ISSUE BRIEF

Prevention for the Health of North Carolina

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In 1946, leading figures in North Carolina created the Good Health Plan—aiming to improve the health of North Carolinians and the state's position of being ranked 42nd (of the then 48 states) in the number of general hospital beds per population, "and a comparable position in the number of doctors."[1] The Good Health Plan focused primarily on improving access to health services with the goal of improving population health. While there have been many improvements in access, there has been very little improvement in overall population health. North Carolina still ranks poorly when compared to other states. According to America's Health Rankings, North Carolina stood 37th among the 50 states in 2009 for overall health.[2] The state ranks in the bottom third for many health indicators, including 41st in obesity prevalence, 40th in premature death, 38th in infectious disease, 37th in smoking prevalence, and 35th in cancer death rates.[2] When compared to the nation, a higher percentage of the state's adult citizens smoke (20.9% versus a national average of 18.4%), fewer are physically active (44.0% versus 49.5%), and more are obese (29.5% versus 26.7%) (see Table 1).

While rankings and statistics such as these provide a comprehensive overview of population health and health risks in the state, they do not adequately convey the very real consequences to North Carolinians. Consider that approximately 13,000 North Carolinians 35 years and older die *prematurely* from a smoking-related condition every year.[a] More than 3 out of 10 children between the ages of 2-18 in this state are overweight or obese, placing them at increased risk for developing diseases such as type 2 diabetes

a. North Carolina Institute of Medicine calculation extrapolating from State Tobacco Activities Tracking and Evaluation (STATE) System and state population estimates.

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Table 1.
North Carolina Ranks Poorly on Most of the Major Health Indicators

Indicator	North Carolina Data	United States Data	National Rank
Adults who are current smokers (2008)[5]	20.9%	18.4%	37
Obese adults (2008)[5]	29.5%	26.7%	41
Physically active adults (2007)[5]	44.0%	49.5%	46
Incidence of syphilis, gonorrhea, and chlamydia cases per 100,000 (2008)[6]	593.5	517.4	40
Adults with alcohol and illicit drug abuse or dependence (2006-2007)[7]	8.2%	9.2%	6
Adults with serious psychological distress (2006-2007)[7]	10.9%	11.1%	15
Average air pollution (particulate matter of 2.5 microns or less in size per cubic meter of air) (2009)[8]	12.6	11.7	36
Motor vehicle fatalities per 100,000 (2008)[9]	15.5	12.3	35
Children ages 19 to 35 months with recommended childhood immunizations (4:3:1:3:3) (2009)[8]	72.4%	78.2%	45
Low-income families (<200% FPG) (2008)[10]	35.2%	31.9%	41
Graduation rate (2009)[8]	71.8%	73.4%	37
Race and ethnicity equity (average rank among states) (2009)[11]	36.4	24.4	49
Uninsured (ages 19-64 years) (2007-2008)[12]	21.1%	20.4%	37

or hypertension and making them more likely to face social discrimination and have low self-esteem.[b,c,3] An estimated 33,000 North Carolinians are living with HIV, an incurable disease requiring regular medical treatment.[4] The prevalence and burden of these conditions signify an immediate need to make dramatic improvements in population health.

Cancer, heart disease, injury, stroke, and type 2 diabetes are among the leading causes of preventable death and disability in North Carolina. These and other diseases and health conditions that North Carolinians face often stem from underlying health risk behaviors such as tobacco use and physical inactivity. The basis of prevention—a guiding principle of public health practice and an important component of clinical care—is to take action in order to avoid illness, disability, and death. By addressing preventable, underlying health risk factors with evidence-based prevention strategies, death and disability in North Carolina can be reduced and population health can be improved.

The downside of prevention is that it is often undervalued. The current approach to health care in this country is more often aimed at reducing the consequences of poor health rather than maintaining good health. Therapeutic interventions to address chronic and acute conditions supersede preventive interventions. Ironically, "sick" care is the foundation of our "health" care system. Our lack of investment in prevention leads to preventable health conditions that create burdens for individuals, families, businesses, and communities, and strains an already thinly stretched health care system. Investing in prevention can reduce this heavy burden by saving lives, reducing disability, and, in some cases, reducing health care costs.

Nationally, only 1%-2% of health care dollars are spent on prevention. In this issue of the *Journal*, Kenneth E. Thorpe provides a national perspective on prevention. North Carolina spends slightly more of its gross state product on health care than the average for the nation, but fares worse than most of

b. The Nutrition Services Branch, North Carolina Division of Public Health maintains the North Carolina Nutrition and Physical Activity Surveillance System (NC-NPASS) and notes that "NC-NPASS data are limited to children seen in North Carolina public health sponsored WIC and child health clinics and some school-based health centers." http://www.eatsmartmovemorenc.com/Data/Texts/2008%20Ages%202%20to%2018.pdf.

c. Note on the terms "at-risk for overweight," "overweight," and "obese"—NC-NPASS data are reported as follows: at-risk for overweight is defined as BMI ≥ 85th percentile but < 95th percentile, and overweight is defined as BMI ≥ 95th percentile. However, this issue brief uses the following terminology for discussing child and adolescent weight: overweight is defined as BMI ≥ 85th percentile but < 95th percentile. Obesity is defined as BMI ≥ 95th percentile. The convention used in this issue brief is based on recommendations for defining overweight and obesity as determined by the Expert Committee on the Assessment, Prevention, and Treatment of Child and Adolescent Overweight and Obesity convened by the American Medical Association (AMA) and co-funded by the AMA, the Health Resources and Services Administration, and the Centers for Disease Control and Prevention.

the rest of the country on key health indicators.[2,13] Compared to the majority of other states, North Carolina underspends on public health; only 10 states in the country spend less (relative to population). North Carolina spends an average of $50 per capita, while neighboring states Virginia and South Carolina spend $82 and $81 per capita, respectively.[14]

North Carolina needs to invest more heavily in interventions that reduce health risk factors such as tobacco use and physical inactivity. Interventions delivered at multiple levels, including the individual, interpersonal, clinical, community/environment, and policy levels, can work in concert to optimally support healthy behaviors and health in general. For example, evidence has shown that a multilevel approach has worked for reducing substance abuse among adults and adolescents. The same has been shown for cardiovascular disease.[15] Promoting clinical preventive services by practitioners is one component of this multifaceted effort. In their commentaries, Tom Bacon, Elizabeth Tilson, J. Carson Rounds, and Ronald Venezie explore various professional roles in achieving this goal. While more effort and time are needed to implement multilevel interventions, the potential effectiveness of this approach to change individual behavior and ultimately population health status outweighs these limitations. The success of multilevel interventions is best exemplified by the long-term reduction of smoking rates seen throughout the industrialized world.[14] Similarly, North Carolina's success in reducing tobacco use has resulted largely from the use of multilevel interventions. In this issue of the *Journal*, Vandana Shah, Sally Herndon Malek, Tom Brown, and Barbara Moeykens examine North Carolina's success in reducing smoking rates. Also in this issue, Pam Seamans presents the role of advocacy for public policy change and uses recent North Carolina tobacco policies as an example, while Representative Hugh Holliman presents the North Carolina General Assembly's legislative decision-making process around prevention issues.

