majority of unintentional injuries are preventable, whether due to motor vehicle crashes, sports injuries, falls, poisoning, or other events. Motor vehicle crashes are the most common cause of unintentional injuries in this age group, accounting for almost one-half of all deaths and resulting in the greatest number of injury-related hospitalizations.²⁷ Younger, more inexperienced drivers are more likely than drivers of any other age to be involved in a motor vehicle crash.²⁹

North Carolina is a national leader in implementing evidence-based policies to reduce the incidence of motor vehicle crashes involving young drivers. The state has a graduated system in place for licensing drivers, primary seat belt laws (which allow law enforcement officials to stop vehicles containing people without a seatbelt), high-visibility enforcement of existing traffic laws, and a zero blood-alcohol-concentration limit for adolescents, all of which have contributed to a reduction in rates of motor vehicle crashes involving young drivers.²⁹

One resource in North Carolina that could be further developed is the driver-education program in public schools. North Carolina is one of the few states that fully funds driver education in the school system. However, although driver education helps train new drivers, these programs have not reduced young drivers' crash rates, and the characteristics of a high-quality driver-education curriculum are unclear. Given North Carolina's strong history of implementing evidence-based preventive policies and programs in this area, it has the unique opportunity to further its leadership and develop an evidence-based driver-education curriculum.

Therefore, the task force recommended that the North Carolina Department of Transportation should develop, implement, and evaluate a driver-education pilot program in the schools.

Improving Mental Health and Reducing Substance Use and Abuse Among Adolescents and Young Adults

Although most youths successfully navigate adolescence without significant psychological, social, or health problems, adolescence is a period when threats to mental and physical health increase and lifelong mental health problems may begin or emerge.³⁰ National data show that at least 20% of children and adolescents have a mental disorder (eg, depression, attention-deficit/hyperactivity disorder, anxiety, and eating and behavioral disorders) and that at least 10% have a serious emotional disturbance (ie, any mental

health disorder that causes a severe disruption in daily functioning).³¹ Adolescents with symptoms of mental illness are more likely to have academic or social problems in school, to be expelled or suspended, to become pregnant before adulthood, to be convicted of a crime, to experiment with alcohol and illegal substances, and to commit suicide.^{32,33}

Many youths begin experimenting with drugs and alcohol during adolescence. Nationally, the use of drugs and alcohol is highest among adolescents and young adults, with drug use peaking at ages 18 to 22 years and alcohol use peaking at ages 21 to 24 years, when consumption of alcohol becomes legal.³⁴ Approximately 7% of adolescents aged 12 to 17 years and 20% of young adults aged 18 to 25 years in North Carolina reported alcohol or illicit-drug dependence or abuse during 2006-2007.³⁴ The early use and misuse of alcohol and drugs can lead to later abuse and addiction; repeated use has also been shown to affect learning and memory, which can lead to poor performance in school. Furthermore, use of alcohol or other drugs is strongly linked to other risky behaviors.

Unfortunately, the majority of cases of mental illness and substance abuse among adolescents go unrecognized or untreated, leaving youths vulnerable to diminished academic performance and to social and behavioral impairments during this critical phase of development.^{34,35} **To address these issues, the task force recommended that the state ensure the availability of substance abuse and mental health services for adolescents.**

Violence

Youth violence affects both young people and society overall. The costs of youth violence, including isolation, loss of income and social capital, and imprisonment, are borne by the victim, the perpetrator, their families, and communities at large. Additionally, individual victims of youth violence may experience adverse physical and/or psychological outcomes, as well as increased risk for future problematic behavior.³⁶ A recent national survey found that 70% to 80% of youths aged 10 to 17 years experienced some type of victimization (eg, maltreatment, including physical and sexual assault, and property damage) in the past year.³⁷ Most youths reported they were physically assaulted without injury by a sibling or peer, and slightly more than 10% reported maltreatment by an adult. In addition to high rates of personal violence, respondents reported high rates of community and family violence. It is difficult to get an accurate representation of the number of youths affected by violence in North Carolina, because of varying definitions, a wide variety of data sources, and inconsistent data.

Reducing youth violence requires a community-wide effort that involves individuals, families, schools, and government agencies in school and nonschool settings. There are several evidence-based programs that target violence directly and indirectly, by addressing the risky behaviors that contribute to violence. Although it is important to

implement these programs for all youths, using evidence-based programs and services is especially critical when targeting at-risk youths, to ensure the best outcomes possible. Juvenile Crime Prevention Councils make decisions at the local level about funding for community sanctions (ie, alternatives to incarceration) and community-level programs to prevent delinquency and substance abuse. **Therefore, the task force recommended that the Department of Juvenile Justice and Delinquency Prevention strongly encourage Juvenile Crime Prevention Councils to fund evidence-based juvenile justice prevention and treatment programs.** It is also important to note that recommendations about funding the evidence-based programs in schools and communities that were discussed above will also help reduce youth violence and delinquency.

Reducing Teenage Sexual Activity and Preventing Sexually Transmitted Diseases and Teenage Pregnancies

During adolescence, many youths begin to have romantic relationships and explore their sexuality. This is a healthy and necessary part of adolescent development and is an important step toward the emergence of the adult role of forming families. However, this exploration can lead youth to engage in health-compromising behaviors that expose them to psychological and emotional risk, as well as to sexually transmitted diseases (STDs) and pregnancy. North Carolina data show that more than 20% of 9th graders and more than 50% of 12th graders report having had sex in the past month.¹ The state's birth rate among teenagers aged 15 to 19 years is one of the highest in the nation (50 births per 1,000 teenagers, compared with the national rate of 42 births per 1,000 teenagers), and nearly one-half of all new STDs in North Carolina occur among people aged 15 to 24 years.^{38,39} Abstaining from sexual contact is the only method that can prevent these outcomes. If adolescents are sexually active, the best ways to reduce the risks of unwanted pregnancy and STDs, including human immunodeficiency virus (HIV) infection, are to use condoms during sex and to minimize the number of sexual partners.

The CDC recommends a multifaceted approach for reducing adolescent involvement in risky sexual behaviors, including promoting abstinence, helping youths who have been sexually active return to abstinence, and educating youths who are sexually active in the correct and consistent use of condoms. North Carolina made an important step toward providing such an approach in 2009 when the state's General Assembly changed North Carolina's reproductive health and safety education from an abstinence-only curriculum, which has not been proven to be effective, to an evidence-based curriculum. There are many other programs to help reduce teenage pregnancies and STDs across the state. Kay Phillips⁴⁰ discusses one innovative new program that uses technology to meet teenagers' needs. To support and complement the programs and services that are already

in North Carolina and to get closer to the multifaceted approach recommended by the CDC, **the task force recommended that North Carolina develop and disseminate a social marketing campaign to prevent unintended pregnancy, expand the Teen Pregnancy Prevention Initiative, and add other STDs to the HIV-associated Get Real. Get Tested. campaign in order to reach more adolescents.**

Chronic Disease Prevention

The health behaviors and habits developed during adolescence affect lifelong health trajectories. Although most adolescents are healthy, almost 50% of American adults have at least one chronic disease (eg, diabetes, high blood pressure, and hypertension).⁴¹ The incidence of adult cardiovascular disease (eg, heart attack and stroke), including early onset adult cardiovascular disease, is particularly high in North Carolina. Early targeting of behaviors that lead to chronic disease, such as the risky health behaviors the task force studied, is critical to preventing or delaying the onset of these diseases. Although there are many behaviors that impact chronic disease, the task force focused on tobacco use and obesity. The underlying behaviors commonly leading to each condition often develop during adolescence and are leading causes of adult chronic and cardiovascular disease.

Tobacco use is a major risk factor for cardiovascular disease and contributes to over 30% of cancer deaths and more than 90% of lung cancer deaths.^{42,43} Almost all adults who smoke became addicted to tobacco during adolescence.⁴⁴ In 2009, 25% of North Carolina high school students reported any tobacco use.⁴⁵ Over the past eight years, North Carolina foundations, governmental entities, health care professionals, insurers, and other community partners have worked together to implement a multifaceted, evidence-based campaign to reduce tobacco use among young people. The campaign has included evidence-based interventions to change social norms, affect clinical practice, improve the community and environment, and strengthen public policies. This multifaceted effort has helped decrease the prevalence of youth smoking by 30% (absolute decrease, 8%) between 2003 and 2007.⁴⁶ Although North Carolina has made great strides, far too many youths still use tobacco products. **Therefore, to further reduce tobacco use, the task force recommended that the state support the full implementation of North Carolina's tobacco control program.**

Being obese or overweight is a major risk factor for cardiovascular disease. Obese and overweight youths are at increased risk for developing high blood pressure, high low-density lipoprotein (ie, "bad cholesterol") levels, and type 2 diabetes during adolescence and later on in life. According to Trust for America's Health and the Robert Wood Johnson Foundation, North Carolina youths aged 10-17 years had the 14th highest prevalence of overweight and obesity in the country during 2007.⁴⁷ Compared with tobacco use, obesity is a much more complex problem that is affected by a

number of factors, including physical activity, nutrition, diet, genetics, metabolism, and the environment. To reduce rates of obesity and overweight among youths, the CDC recommends reducing caloric intake, eating healthier foods, and becoming more active.⁴⁸ These changes can and should be undertaken and supported at all levels—family, school, community, and state. The school food environment is one area in which a huge difference can be made. **To promote healthy eating and reduce overweight and obesity, the task force recommended that North Carolina funders provide financial support to test and evaluate innovative strategies to deliver healthy meals in middle and high schools.**

Mobilizing to Develop All Youths

The task force report was released at the North Carolina Adolescent Health Summit on December 15, 2009, in Chapel Hill, North Carolina.² That meeting brought together more than 200 policymakers, advocates, clinicians, school professionals, parents, youths, and other interested persons who want to ensure that all North Carolina youths have the kinds of opportunities and support needed to become successful adults. In their article, Mark Holmes and Carol Ford⁴⁹ discuss the next steps in implementing the recommendations of the task force. On the basis of work accomplished at the summit, many groups have already started to mobilize around this roadmap for improving the health and well-being of our youths. To improve the lives of adolescents, we must continue to rally young people, parents, and leaders in our communities around this common theme of developing North Carolina youths to their fullest potential. **NCMJ**

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The Case for Programs, Policies, and Practices That Promote Healthy Youth Development

Michael D. Resnick, PhD

Well over a century ago, the noted Midwestern preacher and lecturer Henry Ward Beecher made the observation that “the philosophy of one century is the common sense of the next.”¹ In the mid-1800s, the transformation of avant-garde thinking to shared, taken-for-granted knowledge may well have required up to a century to occur. Today, the rapid accumulation of evidence and experience, coupled with the technology to almost instantly share that information, means that an innovation can move from experimental to mainstream status faster than ever before. Just in the past generation, we have witnessed an evolution regarding how we think about meeting the health and social needs of our young people. In the 1960s and 1970s, “healthy youth development” (what psychologists often call “positive youth development”) could best be described as a philosophy or perspective. People who promoted the use of youth development strategies in their programs, policies, or practices shared a core set of values: they were advocates for youth rights, believed in expanding opportunities and resources for young people, and were committed to the idea that young people developed competence and capacity through contribution, experience, and experimentation.²

Today, there is a base of scientific evidence derived from intervention and evaluation studies that shows that, when deliberate strategies are used to promote healthy youth development, we can reduce the risky behaviors of young people that threaten their health and well-being. Beyond this, by providing opportunities to develop skills and competencies and to have positive experiences with caring adults who have high expectations of and a positive attitude toward youths, we increase the likelihood that young people will grow up to be caring, capable adults.³

However, we also understand that evidence alone is not enough to transform the way we provide health and social services, to alter how we educate adolescents, and to intentionally assure the opportunities, experiences, and resources that demonstrably promote healthy youth devel-

opment.⁴ Shifting the emphasis from risk and problems to an approach that emphasizes strengths and the development of competence requires us to be persuasive with people who may not understand either the philosophy or the science behind healthy youth development. For some, the evidence will be compelling. Results from interventions, evaluations, and health surveys of young people from Asia, Europe, Africa, Latin America, North America, New Zealand, and Australia demonstrate the protective effects of strong, positive relationships, beliefs, and experiences, including:⁵⁻⁷

Investment in the healthy development of our young people has moved well beyond the level of philosophy or perspective. It is now grounded in evidence about what works and what makes a difference.

- Parents and family
- Other adults outside of the family, specifically those who value and reward positive, prosocial behaviors rather than antisocial behaviors
- Teachers who are perceived as fair, interested in students as people, have high expectations of students, and care about students' success
- A sense of spirituality or connectedness with a creative force in the universe, without regard to religious group or affiliation
- A sense of optimism about the future and one's place in it
- Opportunities to learn, to serve, to make a difference

These and related opportunities and experiences that we regard as protective factors for young people provide

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anchoring points within their respective contexts of family, school, and community. The anchoring points, in turn, foster environments that help prevent the emergence of feelings of loneliness and alienation that, in 1970, Phillip Slater⁸ regarded as endemic and inevitable in contemporary American life. The pessimism discussed by Slater is reflected more recently in the brilliant analyses by Australian science writer and epidemiologist Richard Eckersley, who also believes that rapid social change is propelling Western culture toward increasing disconnection and apartness. Young people are regarded as particularly vulnerable to the effects of these social changes.⁹ However, the evidence demonstrates that protective factors can reduce the likelihood that young people will be involved in behaviors, including acts of violence against others or against oneself, substance abuse, early and unprotected sex, and infliction of emotional distress, that are dangerous to themselves and to others.⁵⁻⁷

Of great importance, we also know that these protective effects seem to apply across social groups of young people. Again, drawing from a wide variety of international data, we see protective effects for young people of both sexes; for those in urban and rural areas; for those from a variety of racial and ethnic groups; and for those living in wealthy, highly technological societies and in poor and technologically developing nations.

Research on healthy youth development also shows that social connectedness is the foundation for developing skills, capacity, and experience. In carefully evaluated programs, we see successful outcomes when youths are given opportunities to develop skills in decision making; when they learn skills that allow them to participate in activities that are of service to others in school and community settings; and when they have opportunities to reflect on the meaning of these service activities with the help of trained facilitators. For young people, opportunities for valued contributions reduce involvement in risky behaviors, and participation in service-learning predicts greater involvement in civic life as adults. The latter finding is exciting because it suggests that people who are involved in service-learning during their adolescent years are more likely to become involved during adulthood in their community, in community organizations, and in networks that join them with others.¹⁰

Why is this important?

If you speak with a group of decision makers who are not impressed with the evidence about the importance of protective factors, healthy youth development, and reducing the risky behaviors of young people, you might share the following information: research by Robert Putnam and colleagues¹¹ on the health and community life of adults indicates that adults with fewer connections to their community and less civic involvement have a shorter life expectancy, have less favorable emotional health, and are more likely to live in a community with greater political corruption than adults who have stronger community ties. Their research further indicates that, among adults who are in a

social group (ie, a group connected with a school, a community center, a religion, or another organization that brings together people who have shared purpose), the risk of dying during the next year is half the risk among adults who are not in a social group. This latter finding held up even after a variety of other factors, including health status and poverty, were controlled for in the analysis.¹¹

As people (eg, scholars, health care practitioners, and advocates) concerned with the health and well-being of youths, we must be able to respond persuasively to the skeptical adult who asks, "So, when we think about the problems we have with youth violence, substance abuse, teen pregnancy, school drop out, and teen isolation, are you telling us that social change is creating these difficulties?"

We might say that if history has taught us anything, it is that changes in social conditions change the threats to our health and well-being. The social conditions impacting young people have surely changed: their mobility is increasing, they are confronting an opportunity gap that is widening on the basis of resources and education, and they are less connected to community and adult networks. Many young people are less embedded in their communities than their predecessors were. These changes require that we begin to think differently about the promotion of healthy youth development.

We might also give skeptical adults a brief history lesson. The roots of the modern youth development movement go back more than 100 years. At the dawn of the 20th century, people showed the same kind of imagination we are seeing today in terms of linking the individual's needs, issues, and problems to the larger social context. People understood a century ago that rapid social change was affecting large numbers of young people, sometimes in very challenging ways. Great waves of immigrants, especially from Central and Eastern Europe, came to the United States in the late 1800s and early 1900s, and many of today's Americans had grandparents and parents who were among those millions of immigrants. These social changes led to rapid increases in poverty, the growth of slums, and tenement living. Major social concerns of that day sound very familiar to us today and include educational achievement, employment opportunities, development of strong roots and a sense of connection to one's community, and movement of young people into the social mainstream through active involvement in their communities.

As people thought about the needs of young people, individuals working in capacities similar to those of modern youth workers and social workers focused on helping immigrants acclimate to contemporary American society. The efforts of many of these professionals were guided by a vision of active preparation for modern American life, in which the diverse array of immigrants had an opportunity to learn the skills of citizenship and partake of an active and vibrant community life that embraced the broader culture while nourishing culture-specific elements of theatre, local newspapers, music, and art. Today, we hear echoes of those

efforts within our midst, as youth advocates welcome new arrivals to our nation and struggle to understand how to meet the educational, employment, health, and social needs of people who traveled across the globe to become part of our communities.

At present, our best understanding of the things that young people need in order to be ready for the modern world is captured in the new vocabulary of youth development. We describe the importance of developing the capacities of young people. We talk about strengths, developmental assets, and healthy youth development, and we recognize the importance of civic engagement, well-being, and thriving. The goal of healthy youth development is promotion of competence and positive behaviors, not only the prevention of negative behaviors and reduction of risk factors. We understand that even when young people do not have major problems or high-risk behaviors, they are not necessarily prepared for the demands of adult life. And of note, being prepared for adult life is not the same as being engaged. Our language has changed.

A generation ago, our professional organizations stood shoulder to shoulder with millions of people during strug-

gles for human rights and health care access. Rhetoric associated with the latter issue increasingly focused on what we, as health care professionals, called the five A's: access, availability, affordability, appropriateness, and acceptability of services.

Today, when we think about the needs of our young people, we often focus on the five C's: connection, character, caring, compassion, and contribution.¹²

A May 2000 White House conference about raising teenagers stated that all young people need safe places to grow up, support and guidance from caring adults, and opportunities to learn, contribute, and make a difference.¹³ Our youths need caring role models and energized communities to help them grow into healthy, engaged, and productive adults.

These are the nutrients communities can provide our youths. Investment in the healthy development of our young people has moved well beyond the level of philosophy or perspective. This approach is now grounded in evidence about what works and what makes a difference. Our task is to align programs, policies, and practices with this evidence. Our young people, and all of us, will be the beneficiaries. **NCMJ**

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Adolescence: A Metamorphosis

Daniel P. Krowchuk, MD

metamorphosis, n. [T]he process of transformation from an immature form to a different adult form...

