



# Prevention for the Health of North Carolina: Prevention Action Plan

October 2009

(Revised July 2010)

**North Carolina  
Institute of Medicine**

In collaboration with the North  
Carolina Division of Public Health

Supported by 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





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**North Carolina Institute of Medicine**  
*shaping policy for a healthier state*

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The North Carolina Institute of Medicine (NCIOM) is a nonpolitical source of analysis and advice on important health issues facing the state. The NCIOM convenes stakeholders and other interested people from across the state to study these complex issues and develop workable solutions to improve health, health care access, and quality of health care in North Carolina.

The full text of this report is available online at  
<http://www.nciom.org>

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# Acknowledgements

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The North Carolina Institute of Medicine's (NCIOM) Task Force on Prevention was convened at the request of 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 in 2008. North Carolina's leading health foundations recognize the value of prevention in improving population health and asked the NCIOM to convene a Task Force to develop a Prevention Action Plan for the state. The work of the Task Force was led by four cochairs, including Leah Devlin, DDS, MPH, former State Health Director;<sup>a</sup> Jeffrey P Engel, MD, State Health Director, North Carolina Department of Health and Human Services (NC DHHS); 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. There were 46 additional Task Force members, including legislators, state and local agency officials, primary care providers and other health care professionals, consumers, and other interested people, who dedicated approximately one day a month between April 2008 and August 2009 to study this important issue. Another 11 people participated in the Task Force's work as Steering Committee members. The Steering Committee members helped shape the meeting agendas, identify speakers, and give important input into the report and recommendations. The accomplishments of this Task Force would have not been possible without the combined effort of the Task Force and Steering Committee members. For a complete list of Task Force members and Steering Committee members, please see pages 9-12 of this report.

The NCIOM Task Force on Prevention heard presentations from state and national experts on prevention programs, evidence-based strategies, and promising interventions. Their presentations helped to inform the work of the Task Force, and we want to thank the following people for sharing their expertise: Alice Ammerman, DrPH, RD, Director, UNC Center for Health Promotion and Disease Prevention, and Professor, Department of Nutrition, UNC Gillings School of Global Public Health; David Bergmire-Sweat, MPH, Foodborne Disease Epidemiologist, Communicable Disease Branch, Epidemiology Section, Division of Public Health, NC DHHS; Philip Bors, MPH, Project Officer, Active Living by Design; Doug Campbell, MD, MPH, Head, Steve Cline, DDS, MPH, Deputy State Health Director, NC DHHS; Occupational and Environmental Epidemiology Branch, Division of Public Health, NC DHHS; Paula Hudson Collins, MHDL, Senior Policy Advisor, Healthy Responsible Students, NC State Board of Education; Megan Davies, MD, Medical Epidemiologist, Communicable Disease Branch, Epidemiology Section, Division of Public Health, NC DHHS; Donald Delozier,

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<sup>a</sup> 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.

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In addition to the above individuals, the staff of the NCIOM contributed to the Task Force's study and the development of this interim report. Pam Silberman, JD, DrPH, President and CEO, and Mark Holmes, PhD, Vice President, guided the work of the Task Force. Jennifer Hastings, MS, MPH, Project Director and Director of Communications, served as project director for the Task Force and greatly contributed to the report. Berkeley Yorkery, MPP, Project Director, contributed to the report and project management. Kimberly M. Alexander-Bratcher, MPH, Project Director, and Jesse Lichstein, MSPH, Project Director, also contributed to the report. Christine Nielsen, MPH, Managing Editor, and Phyllis Blackwell, Assistant Managing Editor, *North Carolina Medical Journal*, contributed to the report and provided editorial assistance. Interns David K. Jones, MSPH; Corey Davis, JD; Lindsey Haynes; Julia Lerche, MSPH; Catherine Liao; and Heidi Carter also contributed to the report. Thalia Fuller, Administrative Assistant, assisted in coordination of Task Force meetings. Adrienne Parker, Director of Administrative Operations, handled the business operations of the Task Force.

***Any opinion, finding, conclusion or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view and policies of the North Carolina Health and Wellness Trust Fund Commission, the Blue Cross and Blue Shield of North Carolina Foundation, The Duke Endowment, or the Kate B. Reynolds Charitable Trust.***

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<sup>b</sup> 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 is a Task Force member, abstained from voting on Task Force recommendation 5.3.

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# Executive Summary

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## Introduction

**T**he burden of chronic disease and other preventable conditions in our state is high and increasing steadily. National rankings show that North Carolina is 36th in terms of overall health and 38th in premature death (with “1” being the state with the best health status).<sup>1</sup> Further, North Carolina ranks poorly on many other health comparisons, including health outcomes, health behaviors, access to health care, and socioeconomic measures. The most practical approach to address such conditions—from both a health and economic perspective—is to prevent them from occurring in the first place. However, health care spending in North Carolina, as elsewhere in the country, is drastically skewed toward paying for therapeutic procedures to manage or treat acute or chronic health problems and *not* toward prevention. Reorienting our health system, as well as our overall society, towards a prevention focus represents a fundamental paradigm shift involving all members of our society. In addition to individual personal responsibility for health, health care providers, insurers, employers, schools, communities, industries, and other institutions play a critical role in ensuring the long-term health of our state by recognizing the importance of taking the proper actions now before the burden of preventable disease and conditions becomes too great.

As a state, North Carolina has not invested heavily in the strategies and interventions that can help keep people healthy and that can help people who are not well be as healthy as possible. North Carolina fares poorly on many health outcomes compared to the rest of the nation. This may be in part due to the level of funding the state invests in public health. Compared to other states, North Carolina spends less on public health, spending an average of \$50 per person, which places us in the bottom 11 states in terms of public health spending. North Carolina spends considerably less than some of our neighboring southern states. Virginia, for example, spends \$111 per person (ranked 9th), and South Carolina spends \$81 per person (ranked 19th).<sup>1</sup> As population health worsens, costs to both individuals and the health care system as a whole will continue to rise.

Relying on prevention as a basic strategy can save lives, reduce disability, improve quality of life, and, in some cases, decrease costs. Research has shown that several modifiable behaviors, such as tobacco use, exercise, nutrition, and substance use can either positively or negatively affect health outcomes. Individuals and families can improve their chances of a living a healthier life by engaging in healthy lifestyle choices.<sup>2</sup> However, in today’s fast-paced world, it is not always easy to make healthy lifestyle choices. Programs and policies affecting multiple aspects of our lives can help foster healthy lifestyle choices and improve the health of the environment in which we live. A person’s decision whether to engage in risky health behaviors is influenced by other factors, including family and friends, workplace policies, and the clinical care they receive. In addition, the community and environment in which a person lives and state and federal laws and policies

**As a state, North Carolina has not invested heavily in the strategies and interventions that can help keep people healthy and that can help people who are not well be as healthy as possible.**

can have a profound impact on population health. Working to address these factors will improve the health and well-being of North Carolinians in both the short- and long-term.<sup>3,4</sup>

### Task Force Charge

The North Carolina Institute of Medicine (NCIOM), in collaboration with the North Carolina Division of Public Health (DPH), convened a Task Force to develop a *Prevention Action Plan* for the state. The NCIOM Task Force on Prevention was convened at the request of North Carolina’s leading health foundations, including 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. The Task Force was chaired by Leah Devlin, DDS, MPH, former State Health Director; Jeffrey Engel, MD, State Health Director, Division of Public Health, North Carolina Department of Health and Human Services; William Roper, MD, MPH, CEO, University of North Carolina (UNC) Health Care System and Dean, UNC School of Medicine; Robert Seligson, MA, MBA, Executive Vice President and CEO, North Carolina Medical Society,<sup>a</sup> and included 46 additional members.

The *Prevention Action Plan for North Carolina* includes evidence-based strategies that, if followed, will improve population health in the state. The Task Force followed four steps in developing this plan. **First, the Task Force identified the diseases and health conditions that have the greatest adverse impact on population health in terms of premature death or disability.** Thus, rather than focusing solely on the leading causes of death, the Task Force examined those health conditions that lead to premature death or disability. The top 10 causes of death and disability include cancer, heart disease, chronic lower respiratory disease, alcohol and drug use, motor vehicle accidents, cerebral vascular disease, infectious diseases (including pneumonia and influenza), diabetes, unipolar depression, and non-motor vehicle unintentional injuries.

**Second, the Task Force identified the underlying preventable risk factors that contribute to these leading causes of death and disability.** As the Institute of Medicine of the National Academies and others have advised, it is necessary to move “upstream” to prevent a health problem from occurring in the first place.<sup>5</sup> Personal behaviors, such as smoking, lack of exercise, poor nutrition, use of alcohol or drugs, and risky sexual behavior contribute to most of the leading causes of death and disability in North Carolina. For example, tobacco use contributes to cancer and heart disease; failure to exercise and improper diet can lead to heart disease and diabetes; and use of alcohol and other drugs contributes to motor vehicle injuries and depression. However, there are other risk factors that also impact on individual health status. Exposure to toxic chemicals and other environmental hazards can lead to asthma and cancer, while exposure to bacteria

<sup>a</sup> 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.

**The Prevention Action Plan for North Carolina includes evidence-based strategies that, if followed, will improve population health in the state.**



and viruses can lead to infectious diseases. Further, the lack of education or living in poverty can contribute—both directly and indirectly—to many of the major health problems facing the state. The Task Force identified 10 preventable risk factors that contribute to the leading causes of death and disability in the state:

1. Tobacco use
2. Diet and physical inactivity, leading to overweight or obesity
3. Risky sexual behaviors
4. Alcohol and drug use or abuse
5. Emotional and psychological factors
6. Intentional and unintentional injuries
7. Bacterial and infectious agents
8. Exposure to chemicals and environmental pollutants
9. Racial and ethnic disparities
10. Socioeconomic factors

**Third, the Task Force examined the literature to identify evidence-based strategies that could prevent or reduce the risk factors.** Too often in the past we have based interventions on what we thought or hoped would work, without any real evidence of efficacy. Given current budget constraints, the Task Force was particularly mindful of the need to use existing dollars more efficiently and effectively and to limit new funding to evidence-based strategies, or when unavailable, best or promising practices. Thus, most of the Task Force’s time was spent on identifying evidence-based, best, or promising practices that can reduce risk behaviors and lead to better health outcomes. Essentially, evidence-based programs or strategies are those that have been subjected to rigorous evaluation and have been shown to produce positive outcomes. Unfortunately, there are not well-researched, evidence-based strategies for all of the risk factors identified by the Task Force. In these instances, the Task Force tried to identify best or promising practices—that is, practices where there is evidence to suggest that an intervention could be effective. In other cases, where there is a clear need for additional research, the Task Force has indicated the need for such investments.

**Finally, the work of the Task Force was guided by a socio-ecological model. That is, Task Force members recognized that people do not make health decisions in a vacuum.**<sup>5</sup> A person’s decision to engage in risky health behaviors is influenced by other factors, including the opinions of family and friends, clinical advice, community and environment, and public policies. Thus, the Task Force attempted to identify multifaceted strategies that would support healthy lives on many different levels of the socio-ecological model including the individual, interpersonal, clinical care, community and environment, and public policy levels.

**The Task Force identified 10 preventable risk factors which contribute to the leading causes of death and disability in the state.**

The following provides a summary of the Task Force on Prevention recommendations. The complete recommendations are listed in each corresponding chapter (with chapter number corresponding with the recommendation number). Priority recommendations are so noted.

## Reduce Tobacco Use

Tobacco use is the leading cause of preventable death in North Carolina. From 2005-2009, an estimated 13,000 North Carolinians ages 35 years and older died each year from smoking-related illness.<sup>b</sup> At least 30% of all cancer deaths and nearly 90% of lung cancer deaths—the leading cause of cancer deaths among men and women—are caused by smoking.<sup>6</sup> Other tobacco products such as smokeless tobacco impose great risks to health as well. Aside from the direct impact on individual smokers, nonsmokers are harmed by exposure to the toxins in secondhand smoke.

Given the proven negative impact of tobacco use on health and life and on North Carolina, the Task Force recommended funding to support a comprehensive tobacco control program. The Centers for Disease Control and Prevention (CDC) recommends an annual state appropriation for North Carolina of \$106.8 million for comprehensive tobacco control programs. To meet the CDC best practices requirements for comprehensive tobacco control programs, a state needs funding and activity in five areas: 1) state and community interventions, 2) health communication interventions, 3) cessation interventions, 4) surveillance and evaluation, and 5) administration and management.<sup>7</sup> A practical approach would be to incrementally work toward the full amount, which would allow the state time to build the capacity and infrastructure needed to successfully support and sustain initiatives and efforts within the five best practice areas.

In addition, the Task Force recommended that the state raise the tax on all tobacco products. Increasing tobacco taxes will deter initiation of tobacco use by young people, encourage tobacco users of all ages to quit, and save lives.<sup>8,9</sup> Research shows that a 10% price increase in a pack of cigarettes results in a 4.1% decrease in tobacco use within the general population, and a 4%-7% decrease among youth who smoke.<sup>8</sup> North Carolina has the seventh lowest cigarette tax in the country (45 cents). Increasing the cigarette tax to the national average (\$1.32 as of August 12, 2009) would provide tremendous gain for the state in terms of reducing death and disability due to tobacco use. In addition, raising the tax on other tobacco products (OTP) will discourage the use of these products.

The Task Force also supported implementation of comprehensive smoke-free laws. Secondhand smoke causes the death of approximately 38,000 nonsmokers in the United States every year, which translates into approximately 1,700 North Carolinians.<sup>10,11</sup> The CDC recommends smoking bans and restrictions to decrease exposure to secondhand smoke. In May 2009, North Carolina passed Session Law

**At least 30% of all cancer deaths and nearly 90% of lung cancer deaths—the leading cause of cancer deaths among men and women—are caused by smoking. Other tobacco products such as smokeless tobacco impose great risks to health as well.**

<sup>b</sup> North Carolina Institute of Medicine. Analysis of the State Tobacco Activities Tracking and Evaluation (STATE) System and state population estimates.

2009-27 banning smoking in restaurants and most bars; this law will go into effect January 2, 2010.<sup>c</sup> This bill also provides local governments the ability to restrict smoking in public places, such as movie theaters and shopping malls, with the approval of their Board of County Commissioners. While the new law offers significant protections to people who enter restaurants and bars, it does not provide protection from secondhand smoke exposure in other workplaces and public places. The Task Force supports further expansion of existing laws to mandate that all worksites are smoke free.

Finally, the Task Force recognizes the importance of providing assistance to youth and adults who want to quit smoking. Nationwide, more than 70% of individuals who smoke want to quit, and each year more than 40% try to quit.<sup>7,12</sup> In 2007, 56.8% of smokers in North Carolina stopped smoking for at least one day because they were trying to quit smoking.<sup>13</sup> Unfortunately, individual tobacco cessation rates are low—only about 4%-7% of the 19 million individuals who tried to quit in 2005 were successful. However, success is more likely when individuals receive assistance. Success rates of 10%-30% can occur when individual efforts are combined with other resources and interventions such as a physician's advice to quit, counseling, and appropriate medications.<sup>12</sup>

### **Recommendation 3.1: Fund and Implement a Comprehensive Tobacco Control Program**

The North Carolina General Assembly should provide additional funding to the North Carolina Division of Public Health (DPH) to prevent and reduce tobacco use in North Carolina. DPH should work collaboratively with the North Carolina Health and Wellness Trust Fund and other stakeholders to ensure funds are used in accordance with best practices as recommended by the Centers for Disease Control and Prevention.

### **Recommendation 3.2: Increase North Carolina Tobacco Taxes (PRIORITY RECOMMENDATION)**

The North Carolina General Assembly should increase the tax on cigarettes and other tobacco products to match the national average, and use funds from the revenues to support prevention efforts.

### **Recommendation 3.3: Expand Smoke-free Policies in North Carolina**

The North Carolina General Assembly should amend existing laws to require all worksites to be smoke-free. In the absence of a comprehensive smoke-free law, local Boards of County Commissioners should adopt and enforce laws to restrict or prohibit smoking in other public places.

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c Session Law 2009-27 exempts cigar bars and private clubs.

### Recommendation 3.4: Expand Access to Cessation Services, Counseling, and Medications for Smokers Who Want to Quit

Insurers, payers, and employers should cover evidence-based tobacco cessation services, including counseling and appropriate medications. Providers should provide comprehensive evidence-based tobacco cessation counseling services and appropriate medications.

**Good nutrition and regular physical activity are critical cornerstones for optimal health and are important ways to prevent obesity.**

#### **Promote Healthy Eating and Physical Activity in Order to Reduce Overweight and Obesity**

Overweight and obesity pose significant health concerns for both children and adults. Excess weight is not only a risk factor for several serious health conditions; it also exacerbates a multitude of health conditions.<sup>14</sup> Excess weight increases an individual's likelihood of developing type 2 diabetes and high blood pressure as well as other life-threatening health problems, including heart disease and stroke.<sup>14-17</sup> North Carolina is the 10th most overweight/obese state in the nation.

Good nutrition and regular physical activity are critical cornerstones for optimal health and are important ways to prevent obesity. An optimal diet includes the regular consumption of fruits and vegetables, foods high in fiber (e.g. whole grains) and low in saturated fat, and adequate sources of calcium and important nutrients. A healthy diet can protect against osteoporosis, heart disease, hypertension, type 2 diabetes, and certain cancers. Regular physical activity reduces the risk of premature death by reducing the risk of coronary heart disease, stroke, high blood pressure, type 2 diabetes, and colon cancer. In addition, it protects against depression and helps build healthy bones, muscles, and joints.<sup>18</sup> Adults should have at least 30 minutes of moderate-intensity physical activity, such as walking, five days per week, or at least 20 minutes of vigorous-intensity physical activity, such as jogging, three days per week.<sup>19</sup> Less than half (42.1%) of adults in North Carolina meet this recommended level of activity. The CDC recommends that children get at least 60 minutes of moderate to vigorous physical activity every day of the week.<sup>19</sup> However, only about half (55%) of middle school students and less than half (44.3%) of high school students in North Carolina report being physically active for at least 60 minutes per day five or more days a week.

**Nutrition and Physical Activity in Schools:** Promoting healthy eating patterns among children is particularly important since unhealthy eating habits established in youth tend to be carried into adulthood.<sup>20</sup> Schools can play an important role in helping youth develop lifelong healthy eating habits since youth spend a significant amount of time in the school environment. In 2005 the North Carolina General Assembly directed the State Board of Education to adopt nutrition standards for schools, beginning with elementary schools. The state law does not require elementary schools to implement the new nutrition standards until the end of the 2010 school year, although most schools have already done

so. However, many of the schools that implemented the better nutrition standards—including increased fruit, vegetables, and whole grain products—lost money. Some school systems are making up the lost revenues by offering unhealthy food choices in the a la carte food sales in middle and high school. The North Carolina General Assembly, State Board of Education, and Local Education Agencies should do more to implement the new nutrition standards throughout elementary, middle, and high schools. In addition, schools should offer healthy foods as part of the meals served through the National School Lunch and Breakfast Programs, through a la carte food and beverages sold in the school cafeterias, and through vending machines. Schools should also remove any advertising or marketing of unhealthy foods or beverages in schools.

Physical activity and physical education are also critical to the healthy development of children. Currently, the State Board of Education policy HSP-S-000—known as the Healthy Active Children Policy—requires that children in grades K-8 are provided at least 30 minutes of physical activity daily. The Healthy Active Children Policy does not require physical activity to be conducted in traditional physical activity facilities such as gyms. Instead, physical activity can be accumulated in periods of 10-15 minutes through classroom-based movement, recess, walking or biking to school, activity during physical education courses, and sports that occur during, before, and after school.<sup>21</sup> National recommendations suggest that elementary students receive 150 minutes per week and middle and high school students receive 225 minutes per week of formal instruction in physical education.<sup>22</sup>

In addition, children in child care centers and after-school programs should also be targeted for specific interventions. As with adults, the rate of overweight and obesity is increasing, even in very young children. North Carolina data indicate that approximately 30% of children ages 2 to 4 with family incomes equal to or less than 185% of the federal poverty guidelines are overweight or obese.<sup>23</sup> As many children spend a considerable amount of time in child care, this setting lends itself as an environment to reach young children with obesity prevention interventions. Similarly, after-school programs can offer opportunities for evidence-based interventions to promote physical activity and healthy nutrition.

### **Recommendation 4.1: Implement Child Nutrition Standards in All Elementary Schools and Test Strategies to Deliver Healthy Meals in Middle and High Schools**

The North Carolina General Assembly should appropriate \$20 million in recurring funds to the North Carolina Department of Public Instruction to fully implement the nutrition standards in elementary schools. Additionally, North Carolina funders should provide funding to test innovative strategies to deliver healthy meals in middle and high schools while protecting revenues for the child nutrition program.

**The North Carolina General Assembly, State Board of Education, and Local Education Agencies should do more to implement the new nutrition standards throughout elementary, middle, and high schools.**

## **Recommendation 4.2: Ensure All Foods and Beverages Available in Schools are Healthy**

The North Carolina General Assembly should direct the State Board of Education to establish statewide nutrition standards for foods and beverages available in school operated vending machines, school stores, and other school operations, and should enact a law prohibiting the advertising or marketing of unhealthy foods or beverages in North Carolina schools.

## **Recommendation 4.3: Implement Quality Physical Education and Healthful Living in Schools (PRIORITY RECOMMENDATION)**

The North Carolina General Assembly should require the State Board of Education to implement a five-year phase-in of increased physical education including 150 minutes per week of physical education in elementary schools, 225 minutes of Healthful Living curriculum (including both physical education and health education) in middle schools, and 2 units of Healthful Living curricula in high schools.

## **Recommendation 4.4: Expand Physical Activity and Nutrition in Child Care Centers and After-school Programs**

The North Carolina Division of Public Health and the North Carolina Partnership for Children, Inc. (NCPC) should expand dissemination of evidenced-based approaches for improved physical activity and nutrition standards in preschools. Further, the North Carolina Child Care Commission should assess the process needed to include healthy eating and physical activity in the quality indicators in North Carolina's Star Rated License system. After-school programs should incorporate recommended standards for after-school physical activity into their programming.

*Nutrition and Physical Activity in Communities:* Many North Carolina communities are trying to address the growing number of people who are overweight or obese by implementing initiatives to improve nutrition and increase physical activity. However, communities need help to implement comprehensive evidence-based strategies. Ultimately, long-term, sustainable community-level efforts are needed statewide in order to reach all North Carolinians. Creating local capacity is integral to this approach. Community-level efforts should be augmented by a broad-based social marketing campaign aimed at promoting the importance of nutrition and physical activity.

We also need to do more to promote healthy eating among adults. Less than one in four adults in North Carolina consumes five or more fruits and vegetables a day. Individuals with higher incomes tend to eat a higher quality diet than individuals with lower incomes, as low-income neighborhoods may not have grocery stores offering as wide a choice of fruits and vegetables. Locating farmers markets at

worksites and in faith meeting places could improve access to healthy fruits and vegetables for many low-income people.

In addition, less than half (46.5%) of North Carolinians say that they eat a home-prepared meal at least one time a day every day of the week.<sup>24</sup> Meals eaten away from home are typically higher in calories and fat than meals prepared at home.<sup>25</sup> Most consumers underestimate the calorie and fat content in foods eaten away from home.<sup>26</sup> Having access to nutrition information enables individuals to make informed decisions about the foods they select. Although some restaurants provide nutrition information, most do not provide consumers with easy access to nutrition information about the foods they serve. Menu labeling has been shown to help consumers make informed choices, and may have a long-term impact on reducing or preventing obesity.

An important factor influencing levels of physical activity for people of all ages is the built environment, which includes neighborhood design, land use patterns, and transportation systems.<sup>27</sup> Studies show that enhanced access to places for physical activity increases frequency of activity and weight loss. Specifically, people with access to sidewalks and trails are more likely to be active, and people with easy access to neighborhood parks are nearly twice as likely to be physically active.<sup>28</sup> Focusing new resources on low-income and minority communities is also important, as these communities generally have less access to places for physical activity than do other communities.<sup>29-31</sup>

There are recreational facilities on school property within many communities; however, these facilities are often not available for use by the general public or by school children past school hours. Creating additional recreational facilities requires funding and land—one or both of which are limited in many communities in North Carolina. Joint-usage agreements, under which communities establish partnerships with schools to provide community access to school facilities during after-school hours and on weekends and to allow schools access to parks and recreation facilities when needed, are a potential solution to this predicament.

### **Recommendation 4.5: Implement the *Eat Smart, Move More North Carolina Obesity Plan* and Raise Public Awareness (PRIORITY RECOMMENDATION)**

The North Carolina General Assembly should appropriate \$6.5 million in recurring funds to the North Carolina Division of Public Health to implement evidence-based strategies or best and promising practices in local communities to improve nutrition and increase physical activity. Additionally, the North Carolina General Assembly should appropriate \$3.5 million annually for six years to support more comprehensive demonstration projects aimed at promoting multifaceted interventions in preschools, local communities, faith communities, and health care settings, as well as \$500,000 annually for six years to fund pilot programs to reduce overweight and obesity among adolescents. The North Carolina General Assembly should appropriate additional funds to support a social marketing campaign.

**We need to do more to promote healthy eating among adults.**

### **Recommendation 4.6: Expand Availability of Farmers Markets and Farm Stands at Worksites and Faith-based Organizations**

Employers and faith-based organizations should help facilitate farmers markets/farm stands at the workplace and in the faith community with a focus on serving low-income individuals and neighborhoods.

### **Recommendation 4.7: Promote Menu Labeling to Make Nutrition Information Available to Consumers**

The North Carolina Division of Public Health (DPH) and North Carolina Prevention Partners should work with the North Carolina Restaurant and Lodging Association to promote menu labeling. If voluntary menu labeling is not implemented by a substantial proportion of the restaurants within three years, the North Carolina General Assembly should mandate labeling laws.

### **Recommendation 4.8: Build Active Living Communities**

The North Carolina General Assembly should authorize counties and municipalities to have the local option to raise revenues for community transportation, parks, and sidewalks and should appropriate \$1.5 million in recurring funds to the North Carolina Division of Parks and Recreation to expand trail and greenway planning, construction and maintenance projects.

### **Recommendation 4.9: Establish Joint-use Agreements to Establish use of School and Community Recreational Facilities**

Local governmental agencies, including schools, parks and recreation, health departments, county commissioners and municipalities, and other relevant organizations should work together to develop joint-use agreements that would expand the use of school facilities for after-hours community physical activity and make community facilities available to schools.

### **Recommendation 4.10: Expand Community Grants Program to Promote Physical Activity**

The North Carolina General Assembly should appropriate \$3.3 million annually for five years to the North Carolina Division of Public Health to expand the community grants program to support community efforts to expand the availability of sidewalks, bicycle lanes, parks, and other opportunities for physical activity and recreation.



**Nutrition and Physical Activity in Clinical Care:** Clinicians can also play a role in addressing the growing prevalence of obesity among adults by providing high-intensity counseling on nutrition education, diet, and/or exercise, combined with behavioral interventions to support skill development, strategies to change diet and physical activity, and motivation.

Community Care of North Carolina (CCNC), North Carolina's Medicaid program that helps link low-income Medicaid recipients to primary care providers, is in the midst of a two-year pilot project to develop systems of care for the prevention of obesity in Medicaid enrolled children. The project, known as the Childhood Obesity Prevention Initiative, is being piloted with 187 primary care practices in four of the 14 CCNC networks reaching 102,000 children ages 2-18. The project's objectives are "to promote practice-based standardized screening with prevention messages for all children, to increase provider self-efficacy in treating childhood obesity, and to develop effective linkages between the child's primary care provider and existing community recourses."<sup>32</sup> The intervention pilot will end in December 2009, and, if successful, should be implemented throughout the state.

### **Recommendation 4.11: Increase the Availability of Obesity Screenings and Counseling**

Primary care providers should screen adult patients for obesity using Body Mass Index (BMI) and provide high intensity counseling either directly, or through referrals, on nutrition, physical activity, and other strategies to achieve and maintain a healthy weight. Insurers, payers, and employers should cover screenings and counseling on nutrition and/or physical activity for adults who are identified as obese.

### **Recommendation 4.12: Expand the CCNC Childhood Obesity Prevention Initiative**

If the Community Care of North Carolina Childhood Obesity Prevention Initiative pilots are shown to be successful, the initiative should be expanded throughout the state. The North Carolina General Assembly should appropriate \$174,000 in non-recurring funds to the North Carolina Office of Rural Health and Community Care to support this effort.

### **Reduce Risky Sexual Behaviors**

Risky sexual behaviors can lead to sexually transmitted diseases (STDs), human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), and unintended pregnancy. These potentially preventable conditions can lead to reduced quality of life, result in millions of dollars in preventable health expenditures annually, and result in premature death and disability in North Carolina. In 2007, nearly 54,000 cases of STDs (non-HIV) were reported in North Carolina.<sup>33</sup> In addition, 1,943 new cases of HIV disease were diagnosed, and 953 new AIDS cases were reported.<sup>33</sup> Forty-five percent of all live births in 2006 resulted from unintended pregnancies.<sup>34</sup>

**In 2007, nearly 54,000 cases of STDs (non-HIV) were reported in North Carolina. In addition, 1,943 new cases of HIV disease were diagnosed.**

**Almost half of all pregnancies in North Carolina are unintended.**

**Sexually Transmitted Diseases (STDs):** Chlamydia, gonorrhea, and syphilis are the three most common STDs in North Carolina. Data show that North Carolinians contract these three STDs as well as HIV at rates above national averages.<sup>33</sup> Chlamydia and gonorrhea infection can cause damage to the female reproductive tract. Untreated late stage syphilis can lead to organ damage, paralysis, or blindness. Untreated syphilis in pregnant women can cause premature birth or infant death.

**HIV/AIDS:** HIV is a virus that weakens the immune system and can lead to AIDS.<sup>35</sup> The primary ways HIV is transmitted are through sexual contact or sharing needles with an infected person.<sup>36</sup> According to the DPH, HIV/STD Prevention and Care Branch, there were 21,600 people known to be living with HIV/AIDS in the state in 2007. HIV/AIDS was the 10th leading cause of death among 13-24 year olds, the 7th leading cause of death among 25-44 year olds, and the 9th leading cause of death among blacks in all age groups.<sup>33</sup>

Certain population groups are at higher risk for contracting STDs and HIV and have an increased likelihood of transmitting these diseases. Encouraging high-risk North Carolinians to get tested can increase the proportion of individuals with STDs or HIV who know their status and receive proper treatment and can thereby lead to lower rates of transmission. Social marketing campaigns and outreach efforts can help increase the screening rates, particularly among high-risk populations. Providing rapid-testing for HIV or testing for other STDs in nontraditional settings can also increase the number of people who are screened. In addition, some individuals need case management services to help them access treatment services or medications.