An individual's behavior is a major determining factor of health status, as approximately 50% of individual health can be attributed to behavior alone.[16] However, changing individual health behavior is not simple. Knowledge alone is not sufficient to change behavior. People are influenced by their family and friends, the advice they receive from their health care providers, the communities they live in, the environments in which they work and play, and the public policies that guide and shape all of these components. We can help foster positive health behaviors by creating environments, laws, and social norms that make it easier for people to choose healthy behaviors rather than engage in unhealthy behaviors.

By addressing preventable, underlying health risk factors with evidence-based prevention strategies, death and disability in North Carolina can be reduced and population health can be improved.

The North Carolina Institute of Medicine Task Force on Prevention

The state's leading health foundations—the Blue Cross and Blue Shield of North Carolina Foundation, The Duke Endowment, the Kate B. Reynolds Charitable Trust, and the North Carolina Health and Wellness Trust Fund—recognize the value of prevention and recognized the need for a thoughtful statewide prevention plan. Together, they asked the North Carolina Institute of Medicine (NCIOM) to lead the development of a Prevention Action Plan for the state. Partnering with the North Carolina Division of Public Health, the NCIOM convened a Task Force of experts which met 14 times from April 2008 to August 2009. The Task Force was chaired by Leah Devlin, DDS, MPH, former state health director;[d] Jeffrey P. Engel, MD, state health director, Division of Public Health, North Carolina Department of Health and Human Services; William L. Roper, MD, MPH, CEO, University of North Carolina (UNC) Health Care System and dean, UNC School of Medicine; and Robert W. Seligson, MA, MBA, executive vice president and CEO, North Carolina Medical Society. In addition to the co-chairs, the Task Force was comprised of 44 other members including legislators; representatives of state and local agencies; key health care leaders; public health experts; foundation leaders; business, community, faith leaders; and other interested individuals. Representatives from the four supporting foundations also served as Task Force members. A Steering Committee guided the work of the Task Force. (A full listing of Task Force and Steering Committee members is included in the Acknowledgements section of this issue brief, page 43.)

d. Dr. Leah Devlin served as one of the co-chairs for the Task Force from the inception of the work until she retired as state health director. At that time, Dr. Jeffrey Engel became one of the co-chairs. Dr. Devlin remained as a member of the Task Force.

Specifically, the NCIOM Task Force on Prevention was charged with developing a comprehensive, evidence-based, statewide prevention plan to improve population health and thereby reduce health care costs. To do this, the Task Force:

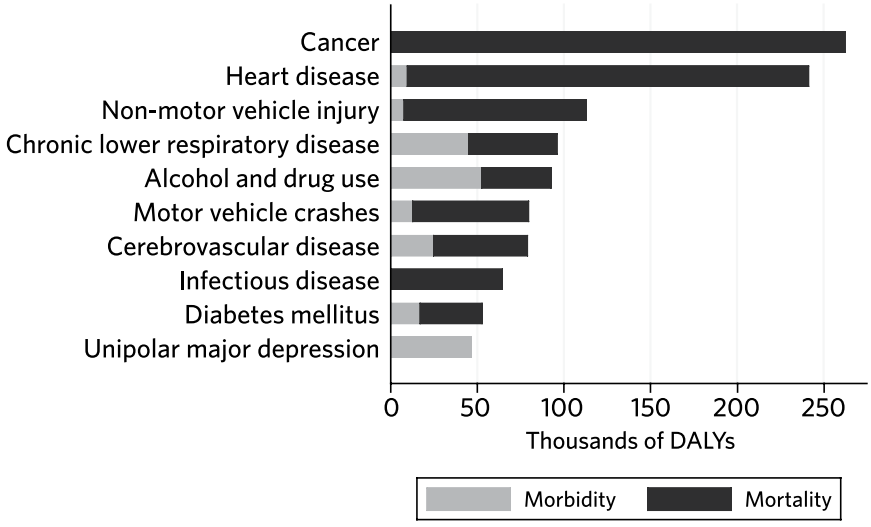
- Identified the 10 leading causes of death and disability in the state (see Figure 1).
- Comprehensively examined the preventable, underlying risk factors which contribute to these 10 leading causes of death and disability.
- Prioritized prevention strategies to improve population health through evidence-based interventions when possible and through best or promising practices when more thoroughly tested evidence-based strategies were not available.
- Developed a comprehensive, multifaceted approach to prevention that includes strategies to address the modifiable factors at different levels of the socioecological model.

To determine the leading causes of death and disability, the Task Force relied on disability adjusted life years (DALYs)—an indicator that measures the overall burden of a disease or health condition. DALYs are derived by combining years of life lost (YLL) due to an early death and years of life lost due to a disability (YLD). Figure 1 shows the leading causes of death and disability—measured in DALYs—in North Carolina in 2005.[e] Preventable risk factors for these leading causes of death and disability were then identified through a literature review (see Table 2, page 34). These preventable risk factors were the topic areas studied by the Task Force.

In its study of each of these areas, the Task Force was asked to consider the best available evidence in the development of its recommendations for the state. Relying heavily on recommendations made by national bodies such as the US Preventive Services Task Force and the US Task Force on Community Preventive Services, the NCIOM Task Force on Prevention developed evidence-based recommendations for each of the study areas based on strategies that have strong evidence of their effectiveness. For Task Force study areas where evidence-based strategies were not available, the Task Force drew from best and promising practices identified at both the state and national levels. Recognizing that individual health is affected by many factors, the Task Force utilized the socioecological model of health behavior in its development of recommendations.