Oxford English Dictionary Online¹

As a physician who has provided care to adolescents for 25 years and, more recently, as the father of an adolescent, I continue to marvel at the physical, cognitive, social, and emotional changes that take place during the period that lies between childhood and adulthood. Truly, there is a metamorphosis—a transformation from an individual who lives in the moment and is reliant entirely on parents, to one who is physically and cognitively capable of thriving independently. What characterizes this period, and what are the implications of this transition?

A Developing Body

The physical changes that take place during adolescence are striking. The growth spurt that begins at around the ages of 9.5 years in girls and 11.5 years in boys contributes 20% of one's adult height and 50% of one's ideal adult weight. In the year of most-rapid growth—at age 11.5 years in girls and 13.5 years in boys—the average girl will grow about 3.5 inches and the average boy 4 inches.² At no time beyond infancy and early childhood will one grow at a more rapid pace. During adolescence, body composition changes with increases in bone mineral density (40% of peak bone mineral density is achieved during this time) and muscle mass (which increases by 100% in boys and 50% in girls).^{2,3}

Of particular note are the physical changes associated with puberty. Beginning at around 6 years of age, the adrenal glands begin to increase production of androgens that ultimately will be responsible for the appearance of hair on the face, chest, axillae, and pubic area, and for the onset of body odor. In girls, the usual first sign of puberty is the onset of breast development (ie, thelarche) that reflects ovarian estrogen production. In the United States, thelarche typically occurs at the ages of 9 years in African American girls and 10 years in white girls. Approximately 2 years after the onset of breast development, between the ages of 9 and 15 years, menarche occurs. For boys, puberty begins at the age of approximately 9.5 years for African Americans and 10 years for whites with an increase in the size of the testes. Over the succeeding 3 years, there are increases in the size of the testes and phallus and the amount of sexual hair.

A Developing Mind

Accompanying the physical changes of adolescence is a process of psychosocial and cognitive maturation. A child is dependent on parents for physical and emotional support. Thought processes are concrete and related to past experiences, and peer relationships are not based on shared interests or values. In the span of a decade or more, however, most individuals are able to think abstractly (allowing them to envision the consequences of their actions), have developed a personal identity and sense of morality, and are self-sufficient and able to thrive independently.

Truly, there is a metamorphosis—a transformation from an individual who lives in the moment and is reliant entirely on parents, to one who is physically and cognitively capable of thriving independently.

Psychosocial development during adolescence occurs as a continuum but often is separated into early (ages 10-13 years), middle (ages 14-16 years), and late (ages 17-21 years) stages. During early adolescence, individuals are keenly aware of and often self-conscious about the many physical changes taking place and are concerned with how others see them. The desire for autonomy becomes apparent and often there is less interest in family activities. Relationships with

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peers take on increasing importance, and there is a tendency to conform to the group's norms with respect to interests and style of dress. It is during this time that the desire to belong to a group places one at risk for experimentation with drugs or alcohol.^{4,5}

By middle adolescence, most teenagers have become comfortable with their bodies. They begin to think abstractly, comparing the actual with the possible, at times finding the former wanting. Parents may find this a frustrating time, as their position of authority and prominence appears less secure in the face of adolescent questioning. However, abstract thinking is essential. It allows the adolescent to see himself or herself in different roles, a major step toward identity formation and independence. Although the ability to think abstractly has begun, during this time adolescents have a sense of invincibility and often do not fully appreciate the consequences of their actions. This, coupled with ongoing peer pressure, increases the likelihood of participating in behaviors that pose a risk to their health, such as substance use and involvement in sexual relationships.^{4,5}

Late in adolescence, most individuals have formed an identity and have the ability to think abstractly and delay gratification. For the most part, the struggle for autonomy has been resolved, and the adolescent may be able once again to appreciate his parents' opinions and values. Mark Twain is said to have observed this process of renewed understanding when he wrote, "When I was a boy of 14, my father was so ignorant I could hardly stand to have the old man around. But when I got to be 21, I was astonished at how much the old man had learned in seven years."⁶

A Work in Progress

Traditionally, it has been stated that adolescence is complete by 21 years of age. However, there is compelling evidence that, despite achieving physical and intellectual maturity by this age, the brain continues to develop late into the third decade. Recognizing this may help explain adolescent behavior and suggests that we may need to rethink the guidance and support we provide them.

As health care professionals will recall, the brain is composed of gray and white matter. Gray matter contains nerve cell bodies that process and route information. White matter is composed of nerve cell extensions (ie, axons) that convey information from one area of the brain to another. Each new experience that we encounter results in new connections between nerve cells (ie, neurons). By the end of adolescence, the brain contains more than 10 billion neurons that form some 100 trillion connections with one another and 100 billion support cells.⁷ The result is an enhanced capacity for learning, reasoning, and problem solving.

The brain is a dynamic organ that undergoes remarkable changes. Studies employing sequential magnetic resonance imaging (MRI) demonstrate that during childhood gray matter increases greatly, presumably enhancing the capacity for learning.⁸ Information that is used regularly is retained; that

which is unimportant or used infrequently ultimately is discarded through a process called pruning, in which a loss of cells or cell connections occurs. As a result of pruning, adolescents may lose up to 15% of synaptic connections each year, compared with 1% to 2% annually for adults.⁷ Pruning continues into the third decade of life, resulting in greater efficiency of information processing. At the same time, the axons that connect cells are being encased in myelin. This fatty insulation increases the speed of impulse transmission 100-fold and, like pruning, is not complete until the third decade. As it turns out, different areas of the brain mature at different rates. For example, the limbic system, responsible for impulsiveness and sensation seeking, develops before the lateral prefrontal cortex, the area that governs impulse control and the ability to envision the consequences of one's actions. This is akin to a car having an accelerator but no brakes and may explain, in part, why some adolescents' impulsivity leads them to become involved in risky behaviors.

Beyond the structural alterations that are occurring, many studies indicate that the adolescent brain works differently than that of an adult. By use of functional MRI (fMRI), a technique that measures hemodynamic responses to neural activity, Galvan and colleagues⁹ have examined an area of the brain called the nucleus accumbens. Activity in this area correlates with the anticipation of a positive consequence of a risky behavior and the likelihood of engaging in such behaviors. These investigators found that adolescents activated the nucleus accumbens to a greater degree than did children or adults, an observation that adds to our understanding of risk-taking behavior.⁹ Studies employing fMRI also illustrate variations in the ways adolescents and adults process social emotions, like embarrassment, guilt, or shame, that require one to consider others' feelings or beliefs. In a study by Burnett and colleagues,¹⁰ fMRI scanning was performed while subjects were asked to think about scenarios designed to evoke various emotions. Adolescents and adults differed with respect to areas of the medial prefrontal cortex that were activated.¹⁰ Burnett and Blakemore¹¹ conclude from the results of this and other studies that adolescents may process information less efficiently and, as a result, have not fully mastered certain social tasks and situations.

Implications of the Metamorphosis

The physical alterations accompanying puberty may have profound effects on adolescents. Uncertainty about the changes in their bodies and questioning whether one is normal is common. Parents can be advised to prepare their child for what is to come, and health care professionals can serve as a source of information and offer reassurance when appropriate. The latter may be particularly important for adolescents in whom the pace of pubertal progression, either slower or quicker, differs from that of their peers.

Because brain maturation is not complete until the third decade, it may be wise to reconsider our role as parents and

health care professionals. Although they may look like adults, adolescents do not think like adults. For this reason, many young people will benefit from continued, albeit progressively diminishing, support from parents, adults, and institutions that provide guidance and help them learn appropriate skills and adult behaviors. As health care professionals, we should regularly inquire about our patients' interests, supports, and strengths, as well as about any involvement in risky behaviors. Beyond this, our efforts at adolescent health promotion, when possible, should be developmentally appropriate. In the case of preventing tobacco use, for example, since adolescents may not fully appreciate the consequences of their actions, simply offering information about the potential haz-

ards and recommending avoidance will often be insufficient. Rather, public policy measures, including the restriction of sales, advertising, and use, likely will be more effective.

Fifty years ago, Dr. J. Roswell Gallagher, the founder of adolescent medicine, wrote, "Adolescents are different, and it is clearly desirable to think about them in different terms than one does of a little child or an adult."^{12(ix)} In view of recent information about brain development during adolescence, this observation is remarkably prescient and remains valid. The adolescent metamorphosis is an extraordinary phenomenon that presents both challenges and opportunities for parents and health care professionals. **NCMJ**

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Using Evidence to Improve the Quality of Programs and Services for Youths

Lewis H. Margolis, MD, MPH; Michael Sanderson, MPH; Ilene S. Speizer, PhD;
Tamera Coyne-Beasley, MD, MPH

Policymakers, researchers, and practitioners are increasingly turning to evidence-based policies, programs, and services. Evidence-based programs are programs that have been evaluated using scientific methods to determine whether program activities achieve their intended outcomes or affect behaviors in the way they are intended. In addition, evidence-based programs are often theoretically grounded, especially when there is insufficient rigorous research to support them. In a recent review of the concept of “evidence based,” Kohatsu and colleagues^{1p419} defined evidence-based public health as “the process of integrating science-based interventions with community preferences to improve the health of populations.” The two key components of this definition—evaluation of interventions by using scientific methods and community preference—are applicable well beyond areas associated with public health, including education, mental health, medical care, and other domains that have an impact on the well-being of adolescents.

There are two primary reasons to use evidence-based approaches to enhance adolescent well-being. First, for the most part, parents, teachers, program directors, and policymakers want to implement programs that have been proven to be effective for adolescents and their communities. Too often, intervention programs and services have been based on what leaders *thought* or *hoped* would work, without good evidence of program effectiveness. Respect for the development of autonomy in adolescents demands that we do not ask them to engage in programs in which effectiveness has not been established or at least assessed.

A second reason to use evidence-based strategies is fiscal prudence. In an environment of increasing fiscal challenges, it is important to maximize the value of funding or, in

other words, to increase the potential return on the investment of financial and human resources. It is important to acknowledge, however, that in the public domain there are always alternative uses for limited resources. Thus, we are

Policies and programmatic decisions that are based on scientifically sound evidence help ensure that the investments made by North Carolinians in the health and education of their youth will pay dividends for years to come.

constantly obliged to use resources efficiently on the basis of measures of effectiveness. The North Carolina Institute of Medicine (NCIOM) Task Force on Adolescent Health focused its work on identifying evidence-based policies, programs, and services to improve adolescent health behav-

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Getting Better Outcomes Through Evidence-Based Programs: The Importance of Quality Implementation

Michelle Hughes, MA, MSW

Getting better outcomes for children and adolescents requires more than choosing an evidence-based program from a list. As it turns out, the quality of the implementation of an evidence-based program significantly impacts outcomes. Although this may seem obvious, quality implementation of these programs is quite challenging because it requires that the program is a good fit for the community and agency and that program delivery is implemented with fidelity and attention to its specific geographic and cultural context. Without careful attention to these issues, community-based agencies that deliver evidence-based programs are unlikely to deliver better outcomes. In other words,

evidence-based programs + quality implementation = improved outcomes.

Unfortunately, many community-based agencies do not have the clinical experience, staff resources, or external support needed to provide high-quality implementation of evidence-based programs. Even agencies with a solid understanding and commitment to evidence-based programs run into a number of challenges associated with implementation, including pressure (real or perceived) from other community agencies to serve a population that is not the best fit for a program, insufficient resources to provide program staff with consistent clinical supervision, and a lack of funding for critical functions, such as program evaluation. There are other reasons that evidence-based programs fail. "Starting an evidence-based program involves running into all kinds

of unexpected challenges. We've learned that it takes two to four years for a new program to work out all the kinks. They go through a version of birth, childhood, and adolescence before fully maturing," says Bud Lavery, executive director of Durham County Communities in Schools, an agency that is currently implementing 10 parenting groups of The Incredible Years, an evidence-based parent-training program. "It's like parenting," according to Lavery. "It has exasperating moments, but seeing the real change in families' lives is amazing."

Implementation Support Provided by Prevent Child Abuse North Carolina (PCANC)

PCANC is a statewide nonprofit organization dedicated to the prevention of child abuse and neglect in all its forms. PCANC advocates for effective prevention strategies, conducts public awareness campaigns, coordinates professional education opportunities, promotes social support for parents and caregivers, supports replication of evidence-based family-strengthening programs, and provides prevention information and resources to its membership of over 250 agencies and professionals across the state.

To help communities address these challenges, PCANC provides implementation support for evidence-based family-strengthening programs, including The Incredible Years and the Strengthening Families Program. PCANC staff provide several types of implementation support to more than 45 community-based agencies.

iors and outcomes and on crafting recommendations based on existing evidence or best practices. The purpose of this article is to describe the principles and approaches that the NCIOM task force used to assemble the evidence for its recommendations.

Evidence-Based Programs

Programs or strategies that have been subjected to rigorous scientific evaluation and have been shown to produce positive outcomes are considered to be evidence based. The best evidence comes from double-blind, randomized, controlled trials (RCTs). In RCTs, study participants are randomly assigned to a group with or a group without the intervention of interest (often referred to as the intervention group and the control group, respectively), and neither researchers nor participants know which group the participants are in. Because randomization reduces the probability that confounding factors are unevenly distributed across study groups, any difference in health status between the groups is likely attributable to the intervention. Although the

RCT is considered to be the gold-standard study design, it is usually expensive and time-consuming and, in real-world public health settings, impractical to perform.

Population-based adolescent health interventions often involve approaches that are not amenable to random assignment of individuals (or groups) to intervention or control arms. These interventions are often evaluated using quasi-experimental study designs. In such studies, participants who received an intervention are compared with participants who have similar characteristics and did not receive the intervention, without participants in either group having been first randomly assigned to one of the study groups.² For example, researchers may use a quasi-experimental study to compare intervention outcomes for students in one high school with outcomes for students in another high school who have characteristics similar to those of students in the first school but did not receive the intervention. This can be done as a post-test-only approach or, alternatively, through a pre-test and post-test approach in which behaviors or markers of health are measured in the intervention

Pre-implementation readiness support. PCANC staff help community-based agencies identify programs that are a good fit for the target population and agency, help assess the agency's capacity to deliver the programs with fidelity, identify strategies for improving "readiness" for implementation, and link community-based agencies with potential funding sources.

Training. Pre-service and in-service training are critical components of high-quality implementation. PCANC staff coordinate training opportunities to ensure that staff responsible for implementing programs acquire and maintain critical skills.

Observation and fidelity assessments. PCANC staff observe program implementation and assess fidelity in areas such as curriculum use, effective facilitation of groups, number of participants, and other critical program components.

On-site coaching and feedback. After observations and as needed by sites, PCANC staff provide reflective coaching and feedback to help practitioners strengthen new skills and competencies, address specific challenges that arise when working with children and parents, and brainstorm strategies to improve service delivery. This kind of technical assistance has been identified in the research literature as being critical to the model's fidelity.

Consultation days. PCANC staff coordinate consultation days in which staff from select evidence-based national programs work with North Carolina practitioners to review skills, support growth, and strengthen practice.

Peer-support calls. Regular conference calls for practitioners implementing evidence-based programs are facilitated by PCANC staff. During these meetings, local practitioners learn from each other, discuss solutions to common challenges, and support implementation with fidelity.

Practitioner listservs. Practitioners implementing each evidence-based program are invited to participate in a group listserv in which they can exchange documents, present ideas, and share information.

Our staff have found that, although community-based agencies are sometimes uncertain at first about using these types of implementation supports, over time they quickly grow to rely on them to ensure effective implementation of services. Indeed, as Bud Lavery points out, "Implementing evidence-based programs at a high-quality level is nearly impossible unless the infrastructure of technical support is already in place."

Conclusion

As North Carolina expands its use of evidence-based programs, public and private funders, policymakers, community-based practitioners, and local agencies will need to identify long-term, sustainable funding strategies for implementation-support efforts. This will require a tremendous change in our collective understanding of effective service delivery, affecting how and when we fund agencies to deliver evidence-based programs and what these agencies need to deliver high-quality programs. We can continue to do what we have always done, which will continue to yield the outcomes we have always gotten. Or we can develop the funding and policy strategies that support effective implementation and lead to better outcomes. The latter option is no doubt a challenge, but it is one well worth undertaking for a better North Carolina. **NCMJ**

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and control groups before intervention implementation and again after intervention completion. Although these studies are generally less expensive and easier to conduct, the findings are not as robust as those from RCTs because the evidence they generate is not considered to be as strong as evidence from a well-designed RCT. An even less robust approach is to restrict measurement of outcomes before intervention implementation and after intervention completion to participants in the intervention group. This approach is often used for "full-coverage" programs, such as mass media interventions, for which no obvious comparison group can be identified. For example, many strategies to address teen smoking attempt to alter the environment at the state or national level and assess the effects of these interventions on smoking rates among teens. According to a report from the Institute of Medicine of the National Academies, many nations implemented bans on tobacco promotion that were followed by declines in tobacco use by young people.³ Researchers showed that smoking declined in association with advertising bans, even if they could not identify indi-

vidual smokers or individuals who consciously noticed such bans. Well-designed RCTs, in contrast, would have been able to identify factors that were likely associated with quitting.

Building a Case From the Evidence

The literature is filled with guidance on how to scientifically evaluate the quality of research studies on the effectiveness of adolescent health programs. However, the greater challenge is to generate a recommendation based on relative effectiveness—that is, to build a case of evidence—from data yielded by multiple studies of varying quality. The Task Force on Community Preventive Services uses six criteria to achieve this goal.^{4,5} *Evidence of effectiveness*, the first criterion, focuses on whether the measures of effectiveness used by the study demonstrate that the intervention achieved the desired or hypothesized effect. *Execution* is the second criterion and specifies that findings from studies in which the intervention was effectively and consistently carried out should receive greater weight than those from pilot studies. The third criterion, *design suitability*, evaluates whether the

designs of the studies used to evaluate the interventions were appropriate for answering the research questions. According to the fourth criterion, *number of studies under review*, if there are many studies that have investigated a problem, there is greater confidence in making recommendations about a particular intervention. Closely related to criterion four is the criterion of *consistency*, which addresses whether findings from each study are qualitatively similar or mixed. The sixth criterion is *effect size* and refers to the strength of the association between the intervention and the outcome in question. After adjustment for the other five criteria, studies that produce larger effects lend more to the strength of the evidence for recommendations than do those with weaker effects.