Rates of infectious disease in general—and STDs in particular—in prisons and jails generally far exceed those in the general population.<sup>37</sup> North Carolina ranked 7th highest in the number of HIV-infected inmates in 2006.<sup>38</sup> Thus, prisons are important settings in which to provide HIV prevention, testing, and treatment.<sup>39</sup> Testing prisoners before release can help ensure that HIV-positive inmates are referred into treatment before they are released back into the community. In addition, expansion of HIV screening programs into county jails, youth development centers, and youth detention centers would likely detect a large number of HIV cases and contribute to decreases in transmission, as many individuals in these institutions also are at high risk for HIV transmission.<sup>40</sup>

**Unintended pregnancy:** Almost half of all pregnancies in North Carolina are unintended (i.e. pregnancies that were mistimed or unwanted at the time of conception). Unintended pregnancy can result in serious health, social, and economic consequences for women, families, and communities. Although the majority of unintended pregnancies occur in adults, most teen pregnancies are unintended.<sup>41</sup> North Carolina's 2006 teen birth rate among girls ages 15-19 years was higher than the national rate (49.7 per 1,000 versus 41.9 per 1,000).<sup>42</sup> About one-third of high school students age 15 or younger reported ever having sexual intercourse, as had two-thirds (69%) of high school students age 18 or older. Many of the sexually active youth do not report using contraception to prevent pregnancy or transmission of STDs or HIV.

Until recently, North Carolina had a law requiring public schools to teach abstinence until marriage. 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.<sup>43</sup> In contrast, 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.<sup>43</sup> The North Carolina General Assembly recently enacted a law requiring local schools to offer comprehensive reproductive health and safety education beginning in seventh grade. However, 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 student's participation in any of this education. An opt-out consent process would ensure that more young people in North Carolina receive evidence-based, scientifically accurate sexuality education.

Additionally, women need access to low-cost family planning services in order to help prevent unintended pregnancies. North Carolina operates a Medicaid family planning waiver, *Be Smart*, which offers family planning services to men and women with incomes at or below 185% of the federal poverty guidelines. Unfortunately, the current Medicaid family planning waiver has enrolled less than 15% of women who could be eligible for these services. North Carolina could do more to enroll eligible individuals by using some of the best practices from other states, including more targeted outreach and streamlined enrollment processes. Further, additional resources are needed to purchase long-acting contraceptives for women who are not eligible for the Medicaid family planning waiver.

**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.**

### **Recommendation 5.1: Increase Awareness, Screening, and Treatment of Sexually Transmitted Diseases and Reduce Unintended Pregnancies**

The North Carolina General Assembly should appropriate \$6.2 million in recurring funds to the North Carolina Division of Public Health (DPH) to support social marketing campaigns around sexually transmitted diseases (STDs) and HIV prevention and to reduce unintended pregnancies. Funds should also be used to offer nontraditional testing sites to increase screening for HIV and STDs among high-risk populations and should be used to support teen pregnancy prevention programs. DPH should also work with health care professionals and other nontraditional providers to increase screenings and treatment.

### **Recommendation 5.2: Increase HIV Testing in Prisons, Jails, and Juvenile Centers**

The North Carolina Department of Correction, North Carolina Department of Juvenile Justice and Delinquency Prevention, and North Carolina county jails should include opt-out HIV testing of prisoners and other detainees prior to release back to the public.

These agencies should collaborate with the North Carolina Division of Public Health to coordinate outpatient care for individuals who are identified as HIV-positive. The North Carolina General Assembly should appropriate \$1 million in recurring funds for this effort.

### **Recommendation 5.3: Ensure Students Receive Comprehensive Sexuality Education in North Carolina Public Schools (PRIORITY RECOMMENDATION)**

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.

### **Recommendation 5.4: Expand the Availability of Family Planning for Low-Income Families**

The North Carolina Division of Medical Assistance and Division of Public Health (DPH) should enhance access to family planning services for low-income families, including implementation of best practices for the Medicaid family planning waiver. The North Carolina General Assembly should appropriate \$931,000 in recurring funds to DPH to purchase long-acting contraceptives for low-income women who do not qualify for the Medicaid family planning waiver.

**People with substance abuse problems or dependence are at risk for premature death, co-morbid health conditions, and disability.**

#### **Prevent Substance Abuse and Improve Mental Health**

Substance use and abuse is both a health problem in itself, as well as a health risk contributing to other health problems. People with substance abuse problems or dependence are at risk for premature death, co-morbid health conditions, and disability. In addition, the use of alcohol and other drugs can also lead to other health problems, including injuries, unintended pregnancies, and sexually transmitted diseases.

Substance abuse carries additional adverse consequences for an individual, his or her family, and society at large. People with addiction disorders are more likely than people with other chronic illnesses to end up in poverty, lose their jobs, or experience homelessness. Addiction to drugs or alcohol contributes to the state's crime rate, family upheaval, and motor vehicle fatalities. Approximately 90% of the criminal offenders who enter the prison system have substance abuse problems.<sup>44</sup> More than two out of five youth in the state's juvenile justice system are in need of further assessment or treatment services for substance abuse.<sup>45</sup> Substance abuse is also one of the primary causes for motor vehicle fatalities, contributing to more than one-quarter (26.8%) of crash-related deaths.<sup>46</sup> Alcohol or drug use is also a major contributor to family disintegration.

Approximately 8% of North Carolinians ages 12 or older reported alcohol or illicit drug dependence or abuse.<sup>47</sup> Youth are particularly susceptible to the influence of

drugs or alcohol, as these substances affect the developing brain. Almost 40% of North Carolina high school students reported having at least one drink in the last 30 days, more than 20% reported binge drinking, and almost as many reported using marijuana or taking prescription drugs without a prescription.<sup>48</sup>

Evidence-based prevention strategies have been shown to be effective in delaying initiation and reducing use of alcohol and other drugs. Many of these programs have also demonstrated other positive effects, such as an improved sense of well-being, reduced depression, reduced delinquency or violence among school aged children, reduced teen pregnancy or risky sexual behavior, and improved academic performance. The most effective prevention strategies are those that involve multifaceted interventions that include the individual, family, schools, and community and are reinforced by supportive public policies, including tax increases on alcohol. Communities can save four to five dollars for every one dollar spent on substance abuse prevention.<sup>49</sup>

Prevention should be the cornerstone of North Carolina's efforts to reduce inappropriate use, misuse, and dependence on alcohol and other drugs, and to prevent the incidence and severity of stress, depression, or other anxiety disorders. Evidence-based prevention programs have been shown to help reduce use and misuse of substances as well as reduce symptoms of depression. However, no prevention intervention will totally eliminate all harmful use of alcohol or other drugs, or feelings of isolation, depression, or stress. Thus, it is important to combine prevention with early intervention activities. Primary care practices are an optimal setting in which to provide early intervention services, including screening, motivational counseling, and referral into treatment for those who need more intensive treatment services for substance use or abuse or mental health problems. Additionally, the faith community may be an appropriate and ideal place for early intervention, especially for people who are uncomfortable seeking help, unaware of needing help, or unsure of how to begin the help process.

### **Recommendation 6.1: Develop and Implement a Comprehensive Substance Abuse Prevention Plan (PRIORITY RECOMMENDATION)**

The North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMHDDSAS) should develop a comprehensive substance abuse prevention plan for use at the state and local levels. The plan should increase capacity at the state level and within local communities to implement a comprehensive substance abuse prevention system, prioritizing efforts to reach children, adolescents, young adults, and their parents. The plan should be pilot tested in six counties or multi-county areas, and if effective, should be implemented statewide. The North Carolina General Assembly should appropriate \$1.95 million in recurring funds and \$3.7 million in recurring funds to DMHDDSAS to support this initiative. In addition, the North Carolina General Assembly should raise the alcohol tax on beer and wine and should use some of these funds for prevention, early intervention, and treatment to support recovery among adolescents and adults.

**Evidence-based prevention strategies have been shown to be effective in delaying initiation and reducing use of alcohol and other drugs...and have demonstrated other positive effects, such as an improved sense of well-being, reduced depression...and improved academic performance.**

## **Recommendation 6.2: Expand the Availability of Screening, Brief Intervention, and Treatment for People with Behavioral Health Problems in the Primary Care Setting**

The North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMHDDSAS) should work with the other appropriate organizations to educate and encourage health care professionals to use evidence-based screening tools and offer counseling, brief intervention, and referral to treatment (SBIRT) to help patients prevent, reduce, or eliminate the use of or dependency on alcohol, tobacco, and other drugs. The North Carolina General Assembly should appropriate \$1.5 million in recurring funds to DMHDDSAS to support this effort and should mandate that insurers offer the same coverage for the treatment of addiction disorders as for the treatment of other physical illnesses. The North Carolina Division of Medical Assistance should work with the Office of Rural Health and Community Care to develop an enhanced payment to support co-location of primary care, mental health, developmental disabilities, and substance abuse services.

## **Recommendation 6.3: Expand Early Intervention Services in the Faith Community**

The North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services should partner with faith-based organizations to develop and offer training specifically designed to help leaders of all faiths recognize signs of stress, depression, and substance abuse in those they counsel and to develop linkages with outside referrals when appropriate.

### **Decrease Environmental Risks**

The environment in which we live affects our health. During the 20th century, most of the advances in population health were the result of public health interventions focused on improving the physical environment.<sup>50</sup> Despite these advances, air and water pollution persist and produce negative effects on the health of the population. Air pollution may cause or worsen respiratory conditions (e.g. asthma and emphysema) and cardiovascular conditions (e.g. heart attack and stroke).<sup>51</sup> Water pollution has been linked to both acute poisonings and chronic effects. In addition, certain air and water pollutants have been linked to cancer.<sup>51-54</sup> Although the term *environment* often refers to outdoor air and water quality, the Task Force took a broader view and incorporated other features of the built environment within which we live, work, learn, and play.

Reducing environmental risks is an important component to preventing death and disability. North Carolina needs to address the major pollutants and causes of pollution in the state, as well as the built environment, to build healthy, active communities. This is particularly important for children and older adults, who are more susceptible to the negative health effects of an unhealthy environment

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and to low-income and minority communities, which are disproportionately exposed to some environmental risks.<sup>55</sup> Many different agencies at the state and local level have responsibilities to monitor or enforce environmental standards and promote healthy communities. Thus, interagency leadership is needed to develop a collaborative plan to link these efforts together to more effectively reduce environmental risks and promote healthy communities.

However, North Carolina specific data are needed to identify the environmental hazards that are causing adverse health outcomes. The Department of Environmental Sciences and Engineering in the UNC Gillings School of Global Public Health is currently the lead institution working to produce an environmental health strategy for the United Arab Emirates, including a systematic assessment of environmental risks in the country and the impacts on health.<sup>56</sup> This project provides a science-based model that North Carolina can use to develop an environmental health strategic plan.

Environmental hazards in homes and schools can be particularly hazardous, especially to children, who spend most of their time in these environments. Damp houses with poor ventilation and/or water or plumbing leaks provide a fertile environment for mold growth as well as for insect or rodent infestations. Both mold and pest infestations have been shown to contribute to asthma and other chronic respiratory problems.<sup>57-59</sup> Exposure to lead, through both lead-based paint and lead in water pipes, is another health risk present in housing, especially in older homes. Exposure to lead can result in behavioral, cognitive, and developmental problems. It can also lead to seizures and, in some instances, death.<sup>60,61</sup> Exposure to airborne toxic substances in the home is also a well-established risk factor for health problems.<sup>62</sup> The CDC, the US Department of Housing and Urban Development, and the Environmental Protection Agency are working together to improve housing conditions and create healthier homes.<sup>63</sup> The goal of the Healthy Homes Initiative is to “identify health, safety, and quality-of-life issues in the home environment and to act systematically to eliminate or mitigate problems.”<sup>d</sup> As part of this initiative, the CDC and its partner agencies are working to broaden the capacity of the different professionals who inspect homes to address multiple housing problems that can affect health or safety, including mold, lead, allergens, asthma, carbon monoxide, home safety, pesticides, and radon. There are many different types of health, environmental, or housing inspectors who work in North Carolina homes and who could be cross-trained to identify and help mitigate multiple health, environmental, and safety risks while in a home.

Many schools also have environmental hazards. Nationally, about one-third of schools in the United States are believed to have significant environmental risk issues and are in need of extensive repair or renovation.<sup>64,65</sup> Schools can have

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d Centers for Disease Control and Prevention. Healthy Homes Initiative. <http://www.cdc.gov/healthyplaces/healthyhomes.htm>. The Healthy Housing Reference Manual is available at: <http://www.cdc.gov/nceh/publications/books/housing/housing.htm>

indoor air quality problems similar to those in homes. Studies have shown that these school-based environmental risks are linked to decreased performance; students attending schools in poor condition (i.e. with environmental hazards) score approximately 11% lower on standardized tests than students who attend schools in good condition.<sup>65,66</sup> In 2006, the North Carolina General Assembly passed the School Children’s Health Act to reduce student and staff exposures to several pollutants in schools: pesticides, mercury, arsenic, diesel fumes, and mold/mildew.<sup>e</sup> The bill requires schools to use integrated pest management to reduce the use of pesticides in schools; seal arsenic treated wood; reduce exposure to idling school bus diesel emissions; prevent mold and mildew; and prohibits the use of bulk elemental mercury in science classrooms. However, more can be done to improve indoor air quality in schools. The EPA has created the Indoor Air Quality Tools for Schools (TfS) Program as a means of reducing exposure to indoor environmental contaminants in schools by identifying, correcting, and preventing indoor air quality problems. Schools that have implemented the TfS Action Kit have seen increases in comfort levels and reductions in absenteeism, headaches, stomach aches, bronchitis, asthma inhaler use, visits to the school nurse for asthma symptoms, and symptoms of other respiratory illnesses.<sup>67</sup> In addition, the costs to implement the program have been minimal.

### **Recommendation 7.1: Create an Interagency Leadership Commission to Promote Healthy Communities, Minimize Environmental Risks, and Promote Green Initiatives**

The Governor or the North Carolina General Assembly should create an Interagency Leadership Commission, including senior level agency staff from different state and local agencies, to develop a statewide plan to promote healthy communities, minimize environmental risks, and promote sustainability and “green” initiatives that will support and improve the public’s health and safety. The plan should include statewide efforts to: promote active, walkable, livable communities; reduce environmental exposures and risks that negatively impact population health; promote clean, renewable energy, green technology, and local production of food, energy, goods, and services; and increase opportunities for mass transportation.

### **Recommendation 7.2: Develop an Environmental Assessment for North Carolina that Links Environmental Exposures to Health Outcomes**

The Department of Environmental Sciences and Engineering in the University of North Carolina (UNC) Gillings School of Global Public Health should work with appropriate state agencies and other university partners to develop an environmental assessment for the state that links environmental exposures/risks and health outcomes and includes

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<sup>e</sup> S.L. 2006-143



strategies to address the exposures/risks. The North Carolina General Assembly should appropriate \$3 million in non-recurring funds to the UNC Gillings School of Global Public Health to support this effort.

### **Recommendation 7.3: Ensure Healthy Homes**

The North Carolina Division of Public Health, North Carolina Division of Water Quality, North Carolina Department of Environment and Natural Resources, Office of the State Fire Marshal, and North Carolina Department of Insurance should expand and enhance efforts to create healthy homes. These efforts should address, but not be limited to, the following: indoor air quality, mold and moisture, carbon monoxide, lead-based paint, radon, asbestos, drinking water, hazardous household products, pesticide exposure, pest management, and home safety (e.g. injury prevention of falls).

### **Recommendation 7.4: Reduce Environmental Risks in Schools and Child Care Settings**

The North Carolina Department of Public Instruction and the North Carolina Division of Child Development, in collaboration with other appropriate state agencies, should develop an implementation plan to phase in the Tools for Schools assessments in all schools and licensed child care centers over a four-year period. In addition, the North Carolina Division of Public Health (DPH) should work with other state agencies to train child care, elementary, and secondary school staff to identify potential environmental hazards. The North Carolina General Assembly should appropriate \$428,000 DPH to support training activities.

### **Reduce Unintentional and Intentional Injuries**

Injury and violence are significant problems in North Carolina leading to death and disability for thousands of people each year. Unintentional injuries, which account for more than two-thirds of all injury deaths nationwide, are defined as injuries in which a harmful outcome was not sought.<sup>68</sup> These include injuries from motor vehicle collisions, falls, and unintentional poisonings. Violence, on the other hand, is defined as intentional injury resulting from the active, deliberate use of force against another person or oneself. This includes family violence, homicide, suicide, partner violence, and child maltreatment. Many injuries are preventable.

Injury is a serious cause of disability, resulting in more than 148,000 hospitalizations, 819,000 emergency department (ED) visits, and an unknown number of outpatient visits and medically unattended injuries in North Carolina each year.<sup>69</sup> Motor vehicle-related accidents and other unintentional injuries, including unintentional poisonings and falls, are the fourth leading cause of death in North Carolina, resulting in more than 4,300 fatalities in 2007. Because such injuries tend to occur among younger populations, they result in more years of life lost than any other leading cause of death.

**Injury is a serious cause of disability, resulting in more than 148,000 hospitalizations, 819,000 emergency department visits, and an unknown number of outpatient visits and medically unattended injuries in North Carolina each year.**

A number of strategies, such as those related to increasing seat belt use, reducing speeding, reducing driving while impaired (DWI), and encouraging motorcycle safety, can be used to prevent motor vehicle-related injuries. It is estimated that in North Carolina in 2007, 37% of traffic fatalities involved someone who was speeding, 32% involved someone who was not wearing a seatbelt, 29% involved a driver with a blood alcohol level of at least 0.08, and 12% involved motorcyclists.<sup>71</sup> To be effective at reducing motor vehicle crashes, injuries, and deaths some of our laws need updating, and others need more enforcement.

The Task Force did not examine every type of intentional injury, but chose to focus on family violence. Family violence includes both child maltreatment and domestic violence. Child maltreatment can take a number of forms, including neglect, physical violence, psychological violence, sexual assault, and witnessing partner violence, and typically occurs with other forms of family violence like domestic violence.<sup>70</sup> Similarly, domestic violence includes physical violence, psychological violence, sexual violence, and stalking.<sup>72</sup> Children who are abused experience long-term physical and psychological effects beyond the immediate harm done to them as a result of maltreatment.<sup>73,74</sup> Partner violence is also associated with long-term health problems.

Historically, the North Carolina General Assembly has not given the same priority to injury prevention as it has to other public health activities. Prevention of injury and violence is not listed as an essential public health service, although injury and violence are both major causes of death and disability in the state. North Carolina should make injury and violence prevention explicit in the list of essential public health services at the state level. Further, greater interagency leadership and coordination is needed across agencies involved with preventing injury and violence in the state. Good data are also important to establish targeted and effective injury prevention initiatives. In addition, evidence-based programs, which have been shown to be effective in reducing falls, child maltreatment, family violence, and motor vehicle injury, should be supported and disseminated in communities across the state.

## **Recommendation 8.1: Review and Enforce All Traffic Safety Laws and Enhance Surveillance**

North Carolina law enforcement agencies should actively enforce traffic safety laws, especially those pertaining to seat belt usage, driving while impaired (DWI), speeding, and motorcycles. The North Carolina General Assembly should strengthen traffic safety laws and enforcement including rear seat occupant seat belt laws, the licensure and training for motorcyclists, and enforcement of speeding and aggressive driving laws, as well as require alcohol interlocks for DWI offenders, and expand Booze It and Lose It checking stations. The North Carolina General Assembly should appropriate \$1 million in recurring funds to the Governor's Highway Safety Program to support these efforts.

### **Recommendation 8.2: Enhance Injury Surveillance, Intervention, and Evaluation**

The North Carolina Division of Public Health (DPH) should identify and implement pilot programs and other community-based activities to prevent unintentional injury and violence. Priority should be given to evidence-based programs or best and promising practices that prevent motor vehicle crashes, falls, unintentional poisonings, and family violence. In addition, DPH should work with other public and private agencies to enhance the current intentional and unintentional surveillance systems. The North Carolina General Assembly should appropriate \$4 million in recurring funds to DPH to support these efforts.

### **Recommendation 8.3: Enhance Training of State and Local Public Health Professionals, Social Workers, and Others**

The University of North Carolina (UNC) Injury Prevention Research Center should develop curricula and train state and local public health professionals, physicians, nurses, allied care workers, social workers, and others responsible for injury and violence prevention so they can achieve or exceed competency in injury control. The North Carolina General Assembly should appropriate \$200,000 in recurring funds to the UNC Injury Prevention Research Center to support this effort.

### **Recommendation 8.4: Create a Statewide Task Force or Committee on Injury and Violence (PRIORITY RECOMMENDATION)**

The North Carolina General Assembly should create an Injury and Violence Prevention Task Force to examine data, make evidence-based policy and program recommendations, monitor implementation, and examine outcomes to prevent and reduce injury and violence. The work of the Task Force should build on the work of the North Carolina 2009-2014 State Strategic Plan for Injury and Violence Prevention and should examine data around motor vehicle crashes; falls; unintentional poisonings; occupational injuries; family violence including child maltreatment and domestic violence; other forms of unintentional injuries such as fires and drowning; and intentional injuries such as homicide and suicide.

### **Reduce the Incidence of Vaccine Preventable Diseases and Foodborne Illnesses**

An infectious or communicable disease is an illness due to a specific infectious agent that is transmitted from a source to a susceptible host. Over the last 100 years, the number of deaths from infectious diseases in the United States generally decreased until the 1980s when it started increasing due to HIV/AIDS and the emergence of antibiotic resistant illnesses. The source can be an infected person, animal, or inanimate source, such as peanut butter in recent salmonella outbreaks.

**Childhood and adolescent vaccinations are a hallmark of preventive care.**

There are many different types of infectious or communicable diseases. The Task Force focused on vaccine preventable diseases and foodborne illnesses. Communicable diseases transmitted through sexual contact are covered elsewhere in the report.

Infectious diseases, including pneumonia and influenza, were the 10th leading cause of death among North Carolinians, causing 1,644 deaths in 2007, and are major causes of disability as well.<sup>75</sup> However, vaccines are available and can help prevent pneumococcal diseases (including pneumonia) and influenza. Vaccines are also effective in preventing other diseases including hepatitis A and B, rotavirus, diphtheria, tetanus, pertussis, measles, mumps, rubella, meningitis, human papillomavirus, polio, and varicella.

Childhood and adolescent vaccinations are a hallmark of preventive care. North Carolina is making strides toward vaccinating all children appropriately. North Carolina provides DTaP (diphtheria, tetanus, pertussis), Hep A (hepatitis A), Hep B (hepatitis B), Hib (Haemophilus influenzae type b), IPV (inactivated polio), MMR (measles, mumps, rubella), and varicella to all children in the state as part of the Universal Child Vaccine Distribution Program (UCVDP). The program was designed to remove financial barriers, assure vaccination access to all children, and simplify the vaccination process for health care providers. The UCVDP does not cover the human papillomavirus, influenza, meningococcal diseases, and pneumococcal vaccines, all of which are recommended by the CDC. Additional outreach is needed to ensure that children and adolescents receive all the recommended vaccines. DPH should also monitor the vaccination rates, especially for vaccines not currently part of UCVDP, to see if other strategies are needed to increase immunization rates.

**Foodborne illnesses are among the most common infectious diseases....[and] can often be prevented with proper food safety and defense.**

Foodborne illnesses are among the most common infectious diseases. Foodborne diseases cause a total of approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths each year in the United States.<sup>76</sup> Foodborne illnesses can often be prevented with proper food safety and defense. Salmonella, listeria, and toxoplasma are the most common pathogens, causing more than 75% of those foodborne illnesses caused by known pathogens. The symptoms of foodborne illness range from mild gastrointestinal discomfort to life-threatening problems in the brain, liver, and kidneys.

Keeping food safe and protecting the food supply is a multifaceted process. There are 12 different federal agencies with more than 35 laws affecting food safety.<sup>77</sup> In North Carolina, the agency responsible for oversight depends on the step in the food process chain. Unfortunately, the current food safety and defense system is very complex and varies by agency. Although oversight and enforcement of food safety standards are split between many different state agencies, our system could be strengthened by developing a single agency approach based on a proactive, scientifically-based strategy to prevent, detect, and respond to foodborne illnesses, and by ensuring that data about foodborne illnesses are shared among appropriate agencies.

## **Recommendation 9.1: Increase Immunization Rates (PRIORITY RECOMMENDATION)**

The North Carolina General Assembly should appropriate \$1.5 million in recurring funds to the North Carolina Division of Public Health (DPH) to conduct an aggressive outreach campaign to increase the childhood immunization rates for all the vaccines recommended by the Centers for Disease Control and Prevention. DPH should monitor the immunization rates, especially for those vaccines not currently covered through the state's Universal Childhood Vaccine Distribution Program, and determine if additional strategies are needed to increase childhood and adolescent vaccination rates.

## **Recommendation 9.2: Strengthen Laws to Prevent Foodborne Illnesses**

The North Carolina General Assembly should direct different state agencies that are involved in protecting food at different points of the food supply chain to develop a unified proactive, scientifically-based strategy to prevent, detect, and respond to foodborne illness. The North Carolina General Assembly should appropriate \$1.6 million in non-recurring funds and \$300,000 in recurring funds to the North Carolina Division of Public Health to develop and maintain an enhanced surveillance system that facilitates sharing of data from different state and federal agencies when needed to detect or prevent the spread of foodborne illnesses, and should ensure that the Governor can use rainy day funds to pay for additional personnel needed in large outbreak investigations, food protection efforts, or other natural or man-made public health emergencies.

### **Eliminate Racial and Ethnic Disparities**

Racial and ethnic minorities have poorer health status and experience poorer health outcomes than non-minorities.<sup>78,79</sup> Health disparities by race and ethnicity are also noted in health care access and quality, with minorities generally having less access to health care and health insurance and experiencing lower quality of health care than non-minorities.<sup>79,80</sup> In North Carolina, minorities are more likely to report that their health status is fair or poor compared to whites. This racial and ethnic disparity translates into lower life expectancies: minorities have, on average, a life expectancy of 72.1 years, versus 76.8 years for whites.

Minority groups in North Carolina are also more likely to have risk factors for some of the underlying causes of poor health. For example, African Americans are significantly more likely to have high blood pressure, be obese, have lower levels of physical activity, and be diagnosed with diabetes than whites. American Indians are more likely than whites to be current smokers, be obese, and have lower levels of physical activity, and Latinos are significantly more likely than whites to have lower levels of physical activity and participate in binge drinking.<sup>81-83</sup>

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Gaps in health outcomes between people of color and white populations can be partly explained by their unique social experiences. The United States has a long history of racial/ethnic segregation and inequality. Research has indicated that perceived racial/ethnic bias contributes to health disparities even after controlling for income and education.<sup>78</sup> Further, some individuals from minority populations are distrustful of the American health system because of the history of segregation and discrimination. As a result, they may be less likely to seek care, or to follow treatment advice.<sup>84</sup> Strategies that promote community involvement and empowerment, such as the use of community health workers or lay health advisors, have been shown to improve health seeking behaviors.<sup>85</sup> As part of the community, lay health advisors are often a trusted source of health information.

## **Recommendation 10.1: Fund Evidence-Based Programs to Meet the Needs of Diverse Populations**

**Public and private funders supporting prevention initiatives in North Carolina should place priority on funding evidence-based programs and practices. Interventions should take into account the racial, ethnic, cultural, geographic, and economic diversity of the population being served. The North Carolina Division of Public Health should involve community leaders in prevention activities, especially those targeting racial and ethnic minorities.**

**A person's income, wealth, educational achievement, race and ethnicity, workplace, and community can have profound health effects.**

### **Reduce Socioeconomic Health Disparities**

A person's income, wealth, educational achievement, race and ethnicity, workplace, and community can have profound health effects. There is a strong correlation between health outcomes and income, wealth, income inequality, community environment and housing conditions, and educational achievement. People with higher incomes or personal wealth, more years of education, and who live in a healthy and safe environment have, on average, longer life expectancies and better overall health outcomes. Conversely, those with fewer years of education, lower incomes, less accumulated wealth, and those living in poorer neighborhoods or substandard housing conditions have worse health outcomes. It is not only the abject lack of resources (i.e. income and assets) that contribute to health outcomes, but also the income inequality in a community that predicts poorer health outcomes.

While many of these factors are inter-related, there is a growing body of literature that suggests some of these factors are also independent determinants of health. For example, in the United States, health status for all racial and ethnic groups increases with income level; individuals with incomes less than 100% of the federal poverty guidelines (FPG) have worse self-reported health in comparison to all other income levels.<sup>f,78</sup> However, within each income level, African Americans

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f 100% of the federal poverty guidelines is \$22,050/year for a family of four in 2009.

have worse health than whites and Latinos, and Latinos generally have worse health than whites. Income and race/ethnicity interact to influence health status. Yet, differences by income level and race/ethnicity remain even when taking the other into account. Other factors, including but not limited to housing and education, have similar independent and interactive effects on health.

More than a million North Carolinians lived in a family that did not earn enough money to afford basic, necessary expenses in 2008, even though 61% of adults in these families worked.<sup>86</sup> Economic insecurity forces families to choose between purchasing health care and other basic necessities. Households in North Carolina with lower incomes are significantly more likely to experience food insecurity, where individuals have limited access to nutritionally adequate foods. One way to increase economic security for low- and moderate-income families and thus allow for greater opportunity for healthful living is through increasing the state Earned Income Tax Credit (EITC), as the majority of poor and low-income families has at least one worker. The federal EITC is one of the most effective anti-poverty measures for low- and moderate-income working families in the United States, and lifts approximately 4.5 million people, more than half of whom are children, out of poverty each year.<sup>87,88</sup> An additional measure to increase economic security—by decreasing food insecurity—would be to increase the use of the Supplemental Nutrition Assistance Program (SNAP) by low-income individuals and families.<sup>g</sup> SNAP helps families with monthly incomes less than or equal to 130% FPG purchase basic groceries.