The Task Force's final report, *Prevention for the Health of North Carolina: Prevention Action Plan*, was officially released in October 2009.[f] The *Prevention Action Plan* is the Task Force's recommended course of action to improve population health in North Carolina. The *Prevention Action Plan* also serves as the basis of a much larger initiative currently underway to improve the health of all North Carolinians. In his commentary, Jeff Spade discusses this initiative, as well as the role of Healthy Carolinians in improving population health through work at the community level. The *Prevention Action Plan* is a resource for many individuals and groups in the state working in the field of prevention. It can provide guidance for new legislative funding and foundation grantmaking. Additionally, it can assist in

Figure 1.
Top 10 Diseases and Conditions Leading to Greatest Disability Adjusted Life Years (DALYs) in North Carolina (2005)



Source: North Carolina Institute of Medicine. Internal analysis of North Carolina Vital Statistics (2005 mortality file); Michaud CM, McKenna MT, Begg S, et al. The burden of disease and injury in the United States 1996. *Popul Health Metr.* 2006;4:11; and NCIOM literature review of underlying causes of death and disability for each leading cause.
Notes: Infectious disease includes pneumonia and influenza. Non-motor vehicle injury includes unintentional and intentional injuries.

e. A detailed description of how the DALYs were determined is contained in the full report, which is available at http://www.nciom.org.
f. In March of 2009, the Task Force released an interim report with recommendations covering tobacco use, poor nutrition, physical inactivity, substance abuse, and risky sexual behavior.

Table 2.
Diseases and Conditions Leading to Greatest DALYs in North Carolina and Their Underlying Preventable Causes

Leading Causes of Death and Disability	Leading Preventable Risk Factors Leading to Major Causes of Death and Disability									
	Tobacco use	Diet, physical inactivity, and overweight/obesity	Risky sexual behavior	Alcohol and drug use	Emotional and psychological factors	Exposure to chemicals and environmental pollutants	Unintentional and intentional injuries	Bacteria and infectious agents	Racial and ethnic disparities	Socioeconomic factors
Cancer	✓	✓		✓		✓			✓	✓
Heart disease	✓	✓		✓	✓				✓	✓
Non-motor vehicle injuries	✓	✓		✓	✓		✓		✓	✓
Chronic lower respiratory disease	✓	✓							✓	✓
Alcohol and drug use				✓	✓				✓	✓
Motor vehicle injuries				✓			✓		✓	✓
Cerebrovascular disease	✓	✓		✓					✓	✓
Infectious diseases			✓	✓				✓	✓	✓
Diabetes		✓							✓	✓
Unipolar major depression				✓	✓				✓	✓

Source: Data from the North Carolina Institute of Medicine literature review.

prioritizing prevention efforts and focusing the work of the North Carolina Division of Public Health and other state and local agencies, health care and public health professionals, health organizations, insurers, community organizations, companies, the faith community, and other groups. In this issue of the *Journal*, Jeffrey P. Engel discusses in his commentary how the *Prevention Action Plan* will be used to shape the work of the Division of Public Health over the next several years. Working together off a common action plan and wisely using resources, which is especially important during this time of limited funding opportunities, offers the greatest opportunity to improve population health in North Carolina and to lower costs to both individuals and the health care system. Of the 45 recommendations developed by the Task Force, 11 were identified as priority recommendations; these are presented in bold in this issue brief. The full report of the Task Force is available on the North Carolina Institute of Medicine's website at http://www.nciom.org.

Tobacco Use

Tobacco use is the leading cause of preventable death in North Carolina. Despite this fact, nearly 2 million, or 20.9%, of adult North Carolinians smoke.[5] This means that one in five adult North Carolinians are at increased risk of death and disability due to heart disease, heart attack, cancer, stroke, high blood pressure, and a host of other health conditions caused by smoking. Many efforts to reduce tobacco use have been launched in the state over the last several years, including interventions such as the state quitline, social marketing campaigns, and broader insurance coverage of cessation counseling and medications. This multifaceted approach partially explains the decline in adult smoking from 24.8% in 2003 to 20.9% in 2008.[17] Even more dramatic declines can be seen in youth smoking rates. From 2003 to 2007, high school youth smoking rates dropped from 27.3% to 19.0%, and middle school use rates were cut in half from 9.3% to 4.5%.[18] North Carolina's youth smoking rates are now below the national average, although adult smoking rates continue to exceed the nation's rate. Further, while we have made progress in reducing youth smoking, far too many young people still smoke and use other tobacco products.

The use of other tobacco products (OTPs) is problematic: 20% of adults reported use of smokeless tobacco in 2008 and 4% reported use of other smoke products.[g,19]

Among youth, 8.6% of high school students and 2.3% of middle school students report current use of smokeless tobacco.[20] OTPs are of particular concern among youth as such products are considered a "gateway" to cigarette use. Adolescents who use smokeless tobacco are more likely to use cigarettes. Youth who use tobacco are also more likely to consume alcohol and use illicit substances.[21]

The Centers for Disease Control and Prevention (CDC) recommends increasing the unit price for tobacco products to reduce smoking initiation and to help those who already smoke to quit. Data show that a 10% increase in the price of a pack of cigarettes leads to a 4.1% decrease in tobacco use within the general population. Youth are even more sensitive to price increases; a 10% price increase leads to a 4%-7% decrease in the number of youth who smoke.[22] Raising North Carolina's cigarette tax to the national average ($1.34 as of January 26, 2009) would reduce youth smoking by 14%, lead to 46,000 fewer adult smokers and 74,400 fewer future youth smokers, and avert 35,900 smoking-related deaths.[23] Comparably increasing the OTP tax to 55% of wholesale would lead to significant health benefits in the state as well.[24] Moreover, increasing taxes on both cigarettes and OTPs would create new state revenues of $350 million.[h,i,23,24]

The Task Force recommended that the North Carolina General Assembly should increase the tax on a pack of cigarettes to meet the current national average and increase the tax on all other tobacco products to a comparable amount. These new revenues should be used for a broad range of prevention activities including preventing and reducing dependence on tobacco, alcohol, and other substances.

Obesity, Nutrition, and Physical Activity

North Carolina is not alone in its fight against obesity. Over the past 20 years, every state in the nation has experienced an increase in the prevalence of obesity, which is now referred to as an epidemic. Two-thirds (65.7%) of North Carolina adults are either overweight or obese compared to 63.2% of adults nationally. From 1990 to 2008, the prevalence of adult obesity in this state more than doubled, growing from 12.9% to 29.5%.[25,26] Youth in this state are also struggling with unhealthy weight: over 30% of youth ages 2-18 years were considered overweight in 2008.[j,27]

Obesity is a risk factor for a number of health conditions including high blood pressure, heart disease, cancer, stroke, and type 2 diabetes.[28-31] Obesity is also a significant driver of health care costs. According to Be Active North Carolina, our state spent $2.81 billion in medical costs, $960 million in prescription drug costs, and $11.8 billion in lost productivity costs due to excess weight in 2006.[32]

There are many reasons why so many North Carolinians, like many people across the country, are confronting overweight and obesity. Larger than necessary portion sizes and sedentary lifestyles are just a few of these reasons. Generally speaking, regular, adequate physical activity balanced with good nutrition is the goal that needs to be met by individuals in order to achieve healthy weight status.