The next challenge in the evaluation of evidence-based approaches involves communicating the assessments in a way that facilitates their understanding by individuals (ie, practitioners and policymakers) who have the responsibility of implementing sound programs and policies in health or education. Table 1 shows five organizations that provided background information and evidence in the report by the NCIOM task force. The second column shows the categories these organizations use to describe the quality of interventions. The US Task Force on Community Preventive Services classifies recommendations as for or against interventions of interest. Interventions for which there is a need for additional research are classified as having insufficient evidence to determine their effectiveness. In the report by the NCIOM task force, this agency was one of the primary sources of information on evidence-based intervention strategies, such as tobacco taxes to reduce youth smoking and school-based programs to reduce violence, substance abuse, and over-

weight and obesity. The US Preventive Services Task Force (USPSTF) assigns interventions a grade of A (ie, recommended) through D (ie, not recommended), with advice on discontinuation provided for interventions assigned the latter grade. Findings of the USPSTF were used by the NCIOM task force during examination of potential clinical interventions, such as health services for reducing the incidence of sexually transmitted diseases and teen pregnancy. *Blueprints for Violence Prevention* identifies evidence-based strategies to reduce youth violence, aggression, delinquency, and substance abuse and characterizes recommended interventions as model or promising programs. Similarly, the US Department of Education maintains a Web site of evidence-based interventions to improve educational outcomes and ranks the effectiveness of interventions as positive, potentially positive, mixed, indiscernible, potentially negative, or negative.

Although the grading scales described for each organization in Table 1 differ, the analytical skills needed to produce the recommendations are often similar across the approaches. In some cases, there are well-researched, evidence-based strategies that address risk factors of concern. For example, at least six well-developed studies have demonstrated that higher alcohol prices are associated with less youth drinking.⁶ For interventions in which the evidence base is less well developed, recommendations are grounded in best practices or promising experiences, such as establishing joint-use agreements for school- and community-based recreational facilities. Although the value of this strategy has not been sufficiently researched, recommendations developed by this method are considered viable because they address interventions that have proven to be effective in communities across the nation.⁷

Overall, the NCIOM task force sought to identify adolescent-specific policies, programs, and services that have the greatest likelihood of producing positive health outcomes for North Carolina adolescents through reductions in risk factors or improvements in health-promoting behaviors.

Implementing Evidence-Based Programs and Services in Communities

The definition of evidence-based programs specified above included two key components. The first—the rigor of the studies from which the evidence is derived—has been the focus of this commentary. However, it is also important to address the second component, community preferences, which help ensure that evidence-based approaches are imple-

Table 1.
Grading Scales for a Selection of Organizations That Review and Evaluate Evidence

Organization	Grading scale
US Task Force on Community Preventive Services	Recommended Recommended against Insufficient evidence
Centers for Disease Control and Prevention	Strong Sufficient Insufficient evidence
US Preventive Services Task Force	Grades A-D Insufficient evidence
Blueprints for Violence Prevention	Model Promising
US Department of Education: What Works Clearinghouse	Positive Potentially positive Mixed effects No discernible effects Potentially negative Negative

mented on a sound foundation. Two aspects of community preferences are addressed below.

Cultural fit of programs and services. Evidence-based adolescent health interventions have typically been tested in a select set of communities. The highest grade of evidence is given to programs whose effectiveness has been demonstrated across multiple geographically and culturally distinct populations. However, in practice, most programs are evaluated in a pilot phase in a few communities or populations, and their effectiveness is assumed to be replicable in other, broadly similar sites, despite the fact that communities have unique characteristics. Thus, providing evidence-based and promising policies, programs, and services for youths is essential to influence health outcomes, but alone it is not enough. When designing or choosing these interventions, it is important to be sensitive to the diverse cultural norms and beliefs of the adolescents and families targeted. Demographic characteristics (eg, age, sex, gender, race, and ethnicity), disability status, and cultural background play a significant role in determining health attitudes, behaviors, and outcomes. Development of health policies, programs, and services that are culturally appropriate, linguistically sound, and relevant to the needs of diverse populations of adolescents can be challenging but is critical to ensuring the effectiveness of investments made to improve their health and well-being.⁸ In other words, the needs, resources, and circumstances of the community must be considered when implementing programs. For example, a smoking-prevention program that was designed and found to be effective for Latino youths in Durham, North Carolina, may not be effective for youths in a rural or coastal community with a different ethnic and cultural composition.

Nevertheless, fidelity to the key elements of an intervention is essential. For example, Douglas Kirby and colleagues⁹ identified 17 common characteristics of effective sex and HIV

curricula for young adults. Even though evaluations of these curricula occurred in 19 developed and developing countries, adherence to practices such as assessing the relevant needs and assets of the target group, pilot testing, and focusing on clearly defined and agreed on goals were associated with generally positive outcomes of the evaluations they reviewed.

Developmentally supportive settings. The second aspect of community preferences states that specific needs of adolescents should be addressed by programs and services provided in developmentally supportive settings. Youth are influenced by the settings in which they spend time, including family, school, neighborhood, and community programs. The Institute of Medicine of the National Academies identified the following eight features of daily settings as important for positive adolescent development: (1) physical and psychological safety, (2) appropriate structure, (3) supportive relationships, (4) opportunities to belong, (5) positive social norms, (6) support for efficacy and mattering, (7) opportunities for skill building, and (8) integration of family, school, and community efforts.¹⁰ Each feature should be considered at the time of policy development, program selection, and program implementation.

Conclusion

The NCIOM task force demonstrated its commitment to the well-being of the youths of North Carolina by crafting recommendations rooted in the best-available research. For some adolescent health problems, sound evidence provides the basis for these recommendations. For others, the evidence base is less well developed, and recommendations are grounded in best practices or promising interventions. Policies and programmatic decisions that are based on scientifically sound evidence help ensure that the investments made by North Carolinians in the health and education of their youths will pay dividends for years to come. **NCMJ**

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Alignment of Policy and Politics: Doing What Is Right for Our Adolescents

Representative Susan Fisher

For approximately one day per month between May 2008 and September 2009, it was my privilege to serve on the North Carolina Institute of Medicine Task Force on Adolescent Health. The charge was to examine the health of North Carolina's 1.4 million adolescents aged 10-20 years. By the time we completed our work, the Task Force had heard from a wide array of experts in the field of adolescent health, and, on the basis of the information presented, we suggested a list of recommended, evidence-based policies geared toward investing in youth. One overarching goal of the Task Force was to develop a framework that gives North Carolina's young people the opportunity to engage in favorable social behaviors that, in turn, result in good health and a promising future.

As a member of the North Carolina General Assembly, one of the most difficult lessons I have learned is that not everyone agrees with my view of the state, much less of the world. The challenges of introducing new potential legislation are as many and varied as there are members of the North Carolina House and Senate. What form do these challenges take?

Know Your Constituency, and Be Willing to Listen to All Stakeholders—Even the Not-So-Obvious Ones

One example that I look back to is one I encountered during the 1990s as a school board member in my home district. Our school system was presented with the opportunity to receive national foundation funding to open student health centers on the campuses of the local middle and high school. This was a great approach to keeping students healthy, in school, and ready to learn. The centers were implemented and have been quite successful—but not before having undergone a great deal of community scrutiny and questioning from some unlikely sources. A public hearing held at the

middle school early in the process yielded good questions and support. Objections to the health center came from persons living outside the school district who had no children enrolled in either middle or high school. The open meetings gave school officials the opportunity to observe support for

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the center from families living in the district of the school where the center would be located and to address the misunderstandings and fears expressed by individuals who lived outside of the school district and were not in favor of the center.

Ask Your Clients What They Want, and Involve Them in the Planning and Decision-Making Process to the Extent Possible

If we hope to see successful passage of evidence-based policy that addressing the health of our adolescents, then we must engage young people in the process. This has proven to be effective with seat belt use, tobacco-use prevention, and teen-pregnancy prevention legislation, among many other initiatives.

Involve Parents and Other Adult Caregivers

Although adolescence is a period during which persons begin to make more decisions on their behalf, adolescents walk a fine line between childhood and adulthood. Parents and other adult caregivers need to be available for those

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moments—sometimes brief—when adolescents are ready to talk about areas of concern, although it must be kept in mind that such moments may consist of being ready to listen without making a snap judgment. Adults need to be informed about and encouraged to pursue the ways in which they can model healthy decision-making and be given the resources to do so through sound policy-making. These same adults, given opportunities and effective methods of engaging with adolescents, will be our best advocates for passage of evidence-based policy in the legislature. The good news is that parents want to know more about how to engage with adolescents.

What Will It Cost?

In economic times such as these, cost continues to be one of the biggest challenges to the passage of new and worthwhile legislation. However, the question that must be asked is, what is the cost of doing nothing? In many instances, there will be an increased cost. For example, North Carolinians pay on average \$312 million dollars each year to cover the costs associated with teen pregnancy, yet up to now we have invested only \$2.5 million dollars annually for programs to prevent teenage pregnancy.¹ Although this investment is a step in the right direction, it is not nearly enough to fully address this increasing concern.

According to a report by the National Teen Pregnancy Campaign, North Carolina spends, on average, \$3,868 annually for *each child* born to a mother younger than 18 years of age.¹ Between 1991 and 2004, there were more than 212,900 teen births, with an associated cost of \$5.2 billion. This is a hefty price that taxpaying North Carolinians had to bear. Inclusion of the cost associated with dropping out of school—an event that is often due to accumulated absences—sheds light on the views of Bob Wise, former governor of West Virginia and current president of the Alliance for Excellent Education, who reminds us that “the best economic stimulus is a high school diploma.”²

There Is No Need to Work in a Vacuum

As a legislator working with 169 other elected individuals in the General Assembly, my experience so far, albeit brief, has told me that it is of some comfort to know that I don't have to enact policy on my own. In fact, it is better that, as a policy maker, I obtain the assistance of coalitions and advocates on the issues of importance to the health and well-being of adolescents.

In 2001, Alan Rosenthal³ suggested that we may need to replace the well-known metaphor, attributed to the Prussian/German statesman Otto von Bismarck (1815-1898), that characterizes the legislature as a sausage factory. Two interesting metaphors about the legislature were offered by John A. Straayer.⁴ One metaphor describes the legislature as an arena in which, “a score of basketball games are progressing, all at one time, on the same floor, with games at different stages, with participants playing on several teams at once, switching at will, opposing each other in some instances and acting as teammates in others.”⁴ The second metaphor characterizes the legislature as a casino: although there are lots of tables and games, high stakes, and winners and losers, the outcome is never final because there is always a new game ahead.

The stakes are undoubtedly high. We all have different philosophies and opinions about, and ways of approaching, society's issues, but if I keep my focus on the bottom line—the health, well-being, and future of our state, as well as the young people who will be making new policy for us after we are no longer in the legislature—I cannot but stay on the path toward providing adolescents with the best opportunities for becoming healthy, productive adults. This is both the challenge and the opportunity that awaits us in the General Assembly. When we meet that challenge, we are all winners. **NCMJ**

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Challenges of Implementing Evidence-Based Programs

Lindsey E. Haynes, MHA; Anne B. Hardison, MEd

More and more we hear that policy decisions should be based on strong evidence. The strength of evidence is based on the rigor of the research that goes into answering questions about whether a program can and does work in the field. No matter how strong the evidence is that supports a particular policy option or program, there is no guarantee that it will work in every community every time. The evidence that supports one program may be based on experiences in slightly different populations under different circumstances, and the evidence-based program that is implemented may not be identical to the programs that were studied. The last concern about evidence-based policymaking is that there are very few examples of well-tested policies and programs. Basing decisions on evidence is desirable but hard to do.

Many evidence-based programs are broadly generalizable, but that does not mean they will work in a specific community now or in the future. For instance, a program for which there is sufficient evidence supporting its use in an urban setting may not address issues that are relevant in a rural setting. This leads to a caution that policymakers should heed: before evidence-based programs are implemented in a community, it is important to first assess the community's characteristics, such as demographic factors (eg, race, ethnicity, language, and sex) and the nature of the need. Findings from this assessment can then be used to tailor evidence-based programs to the community.

Resource Constraints

Sustainability is essential to the success of evidence-based programs. When local communities seek to build systems and institutionalize practices, they must have the resources to sustain projected outcomes beyond the life of any specific program. One challenge to implementing evidence-based programs is that public resources are often limited. Local health problems are best addressed at the community level where the problems are manifest and because community members are most familiar with them. Often it is difficult to initially fund and then sustain

evidence-based programs that meet the needs of the entire community in the short-term, intermediate-term, and long-term. Additionally, many nonprofit and governmental organizations operate in resource-constrained environments that lack funding for performance improvement projects.²

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Therefore, addressing and implementing evidence-based practices and programs are often not a high priority for organization directors and staff members. Costs associated with implementation include purchasing subscriptions to scholarly journals, developing training manuals for upper-level management and staff, sending staff to conferences and training sessions, reviewing organizational practices on a timely basis, and continuously monitoring and evaluating the practice or program.² Organizations and communities are fortunate if they have the human capital and financial

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resources to cover the cost of implementing evidence-based programs and practices—but what about those that do not? Moreover, many organizations depend on grants to cover the costs of programs and practices, but when the funding streams end, the ability to measure outcomes is diminished, making it extremely difficult to determine a program's effectiveness.

Lack of Evidence-Based Programs

A recent report by the North Carolina Institute of Medicine (NCIOM) found that “there are not well-researched evidence-based strategies for all risk factors identified by the NCIOM task force [on prevention].”³ Areas that are most lacking in evidence-based practices are predominately in child and adolescent health and mental health. One study observed that only 10% of publicly funded child welfare, mental health, and juvenile justice systems used evidence-based practices.⁴ There are several reasons for the lack of evidence-based practices in child and adolescent health programs. The first is the short duration of the developmental stages in these age groups. Children and adolescents are constantly undergoing emotional and physical changes, so an evidence-based practice for treating an adolescent may be completely inappropriate or even harmful for a younger child.⁵ Additionally, when testing evidence-based practices for children and adolescents, researchers must not only consider the developmental stage of people in the targeted age groups, but also the context in which they live (eg, family, community, and environmental settings). If the developmental stage of children and the family/environmental context are not addressed in the clinical trial or pilot study, the generalizability of the program under evaluation might decrease. Since evidence-based practices and programs are

not available for all health sectors, communities may have to look to “best” or “promising” practices and adapt them to their local conditions.

Duration of Policy Implementation

Individualized programs and practices are important to addressing problems in targeted groups, but effective public policies are needed to address problems at the population level. Unfortunately, evidence that supports policy approaches to public health problems can often take a long time to develop. To overcome this barrier, portions of the policy can be implemented over time into the local community as the evidence supporting them emerges, as exemplified in North Carolina's campaign against tobacco. A combination of strategies—increased tobacco taxes, implementation of social media campaigns, expansion of smoke-free policies, and expansion of access to cessation services—has helped reduce tobacco use in this state. Because no single program or practice is likely to change community norms, attitudes, or beliefs, a combination of programs and practices is needed to promote change in local communities.

Putting It All Together

Many successful public health interventions in North Carolina reflect the importance of evidence-based programs, practices, and policies. To address public health problems, it is essential that there is respect for local culture, identification of barriers, creation of partnerships, and, most importantly, acknowledgment of resource limitations, particularly for the prevention of health problems. Improving the health of a community requires a comprehensive effort, and it is important to remember that implementation of evidence-based programs is only part of the solution. **NCMJ**

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To Friend or Not to Friend: Using New Media for Adolescent Health Promotion

Kristin E. Ito, MD, MPH; Jane D. Brown, PhD

The new forms of electronic media have become the air that adolescents breathe. For more than seven hours per day, which is almost the amount of time most adults spend at work, adolescents are using some form of media.¹ Indeed, it is difficult to imagine an adolescent without the ubiquitous cell phone, MP3 player, gaming device, or computer. In fact, the average adolescent in the United States owns more than three such devices.² Although television is still the medium used most frequently (approximately four hours per day), newer forms of media that are digital, more interactive, and more mobile are increasingly attractive to adolescents. These “new media” include Web sites, online social-networking platforms (eg, MySpace, Facebook, and Twitter), computer-based multimedia (eg, CD-ROMs and DVDs) and games, and smart phones that provide Internet access. Although in-home Internet access and quality varies slightly by race, ethnicity, and socioeconomic status, the digital divide is narrowing quickly, and nearly all adolescents report going online at home or school.²

New-Media Opportunities for Adolescent Health

Health practitioners and researchers in North Carolina are beginning to see that many young people prefer new media as an effective way to communicate about health. More than 100 youth and their trusted adults at the town hall event in November 2009 for the Adolescent Health Initiative, a partnership between the Durham County community and Duke University Medical Center, said that text

messaging and social media such as Facebook were their first choices for a community intervention to improve adolescent health.

The Adolescent Pregnancy Prevention Campaign of North Carolina (APPCNC) is successfully reaching teens across the state with the BrdsNBz text-messaging service, which addresses questions about sexual health (available at: <http://www.appcnc.org>). Teens can text their question to BrdsNBz, and an APPCNC staff member provides a medically accurate answer within 24 hours. Other uses of new media for health have been shown to have high levels of acceptability among youth.³

Online, mobile, and multimedia adolescent health interventions have numerous advantages. New-media communication may increase content retention because it facilitates active, participatory learning. Diverse styles of learning among users can be accommodated by presenting information in multiple modalities, such as audio, text, graphics, and video. Tailored or individualized content based on user characteristics is also possible. The perceived anonymity of online and mobile media also may facilitate discussion of potentially embarrassing health topics, such as sexual health. Although multimedia interventions may have more up-front development costs, lower costs for replication and personnel may result in long-term cost savings.

New media are being used for adolescent health promotion in at least five ways: health education and behavior change, disease management, health service referral, health service delivery (eg, telemedicine), and health advocacy.

Health practitioners and researchers in North Carolina are beginning to see that many young people prefer new media as an effective way to communicate about health.

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BrdsNBz: A Text-Messaging Forum for Improving the Sexual Health of Adolescents in North Carolina

Kay R. Phillips

The BrdsNBz Text Message Warm Line (hereafter, "BrdsNBz") was launched by the Adolescent Pregnancy Prevention Campaign of North Carolina (APPCNC) in February 2009 to address the sexual-health needs of our state's teenage population. The primary objective of BrdsNBz is to provide a trusted forum for adolescents to ask questions and receive medically accurate information about their sexual health. Of importance, the program engages adolescents "on their turf," using technology, social networking, and texting to ascertain their specific needs and provide targeted, positive messages promoting sexual health. The APPCNC accomplishes this by using a simple, yet highly effective platform—text messaging. BrdsNBz was initially designed to engage adolescents aged 14 to 19 years in areas of North Carolina where resources are limited. The service was also developed as a response to increased rates of teen pregnancy and sexually transmitted infections (STIs), including human immunodeficiency virus (HIV) infection, to create a simple solution to the monumental problem of providing accurate information to youth in a format that is suitable to their lifestyle. BrdsNBz provides a safe and anonymous forum for adolescents to ask questions about their sexual health and receive informed, medically accurate, and prompt responses.