Having inadequate income to meet basic living necessities can cause health problems. Similarly, living in substandard, unhealthy, overcrowded, and unaffordable home environments contribute to a large number of health problems.<sup>62,89,90</sup> Housing affordability is a particular problem in North Carolina. Families, especially low-income families, that spend a large amount of their income on housing (rent or mortgage), have less disposable income to spend on food, heating, medical needs, transportation, or other basic needs. Studies have shown that families that report having difficulty paying rent or utilities have greater reported barriers accessing health care, higher use of the emergency department, and more hospitalizations.<sup>91</sup> Housing is considered unaffordable if a family has to spend more than 30% of their income on housing. In North Carolina, approximately 1.1 million households spent more than 30% of their household income on housing costs in 2007.<sup>92,93</sup> In 1987, the North Carolina General Assembly established the Housing Trust Fund. Funds from the Housing Trust Fund are used to leverage other private development funds and to lower the costs of building single, multi-unit, and apartment complexes so that they are affordable to low-income families, seniors, and people with disabilities. North Carolina can do more to expand affordable housing options. The major constraint is the lack of funding through the Housing Trust Fund.

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g SNAP benefits were formerly called Food Stamps.

**Academic achievement and education also are strongly correlated with health across the lifespan. Adults who have not finished high school are more likely to be in poor or fair health than college graduates.**

Academic achievement and education also are strongly correlated with health across the lifespan. Adults who have not finished high school are more likely to be in poor or fair health than college graduates. The age-adjusted mortality rate of high school dropouts ages 25-64 is twice as large as the rate of those with some college education. They are also more likely to suffer from the most common acute and chronic health conditions, including heart disease, hypertension, stroke, elevated cholesterol, emphysema, diabetes, asthma attacks, and ulcers. In contrast, people with more years of education are likely to live longer, healthier lives. Those with four more years of education are less likely to smoke, binge drink, or use illegal drugs than are those with less education.

Low-income families generally have worse educational outcomes than families with higher incomes. Gaps in behavioral and academic skills at the start of schooling have an effect on both short- and long-term achievement. Interventions that support families with high quality child care and preschool programs can help low-income children start school on more equal footing. There is no one strategy that works for all children, as interventions should match a child or family's needs.<sup>94</sup> Fortunately, there are different evidence-based programs that have been found to increase parental bonding, identify children with or at risk of developmental delay, and increase school readiness. North Carolina should promote and expand high-quality early childhood health and education programs.

After the early years, an intensified focus on youth and adolescent development is essential for increasing school success for middle- and high-school students. Schools play a vital role in helping young people achieve the competence, confidence, character and connectedness that they require to succeed in school. Unfortunately, North Carolina does not fare well in educational achievement. According to the North Carolina Department of Public Instruction (DPI) data for 2007-2008, the four year cohort graduation rate is 70.3%. Nationally, North Carolina ranked 39th in the percentage of incoming ninth graders who graduate within four years.<sup>95</sup> Fortunately, some schools have started to implement evidence-based programs to improve educational outcomes, reduce suspensions, and drop-out rates. Investments aimed at increasing educational attainment can decrease society's health-related costs, increase earnings, boost tax revenues for governments, decrease welfare expenditures, and decrease crime and incarceration rates.

## **Recommendation 11.1: Promote Economic Security (PRIORITY RECOMMENDATION)**

**The North Carolina General Assembly should increase the state Earned Income Tax Credit. In addition, the North Carolina Division of Social Services should conduct outreach to encourage low-income individuals and families to apply for the Supplemental Nutrition Assistance Program.**



## **Recommendation 11.2: Increase the Availability of Affordable Housing and Utilities**

The North Carolina General Assembly should appropriate \$10 million in recurring funds to the North Carolina Housing Finance Agency to increase funding to the North Carolina Housing Trust Fund and should enact legislation to help low-income North Carolinians lower their utility bills.

## **Recommendation 11.3: Expand Opportunities for High Quality Early Childhood Education and Health Programs**

North Carolina Smart Start should further disseminate high quality health and education programs to promote healthy social and emotional development among children in need in all North Carolina counties. The North Carolina General Assembly should appropriate \$1.2 million in recurring funds to the North Carolina Partnership for Children, Inc. to support this effort.

## **Recommendation 11.4: Increase the High School Graduation Rate (PRIORITY RECOMMENDATION)**

The North Carolina State Board of Education (SBE) and the North Carolina Department of Public Instruction should 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. The SBE should implement evidence-based strategies to improve student attendance rates and decrease truancy, foster a student-supportive school climate that promotes school connectedness, explore and implement customized learning options for students, and more fully engage students in learning. The SBE should examine the experiences of other states, develop cost estimates to implement evidence-based initiatives to increase high school graduation, and report their findings to the Joint Legislative Education Oversight Committee by April, 2010.

## **Implement Prevention Strategies in Schools, Worksites, and Clinical Settings**

Multi-faceted prevention efforts that promote healthy behaviors at the individual, interpersonal, clinical, community, and policy level have a better chance of positively impacting the health of a population than solitary interventions.<sup>2</sup> Most of the Task Force work focused on evidence-based strategies to reduce specific risk factors (e.g. tobacco use, lack of exercise, substance use or abuse). However, the Task Force also wanted to examine site-specific strategies, such as those that can be provided through schools, worksites, or clinical settings, to improve population health across multiple risk factors.

One of the five goals of the North Carolina State Board of Education (SBE) is to ensure that North Carolina public school students will be healthy and responsible. Healthy children and adolescents are better learners and are likely to do better in

**Healthy children and adolescents are better learners and are likely to do better in school.**

school.<sup>96,97</sup> The CDC promotes an integrated approach to student and staff well-being through the use of the Coordinated School Health Program (CSHP). The CSHP model has eight components including 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. State and local support are needed to successfully implement CSHP. In order for school districts to effectively teach a health curriculum that has evidence of causing behavior changes in youth, and to successfully integrate school health into the instructional and operational components of a school, there needs to be strong leadership and an infrastructure in place for administering funds, selecting evidence-based curricula, providing technical assistance for implementation, and monitoring for compliance and improvement.<sup>98</sup>

**Worksites are also an ideal place to intervene on lifestyle behaviors that lead to chronic disease and related death and disability.**

North Carolina schools are required to teach health education to students in kindergarten through high school. By statute, health education is required to include age-appropriate instruction covering mental and emotional health; drug and alcohol prevention; nutrition; dental health; environmental health; family living; consumer health; disease control growth and development; first aid and emergency care; preventing sexually transmitted diseases; abstinence-until-marriage education; and bicycle safety. The SBE sets the Healthful Living Standard Course of Study (SCOS), which is a curriculum content guide that includes content areas and skills to be taught in each grade level. Selection of the specific curriculum used to teach these objectives is made by local school districts. While there are evidence-based curricula for some of the subject areas that have been shown to produce behavioral changes, schools are not required to use these curricula. DPI can promote the use of evidence-based curricula by reviewing and selecting specific curricula that have been shown to be effective in health-promoting behavioral changes in adolescents across multiple dimensions (e.g. violence prevention, teen pregnancy prevention, and prevention of substance use), and providing grants to local school systems to help them offset the additional costs in using these curricula. To help ensure that such curricula are implemented with fidelity, DPI should provide training and technical assistance to the schools.

Worksites are also an ideal place to intervene on lifestyle behaviors that lead to chronic disease and related death and disability, as adults spend about half of their waking hours during the work week at their workplace. Comprehensive worksite health promotion programs have been shown to be effective in improving health outcomes and reducing risky health behaviors such as tobacco use, lack of physical activity, excessive use of alcohol, high blood pressure, and high cholesterol.<sup>99</sup> Studies have shown that healthy employees miss fewer days of work, are more productive, and have lower health care costs.<sup>100,101</sup> To encourage broader implementation of comprehensive worksite health promotion programs, the Task Force recommends the creation of a statewide collaborative that will offer technical assistance to small businesses, non-profits, and state and local government for implementing evidence-based strategies and best practices.

In addition to schools and workplaces, primary care and other clinical settings are effective intervention points. Congress charged the US Preventive Services Task Force (USPSTF) with identifying which screening, counseling, and preventive medications should be offered routinely to different populations in a primary care setting. After reviewing evidence of efficacy, the USPSTF has recommended 30 preventive services for either all or a subpart of the population. Unfortunately, many people lack access to preventive screenings, preventive services, or primary care, generally when they lack health insurance coverage. Currently, there are an estimated 1.75 million non-elderly people in North Carolina who lack health insurance coverage. Because of the importance of having insurance coverage to obtaining preventive screenings and other primary care services, the Task Force recommended that everyone in the country have health insurance coverage, and that existing benefit packages should be expanded to ensure coverage of all the recommended preventive screenings.

Expanding access to clinical services can improve health outcomes. Nonetheless, just guaranteeing access to a provider does not ensure that individuals will receive all the recommended health services. Studies have shown that adults and children generally only receive about half of the recommended health services.<sup>102,103</sup> Because medical care is constantly evolving, health care professionals need help keeping up with changes in medicine, as recommended guidelines change as new treatments are developed or new evidence suggests a better or different course of action. The North Carolina Area Health Education Centers (AHEC) program provides educational programs in partnership with health professional associations, academic institutions, and other health agencies. These trainings are intended to enhance the quality of care and improve health outcomes. The Task Force identified the need to enhance health professional training to help patients reduce their health risks leading to poor health outcomes.

**In addition to schools and workplaces, primary care and other clinical settings are effective intervention points.**

### **Recommendation 12.1: Enhance North Carolina Healthy Schools (PRIORITY RECOMMENDATION)**

The North Carolina Department of Public Instruction (DPI) should expand the NC Healthy Schools Initiative to include a local healthy schools coordinator in each Local Education Agency (LEA). Healthy school coordinators would help schools implement evidence-based programs, practices, and policies to support Coordinated School Health programs. The North Carolina General Assembly should appropriate \$1.5 million in recurring funds beginning in SFY 2011 increased by an additional \$1.5 in recurring funds in each of the following five years (SFY 2012-2017) for a total of \$12 million recurring to support these positions. The NC Healthy Schools Section of DPI should provide monitoring, evaluation, and technical assistance to the LEAs through the local healthy schools coordinators. The North Carolina General Assembly should appropriate \$225,000 in recurring funds in SFY 2011 to DPI to support the addition of 3 full-time employees to do this work.

## **Recommendation 12.2: Require the Use of Evidence-based Curricula for Healthful Living Standard Course of Study.**

The North Carolina General Assembly should require schools to use evidence-based curricula when available to teach the objectives of the Healthful Living Standard Course of Study. The North Carolina General Assembly should appropriate \$1.2 million in recurring funds in SFY 2011 to the North Carolina Department of Public Instruction (DPI) to provide grants to Local Education Agencies (LEAs) to implement evidence-based curricula. To implement this provision, the DPI Healthy Schools Section should identify 3-5 evidence-based curricula that demonstrate positive change in behavior across multiple health risk behaviors (i.e. substance use, violence, sexual activity) and provide grants (of up to \$10,000 per LEA) for implementation and technical assistance to ensure curricula are implemented with fidelity. DPI should provide training to school staff to help them assess and evaluate health and physical education programs and curricula. In addition, DPI should develop additional academically rigorous health education and physical education honors courses at the high school level.

## **Recommendation 12.3: Create the North Carolina Worksite Wellness Collaborative and Tax Incentives for Small Businesses**

The North Carolina General Assembly should direct the North Carolina Public Health Foundation to establish the North Carolina Worksite Wellness Collaborative to promote evidence-based strategies to support the optimal health and well-being of North Carolina's workforce. The collaborative should help businesses implement healthy workplace policies and benefits, implement health risk appraisals, develop comprehensive employee wellness programs, and implement data systems that track outcomes and the organizational and employee level. The North Carolina General Assembly should provide start-up funding of \$800,000 in SFY 2011, with a reduced amount over the next four years, to support this collaborative. In addition, the North Carolina General Assembly should provide a tax credit to businesses with 50 or fewer employees that have implemented a comprehensive worksite wellness program for their employees.

## **Recommendation 12.4: Expand Health Insurance Coverage to More North Carolinians (PRIORITY RECOMMENDATION)**

The Task Force believes that everyone should have health insurance coverage. In the absence of such, the North Carolina General Assembly should begin expanding coverage to groups that have the largest risk of being uninsured. Additionally, insurers should expand coverage to include the screenings, counseling and treatment recommended by the US Preventive Services Task Force.

### **Recommendation 12.5: Improve Provider Training to Promote Evidence-based Practices**

The Area Health Education Centers (AHEC) Program should offer training courses to enhance the training of health professionals, including physicians, nurses, allied health, and other health care practitioners, to increase the use of evidence-based prevention, screening, early intervention, and treatment services to reduce certain high-risk behaviors and other factors that contribute to the state’s leading causes of death and disability. Training courses should be expanded into academic and clinical settings, residency programs, and other continuing education programs. The North Carolina General Assembly should appropriate \$250,000 in recurring funds to AHEC to support these efforts.

### **Improve Data Systems to Support Prevention Efforts**

Throughout its deliberations, the Task Force on Prevention focused on identifying evidence-based practices that would address North Carolina’s most pressing health needs most effectively. To do this requires good data to help identify health concerns, the health risks contributing to these problems, evidence-based interventions, and to measure progress—or lack thereof—in improving the health of the state’s population. North Carolina needs information both about the prevalence of certain types of diseases or health conditions (e.g. data on specific types of cancer), as well as the number of people engaging in certain risky health behaviors. While North Carolina has many different data systems that collect specific health data, these data systems are not well-integrated. They often operate in silos, making it difficult to capture a complete understanding of the health problems facing the state. Additionally, there are significant gaps in the data that are collected.

The state and other community groups also need information about evidence-based interventions which have been shown to be effective in addressing certain health problems. However, evidence-based interventions do not exist for every health problem. In these instances, community groups need access to best or promising practices which they can employ or modify to address their specific health concern. More is needed to disseminate both evidence-based strategies, as well as those best or promising practices that have been identified in North Carolina. Development of a clearinghouse of options well-suited to North Carolina communities would make this information-gathering more efficient.

### **Recommendation 13.1: Enhance Existing Data Systems**

North Carolina agencies should enhance specific existing data collection systems to ensure that the state has adequate data for health and risk assessment, including youth risk data, school health profiles, environmental risks, and improved data collected in the cancer registry.

## **Recommendation 13.2: Identify and Disseminate Effective Nutrition, Physical Activity, Obesity, and Chronic Disease Prevention Practices in North Carolina**

The UNC Center for Health Promotion and Disease Prevention (HPDP) should work with North Carolina foundations to identify effective practice-level nutrition, physical activity, obesity, and chronic disease prevention interventions within the state. Foundations should provide HPDP with \$50,000 per year to review five foundation-funded prevention initiatives and should help disseminate effective practices to other communities.

**The state's poor health performance is not intractable. We can make changes to become a healthier state, by implementing multifaceted evidence-based prevention interventions.**

### **Conclusion**

North Carolina currently ranks poorly on many health indicators, including health outcomes, health behaviors, access to care, and socioeconomic measures. However, the state's poor health performance is not intractable. We can make changes to become a healthier state, by implementing multifaceted evidence-based prevention interventions.

North Carolina has already demonstrated significant success in reducing tobacco use by using a multifaceted strategy which touches on all the levels of the socio-ecological model. North Carolina first began its multifaceted strategy to reduce tobacco use in 1991 with funding from the National Cancer Institute and American Cancer Society which was used to develop the comprehensive tobacco prevention and reduction plan. Prior to that, there was little improvement in tobacco use rates. The state implemented more systemic multifaceted interventions beginning in 2003, with the infusion of funding from the North Carolina Health and Wellness Trust Fund (HWTF). For example, the HWTF initiated a social marketing campaign (i.e. TRU) targeting individual behaviors and helped provide funding for QuitlineNC, which helped support individuals who wanted to quit smoking. North Carolina public and private insurers began to pay for clinical interventions (e.g. counseling and tobacco cessation medications). Private funders (e.g. The Duke Endowment and HWTF) supported interventions to reduce tobacco use in the community (e.g. 100% tobacco-free schools and hospitals), and the North Carolina General Assembly supported policy interventions (e.g. increasing the tobacco tax, and later, mandating that all public schools be 100% tobacco-free). Between 1995 and 2003, the adult smoking rate hovered at about 25%. Since implementing this multifaceted evidence-based strategy, the adult smoking rate decreased from 24.8% (2003) to 20.9% (2008). Similarly, the youth smoking rate has declined. From 2003 to 2007, the high school use rate has declined from 27.3% to 19.0%, while the middle school use rate dropped from 9.3% to 4.5%.

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The Task Force recognized that similar multifaceted strategies could be successful in addressing other seemingly “intractable” public health problems. Thus, when possible, the Task Force tried to identify evidence-based, best, or promising practices in different levels of the socio-ecological model. (See Table ES.1.) We can make progress in preventing and reducing other underlying causes of death and disability in the state by adopting a similar approach that includes evidence-based strategies aimed at the various levels of the socio-ecologic model.

		Intervention Type								
		Individual	Clinical	Community and Environment				State Policies (Legislative or Administrative)	Research, Evaluation, Data	
				Schools & Daycare Providers	Family/Home	Worksites	Insurers			Community atlarge
Risk Factor	Tobacco Use (including secondhand smoke exposure)	Be tobacco-free and quit all tobacco use	3,4 Expand Access to Cessation Services, Counseling, and Medications for Smokers Who Want to Quit			3.3 Expand Smoke-Free Policies in NC 3.4 Expand Access to Cessation Services, Counseling, and Medications for Smokers Who Want to Quit	3.4 Expand Access to Cessation Services, Counseling, and Medications for Smokers Who Want to Quit	3.3 Expand Smoke-free Policies in NC	3.1 Comprehensive Tobacco Control Program <b>3.2 PRIORITY Increase NC Tobacco Taxes</b> 3.3 Expand Smoke-free Policies in NC	
	Poor Nutrition & Physical Inactivity	Eat a nutritious diet Be physically active most days of the week	4.11 Increase the Availability of Obesity Screening and Counseling 4.12 Expansion of CCNC Childhood Obesity Prevention Initiative	4.1 Implement Child Nutrition Standards in All Elementary Schools 4.2 Ensure that All Foods and Beverages Available in Schools are Healthy <b>4.3 PRIORITY Implement Quality Physical Education and Healthful Living in Schools</b> 4.4 Expand Physical Activity and Nutrition in Child Care Centers and After-school Programs <b>4.5 PRIORITY Implement the Eat Smart, Move More North Carolina Obesity Plan and Raise Public Awareness</b> 4.9 Establish Joint-use Agreements to Expand Use of School and Community Recreational Facilities		4.6 Expand the Availability of Farmers Markets and Farm Stands at Worksites and Faith-based Organizations 4.11 Increase the Availability of Obesity Screening and Counseling	4.11 Increase the Availability of Obesity Screening and Counseling	4.1 Implement Child Nutrition Standards in All Elementary Schools 4.2 Ensure that All Foods and Beverages Available in Schools are Healthy 4.4 Expand Physical Activity and Nutrition in Child Care Centers and After-school Programs <b>4.5 PRIORITY Implement the Eat Smart, Move More North Carolina Obesity Plan and Raise Public Awareness</b> 4.6 Expand the Availability of Farmers Markets and Farm Stands at Worksites and Faith-based Organizations 4.7 Promote Menu Labeling to Make Nutrition Information Available to Consumers 4.8 Build Active Living Communities 4.9 Establish Joint-use Agreements to Expand Use of School and Community Recreational Facilities	4.1 Implement Child Nutrition Standards in All Elementary Schools 4.2: Ensure that All Foods and Beverages Available in Schools are Healthy <b>4.3 PRIORITY Implement Quality Physical Education and Healthful Living in Schools</b> 4.4 Expand Physical Activity and Nutrition in Child Care Centers and After-school Programs <b>4.5 PRIORITY Implement the Eat Smart, Move More North Carolina Obesity Plan and Raise Public Awareness</b> 4.7 Promote Menu Labeling to Make Nutrition Information Available to Consumers 4.8 Build Active Living Communities 4.10 Expand Community Grants Program to Promote Physical Activity 4.12 Expansion of CCNC Childhood Obesity Prevention Initiative	
	Sexual Health	Know your STD/HIV status and use protection to prevent infection and unintended pregnancy	5.1 Increase Awareness, Screening and Treatment of Sexually Transmitted Diseases and Reduce Unintended Pregnancies 5.2 Increase HIV Testing in Prisons, Jails and Juvenile Centers 5.4 Expand the Availability of Family Planning for Low-Income Families	5.3 PRIORITY Ensuring Comprehensive Sexuality Education for More Young People in North Carolina				5.1 Increase Awareness, Screening and Treatment of Sexually Transmitted Diseases and Reduce Unintended Pregnancies 5.2 Increase HIV Testing in Prisons, Jails and Juvenile Centers 5.3 PRIORITY Ensuring Comprehensive Sexuality Education for More Young People in North Carolina 5.4 Expand the Availability of Family Planning for Low-Income Families	5.1 Increase Awareness, Screening and Treatment of Sexually Transmitted Diseases and Reduce Unintended Pregnancies 5.2 Increase HIV Testing in Prisons, Jails and Juvenile Centers <b>5.3 PRIORITY Ensuring Comprehensive Sexuality Education for More Young People in North Carolina</b> 5.4 Expand the Availability of Family Planning for Low-Income Families	
	Substance Use and Abuse	Be free of dependence on alcohol, drugs, and other substances	<b>6.1 PRIORITY Develop and Implement a Comprehensive Substance Abuse Prevention Plan</b> 6.2 Expand the Availability of Screening, Brief Intervention, and Treatment for People with Behavioral Health Problems in the Primary Care Setting	<b>6.1 PRIORITY Develop and Implement a Comprehensive Substance Abuse Prevention Plan</b>			6.2 Expand the Availability of Screening, Brief Intervention, and Treatment for People with Behavioral Health Problems in the Primary Care Setting	6.1 PRIORITY Develop and Implement a Comprehensive Substance Abuse Prevention Plan 6.3 Expand Early Intervention Services in the Faith Community	6.1 PRIORITY Develop and Implement a Comprehensive Substance Abuse Prevention Plan 6.2 Expand the Availability of Screening, Brief Intervention, and Treatment for People with Behavioral Health Problems in the Primary Care Setting	
	Environmental Risks	Keep your home safe and healthy		7.4 Reduce Environmental Risks in Schools and Child Care Settings	7.3 Ensure Healthy Homes			7.3 Ensure Healthy Homes	7.1 Create an Interagency Leadership Commission to Promote Healthy Communities, Minimize Environmental Risks and Promote Green Initiatives 7.2 Develop an Environmental Assessment for North Carolina that Links Environmental Exposures to Health Outcomes 7.3 Ensure Healthy Homes 7.4 Reduce Environmental Risks in Schools and Child Care Settings	7.2 Develop an Environmental Assessment for North Carolina that Links Environmental Exposures to Health Outcomes



by Risk Factor and Socioecological Model Intervention Type

		Intervention Type								
		Individual	Clinical	Community and Environment				State Policies (Legislative or Administrative)	Research, Evaluation, Data	
			Schools & Daycare Providers	Family/Home	Worksites	Insurers	Community atLarge			
Risk Factor	Injury	Practice common-sense safety	8.3 Enhance Training of State and Local Public Health Professional, Social Workers and Officers					8.1 Review and Enforce All Traffic Safety Laws and Enhance Surveillance 8.2 Enhance Injury Surveillance, Intervention, and Evaluation 8.2 Enhance Injury Surveillance, Intervention, and Evaluation	8.1 Review and Enforce All Traffic Safety Laws and Enhance Surveillance 8.2 Enhance Injury Surveillance, Intervention, and Evaluation 8.3 Enhance Training of State and Local Public Health Professional, Social Workers and Officers 8.4 PRIORITY Create a Statewide Task Force or Committee on Injury and Violence	8.2 Enhance Injury Surveillance, Intervention, and Evaluation 8.4 PRIORITY Create a Statewide Task Force or Committee on Injury and Violence
	Infectious Disease and Food-Borne Illness	Get all the immunizations you need, and wash your hands often	9.1 PRIORITY Increase Immunization Rates	9.1 PRIORITY Increase Immunization Rates	9.2 Strengthen Laws to Prevent Food-Borne Illnesses	9.1 PRIORITY Increase Immunization Rates	9.1 PRIORITY Increase Immunization Rates 9.2 Strengthen Laws to Prevent Food-Borne Illnesses	9.1 PRIORITY Increase Immunization Rates 9.2 Strengthen Laws to Prevent Food-Borne Illnesses	9.1 PRIORITY Increase Immunization Rates 9.2 Strengthen Laws to Prevent Food-Borne Illnesses	
	Race & Ethnicity							10.1 Fund Evidence-Bases Programs that Meet the Needs of Diverse Populations	10.1 Fund Evidence-Bases Programs that Meet the Needs of Diverse Populations	
	Socioeconomic Factors	Get your high school diploma and pursue other advanced educational opportunities	11.3 Expand Opportunities for High Quality Early Childhood Education and Health Programs	11.3 Expand Opportunities for High Quality Early Childhood Education and Health Programs 11.4 PRIORITY Increase the Graduation Rate				11.1 PRIORITY Promote Economic Security 11.3 Expand Opportunities for High Quality Early Childhood Education and Health Programs	11.1 PRIORITY Promote Economic Security 11.2 Increase the Availability of Affordable Housing and Utilities 11.3 Expand Opportunities for High Quality Early Childhood Education and Health Programs 11.4 PRIORITY Increase the Graduation Rate	
	Cross-Cutting Issues		12.5 Improve Provider Training to Enhance Knowledge of Evidence-Based Practices	12.1 PRIORITY Enhance North Carolina Healthy Schools 12.2 Require the Use of Evidence-Based Curricula for Healthful Living Standard Course of Study 12.4 PRIORITY Expand Health Insurance Coverage to More People		12.3 Create the North Carolina Worksite Wellness Collaborative and Tax Incentives for Small Businesses	12.4 PRIORITY Expand Health Insurance Coverage to More People	12.3 Create the North Carolina Worksite Wellness Collaborative and Tax Incentives for Small Businesses 12.4 PRIORITY Expand Health Insurance Coverage to More People	12.1 PRIORITY Enhance North Carolina Healthy Schools 12.2 Require the Use of Evidence-Based Curricula for Healthful Living Standard Course of Study 12.3 Create the North Carolina Worksite Wellness Collaborative and Tax Incentives for Small Businesses 12.4 PRIORITY Expand Health Insurance Coverage to More People 12.5 Improve Provider Training to Enhance Knowledge of Evidence-Based Practices	
	Data							13.2 Identify and Disseminate Effective Nutrition, Physical Activity, Obesity and Chronic Disease Prevention Practices in North Carolina		13.1 Enhance Existing Data Systems 13.2 Identify and Disseminate Effective Nutrition, Physical Activity, Obesity and Chronic Disease Prevention Practices in North Carolina

Notes: Italics indicate recommendations that may be implemented absent a new law or legislative funding. Some recommendations may require seeking other funding sources if state funding is not available. Other recommendations may be implemented voluntarily by organizations absent a state mandate.

Most recommendations appear more than once.

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**T**he burden of chronic diseases and other preventable conditions in our state is skyrocketing. National rankings show that North Carolina is 36th in terms of overall health and 38th in premature death.<sup>a,1</sup> Leading causes of death and disability in North Carolina include cancer, heart disease, injuries, strokes, and type 2 diabetes. Further, as shown in Table 1.1, North Carolina ranks poorly on many other health comparisons, including health outcomes, health behaviors, access to care, and socioeconomic measures. The most practical approach to address such conditions—from both a health and economic perspective—is to prevent them from occurring in the first place. However, health care spending in North Carolina, as elsewhere in the country, is drastically skewed toward paying for therapeutic procedures to manage or treat acute or chronic health problems and *not* toward prevention. Reorienting our health system, as well as our overall society, towards a prevention focus represents a fundamental paradigm shift affecting all members of our society. In addition to individual personal responsibility for our own health, health care providers, employers, schools, communities, industries, and other institutions have a critical role to play in ensuring the long-term health of our state by recognizing the importance of taking the proper actions now, before the burden of preventable disease and condition becomes too great.

As a state, North Carolina has not invested heavily in the population-, community-, and clinical-level strategies and interventions that can help keep people healthy and that can help people who are not well be as healthy as possible. As population health worsens, costs to both individuals and the health care system as a whole continue to rise. North Carolina spends a greater percentage of its gross state product on health care than the rest of the nation (13.8% compared to 13.3%).<sup>2</sup> Despite spending more, North Carolina fares poorly on many health outcomes compared to the rest of the nation. (See Table 1.1). This may be in part due to the level of funding the state invests in public health. Compared to other states, North Carolina spends less on public health, spending an average of \$50 per person and placing us in the bottom 11 states in terms of public health spending. North Carolina spends considerably less than some of our neighboring southern states. Virginia, for example, spends \$111 per person (ranked 9th), and South Carolina spends \$81 per person (ranked 19th).<sup>1</sup> However, this is beginning to change as state leaders have begun to realize that we can no longer “treat” our way out of the problem.

**Reorienting our health system, as well as our overall society, towards a prevention focus represents a fundamental paradigm shift affecting all members of our society.**

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a All rankings reported in Chapter 1 are based upon the best state ranked as 1st. A larger number indicates poor performance for a particular measure compared to the best state. It is noted when a ranking includes Washington, DC.

Relying on prevention as a basic strategy can save lives, reduce disability, improve quality of life, and potentially decrease costs.