Physical activity and physical education are particularly important to the healthy development of children. Physical education involves "teaching students the skills, knowledge, and confidence they need to lead physically active lives."[33] The National Association for Sport and Physical Education recommends that elementary school children receive 150 minutes of physical education each week and high school students receive 225 minutes each week. To ensure elementary school children receive the recommended weekly level of quality physical education, and that middle and high school students are receiving a sufficient level of the Healthful Living curriculum that equally emphasizes health and physical education, **the Task Force recommended that the North Carolina General Assembly require the State Board of Education to implement a five-year phase-in requirement of quality physical education that includes 150 minutes of elementary school physical education weekly, 225 minutes weekly of Healthful Living curriculum in middle schools, and two units of Healthful Living curriculum as a graduation requirement for high schools.**

As we learned from successful tobacco interventions, we must address obesity through sustained, multifaceted efforts addressing individuals, families, schools, communities, and policy. The existing *Eat Smart, Move More North Carolina Obesity Prevention Plan* provides a roadmap to do this. **Therefore, the Task Force recommended that the North Carolina Division of Public Health (DPH) along with its partner organizations should fully implement the *Eat Smart, Move More North Carolina Obesity Prevention Plan* to combat obesity in selected local communities and identify best practices for improving nutrition and increasing physical activity that will ultimately be adopted across the state. The North Carolina General Assembly should appropriate $6.5 million in recurring funds beginning in SFY 2011 to DPH to support efforts in every community**

g. Adult smokeless tobacco users are those who use smokeless tobacco some days or every day. Adult other tobacco product users are those who report current use of cigars, pipes, bidis, kreteks, or other tobacco products.

h. Statistics and revenue projections are dependent on the current national average tax and prevalence of smoking and tobacco use. Projections (e.g., new revenue generated, lives saved) in circulation may differ for this reason.

i. These projections include the September 1, 2009 10-cent increase in the state cigarette tax (projections in the final report do not). They also include the 2009 66-cent federal tax increase that occurred with the federal reauthorization of the Children's Health Insurance Program.

j. The data on children capture BMIs of children seen in North Carolina public health sponsored WIC and child health clinics and some school-based health centers.

across the state, **$3.5 million annually for six years to support more comprehensive demonstration projects**, **$500,000 annually for six years to support adolescent focused interventions**, **and additional funding to support a social marketing campaign.**[k]

Risky Sexual Behaviors

Risky sexual behaviors can lead to unintended pregnancies as well as sexually transmitted diseases (STDs), including human immunodeficiency virus (HIV). Sexually transmitted diseases can lead to illness, chronic disease, and death. Unintended pregnancy is associated with greater risk of morbidity for women and potentially compromised infant health due to delay of prenatal care among women who have an unintended pregnancy.[34] Unintended pregnancy can lead to significant potential social and economic consequences as well. In addition, these preventable health conditions lead to substantial costs to the state. Evidence-based pregnancy prevention programs and access to family planning resources can help prevent unintended pregnancies. Education and risk-reducing behavior can help prevent STDs, HIV, and unintended pregnancy.

Nearly half of all pregnancies in North Carolina are unintended.[35] Most unintended pregnancies occur among adults; however, almost all teen pregnancies are unintended.[36] Currently, North Carolina has the 14th highest teen pregnancy rate.[37] The annual cost of unintended pregnancy in the Medicaid population alone is over $500 million.[38] According to the National Campaign to Prevent Teen and Unplanned Pregnancy, teen pregnancy in North Carolina cost taxpayers more than $312 million in 2004.[39]

Chlamydia, gonorrhea, and syphilis are the most prevalent reportable STDs in North Carolina.[l,4] Currently, North Carolina has the 14th highest incidence per 100,000 of these three STDs in the country. Annual direct medical costs in the state for all STDs, including HIV, was over $200 million in 1997.[37] Certain population groups are at increased risk of contracting STDs and HIV. African Americans and Latinos—both men and women—have higher rates of chlamydia, gonorrhea, syphilis, and HIV, than do whites. Youth in this state are also at increased risk for STDs and HIV infection. In fact, of all new STD infections, almost half occur in young people between the ages of 15 and 24.[4]

Providing youth with the knowledge and skills to avoid STDs, HIV, and unintended pregnancy is an important prevention strategy. Comprehensive sexuality education programs have been shown to be effective at delaying the initiation of sex, reducing frequency, reducing the number of sexual partners, increasing contraceptive use, and reducing sexual behavior that increases risk. In contrast, evaluations of many abstinence programs, including abstinence-until-marriage programs, have shown no overall impact on delaying age of initiation of sex, number of sexual partners, or condom or contraceptive use.[40]

Until the passage of HB 88 (SL 2009-213) in 2009, local education agencies (LEAs) were required to offer only abstinence-until-marriage education. The law now calls for LEAs to offer comprehensive sexuality education—referred to as reproductive health and safety education—as part of the Healthful Living Standard Course of Study. While this new legislation is a huge step forward, it does not require that *all* youth receive comprehensive sexuality education. Existing statute indicates that each local board of education is still required to adopt a policy to allow parents or legal guardians to consent or withhold consent for their child's participation in any of this education. If local school boards enacted an opt-out consent process, more young people in North Carolina would receive evidence-based, effective sexuality education. **Thus**, **the Task Force recommended that local school boards should adopt an opt-out consent process to automatically enroll students in the comprehensive reproductive health and safety education program unless a parent or legal guardian specifically requests that their child not receive any or all of this education.**

Substance Abuse and Mental Health

Alcohol and drug use is the fifth greatest contributor to disability adjusted life years in the state, while depression is the second leading cause of life lived with a disability in North Carolina.[41] According to the 2006-2007 Substance Abuse and Mental Health Services Administration (SAMHSA) annual household survey, one in 12 North Carolinians ages 12 or older reported dependence or abuse of alcohol or illicit drugs.[m] One in 12 North Carolinians ages 12 or older also reported having a diagnosable major depressive episode.[7]

Substance abuse increases an individual's risk for premature death, comorbid health conditions, and disability. Individuals with addiction disorders face an increased risk of joblessness, homelessness, and poverty. Aside from the adverse effects addiction has on the individual, addiction also severely impacts families and communities. In 75% of cases where children are placed in foster care, parental use of alcohol or drugs is a contributing factor.[42] Ninety

k. The Task Force recommended $16 million for a social marketing campaign based upon the CDC's recommendation of $1.83 per capita for health communications interventions addressing tobacco use. See *Best Practices for Comprehensive Tobacco Control Programs, 2007* at http://www.cdc.gov/tobacco/tobacco_control_programs/stateandcommunity/best_practices.