Data on teen pregnancy in North Carolina underscore the magnitude of the need for such a service. For example, in 2007, more than 20,000 females aged 15 to 19 years became pregnant, and for 29%, the pregnancy was not their first.¹ These pregnancies, most of which are unintended, not only carry a set of responsibilities that most adolescents are not prepared to assume, they are also linked to a multitude of other short-term consequences, including increased school drop-out rates, poor academic performance, and risk for

additional unintended pregnancies. Longer-term impacts of unplanned pregnancy among teens include adult poverty, reduced workforce readiness, and decreased overall child and family well-being. Individuals who may feel unaffected by this issue unknowingly bear the burden, as well. Unplanned teenage pregnancies in North Carolina cost taxpayers \$312 million each year.²

By design, the logistics of how to use BrdsNBz are quite easy to master. To match the on-demand nature of text messaging among teenagers, the APPCNC responds to the question posed in the text message within 24 hours. Keeping the teens engaged through a question-and-answer format mediated by text messaging often leads to follow-up questions on related topics that were not included in the initial text.

Venues in which BrdsNBz is advertised include the APPCNC Web site (available at: <http://www.appcnc.org>), the Advocates for Youth's Teen Leadership Council Web site, and Amplify (available at: <http://www.amplifyyourvoice.org/main.cfm?s=amplify>); banner-based advertising is purchased on MySpace (available at: <http://MySpace.com>). Although these venues have been fruitful, the MySpace advertisements achieve the highest rates of response, as noted by the increase in the number of texted questions at the beginning of each month, coinciding with appearance of the banner advertisements. However, these advertisements are extremely expensive, which creates an opportunity for the APPCNC to identify and establish new, cost-effective methods by which to market the service. Other nonprofit organizations that support the APPCNC and its work also cross-promote BrdsNBz on their Web sites, as well as through other marketing programs.

Health Education and Behavior Change

Online, mobile, and multimedia platforms are increasingly used for health education and behavior-change interventions for adolescents. Numerous nonprofit and for-profit organizations operate Web sites containing health information, and some are tailored specifically to adolescents. Many of these Web sites allow users to confidentially ask questions and receive a direct response that is often later posted anonymously for the general readership. Other features include Weblogs (hereafter, "blogs") or Twitter feeds for users to follow. Twitter and blogging are less popular on average among adolescents, with only 8% to 14% of persons younger than 18 years reporting use.² Such new forms of communication may be more effective with young adults aged 18 to 29 years because one-third of individuals in this age group report Twitter use.

Many adolescents report that they seek health informa-

tion online. Almost one-third (31%) of US teens who completed surveys about online habits said that they get health information from the Internet, and 17% reported looking for information online about health topics, such as drug use and sexual health, that are hard to discuss with others.² Attracting adolescents to a specific Web site is a central challenge of providing health information online. An evaluation of the I wanna know! Web site (available at: <http://www.iwannaknow.org>), which is aimed at the prevention of sexually transmitted infections (STIs), revealed more than 50,000 users in a three-month period, but fewer than half were of the target age of less than 18 years.⁴

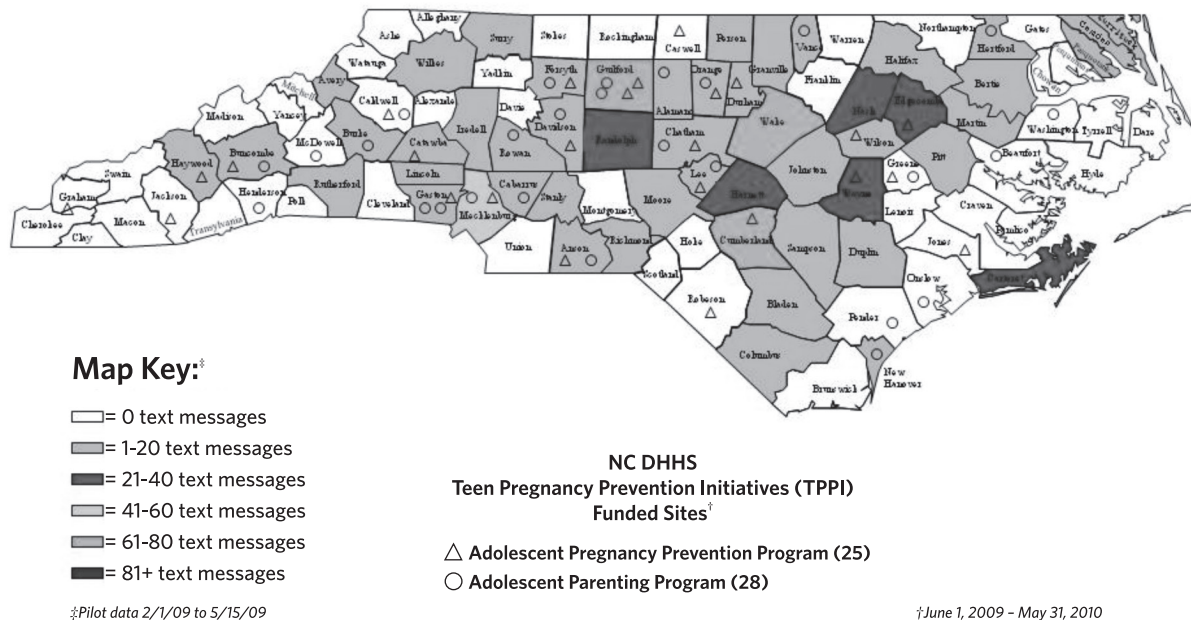
Interventions that rely on theories of health behavior change to alter behavior may require prolonged contact with the user and more-complicated and more-interactive programming. Computer-delivered interventions can be administered via the Internet or via CD-ROMs and DVDs. A number of such interventions have been effective in chang-

BrdsNBz has garnered national attention from newspapers, magazines, and local, state, and national television affiliates.³⁻⁸ In addition, the APCNC receives requests weekly from organizations across the United States (and from around the world) for information on how to tailor this service to their target populations.

Formative research conducted in cooperation with Dr. Jane Brown and investigators at the University of North Carolina at Chapel Hill School of Journalism and Mass Communication found that adolescents not only felt they could trust the service but were more likely to follow-up on an answer from

BrdsNBz than from other resources they were exposed to in schools, at home, or in the community.^{9,10} At the same time, Brown and colleagues also emphasized the need for BrdsNBz to reach areas in the state that demonstrate the greatest need—primarily rural, outlying communities in northeastern, southeastern, and western North Carolina. In support of this assertion, Figure 1 shows data from the pilot phase of the project that demonstrate the frequency of BrdsNBz use across North Carolina. Figure 1 also highlights locations that have primary or secondary teen pregnancy prevention programs in place via funding from the North Carolina Department of Health and Human Services.

Figure 1.
BrdsNBz Use and Teen-Pregnancy Prevention Sites Across North Carolina



ing knowledge, attitudes, and behavior in many health areas. Female adolescents rated our interactive CD-ROM about STI prevention, *Let's Talk About Sex*, as highly acceptable during pilot testing in the clinical setting.³ Test takers increased their STI knowledge, and nearly all intended to use condoms at next intercourse after viewing the CD-ROM.

Despite demonstrated effectiveness, computer-based multimedia interventions are not frequently used in health care and community settings. Health care professionals face numerous barriers to their use, including poor reimbursement for health education, limited awareness and access, and logistical challenges, including short patient visits and limited computer availability.^{5,6}

Cell phone-delivered interventions have been developed to keep pace with the explosion of mobile devices and have been effective in many health interventions, including tobacco-cessation programs.⁷ Most interventions include

personalized text messages and reminders sent at varying time intervals. An innovative North Carolina program combines text messaging with social networking. The Durham County Health Department (DCHD) operates the community-wide *Knowing Is Sexy* reproductive health intervention on Facebook (available at: <http://www.facebook.com/pages/Durham-NC/Knowing-Is-Sexy/68885537876>); a free, text message-based advice line; and a teleconferencing consulting service. The Facebook page was launched in Spring 2009 and attracted 500 fans in one year, one-third of whom were in the targeted age group of 13 to 24 years. More than half of persons who underwent STI testing at DCHD-supported events reported hearing about the event via Facebook.⁸ After users reported that they did not ask questions via the Facebook site because of a lack of anonymity, the text message-based advice line and an option to schedule a counseling session via a free teleconferencing service (ie, Skype) were added.

As BrdsNBz moves into its second year of service, the APPCNC will focus on promoting the service in underserved parts of the state. BrdsNBz seeks to become a more universally available and accessible resource to all individuals in North Carolina aged 14 to 19 years. Ideally, the APPCNC will experience an increase in the number of text messages sent

from underserved counties that have limited resources. For example, a pilot study of BrdsNBz conducted from February 1 through May 15, 2009, found that 70% of incoming texts were sent from western North Carolina and from the region east of (and including) Chapel Hill (Table 1). North Carolina cities demonstrating the lowest frequency of BrdsNBz use

Table 1.
BrdsNBz Use During Its Pilot Phase, by Area Code and Exchange

Area Code	OR (95% CI)	Text messages, no. % (N=597)
252	Elizabeth City, Greenville, Havelock, Henderson, Kinston, Morehead City, New Bern, Roanoke Rapids, Rocky Mount, Tarboro, Washington, Wilson	111 (18.6)
336	Asheboro, Burlington, Clemmons, Eden, Graham, Greensboro, High Point, Kernersville, Lewisville, Lexington, Mount Airy, Reidsville, Roxboro, Summerfield, Thomasville, Trinity, Winston-Salem	68 (11.4)
704	Albemarle, Charlotte, Concord, Cornelius, Davidson, Gastonia, Huntersville, Indian Trail, Kannapolis, Kings Mountain, Lincolnton, Matthews, Monroe, Mooresville, Mount Holly, Salisbury, Shelby, Stateville	66 (11.1)
828	Asheville, Black Mountain, Boone, Brevard, Conover, Forest City, Hendersonville, Hickory, Lenoir, Morganton, Newton, Waynesville	19 (3.2)
910	Clinton, Dunn, Fayetteville, Fort Bragg, Hamlet, Hope Mills, Jacksonville, Laurinburg, Lumberton, Oak Island, Pinehurst, Rockingham, Southern Pines, Spring Lake, Wilmington	154 (25.8)
919	Apex, Cary, Chapel Hill, Clayton, Durham, Fuquay-Varina, Garner, Goldsboro, Mebane, Oxford, Raleigh, Sanford, Siler City, Smithfield, Wake Forest, Wilson	148 (24.8)
980	Charlotte, Concord, Gastonia, Huntersville, Kannapolis, Matthews, Monroe, Salisbury, Statesville	31 (5.2)

Note. Data are from February 1 through May 15, 2009.

Disease Management

New media can provide an alternative presentation method and communication link for chronic-disease management. Examples of the use of new media include posting educational materials online, providing virtual support groups via social-networking sites, sending reminders for appointments and daily medications by means of text messages or e-mails, collecting health information (eg, logs of blood glucose levels and peak expiratory flows), adjusting medications, and providing counseling. Cell phone and text-messaging interventions have been shown to improve medication adherence, appointment attendance, asthma symptoms, and, in diabetic patients, HbA1C levels.⁵ Planned Parenthood of Central North Carolina operates one such service, a text message-based medication reminder called Pill Pixy (available at: <http://www.plannedparenthood.org/centralnc/pill-pixy-31056.htm>). Users of this service receive daily text reminders to take their birth control pills.

Researchers in the University of North Carolina Eating Disorders Program have launched a successful online pro-

gram aimed at the prevention and early intervention of eating disorders among college students in North Carolina. Participants in the PACE (Pathway to Awareness in College Eating) intervention (available at: <http://www.pace.unc.edu>) have access to modules offering psycho-education on topics ranging from stress in college to eating disorders, short activities designed to promote cognitive dissonance about disordered eating, weekly self-monitoring with automated feedback, and counselor-led group and individual chat sessions. PACE also strives to detect students who may need more-intensive care and refer them for face-to-face treatment. More than 100 students have participated in PACE since Fall 2009.

Health Service Referral

Existing health services can be difficult for adolescents to access. For example, the Durham County Adolescent Health Initiative's community health assessment documented many adolescent-focused services, but many adolescents, parents, and health care professionals were not aware of or did not know how to access these services (unpublished data).

included Asheville, Black Mountain, Boone, Brevard, Conover, Forest City, Hendersonville, Hickory, Lenoir, Morganton, Newton, Waynesville, Charlotte, Concord, Gastonia, Huntersville, Matthews, Salisbury, Kannapolis, Monroe, and Statesville. Hence, these areas will be a focus of the second-year expansion to increase use.

Texting is extremely common among teens in North Carolina and across the world, allowing the APPCNC to keep a finger on the pulse of issues that are most salient to our state's youth. Through the text-messaging line, the APPCNC aims to indirectly increase teenagers' knowledge and awareness

of accurate sexual health information, as well as their quality of life, by reducing the incidence of unintended pregnancies and STIs. Text-messaging technology provides a great opportunity to provide teens with free, confidential, and accurate information about their sexual health. The APPCNC will continue to take advantage of this novel, yet simple, approach to promoting positive outcomes for adolescents in North Carolina. **NCMJ**

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New media can be used for efficient referrals to relevant resources. One innovative example is a joint program of the San Francisco Department of Public Health and ISIS called SEXINFO, a text-messaging system that provides sexual health information and referrals.⁹ Youths text a five-digit phone number and get a basic response to their question and/or a list of services available for face-to-face consultation. Examples include texting C3 "to find out about STDs," E9 "if ur sexually active," F10 "if someone's hurting u," and E5 if there is a "need to speak to someone now."

Online directories are another example of the use of new media for health service referral. Two examples in North Carolina include Durham County's Network of Care (available at: <http://durham.nc.networkofcare.org/family/home/>) and North Carolina Health Info (available at: <http://www.nchealthinfo.org>), a statewide directory operated by the University of North Carolina Health Sciences Library. Challenges to online directories include raising and maintaining awareness of the Web site among clinicians and community members, creating user-friendly formats and features, and keeping information constantly updated.

Service Delivery

Virtual communication via new media can be especially beneficial for communities lacking health services. Telemedicine is the use of telecommunications technology for medical diagnosis and patient care at a distance. Patient care can be provided using videoconferencing and specially equipped biologic monitors and cameras. Telemedicine programs based in schools have been found to decrease emergency department visits and diabetes- and asthma-related hospitalizations.¹⁰ Mental health and health education professionals in particular have been early adopters of videoconferencing technology. Mental health teleconferencing services are currently provided in select Durham public schools by clinicians in the Duke University Medical Center Division of Child Development and Behavioral Health and in Mitchell and Yancey County schools through the MY Health-e-Schools program (available at: <http://www.myhealthschools.org/Home>), with plans to expand to physical health care.

Health Advocacy

Web sites, social-networking platforms, blogs, and Twitter

are particularly suited for mobilizing youth and the community for advocacy related to adolescent health issues. Planned Parenthood of Central North Carolina's Choice 2.0 blog (available at: <http://www.plannedpcnc.org/blog>) encourages readers to contribute to conversations about reproductive health. Their Twitter feed (available at: <http://www.twitter.com/PPCNC>) about the passage of the North Carolina Healthy Youth Act of 2009 offered an insider perspective on the legislative process.

Conclusion

Adolescents spend much of their day using new media. Health professionals can effectively use Web sites, social-networking platforms, multimedia, and mobile media to educate, refer, advocate for, and even treat adolescents.

Many innovative programs are underway across the state. Initial studies of their reach and effectiveness suggest that

new media can augment and extend existing programs and, in some cases, can reach teens who may not be reachable in other ways. Challenges include making adolescents and health care professionals aware of new media-based services, encouraging them to use these services, keeping services updated and user-friendly, and ensuring sufficient reimbursement for health care services provided to patients via new media. As these challenges are addressed, health professionals should harness the power of new media to improve the health of North Carolina's adolescents. **NCMJ**

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Annual High-Quality Wellness Visits for Adolescents: A Standard Whose Time Has Come

Carolyn Sexton, RN, BSN, MPH; Laura Gerald, MD, MPH; Kristin M. Rager, MD, MPH

Adolescence is often described as the period when people are in their best physical health. It is also a time of rapid change in physical, cognitive, emotional, and social development. As teens strive to define themselves in relation to the world, they are also faced with increasing responsibilities and independent decision making. Along the way, there are challenges as adolescents experiment and take risks as a part of their increasing independence.

Through recent brain-imaging studies, we know that brain development continues during adolescence and, specifically, that an area called the prefrontal cortex may not finish developing until an individual reaches their mid-twenties.¹ The prefrontal cortex is responsible for making decisions, paying attention, and controlling impulses; therefore, it is not surprising that the immaturity of this area of the brain in teens can result in poor decisions and risky behavior. The top three causes of death among North Carolina adolescents and young adults aged 10 to 24 years—accidental trauma, suicide, and homicide—are largely related to risk-taking behavior and mainly preventable.² In addition, many decisions that adolescents must make, including those about sexual behavior, driving, substance use, nutrition, and exercise, may not have deadly consequences but can have long-lasting effects on one's future. Routine preventive health screening helps ensure that adolescents choose patterns of behavior and make decisions that enhance long-term health and permits early diagnosis and intervention when problems emerge.

Immunizations are another important determinant of future health during the teen years. Currently, immunizations recommended for adolescents include tetanus diphtheria toxoids and acellular pertussis vaccine (ie, Tdap), meningococcal conjugate vaccine (ie, MCV4), human papillomavirus vaccines, seasonal influenza vaccine, H1N1 influenza vaccine, and any others missed during childhood.³

Although any interaction with a health care practitioner is an opportunity for administering a vaccine, most of the vaccines listed above are provided during an adolescent's routine preventive screening visit.

Despite the clear need for routine preventive health screening among adolescents, only 64.1% of North Carolina high school students reported that they saw a physician or

Routine preventive health screening helps ensure that adolescents choose patterns of behavior and make decisions that enhance long-term health and permits early diagnosis and intervention when problems emerge.

nurse during the past 12 months for a wellness check-up or physical examination when they were not sick or injured.^{4p89} Perhaps this statistic will improve after a policy change by the North Carolina Division of Medical Assistance (DMA) that took effect July 1, 2009, and recommends an annual wellness visit for all persons aged 2 to 20 years.^{5p13} In keeping with current national standards and guidelines, the North Carolina Institute of Medicine Task Force on Adolescent Health recommends that Medicaid and other insurers provide and/or improve coverage for annual high-quality wellness visits among persons 20 years of age or younger.^{6p75}

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Although an annual visit is now recommended, a consensus policy defining the quality components of the Adolescent Health Check Screening Assessment remains pending at the time of writing but has strong support from the DMA and from health care professionals who treat adolescents. The policy was developed by the North Carolina Division of Public Health and the DMA in collaboration with content experts and clinical reviewers broadly representative of the private and public sectors. The policy was approved by the DMA's Physician Advisory Group and made available for public comment, and a final draft has been prepared. The North Carolina Department of Health and Human Services is considering the fiscal impact of and publication timing for this policy.