**Table 1.1**  
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) <sup>1</sup>	20.9%	18.4%	37 <sup>th</sup>
Obese adults (2008) <sup>1</sup>	29.5%	26.7%	41 <sup>st</sup>
Physically active adults (2007) <sup>1</sup>	44.0%	49.5%	46 <sup>th</sup>
Incidence of syphilis, gonorrhea, and chlamydia cases per 100,000 (2007) <sup>2</sup>	537.4	492.9	37 <sup>th</sup>
Adults with alcohol and illicit drug abuse or dependence (2006-2007) <sup>3</sup>	8.2%	9.2%	6 <sup>th</sup>
Adults with serious psychological distress (2006-2007) <sup>3</sup>	10.9%	11.1%	15 <sup>th</sup>
Average air pollution (micrograms of fine particulate per cubic meter) (2005-2007) <sup>4</sup>	13.6	13.1	35 <sup>th</sup>
Motor vehicle fatalities per 100,000 (2008) <sup>5</sup>	15.5	12.3	35 <sup>th</sup>
Children ages 19 to 35 months with recommended childhood immunizations (4:3:1:3:3) (2007) <sup>4</sup>	80.0%	80.1%	27 <sup>th</sup>
Low-income families (<200% FPG) (2007-2008) <sup>6</sup>	39.4%	35.8%	39 <sup>th</sup>
Graduation rate (2004-2005) <sup>4</sup>	72.6%	74.7%	39 <sup>th</sup>
Race and ethnicity equity (2007) <sup>7</sup>	33.7	24.1	42 <sup>nd</sup>
Uninsured (2006-2007) <sup>6</sup>	17.2%	15.3%	38 <sup>th</sup>

Sources: [1] Centers for Disease Control and Prevention (CDC), US Department of Health and Human Services. Behavioral Risk Factor Surveillance System Survey Data website. [www.cdc.gov/brfss](http://www.cdc.gov/brfss). Published May 22, 2009. Accessed July 16, 2009. [2] North Carolina Institute of Medicine. Analysis of Centers for Disease Control and Prevention, Sexually Transmitted Disease Surveillance Data, 2007. [3] Hughes A, Sathe N, Spagnola K. (2009). State Estimates of Substance Use from the 2006-2007 National Surveys on Drug Use and Health. Office of Applied Studies, Substance Abuse and Mental Health Services Administration, NSDUH Series H-35, HHS Publication No. SMA 09-4362. Rockville, MD. <http://www.oas.samhsa.gov/2k7/state/adultTabs.htm>. [4] United Health Foundation. America's Health Rankings: data tables. United Health Foundation website. <http://www.americashealthrankings.org/2008/tables.html>. Published 2008. Accessed December 4, 2008. [5] National Highway Traffic Safety Administration. State Traffic Safety Information for Year 2008 website. <http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/USA%20WEB%20REPORT.HTM>. Accessed July 16, 2009. [6] The Kaiser Family Foundation. [statehealthfacts.org](http://statehealthfacts.org). Data Source: Urban Institute and Kaiser Commission on Medicaid and the Uninsured estimates based on the Census Bureau's March 2007 and 2008 Current Population Survey. Accessed August 21, 2009. [7] Cantor JC, Schoen C, Belloff D, How SKH, McCarthy D. Aiming Higher: Results from a State Scorecard on Health System Performance, The Commonwealth Fund Commission on a High Performance Health System, June 2007.

Relying on prevention as a basic strategy can save lives, reduce disability, improve quality of life, and potentially decrease costs. Research has shown that several modifiable factors impact health, including personal behaviors, interpersonal relations, clinical care, communities and the environment, and public and health policies.<sup>3</sup> Furthermore, there are evidence-based, prevention-focused strategies that can address these modifiable factors. Working to address these factors will improve the health, well-being, and overall quality of life of North Carolinians in both the short- and long-term.

## Task Force Charge

North Carolina's leading health foundations recognize the value of prevention to health. These four 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—joined together to ask the North Carolina Institute of Medicine (NCIOM) to convene a Task Force on Prevention. The NCIOM, in collaboration with the North Carolina Division of Public Health (DPH), convened the Task Force in the spring of 2008. The Task Force was chaired by Leah Devlin, DDS, MPH, former State Health Director;<sup>b</sup> Jeffrey Engel, MD, State Health Director, Division of Public Health, North Carolina Department of Health and Human Services; William Roper, MD, MPH, CEO, University of North Carolina (UNC) Health Care System and Dean, UNC School of Medicine; and Robert Seligson, MA, MBA, Executive Vice President and CEO, North Carolina Medical Society. Importantly, representatives of all four foundations were members of the Task Force, so key funders of North Carolina prevention programs helped craft the *Prevention Action Plan for North Carolina* outlined here. In addition to the co-chairs, the Task Force had 46 other members including legislators; representatives of state and local agencies; key health care leaders; public health experts; foundation leaders; business, community, and faith leaders; and other interested individuals. A Steering Committee of 13 individuals, representing many of the same groups mentioned above, guided the work of the Task Force. (See pages 9-12 for a complete listing of Task Force and Steering Committee members.)

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

- Comprehensively examine the preventable, underlying causes of the top 10 leading causes of death and disability in the state.
- Examine health disparities.
- Prioritize 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.
- Develop a comprehensive approach to prevention that includes strategies to address the modifiable factors (i.e. personal behaviors, interpersonal relations, clinical care, communities and the environment, and public and health policies) that affect health outcomes.

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<sup>b</sup> 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.

**The NCIOM Prevention Task Force was charged with developing a comprehensive, evidence-based, statewide prevention plan to improve population health.**

**Working together  
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individuals and the  
system.**

The Task Force met 14 times between April 2008 and August 2009. In March of 2009, the Task Force released an interim report with recommendations covering tobacco use, poor nutrition, physical inactivity, and substance abuse. The Task Force's final report, the *Prevention Action Plan for North Carolina*, is a roadmap that will lead to improved population health if implemented. It is the start of a much larger initiative to improve the health of all North Carolinians. This Plan can provide guidance for new legislative funding and foundation grant-making. Additionally, it can assist in 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. Working together off a common action plan and making wise use of resources offers the greatest opportunity to improve population health in North Carolina and to lower costs to individuals and the system.

The *Prevention Action Plan for North Carolina* contains 14 chapters, with this chapter being an introduction to the work of the Task Force. Chapter 2 provides an overview of prevention and the methodology used to determine the leading causes of death and disability in the state and the preventable underlying causes. This information provided the foundation for the areas of study of the Task Force. The remaining chapters contain recommendations addressing each area the Task Force studied over the 17-month period. Chapter 3 focuses solely on tobacco use—North Carolina's leading cause of preventable death. Chapter 4 examines the impact of poor nutrition and physical inactivity on obesity. Chapter 5 explores sexually transmitted diseases, HIV, and unintended pregnancy in North Carolina. Chapter 6 examines substance abuse and mental health prevention and early intervention. Chapter 7 broadly discusses environmental risks in North Carolina as they relate to population health. Chapter 8 is dedicated to injury, an often overlooked, but major contributor to death and disability. Chapter 9 focuses on preventable infectious disease and foodborne illness. Chapter 10 discusses racial and ethnic disparities, which are pervasive in health behaviors and health outcomes. Chapter 11 addresses upstream socioeconomic factors impacting health such as income, education, and housing. Chapter 12 examines site-specific strategies to improve population health across multiple risk factors. Chapter 13 looks at data needs and translation. Finally, Chapter 14 includes a brief conclusion and a summary of the Task Force recommendations.

Although the *Prevention Action Plan for North Carolina* was developed as the global economic situation deteriorated, a large portion of the work occurred prior to the more dire budget news of the spring and summer of 2009. The 2009-2010 state budget was being adopted just as this report was being finalized, so although there was considerable effort to incorporate noteworthy changes in state policy into the report, not all aspects may have been included. The *Prevention Action Plan for North Carolina* represents a way forward that can occur only if state investments in prevention activities are restored; in other words, for us to improve our efforts in prevention, in some cases we need to climb back up in future years just to get to where we were at the inception of the Task Force in 2008.

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**A**s our nation spends an ever-increasing portion of our gross domestic product on health care, the cost threatens to stifle our ability to remain competitive in the world. Americans are generally in poorer health than our counterparts in the developed world. This may be why we spend more than most other countries yet have similar—or worse—health outcomes. It has been observed that we do not operate a “health care” system; instead we operate a “sick care” system. What if we were to rethink our health care system and turn from a primary focus on treatment to a greater focus on preventing diseases in the first place? This could lead to healthier people and, perhaps, improve our current cost problem. Given that we currently spend only 1%-2% of our health care dollars on prevention activities, this would be a considerable change from the way we think about health care.

North Carolinians face a myriad of different diseases and conditions. Some of these diseases are benign and will resolve on their own or can be cured with medical intervention. Others are chronic but can be managed successfully. Still others can lead to long-term disabilities or premature death. Many of the leading causes of death and disability in North Carolina are preventable, in whole or in part. The North Carolina Institute of Medicine (NCIOM) Task Force on Prevention was charged with identifying evidence-based strategies to prevent these conditions from occurring or to identify the health problems early in the disease so as to more easily treat and resolve the problems.

The *Prevention Action Plan for North Carolina* includes evidence-based strategies that, if followed, would improve population health in the state. The Task Force followed four steps in developing this plan. First, the Task Force identified the diseases and health conditions that had the greatest adverse impact on population health. Second, the Task Force identified the underlying preventable risk factors which contribute to these leading causes of death and disability. Third, the Task Force examined the literature to identify evidence-based strategies that could prevent or reduce the risk factors. Finally, the work of the Task Force was guided by a socio-ecological model. That is, Task Force members recognized that people do not make health decisions in a vacuum. A person’s decision whether to engage in risky health behaviors is influenced by other factors, including the opinions of family and friends, clinical advice, community and environment, and public policies. Through this four-step process the Task Force attempted to identify multifaceted strategies that would support healthy lives on many different levels of the socio-ecological model. Each of these factors is described in more detail below.

## **Leading Causes of Death and Disability in North Carolina**

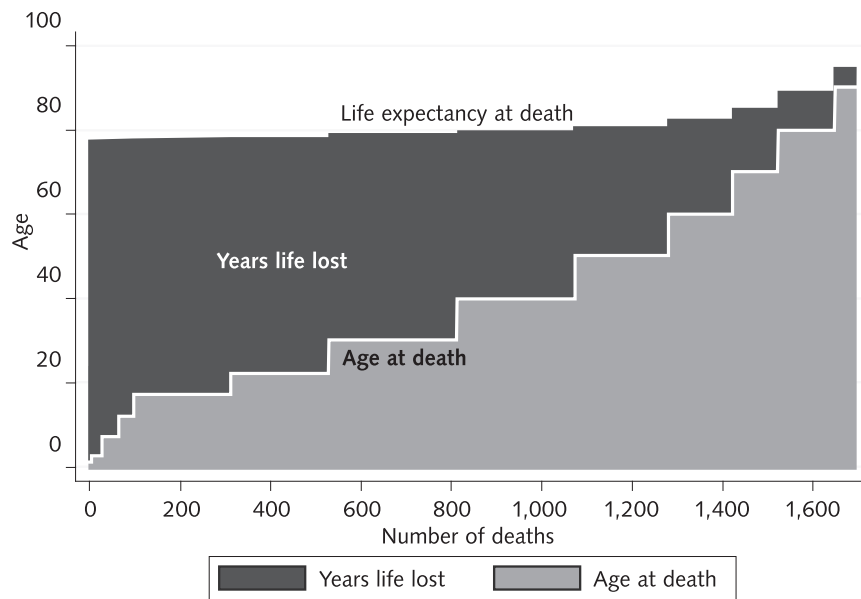
The burden of disease can be conceptualized as two distinct elements: death and disability. Death, or mortality, can be measured in multiple ways, including the

**What if we were to rethink our health care system and turn from a primary focus on treatment to a greater focus on preventing diseases in the first place?**

The burden of disease can be conceptualized as two distinct elements: death and disability.

total number of deaths by underlying cause, age-specific death rates, and *years of life lost* (YLL). The Task Force chose to use YLL, a calculation that estimates the years of life that a person lost due to early death. For example, a newborn in North Carolina has a life expectancy of 76 years. If that newborn dies, there is a loss of 76 years of life. Similarly, a 50-year old has a life expectancy of 79 years, so someone dying at age 50 loses 29 years of life; the death of a 75-year old (life expectancy of 86) leads to a loss of approximately 11 years of life.<sup>1</sup> Effectively, this approach places more weight on deaths at earlier years. As an example, Figures 2.1 and 2.2 show the YLL for two common causes of death for North Carolinians in 2005: motor vehicle accidents (MVAs) and Alzheimer’s. Although there were roughly 30% more deaths due to Alzheimer’s than MVAs, the YLLs for MVAs are much higher. This is due to the fact that Alzheimer’s occurs primarily in older individuals.

**Figure 2.1**  
Years of Life Lost Due to Motor Vehicle Accidents in North Carolina, 2005



Source: North Carolina Institute of Medicine. Analysis of North Carolina Vital Statistics, 2005.

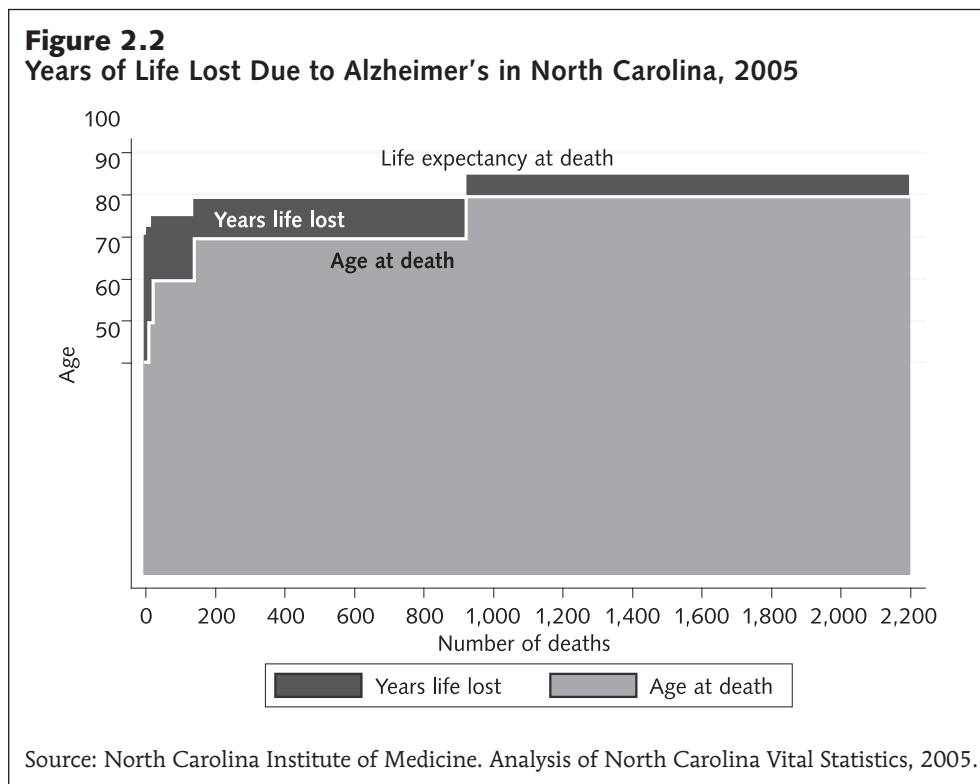
Just as there are multiple ways to measure mortality, there are many ways to measure morbidity. The Task Force chose to measure morbidity as *years of life lost due to disability* (YLD). The measure attempts to quantify the impairments that result from less than perfect health. The term “disability” carries a connotation of being debilitating; however, in this case, disability means a decrease in quality of life, so even common colds carry a disability “weight.” Essentially, YLD uses conversion factors to account for the decrease in quality of life resulting from a particular condition, with 0 representing perfect health and 1 representing death. The closer a weight is to 0, the smaller the disability burden. Weights have been



developed using a variety of methods and are most often based on surveys of people with a particular condition.<sup>a</sup> As examples, an ear infection has a disability weight of 0.023, an episode of limiting low back pain is 0.063, an arm amputation is 0.257, and Alzheimer’s is 0.66.<sup>2</sup> Using these weights, the duration of time with the condition, and the number of people with the condition, measures of the disability burden on North Carolinians can be developed. For example, four years of limiting low back pain ( $4 \times 0.063 = 0.252$ ) is approximately equal in burden to one year of life with an arm amputation (0.257).

The two measures—YLL and YLD—were developed in concert and can be added together to calculate *disability-adjusted life years*, or DALYs. DALYs measure the overall burden of a disease or condition and include the deaths resulting from it, the disabilities (and duration of those disabilities) associated with it, and the

**DALYs measure the overall burden of a disease or condition and include the deaths resulting from it, the disabilities (and duration of those disabilities) associated with it, and the number of people with the particular disease/condition.**



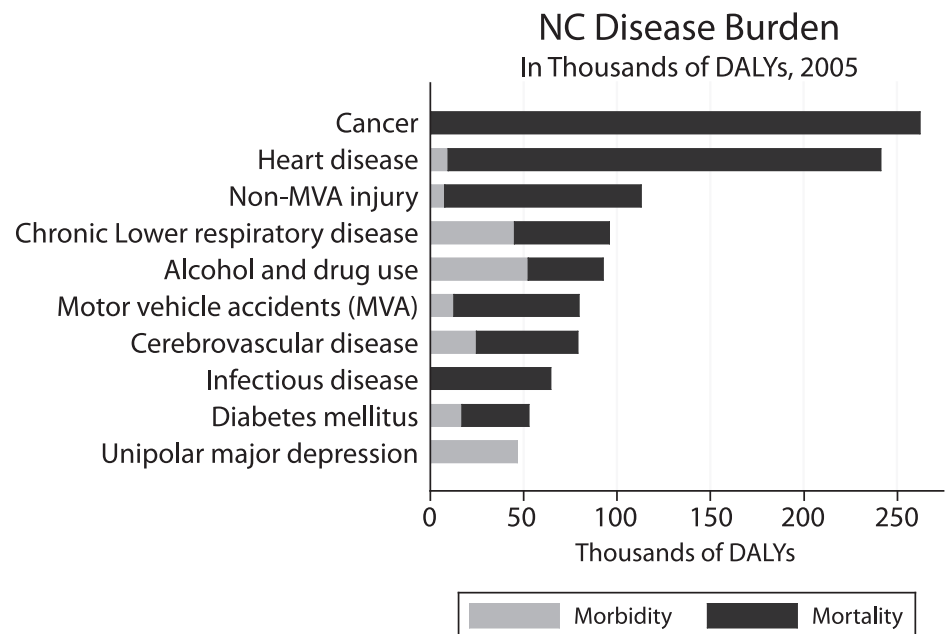
number of people with the particular disease/condition. Although the North Carolina State Center for Health Statistics produces good estimates of YLLs in North Carolina (from death records and life expectancy tables), state-specific data on YLDs are unavailable.<sup>3</sup> However, national data are available.<sup>b,4</sup> The Task Force

a World Health Organization. [http://www.who.int/healthinfo/global\\_burden\\_disease/daly\\_disability\\_weight/en/index.html](http://www.who.int/healthinfo/global_burden_disease/daly_disability_weight/en/index.html)  
 b For this study, the authors used a variety of national data sources (such as hospital discharge data and the National Health and Nutrition Examination Survey data) to estimate the prevalence of diseases and conditions and then applied the Global Burden of Disease disability weights to generate national YLD estimates. See Additional File 2 of Michaud et al. (Population Health Metrics 2006;4:11) available at <http://www.pophealthmetrics.com/content/supplementary/1478-7954-4-11-s2.doc>.

adjusted the national data to the North Carolina population to develop YLD estimates for the state.<sup>c</sup> Figure 2.3 presents the estimated number of DALYs associated with the top 10 conditions yielding the largest death and disability burdens in North Carolina.

Top 10 diseases and conditions leading to greatest disability adjusted life years in North Carolina.

**Figure 2.3**  
**Top 10 Diseases and Conditions Leading to Greatest Disability Adjusted Life Years in North Carolina**



Notes: Infectious disease includes pneumonia and influenza. Non-MVA Injury includes unintentional and intentional injuries.

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 literature review of underlying causes of death and disability for each leading cause.

<sup>c</sup> The national data YLD rates were divided by the national population (in 1996) and multiplied by the North Carolina population (2005); thus, the North Carolina rate was 3.38% of the national rate. This is only an estimate, as it assumes, among other things, a disease prevalence and age structure identical to the national structure in 1996.

Cancer imposes the greatest burden, even without good disability measures, which is due to the lack of an estimated disability burden of cancer.<sup>d</sup> Heart disease closely follows cancer. The combined incidence of cancer and heart disease yields a “cost” of over 500,000 DALYs in North Carolina each year. In terms of morbidity, 500,000 DALYs is equivalent to 6,579 newborn deaths (=500,000/76 years expected life) annually. Other conditions leading to large burdens include chronic lower respiratory disease (such as asthma, emphysema, and chronic bronchitis), intentional and unintentional injuries, alcohol and drug use, motor vehicle accidents, strokes, infectious diseases, diabetes, and unipolar depression.

### **Underlying Preventable Risk Factors Contributing to the Leading Causes of Death and Disability in North Carolina**

North Carolina can do more to prevent premature death and disability by reducing the number of people who engage in or are exposed to certain risk factors or by providing individuals with more health promoting opportunities. The idea is to move “upstream” to prevent a given health problem from occurring in the first place. Thus, the second step that the Task Force undertook was to identify preventable risk factors which contribute to the leading causes of death and disability. Staff at the NCIOM undertook a literature review to identify the most common preventable risk factors. (See Appendix C.)

Personal behaviors, such as smoking, exercise, nutrition, use of alcohol or drugs, and risky sexual behavior contribute to most of the leading causes of death and disability in North Carolina. For example, tobacco use can contribute to cancer and heart disease, failure to exercise and improper diet can lead to heart disease or diabetes, and use of alcohol or other drugs can contribute to motor vehicle injuries or depression. However, there are other risk factors which also impact individual health status. Exposure to toxic chemicals or other environmental hazards can lead to cancer, while exposure to bacteria or viruses can lead to infectious diseases. Further, lack of education or living in poverty can contribute—both directly and indirectly—to many of the major health problems facing the state. Based on this literature review, the Task Force identified 10 preventable risk factors which contribute to the leading causes of death and disability in the state. (See Table 2.1.) These include the following: tobacco use; poor nutrition and physical inactivity resulting in overweight and obesity; risky sexual behavior; alcohol and drug use; emotional and psychological factors; chemical and environmental pollutants; unintentional and intentional injuries; bacteria and infectious agents; racial and ethnic disparities; and socioeconomic factors.

**North Carolina can do more to prevent premature death and disability by reducing the number of people who engage in or are exposed to certain risk factors or by providing individuals with more health promoting opportunities.**

<sup>d</sup> Given prevalence rates and disability weights, it would be possible to calculate North Carolina-specific disability estimates. But estimates for other conditions would not be as easy to calculate (due to limited data on prevalence or disability weights), so for comparison purposes the Task Force decided not to develop estimates beyond those included in the Michaud et al. (Population Health Metrics 2006;4:11) study.

Given current budget constraints, the Task Force was particularly mindful of the need to use existing dollars more constructively and sought to direct new funding to evidence-based strategies, or when unavailable, best or promising practices.

**Table 2.1**  
Diseases and Conditions Leading to Greatest DALYs in North Carolina and Their Underlying Preventable Causes

	Tobacco use	Diet, physical inactivity, 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 injury	✓	✓		✓	✓		✓		✓	✓
Chronic lower respiratory disease	✓	✓				✓			✓	✓
Alcohol and drug use				✓	✓				✓	✓
Motor vehicle injuries (MVI)				✓			✓		✓	✓
Cerebrovascular disease	✓	✓	✓	✓					✓	✓
Infectious diseases				✓		✓		✓	✓	✓
Diabetes		✓							✓	✓
Unipolar major depression				✓	✓				✓	✓

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

### Identifying Evidence-Based Strategies to Reduce the Preventable Risk Factors or Promote Healthful Behaviors and Environments

Too often in the past we have based our interventions on what we thought or hoped would work, without any real evidence of their efficacy. Or, we might identify an initiative that works in one location and try to replicate it without following the same program structure. These efforts often fail to live up to our expectations and do not produce the results we are seeking.

Given current budget constraints, the Task Force was particularly mindful of the need to use existing dollars more constructively and sought to direct new funding to evidence-based strategies, or when unavailable, best or promising practices. Thus, most of the Task Force’s time was spent identifying evidence-based, best, or promising practices that could reduce risky behaviors and lead to better health outcomes.

Essentially, evidence-based programs or strategies are those that have been subject to rigorous evaluation and have been shown to produce positive outcomes.

Typically, an intervention is considered “evidence-based” when it has been subject to multiple evaluations across different populations, when the evaluations include large enough sample sizes to be able to measure meaningful effects of the intervention, and when the evaluations consistently find positive outcomes.<sup>5</sup> The best studies are double-blind randomized control studies, where the individuals who are part of the study (“subjects”) are randomly assigned to an intervention or nonintervention (“control”) group, and neither the researchers nor the subjects knows which group the subjects are in. Any changes in health status as a result of the intervention can generally be attributed to the intervention because individuals were randomly assigned to a control or intervention group. While considered the “gold standard,” randomized control trials (RCTs) are usually more expensive and take a longer time to conduct. Further, it is difficult to test community-wide interventions through RCTs. These types of trials are often used to test clinical interventions.

Population-based prevention interventions are often evaluated through other study designs. For example, researchers may use a comparison-group study (examining the outcomes of an intervention in one community with a “matched” group or another community with similar characteristics that did not receive the intervention). Or they may conduct pre-post studies (which measure the changes in the same individuals before and after the intervention). While these evaluation studies are generally less expensive and quicker to conduct, the findings are not as robust as those that come from a well-designed RCT.

The NCIOM Task Force on Prevention began its efforts to identify evidence-based strategies by examining the work of other national organizations that have been charged with reviewing the evidence and making recommendations about clinical interventions, programs, or policies that have been shown to be successful in producing positive health outcomes. For example, the NCIOM Task Force examined the recommendations of the US Preventive Services Task Force (USPSTF) when examining potential clinical interventions.<sup>e</sup> The USPSTF is charged by Congress to identify the screening, counseling, and preventive medications that should be routinely offered to populations in primary care settings. For community and environmental approaches, the NCIOM Task Force relied upon recommendations developed by the US Task Force on Community Preventive Services and published in the Guide to Community Preventive Services (Community Guide).<sup>f</sup> The US Task Force on Community Preventive Services is appointed by the Director of the Centers for Disease Control and Prevention (CDC) to identify evidence-based community-based prevention initiatives.

**Evidence-based programs or strategies are those that have been subject to rigorous evaluation and have been shown to produce positive outcomes.**

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e The US Preventive Services Task Force studies preventive clinical services and issues recommendations to guide clinical care for a variety of health issues ranging from nutrition to sexually transmitted diseases.  
<http://www.ahrq.gov/CLINIC/uspstfix.htm>.

f The Centers for Disease Control and Prevention’s Guide to Community Preventive Services (Community Guide) provides information on recommended evidence-based interventions to improve public health and systematic reviews of the evidence behind multiple strategies for major public health issues.  
<http://www.thecommunityguide.org/index.html>.

**The Task Force also considered promising practices when it was unable to identify either evidence-based or best practices.**

Both of these organizations follow a similar approach in making their recommendations and continue to refine their recommendations based upon new and emerging evidence. They both begin by reviewing all studies that have evaluated a particular intervention. The USPSTF focuses on clinical interventions, whereas the Community Guide focuses on population-based prevention interventions affecting communities or health care systems.<sup>6</sup> Both Task Forces examine the quality of the studies, design suitability, number of studies, consistency of results across multiple studies, generalizability to other populations, and the strength of the findings (i.e. large impact, small impact, no impact).

Neither the USPSTF nor the Community Guide has covered all the topics addressed in the *Prevention Action Plan for North Carolina*. Thus the NCIOM Task Force on Prevention turned to other sources for evidence-based strategies. For example, the US Substance Abuse and Mental Health Services Administration (SAMHSA) identifies evidence-based strategies to prevent or reduce use of alcohol and other drugs.<sup>g</sup> Similarly, the US Department of Education maintains a website of evidence-based interventions to improve educational outcomes.<sup>h</sup> Additionally, there are other national organizations that have examined the evidence and made recommendations for subjects that were not addressed through the USPSTF or Community Guide, including the Institute of Medicine of the National Academies and professional associations such as the American Academy of Pediatrics.

Unfortunately, there are not well-researched evidence-based strategies for all of the risk factors identified by the NCIOM Task Force. Some interventions have not yet been subject to sufficient evaluation to draw a definitive conclusion about their effectiveness. The intervention may not have been subject to multiple different evaluations (in different settings), or the intervention may be too new to have been evaluated. In these instances, the Task Force tried to identify best practices—that is, practices where there is scientific evidence to suggest that this intervention *might* be effective. There may be some evidence from the published scientific literature but not a sufficient number or quality of studies to warrant designation as an evidence-based practice. Alternatively, there may have been internal program evaluations or some evidence from public health practice of positive results that have not been published in the scientific literature.

The Task Force also considered promising practices when it was unable to identify either evidence-based or best practices. Promising practices include interventions that may have yielded positive intermediate effects (e.g. changes in knowledge) but have not been tested to determine whether it produced changes in health outcomes (e.g. behavioral changes).<sup>6</sup>

Overall, the Task Force tried to identify preventive services, programs, or policies which had the greatest likelihood of producing positive health outcomes—either

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g The US Substance Abuse and Mental Health Services Administration maintains a website of evidence-based prevention, early intervention and treatment programs for substance abuse and mental health. The information is available at: <http://www.nrepp.samhsa.gov/>.

h The US Department of Education maintains a website of evidence-based programs that have been shown to improve educational outcomes. <http://ies.ed.gov/ncee/wwc/>.

through reductions in risk factors or improvements in health promoting behaviors. The Task Force focused on the demonstrated or potential *effectiveness* of an intervention in producing the results. When available, the Task Force also considered the *cost-savings* or *cost-effectiveness* of the intervention. Cost-savings measure whether the interventions lead to absolute savings through lower lifetime costs. For example, the costs of providing immunizations to an entire population are more than offset by the savings in health care costs for the people who would have otherwise become sick.<sup>7</sup> Unfortunately, with the exception of immunizations and a few other clinical services such as smoking cessation and aspirin use for high-risk patients, there are few other clinical interventions which have been proven to lower overall health care spending.<sup>8</sup> Sometimes prevention interventions have been shown to produce cost-savings when considering other non-health care related costs. However, most clinical interventions do not lower total expenditures, but rather save lives and improve the quality of life.<sup>8</sup> There is less evidence on the cost-effectiveness for community-based prevention programs; the Community Guide Task Force states in its Community Guide that it frequently finds that:

“no economic evaluations are available for interventions recommended by the [CDC] Task Force (economic evidence was available for only about half of the interventions recommended by the Task Force as of February 2004, and the available evidence was frequently just a single study).” (CDC Guide to Community Preventive Services, page 459)

Thus, there is little evidence suggesting that community-based prevention programs lead to a net decrease in health expenditures. But as others have observed, this is not necessarily the most appropriate question; the more important question is whether investment in community-based prevention activities yields a reasonable improvement in health for the cost.<sup>8</sup> Most people would likely agree that the goal of preventive care, services, programs, or policies—or for that matter, any health care intervention in general—should not be to minimize total costs—which would mean providing fewer health care services—but instead to choose those interventions that are most cost-effective. That is, we should spend our health care dollars on interventions that work reasonably well or that are cost-effective.<sup>i</sup> Cost-effectiveness examines the potential health outcomes compared to the investment, with those interventions producing the best health outcomes for the least amount of money considered more cost-effective than those that produced moderate to small outcomes for a lot of money. Unfortunately, few of the evidence-based strategies were evaluated using either cost-savings or cost-effectiveness analysis. Thus, the Task Force focused most of its work on identifying strategies that are effective in producing desired health outcomes.