l. Hepatitis A and B are also reportable (§ 10A NCAC 41A 0.101 Reportable Diseases and Conditions). However, only the three most common STDs (chlamydia, gonorrhea, and syphilis) were studied by the Task Force.

m. Illicit drugs include marijuana, hashish, cocaine, heroin, hallucinogens, inhalants, and prescription drugs that are used non-medically.

percent of people in the North Carolina prison system have substance abuse problems.[43] In addition, substance abuse contributes to more than one-quarter (28.6%) of all vehicle crash-related deaths in the state.[44]

Substance use, abuse, and addiction can be prevented.[45] Prevention strategies should be aimed at young people; while substance abuse has detrimental effects on adults, youth are at particular risk due to the impact that use has on the developing brain, as the brain is not fully formed until 25 years of age.[46,47] This is worrisome considering that almost 4 out of 10 North Carolina high school students reported having at least one drink in the last 30 days, and more than 2 out of 10 reported binge drinking.[48] One in five high school students reported using marijuana in the last 30 days, and 17% reported that they took an unprescribed prescription drug.[48]

Like substance abuse, mental health disorders severely impact individuals. Mental health disorders reach beyond the affected individual and affect interpersonal relationships.[49] Depression has been linked to reductions in productivity in the workplace and increased use and cost of health services.[48,50] Depression is also associated with 60% of all suicides—making it the leading cause of suicide.[51] In 2007, suicide was the sixth leading cause of death for children ages 10-14 in North Carolina, the fourth leading cause of death for youth and adults ages 15-34, and the fifth leading cause of death for adults ages 35-44.[52]

The North Carolina Division of Mental Health, Developmental Disabilities and Substance Abuse Services (DMHDDSAS) currently receives funding from Substance Abuse Prevention and Treatment Block Grants from SAMHSA and from the North Carolina General Assembly. However, these two funding streams do not provide enough funds to provide substance abuse prevention services to all who need them. According to DMHDDSAS, in SFY 2007, more than 275,000 youth were in need of substance abuse prevention services; however, only 42,000 actually received those services.[n,44,53] Currently, there are a limited number of local substance abuse coalitions, which means few communities have implemented comprehensive substance abuse prevention programs. Schools are required to teach information about substance abuse and use, mental health, and emotional well-being; however, a 2004 study showed that most public schools in the state had not implemented evidence-based substance abuse prevention programs.[54] To address these gaps in substance abuse prevention, a statewide comprehensive substance abuse prevention plan is needed to reach all North Carolinians in need of prevention services.[44] Efforts should be evidence-based and should target those population groups at varying risk levels with the express goal of preventing or delaying use of alcohol, tobacco, or other drugs. To support the development and testing of a comprehensive substance abuse prevention plan, **the Task Force recommended that the Division of Mental Health, Developmental Disabilities and Substance Abuse Services develop a comprehensive substance abuse prevention plan for use at the state and local levels prioritizing efforts to reach children, adolescents, young adults, and their parents. In addition, the North Carolina General Assembly should appropriate funds to support comprehensive local or regional demonstration projects that prevent or delay the onset of use of alcohol, tobacco, or other drugs and promote emotional and mental health**.

Similar to the effect that increasing tobacco taxes has on use, increasing taxes on alcohol has also been shown to reduce its use. Youth and heavy drinkers are sensitive to tax increases on alcohol.[55-57] North Carolina increased its alcohol tax in 2009 by 0.8 cents per can of beer and 4-cents per bottle of wine.[o] Therefore, to further prevent of the misuse of alcohol, **the Task Force recommended raising the excise taxes on malt beverages and wine. The increased revenue should be used to fund effective prevention and treatment efforts for alcohol, tobacco, and other drugs. In addition, the Task Force recommended that the North Carolina General Assembly support a comprehensive alcohol awareness education and prevention campaign.**

Environmental Risks

Air and water pollution are environmental risks that threaten the health of all North Carolinians. Air pollution can cause and exacerbate respiratory and cardiovascular conditions such as asthma, emphysema, heart attack, and stroke, while water pollution can lead to acute poisoning and can have chronic effects. Both types of pollution have been linked to cancer.[58-61]

Specific population groups are more susceptible to the deleterious effects of air pollution. For example, sulfur dioxide is particularly problematic for the young and old and people with asthma, heart disease, and lung disease.[62] Ozone is one of the state's most prevalent air quality problems.[57,63] Major sources of air pollution in North Carolina include motor vehicles,[64] coal-fired plants,[65] poultry waste incineration, hog waste, medical waste incineration, and waste to energy incineration.[66]

Water pollution can occur in groundwater (wells and aquifers) and source water (streams, lakes, and rivers), which are sources of drinking water. Preventing pollution of groundwater is critical—as over half of all North Carolinians rely on groundwater for their drinking water.[67] In addition, approximately 2.7 million (34%) of North Carolinians rely

n. Certain groups have a higher risk of developing a substance abuse disorder, including those who have a parent with substance abuse problems, have academic difficulties in school, and/or have started experimenting with substances themselves.

o. SL 2009-451, Section 274.4 (a).

on private wells, which are not subject to inspection, for their drinking water.[68]

Naturally occurring contaminants and human activities can cause water pollution. Arsenic is an example of a naturally occurring contaminant. Consumption of arsenic in water has been linked to many cancers, gastrointestinal problems, and other health conditions.[58,60,69] Other sources of water pollution in North Carolina include agricultural run-off, unlined solid waste facilities, power plants, pharmaceutical manufacturers, and gasoline storage tanks.[59,70]

To address environmental health hazards, the Task Force recommended a statewide environmental assessment for North Carolina that links exposures to health outcomes. The Task Force also recommended ways to improve the environments of indoor spaces such as schools and homes and to improve the built environment.[p]

Injury

Injury is a larger public health problem than is often realized. Every year in North Carolina, injuries result in more than 148,000 hospitalizations, 819,000 emergency department (ED) visits, and an unknown number of outpatient visits and medically unattended injuries.[71] Unintentional injury is the fourth leading cause of death and disability in this state. Unintentional injuries led to 4,300 deaths in 2007 in North Carolina. Because there are so many potential causes of injuries, the Task Force focused on the leading causes of unintentional injuries: motor vehicle crashes, unintentional poisonings, and falls.