The consensus policy is based on evidence-informed and, when possible, evidence-based guidelines. These include the 2008 Bright Futures guidelines from the American Academy of Pediatrics⁷ and recommendations from the Centers for Disease Control and Prevention (CDC), the US Preventive Services Task Force (USPSTF), and the Advisory Committee for Immunization Practices (ACIP). The policy also provides links to tools and resources that support the implementation of these guidelines.

The proposed package of services recommends an annual preventive health screening for all adolescents. The specific elements vary on the basis of risk-assessment findings, but an Adolescent Health Check Screening Assessment would include, at minimum, the following components: a comprehensive health history, measurement of blood pressure and anthropometric characteristics, visual and hearing risk assessment and screening (as clinically indicated), dental screening, laboratory testing (as clinically indicated), a nutrition assessment, developmentally appropriate psychosocial/behavioral and alcohol/drug use assessments, a comprehensive physical assessment, immunizations (as clinically indicated by ACIP guidelines), anticipatory guid-

ance, and follow-up visits and/or referrals (as indicated, including transition to adult care). Each component is defined specifically for adolescents, based on evidence-informed or evidence-based practice.

An Extended Adolescent Health Check Screening Assessment is appropriate for and applicable only to female adolescents receiving preventive health screening that has a family-planning component. This assessment includes all of the components of the Adolescent Health Check Screening Assessment, as well as enhanced anticipatory guidance related to contraceptive options and their efficacy and risks; cervical dysplasia screening, as clinically indicated for immunocompromised persons; and a bimanual pelvic examination, as appropriate.

Several components of the Adolescent Health Check Screening Assessment are endorsed by multiple national organizations and agencies and are of critical focus for adolescents.^{6pp70-71} One component is a comprehensive health history and physical assessment, including measurement of blood pressure and anthropometric characteristics (eg, height, weight, and body mass index).

A second component consists of laboratory testing, most importantly for sexually transmitted infections and diseases, including chlamydial infection, gonorrhea, human immunodeficiency virus infection, and syphilis, in accordance with CDC and USPSTF recommendations.

A third component is a health-risk screening tool for adolescents, such as Bright Futures,^a HEADSSS,^b or the American Medical Association's Guidelines for Adolescent Preventive Services,^c that gathers information in several priority areas, focusing on assets (ie, strengths) and areas of concern for youths and their parents (Table 1).⁷ Of note, further screening is recommended for behavioral/mental health and substance use issues, using evidence-based tools such as the Pediatric Symptom Checklist,^d the Strengths and

Table 1.
Priority Areas for an Adolescent Health-Risk Screening Tool

Priority Area	Characteristics
Physical growth and development	Body image, diet, weight, physical activity, sexuality
Academic competence	School attendance, attitude, performance
Social competence	Relationships with family and friends and involvement in school and the community
Emotional well-being	Self-esteem, coping skills, adult and peer support systems, responsibility, independent decision making
Risk reduction	Tobacco, alcohol, and drug use; avoidance of pregnancy and sexually transmitted disease
Violence and injury prevention	Motor vehicle safety, weapon use, physical confrontation

a. Available at: http://brightfutures.aap.org/tool_and_resource_kit.html.

b. Available at: <http://www.health.state.mn.us/youth/providers/headsslong.html>.

c. Available at: <http://www.ama-assn.org/ama/pub/physician-resources/public-health/promoting-healthy-lifestyles/adolescent-health.shtml>.

Difficulties Questionnaire,^e the Patient Health Questionnaire Modified for Teens (PHQ-9, Modified; this is a slightly reformatted tool that adapts the Patient Health Questionnaire-Adolescent [PHQ-A] to facilitate ease of use in a practice setting),^f the BDI-FastScreen for Medical Patients,^g and the CRAFFT questions.^h In March 2009, the USPSTF gave a grade B recommendation for “screening of adolescents (12-18 years of age) for major depressive disorder when systems are in place to ensure accurate diagnosis, psychotherapy (cognitive-behavioral or interpersonal), and follow-up.”⁸

A fourth component involves administration of vaccines recommended by the ACIP.³

A fifth component consists of developmentally appropriate anticipatory guidance tailored to the questions, issues, and/or concerns of each adolescent and their family. Priority areas for the series of annual visits that occur during early, middle, and late adolescence are summarized in Table 1 and focus on the child’s medical history and findings from health-risk screening.⁷

Widespread adoption of annual wellness visits for adolescents that meet quality-of-care guidelines will be challenging to achieve. Clinician capacity to meet the increased demand for adolescent health checks is a concern, as is clinician efficacy and efficiency in treating adolescents, particularly with respect to providing comprehensive health-risk screening, behavioral health assessments and interventions, clinically effective family-planning interventions, sexually transmitted infection and disease screening, and gynecologic examinations. There will also need to be additional outreach to adolescents and their families to increase awareness of the need for yearly health checks. Finally, progress toward increasing the percentage of adolescents who receive annual health checks and the amount of feedback received about the quality and content of these checks will need to be monitored.

Several agencies and organizations may be enlisted to assist with implementation and to provide technical assistance to practices and health care professionals. The North Carolina Institute of Medicine Task Force of Adolescent Health recommends that Community Care of North Carolina, the North Carolina Area Health Education Centers, the North Carolina Division of Public Health, professional societies, and content experts from North Carolina’s academic centers pilot tools and strategies to help primary care professionals deliver these high-quality health checks to adolescents. Strategies include providing training and other educational opportunities related to the components of the Adolescent Health Check Screening Assessment, as well as developing and implementing a model for improving the

quality of health care provided to adolescents.^{6p75}

The Task Force also recommends that North Carolina’s philanthropic foundations support this effort. Initial training efforts for health care professionals are ongoing and in development. For example, training sessions on high-quality preventive health screening for adolescents have been included in the annual meetings for the North Carolina Pediatric Society, the North Carolina Academy of Family Physicians, and the North Carolina School Community Health Alliance. Training webinars have also been developed and will be offered once the proposed policy on the Adolescent Health Check Screening Assessment is published. Additional elements of support include algorithms (Gerri Mattson, unpublished findings) and tool kitsⁱ that have been developed to assist health care professionals with prompts for risk assessments and next steps.

Strategies for outreach and for increasing clinician capacity will need to be developed. Community Care of North Carolina case managers and Health Check coordinators, who work directly with Medicaid recipients, may assist practices in communicating with patients about the need for annual visits. Outreach efforts will be supported by automated submission of reminder letters to patients. School-based health centers also have a critical role to play in reaching adolescents and increasing clinician capacity.

Use and quality will need to be monitored. There are existing models in the Medicaid program for data measurement. For example, national Healthcare Effectiveness Data and Information Set indicators measure the number and percentage of enrollees, stratified by payer type and enrollee age, who have had annual wellness visits.⁹ The North Carolina Medicaid program reports these values and posts them on their Web site¹⁰; however, practices and health care professionals may not be aware of statewide results. Community Care of North Carolina has recently begun tracking data on preventive measures, such as the number of adolescents who receive health checks yearly. These data will be reported at the practice and patient levels so that interventions can be targeted to patients and practices to improve results.

Annual high-quality wellness visits for adolescents provide a tremendous opportunity to impact the lifelong health trajectories of North Carolina’s population. Passage of a policy that defines high-quality Adolescent Health Check Screening Assessments is an important step toward this goal. To maximize this impact, these preventive visits should be accessible to all adolescents regardless of their source of insurance coverage. **NCMJ**

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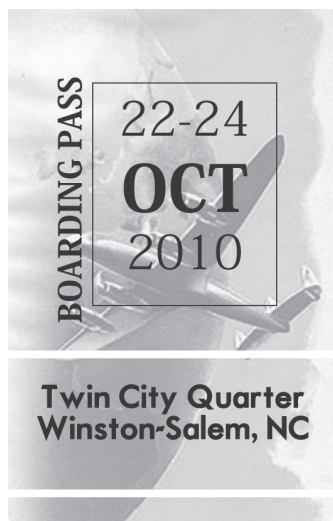
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Now the Hard Work Begins

Mark Holmes, PhD; Carol Ford, MD

North Carolina is fortunate to have hundreds of policy-makers, researchers, health care professionals, community leaders, students, and adolescent advocates who have given hours of their time to advance the work of the North Carolina Metamorphosis Project (NCMP; available at: <http://www.med.unc.edu/ncmp>). The NCMP comprises the following three projects: the Portrait of Adolescent Health in North Carolina, a parent survey, and the North Carolina Institute of Medicine (NCIOM) Task Force on Adolescent Health.¹ Tangible improvements in the health of North Carolina adolescents can be made by building on the results of these projects. However, because it can be difficult to maintain the level of energy and focus that accompanies a task force's work, and because some of the recommendations and findings generated by the NCMP projects call for state investment (the delivery of which can be challenging during tough fiscal times), the vigilance of stakeholders across the state will be necessary to help continue these efforts to improve the health of North Carolina adolescents.

To help maintain the momentum of the NCMP agenda, two strategies have been employed. The initial strategy involved organization of the first-ever North Carolina Adolescent Health Summit in December 2009. The summit brought together many NCMP supporters to identify strategies for implementing the NCIOM task force recommendations at the state and local levels and to determine the partnerships needed to do this work. To this end, breakout sessions were designed to build strategic partnerships that would endure after the summit. The second strategy involved appointment by the NCMP leadership of an advisory board. The advisory

board, consisting of individuals representing many of the key partners in adolescent health in North Carolina, meets quarterly to track progress on implementation of the recommendations. This structured approach can help encourage continued partnership and focus on implementing the recommendations of the NCIOM task force.

Summit Breakout Sessions

The NCIOM task force report was officially released at the summit. A total of 200 individuals from across the state were in attendance, and activities included plenary presentations and a reactors' panel. After presentation of the task force recommendations, attendees were separated into breakout sessions organized around four areas—clinics, schools, families and communities, and state-level public policies—in which the recommendations would be implemented. Attendees brainstormed possible strategies for implementing each of the priority recommendations and any other recommendations that had potential for immediate action. The goals of the breakout sessions were to develop strategies and partnerships that could lead to successful implementation of the recommendations.

Attendees in all four breakout sessions viewed adolescents as critical partners in the implementation of the priority recommendations. Approximately 20 adolescents from across the state attended the summit and breakout sessions, and their input was critical and highly informative. They will serve as key partners (by serving as their own advocates) in implementing the recommended strategies, and finding ways to encourage and support their efforts will be critical.

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During the process of identifying strategies and partnerships, many attendees identified NCIOM task force recommendations they were interested in pursuing and met potential partners. A summary of the key points from each of the breakout sessions follows.

Clinics. The priority recommendations yielded by the breakout session about clinics were grouped into two themes: increasing the frequency of annual wellness visits and improving delivery of behavioral health services. One recommended strategy for increasing wellness visits involved expansion of insurance coverage for young adults, and it was noted that versions of national health reform legislation available at the time of the summit included many programs aiming to increase coverage for this group. Another strategy was to leverage adolescents' use of cell phones, to provide a forum for health-information exchange.³ Additional strategies included calling on schools and other community partners to educate parents about the timing of recommended youth check-ups and encouraging the North Carolina Area Health Education Centers program and Community Care of North Carolina to educate health care professionals about the characteristics of a high-quality wellness visit.

Insurer reimbursement policy was cited as a key barrier to improving behavioral health services. Continued innovation in approaches to team-based delivery and collocation of different types of health care professionals were seen as promising strategies for overcoming this obstacle.

Schools. The following three priority recommendations were determined by the school work group: improving school-based health services, funding healthy-schools coordinators, and ensuring that healthy foods are available in schools. To help improve school-based services, session attendees recommended that the North Carolina School Community Health Alliance (available at: <http://ncscha.org/>) take the lead in fostering expansion and improvement of school-based and school-linked health centers. Demonstration of the effectiveness of these centers will be the key to their long-term existence. The North Carolina Education Data Center has much of the data that are needed for effectiveness studies, and graduate students may be great resources for initiating research. One attendee noted that the scope of services delivered in a school can be controversial. For example, at a given school, practitioners may not be permitted to inform students about where to receive contraceptives, yet onsite day care might be available. Ensuring that school-based and school-linked health centers provide care that is necessary and supported by the community will require the efforts of broad-based community partnerships that include local Healthy Carolinians coalitions, local health departments, health-education training programs, local chapters of the Parent-Teacher Association, and students.

Breakout participants believed that the Healthy Schools division of the North Carolina Department of Public

Instruction was the natural partner to take the lead in the effort to fund healthy-schools coordinators. One of the key challenges in this area is to educate legislators, policy-makers, and local education leaders about the distinct role played by these coordinators and how it differs from that of healthy-living coordinators and school health advisory committees.

There was general agreement that local philanthropies with an interest in improving the school food environment would be ideal leaders in the creation of strategies to ensure that schools provide healthy food. A three-stage process—solicitation of proposals, development of innovative interventions based on the most-promising proposals, and evaluation of the interventions' efficacy at the local level—was envisioned to determine which programs were fiscally sound and could be expanded across the state. Several North Carolina schools were recommended as pilot sites.

Families and communities. Two priority recommendations were considered during the breakout session addressing families and communities. The first was to ensure that programs were evidence based and appropriate for their target populations. Attendees noted that these goals can sometimes conflict—although most evidence-based programs translate reasonably well to most populations, some programs developed and tested elsewhere may not be a good fit for North Carolina. Philanthropies were again seen as the proper leader in this area by funding evidence-based programs, encouraging collaboration among multiple stakeholders, and supporting fidelity to the model by providing technical assistance when possible. Many of North Carolina's larger foundations, such as Prevent Child Abuse North Carolina,⁴ are already moving in this direction and could provide leadership to local and regional funders.

The second recommendation emphasized the need for evidence-based violence-prevention programs. The North Carolina Department of Juvenile Justice and Prevention (DJJDP) allocates funds to Juvenile Crime Prevention Councils (JCPCs) in each North Carolina county to support community-based sanctions (ie, alternatives to incarceration) and community-level programs for preventing delinquency and substance abuse. Similar to foundations and other funding agencies, JCPCs have tremendous influence over the quality of the programs they support. Accordingly, JCPCs should work with the DJJDP to focus funding efforts on evidence-based programs and should include representatives in local health partnerships to ensure that the funded programs are having their intended effects. Although the DJJDP was identified as the appropriate leader for implementation of this recommendation, individuals can contribute at the community level. For example, members of the public can influence the work of JCPCs by educating members about the importance of evidence-based programs or by trying to become members of their local JCPC.

State-level public policies. The policy work group was charged with discussing the implementation of two priority recommendations. The first addressed improving driver-education courses. Because the North Carolina Child Fatality Task Force has played an active role in this area, it was considered a natural leader of this initiative, with key partners including the North Carolina Department of Transportation, the North Carolina State Highway Patrol, the Governor's Highway Safety Program, and the University of North Carolina Highway Safety Research Center. The second recommendation was to reduce the incidence of sexually transmitted diseases and unintended pregnancies among adolescents. The Healthy Youth Act⁵ was seen as a tremendous victory for adolescent health because it allows the delivery of evidence-based curricula and programs, and attendees thought that the Adolescent Pregnancy Prevention Campaign of North Carolina should take the lead on monitoring provisions in the Act to ensure it is as effective as possible. The North Carolina Division of Public Health was suggested as the lead agency for activities to prevent sexually transmitted diseases among adolescents. With regard to the prevention of unintended pregnancy, a number of strategies were suggested. For example, one attendee cited a recent policy change in Wisconsin that increased access to contraceptives driven largely by student advocacy and involvement.

Advisory Board

Part of the grant provided by the Duke Endowment in support of the NCIOM task force was dedicated to implementation of the task force recommendations. In addition to in-kind support from other partners, these resources increase the likelihood that progress on implementation will be made in a timely manner. The advisory board has met twice since the summit, reviewing progress in carrying out the recommendations and identifying opportunities for collaboration. In addition, the NCIOM will conduct a follow-up meeting with all members of the Task Force on Adolescent Health in late 2011 or in 2012 to track progress of the recommendations. Even in the past six months, a number of recommendations have met with some success. For example, the John Rex Endowment recently awarded a grant to YES! (Youth Empowered Solutions) to help them advocate for evidence-based programs in Wake County, and the Healthful Living Course of Study (available at: <http://www.ncpublicschools.org/curriculum/healthfulliving/scos>), a curriculum guide that includes the competencies for physical education and health education, is under revision. The advisory board serves as a focal point of efforts to ensure that progress on these key strategies continue. For more information about the advisory board and about how to partner with the NCMP, please visit the NCMP Web site. **NCMJ**

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North Carolina's School-Based and School-Linked Health Centers

Steve North, MD, MPH; Constance Parker, MSN, RN

North Carolina was one of the first states to have a school-based health center (SBHC), and North Carolina continues to be a national leader in the management of and collaboration among these facilities. Greene County Health Care's Student Health Services program on the campus of Greene Central High School in Snow Hill, North Carolina, was among the first SBHCs in the nation when it opened in 1983. Currently, the center provides comprehensive physical and mental health services to all students at Greene Central High School. Since this site opened, the number of SBHCs and school-linked health centers (SLHCs) in North Carolina has expanded significantly, and currently there are 56 centers in the state.

Why School-Based and School-Linked Health Care?

Providing comprehensive health care to children and adolescents can be difficult because of several reasons, including accessibility, clinician comfort with adolescent health issues, and health insurance status.¹ Establishment of a health services facility in a school allows health visits to become a normal part of school life and improves access for students who may be stigmatized by their disease, require management of chronic health problems, or lack routine access to a health care professional. SBHCs provide developmentally appropriate physical and mental health services in a school or on school grounds as a means of improving attendance and academic outcomes. SLHCs have the same goals but are geographically separate from the school to better meet community needs, including providing care to multiple schools and having an expanded scope of services. In North Carolina, SBHCs and SLHCs target vulnerable urban and rural populations and have expanded beyond adolescent care to caring for students at every grade level.