**The Task Force focused most of its work on identifying strategies that are effective in producing desired health outcomes.**

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i The historical benchmark for cost effectiveness is between \$50,000 and \$100,000 per year of life, roughly the cost of kidney dialysis. (Ubel PA, Hirth RA, Chernew ME, Fendrick AM. What is the price of life and why doesn't it increase at the rate of inflation? *Arch Intern Med.* 2003;163(14):1637-1641. Winkelmayr WC, Weinstein MC, Mittleman MA, Glynn RJ, Pliskin JS. Health economic evaluations: the special case of end-stage renal disease treatment. *Med Decis Making.* 2002;22(5):417-430.) Cost-effectiveness of interventions can thus be divided into four categories: cost-saving, highly-cost effective, moderately cost-effective, and not cost-effective.

People do not act in a vacuum. Their actions are influenced not only by personal preferences, but by family, friends and peers; the advice they receive from their health providers; the broader community in which they live, attend school, or work; and public policies.

## Multifaceted Interventions are Key to Changing Population Health

The Task Force recognized that health outcomes are often influenced by personal behaviors and choices.<sup>j</sup> However, people do not act in a vacuum. Their actions are influenced not only by personal preferences, but by family, friends and peers; the advice they receive from their health providers; the broader community in which they live, attend school, or work; and public policies. Essentially, this is a socio-ecological model of health behavior.<sup>9</sup> (See Figure 2.4.) The five levels of intervention considered by the Task Force are the following:

- **Individual:** a person's behaviors, attitudes, characteristics, and practices.
- **Interpersonal:** a person's family, friends, peers, and others who influence their behaviors and experiences.
- **Clinical Care:** a person's doctors and other health professionals whose care impacts their health and well-being.
- **Community and Environment:** a person's school, neighborhood, church/synagogue/mosque, where social interactions occur, as well as the built environment, weather, and community design which many influence health.
- **Public Policies:** policies at the local, state, and national level that influence health.

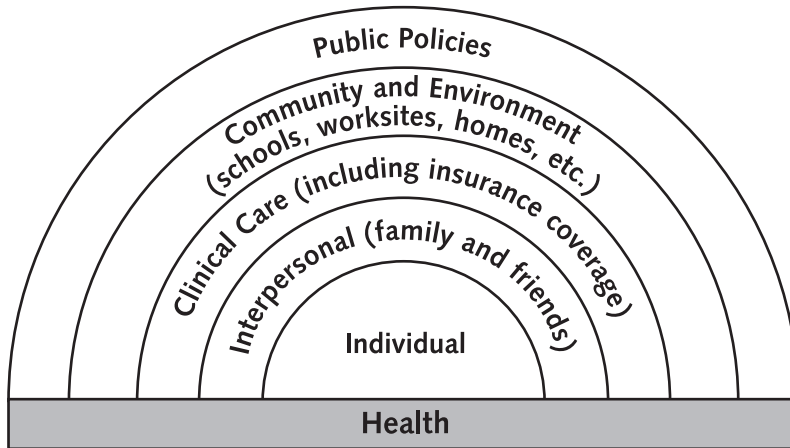
Each of the layers of the socio-ecologic model influences other levels. For example, an individual can influence his friends or family just as friends and families can influence the individual's behavior. Many individuals, working together, can influence public policies. And public policies can have 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.<sup>10</sup>

North Carolina first began its multifaceted strategy to reduce tobacco use in 1991 with funding from the National Cancer Institute and the American Cancer Society, which was used to develop a tobacco prevention and reduction plan. The state implemented more systemic multifaceted interventions beginning in 2003, with the infusion of funding from the North Carolina Health and Wellness Trust Fund (HWTF). For example, the HWTF initiated a social marketing campaign (i.e. the TRU campaign) targeting individual behaviors and helped provide funding for QuitlineNC, which supports individuals who wanted to quit smoking. In addition

j The Task Force also recognized that personal behaviors and lifestyle choices do not contribute to all adverse health outcomes. For example, genetics plays a role in many illnesses. Exposure to environmental hazards may play a role in many cancers, and accidents may be caused by the actions of others rather than the individual who is harmed. The US Surgeon General estimated that as much as 50% of health outcomes are due to personal choices, 20% due to genetics, 20% due to environment or community factors, and 10% due to medical interventions. (Office of the Surgeon General, US Department of Health and Human Services. Healthy people: the Surgeon General's report on health promotion and disease prevention. [http://profiles.nlm.nih.gov/NN/B/B/G/K/\\_/nnbbgk.pdf](http://profiles.nlm.nih.gov/NN/B/B/G/K/_/nnbbgk.pdf). Published 1979. Accessed July 15, 2009.)



**Figure 2.4**  
Many Different Factors Influence Individual Behavior and Ultimately the Health of the Individual



Source: Figure created by the North Carolina Institute of Medicine.

to investments from the HWTF, North Carolina public and private insurers began to pay for clinical interventions (e.g. counseling and tobacco cessation medications); private funders (e.g. The Duke Endowment and HWTF) supported interventions to reduce tobacco use in the community (e.g. 100% tobacco-free schools and hospitals); and the North Carolina General Assembly supported policy interventions (e.g. increasing the tobacco tax, and later, mandating that all public schools be 100% tobacco-free). Prior to that, there was little improvement in tobacco use rates. Between 1995 and 2003, the adult smoking rate hovered at around 25%. Since implementing this multifaceted evidence-based strategy, the adult smoking rate decreased from 24.8% (2003) to 20.9% (2008). Similarly, the youth smoking rate has declined. From 2003 to 2007, the high school use rate declined from 27.3% to 19.0%, while the middle school use rate dropped from 9.3% to 4.5%. The implication from our state's improvement in tobacco use rates is clear: broad-based, systematic investment in multifaceted interventions can be effective at addressing seemingly "intractable" public health problems. The path demonstrated by our success in decreasing tobacco use should be replicated across the risk factors outlined in this report.

The Task Force learned from the success of our state's tobacco prevention activities; thus, when possible, the Task Force tried to identify evidence-based, best, or promising practices in different levels of the socio-ecological model. We can make progress in preventing and reducing other underlying causes of death and disability in North Carolina by adopting a similar approach that includes evidence-based strategies aimed at the various levels of the socio-ecologic model.

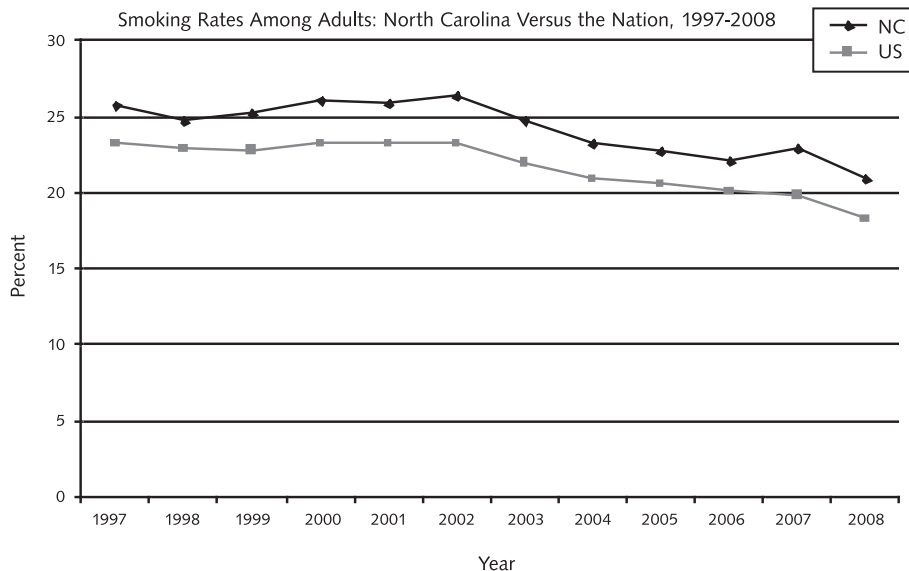
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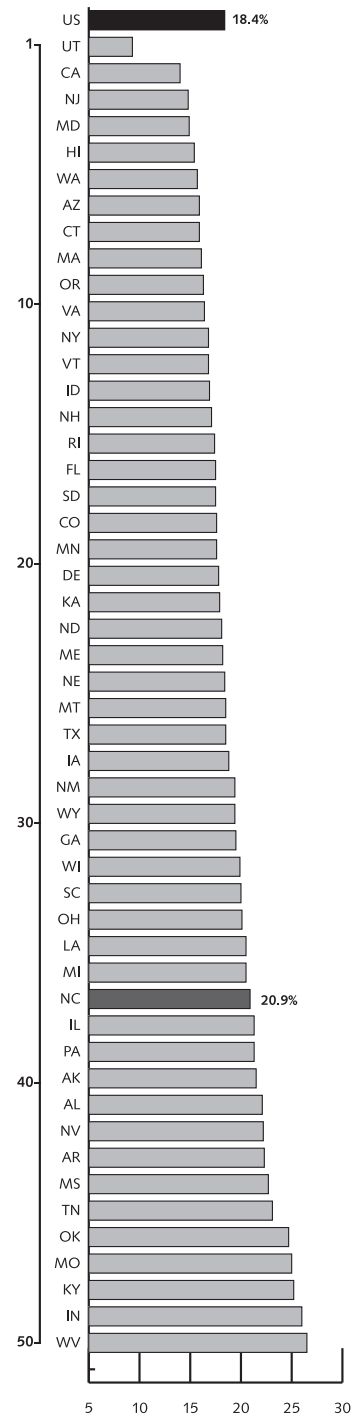
**T**obacco use is the leading cause of preventable death in North Carolina. From 2005-2009, an estimated 13,000 North Carolinians ages 35 years or older died each year from a smoking-related death.<sup>a</sup> In 2008, nearly 2 million, or 20.9%, of adults in North Carolina smoked compared to 18.3% of adults in the United States as a whole, ranking North Carolina 14th highest in smoking prevalence in the nation.<sup>b,1</sup> Although overall smoking rates among adults in North Carolina have dropped since 1997, North Carolina's rates consistently remain above those of the nation. (See Figure 3.1.) In contrast, North Carolina youth are less likely to smoke than youth nationwide (19.0% vs. 19.7% among high school students and 4.5% vs. 6.3% among middle school students).<sup>c</sup>

**Figure 3.1**  
North Carolinians More Likely to Smoke than Rest of Nation



Source: Centers for Disease Control and Prevention (CDC), US Department of Health and Human Services. Behavioral Risk Factor Surveillance System Survey Data website. [www.cdc.gov/brfss](http://www.cdc.gov/brfss). Published May 22, 2009. Accessed July 16, 2009.

**Adults Who Are Current Smokers, 2008**



Source: Centers for Disease Control and Prevention (CDC), US Department of Health and Human Services. Behavioral Risk Factor Surveillance System Survey Data website. [www.cdc.gov/brfss](http://www.cdc.gov/brfss). Published May 22, 2009. Accessed July 16, 2009.

- a North Carolina Institute of Medicine calculation extrapolating from State Tobacco Activities Tracking and Evaluation (STATE) System and state population estimates.
- b Adult smokers are those who have smoked more than 100 cigarettes in their life and now smoke some days or every day.
- c Placona M. Evaluation Specialist, Surveillance and Evaluation Team, Tobacco Prevention and Control Branch, Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. May 27, 2009. State Tobacco Activities Tracking and Evaluation (STATE) System. <http://apps.nccd.cdc.gov/statesystem/DataSource.aspx>. Accessed August 5, 2009.

**Tobacco use is the leading cause of preventable death in North Carolina. From 2005-2009, an estimated 13,000 North Carolinians ages 35 years or older died each year from a smoking-related death.**

Many North Carolinians also use other tobacco products (OTP). In 2008, 20% of adults used smokeless tobacco products and 4% used other smoke tobacco products.<sup>d,2</sup> Among youth, 26.6% of high school students and 9.1% of middle school students report current use of any tobacco product.<sup>e,3,4</sup>

At least 30% of all cancer deaths and nearly 90% of lung cancer deaths—the leading cause of cancer deaths among men and women—are caused by smoking.<sup>5</sup> Furthermore, many other cancers such as oral, esophageal, pancreatic, cervical, bladder, stomach, and kidney are caused by smoking. Other diseases linked directly to smoking include chronic obstructive lung disease and coronary heart disease. Additionally, the risk for health events such as stroke and heart attack are greatly increased in those who smoke.<sup>6</sup> Other tobacco products, such as smokeless tobacco, impose great risks to health as well. Not only do OTP such as chewing tobacco lead to nicotine addiction, they also cause oral cancer. There are 28 cancer-causing substances in smokeless tobacco.

Aside from the direct impact on individual smokers, nonsmokers are harmed by exposure to the toxins in secondhand smoke. Secondhand smoke contains 250 or more toxic chemicals, and more than 50 of them are known to cause cancer.<sup>7</sup> There is no safe level of exposure to secondhand smoke and even exposure for a short duration is harmful to health.<sup>7</sup> Similar to the effects of active smoking on individuals, secondhand smoke exposure causes premature death and disease in children and adults who are nonsmokers. Secondhand smoke exposure has been linked to heart disease and lung cancer in nonsmoking adults.<sup>8</sup> It also increases the risk of heart attack, especially among people who have heart disease. Youth are uniquely affected by secondhand smoke. Lung development in children is hindered by secondhand smoke exposure, and exposure can also lead to acute respiratory infections and ear problems and exacerbate asthma, thus causing more severe and frequent attacks.<sup>9</sup>

Nationwide, more than 70% of individuals who smoke want to quit, and each year more than 40% try to quit.<sup>10,11</sup> In 2007 56.8% of smokers in North Carolina stopped smoking for at least one day because they were trying to quit smoking.<sup>12</sup> Unfortunately, individual tobacco cessation rates are low—only about 4%-7% of the 19 million individuals who tried to quit in 2005 were successful. However, success is more likely when individuals receive assistance. Success rates of 10%-30% can occur when individual efforts are combined with other resources and interventions such as a physician's advice to quit, counseling, and appropriate medications.<sup>f,g</sup> For example, simple advice from a physician can increase quit rates up to 10%, while eight counseling sessions in addition to medication increase quit rates to 32.5%.<sup>10</sup>

d 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.

e Current use of other tobacco products includes those who report use in the past 30 days of any of the following: cigars, smokeless tobacco, pipes, and bidis.

f Success rates reported here depend on medication and on length, duration, and intensity of counseling.

g Estimated long-term abstinence rates according to meta-analyses of first-line pharmacotherapies, which include bupropion SR, nicotine gum, nicotine inhaler, nicotine nasal spray, and nicotine patch.

North Carolina first began its multifaceted strategy to reduce tobacco use in 1991 with funding from the National Cancer Institute and the American Cancer Society, which was used to develop a tobacco prevention and reduction plan. The state implemented more systemic interventions beginning in 2003 with the infusion of funding from the North Carolina Health and Wellness Trust Fund (HWTF). Prior to this, there was little improvement in tobacco use rates; between 1995 and 2003, the adult smoking rate hovered at about 25%. Since implementing this multifaceted evidence-based strategy—including a social marketing campaign aimed at changing individual behavior (i.e. TRU), clinical counseling and interventions (e.g. QuitlineNC and insurance coverage for counseling and tobacco cessation medications), community efforts (e.g. tobacco-free schools and hospitals), and policy interventions (e.g. a modest increase in the tobacco tax)—the adult smoking rate decreased from 24.8% (2003) to 20.9% (2008).<sup>13,14</sup> Similarly, the youth smoking rate has declined. From 2003 to 2007 the high school use rate declined from 27.3% to 19.0%, while the middle school use rate dropped from 9.3% to 4.5%.<sup>15</sup>

Despite our initial achievements, far too many North Carolinians continue to use tobacco products. North Carolina has not done as much as it can to help protect youth from tobacco use initiation, to assist smokers or other adult and youth tobacco users who want to quit, and to protect the public from secondhand smoke. Given the proven negative impacts of tobacco use on health and life and on North Carolina, the Task Force on Prevention has developed recommendations on how to strengthen and improve North Carolina's comprehensive tobacco control program.

### Comprehensive Tobacco Control Program

The Centers for Disease Control and Prevention (CDC) promotes the implementation of sustained, accountable, comprehensive, statewide tobacco control programs as the best way to reduce smoking rates, tobacco-related deaths, and diseases caused by smoking. The CDC defines a comprehensive tobacco control program as a “coordinated effort to establish smoke-free policies and social norms, to promote and assist tobacco users to quit, and to prevent initiation of tobacco use.” This approach combines educational, clinical, regulatory, economic, and social evidence-based strategies to reduce smoking and the negative health effects of smoking. In California, the state with the longest running comprehensive tobacco control program, smoking rates declined from 22.7% in 1998 to 13.3% in 2006. As a result, heart disease deaths and the incidence of lung cancer have declined at accelerated rates compared to the rest of the country. In particular, the incidence of lung cancer is decreasing at a rate four times faster in California than in the rest of the country.<sup>11</sup>

There are five components of comprehensive tobacco control programs recommended by the CDC to meet best practice requirements. These include state and community interventions, health communications interventions, cessation interventions, surveillance and intervention, and administration and management.

**Since implementing this multifaceted evidence-based strategy...the adult smoking rate decreased from 24.8% (2003) to 20.9% (2008).... From 2003 to 2007 the high school use rate declined from 27.3% to 19.0%, while the middle school use rate dropped from 9.3% to 4.5%.**

**There are five components of comprehensive tobacco control programs recommended by the CDC to meet best practice requirements. These include state and community interventions, health communications interventions, cessation interventions, surveillance and intervention, and administration and management.**

### *State and Community Interventions*

The CDC recommends approximately 40% of funding be used on statewide and community interventions.<sup>11</sup>

The CDC recommends statewide program funds are used to:

- Support and/or facilitate tobacco prevention and control coalition development and to create links to other coalitions with related goals.
- Implement evidence-based policy interventions to protect people from secondhand smoke and increase cessation rates.
- Collect community-specific data and implement culturally appropriate interventions with appropriate multicultural involvement.
- Monitor pro-tobacco use influences to facilitate public discussion and debate among partners, decision makers, and other stakeholders at the community level.

The CDC recommends community program funds be used to:

- Fund community-based organizations to strengthen the capacity of these groups to positively influence social norms regarding tobacco use and to build relationships between health departments and grassroots, voluntary efforts.
- Empower local agencies to build community coalitions that facilitate collaborations among programs.
- Build and sustain capacity through technical assistance and training through collaboration with partners.
- Support local strategies to educate the public and the media and decision makers about secondhand smoke and cessation services.

Funds are also to be used to support planning, prevention of tobacco-related disparities, and collaboration with chronic disease programs.<sup>11</sup>

### *Health Communications Interventions*

According to CDC best practice recommendations, funding should be sufficient to conduct a health communications campaign in the state's major media markets to promote cessation resources, prevent and eliminate exposure to secondhand smoke, and reach populations with health disparities attributable to tobacco use. Campaigns should educate the public and diverse populations about the health risks of tobacco use and secondhand smoke exposure and should focus on cessation and youth prevention.<sup>11</sup>

North Carolina has a very active health communications practice area, with the HWTF investing in evidence-based paid media campaigns for the first time in the state's history. In particular, the HWTF's campaigns target tobacco prevention and cessation in young people. Forty-six percent of North Carolinians reported they had seen the North Carolina "Tobacco.Reality.Unfiltered" (TRU) media campaign,

which uses emotional testimony of North Carolinians whose health has been severely impacted by tobacco use to help prevent tobacco use among youth.<sup>h,16</sup> A University of North Carolina at Chapel Hill evaluation of the campaign found that 71% of North Carolinians were aware of the campaign and that more than 95% of North Carolina youth who had seen the 2007 TRU ads reported that the ads were “convincing, attention-grabbing, and gave good reasons not to use tobacco.”<sup>15</sup>

Media campaigns are also being used to promote cessation through use of the North Carolina Tobacco Use Quitline (QuitlineNC).<sup>i</sup> The “Call It Quits” campaign launched in 2007 by the HWTF is another example of a successful mass media health communications campaign in the state. This campaign led to a seven-fold increase in call volume to the state’s quitline, particularly among young adults, parents, and others whose behavior influences teen tobacco use.<sup>15</sup> Moreover, state surveys from 2004-2007 show that media is the most commonly acknowledged method through which smokers in North Carolina learn about cessation services.<sup>j,17</sup> Another successful campaign is the “Become An EX” campaign.<sup>k</sup> Since April 2008, over 4,000 adult smokers in North Carolina have registered as users at [www.BecomeAnEX.org](http://www.BecomeAnEX.org) to quit tobacco use. Also during this time period, there have been over 26,000 visitors to the website. Once adequate funding is in place for adult callers to use the QuitlineNC, this campaign can be used to urge adult tobacco users to call the quitline for cessation services.

### **Cessation Interventions**

The CDC recommends telephone counseling and support to assist individuals in quitting tobacco as part of a comprehensive tobacco cessation plan.<sup>m</sup> All 50 states and the District of Columbia offer quitline services as evidence-based practice for smoking cessation.<sup>18</sup>

**[Media] campaigns should educate the public and diverse populations about the health risks of tobacco use and secondhand smoke exposure and should focus on cessation and youth prevention.**

h In preventing teen tobacco use, research shows that ads that “elicit strong emotional response, such as personal testimonials and viscerally negative content, produce stronger and more consistent effects on audience recall.” (Terry-McElrath Y, Wakefield M, Ruel E, Balch GI, Emery S, Szczypka G, et al. The effect of antismoking advertisement executional characteristics on youth comprehension, appraisal, recall, and engagement. *J Health Commun.* 2005;10:127-143.)

i The quitline, 1-800-Quit-Now, is free and confidential for the caller and is available daily from 8 a.m. to 2 a.m.

j Behavioral Risk Factor Surveillance System (North Carolina). Results from 2004, 2005, 2006, and 2007. Survey asked of respondents who smoked and who had heard of Quit Now NC. Question: If yes, how did you hear of the Quit Now NC smoking cessation services?

k The North Carolina Division of Public Health, with support from Blue Cross and Blue Shield of North Carolina, participated in this national ad campaign designed to help adult tobacco users learn how to get beyond events of the day that typically trigger smoking behavior.

l Malek SH. Tobacco Prevention and Control Branch, Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. June 30, 2009.

m This recommendation was developed by the US Task Force on Community Preventive Services, which is a group of experts appointed and supported by the Centers for Disease Control and Prevention. The recommendations of the US Task Force on Community Preventive Services are compiled in the *Guide to Community Preventive Services*, which “serves as a premier source of high quality information on those public health interventions and policies (including law-based interventions) that have been proven to work in promoting health and preventing disease, injury, and impairment.” (Community Guide website. <http://www.thecommunityguide.org/about/> and <http://www.thecommunityguide.org/policymakers.html>.)

**Funds are needed to support the quitline so it can serve all adult tobacco users who want to quit.**

From November 2005 to September 2007, more than 5,000 callers reached North Carolina's Tobacco Use Quitline for cessation assistance.<sup>n,o</sup> Success rates for QuitlineNC show an average 17% quit rate, which is comparable with other tobacco use cessation programs. Preliminary data show that 94% of callers were satisfied with their QuitlineNC experience. On average, state quitlines reach an average of 4% of all smokers; however, the current annual funding of North Carolina's quitline only allows the quitline to reach less than 1% of smokers in the state. In addition, state funding for the quitline was reduced by \$500,000 in the 2009-2010 budget. The CDC recommends that state quitlines reach 6% of smokers.<sup>19</sup> Given the experience of other states, a tobacco tax increase in North Carolina should lead to an increase in call volume. Wisconsin's quitline, for example, received 20,000 calls in the first two months following its \$1.00 cigarette tax increase in 2008. Typical annual call volume was just 9,000 before the increase.<sup>20</sup>

The reach of North Carolina's quitline is limited by the resources devoted to the cessation intervention practice area. The HWTF is by far the largest funder of North Carolina Tobacco Use Quitline services, but its funds are limited to pay for calls from teens, young adults, pregnant women, and adults whose tobacco use behavior impacts teens (e.g. parents who are primary caregivers to children under 18 and school and day care personnel).

Funds are needed to support the quitline so it can serve all adult tobacco users who want to quit. Funding is also needed for nicotine replacement therapy (NRT). Evidence shows that counseling assistance combined with evidence-based cessation medications including NRT increases an individual's chance of quitting. Medication combined with quitline counseling leads to higher abstinence rates than medication alone (28.1% versus 23.2%).<sup>10</sup> Due to legislation passed in 2008, NRT may be supplied free-of-charge to callers through the quitline.<sup>p</sup> The CDC recommends a minimum two-week course of NRT and up to an eight-week course for uninsured or publicly insured callers.<sup>11</sup>

### ***Surveillance and Evaluation***

Surveillance and evaluation of programs and other statewide efforts are of utmost importance and should be a priority in the planning process. The CDC recommends about 10% of total annual funding be allocated to surveillance and evaluation of short-term, intermediate, and long-term intervention outcomes to guide programs and policies and to guarantee accountability to those with fiscal oversight. The intent of this funding is to ensure that North Carolina's tobacco control efforts are achieving the intended purposes and to identify appropriate modifications to existing programs and policies.

n QuitlineNC was established in November 2005.

o The NC Tobacco Use Quitline program is administered by the Tobacco Prevention and Control Branch, North Carolina Division of Public Health (DPH), North Carolina Department of Health and Human Services. Funding is provided by the North Carolina Health and Wellness Trust Fund and the Centers for Disease Control and Prevention (through DPH). Start-up promotions funding was provided by Blue Cross and Blue Shield of North Carolina. Free & Clear, Inc. is the current QuitlineNC vendor.

p NCGS §90-18.6



State surveillance includes “monitoring tobacco-related attitudes, behaviors, and health outcomes at regular intervals of time.” At its core is monitoring achievement within four CDC main program goals:

- Preventing initiation of tobacco use among youth and young adults.
- Promoting quitting among adults and youth.
- Eliminating exposure to secondhand smoke.
- Identifying and eliminating tobacco-related disparities among population groups.

Building and maintaining effective surveillance systems at the state level is critical to achieve these goals. In addition, participation in national surveillance systems enables states to compare progress against other states.<sup>11</sup>

#### **Administration and Management**

The CDC recommends approximately 5% of total annual funding be allocated to state administration and management. Funds are used to support collaborative efforts and coordination among state agencies, public health programs, and policy makers.<sup>11</sup> The infrastructure for tobacco cessation and prevention that is made possible through investments in the administration and management practice area is critical to the occurrence of effective state efforts.

#### **Funding for a Comprehensive Tobacco Control Program**

The CDC recommends that states fund a comprehensive tobacco control program at levels based on the evidence as documented in *Best Practices for Comprehensive Tobacco Control Programs* (2007).<sup>11</sup> Based on North Carolina’s population, smoking prevalence, and other factors, the CDC recommends an annual state appropriation for North Carolina of \$106.8 million for comprehensive tobacco control programs.<sup>9</sup> To meet the CDC best practices requirements for comprehensive tobacco control programs, a state needs funding and activity in all five areas (as outlined above).<sup>11</sup> A practical approach would be to incrementally work toward the full amount, which would allow the state time to build the capacity and infrastructure needed to successfully support and sustain initiatives and efforts within the five best practice areas. CDC funding, tobacco tax revenues (see Recommendation 3.2), or general funds could be used to provide such funding. Combining all sources of tobacco prevention and control funding, North Carolina’s total funding amount for FY 2008-2009 was \$20.6 million, which the CDC considers “minimal reach,” reaching less than 10% of the total population. Total funding for FY 2009-2010 is expected to be below \$17.8 million due to the decrease in funding to the HWTF.

**Based on North Carolina’s population, smoking prevalence, and other factors, the CDC recommends an annual state appropriation for North Carolina of \$106.8 million for comprehensive tobacco control programs.**

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q Comprehensive tobacco control programs are coordinated efforts to establish smoke-free policies and social norms in all populations and age groups, to help all tobacco users to quit, and to prevent the initiation of tobacco use in young people.

**Research by the CDC has shown that the more states spend on comprehensive tobacco control programs, the greater the reductions in smoking.**

Research by the CDC has shown that the more states spend on comprehensive tobacco control programs, the greater the reductions in smoking. Additionally, sustained investments have shown greater and faster impacts.<sup>11</sup> The North Carolina Division of Public Health (DPH) and the HWTF, along with key stakeholders, are planning to convene a committee to develop North Carolina's *Vision 2020 Plan* for comprehensive evidence-based tobacco prevention and control using the CDC best practice areas. The *Vision 2020 Plan* planning committee will involve key stakeholders who will determine a funding plan to incrementally and strategically address all five evidence-based tobacco prevention and control intervention areas according to greatest need and demand. Reaching the CDC's current recommended funding level, \$106.8 million, by 2020 will be integral to the completion and successful implementation of the plan. The *Vision 2020 Plan*, shown in Table 3.1, recommends an incremental approach to reaching the CDC recommended level of funding.

In theory, most or all of the funding recommended by the CDC could come from Tobacco Master Settlement Agreement (MSA) funds. In North Carolina, only 25% of MSA funds were allocated specifically for population health improvement. These funds were allocated to the HWTF.<sup>r</sup> This funding has been primarily focused on reducing tobacco use among teens and young adults up to age 24. For FY 2008-2009, the HWTF's funding for tobacco prevention and cessation initiatives was \$19.2 million. However, the HWTF will have less money available to support tobacco prevention and cessation or other health promotion activities in the future. In 2004, the North Carolina General Assembly scheduled the HWTF to pay \$350 million in bonds that the state issued to support capital construction unrelated to prevention and cessation services. Due to this debt service burden, the HWTF will have significantly less money to put towards tobacco prevention and cessation. HWTF funding for these activities is expected to decrease to below \$15 million starting in FY 2009-2010 as it begins to pay for the debt service at the highest level under the 2004 legislation.

The CDC is the other primary source of current funding for tobacco prevention and control in North Carolina. In FY 2008-2009, the Tobacco Prevention and Control Branch received \$1.4 million from CDC grants. A similar funding level is anticipated in FY 2009-2010. This federal funding provides infrastructure for DPH's evidence-based tobacco control efforts.

<sup>r</sup> In 2000, the North Carolina General Assembly created the HWTF. With its funding (25% of the Tobacco MSA), the HWTF invests in programs and partnerships to help all North Carolinians achieve better health." The HWTF invests in a wide array of prevention activities, including teen tobacco use and prevention and cessation (\$19.2 million in FY 2008-2009); obesity prevention (\$3.4 million in FY 2008-09); health disparities reduction (\$5 million in 2008-09); and other prevention activities (\$1 million in FY 2008-09).