Motor vehicle injuries caused more than one in four injury-related deaths, or nearly 1,800 fatalities in 2007.[72] Younger populations are disproportionately affected by motor vehicle injury. It was one of the leading three causes of injury-related hospitalizations in North Carolina in 2006 for people ages 5-44 years and the leading cause of hospitalization for people ages 15-24 years.[51] Evidence-based strategies to reduce the incidence of motor vehicle injury are available. The Task Force recommended strategies and increased funding to eliminate driving while impaired, reduce speeding and aggressive driving, encourage seat belt use, and ensure proper licensing and training for motorcyclists.

Unintentional poisonings include the use of drugs or chemicals in excessive amounts for recreational or non-recreational purposes.[73] This is the second leading cause of injury-related death in the state, accounting for 22% of injury fatalities in the state, and its incidence has been rising dramatically in recent years.[74,75]

Unintentional falls are the third leading cause of injury-related deaths in North Carolina, accounting for nearly 10% of injury fatalities in 2007.[76] Of all falls, 10%-20% cause serious injury, and they disproportionately affect individuals over the age of 65. The risk of death from falling is 23 times greater among those aged 65 or over than it is for individuals less than 65 years of age.[77]

The Task Force also examined violence, or intentional injuries. Specifically, the Task Force focused on family violence, which includes domestic violence and child maltreatment. Unlike the other causes of injury the Task Force examined, data on the prevalence and incidence of family violence are incomplete due to many factors including under-reporting and a lack of well-established terms and measures. There were nearly 15,000 reports of substantiated child maltreatment in North Carolina in 2007.[78] Child physical abuse has been associated with suicidal behavior, risk-taking, psychiatric disorders, altered brain development, hormonal changes, and impaired sleep.[79] Major depression, dysthymia, and sexualized behaviors, which can lead to an increased risk of sexually transmitted diseases, have been associated with child sexual abuse.[80] Domestic violence is also a significant and tragic public health problem. According to some estimates, one in four women in North Carolina has reported experiencing physical or sexual violence since the age of 18. The majority report either physical or sexual violence at the hands of their former or current partner.[81]

Historically, the state has not prioritized preventing intentional and unintentional injury as it has other preventable health problems. **Therefore, the Task Force recommended that the General Assembly create an Injury and Violence Prevention Task Force to identify and implement strategies to reduce injury and violence.**

Vaccine Preventable Disease and Foodborne Illness

Vaccine Preventable Disease

Infectious disease, including pneumonia and influenza, was the 10th leading cause of death among North Carolinians in 2007.[71] Fortunately, many infectious diseases such as measles and influenza that once widely afflicted populations are now preventable through vaccinations. Vaccines have been proven to save lives and money. For every dollar spent on childhood vaccination, the United States' childhood immunization program saves $5 in direct costs and $11 in additional costs to society.[82]

However, everyone does not receive recommended immunizations, even when these vaccines are free. The lack of immunization among the population leads to negative, yet preventable health outcomes every year. North Carolina's Universal Childhood Vaccine Distribution Program (UCVDP) provides combined diphtheria and tetanus toxoids and

p. The built environment includes neighborhood design, land use patterns, and transportation systems.

q. Grimshaw A. Data collection and analysis unit supervisor, Immunization Branch, North Carolina Department of Health and Human Services. Written (email) communication. June 30, 2009.

acellular pertussis (DTaP or Tdap); hepatitis A (Hep A); hepatitis B (Hep B); *Haemophilus influenzae* type B (Hib); inactivated polio virus (IPV); measles, mumps, and rubella (MMR); and varicella to all children in the state.[q] The program removes financial barriers, assures vaccination access for all children, and simplifies the vaccination process for health care providers. Both public and private medical providers receive all required vaccines for children ages 0 through 18 at no charge.[83] In general, North Carolina's UCVDP is working well. In fact, North Carolina's childhood vaccination rates have been higher than the national rate since 1995.[84] Although recent changes to the UCVDP, combined with reduced funding, and cost of newly developed vaccines have lowered our rates.[r]

While many childhood vaccines are covered through UCVDP, other newer vaccines are not. For example, UCVDP does not currently cover the vaccines for human papillomavirus (HPV), rotavirus, meningococcal, or pneumococcal although children who are uninsured, eligible for Medicaid, Alaskan Native, American Indian, or who are receiving care from a health department or federally qualified health center can receive these immunizations for free through the Vaccines for Children program. Given the need to increase immunization rates, **the Task Force recommended that the North Carolina Division of Public Health aggressively seek to increase immunization rates for all vaccines recommended by the Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices which are not currently covered through the state's Universal Childhood Vaccine Distribution Program (UCVDP). In addition, it recommended that all public and private insurers provide first dollar coverage (no co-pay or deductible) for all CDC-recommended vaccines that the state does not provide through the UCVDP and should provide adequate reimbursement to providers to cover the cost and administration of the vaccines. The North Carolina General Assembly should appropriate $1.5 million in recurring funds in SFY 2011 to support greater education and outreach efforts.**

Foodborne Illness

In most cases of foodborne illness the exact pathogen is unknown.[85] However, foodborne illnesses are extremely common infectious diseases. There are more than 200 known diseases transmitted through food by viruses, bacteria, metals, toxins, parasites, and prions. Foodborne pathogens lead to 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths each year in the United States.[84] Fortunately, food safety can prevent foodborne illness.

A recent performance review of the North Carolina food safety system found that the state's system is fragmented as many agencies—including the North Carolina Department of Agriculture, the North Carolina Department of Environment and Natural Resources, North Carolina Department of Transportation, and the North Carolina Division of Public Health—oversee food safety as food moves from farm to table.[86] The Task Force recommended that the North Carolina General Assembly enact laws to strengthen the state's ability to prevent and respond to foodborne illness.

Racial and Ethnic Disparities

In 2008, approximately 30% of North Carolina's population was comprised of racial and ethnic minorities: 67.2% of North Carolinians were white, 21.2% African American, 7.4% Latino, 1.9% Asian, 1.1% American Indian, 1.1% two or more races, and 0.1% Native Hawaiian or Pacific Islander.[87] Compared to non-minorities, racial and ethnic minorities generally have poorer health status and experience poorer health outcomes.[88,89] Mortality rates due to cancer, heart disease, stroke, and diabetes are generally higher among minorities than whites. Minorities in North Carolina are also more likely to have risk factors for disease and illness than non-minorities (see Table 3, page 40). For example, African Americans are more likely to smoke, be obese, report no leisure time physical activity, report fair/poor health, be uninsured, and report not having a personal provider.