There is clear evidence that supports the use of SBHCs

and SLHCs to reach underserved populations. Students with access to an SBHC or SLHC are more likely to receive care than are students without access.² Examination of the use of mental health services demonstrates that adolescents are 10 to 21 times as likely to come to an SBHC or SLHC for care than to a community health center or a health maintenance

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organization.^{3,4} Additionally, the use of SBHCs and SLHCs was found to reduce inappropriate emergency department use⁵ and in an elementary school setting was shown to reduce Medicaid expenditures related to inpatient and emergency department use.⁶ Emerging data demonstrate a positive impact on academic outcomes.

Providing multidisciplinary care allows SBHCs and SLHCs in North Carolina to place an emphasis on comprehensive care that includes physical and mental health and nutrition

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and health education. A key to providing comprehensive care for adolescents is the use of screening tools to identify both individual strengths and risk-taking behaviors. This allows clinicians to focus their prevention and treatment efforts on issues such as obesity, tobacco use, substance use, sexually transmitted diseases, and unintended pregnancy.

Management and oversight of SBHCs and SLHCs is unique in that it requires an understanding of FERPA (Family Educational Rights and Privacy Act) and HIPAA (Health Insurance Portability and Accountability Act) to ensure the privacy of student patients. Two essential components of SBHCs and SLHCs in North Carolina are a system for obtaining parental permission for children to receive health care services and an advisory board drawn from the entire school community.

State Support for SBHCs and SLHCs

A minority of states have a state-level office that supports SBHCs and SLHCs. The North Carolina Office is the Department of Health and Human Services (NC DHHS) School Health Center Program. The legislated goals of this program are to improve access to health care for school-aged adolescents, collaborate with individual schools and local education agencies, address a wide range of health challenges facing adolescents, provide comprehensive services for adolescents in high-risk communities, and develop community-based, multiagency partnerships. The program office provides support for SBHCs and SLHCs through two independent sources.

The first means of support is direct financial assistance for comprehensive and alternate-model SBHCs and SLHCs. Comprehensive SBHCs and SLHCs provide physical and mental health care in addition to nutritional and health education. By definition, these centers must have a physician assistant, nurse practitioner, or physician, as well as a mental health professional, on staff. Alternate models provide a different level of services, which include risk screening, basic medical services that can be provided by a registered nurse, and one of the following: nutritional counseling, health education, mental health services, or medical care. Of the SBHCs and SLHCs in North Carolina, approximately one-half receive some form of financial support from the NC DHHS. Unfortunately, the recurring budget for the program remained stagnant at \$1.5 million for each state fiscal year (SFY) during 2001-2009, and was cut in SFY 2009-2010, resulting in the loss of all funding for two centers. The amount of funds available can only provide partial support to 26 of the 56 centers in North Carolina. There are no funds for expanding into the many communities that desire new centers, nor are there funds to help existing centers that have only local resources to grow and improve.

The second means of state support is the credentialing program for SBHCs and SLHCs, facilitated by the School Health Center Program office. This program is nationally recognized and is unique in that it is independent of

the sources of funding for the individual center. Becoming a credentialed SBHC or SLHC not only signifies the quality of service provided, but it also creates a financial advantage. State-credentialed centers are exempt from the need for prior authorization from Carolina Access for services received from primary care professionals. The credentialing process is currently suspended by the state because of financial limitations that restrict visits to candidate sites.

In addition to the challenges listed above, the current financial condition of North Carolina is limiting the quality and further development of SBHCs and SLHCs. Currently, the state is unable to provide technical assistance to centers, creating a challenge in keeping SBHCs and SLHCs on the cutting edge of prevention and practice developments. Vacant positions in the program office are hindering the data analysis for outcomes of the program's funded centers. Limited state-level comprehensive data on the effectiveness of SBHCs and SLHCs makes it more difficult for both state funded and independently supported programs to leverage funding from private and community sources.

Challenges to Successful Development and Implementation of Programs

In a national survey conducted in 2003, 82% of Americans supported SBHCs and SLHCs.⁷ A total of 88% of respondents believed that teaching kids how to keep healthy is as important as teaching them how to read, write, and do math; 81% believed that schools may be the only place for uninsured children to receive care; and 80% believed that SBHCs and SLHCs will help keep kids healthy.

Beyond the ongoing financial challenges faced by SBHCs and SLHCs, moving from a concept to the successful implementation of a program can be a difficult path to negotiate. Developing broad-based support is often difficult because of resistance from several parts of the community. Parents are often concerned about the scope of services that will be provided to their children, potentially without their knowledge. Local practitioners are often concerned about the possible loss of patients to the SBHC or SLHC. Schools and school districts are often concerned about the potential liability and disruption that an SBHC or SLHC could create.

Recommendations for Improving SBHCs and SLHCs in North Carolina

The SBHCs and SLHCs in North Carolina work to improve the health and academic performance of students on a daily basis. To improve the quality of these centers in North Carolina, the state, the North Carolina School Community Health Alliance, and the individual centers need to collaborate to increase evaluation of academic and health outcomes. In addition, the scope of the North Carolina School Health Center Initiative should expand to include all students, regardless of grade level, who have difficulty accessing health care. To support this work, the state should mandate that all insurers reimburse for services provided at

state-credentialed SBHCs and SLHCs. Dental care, a critical component of comprehensive health care, is missing from all SBHCs and SLHCs in North Carolina. To expand dental

care to students, the dental board will need to make policy changes to allow dental hygienists to perform cleanings and screenings without a supervising dentist on site. **NCMJ**

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Parents' Roles in Improving the Health of Adolescents

Dale Galloway

Connor Edward Galloway was born on December 19, 1994. He was our first child, and we, like many new parents, thought he was the greatest thing in the world. He grew quickly and was a very healthy boy, although we worried about every minor event affecting his health, including the occasional runny nose. Two years and nine months later, his brother Aidan was born, and we felt our family was complete.

With regard to our second child, we did not stress over the little things as we had done the first time around. Instead, Connor was the family member who worried most about Aidan. I suppose it is typical behavior for an older sibling to exhibit parent-like attitudes and behavior, but in our little family, it felt special. We took great pride in the relationship developing between our two sons.

Connor and Aidan were excited to begin school, and learning came easily for both. We counted our blessings to have two healthy children who did not struggle with school in any way. In fact, they both excelled academically.

Because of my career, my family had to move around North Carolina.

If this ever caused difficulties for my children, they certainly did not show it. They seemed proud to be the sons of the local high school football coach. Connor was especially fond of the game and wanted to be around it all the time. He began his football career in the third grade as my ball boy.

In 2006, we moved to Jackson County, North Carolina, and I became the head football coach at the local high school. We felt different about this move and thought it might be our last until our sons finished high school. My wife and I were succeeding in our jobs, and our children were doing well in school. In the spring of 2007, we built our first home, and in August 2007, we moved in. Connor had first choice of bedrooms but gave up the room with the big window as a gift to his brother.

On October 18, 2007, our lives changed forever when my wife went to wake Connor for school and found him hanging from his loft bed with his feet less than one inch from the floor.

There are things I cannot remember about those first hours. There are many more things I would like to forget. I struggle daily with the images and emotions associated with my son's completely unexpected and horrible death.

The day after Connor's death, a conversation took place in our kitchen between me, my wife, and the police officer who investigated Connor's case. I remember this meeting. The information we received that morning has direct bearing on how my wife and I now spend our spare time, and ultimately, it is the reason I am writing this commentary.

Have you ever heard of the choking game (also known as the "hanging game" and the "fainting game")? This question will ring in my ears for as long as I live. The officer explained to us that, through interviews with kids at Connor's school, he discovered that the act of choking oneself in order to feel

"high" had become a popular activity. The conclusion of the police investigation was that Connor had died while engaging in this activity. Our beautiful, bright, and happy child was dead at 12 years of age because he wanted to see what it felt like to be "high."

Our reaction to Connor's death has not been easy. It is often hard to find just the right words to describe how we feel. The pain I feel is different from the pain my wife feels. Connor's relatives and friends will forever deal with the loss. And then there is Aidan. He was 10 years old when his brother passed, and he misses him in ways that I will never be able to see or understand. But we all knew that some kind of response to the circumstances involving Connor's death was necessary. With the support of many people, we

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started a foundation called Connor's HEART (Help Eliminate Adolescent Risk Taking).

The purpose of Connor's HEART is to address risky behavior among adolescents. The choking game, over-the-counter drug abuse, prescription drug abuse, and inhalant abuse are just a few of the behaviors we wish to confront. We communicate to young people that these activities do not produce a "safe high." We are also a resource for health educators who want to address this issue in a classroom setting.

The foundation has been very active since its beginning, visiting schools, community groups, and faith-based organizations. We have distributed a lot of information, including a DVD produced by Asheville City Schools. The DVD contains a seminar on risky behavior, and my wife and I are the key speakers. Since June 2008, we have distributed more than 1000 copies of the DVD to individuals, organizations, and schools in all 50 states and six countries. Along the way, we have learned many lessons about being an advocate for adolescent health in North Carolina. There are four particular lessons we feel are worth including here.

First, parents need to understand the North Carolina Healthful Living curriculum and how it is applied in our public schools.¹ Although I am a career educator, before Connor's death I held the incorrect belief that I knew a great deal about health education. The things I have learned since Connor's death about health education in North Carolina illustrate why parents should be more involved.

The reference to the school curriculum on health education as "K to 12" is a little misleading. To begin with, high school students are required to take only one credit of health and physical education. Although students can take this course any time during their high school career, most take it during their freshman year. Therefore, many students complete high school without having had recent exposure to health education.

Half of the curriculum of the health and physical education course involves health education, and half involves physical education. With many high schools in North Carolina on a semester schedule, this translates into nine weeks of health education and nine weeks of physical education. Therefore, in four years of high school in North Carolina, only nine weeks of health education are required.

Each school system and school is responsible for scheduling how and when these nine weeks of health education will be taught. However, many school systems have no mechanism in place to ensure that the full time allotted for health education is used. There is also no way to guarantee that the entire curriculum is taught.

There are other issues at the middle school level. At present, there is no definition of how much time should be spent on health education for students in middle school. Therefore, school systems can devise any number of strategies for executing the North Carolina Healthful Living curriculum in middle schools.

Initially, I felt that the flexibility of the curriculum struc-

ture would be an asset and encourage schools to be creative. I now believe the structure to be inefficient and insufficient. Schools currently have the right to assign objectives of the health curriculum to other disciplines. As a result, instructors specializing in mathematics, science, language arts, and social studies can be assigned to teach part of the health curriculum. These same teachers are responsible for preparing their students for the state's end-of-grade tests. The objectives of the health curriculum are not part of this test. Therefore, there is no way to ensure that our middle school students are getting quality health education instruction on a daily basis from an individual certified to teach health education.

Our thoughts and position on this topic relate to the next lesson we feel parents need to know as advocates of adolescent health. We believe that parents need to feel comfortable with the pursuit of policy issues.

Changing how health education is perceived and executed is a policy issue. The amount of available funding and the way in which such funds are allocated to the state and local health departments are policy issues. From the governor's office to the classrooms in which the health curriculum is taught, policy decisions affect the health outcomes of our young people.

Although our foundation wishes to support initiatives aimed at reducing risk taking among adolescents, we also recognize many other benefits associated with enactment of policies that affect adolescent health. With greater emphasis being placed on issues such as childhood obesity and other preventable conditions, we feel the moment is right to transform how we spend our time and dollars when considering adolescents. Whether this activity involves changing the way we teach health or creating opportunities for young people to be involved in positive, healthy activities outside of school hours, we advocate for an all-out effort to address ways to create better lifelong health outcomes for the young people of North Carolina.

Policy decisions will not cure all of our problems. But without a conscious effort to curb issues adversely affecting adolescent health, we can count on more difficulties to come. We believe there is room for everyone in the policy process. We encourage all parents to seek ways to contribute to the dialogue surrounding adolescent health. We have found an open and sympathetic ear at most levels of government in North Carolina. The one caution I would give parents is to be prepared to enter the conversation about *what* is to be done. We have found that many citizens and bureaucrats are ready to discuss *why* policy change should be considered. However, the real effort is to decide on *what* is to be done and *how* to pay for it. It is important for parent advocates to seek out professionals who can assist or even lead the fight for policy change. Therefore, our third recommendation to parent advocates is to understand the role played by individuals in the medical field for promoting adolescent health.

It may seem redundant to say that medical professionals should play a role in advocating for adolescent health. However, I do not often meet physicians who specialize in adolescent medicine. Although the issues facing adolescents may be unique, the preparations provided to medical professionals may not be uniquely focused on the adolescent. Most medical professionals I meet are compassionate and dedicated people. Many of them acknowledge the difficulty of dealing with the wide range of issues associated with adolescence. As a parent, I feel there are two major points to emphasize, here. First, I believe we should not hold our medical professionals responsible for possessing all of the information and details about adolescent health. I feel this to be especially true when it comes to the risk-taking activities that seem to be more social in nature. Second, I believe we should engage health care professionals in a manner that helps address the first point. Our foundation advocates for parents and community health professionals to convene on a regular basis to discuss current adolescent health issues. This open, public discussion has the potential to support another group in the community. I have many students in my classes who do not have a regular doctor or health insurance. Their only interaction with a medical professional is if an emergency arises that requires them to go to the emergency department.

Of course, one parent and one physician may not be able to affect the long-term health outcomes of an entire community. This leads to the final lesson to be learned from our experiences. Parents must strive to consolidate and focus the efforts of community-based organizations designed or founded for the purpose of addressing issues associated with adolescents.

We believe there are many ways to improve the health of our young people. Community activities intended to entertain our youth should also promote healthy behavior and vice versa. The idea is that all groups dealing with adolescents should make health promotion a pivotal part of their efforts and activities.

I recognize that our philosophy and plan of action for parents may be difficult and time-consuming. Our goal is to use our experience as motivation. We wish to motivate adolescents to better consider the decisions they confront and to make good choices. We wish to motivate parents to be proactive: parents should never assume that their children have been introduced to certain issues in an educational setting or during conversations at home. We wish to motivate efforts to improve the educational system in North Carolina: the state should change the way in which health education is taught, to better serve our students. We wish to motivate health care professionals to place a greater emphasis on adolescent health and to create information-sharing opportunities in North Carolina communities. We wish to motivate lawmakers to provide leadership in policy and funding. Finally, we wish to motivate communities to promote healthy adolescent behaviors whenever possible.

Connor's death should be used to educate individuals about the determinants of adolescent health and to motivate people to take an active part in improving the health of adolescents. A question I ask myself now is whether I would have been an active advocate for adolescent health in 2010 had my son not died in 2007. The answer is no. I do not want others to wait until something personal happens and then react. Let us join together now and do all we can to help the young people of North Carolina grow to be happy, productive, and, especially, healthy citizens. **NCMJ**

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Educating Adolescents About Their Sexual Health

Lee Storrow

"Dad, where do babies come from?" These are the words every parent dreads to hear. It may be easy in such moments to quickly share a myth about a stork and move on, dodging the question. However, it is time we had a realistic conversation in North Carolina about sex education. These conversations should happen between parents and children, but they also must occur among public health professionals, teachers, educators, and politicians. We have a crisis in this state that is affecting the health of my generation: North Carolina has one of the highest teenage pregnancy rates in the country.¹ Without these conversations, the rate of teenage pregnancy is unlikely to decrease, and the overall sexual health of North Carolina adolescents may be adversely impacted.

For too long, school districts across North Carolina have only taught students to "just say no" to sex, without acknowledging that some students will and do have sex and, therefore, need to know how to protect themselves. The emergence of sexual feelings and behaviors should be viewed as a consequence of normal development among healthy adolescents. Educators and teachers must take responsibility for ensuring that my peers have accurate knowledge about sex and about how to protect their health during sexual activity.

When I first sat down to write this commentary, I found myself including statistics on rates of pregnancy among teenagers in North Carolina and how abstinence-only sex education places teens at a disadvantage with respect to their ability to make informed decisions about sex. These statistics are important, but something would be missing from the story if I did not include the voices of students in North Carolina who have been disadvantaged by policies based on these data. Facts and statistics can only tell us so much.

I have had the great fortune to work with Delsie, a first-year student at the University of North Carolina at Chapel Hill (UNC), in advocating on behalf of the Adolescent Pregnancy Prevention Campaign of North Carolina for comprehensive sex education policies. Delsie received abstinence-only sex education in the public schools of Johnston County. In high school, she found herself expecting a child after having had unprotected sex. Delsie is currently enrolled at UNC and is fortunate to have a mother who cares for her daughter while

[I]t is time we had a realistic conversation in North Carolina about sex education. These conversations should happen between parents and children, but they also must occur among public health professionals, teachers, educators, and politicians.

Delsie is in school; Delsie is able to see her daughter every weekend. Delsie is a fantastic mother, but she wishes she had better knowledge about her options before having had sex. Specifically, she wishes that she and her sex partner had been educated about types of birth control and how to effectively use them.

Policies about sex education have been inconsistent across school districts in North Carolina. Until recently, most students in the state received abstinence-only sex education, similar to what Delsie received. Quality curricula should and often do include information to help ensure that sexual activity is conducted in a healthy manner and that skills for communicating with sex partners and managing

Lee Storrow was a youth leader with Youth Empowered Solutions in high school. He is currently a member of the Youth Leadership Council with the Adolescent Pregnancy Prevention Campaign of North Carolina and a junior at the University of North Carolina at Chapel Hill. He can be reached at lstorrow (at) email.unc.edu.

peer pressure are built. Abstinence-only sex education, by contrast, teaches students to delay sexual activity until marriage. I do not deny that this message is important. Students should know that abstaining from sex until they find a permanent partner is a healthy decision worthy of respect. Comprehensive sex education teaches that abstinence is the only guaranteed way to prevent pregnancy and sexually transmitted infections (STIs). However, it also teaches students techniques to protect themselves, by providing information about contraception and family planning. The North Carolina Institute of Medicine report on adolescent health states that young people who participate in comprehensive sex education programs have a lower risk of acquiring STIs, acquiring HIV infection, and having an unintended pregnancy than do those who are in abstinence-only programs.²

My experience with sex education was very different from Delsie's experience. I took sex education several years ago, when I was still in high school. I grew up in Asheville, North Carolina, and before I entered high school our local school board adopted a policy that required teachers and educators to teach comprehensive sex education. My curriculum contained information about contraception, including condom use, and techniques to prevent the acquisition and spread of STIs.

Sex education was awkward. Most high school students are immature. I remember that some students laughed when we were shown diagrams of the human body and that some anonymously placed inappropriate questions in the question box, but the vast majority of our questions and comments focused on important information. Students asked questions about rumors regarding techniques to prevent pregnancy, who could acquire HIV, and what to do if one felt pressured to have sex. For example, some of my ninth-grade peers mistakenly thought that HIV could not be spread through heterosexual sex. Although the answers to these questions seem clear now, at the time such questions were confusing and difficult to understand.