**Table 3.1**  
**North Carolina Tobacco Prevention and Control Current and Recommended State Funding Levels**  
**(2009-2020)**

		Minimal Reach (<10% smokers)	Minimal Reach (<10%)	Limited Reach (25%)	Midpoint (50%)	Large Reach (85%)	Full Reach (100%)
	CDC Recommended Funding Level	2008-2009 Funding	FY 2010 Expected Funding with HWTF Decrease	25% of GOAL by 2011	50% of GOAL by 2015	85% of GOAL by 2018	100% of GOAL by 2020
<b>State and Community Interventions</b>	\$42.7 M	\$8.8 M <sup>2</sup>	\$7.5 M	\$4.7-10.7 M	\$11.1-21.4 M	\$21.8-42.3 M	\$42.7 M
<b>Health Communication Interventions<sup>3</sup></b>	\$17.1	\$6.9	\$5 M	At 25% level in FY 2009 and in FY 2010 (based on projections) <sup>4</sup>	\$4.4-8.5	\$8.7-16.9	\$17.1
<b>Cessation Interventions<sup>5</sup></b>	\$33.1	\$1.9	\$1	\$3.6-8.3	\$8.6-16.6	\$18.2-32.8	\$33.1
<b>Surveillance and Evaluation</b>	\$8.5	\$0.7	\$0.5	\$0.94-2.1	\$2.2-4.3	\$7.4-8.5	\$8.4
<b>Administration and Management</b>	\$5.3	\$1.6	\$1.0	At 25% level in FY 2009 and in FY 2010 (based on projections) <sup>4</sup>	\$1.4-2.7	\$2.7-5.3	\$5.3
<b>TOTAL</b>	<b>GOAL \$106.8 M</b>	<b>\$22.0 M<sup>1</sup></b>	<b>\$17.8 M</b>	<b>\$26.7 M</b>	<b>\$53.4 M</b>	<b>\$90.8 M</b>	<b>GOAL \$106.8 M</b>

[1] This represents 18.6% of CDC's best practices level for FY 2009; however HWTF's funding for tobacco prevention and cessation goes from \$19.2 million in 2008-09 to approximately \$15 million in 2009-2010 due to the debt service burden.

[2] Note that 86% of this funding is focused on teen tobacco interventions and only 14% is focused on other evidence-based interventions, such as eliminating exposure to secondhand smoke from workplaces, creating systems change to promote cessation, and other evidence-based policy interventions.

[3] Considering the reach and average relative cost of media in the state.

[4] The HWTF's TRU Campaign and quitline promotions are evidence-based campaigns. They are effective and the state's first successful education campaigns for tobacco prevention and cessation. The CDC recommends that priority funding be given to health communication interventions even when overall tobacco control funding is limited.

[5] Considering the state prevalence rate and the total number of smokers.

Source: Tobacco Prevention and Control Branch, Division of Public Health, NC DHHS. Developed in response to NC recommendations from the CDC in *Best Practices for Comprehensive Tobacco Control Programs, 2007*. [http://www.cdc.gov/tobacco/tobacco\\_control\\_programs/stateandcommunity/best\\_practices/](http://www.cdc.gov/tobacco/tobacco_control_programs/stateandcommunity/best_practices/).

To ensure that North Carolina has an effective tobacco control program that meets the CDC's recommendations, the Task Force recommends:

### **Recommendation 3.1: Fund and Implement a Comprehensive Tobacco Control Program**

- a) The North Carolina General Assembly should support the state's Comprehensive Tobacco Control Program by protecting the North Carolina Health and Wellness Trust Fund's (HWTF) ability to continue to prevent and reduce tobacco use in North Carolina by:
  - 1) Ensuring that no additional funds are diverted from HWTF's share of the Master Settlement Agreement (MSA).
  - 2) Releasing HWTF from its obligation to use over 65% of its annual MSA receipts to underwrite debt service for the State Capital Facilities Act, 2004.
- b) The North Carolina General Assembly should better enable the North Carolina Division of Public Health (DPH) and HWTF to prevent and reduce tobacco use in North Carolina by appropriating additional funding to DPH so that this new state funding, combined with HWTF's annual allocation for tobacco prevention (based on provision A), reaches \$106.8 million in recurring funds by SFY 2020. The total amount of the funds available for Tobacco Control in North Carolina should be increased as follows:
  - 1) \$26.7 million in recurring funds by SFY 2011
  - 2) \$53.4 million in recurring funds by SFY 2015
  - 3) \$90.8 million in recurring funds by SFY 2018
  - 4) \$106.8 million in recurring funds by SFY 2020
- c) DPH should work collaboratively with the HWTF and other stakeholders to ensure that the funds are spent in accordance with best practices as recommended by the Centers for Disease Control and Prevention.

#### **State and Community Policy Interventions**

Evidence-based comprehensive state and community tobacco prevention and cessation policies are an important component of a state's comprehensive tobacco control program. Such policies help all tobacco users quit, prevent young people from starting to use tobacco products, and protect everyone from the dangers of secondhand smoke. Three of the five most significant actions the CDC recommends states and communities take are policy changes: levying effective tobacco taxes on all tobacco products, enacting smoke-free laws, and reducing out-of-pocket costs for effective cessation therapies.<sup>21</sup>

**Tobacco Taxes**

The CDC recommends increasing taxes on all tobacco products as a primary method to reduce tobacco use and improve public health.<sup>21</sup> In 2005-2006 North Carolina increased its cigarette tax to 35 cents. In 2009-2010 the state increased the cigarette tax an additional 10 cents, bringing the state cigarette tax up to its current rate of 45 cents. With this increase, North Carolina still has the 7th lowest cigarette tax in the country (as of August 12, 2009).<sup>s,t,22,23</sup> Further, the state's tax on OTP, which is currently 12.8% of the wholesale price,<sup>u</sup> is among the lowest in the country.<sup>24</sup>

Raising the tax on all tobacco products will deter initiation of tobacco use by young people, encourage tobacco users of all ages to quit, and save lives.<sup>21,25</sup> The CDC recommends increasing the unit price for tobacco products to reduce the number of people who start smoking and help those who smoke quit.<sup>v</sup> Research shows that a 10% price increase in a pack of cigarettes results in a 4.1% decrease in tobacco use within the general population.<sup>21</sup> Furthermore, youth are reportedly more sensitive to an increase in cigarette price: a 10% price increase results in a 4%-7% decrease in the number of youth who smoke.<sup>21</sup> Although the recent 10-cent increase in the state tobacco tax is too small to have a measurable impact on youth smoking rates, youth smoking rates across the country are expected to decrease due to the 62-cent federal tobacco tax increase in 2009. When added together, the two taxes represent a 19% increase in the cost of a pack of cigarettes, which should result in an 8%-14% decrease in the number of youth who smoke.<sup>26</sup>

Increasing the cigarette tax to the national average would provide tremendous gain for the state in terms of reducing death and disability due to tobacco use. The Campaign for Tobacco-Free Kids estimates that increasing North Carolina's cigarette tax to the national average of \$1.32 (as of August 12, 2009) would result in a 14% decrease in the youth smoking rate. The organization also estimates that there would be 73,700 fewer future youth smokers and 45,500 fewer adult smokers. Additionally, 35,600 future smoking-related deaths would be avoided.

**The CDC recommends increasing taxes on all tobacco products as a primary method to reduce tobacco use and improve public health.**

s Including the District of Columbia

t Alabama, Georgia, Louisiana, North Dakota, South Carolina, and Virginia have cigarette taxes lower than 45 cents.

u Section 27A.5.(c) of SL 2009-451.

v This recommendation was developed by the US Task Force on Community Preventive Services, which is a group of experts appointed and supported by the Centers for Disease Control and Prevention, US Department of Health and Human Services. The recommendations of the US Task Force on Community Preventive Services are compiled in the *Guide to Community Preventive Services*, which "serves as a premier source of high quality information on those public health interventions and policies (including law-based interventions) that have been proven to work in promoting health and preventing disease, injury, and impairment." (Community Guide Web site. <http://www.thecommunityguide.org/about/and> <http://www.thecommunityguide.org/policymakers.html>.)

w Campaign For Tobacco-Free Kids is a nonprofit 501(c)(3) based in Washington, DC, that is dedicated to being a leader in reducing tobacco use and its consequences. Major funders include the American Cancer Society, the Robert Wood Johnson Foundation, the American Legacy Foundation, the American Heart Association, and GlaxoSmithKline Consumer Healthcare. Numerous professional associations including the American Academy of Family Physicians, American Academy of Pediatrics, American College of Obstetricians and Gynecologists, American Dental Association, and American Medical Association are partner organizations. For more information, visit <http://www.tobaccofreekids.org>.

Further, estimated health care savings from raising North Carolina's cigarette tax to the national average of \$1.32 are as follows:

- \$19.1 million in 5-year health care savings from fewer smoking-affected births.
- \$25.6 million in 5-year health care savings from fewer smoking-caused heart attacks and strokes.
- \$1.7 billion in overall long-term health care savings.<sup>22</sup>

In addition, the Campaign for Tobacco-Free Kids estimates that the amount of new annual state tax revenue generated from raising North Carolina's cigarette tax to the national average would be \$296.6 million.<sup>x,27</sup> (This is in addition to the revenue raised by the existing 45-cent tax.) The federal tax on cigarettes was increased to 61.66 cents with the February 2009 federal reauthorization of the Children's Health Insurance Program.<sup>y,z</sup> All of these projections consider the impact of the 61.66-cent federal tax increase on state smoking levels, pack sales, and pack prices.<sup>27</sup>

Raising the tax on OTP will discourage the use of these products as well, with a more significant impact on youth initiation.<sup>aa,28</sup> Furthermore, according to a report of the US Surgeon General, adolescents who use smokeless tobacco are more likely to use cigarettes than those who do not.<sup>29</sup> In addition, an OTP tax comparable to the cigarette tax would discourage the use of OTPs as an alternative to cigarettes by individuals who are quitting or reducing their cigarette consumption.<sup>28</sup> Therefore, implementing these tax increases at the same time is ideal.

An OTP tax comparable to a \$1.32 cigarette tax would be 55% of the wholesale price of OTPs. North Carolina's current OTP tax is 12.8% of the wholesale price. Increasing North Carolina's OTP tax to 55% would lead to an overall OTP consumption decline of 14.8% and a youth use decline of 27.4%, according to the Campaign for Tobacco-Free Kids. New annual revenue of \$48.8 million would be created (in addition to the \$296.6 million of new revenue created by increasing the cigarette tax to the national average).<sup>28</sup> Together, these two tobacco taxes would raise \$345.4 million in new revenues. Revenues generated from the increased taxes on cigarettes and OTP should be used to support tobacco cessation and prevention efforts.<sup>28</sup>

Based on research findings and experiences of other states, the Task Force on Prevention determined that raising North Carolina's tobacco taxes is one of the

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x Note from Campaign from Tobacco-Free Kids: "These estimates are fiscally conservative because they include a generous adjustment for lost state pack sales (and lower net new revenues) from new smuggling and tax evasion after the rate increase and from fewer sales to smokers or smugglers from other states."

y P.L. 111-003

z The new federal tax went into effect April 1, 2009.

aa Taxable tobacco products are defined in this report as smoking tobacco, cigarettes, cigars, cigarillos, bidis, kreteks, snuff, chewing tobacco, snus, and also includes any other product expected or intended for consumption that contains tobacco or nicotine unless it has been approved by the United States Food and Drug Administration as a cessation-assistance product and is being distributed and sold exclusively for that approved cessation-assistance purpose.

most effective ways to reduce initiation of tobacco use by young people and encourage all tobacco users to quit. In addition, North Carolina can show continued commitment to protecting public health and saving lives from tobacco use and secondhand smoke exposure by maintaining a cigarette tax rate that always meets or exceeds the current national average.

Therefore the Task Force recommends:

### **Recommendation 3.2: Increase North Carolina Tobacco Taxes (PRIORITY RECOMMENDATION)**

- a) The North Carolina General Assembly should increase the tax on a pack of cigarettes to meet the current national average. The cigarette tax should be regularly indexed to the national average whenever there is a difference of at least 10% between the national average cost of a pack of cigarettes (both product and taxes) and the North Carolina average cost of a pack of cigarettes.
- b) The North Carolina General Assembly should increase the tax on all other tobacco products to be comparable to the current national cigarette tax average, which would be 55% of the product wholesale price.
- c) These new revenues should be used for a broad range of prevention activities including preventing and reducing dependence on tobacco, alcohol, and other substances.

#### ***Comprehensive Smoke-Free Laws***

Secondhand smoke causes the death of approximately 38,000 nonsmokers in the United States, which translates into approximately 1,700 North Carolinians every year.<sup>30,31</sup> The CDC recommends smoking bans and restrictions to decrease exposure to secondhand smoke. In addition, smoking bans are effective in reducing cigarette consumption and in increasing the number of people who quit smoking.<sup>bb,21</sup>

In May 2009, North Carolina passed Session Law 2009-27, which bans smoking in restaurants and most bars effective January 2, 2010.<sup>cc</sup> The bill also provides local governments the ability to restrict smoking in public places such as movie theaters and shopping malls with the approval of their Board of County Commissioners. Specifically, the bill says that local governments may “enforce ordinances, board of health rules, and policies restricting or prohibiting smoking that are more restrictive than State law and that apply in local government buildings, on local

**Secondhand smoke causes the death of approximately 38,000 nonsmokers in the United States, which translates into approximately 1,700 North Carolinians every year.**

bb This recommendation was developed by the US Task Force on Community Preventive Services, which is a group of experts appointed and supported by the Centers for Disease Control and Prevention, US Department of Health and Human Services. The recommendations of the US Task Force on Community Preventive Services are compiled in the Guide to Community Preventive Services, which “serves as a premier source of high quality information on those public health interventions and policies (including law-based interventions) that have been proven to work in promoting health and preventing disease, injury, and impairment.” (Community Guide web site. <http://www.thecommunityguide.org/about/and> <http://www.thecommunityguide.org/policymakers.html>.)

cc Session Law 2009-27 exempts cigar bars and private clubs.

**In May 2009, North Carolina passed Session Law 2009-27, which bans smoking in restaurants and most bars effective January 2, 2010. While the new law is a step forward and marks progress in protecting North Carolinians from secondhand smoke, North Carolina still does not have comprehensive smoke-free laws that protect all North Carolinians from secondhand smoke exposure by prohibiting smoking in all indoor workplaces and public areas.**

government grounds, in local vehicles, or in public places.” While the new law is a step forward and marks progress in protecting North Carolinians from secondhand smoke, North Carolina still does not have comprehensive smoke-free laws that protect all North Carolinians from secondhand smoke exposure by prohibiting smoking in *all* indoor workplaces and public areas.

Current smoke-free policies in the state only provide limited protection from secondhand smoke exposure. Partial coverage leads to disparities in secondhand smoke exposure. For example, blue collar workers in North Carolina are less likely to report a smoke-free workplace policy than white-collar workers.<sup>32</sup> Current smoking ban laws and regulations cover an estimated 69% of the workforce, leaving 31% unprotected.<sup>33</sup> To protect the public’s health, *all* workers in North Carolina, no matter where they are employed, should be provided with a completely smoke-free work environment as a minimum level of protection from secondhand smoke exposure. A comprehensive state law would protect workers at *all* worksites including small worksites, private offices, factories, clubs, and bowling alleys. Current practices for decreasing second-hand smoke exposure, such as ventilation and smoking areas, are ineffective in protecting workers and visitors from second-hand smoke exposure. Ventilation systems are ineffective since they do not remove the harmful constituents of secondhand smoke.<sup>34</sup> Allowing smoking in certain worksites or in certain areas of worksites does not provide equal and adequate protection to all employees and visitors. A recent study revealed that while business owners in North Carolina generally agree that secondhand smoke may cause lung cancer and heart disease, the single greatest motivation among business owners to adopt a 100% smoke-free policy would be legal regulation or requirement.<sup>35</sup>

Existing state law prohibits smoking in state government buildings and vehicles. Other laws allow, but do not *require*, local governments to prohibit smoking in local government buildings and vehicles, and allow, but do not *require*, the University of North Carolina system and North Carolina Community College System to regulate smoking on campuses. North Carolina state laws and regulations require local boards of education to adopt policies that prohibit tobacco use in public schools (K-12); prohibit smoking in long-term care facilities; prohibit child care facility operators from using tobacco products when children are in care or are being transported; and prohibit the use of tobacco products in state correctional facilities.<sup>dd,ee,36</sup> Private businesses may, of course, set up their own smoke-free policies. But under current North Carolina laws, businesses are not required to be smoke-free. Venues that are currently not covered by a smoke-free law at the state level in North Carolina include private workplaces, retail stores, and recreational/cultural facilities.<sup>36</sup>

dd SL 2007-236, SL 2007-193, Sec. 3.1 Effective August 1, 2008; SL 2007-459; NC Child Care Commission Rule 1720; SL 2005-372

ee Malek SH. Tobacco Prevention and Control Branch, Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. May 27, 2009.



As of June 2009, 27 states and the District of Columbia have passed smoke-free laws that cover restaurants and bars.<sup>ff</sup> Four other states have smoke-free laws that cover restaurants but exempt stand-alone bars.<sup>gg,37</sup> As of July 1, 2009, 17 states have comprehensive smoke-free laws that cover all worksites including restaurants and bars.<sup>38</sup>

Comprehensive statewide smoke-free laws to eliminate exposure to secondhand smoke in all workplaces would save lives in North Carolina. To protect all North Carolinians from secondhand smoke, the Task Force on Prevention recommends:

### **Recommendation 3.3: Expand Smoke-free Policies in North Carolina**

- a) The North Carolina General Assembly should amend current smoke-free laws to mandate that all worksites and public places are smoke-free.
- b) In the absence of a comprehensive state smoke-free law, local governments, through their Boards of County Commissioners, should adopt and enforce ordinances, board of health rules, and policies that restrict or prohibit smoking in public places in accordance with GS 130A-497.

#### ***Cessation Interventions***

Only about 4%-7% of individuals who try to quit tobacco use are successful. A lack of consistent and effective treatment and the chronic nature of tobacco dependence are among the reasons that quit attempts are unsuccessful. Consistent and effective tobacco intervention in the health care delivery system requires the involvement of providers, health care systems, insurers, and purchasers of health insurance.<sup>10</sup>

Providers can play a critical role in helping people quit tobacco use—the leading cause of preventable death in North Carolina. Evidence shows that physicians advising patients to quit provide individuals with motivation for quitting and can increase successful quit rates to 5%-10%.<sup>39</sup> Moreover, cessation success (or abstinence) is directly related to the length, number, and intensity of counseling sessions. Research shows that as these factors increase so do long-term quit rates.<sup>10</sup> Yet, nearly 30% of smokers in the state reported they had not been advised to quit

**Providers can play a critical role in helping people quit tobacco use—the leading cause of preventable death in North Carolina.**

<sup>ff</sup> States with smoke-free laws covering restaurants and bars include Arizona, California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Iowa, Maine, Maryland, Massachusetts, Minnesota, Montana (extends to bars October 1, 2009), Nebraska (June 1, 2009), New Hampshire, New Jersey, New Mexico, New York, North Carolina (January 1, 2010), Ohio, Oregon (January 1, 2009), Rhode Island, South Dakota (July 1, 2009), Utah (extends to bars Jan. 7, 2009), Vermont, Washington, and Wisconsin (July 5, 2010).

<sup>gg</sup> States with smoke-free laws covering restaurants, but exempting stand-alone bars, are Florida, Idaho, Louisiana, and Nevada.

Smoking cessation treatment (i.e. counseling and pharmacotherapy) has been called the “gold standard” of preventive interventions due to the cost savings gained by eliminating tobacco use.

by their provider within the last 12 months.<sup>hh,40</sup> Appropriate medication is another effective method for treating tobacco dependence. However, in 2007, 61.6% of smokers in North Carolina reported that their health care provider did not “recommend or discuss medication to assist them with quitting smoking.”<sup>41</sup> Moreover, national survey data show less than a quarter of current smokers who tried to quit in 2000 used cessation medications.<sup>10</sup>

Smoking cessation treatment (i.e. counseling and pharmacotherapy) has been called the “gold standard” of preventive interventions due to the cost savings gained by eliminating tobacco use.<sup>39</sup> Insurance coverage of tobacco cessation counseling and pharmacotherapy supports primary care providers in providing tobacco use treatment. Research shows that medication and counseling are most effective when used together, and they should be covered benefits for all enrollees and all enrollees should be aware of them.<sup>10</sup> A Healthy People 2010 goal is to “increase insurance coverage of evidence-based treatment for nicotine dependency to 100%.”<sup>42</sup> However, many North Carolinians lack health insurance that provides low- or no-cost tobacco use cessation coverage for counseling and appropriate medications. While the major insurance plans in North Carolina all offer some tobacco cessation products, benefits, or buy-up programs, out-of-pocket costs for individuals remain.<sup>43</sup> These costs can be significant depending on the plan and the individual’s ability to pay. The CDC Community Guide recommends reducing out-of-pocket costs for effective cessation therapies to increase the use of effective therapies, the number of people who attempt to quit, and the number of people who successfully quit.<sup>21</sup> In addition, some insurance coverage has lifetime limits on tobacco cessation treatment. Limiting access to treatment is problematic when one considers the chronic nature of tobacco dependence as most tobacco users cycle through remission and relapse for several years.<sup>10</sup>

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hh The NCIOM has long recognized the multiple demands placed on primary care providers who face significant challenges providing all the recommended care to their patients. There are more than 1,800 evidence-based clinical guidelines to treat patients with different health conditions, and new guidelines continuously evolve for various health conditions. (Agency for Healthcare Research and Quality, US Department of Health and Human Services. National Guideline Clearinghouse. <http://www.thecommunityguide.org/about/>. Published June 23, 2009. Accessed July 31, 2009.) It would take more than 17 hours each day for primary care providers to provide all the evidence-based preventive services and recommended services to a typical daily patient panel. (Bodenheimer T. Primary care—will it survive? *N Engl J Med* 2006; 355(9):861-864. Ostbye T. Is there time for management of patients with chronic diseases in primary care? *Ann Fam Med* 2005; 3(3):209-214. Yarnall KS. Primary care: Is there enough time for prevention? *Am J Public Health* 2003;93(4):635-641.)

To fully reach the potential that can be realized through tobacco cessation treatment services, the Task Force recommends:

### **Recommendation 3.4: Expand Access to Cessation Services, Counseling, and Medications for Smokers Who Want to Quit**

- a) Insurers, payers, and employers should cover comprehensive, evidence-based tobacco cessation services and benefits including counseling and appropriate medications.
- b) Providers should deliver comprehensive, evidence-based tobacco cessation services including counseling and appropriate medications.

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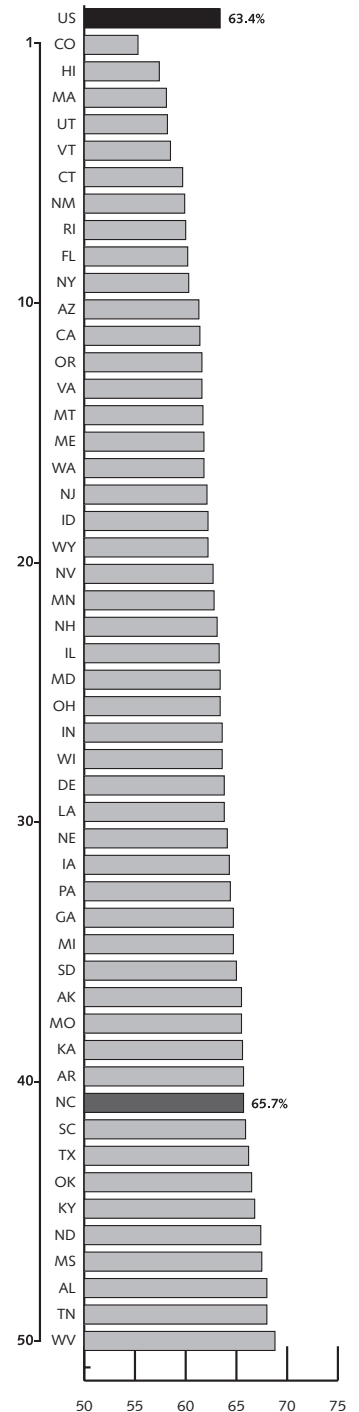
Overweight and obesity pose significant health concerns for both children and adults. Excess weight is not only a risk factor for several serious health conditions, but it also exacerbates existing conditions.<sup>1</sup> For the first time in two centuries, the life expectancy of children in the United States is predicted to be lower than that of their parents. The root cause of this phenomenon is the increased prevalence of obesity.<sup>2</sup>

Excess weight increases an individual's likelihood of developing type 2 diabetes and high blood pressure.<sup>1</sup> Excess weight also increases the likelihood of other life-threatening health problems including heart disease, cancer, and stroke.<sup>3-5</sup> Other health consequences include increased risk of arthritis, pregnancy complications, sleep apnea, asthma, and depression.<sup>1</sup> As the root cause of serious health problems, obesity is a public health problem that requires swift, thoughtful, and comprehensive action by governments, communities, and individuals. North Carolina's action plan to prevent and reduce obesity must include effective and enforced policies, increased attention to the built environment, and information and education for all North Carolinians.

North Carolina is the 10th most overweight/obese state in the nation. Two-thirds (65.7%) of North Carolina adults are overweight or obese.<sup>a</sup> This is slightly higher than the national prevalence of 63.2%.<sup>b,6</sup> Between 1990 and 2008, the prevalence of overweight in North Carolina grew slightly from 33.5% to 36.2%. However, the obesity rate increased rapidly during that time period. In 1990, 12.9% of North Carolinian adults were obese; by 2008, 29.5% of North Carolinians were obese.<sup>6,7</sup> The prevalence of North Carolina adults who are overweight or obese is shown by county in Figure 4.1.

A large proportion of youth in North Carolina are also overweight or obese. According to Trust for America's Health, North Carolina youth ages 10-17 years ranked 14th highest in the country for overweight and obesity.<sup>8</sup> In 2008, 16.4% of children ages 2-18 years were considered overweight and 17.5% were considered

**Percent of Adults Who Are Obese (BMI>30)**



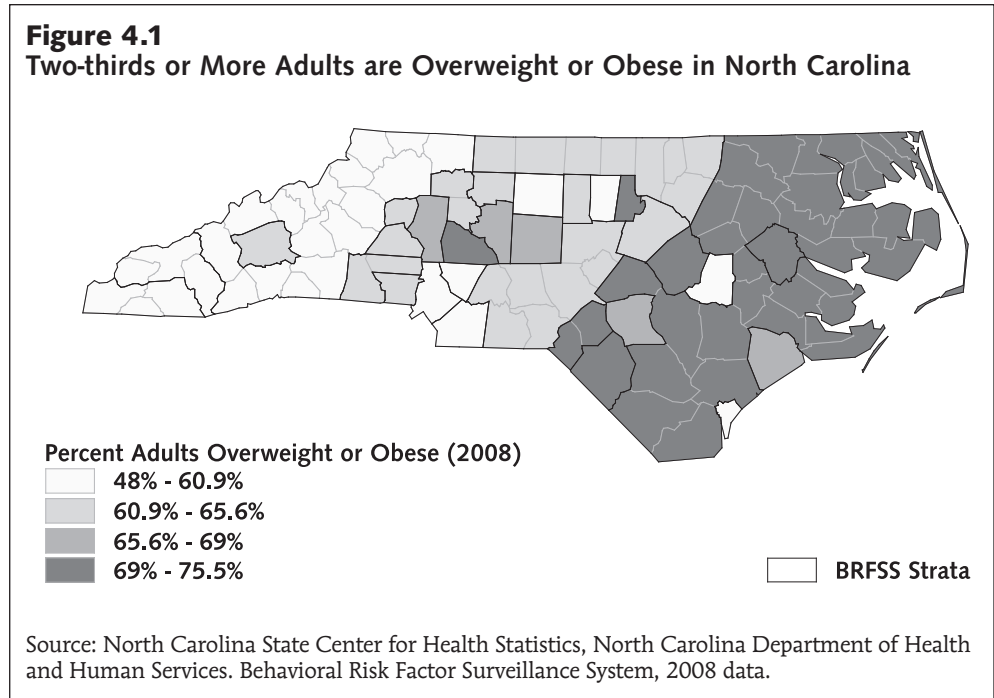
Source: Centers for Disease Control and Prevention (CDC), US Department of Health and Human Services. Behavioral Risk Factor Surveillance System Survey Data website. [www.cdc.gov/brfss](http://www.cdc.gov/brfss). Published May 22, 2009. Accessed July 16, 2009.

a Body Mass Index (BMI) is weight in kilograms/height in meters<sup>2</sup>. BMI is a measure used to determine an individual's weight status. In most individuals, it correlates to the amount of body fat. An individual with a BMI <18.5 is considered underweight; a BMI of 18.5-24.9 is considered normal weight; a BMI of 25.0-29.9 is considered overweight; and a BMI ≥30.0 is considered obese. It should be noted that BMI is a good measure to use on a population basis and that individuals with high muscle mass may have a high BMI even though they are not actually overweight or obese.

b Including all 50 states and the District of Columbia.

North Carolina is the 10th most overweight/obese state in the nation. Two-thirds (65.7%) of North Carolina adults are overweight or obese.

**Figure 4.1**  
Two-thirds or More Adults are Overweight or Obese in North Carolina



obese.<sup>c,d</sup> The prevalence of obesity in low-income children ages 2-18 years increased from 15.6% to 17.5% (from 2002-2008).<sup>9</sup> White and Latino children are more likely to be obese than African American children (17.7%, 22.7%, and 15.7%, respectively).<sup>9</sup> In addition, children in rural areas are at increased risk of being obese.<sup>10</sup>

The increase in overweight and obesity is not unique to North Carolina as the nationwide prevalence of overweight and obesity has risen dramatically over the last 20 years. Figures 4.2 and 4.3 show the increasing prevalence of adult obesity within each state from 1990 to 2007.<sup>e</sup> In 1990 no state (of the 45 states reporting data) had an adult obesity prevalence greater than 14%; in 2007, more than half of states had an adult obesity prevalence of 25% or greater.<sup>11</sup> Childhood overweight and obesity have also risen substantially.<sup>f</sup> From 1963-2004, United States obesity

c The Nutrition Services Branch, North Carolina Division of Public Health maintains the North Carolina Nutrition and Physical Activity Surveillance System (NC-NPASS) and note that “NPASS data are limited to children seen in North Carolina Public Health Sponsored WIC and Child Health Clinics and some School Based Health Centers.”