The exact causes of racial and ethnic health disparities are not fully understood, but it is known that minority populations generally have less access to health care and health insurance and lower quality of health care compared to non-minorities.[88,90] Socioeconomic factors such as housing, income, and education also contribute to poorer health outcomes. Another important factor is our country's history of discrimination, which has shaped and restricted opportunities through interpersonal and institutional bias.[87] This history has led to many minorities mistrusting medical care and the health care system.[87,91,92]

The health disparities between the majority and minority populations cannot be ignored. The Task Force recommended that private and public funders support evidence-based prevention initiatives to meet the needs of diverse populations. The Task Force also recommended that the Division of Public Health examine racial and ethnic disparities in all its health promotion and disease prevention activities. The Task Force also made recommendations regarding socioeconomic factors, which contribute to racial and ethnic disparities (see below).

Socioeconomic Factors

Race and ethnicity, income, educational achievement, housing conditions, and other social determinants are among the best predictors of an individual's health status.

r. Cline S. Deputy director, North Carolina Division of Public Health. Personal communication. February 17, 2010.

Table 3.
Minorities in North Carolina are Generally More Likely than Whites to Have Risk Factors for Disease or Illness

	White	African American	Latino	American Indian	Asian	Other Races	Total
Current smoker	21%	22%	14%*	35%*	16%	19%	21%
Obese	27%	41%*	28%	35%*	5%*	22%	30%
No leisure time physical activity	23%	29%*	33%*	36%*	26%	17%	25%
Fair/poor health	15%	20%*	28%*	30%*	13%	25%	17%
Diabetes	8%	16%*	5%*	12%	2%*	5%*	9%
High blood pressure	29%	42%*	12%*	34%	13%	29%	29%
Uninsured	11%	21%*	67%*	27%*	13%*	31%*	18%
Did not see doctor due to cost	13%	23%*	30%*	26%*	10%	28%*	17%
No personal provider	17%	20%	64%*	26%*	19%	35%*	22%

Source: North Carolina Institute of Medicine. Analysis of North Carolina Behavioral Risk Factor Surveillance System 2008 data except for high blood pressure (2005 data).
Note: Shaded cell denotes value, after adjustment for age and income, is significantly different from average for white at 5%.
* Denotes unadjusted (sample average) significantly different from average for white at 5%.

Individuals with higher incomes or greater personal wealth, more years of education, and who live in a healthy, safe environment, have longer average life expectancies and better health outcomes than individuals who do not have these attributes. In this issue of the *Journal*, Ronny Bell delves further into the social determinants of health.

Income

Increasing income levels correspond to gains in health and health outcomes.[93] Individuals with higher incomes have greater opportunity to engage in healthy behaviors, live in safe and healthy communities, and afford health insurance coverage. In 2007, nearly 15% of North Carolinians lived below the federal poverty guideline (FPG) ($20,650 per year for a family of four in 2007), and approximately 35% lived in low-income households with incomes below 200% FPG ($41,300 for a family of four in 2007).[s] Due to the recent economic downturn, it is probable that even more North Carolinians are currently living in poverty. The state's unemployment rate between 2007 and January 2009 was the second largest increase in the nation (five percentage points, from 4.7% to 9.7%).[94] To promote economic security, **the Task Force recommended the North Carolina General Assembly increase the state Earned Income Tax Credit (EITC) to 6.5% of the federal EITC. In addition, the Task Force recommended that the North Carolina Division of Social Services and local departments of social services should conduct outreach to encourage uptake of the Supplemental Nutrition Assistance Program (SNAP), formerly known as food stamps, to low-income individuals and families.**

Housing

Poor housing conditions, including substandard, unhealthy, overcrowded, and unaffordable homes, contribute to a large number of health problems.[95-97] Some problems found in substandard housing conditions include dampness, inadequate ventilation, unregulated temperatures, overcrowding, and the absence of hot water, adequate food storage, or sufficient waste disposal. These problems have all been linked to infection, disease, and other illness.[95] Young children may be at a particularly high risk from health problems resulting from unhealthy home environments since they spend so much time at home.[98] In addition, poor housing conditions can lead to injuries within the home. An estimated half of all deaths due to falls, one-fourth of all poisoning-related deaths, and 90% of all fire- or burn-related deaths occur in the home.[99] Not surprisingly, lower-income people are more likely to live in substandard, unhealthy, or overcrowded housing.[100]

Housing affordability is also closely connected to health status. Low-income people or families living in unaffordable housing have less money to spend on basic needs such as health care, nutritious foods, heating, and transportation. In fact, those people who have problems paying rent or utility bills report barriers in accessing health care, higher use of the emergency department, and more hospitalizations.[101] To increase the availability of affordable housing and utilities, the Task Force recommended that the North Carolina General Assembly appropriate $10 million in additional recurring funding beginning in SFY 2011 to the North Carolina Housing Trust Fund to increase the availability of affordable housing for low-income families, seniors, and people with disabilities.

s. Holmes M. North Carolina Institute of Medicine. Analysis of the US Census Bureau's Current Population Survey, 2007.

Education

Increasing years of education is one way to improve the health of North Carolinians. On average, people with less education earn less money and are more likely to live in poverty. People with more education have better health outcomes. College graduates live an average of five years longer than those who do not complete high school.[102] Those with more education are also less likely to report functional limitations and are less likely to miss work due to illness or disease. In addition, individuals with four additional years of education are less likely to smoke or binge drink and more likely to get preventive care, such as flu shots and screenings, than those with less education. These positive health impacts persist even after controlling for income, family size, marital status, urban or rural location, race, Hispanic origin, coverage by health insurance, occupation, and industry.[101]

It is important for young children to be ready to learn once they begin school. Cognitive, language, and socioemotional skills of children who live in poverty lag behind those of more affluent children.[103] High quality early education programs can increase school readiness among low-income and minority children.[104] Smart Start, North Carolina's early childhood initiative, helps ensure that young children are healthy and ready to learn. While the state generally is considered a national leader in early childhood education, we trail many other states when it comes to the percentage of incoming ninth graders who graduate within four years, ranking 39th nationally.[105] Three of 10 North Carolina students did not graduate from high school in the 2007-2008 school year. The percentage of minority and disadvantaged students who do not graduate is even greater.[106]

Recognizing the strong link between education and health outcomes, **the Task Force recommended the North Carolina State Board of Education and the North Carolina Department of Public Instruction 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.**

Cross-cutting Strategies in Schools, Worksites, and Clinical Settings

Multifaceted prevention efforts that promote healthy behaviors at the individual, interpersonal, clinical, community, and policy levels have a better chance of positively impacting the health of a population than solitary interventions. Most of the Task Force's work focused on evidence-based strategies to reduce specific risk factors (e.g., tobacco use, lack of exercise, substance use, or risky sexual behavior). However, the Task Force also wanted to examine site-specific strategies, such as those that address multiple risk factors in schools, worksites, and clinical settings.