Parents and families also have an important role to play in this discussion. In elementary school, I was a giant fan of Judy Blume's books. By the time I finished fifth grade, I had read the "Fudge" books three times and every other book by Blume that I could find, including *Starring Sally J. Freedman as Herself*, *Freckle Juice*, and *Blubber*. One day I stumbled across Blume's classic novel *Are You There God? It's Me Margaret*. For many young women, this book is a formative novel. For young boys, the book has no warning sticker that states they might not be the target audience for the novel. The novel tells the story of Margaret, a young woman who grapples with issues of self-identity and physical development during middle school. One of her parents is Jewish and the other is Christian, and the story traces Margaret's attempt to come to terms with her religious ideology and find her place in the world. The story also follows her mental and physical journey from childhood to adolescence. Margaret buys her first bra and has her first period during the book, and she also

experiences peer pressure and interest in boys for the first time.

By the time I finished the book, I was very confused. I did not understand the references to "sanitary napkins" (the book was published in 1970), nor did I understand what the characters did when they "went behind the back of the school." I decided to ask my mom the questions I had about the book. Although I, as a fifth grader, did not realize it, her initial internal reaction must have been something akin to "Lee is a boy. I'm not supposed to be talking about *Are You There God? It's Me Margaret* with him!"

Blume's book has messages that person of all genders should hear. After a few seconds of awkwardness, my mom quickly answered my questions, using as much grace as she could probably muster at the moment. I ended our conversation with more information about the menstrual cycle than I probably needed at age 11, and I felt more confident in understanding the dynamics of sex and relationships. My mom's response might not have been as elegant as it could have been, but she attempted to answer my questions with a level of comfort and openness that to this day I appreciate. Parents have an obligation to answer their children's questions about sex, physical development, and intimate relationships. Their children will appreciate their honesty for years into the future.

I was lucky to attend school in a school district that made it a priority to provide comprehensive sex education to its students. I also had parents who considered it valuable and important that I receive this information. However, not all students in North Carolina have had the opportunity to access this curriculum. Fortunately, in 2009 North Carolina made a historic step forward in the way in which its students are taught about sex. On June 30 of that year, Governor Bev Perdue signed the Healthy Youth Act of 2009 (HB 88), which requires all school districts in North Carolina to teach medically accurate information about preventing pregnancy and STIs.

Although the Healthy Youth Act is a major step forward for improving the sexual health of adolescents in North Carolina, we must work to improve the quality of the education that our children receive. Now that HB 88 has been signed into law, we must all be advocates to ensure that it is implemented in a way that is true to its purpose and intentions.

One final major hurdle to ensuring that *all* students receive necessary information about sexual health is to create curricula that are inclusive of all sexualities. Specifically, it is important that sex education curricula affirm rather than stigmatize homosexual relationships. Unfortunately, the Healthy Youth Act falls short of meeting this challenge.

HB 88 states that sexual health programs shall include instruction that "a mutually faithful monogamous heterosexual relationship in the context of marriage is the best lifelong means of avoiding sexually transmitted diseases."³ Statements such as these diminish and disregard sexual

minorities. Coming out of the closet or affirming one's identity as a gay student is by no means easy, and the last thing adolescents need to hear is that their same-sex relationship is unhealthy and inferior to a heterosexual marriage. Studies have shown that lesbian, gay, and bisexual youth who receive gay-sensitive HIV-prevention instruction in school tend to engage in risky sexual behavior less frequently than do similar youth who do not receive such instruction.⁴ In talking with my gay and lesbian friends during high school and college, it is clear that the kind of sex education they received impacts and influences their decisions. One friend commented, "I never felt like anything said in sex ed applied to me. I can only get 'married' in a couple states, and I want to live in North Carolina when I grow up, so I may never get married. Yet my teacher kept saying that we should wait until marriage to have sex. How does that apply to me?" Our legislators should revise the law to affirm all gender identities and sexual orientations and end the stigmatization of homosexual relationships.

Abstinence-only sex education does not work. I wish it did. I wish my peers in middle and high school chose to not have sex until they were emotionally prepared and in a long-term relationship. I also wish that everyone had adequate access to health care, that children never lied to their parents, and that the sky was always sunny and bright. We do not live in that world. It is time our communities in North Carolina made a commitment to my generation. We must commit to teaching students medically accurate information about protecting themselves from unwanted pregnancy and STIs. We must also commit to valuing the experiences of all children and to avoid stigmatizing persons who may express love in a way that differs from society's current norm. These policies impact the future of our state. Having sex before one is emotionally prepared and has been educated about proper prophylactic measures can negatively impact one's family, school, and community. My generation deserves better from this state. **NCMJ**

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Spotlight on the Safety Net

*A Community Collaboration
Kimberly Alexander-Bratcher, MPH*

Assessment, Support, and Counseling Center

Adolescence introduces physical and psychological changes that pose a challenge to some people in this age group. The Assessment, Support, and Counseling (ASC) Center at Watauga High School is a community collaborative effort created to help fill a gap in behavioral health services provided to adolescents in the rural community of Boone, North Carolina.

In 2006, Angela Quick, who was then the principal of Watauga High School, joined Kurt Michael, a professor of psychology at Appalachian State University, in discussions about the unmet behavioral health needs of local students. Although Boone had a good community health system in place, the needs of many adolescents in the area were not being served. Of particular concern to Quick and Michael were students whose adverse behavior (eg, substance use) and/or mental health status affected them academically. The ASC Center was created with the goal of using community resources and specialized attention to help students modify their adverse behavior and improve their academic performance.

This partnership between the university and the high school provides a much needed service to the school system and a valuable training opportunity for future clinicians. Michael has experience working with schools and with training mental health professionals. With the support of Quick, Michael began providing assessments to students at the high school. A full-time licensed clinical social worker was hired, and graduate students, who connect well with younger students, were brought in from Appalachian State University under the supervision of clinical faculty. Supervisors were available to help graduate students with more-complex cases and to facilitate referrals to community-based mental health agencies.

Jennifer Wandler is the provisionally licensed clinical social worker hired by the Watauga County School District to coordinate services through the ASC Center. She works at Watauga High School full-time and believes that her onsite presence helps make the program work. She advocates for students from an insider perspective and is in her second year in the position.

The ASC Center is currently operated through a collaboration involving Watauga County High School, the Institute for Health and Human Services at Appalachian State University, and New River Behavioral Health Care (the local management entity). The staff consists of a multidisciplinary team of more than 20 people, including social workers who possess a bachelor's or master's degree, as well as marriage and family therapists. During weekly team meetings, the principal, a resource officer, the school psychologist, and others (eg, teachers and counselors) discuss cases and find the most appropriate help for students.

The ASC Center provides short-term and solution-focused services. Counselors play the primary role in helping students enter or exit the behavioral health system. The average number of visits among students receiving assistance in the program is between six and seven. Students participate in an individualized transition process, moving from services provided at the ASC Center to guidance provided by a counselor, to whom a student is assigned for follow-up through grade 11. Wandler is available to consult with other school staff and to ensure a stable and timely transition to other services. Parents are notified of the plan, and follow-up with school counselors is prearranged.

If the ASC Center cannot meet a student's need, the student is referred to an outside agency for assistance. ASC Center counselors have developed a framework for medical consultations and can therefore help with referrals ranging from active treatment to aftercare. For students who require consultations,

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counselors endeavor to avoid in-house duplication of services provided by community-based mental health agencies, in some cases, simply provide support and transition care until the consultation is completed. The ASC Center does not operate during the summer. At the final staff meeting of the school year, team members review the cases of students who might need services over the summer, to ensure the students' transition to community-based agencies that provide appropriate services.

As the 2010-2011 school year resumes, ASC Center counselors have more tools to help them provide behavioral health services to students at the high school. Near the end of the 2009-2010 school year, the ASC Center administered its first student-satisfaction survey. The results are being compiled and will help the team understand even more about their students. Preliminary findings were very positive. One student expressed thanks to the counselors for saving her life and helping her mature. This student, who had a history of self-mutilation and attempted suicide, came to the ASC Center in need of anger-management counseling to help her manage difficult relationships. After a long course of interaction with counselors at the ASC Center, she improved relationships with her parents, interactions with her peers, and communication with authority figures. She also enhanced her academic performance, increased her self-respect, and created personal goals, concluding that if she had lacked "someone to talk to and process this stuff," she would likely be making "the same wrong decisions."

The ASC Center is making a difference in the lives of Watauga High School students and the Boone community. Provision of these services in the school eliminates barriers to health care access, such as lack of transportation. The founders of the program believe that the model can work for many large high schools. As the new school year begins, students at Watauga High School are greeted by morning announcements with the reminder that "If you need help, just ASC."

Kurt Michael, PhD, director of clinical services, Institute for Health and Human Services, Department of Psychology, Appalachian State University; Jennifer Wandler, MSW, P-LCSW, clinical social worker and school social worker, Watauga High School Assessment, Support, and Counseling Center; and Angela Quick, deputy chief academic officer, North Carolina Department of Public Instruction, contributed to this article.

Running the Numbers

A Periodic Feature to Inform North Carolina Health Care Professionals
About Current Topics in Health Statistics

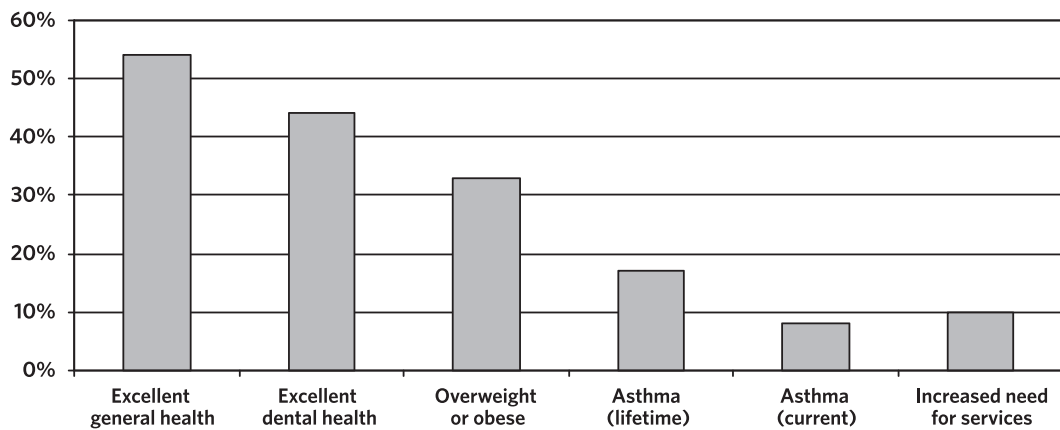
From the State Center for Health Statistics, North Carolina Department of Health and Human Services
<http://www.schs.state.nc.us/SCHS>

Adolescent Health in North Carolina

The North Carolina Child Health Assessment and Monitoring Program (NC CHAMP) is a comprehensive surveillance system used to assess the health characteristics of approximately 2.2 million North Carolina children aged 0 to 17 years. It was first developed in the fall of 2004 and has been implemented annually since January 2005. Children eligible for the NC CHAMP survey are drawn each month from the Behavioral Risk Factor Surveillance System (BRFSS) telephone survey of adults aged 18 and older. All BRFSS respondents with children younger than 18 years living in their households are invited to participate in the NC CHAMP survey. One child is randomly selected from the household, and the adult most knowledgeable about the health of the selected child is interviewed over the telephone in a follow-up survey. Questions on the NC CHAMP survey are revised each year on the basis of state surveillance needs and pertain to a wide variety of health-related topics, including breastfeeding, health care access and utilization, oral and physical health, nutrition, immunization, physical activity, and parent perspectives on health issues. During 2008, nearly 1,500 parents responded to NC CHAMP survey questions about their adolescent child aged 10 to 17 years. This report provides an overview of the health of North Carolina adolescents, based on the 2008 NC CHAMP survey results.

Fifty-five percent of parents reported that their adolescent was in excellent health, whereas less than half rated the condition of their adolescent's teeth as excellent (Figure 1). On the basis of body mass index (BMI; defined as the weight in kilograms divided by height in meters squared) percentiles for age and sex, 18% of adolescents were overweight (ie, BMI between the 85th and 94th percentile) and 15% were obese (ie, BMI \geq 95th percentile) at the time of the survey. Yet only 10% of parents reported that a health

Figure 1.
Health Status of Adolescents, North Carolina Child Health Assessment and Monitoring Program, 2008



Note. Data are percentage of parents whose child had the specified characteristic. The age range for adolescents is defined as 10-17 years.

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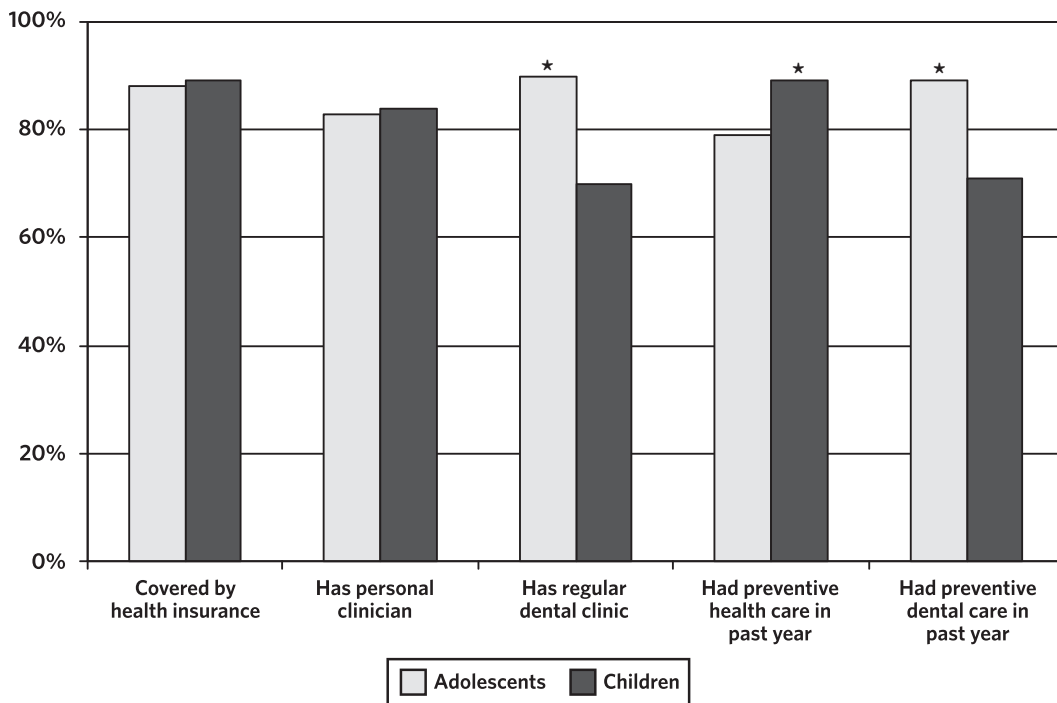
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care professional has told them that their adolescent was overweight. Seventeen percent of adolescents received a diagnosis of asthma at some point, whereas 8% had symptoms of asthma at the time of the survey. Ten percent of parents reported that their adolescent currently needs or uses more medical care, mental health, or educational services than their adolescent's peers because of a chronic medical, behavioral, or other health condition.

Figure 2 compares health care access and utilization between adolescents aged 10 to 17 years and children aged 0 to 9 years. Although the majority of parents reported that their adolescent was covered by some form of health insurance, 12% reported that their adolescent did not have health insurance at some point during the past 12 months. One-fourth of participating adolescents with health insurance were covered by Medicaid or the state's Children's Health Insurance Program (ie, North Carolina HealthChoice), 65% were covered by a private health insurance plan, and 10% were covered by another health insurance provider (eg, the military, the Civilian Health and Medical Program of the Uniformed Services, or another, unspecified plan).

Almost all parents (92%) believed that teenagers should be seen by a doctor or nurse for an annual check-up; however, only 79% reported that their adolescent had had a preventive health care visit in the past 12 months. This percentage is significantly lower than that for participating children aged 0 to 9 years, 89% of whom had had a check-up in the past year. Conversely, the frequency of access to and utilization of dental care increased with age, such that adolescents in the survey were more likely to have a dentist or dental clinic they visited regularly and to have visited a dentist in the past 12 months, compared with participating children younger than 10 years of age. There were no noticeable differences in the patterns of health care access and utilization across age subgroups of the adolescent population.

Figure 2.
Health Care Access and Utilization Among Children and Adolescents, North Carolina Child Health Assessment and Monitoring Program, 2008



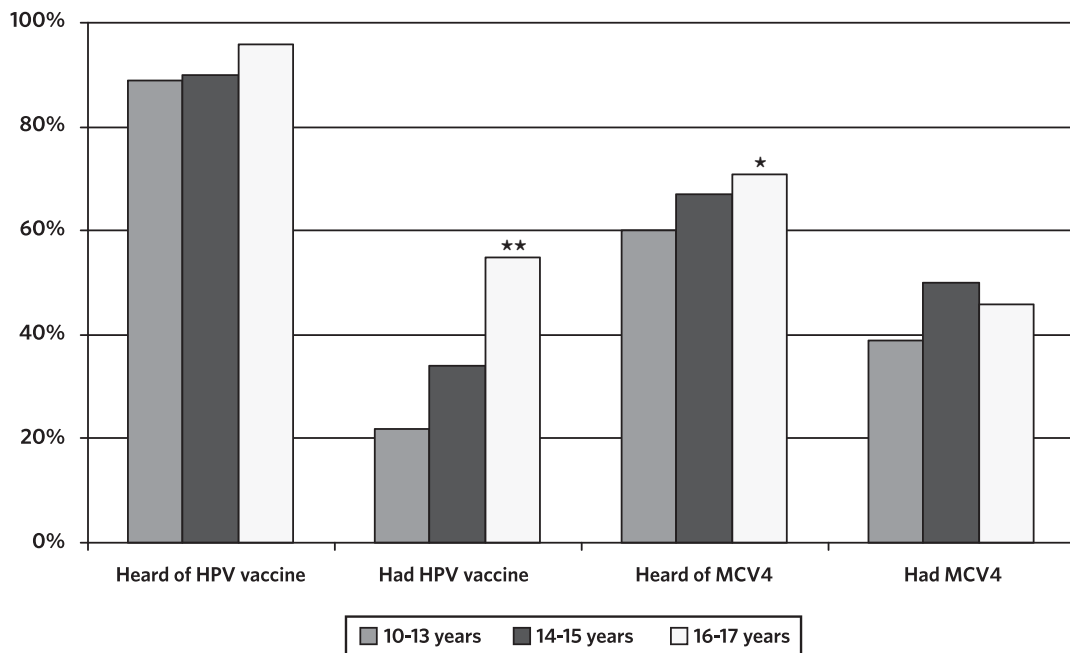
Note. Data are percentage of parents whose child had the specified characteristic. The age ranges for children and adolescents are defined as 0-9 years and 10-17 years, respectively.