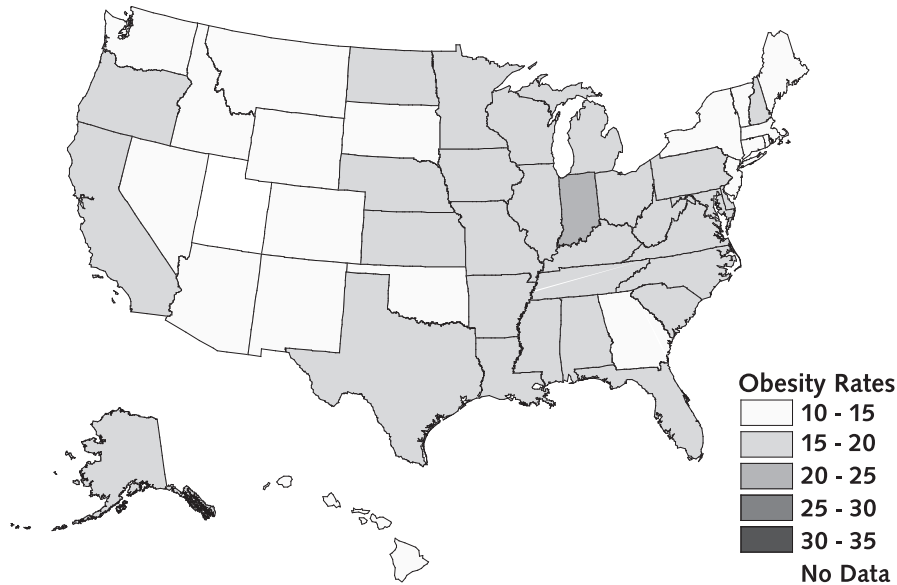
d Note on the terms at-risk for overweight, overweight, and obese. NC-NPASS data are reported as follows: at-risk for overweight is defined as BMI ≥ 85th percentile but < 95th percentile, and overweight is defined as BMI ≥ 95th percentile. However, this report uses the following terminology for discussing 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 report 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 (CDC).

e Since 1985 the CDC has tracked the prevalence of obesity within all 50 states. In 1990 five states including Hawaii, Nevada, Wyoming, Kansas, and Arkansas were not collecting BMI data.

f The 2009 Studies Act creates a Legislative Task Force on Childhood Obesity, which is to report its findings to the General Assembly for the 2010 regular session.

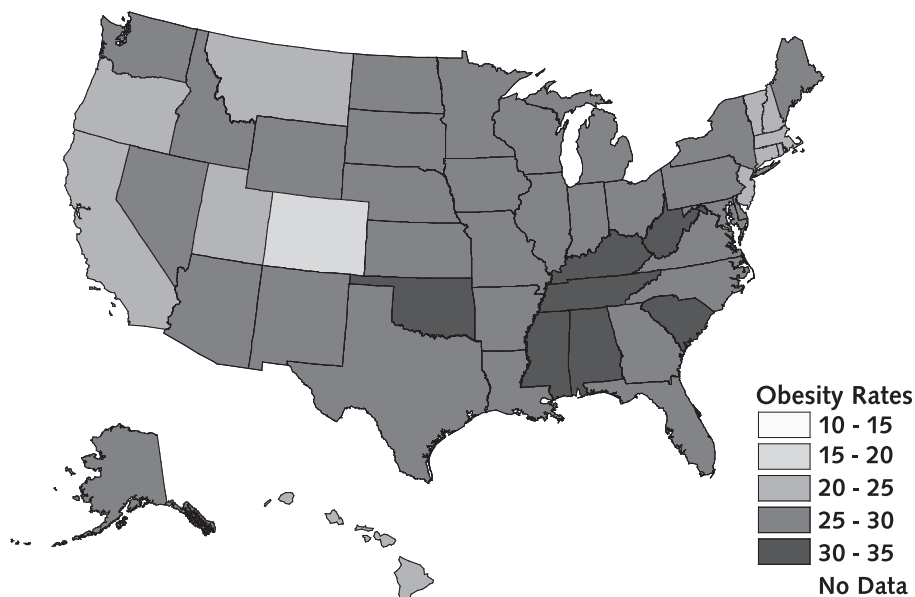


**Figure 4.2**  
**Obesity Rates Have Increased Dramatically Over the Last 13 Years.**  
**1995 Obesity Rates**



Source: Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System: prevalence and trends data, United State, 1985-2008. <http://www.cdc.gov/obesity/data/trends.html>. Accessed August 12, 2009.

**Figure 4.3**  
**Obesity Rates Have Increased Dramatically Over the Last 13 Years.**  
**2008 Obesity Rates**



Source: Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System: prevalence and trends data, United State, 1985-2008. <http://www.cdc.gov/obesity/data/trends.html>. Accessed August 12, 2009.

**Excess weight in North Carolina led to an increase of \$2.81 billion in medical costs, \$0.96 billion in prescription drug costs, and \$11.80 billion in lost productivity costs in 2006.**

rates quadrupled for children ages 6-11 years and tripled for adolescents ages 12-19 years.<sup>12</sup> Due to its widespread impact on every state in the country and on all age groups, obesity is often referred to as an epidemic.

In addition to significant human costs, obesity has significant economic costs as well. Be Active North Carolina reports that excess weight in North Carolina led to an increase of \$2.81 billion in medical costs, \$0.96 billion in prescription drug costs, and \$11.80 billion in lost productivity costs in 2006.<sup>13</sup>

Research shows that as BMI increases, so do medical costs. A claims analysis by Blue Cross and Blue Shield of North Carolina (BCBSNC) revealed that overweight and obese members cost significantly more than normal weight members—18% and 32% more, respectively.<sup>14</sup> Overweight and obesity cost BCBSNC \$83 million in medical costs in 2003.<sup>14</sup> In addition, obesity in North Carolina from 1998-2000 cost an estimated \$448 million in medical expenditures for Medicare (7% of state Medicare dollars) and \$662 million in Medicaid (11.5% of state Medicaid dollars).<sup>15</sup> Obesity leads to increased health care costs, even after accounting for varying survival rates among individuals who are obese.<sup>16</sup>

Weight gain results from an energy imbalance. Simply put, individuals gain weight when more calories are consumed than expended. An *obesigenic* environment is one that encourages weight gain by promoting high caloric food intake and discouraging physical activity.<sup>17</sup> Below are many of the reasons calorie consumption has increased and physical activity has decreased over the past several decades.

#### *Increased Caloric Consumption*

- Increased portion sizes<sup>18,19</sup>
- Greater access to unhealthy foods (i.e. high-calorie, high-fat foods)<sup>18</sup>
- Eating away from home/eating out more often<sup>20</sup>

#### *Decreased Physical Activity*

- Increased screen time (i.e. television, computer, and video game time)<sup>19,17</sup>
- Lack of access to safe recreational facilities<sup>21</sup>
- Decreased active/play time for youth and adults<sup>19,17</sup>
- Built environment does not encourage active living<sup>17,21</sup>

Aside from the large role that the environment and behavior play, genes and metabolism also affect body weight. There is no one cause and no one solution to the obesity epidemic given the variety of factors affecting calorie intake and physical activity and, thus, weight status. However, prevention interventions at the behavioral and environmental level represent the greatest opportunity for action.<sup>1</sup> Therefore, a multipronged approach must be taken—one that targets all aspects of the obesigenic environment. Examples of such approaches include ensuring that communities have accessible recreational facilities, ensuring that

consumers have easy access to nutrition information at restaurants so they can make informed food selections, and ensuring that state and local policies are enacted and enforced to make school environments conducive to practicing healthy behaviors such as eating nutritiously and being physically active. The University Center of Excellence for Training and Research Translation at the University of North Carolina at Chapel Hill<sup>g</sup> is working to identify evidence-based interventions and to translate and disseminate those interventions as well as best practices/processes and implementation tools for use by public health practitioners to prevent and control obesity, heart disease and stroke, and other chronic illnesses.

## Nutrition

Good nutrition is a cornerstone to optimal health. An optimal diet is one that includes the regular consumption of fruits and vegetables, foods high in fiber (e.g. whole grains) and low in saturated fat, and adequate sources of calcium and important nutrients. Among items to limit to achieve a healthy diet are saturated and trans fats, cholesterol, added sugars, and salt. A healthy diet can help protect against osteoporosis, heart disease, hypertension, type 2 diabetes, and certain cancers. Managing calorie intake, while consuming adequate nutrients, is important to avoid overweight and obesity.<sup>22</sup>

Fewer than one in four (21.6%) adults in North Carolina consume five or more servings of fruits or vegetables a day.<sup>h,23</sup> Only 14.8% of high school students consume fruits and vegetables five or more times per day.<sup>24</sup> Data on the specific dietary patterns of North Carolinians is limited. However, at the population level, caloric consumption is greater than it should be given the prevalence of overweight and obesity in the state.

## Physical Activity

Physical activity is a key component of a healthy lifestyle and an important part of preventing obesity.<sup>25</sup> (See Figure 4.4.) The health and financial benefits of high levels of physical activity have been demonstrated by numerous studies. Regular physical activity reduces the risk of premature death by reducing the risk of coronary heart disease, stroke, high blood pressure, type 2 diabetes, and colon cancer. In addition, it protects against feelings of depression and helps build healthy bones, muscles, and joints. Also, regular physical activity is an important part of reaching and maintaining a healthy weight.<sup>26</sup> Even small amounts of regular physical activity are shown to yield significant financial savings in obesity-related medical expenses later in life.<sup>27</sup>

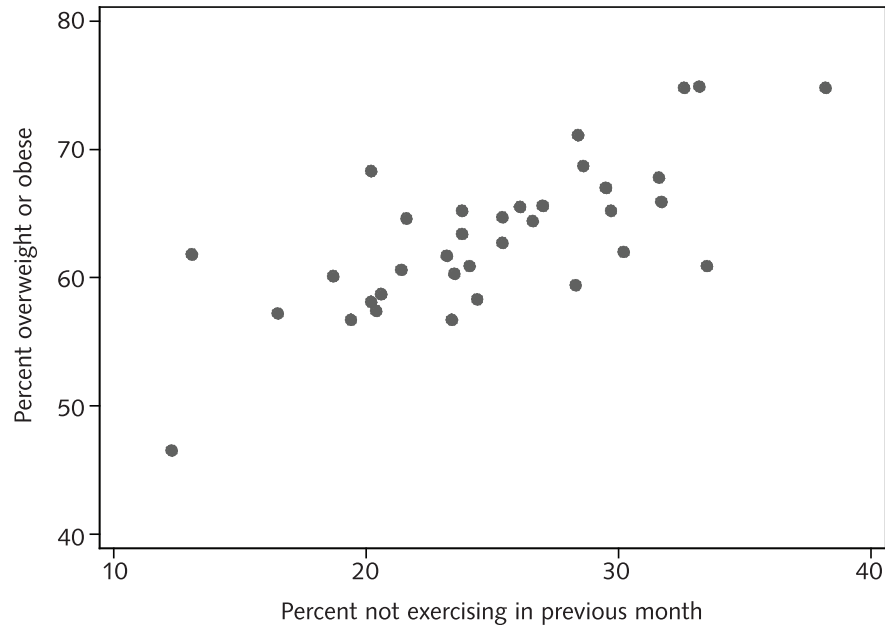
**Good nutrition is a cornerstone to optimal health. An optimal diet is one that includes the regular consumption of fruits and vegetables, foods high in fiber (e.g. whole grains) and low in saturated fat, and adequate sources of calcium and important nutrients.**

g Body Mass Index (BMI) is weight in kilograms / height in meters<sup>2</sup>. BMI is a measure used to determine an individual's weight status. In most individuals, it correlates to the amount of body fat. An individual with a BMI <18.5 is considered underweight; a BMI of 18.5-24.9 is considered normal weight; a BMI of 25.0-29.9 is considered overweight; and a BMI ≥30.0 is considered obese. It should be noted that BMI is a good measure to use on a population basis and that individuals with high muscle mass may have a high BMI even though they are not actually overweight or obese.

h Including all 50 states and the District of Columbia.

Physical activity is a key component of a healthy lifestyle and an important part of preventing obesity. Even small amounts of regular physical activity are shown to yield significant financial savings.

**Figure 4.4**  
Regions of North Carolina with Lower Exercise Rates Have Higher Overweight and Obesity Rates

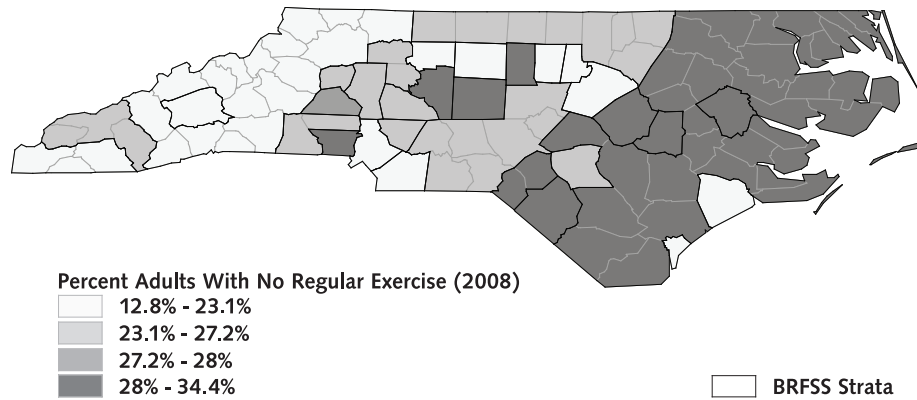


Source: North Carolina State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2008.

Current recommendations are for adults to have at least 30 minutes of moderate-intensity physical activity such as walking five days per week or at least 20 minutes of vigorous-intensity physical activity such as jogging three days per week. Additionally, adults should incorporate muscle-strengthening activities twice a week.<sup>28</sup> Less than half (42.1%) of adults in North Carolina meet this recommended level of activity. (See Figure 4.5.) There are significant disparities by gender, race, ethnicity, and location within the state in terms of physical activity. Men are more likely to meet the recommended level than women (46.6% vs. 41.6%). Whites (46.8%) are the most likely to meet this recommendation, followed by Asians (45.3%), American Indians (43.6%), and African Americans (37.9%). Non-Latinos (45.1%) are more likely to meet this recommendation than Latinos (31.0%).<sup>29</sup> There are also disparities related to household income level and education; as household income level increases so does the likelihood of meeting recommended levels of physical activity. Similarly, this likelihood increases as education level increases.<sup>23</sup> The percentage of adults meeting the recommended level for physical activity also varies throughout the state. (See Figure 4.5.)

It is recommended that children get at least 60 minutes, and up to several hours, of moderate to vigorous physical activity every day of the week.<sup>28</sup> However, not enough children in North Carolina meet this recommendation. (See Table 4.1.)

**Figure 4.5**  
Fewer than Half of All Adults in North Carolina Get the Recommended Level of Physical Activity Each Week



Source: North Carolina State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2008.

Slightly more than half (55%) of middle school students...[and] less than half (44.3%) of high school students report being active at the recommended level.

Slightly more than half (55%) of middle school students in North Carolina report being physically active for at least 60 minutes per day on five or more of the past seven days. Less than half (44.3%) of high school students report being active at the recommended level. Levels of physical activity are lower for girls and racial and ethnic minorities and tend to decrease as children get older.<sup>24</sup> (See Table 4.1.)

**Table 4.1**  
Many North Carolina Students Do Not Get the Recommended Level of Physical Activity Each Week

Percent of Students Who Report Being Physically Active for 60 Minutes Per Day, Five or More of the Past 7 Days

	Middle School	High School
<b>Gender</b>		
Male	60.5	54.0
Female	49.1	37.8
<b>Race/Ethnicity</b>		
White	59.3	48.4
African American	49.7	39.0
Latino	49.3	34.5
<b>TOTAL</b>	55.0	44.3

Source: North Carolina Department of Public Instruction, North Carolina Department of Health and Human Services. North Carolina Youth Risk Behavior Survey, 2007. <http://www.nchealthyschools.org/docs/data/yrbs/2007/highschool/statewide/tables.pdf>. Accessed July 31, 2009.

Additionally, 43.5% of middle school students and 35.3% of high school students reported watching three or more hours of television on an average school day, while 25.0% of middle school students and 21.1% of high school students reported playing video games or using a computer for non-homework related activities for 3 or more hours on an average school day.<sup>24</sup> Screen time (e.g. time spent watching television, playing video games) is associated with increased sedentary behaviors, lower levels of physical activity, and increased risk of overweight.<sup>30</sup>

## Nutrition and Physical Activity in Schools

Schools can play an important role in helping youth develop lifelong healthy eating and physical activity habits since youth spend a significant amount of time in the school environment.

**Schools can play an important role in helping youth develop lifelong healthy eating and physical activity habits since youth spend a significant amount of time in the school environment.**

### Nutrition in Elementary and Secondary Schools

Promoting healthy eating patterns among children is particularly important since unhealthy eating habits established in youth tend to be carried into adulthood.<sup>31</sup> Making healthy food available, while also reducing access to unhealthy foods, is one strategy schools can use to promote healthy eating among students.<sup>32</sup> Food and beverages are typically sold in schools in three ways: as meals qualify for reimbursement in the National School Lunch and Breakfast Programs, through *a la carte* food and beverage sales in the school cafeteria, and/or through vending machines.<sup>i,j,k</sup>

#### School Nutrition Standards

Over the last 20 years, there have been many federal and state-level efforts to improve the nutritional profile of foods and beverages served in North Carolina schools. The Child Nutrition and WIC Reauthorization Act of 1995 required that all meals qualifying for federal reimbursement meet the 1995 Dietary Guidelines for Americans. These requirements apply to breakfasts, lunches, and food provided through the after-school snack programs that are part of the National School Lunch and Breakfast Programs. (There are no federal or state standards for *a la carte* foods and beverages except that the child nutrition program may not sell foods of minimal nutrition value.)

Child nutrition programs serve over 1.4 million meals every day to North Carolina's children enrolled in public schools.<sup>33</sup> All public schools in the state

i "The National School Lunch Program is a federally assisted meal program operating in over 101,000 public and non-profit private schools and residential child care institutions. It provided nutritionally balanced, low-cost or free lunches to more than 30.5 million children each school day in 2007. In 1998, Congress expanded the National School Lunch Program to include reimbursement for snacks served to children in afterschool educational and enrichment programs to include children through 18 years of age. The Food and Nutrition Service administers the program at the Federal level. At the State level, the National School Lunch Program is usually administered by State education agencies, which operate the program through agreements with school food authorities." (Food and Nutrition Service, US Department of Agriculture. 2008 Fact Sheet. <http://www.fns.usda.gov/cnd/Lunch/>. Published June 4, 2009. Accessed on July 31, 2009.)

j *A la carte* sales refer to foods and beverages that are sold in the cafeteria but not as part of the National School Lunch Program.

k In North Carolina, vending machines are not allowed in elementary schools, and their content is limited in middle and high schools.

l More information on the Dietary Guidelines developed jointly by the US Department of Health and Human Services and the US Department of Agriculture is available online at <http://www.health.gov/DietaryGuidelines/>.

participate in the National School Lunch Program and 95% participate in the School Breakfast Program. Children in families with incomes up to 130% of the federal poverty guidelines (FPG) (\$27,560 for a family of four effective July 1, 2008-June 20, 2009) qualify for free breakfast and lunch, and those with family incomes between 130%-185% FPG (up to \$39,220 for a family of four) qualify for reduced price meals.<sup>34</sup> Other students or school personnel can purchase school meals at prices set by the local Board of Education.

In 2005 the North Carolina General Assembly approved legislation directing the North Carolina State Board of Education (SBE) to adopt nutrition standards for elementary schools and implement them by the end of the 2008 school year.<sup>m,n</sup> The SBE, in collaboration with Child Nutrition Administrators in the school districts, developed nutrition standards, which were pilot tested in 124 elementary schools from January to May 2005. (The nutrition standards for elementary schools promote gradual changes to increase fruits and vegetables, increase whole grain products, and decrease foods high in total fat, trans fat, saturated fat, and sugar.) The schools involved in the pilot test lost money implementing the new standards (described more fully below). As a result, the North Carolina General Assembly has ultimately delayed mandatory implementation of the new nutrition standards in all elementary schools until the end of the 2010 school year.<sup>o</sup>

Many districts tried to improve the nutritional content of *a la carte* items in middle and high schools at the same time that they were implementing the SBE-adopted nutrition standards in elementary schools. While some *a la carte* foods and beverages provide healthy options for students, many student-appealing *a la carte* items like fried foods, desserts, and sweetened beverages are generally nutrient-poor, high in fat and/or sugar, and high in calories.<sup>p</sup> These types of foods and beverages in schools have been shown to have a detrimental impact on the diets of children and adolescents.<sup>35</sup> However, *a la carte* items are popular with students and historically have provided substantial revenue that schools have relied upon to subsidize the school meal programs. In the early 2000s, revenues from *a la carte* sales provided half of the operating funds for child nutrition programs in the state. As districts have gradually begun to reduce the availability of less healthful *a la carte* foods and beverages, operating budgets have suffered.<sup>q</sup> While the termination of *a la carte* items often leads to increases in the sale of school meals, overall

**In 2005 the North Carolina General Assembly approved legislation directing the North Carolina State Board of Education to adopt nutrition standards for elementary schools.**

m § 115C-264.3.

n The Child Nutrition and WIC Reauthorization Act of 2004 is scheduled for reauthorization in the fall of 2009. As part of this process, it is likely that there will be new uniform national nutrition standards consistent with the 2005 Dietary Guidelines. North Carolina's Child Nutrition Program guidelines will be updated to be in compliance with the new standards after reauthorization. (Hoggard L. Director, Child Nutrition Services, North Carolina Department of Public Instruction. Oral communication. August 6, 2009.)

o During the 2007 and 2008 legislative sessions, the North Carolina State Board of Education requested recurring state funds (\$20 million) to support the implementation of the State Board of Education-adopted nutrition standards in all elementary schools in North Carolina. The North Carolina General Assembly has not appropriated funds for this purpose.

p Many school districts across the country turned to supplemental sales to offset an early 1980's federal budget cut in the Child Nutrition Program. Even after Federal funding was restored, North Carolina continued to rely on supplemental sales, which evolved into the *a la carte* meals program.

q Hoggard L. Section Chief, Child Nutrition Services, North Carolina Department of Public Instruction. Written (email) communication. September 24, 2008.

revenues still suffer because federal reimbursement for school meals is inadequate to cover the cost of the meal.<sup>r</sup> In addition, there are few, if any, state and local funds to support the cost of serving healthful meals to children.<sup>s</sup> Table 4.2 shows the revenue losses elementary schools incurred during the pilot project (January-May 2005). Losses in the pilot were due to the elimination of the majority of *a la carte* sales in the 124 elementary schools in the pilot project. Specifically, schools had only a few healthy *a la carte* items for sale, which had comparably lower profit margins. Thus, the decrease in *a la carte* revenue was due to fewer items being sold and lower profit margins on those items that were being sold. Losses were also incurred due to increased food costs because healthier foods cost more (a 7% increase during the pilot) as shown in Table 4.2.<sup>t</sup> Based on the results of the pilot, the Department of Public Instruction (DPI) projected that the loss for all 1,170 elementary schools to implement child nutrition standards would be approximately \$20 million. (See Table 4.2.)

Although the new elementary school nutrition standards are not yet mandatory, approximately 95% of the elementary schools in the state have implemented them voluntarily. [However, most districts] report significant revenue losses.

**Table 4.2**  
Elementary Schools Lost Revenue Implementing the New North Carolina Child Nutrition Standards

	Loss per elementary school in pilot program	Loss in all pilot project elementary schools (n=124)	Projected total revenue loss from implementation in all 1,170 North Carolina elementary schools
Average revenue loss from the elimination of <i>a la carte</i> sales	\$10,754	\$1,333,496	\$12,582,180
Average increase in food cost <sup>[1]</sup>	\$6,368	\$789,632	\$7,450, 560
Cost of implementing standards	\$17,122	\$2,123,128	\$20,032,740

[1] The cost of healthy foods such as fresh fruits and vegetables and whole grain products contributed to this increase. (Hoggard L. Director, Child Nutrition Services, North Carolina Department of Public Instruction. Written (email) communication. October 14, 2008.)

Source: Child Nutrition Services, North Carolina Department of Public Instruction.

Although the new elementary school nutrition standards are not yet mandatory, approximately 95% of the elementary schools in the state have implemented them voluntarily.<sup>q</sup> The vast majority of districts that have implemented the standards report significant revenue losses. As with the pilots, the loss in earnings stem in large part from two reasons: 1) increased food prices; and 2) decreased sales revenues from *a la carte* foods and beverages.<sup>q</sup>

r Sackin B. B. Sackin and Associates. Written (email) communication. September 25, 2008.

s Hoggard L. Section Chief, Child Nutrition Services, North Carolina Department of Public Instruction. Written (email) communication. October 30, 2008.

t Hoggard L. Section Chief, Child Nutrition Services, North Carolina Department of Public Instruction. Written (email) communication. October 14, 2008.



In addition to the increased food costs and decreased revenues from the sale of *a la carte* items, school nutrition programs—during the pilot and since—have incurred other expenses in implementing healthier food choices, including increased labor costs, and new capital expenses to buy equipment needed to store and support healthy meals.<sup>u</sup> Further compounding this problem is the common practice of school districts charging “indirect costs” to their child nutrition programs (amounting to more than \$125 million since 2003). These indirect costs further deplete limited resources. The imposition of indirect costs may be in contradiction with the existing state law (§115C-264), which states:

All school food services shall be operated on a nonprofit basis, and any earnings there from over and above the cost of operation as defined herein shall be used to reduce the cost of food, to serve better food, or to provide free or reduced-price lunches to indigent children and for no other purpose. The term "cost of operation" means the actual cost incurred in the purchase and preparation of food, the salaries of all personnel directly engaged in providing food services, and the cost of nonfood supplies as outlined under standards adopted by the State Board of Education.

As a result of cost increases, decreases in *a la carte* revenues, and the practice of charging school indirect costs to child nutrition programs, 93 of 115 school districts in North Carolina are currently in significant financial trouble.<sup>q</sup> Schools have experienced difficulties in trying to increase revenues sufficiently to offset the increased costs. More than half (57%) of the funding for North Carolina’s child nutrition program comes from federal funds for reimbursable meals served to students who qualify for free or reduced price meals. There is also a federal supplement of \$0.24 per meal served to students who pay for their meals as long as the meal meets the criteria for federal reimbursement.<sup>36</sup> A little less than half (42%) of child nutrition program funding in the state comes from student purchases. Only 1% of program funding comes from state funds (via a required state match).<sup>36</sup>

Unlike 21 other states, North Carolina does not contribute to the costs of the school nutrition program above the required federal match.<sup>v</sup> At this time, federal reimbursement and student meal repayments are inadequate to cover the operating costs of the program in North Carolina.<sup>36</sup> Free lunch is reimbursed at \$2.57, reduced lunch is reimbursed at \$2.17, and paid lunch is reimbursed at \$0.24, while the average cost of preparing a meal in North Carolina is \$3.00.<sup>w,37</sup>

**Unlike 21 other states, North Carolina does not contribute to the costs of the school nutrition program above the required federal match.**

u Labor costs for the child nutrition program have increased due to the need for additional personnel to prepare healthier foods versus using convenience foods. In contrast to the funding of other school personnel, the North Carolina General Assembly does not appropriate funds to pay the salaries and benefits of child nutrition personnel. Instead, the child nutrition program has to increase the sale of foods and beverages to students in order to meet payroll obligations. Since 2005, the North Carolina General Assembly has increased the salaries of the school nutrition personnel, but has not appropriated the \$30 million necessary to pay for the salary and benefits increases. (Hoggard L. Director, Child Nutrition Services, North Carolina Department of Public Instruction. Written (email) communication. September 24, 2008.)

v Sackin B. B. Sackin and Associates. Written (email) communication. September 5, 2008.

w Hoggard L. Director, Child Nutrition Services, North Carolina Department of Public Instruction. Written (email) communication. September 3, 2008

To offset losses due to the implementation of the improved nutrition standards in elementary schools, two-thirds of the school districts have returned to the sale of unhealthy, high-fat, high-sugar, and high-calorie foods and beverages in middle and high schools.

Local Education Agencies (LEAs) determine meal prices, which are then adopted by local Boards of Education.<sup>w</sup> Table 4.3 shows meal prices for the 2008-2009 school year. In academic year 2008-2009, 95 of 115 LEAs increased meal prices. Increasing student meal costs to increase revenue is difficult, as almost half (49.2%) of all students attending public school in North Carolina qualify for free- or reduced-price meals.<sup>36</sup> Families at 130%-225% of the federal poverty level often cannot afford the full price of school meals, and raising the price of meals puts some children in jeopardy of having no food during the school day.<sup>w</sup> According to Child Nutrition Services, many North Carolina households cannot afford 70-cents a day to purchase reduced-price meals (30 cents for breakfast and 40 cents for lunch).<sup>33</sup>

**Table 4.3**  
2008-2009 Meal Price Information

2008-2009 Meal Price Information			
	Elementary School	Middle School	High School
Average	\$1.76	\$1.92	\$1.95
Lowest	\$1.00	\$1.00	\$1.00
Highest	\$2.60	\$2.85	\$2.85
Median	\$1.75	\$2.00	\$2.00

Source: Child Nutrition Services, North Carolina Department of Public Instruction. <http://www.ncpublicschools.org/childnutrition/>. Accessed July 31, 2009.

To offset losses due to the implementation of the improved nutrition standards in elementary schools, two-thirds of the school districts have returned to the sale of unhealthy, high-fat, high-sugar, and high-calorie foods and beverages in middle and high schools.<sup>q</sup> These items produce a high profit margin but arguably may also contribute to the growing obesity problem among North Carolina youth.

It is of utmost importance that all foods and beverages made available through the Child Nutrition Program contribute to optimal healthy growth and proper development. Continued implementation of the standards in elementary schools is not possible without state funding support. Maintaining the financial integrity of child nutrition programs will enable districts to ensure child nutrition standards are being met in all North Carolina elementary schools. Furthermore, it will allow the child nutrition program to begin taking steps to implement improved nutrition standards in middle and high schools. Therefore, the Task Force recommends:

**Recommendation 4.1: Implement Child Nutrition Standards in All Elementary Schools and Test Strategies to Deliver Healthy Meals in Middle and High Schools**

- a) Elementary schools should fully implement the State Board of Education (SBE)-adopted nutrition standards. Districts should receive support for implementation from the North Carolina General Assembly under the following conditions:

- 1) The school district is in full compliance with SBE policy on nutrition standards in elementary schools (GS 115C-264.3).
  - 2) The school district is not charging indirect costs to the Child Nutrition Program until such time as the Child Nutrition Program achieves and sustains a three-month operating balance.
- b) The North Carolina General Assembly should appropriate \$20 million in recurring funds beginning in SFY 2011 to the North Carolina Department of Public Instruction (DPI) to support the full and consistent implementation of the SBE-adopted nutrition standards in elementary schools.
  - c) North Carolina funders should develop a competitive request for proposals to fund a collaborative effort between DPI and other partners to test the potential for innovative strategies to deliver healthy meals in middle and high schools while protecting/maintaining revenue for the Child Nutrition Program. Funders should require grant recipients to conduct an independent rigorous evaluation that includes cost.