Schools

Schools play a leading role in helping young people learn skills and gain knowledge critical to a lifetime of good health. While educating students is the foremost goal of public education, the North Carolina State Board of Education also has a goal of ensuring that students are healthy and responsible. Research shows improved academic performance and greater readiness to learn among students who are healthy.[107,108] In this issue of the *Journal*, June St. Clair Atkinson and Paula Hudson Collins discuss the role schools play in producing healthy youth.

The aim of the North Carolina Healthy Schools Initiative—a collaborative effort of the North Carolina Department of Public Instruction, the North Carolina Division of Public Health, and other state agencies funded by the CDC—is to unify learning and health within the public school setting.[32] The initiative works to establish and support the Coordinated School Health Program (CSHP), which is recommended by the CDC to promote student and staff well-being. The eight major components of the CSHP are 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.

Research has shown that school districts that have local school health coordinators are more likely to implement evidence-based health education curriculum.[109] The National School Boards Association found in their review of 25 schools with exemplary school health programs that all schools had designated a central person to be the healthy schools coordinator.[110] **The Task Force recommended that the NCGA appropriate $1.5 million in recurring funds (increased by a similar amount for the next five years) to hire a local healthy schools coordinator in each Local Education Agency.** The Task Force also made a recommendation for use of evidence-based curricula in the Healthful Living Standard Course of Study when available.

Worksites

Employers can benefit from implementing comprehensive wellness programs for their employees. Comprehensive programs include five elements: health education and promotion programs, supportive social and physical environments, screening and education, integration into the organizational structure, and linkages with other related worksite programs.[111] They have been shown to be effective in reducing risky health behaviors and improving health outcomes.[112] Healthy employees miss fewer days of work, are more productive, and have lower health care costs.[113,114] In her commentary in this issue of the *Journal*, Laura Linnan discusses why businesses should invest in the health of their employees.

There are evidence-based strategies that employers can implement to improve health outcomes of their employees. Smoke-free policies, point-of-decision prompts to use the stairs, and access to places to be physically active are some examples of such strategies.[111] Health risk appraisals (HRAs), when combined with employee feedback, have also been

shown to be effective in changing employee health behaviors and outcomes.[111] To support worksite wellness programs throughout North Carolina, the Task Force recommended that the North Carolina General Assembly provide start-up funding to create the North Carolina Worksite Wellness Collaborative to provide support to businesses in implementing comprehensive worksite wellness programs.

Clinical Setting

Currently, there are 30 clinical preventive services recommended by the US Preventive Services Task Force (USPSTF). Some of the recommended services are intended to prevent a condition or disease from occurring in the first place (e.g., tobacco screening and cessation counseling to prevent lung cancer). Other clinical preventive services are recommended for early detection and to prevent existing health conditions from getting worse (e.g., colonoscopies to detect cancer in its early stage). Increasing the number of North Carolinians who receive the recommended clinical preventive services is critical to preventing premature death and disability and improving population health.

In general, people who a have regular source of care are more likely to receive preventive services than those who do not have a regular source of care.[115] Individuals who do not have health insurance coverage are less likely to have a primary care home and not as likely to receive the recommended preventive services (see Table 4). An estimated 1.75 million non-elderly North Carolinians are currently uninsured.[93]

The Task Force felt strongly that every North Carolinian should have access to health insurance coverage. **Thus, the Task Force recommended expanding coverage to those groups at the greatest risk of being uninsured, including children, low-income adults, and employees who work for small businesses.[t] The Task Force also recommended better surveillance of existing insurance policies to determine whether private insurance policies cover all the clinical preventive services recommended by the USPSTF.** In this issue of the *Journal*, Meg Molloy discusses the status of insurance coverage for preventive benefits in North Carolina in her sidebar, and Jack W. Walker, Anne B. Rogers, and Sally Morton discuss the North Carolina State Health Plan's use of prevention strategies to improve member health and lower costs in their commentary.

Data

Access to robust, accurate data is essential to developing effective strategies to improve population health. A strong data infrastructure system is important for public health practitioners, educators, advocacy groups, health associations, and legislators who use related information in implementing prevention efforts or crafting health policy for the state. The Task Force identified gaps in data collected for youth health behaviors, school health, environmental health hazards, and cancer prevalence. The Task Force recommended that North Carolina agencies should enhance specific existing data collection systems to ensure that the state has adequate data for health and risk assessment.

Conclusion

Prevention should be the cornerstone of our efforts to reduce death and disability in North Carolina. Far too many people die prematurely or suffer from disabilities that are avoidable. The Task Force's intensive study of preventable risk factors resulted in a plan that, if implemented, could benefit all North Carolinians. The *Prevention Action Plan* will serve as a roadmap to guide local- and state-level actions to improve population health for many years to come. However, leadership and broad-based participation by all segments of the state are needed to reap the benefits of prevention on a population-wide scale. Individuals, employers, schools, advocates, health care providers, communities, and policymakers all have a role to play. A strong statewide effort can reduce preventable death and disability in North Carolina. Such an effort would translate into fewer missed days of school and work, reductions in hospitalizations and emergency department use, and an increase in productivity—all of which are the result of a healthier population. **NCMJ**

Table 4.
The Uninsured are Generally Less Likely to Receive Preventive Screenings or Have a Regular Source of Care (North Carolina, 2008)[19]

	Insured	Uninsured
Have one or more people who they consider to be their personal doctor or health care provider	85.3%	44.4%
Had a mammogram in the last two years (women 50 and older)	84.5%	57.2%
Had a Pap smear in the past three years (women 18 and older)	88.4%	79.8%
Received the HPV vaccine	14.0%	8.1%
Tested for diabetes	64.8%	41.8%
Tested for HIV	41.9%	44.1%

t. A small business is defined as having 25 or fewer employees.

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u. Dr. Leah Devlin served as a co-chair from the inception of the work until she retired as state health director in February 2009. At that time, Dr. Jeffrey Engel became a co-chair, and Dr. Devlin remained as a member of the Task Force.

v. Because the NC Council of Churches is made up of religious bodies with differing positions on sexuality education and on the use of contraceptives, the Council does not speak to these issues. Therefore the Council's executive director, who was a Task Force member, abstained from voting on Task Force recommendation 5.3 regarding comprehensive sexuality education.

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