* Statistically significant difference between groups ($P < .001$).

NC CHAMP respondents also provided information about their knowledge of childhood immunization and the immunization status of their adolescent (Figure 3). Immunization is an important part of adolescence. At the time of the survey, human papillomavirus (HPV) vaccination was recommended for females aged 11 to 12 years (vaccination was licensed for females as young as 9 years old, and catch-up vaccination was recommended for females aged 13-26 years), and the meningococcal conjugate vaccine (MCV4) is recommended for males and females aged 11 to 12 years. In 2008, a total of 91% of parents of adolescent females had heard of HPV vaccine, of whom only one-third had had their adolescent daughter vaccinated against HPV infection. The frequency of HPV vaccination increased with age among adolescents, such that twice as many individuals aged 16 to 17 years than those aged 10 to 13 years (45% vs 22%) had been vaccinated. Parents were less likely to have heard of the MCV4 (64%) than to have heard of HPV vaccination, and parents of older adolescents were more likely than parents of younger adolescents to have heard of the MCV4. However, parents who had heard of the MCV4 were more likely to have had their adolescent vaccinated against meningitis (44%) than against HPV infection. Unlike findings for HPV vaccination, the frequency of vaccination against meningitis did not vary significantly by age among adolescents.

The NC CHAMP annual survey provides valid and reliable data that can be used to present a comprehensive overview of adolescent health and offer valuable insights into health issues in North Carolina. This report highlighted health status, health care access and utilization, and immunization characteristics among adolescents. Information about other survey results can be accessed at the NC CHAMP Web site (available at: <http://www.schs.state.nc.us/SCHS/champ>).

Figure 3.
Human Papillomavirus (HPV) Vaccine and Meningococcal Conjugate Vaccine (MCV4) Characteristics among Adolescents, by Age, North Carolina Child Health Assessment and Monitoring Program, 2008



* Statistically significant difference between age groups (P < .01).
 ** Statistically significant difference between age groups (P < .001).

*Contributed by Donna R. Miles, PhD, and Robert E. Meyer, PhD, MPH,
 State Center for Health Statistics, North Carolina Division of Public Health.*

Philanthropy Profile

Supporting the School-Based Health Care Movement in North Carolina

Students who are hungry, sick, troubled, or depressed cannot function well in the classroom, no matter how good the school.

Carnegie Council on Adolescent Development

Adolescents are among the most underserved populations in America's health care system and are often overlooked in the larger debate on health care reform. Many youths face barriers in accessing preventive and primary health services because of factors such as lack of access, socioeconomic status, and insufficient or no medical insurance coverage. One way to address these issues is to consider school-based health centers (SBHCs) as access points to comprehensive health care for younger populations. SBHCs are partnerships created by school and community health organizations and serve as comprehensive medical homes, promoting the health, wellness, and emotional success of school-aged youths. SBHCs have also been shown to improve the level of educational success.¹ The state of North Carolina considers these centers as safety net providers of student access to essential services, which include primary, dental, and mental health care in the most comprehensive centers. At the time of writing, there are 56 SBHCs in 23 counties across the state. The majority of the SBHCs are based in high schools. There are approximately 17 SBHCs in middle schools and 5 in elementary schools. The North Carolina Department of Health and Human Services currently funds 28 SBHCs. Over the past 13 years, the Kate B. Reynolds Charitable Trust (hereafter, "the Trust") has made 30 grants totaling more than \$5 million to support SBHCs in 21 counties.

The Trust's strategy to support SBHC services in North Carolina over the years has been driven by the alignment of the Trust's Health Care Division funding priorities in the Prevention and Treatment program areas. Initially, the bulk of these grants supported direct operating costs, such as those associated with the start-up and expansion of services (ie, staff salaries, technology, and capital). As the Trust increased its focus on the provision of a medical home through its Access to Primary Medical Care program area, the interest in increasing the number of SBHCs grew. In North Carolina, SBHCs serve as a medical home for many school-aged persons, specifically because the centers provide core services such as preventive care, mental health care, and integrated primary medical care. After years of the Trust's investment in direct services, the conversation about sustaining these efforts through favorable policy advancement began.

In North Carolina, SBHCs are predominantly located in communities where access to care for a significant number of youths is limited because of low household income, lack of health insurance, lack of access to primary care professionals, or geographic isolation. SBHCs throughout North Carolina have been essential in increasing health care coverage to low-income and disadvantaged students who may not have otherwise had access. In 2000, the Trust made a grant to the North Carolina School Community Health Alliance (NCSCHA), the statewide SBHC association, for \$48,181 to establish a centralized office that provides technical assistance to SBHCs and to lead advocacy efforts by raising awareness about the value of SBHCs in North Carolina, particularly in rural areas. The SBHC movement in North Carolina was essentially initiated by the formation of this association. Years later, in 2007, the Trust made a second investment in the NCSCHA that went beyond grantmaking. While the second grant of \$310,759 allowed for a more robust, established central association, the Trust's involvement after the grant was distributed resulted in the leveraging of additional resources, partnerships, and support for the advancement of the movement.

In 2009, the partnership between the Trust and the NCSCHA resulted in the leveraging of additional resources for the state from the W. K. Kellogg Foundation. For many years, the Kellogg Foundation has been the leader in influencing SBHC public policy at the national level, resulting in great achievements in the recent national health reform legislation. As a result of the Trust's partnership with the Kellogg Foundation and the NCSCHA, local SBHCs have had the unique opportunity to benefit from a wealth of technical assistance in advancing policy through advocacy efforts and strategic communication. Much of the advocacy has been accomplished through a youth-empowerment model.

There is a demonstrated return on investment as a result of the Trust's support of the SBHC movement. The greatest gains are found among disadvantaged, vulnerable youths who have experienced improved health and educational outcomes. At present, the NCSCHA member organizations reach approximately 34,000 young people aged 5 to 18 years; 48% to 65% of participants are enrolled in Medicaid or the Children's Health Insurance Program, and an additional 10% to 22% are uninsured.

The important role of leadership in the success of the SBHC movement in North Carolina cannot be ignored. With the emergence of a more robust state association, efforts were made to take a stronger stance in public policy at all levels and to engage key stakeholders, including youths, in the value of the movement.

The Trust has had the unique opportunity to influence public policy focused on school-based health care in North Carolina by partnering with the NCSCHA to raise awareness about the "value add" of SBHCs and about their potential to increase access to health care for vulnerable adolescents. In partnership with the Kellogg Foundation, the Trust has been better positioned to support policy and advocacy work associated with school-based health care. Several key lessons are illustrated by the Trust's strategy to fund the SBHC movement, including the importance of establishing partnerships and collaborations, leveraging resources, and making timely, calculated risks. The Trust's support of the SBHC effort came about because the SBHCs' work is directly aligned with the mission of the Trust. Going the extra mile to create partnerships and opportunities and to leverage additional expertise and dollars for North Carolina has resulted in greater opportunities for SBHCs across the state and for the NCSCHA to sustain their work through advancement of favorable policy.

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Edgar G. Villanueva has been a senior program officer at the Kate B. Reynolds Charitable Trust and can be reached at edgar (at) kbr.org; Shinika McKiever was a program fellow at the Kate B. Reynolds Charitable Trust and completed her term in June 2010.

Correspondence

To the editor:

I commend you, the *NCMJ* staff, and the multiple contributing authors for work on the comprehensive and informative May/June 2010 issue on the impact of health care reform in North Carolina. Of particular interest is the influence health reform provisions will likely have on the state budget. I obtained two extra copies of the issue and forwarded them to the state representative and state senator from my legislative district in the hope of heightening their awareness of this and related consequences of the Affordable Care Act in our state.

Thank you for your continued publication of the *NCMJ*. I look forward to receiving future issues and learning about topics pertinent to the medical care of North Carolina citizens.

*R. S. Cline, MD
Burlington, NC*

To the editor:

Thank you so much for publishing the May/June 2010 issue on health care reform. Although I look forward to receiving each issue of the *NCMJ*, I read *this* issue word for word, cover to cover. It is excellent, informative, and clear. Before reading the issue, I had been somewhat discouraged with health reform legislation, thinking it was not going to do much for many segments of the population. I am a nurse practitioner at a free clinic, where I care for people without health insurance. Daily, I treat hard-working people who have been laid off, who are not getting health insurance benefits, and who cannot get care. I also provide care to people who have health problems that make it hard for them to find work.

The articles from this issue have so much information in them and spell out many ways that health care services will be expanded. I am very pleased that North Carolina is strategically positioned to take advantage of federal health care funds, with the North Carolina Office of Rural Health, the North Carolina Division of Public Health, the state's medical schools, and the North Carolina Area Health Education Centers' programs among the organizations and institutions that will benefit from this assistance. Now, after reading this issue, I am excited and anxious for all of us to work together to bring better care to our people.

*Kathy Johnson
Wayne Action Team for Community Health
Wayne Memorial Hospital
Goldsboro, NC*

To the editor:

I recently reviewed the May/June 2010 *NCMJ* issue on health care reform and was troubled by the lack of perspectives from practicing medical professionals. I hope you adhere to the statement made toward the end of your introductory article that future issues of the *NCMJ* will have contributions from various stakeholders "who will describe how health reform will affect their particular industry."

During my 33-year experience as a full-time emergency medicine physician, I have become well aware that the present health care systems has many problems, including high costs, barriers to access, and lower than desired quality. I strongly believe that the Affordable Care Act will solve few and exacerbate these and many other problems associated with health care. I see a future health care system that will generate even more political confrontation, require greater rationing of care, have more layers of management, and be even less patient friendly. In the wake of this legislation, the law of unintended consequences will roar to life.

This week, one of my nieces spent a day with me at work. She is very interested in a career in medicine. Her visit gave us the chance to ask physicians, nurses, physician assistants, and allied health personnel their opinions about a career in health care. I was shocked by their responses—the negative opinion was nearly universal. The front-line folks in health care, from my anecdotal experience, are against the legislation as passed. I do not know what a review of the literature on this subject has to offer, but I would like to see future articles in the *NCMJ* address the dissatisfaction of health care professionals.

Otto F. Rogers, MD, FACEP

To the editor:

The US Food and Drug Administration (FDA) has assigned pregnancy category D to valproate (ie, valproic acid, divalproex sodium, and sodium valproate), which signifies that, although valproate is known to harm the fetus, the benefits of valproate use may outweigh the risks. During the 1980s, several cases of "fetal valproate syndrome" among pregnant women who took valproate confirmed that valproate use during pregnancy poses a hazard to the fetus.¹ When valproate was first licensed by the FDA in 1978 for the treatment of epilepsy, it was well-known that anticonvulsant agents may have adverse effects on fetal development. However, because status epilepticus can cause significant harm to the fetus or termination of the pregnancy, the benefits of anti-

epileptic therapy may, in many cases, outweigh the potential risks. During the first 19 years of valproate availability in the United States, there was no clear evidence that the teratogenic risk associated with valproate use was any greater than that for other commonly used anticonvulsants.

In 1997, Samren and colleagues² reported that valproate appeared to be associated with a greater risk for major congenital malformations (MCMs), compared with other anticonvulsants, especially in doses of 1,000 mg per day or more. Since 2004, several reports from the North American Pregnancy Registry, the Australian Pregnancy Registry, the Swedish Medical Birth Registry, the Finnish National Medical Birth Registry, the United Kingdom Pregnancy Registry, and the International Lamotrigine Pregnancy Registry have confirmed that, among the anticonvulsants assessed, valproate is associated with the greatest incidence of MCMs, especially in doses of 1,000 mg per day or more.³ Data from the North American Antiepileptic Drug Pregnancy Registry confirmed that the risk of neural tube defects among babies born to mothers who used valproate during the first trimester is 1 in 20, which is 75 times the risk (ie, 1 in 1,500 persons) in the general US population. Additionally, the risk of any MCM in a child who is exposed to valproate monotherapy in utero is 10.7%, which is more than 3 times the risk among children exposed to any other anticonvulsant in utero (2.9%).⁴ These data prompted the FDA to release a drug safety alert on December 3, 2009, to remind health care practitioners about the risks associated with valproate use and the need to discuss the risks and benefits of valproate therapy with female patients.⁵

A recent article published by Meador and colleagues⁶ reported results of an interim analysis of the cognitive function of three-year-old children who were exposed to carbamazepine, lamotrigine, phenytoin, or valproate monotherapy in utero (the full analysis will be completed when subjects are six years old). The interim findings revealed that the intelligence quotient (IQ) for children exposed to valproate was 6 to 9 points less than that for children who received one of the other anticonvulsants ($P \leq .04$). The effect of valproate was also deemed to be dose dependent, with a mean IQ of 87 for children whose mothers received 1,000 mg per day or more of valproate, compared with a mean of 97 for children whose mothers received less than 1,000 milligrams per day ($P = .005$). These data do not support use of valproate as a first-line treatment for women of child-bearing potential.

Because of the recent FDA drug safety alert, the North Carolina Drug Utilization Review (DUR) board assessed all female Medicaid recipients who received a diagnosis of pregnancy between September 2009 through January 2010 and identified 141 patients who had a prescription for valproate. The rationale or diagnosis associated with use of valproate in these patients is not known. Because the DUR board identified these patients in late February 2010, most were well past the first trimester of their pregnancy. Because the tera-

togenic effects of valproate occur during the first trimester of pregnancy,⁷ it is not known whether switching treatment from valproate to another anticonvulsant drug several weeks after conception will decrease the incidence of MCMs.

The DUR board identified 405 additional female Medicaid recipients of childbearing age (defined as 13 to 50 years of age) who have a current prescription for valproate. The rationale or diagnosis for use of valproate in these patients is also unknown. A major question in regard to these women is whether they discussed the risks and benefits of valproate use, as well as appropriate contraception methods, with their physicians.

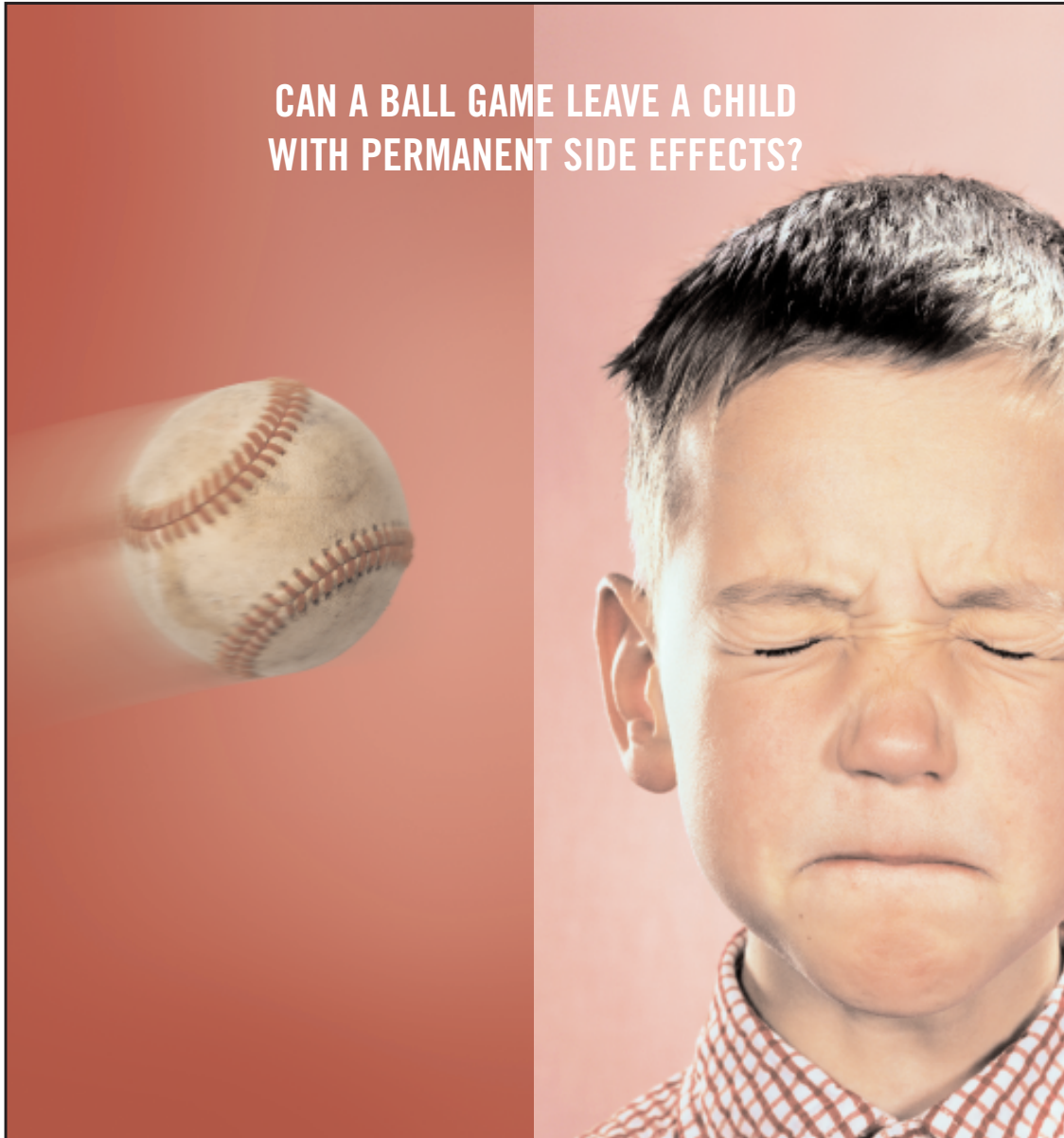
Currently, the FDA indications for valproate use include the treatment of mania and migraine headaches, which significantly increases the number of female patients who may benefit from valproate therapy. Approximately half of all pregnancies are not planned.⁸ Therefore, a prescription for valproate for women of childbearing age should necessitate a discussion that includes contraceptive options. The definition of "childbearing age" should be broad enough to include females who have a menstrual cycle and, possibly, nonmenopausal women who have had tubal ligation, with additional consideration for the patient's level of sexual activity. Additionally, the concomitant use of folic acid tablets must be strongly considered. Dietary folic acid supplementation is strongly recommended for all female patients who may become pregnant during valproate therapy. However, it should be recognized that, although evidence suggests that use of folic acid supplements during pregnancy is associated with a decreased risk of delivering a child with a neural tube defect, there is no evidence that use of folic acid supplements by pregnant women who are also receiving valproate decreases their risk of delivering a child with a neural tube defect.⁷

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