#### *Selling and Marketing of Unhealthy Foods and Beverages in Schools*

Foods and beverages sold to students outside of the reimbursable school meals program, such as those sold through vending machines or as *a la carte* items, are viewed as competitive foods. Competitive foods are foods and beverages sold in competition with the Child Nutrition Program and have been said to “erode the nutritional, operational, and financial integrity of the school meals program.”<sup>9</sup> Students with access to competitive foods will often choose them over the healthy school-provided meal.<sup>38</sup> Almost half (46.9%) of high school students in North Carolina report they bought food or drinks from vending machines at least once during the last seven days.<sup>24</sup>

While meals served in the National School Lunch and School Breakfast Programs are required to meet the 1995 Dietary Guidelines for Americans and federal nutrition requirements, vending machine items are not required to meet either. In 2005 the North Carolina General Assembly enacted a law to limit the type and availability of foods and beverages sold in vending machines in schools.<sup>x</sup> Specifically, § 115C-264 states the following about beverages:

- a) Each school may, with the approval of the local board of education, sell to student beverages in vending machines during the school day so long as:
  - 1) Soft drinks are not sold
    - i) during the breakfast and lunch periods,
    - ii) at elementary schools, or
    - iii) contrary to the requirements of the National School Lunch Program;

**Almost half of high school students in North Carolina report that they bought food or drinks from vending machines at least once during the last seven days.**

x § 115C-264.2.

- 2) Sugared carbonated soft drinks, including mid-calorie carbonated soft drinks, are not offered for sale in middle schools;
- 3) Not more than fifty percent (50%) of the offerings for sale to students in high schools are sugared carbonated soft drinks;
- 4) Diet carbonated soft drinks are not considered in the same category as sugared carbonated soft drinks; and
- 5) Bottled water products are available in every school that has beverage vending.”

**Without proper enforcement and control of school-owned vending machine content, vending machines are contributing to an unhealthy school environment by providing students with access to nutrient-poor, high-calorie, high-fat foods, and high-calorie beverages.**

In addition, this law requires that snack vending in all schools meets NC Eat Smart Nutrition Standards:

(c) Snack vending in all schools shall, by school year 2006-2007, meet the Proficient Level of the NC Eat Smart Nutrition Standards, such that in elementary schools, no snack vending is available to students, and in middle and high schools, seventy-five percent (75%) of snack vending products have not more than 200 calories per portion of snack vending package.

Further, federal regulations, general statutes, and SBE policies “prohibit North Carolina public schools from selling soft drinks or any other ‘food of minimum nutritional value’ anywhere in the schools before the end of the lunch period.”<sup>y</sup> However, there is minimal enforcement of these laws and there are no reporting requirements.<sup>z</sup>

School-owned vending machines in North Carolina schools are not part of the Child Nutrition Program; they are school-owned and operated, and contracts are negotiated on a school-by-school basis.<sup>aa</sup> Without proper enforcement and control of school-owned vending machine content, vending machines are contributing to an unhealthy school environment by providing students with access to nutrient-poor, high-calorie, high-fat foods, and high-calorie beverages. Additionally, foods sold through school stores and other school operations are not subject to the state nutrition standards.

In addition to selling unhealthy foods and drinks in vending machines and as *a la carte* items, schools also frequently provide a venue through which unhealthy

<sup>y</sup> “Insofar as GS § 115C-264(c) and 16 NCAC 6H .0107(a)(1)(A) require CNPs [Child Nutrition Programs] to operate all food and beverage services offered in the schools before the end of the lunch period, these regulations prohibit North Carolina public schools from selling soft drinks or any other ‘food of minimum nutritional value’ anywhere in the schools before the end of the lunch period.” Excerpted from guidance dated March 10, 2006, given to Superintendents, Finance Officers, and Child Nutrition Directors, which was prepared by the Attorney General’s office to assist Local Education Agencies in clarifying the statutory and policy language in federal regulations (7 CFR 210 and 200), general statutes (GS 115C-263 and 264), and State Board of Education policies (16 NCAC 6H.00004).

<sup>z</sup> Collins P, Hoggard L. North Carolina Department of Public Instruction. Written (email) communication. September 4, 2008.

<sup>aa</sup> The Child Nutrition Program may use child nutrition-owned vending machines to dispense foods sold as *a la carte* items inside the school cafeteria.

products are marketed to students.<sup>35</sup> Currently there are some, but not many, exclusive pouring rights contracts<sup>bb</sup> in North Carolina; however, it is important to take steps to ensure they do not increase. Vending contracts often require schools to allow the marketing of high-fat, high sugar products and often contain provisions giving companies exclusive marketing rights on campus, which may include free samples, promotional products, and signage.<sup>39</sup> Companies also include opportunities to sponsor field trips, class parties, and scoreboards in their contracts, as well as stipulate the items that can be sold, where machines must be located, and what images are shown on the machines.

Major concerns about vending contracts include that they create environments which contradict existing health and nutrition education taught in schools and that they can overly influence youth who may not have the skills or ability to accurately assess marketing messages.<sup>39</sup> Currently, North Carolina does not have any laws regulating the *marketing* of foods and beverages in schools. The Institute of Medicine of the National Academies recommends that healthy diets should be promoted in all aspects of the school environment including commercial sponsorships, and the Federal Trade Commission recommends that “companies should cease all in-school promotion of products that do not meet meaningful nutrition-based standards.”<sup>35,40</sup>

To improve the quality of all foods and beverages available through schools, ensure that items sold in school vending machines meet the most current nutrition standards, and to remove the advertising and marketing of unhealthy foods and beverages in schools, the Task Force recommends:

## Recommendation 4.2: Ensure All Foods and Beverages Available in Schools are Healthy

The North Carolina General Assembly should direct the State Board of Education to establish statewide nutrition standards for foods and beverages available in school-operated vending machines, school stores, and all other operations on the school campus during the instructional day. These standards should meet or exceed national standards.

- a) The North Carolina General Assembly should direct local Boards of Education to require all principals whose schools operate vending machines outside of the Child Nutrition Program to sign a Memorandum of Agreement (MOA) with beverage and snack vendors to ensure vending machines contain only those foods and beverages that are consistent with the new nutrition standards or with current law GS 115C-264.2 until the new standards are developed. The MOA should be submitted to the North Carolina Department of Public Instruction annually to indicate full compliance.
- b) The North Carolina General Assembly should enact a law to remove advertising and marketing of unhealthy foods and beverages in schools that do not meet standards of GS 115C-264.3.

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<sup>bb</sup> A pouring rights contract is created when soft drink companies pay schools or school districts for the right to sell their product within the school. (Almeling DS. The problems of pouring-rights contracts. *Duke Law J.* 2003;53: 1111-1135.)

**Healthy diets should be promoted in all aspects of the school environment including commercial sponsorships.**

**Both physical activity and physical education are critical to the healthy development of children...Currently, the [State Board of Education] policy requires that children in grades K-8 are provided at least 30 minutes of *physical activity* daily.**

### Physical Activity in Elementary and Secondary Schools

Both physical activity and physical education are critical to the healthy development of children. Physical activity is actual bodily movement, such as jumping rope or walking, and physical education “involves teaching students the skills, knowledge, and confidence they need to lead physically active lives.”<sup>41</sup> The physical and psychological benefits of increased physical activity for children and adolescents include improving strength and endurance, building healthy bones and muscles, helping control weight, reducing anxiety and stress, and increasing self-esteem.<sup>28</sup> Studies also show that increased levels of physical activity coupled with an increased curricular focus on physical education have a beneficial impact on students’ academic achievement.<sup>42,43</sup> Since youth spend such a large percentage of their time at school, policies that increase the amount of physical activity a child has during the school day are likely to have a significant effect on a child’s activity level and therefore their overall health. Likewise, policies that emphasize physical education are likely to have positive impacts on lifelong health and physical activity behavior.

The National Association for Sport & Physical Education (NASPE) is a leading national authority on physical education. NASPE recommends that elementary school students receive 150 minutes per week and middle and high school students receive 225 minutes per week of formal instruction in *physical education*.<sup>cc,44</sup> Components of quality physical education programs include emphasizing knowledge and skills for a lifetime of physical activity, meeting the needs of all students, keeping students active for most of physical education time, teaching self-management as well as movement skills, and being enjoyable for students.<sup>45</sup> These courses should be taught by physical educators with appropriate qualifications. In October 2008, the SBE passed a policy stating that physical education teachers must be licensed in health education, physical education, or both by 2012.<sup>46</sup>

Currently, SBE policy HSP-S-000—known as the Healthy Active Children Policy—requires that children in grades K-8 are provided at least 30 minutes of *physical activity* daily.<sup>dd</sup> The Healthy Active Children Policy does not require physical activity to be conducted in traditional physical activity facilities such as gyms. Instead, physical activity can be accumulated in periods of 10-15 minutes through classroom-based movement, recess, walking or biking to school, activity during physical education courses, and sports that occur during, before, and after school.<sup>43</sup>

North Carolina schools can play a key role in helping young people become physically educated and attain skills, confidence, and knowledge to help them be physically active for a lifetime. To ensure elementary school children are receiving the recommended weekly level of quality physical education and that middle and

cc The National Association for Sport & Physical Education (NASPE) is a leading national authority on physical education. NASPE has 16,000 members including K-12 physical education teachers, coaches, athletic directors, researchers, and college/university faculty among others. It is one of five national associations in the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD). <http://www.aahperd.org/naspe/>  
dd §HSP-S-000

high school students are receiving a sufficient level of the Healthful Living curriculum that equally emphasizes health and physical education, the Task Force recommends:

### **RECOMMENDATION 4.3: Implement Quality Physical Education and Healthful Living in Schools (PRIORITY RECOMMENDATION)**

- a) The North Carolina General Assembly should require the State Board of Education (SBE) to implement a five-year phase-in requirement of the following:
  - 1) Quality physical education that includes 150 minutes of elementary school physical education weekly.
  - 2) 225 minutes weekly of Healthful Living curriculum in middle schools, and 2 units of Healthful Living curricula as a graduation requirement for high schools. The new requirement for middle and high school should require equal time for health and physical education.
- b) The SBE shall be required to report annually to the Education Oversight Committee regarding the Healthful Living education program, physical education program, and Healthy Active Children policy.
- c) The SBE should work with appropriate staff members in the North Carolina Department of Public Instruction, including curriculum and finance representatives, and staff from the North Carolina General Assembly Fiscal Research Division to examine the experiences of other states and develop cost estimates for the five-year phase-in, which will be reported to the research division of the North Carolina General Assembly and the Education Oversight Committee by April 1, 2010.

#### **Physical Activity and Nutrition in Child Care and After-school Programs**

##### *Child Care Programs*

From 1976-1980 to 2003-2006, the prevalence of obesity among preschool aged children (ages 2-5 years) in the United States increased from 5.0% to 12.4%.<sup>47</sup> Data show that 3 in 10 children (31.7%) ages 2-4 years seen in public health-sponsored Women, Infants, and Children (WIC) Program and child health clinics in North Carolina were considered overweight or obese in 2008.<sup>ee,9</sup> When compared to healthy-weight children, obese children are at an increased risk for becoming obese adults. In fact, research has shown that when overweight begins before age 8, adult obesity is likely to be more severe.<sup>48</sup> These data and information suggest a need for obesity prevention interventions aimed at young children.

<sup>ee</sup> The Nutrition Services Branch, Division of Public Health, North Carolina Department of Health and Human Services maintains the North Carolina Nutrition and Physical Activity Surveillance System (NC-NPASS) and note that "NPASS data are limited to children seen in North Carolina Public Health Sponsored WIC and Child Health Clinics and some School Based Health Centers." In addition, "For children ages 2 to 4, the data are reflective of the population at 185% of the federal poverty level."

**Data show that 3 in 10 children (31.7%) ages 2-4 years seen in public health-sponsored Women, Infants, and Children Program and child health clinics in North Carolina were considered overweight or obese in 2008.**

**The Nutrition and Physical Activity Self-Assessment for Care (NAP SACC) ...is a promising practice for improving the nutrition and physical activity environments in child care settings.**

The Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) program is an innovative program developed by Center for Health Promotion and Disease Prevention at the University of North Carolina at Chapel Hill and key advisory partners to improve the nutrition and physical activity environment within child care settings to promote healthy weight among children. It is the first known program designed to specifically target this particular setting. A self-assessment tool for child care centers, continuing education workshops, and technical assistance are provided through NAP SACC. The program was developed in consideration of existing evidence and theory and has been pilot tested. It is a promising practice for improving the nutrition and physical activity environments in child care settings.<sup>49</sup>

North Carolina's Star Rated License system for licensed child care centers was developed by the North Carolina Division of Child Development. The system is an easy to understand child care center quality indicator for parents. Since 2000, eligible child care centers and family child care homes receive a ranking of one to five stars, with five being the best. A facility's star rating is determined by points rewarded for staff education, program standards, and compliance history.<sup>50</sup> Currently, the nutrition and physical activity practices of facilities are not components of the rating system for child care centers. Adding these as indicators to the Star Rated License system would encourage child care centers to meet state-set nutrition and physical practice standards. Furthermore, parents would be provided with important information to consider in the selection of child care facilities for their children.

***After-School Programs***

The Move More After-School Collaborative in North Carolina has developed recommended standards for physical activity in the after-school setting based on best and promising practices outlined in peer-reviewed literature. The Move More standards for after-school physical activity recommend the following:

- At least 20% of the after-school program time should be spent on physical activity when the focus of the after-school program is on supervision, youth development, or teaching skills in arts, sciences, computers, academics, or other enrichment activities.
- At least 80% of the time should be spent on physical activity when the focus of the program is on sport, exercise, recreation, or other movement.<sup>51</sup>

Faith- and community-based organizations, school systems, local government agencies, and other organizations provide a variety of after-school programs including programs that focus on academics, sports, arts, and youth development. After-school program funding comes from a variety of sources including fees, foundations, businesses, and federal, state, and local funding.

Many North Carolina agencies provide funding for after-school programming, whether through state funds or federal funds that are administered by the state. The Department of Public Instruction (DPI) administers US Department of Education grant funds that support 21st Century Community Learning Centers



(CCLCs) in communities across North Carolina.<sup>ff,52</sup> Similarly, the North Carolina Department of Health and Human Services provides funding for after-school programs through the federally-funded Child Care and Development Fund. The Department of Juvenile Justice and Delinquency Prevention provides funding for after-school programs through the state-funded Support Our Students fund.

Currently the *Move More North Carolina: Recommended Standards for After-School Physical Activity* are just guidelines for after-school programs and are not required. The Task Force on Prevention recommends that after-school programs that receive state or federal grants be required to implement the standards to ensure that more children meet the recommended daily physical activity guidelines. The Task Force did not support a similar mandate for after-school programs that do not receive state and federal fund. However, the North Carolina Center for Afterschool Programs, which brings together after-school providers with the goal of increasing the quality of after-school programs, and DPI, which oversees LEAs and the programs they provide, should encourage all after-school program providers to implement the standards.

Overweight and obesity can become concerns very early in children’s lives, so it is important to ensure that the environments where children and youth spend their time support healthy eating and physical activity habits. Therefore, the Task Force recommends:

### **Recommendation 4.4: Expand Physical Activity and Nutrition in Child Care Centers and After-school Programs**

- a) The North Carolina Division of Public Health (DPH) and the North Carolina Partnership for Children, Inc. (NCPC) should expand dissemination of evidenced-based approaches for improved physical activity and nutrition standards in preschools using Nutrition and Physical Activity Self-Assessment for Child Care (NAP-SACC). Beginning in SFY 2011, the North Carolina General Assembly should appropriate \$70,000 in recurring funds to the DPH and \$325,000 in recurring funds to NCPC for these activities.
- b) The North Carolina Child Care Commission should assess the funding needed for child care centers to incorporate healthy eating and physical activity practices and the process to include healthy eating and physical activity as quality indicators in North Carolina’s Star Rated License system for licensed childcare centers.
- c) After-school programs should use the *Move More North Carolina: Recommended Standards for After-School Physical Activity*. Specifically:
  - 1) State agencies should require after-school programs that receive state funding or federal funding administered by the state to use the standards.

**After-school programs that receive state or federal grants [should] implement the *Move More North Carolina Recommended Standards for After-School Physical Activity* to ensure that more children meet the recommended daily physical activity guidelines.**

<sup>ff</sup> CCLCs provide after-school academic enrichment opportunities for students in grades K-12, particularly those attending high-poverty, low-performing schools. In addition, other valuable services are provided, such as community service opportunities, cultural activities, and sports.

- 2) The North Carolina Department of Public Instruction and the North Carolina Center for Afterschool Programs should encourage other after-school programs that do not receive state or federal funds to use the standards.

## Nutrition and Physical Activity in Communities

### Eat Smart, Move More Obesity Plan

Many North Carolina communities are addressing the growing obesity epidemic by implementing evidence-based strategies and best or promising practices to improve nutrition and increase physical activity. The *Eat Smart, Move More North Carolina* plan to combat obesity has been developed through a partnership of stakeholder organizations from across the state. The plan takes a socio-ecological approach, outlining strategies at the individual and family, community and school, and policy and environment levels. These strategies are aligned for progress toward four specific goals:

1. Increase healthy eating and physical activity opportunities for all North Carolinians by fostering supportive policies and environments.
2. Increase the percentage of North Carolinians who are at a healthy weight.
3. Increase the percentage of North Carolinians who consume a healthy diet.
4. Increase the percentage of North Carolina adults and children ages 2 and up who participate in the recommended amounts of physical activity.<sup>53</sup>

The *Eat Smart, Move More North Carolina* plan outlines the path to reducing the obesity rate and provides a roadmap for progress. However, long-term, sustainable, community-level efforts are needed statewide in order to reach all North Carolinians, and creating local capacity is integral to this approach.

In 2008, the North Carolina General Assembly appropriated \$1.9 million in non-recurring funds to the North Carolina Division of Public Health (DPH) to establish community-based Childhood Obesity Prevention Demonstration Projects. DPH distributed \$380,000 each to five communities and contracted with the University of North Carolina to evaluate the project implementation and outcomes. The Demonstration Projects have shown early success. Each county's health department, preschools, schools, pediatric clinics, faith communities, and local clubs are working together to make healthy eating and active living part of every resident's daily life. Survey data collected over just a four-month period showed statistically significant changes in physical activity and healthier eating behavior. For example, 5.7% of residents improved what they ate (Pre=27.3%, Post=33.0%) and 3.3% of residents started exercising more (Pre=16.2%, Post=19.5%).<sup>54</sup> However, it is unclear if this one-time funding opportunity provided a sufficient amount of time to continue momentum and sustain changes to yield positive long-term outcomes. Lessons learned from the Demonstration Projects have just begun to influence obesity prevention efforts in the state.

**The *Eat Smart, Move More North Carolina* plan outlines the path to reducing the obesity rate and provides a roadmap for progress.**

Moving the bar on obesity requires a concerted effort and the commitment of many partners. Additional appropriations are needed over a longer period of time to test the viability of community-based obesity reduction interventions in North Carolina. However, a three-year community-based intervention in Massachusetts aimed at preventing childhood obesity resulted in a decrease in body mass index (BMI) among participating children. This intervention showed that multifaceted community-based environmental change can impact children's weight status as shown by the significant decrease in BMI within the intervention community as compared to the control community.<sup>18</sup>

DPH and other expert groups and organizations are providing technical assistance to help guide the above initiatives. Additionally, evaluation will be needed—especially for those interventions that have not been thoroughly evaluated elsewhere—to determine if these initiatives are having an impact on reducing obesity and overweight.

Social marketing campaigns to raise public awareness on various public health issues have been shown to be effective in North Carolina and have been shown to change behavior and initiate dialogue.<sup>gg</sup> *Eat Smart, Move More North Carolina's* (ESMM) social marketing messages have been designed to increase awareness among key decision makers and women ages 25-54 with at least one child in the home.<sup>hh</sup> Messages convey the need for policy and environmental supports to promote health behaviors related to nutrition and physical activity. Choosing healthy drinks, preparing and eating more meals at home, controlling portion size, breastfeeding, consuming more fruits and vegetables, decreasing screen time, and increasing physical activity are the cornerstones of ESMM and its messages. These messages—consistent with health behavior messages promoted by the CDC—direct consumers to ESMM partner services and programs.

The CDC recommends spending \$1.83 per capita for health communications related to tobacco prevention and cessation.<sup>55</sup> Therefore, the Task Force on Prevention recommends this per capita funding amount for state social marketing to encourage physical activity and good nutrition among North Carolinians.

Given the need to have sustainable interventions at the community and state level, to determine which interventions have the most impact, and to widely disseminate social marketing messages about the importance of nutrition and physical activity in obesity prevention, the Task Force recommends:

**Moving the bar on obesity requires a concerted effort and the commitment of many partners. Additional appropriations are needed over a longer period of time to test the viability of community-based obesity reduction interventions in North Carolina.**

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gg See Chapter 3 for more information.

hh *Eat Smart, Move More North Carolina* is a statewide movement that “promotes increased opportunities for healthy eating and physical activity wherever people live, learn, earn, play and pray.” *Eat Smart, Move More North Carolina* creates materials and tools for communities, schools, faith-based groups, worksites, and other organizations.

### Recommendation 4.5: Implement the Eat Smart, Move More North Carolina Obesity Prevention Plan and Raise Public Awareness (PRIORITY RECOMMENDATION)

- a) 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 this effort. Funding should be allocated as follows:
  - 1) \$5 million (\$50,000 per county) to support local capacity (1 full-time employee) for the dissemination of evidence-based prevention programs and policies in North Carolina communities.
  - 2) \$1 million to *Eat Smart, Move More North Carolina* to expand community competitive grants. Communities should be limited to grants of up to \$40,000 to support evidence-based strategies or best and promising practices that improve nutrition and/or physical activity behavior, thereby promoting healthy weight and reducing chronic disease.
  - 3) \$500,000 to DPH to provide technical assistance for the implementation of the *Eat Smart, Move More North Carolina Obesity Prevention Plan* and/or the competitive grants and to conduct an independent evaluation.
- b) The North Carolina General Assembly should appropriate \$500,000 annually in non-recurring funds for six years beginning in SFY 2011 to DPH for pilot programs of up to \$100,000 per year to reduce overweight and obesity among adolescents.
- c) The North Carolina General Assembly should appropriate \$3.5 million annually for six years beginning in SFY 2011 to DPH to continue the demonstration projects initially funded by the North Carolina General Assembly in 2008. Funding will be distributed to the five current demonstration counties and to three additional counties (on a competitive basis) for interventions in preschools, schools, local communities, faith organizations, worksites, and health care settings to promote and support physical activity and healthy eating. DPH should work in collaboration with *Eat Smart, Move More North Carolina* partners, NC Prevention Partners, the UNC Center for Health Promotion and Disease Prevention, and others to provide technical support and disseminate best practices.
- d) DPH, the North Carolina Health and Wellness Trust Fund (HWTF), and the North Carolina Department of Public Instruction (DPI) should raise public awareness and implement a statewide social marketing campaign to promote healthy physical activity and nutrition behaviors and environments in schools, homes, and the community. Campaign messages should be based on behaviors identified by the Centers for Disease Control and Prevention to guide state efforts against obesity. DPH should work with the HWTF and DPI on the expansion and evaluation of this social marketing campaign. The North Carolina General Assembly should appropriate recurring funds beginning in SFY 2011 to DPH until the funding level reaches \$16 million annually to support this effort.

A portion of the funding will be used for evaluation. Funding should be increased as follows:

- 1) \$5.0 million in recurring funds by SFY 2011
- 2) \$8.0 million in recurring funds by SFY 2015
- 3) \$12.0 million in recurring funds by SFY 2018
- 4) \$16.0 million in recurring funds by SFY 2020

**Access to Healthy Foods in Communities**

Fruits and vegetables are the chief constituents of a healthy diet. A diet rich in fruits and vegetables can contribute to a sense of fullness and decrease overall calories consumed making regular consumption of these foods a weight management strategy.<sup>56</sup> Furthermore, numerous studies document the general protective benefit of a diet high in fruits and vegetables, showing that such a diet guards against many chronic diseases including cardiovascular disease, type 2 diabetes, and certain cancers.<sup>57</sup>

As mentioned earlier, fewer than 1 in 4 (21.6%) adults in North Carolina consumes five or more fruits or vegetables a day.<sup>23</sup> As shown in Table 4.4, household income and fruit and vegetable consumption are directly correlated: consumption decreases as income decreases. A similar correlation is seen between fruit and vegetable consumption and education level.

Numerous studies document the general protective benefit of a diet high in fruits and vegetables, showing that such a diet guards against many chronic diseases including cardiovascular disease, type 2 diabetes, and certain cancers.

**Table 4.4**  
**Adult Fruit and Vegetable Consumption is Correlated with Household Income Level**

Household Income Level	Percent Consuming 5 or More Fruits or Vegetables Per Day
\$75,000+	26.6
\$50,000-74,999	25.8
\$35,000-49,999	22.0
\$25,000-34,999	17.9
\$15,000-24,999	17.6
Less than \$15,000	16.2

Source: North Carolina State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2007.

Individuals with higher incomes tend to eat a higher quality diet than individuals with lower incomes. There are many reasons underlying this disparity. One reason is that as food quality increases, food prices increase. Access to healthy foods is another issue. Low-income neighborhoods often do not have grocery stores, and individuals with low incomes may have limited access to transportation to grocery stores to purchase produce. Fruit and vegetable consumption has been shown to be higher among low-income populations when grocery stores are easily accessible.<sup>58</sup> One study examining the location of food stores and food services

**Today, the average American eats out 5.8 times per week...Foods eaten away from home—in particular, fast foods—are likely contributors to the rising prevalence of obesity in the United States.**

(including restaurants) in four states (including North Carolina) found that there were three times as many supermarkets located in wealthier neighborhoods compared to the lowest-wealth neighborhoods.<sup>59</sup> Similarly, there are four times as many grocery stores in predominantly white neighborhoods compared to predominantly African American neighborhoods. Supermarkets typically offer a wider array of food choices, at less cost, and with more fruits and vegetables than do other types of small grocery stores or convenience stores. Thus, the lack of available supermarkets in lower-income communities makes it harder for members of those communities to buy healthy food and has been linked to higher levels of obesity.<sup>60</sup>

Just as schools provide a convenient medium to reach young North Carolinians, worksites and faith-based organizations offer a unique opportunity to reach a substantial portion of adults in North Carolina with messages and interventions to improve nutrition and health. Adults spend a substantial proportion of their lives in the worksite setting, and currently there are 4.3 million working North Carolinians.<sup>61</sup> One in two (53%) North Carolinians attend church or synagogue once a week or almost every week.<sup>62</sup> Locating farmers markets at worksites and in faith-meeting places creates convenient access to healthy fruits and vegetables that many individuals might not otherwise have. In addition, holding farmers markets in communities will both increase access to fruits and vegetables and also support local farmers.

Given the beneficial role of fruits and vegetables in the diet and the need to increase North Carolinians' access to fruits and vegetables, the Task Force recommends:

### **Recommendation 4.6: Expand the Availability of Farmers Markets and Farm Stands at Worksites and Faith-based Organizations**

**Employers and faith-based organizations should help facilitate farmers markets/farm stands at the workplace and in the faith community with a focus on serving low-income individuals and neighborhoods.**

#### *Menu Labeling*

Eating out has become more common as Americans' lives have become busier, and the convenience of eating away from home is more appealing. Today, the average American eats out 5.8 times per week.<sup>63</sup> Assuming North Carolinians are similar to the majority of Americans, this means that North Carolinians are eating many meals away from home. In fact, less than half (46.5%) of North Carolinians say that they eat a home-prepared meal at least one time a day every day of the week.<sup>23</sup>

Foods eaten away from home—in particular, fast foods—are likely contributors to the rising prevalence of obesity in the United States.<sup>20</sup> Meals eaten away from home are typically higher in calories and fat than meals prepared at home.<sup>64</sup> A single fast-food meal often has enough calories to meet an individual's caloric

requirements for an entire day.<sup>65</sup> Moreover, consumers underestimate the calorie and fat content in foods eaten away from home.<sup>66</sup> One study showed that consumers underestimated the caloric content in unhealthful foods by as much as 600 calories and that they also drastically underestimated fat content. To put this into perspective, consuming an extra 600 calories just one time per week over the course of one year would result in a nine-pound weight gain.<sup>ii,67</sup>

Having access to nutrition information enables individuals to make informed decisions about the foods they select. It has been shown that most adult consumers use nutrition labeling information on packaged foods, although adults under 30 years of age have shown a decline in the use of nutrition labels on packaged foods. Given that more meals are eaten away from home, the labeling on packaged foods—mandated by the National Labeling and Education Act (NLEA) in 1993—provides nutrition information for a decreasing proportion of food in the average American diet.<sup>68</sup> The NLEA requires food companies to disclose ingredients and provide a nutrition facts panel on product packaging. However, despite the fact that the average American eats out 5.8 times per week, there is no federal law requiring menu labeling. Nationally, provision of nutrition information by restaurants is voluntary; however, in October 2008 California became the first state to enact a menu labeling law. Since then, Oregon and Connecticut have also passed menu labeling laws.<sup>69</sup> In addition, some municipalities and counties have mandated restaurant menu labeling including King County, WA, and New York City.<sup>jj</sup> In June 2008, several other cities and counties had pending menu labeling legislation. An additional 16 states considered menu labeling legislation in 2007 or 2008.<sup>kk,70</sup> No municipality in North Carolina requires menu labeling.

Although some restaurants provide nutrition information, most do not provide consumers with easy access to nutrition information about the foods they serve. Often information that is provided is made available only through websites (i.e. not at the point of purchase) or through brochures upon request.<sup>67</sup> Nutrition information may also be posted in an unreadable font size or in an inconspicuous location thereby reducing its usefulness to consumers.<sup>71,72</sup>

Menu labeling is supported by many leading health organizations including the American Cancer Society, American Diabetes Association, American Medical Association, and the Institute of Medicine of the National Academies.<sup>73</sup> In addition, in its 2004 report the US Food and Drug Administration Obesity Working Group recognized the importance of including point-of-sale nutrition information in restaurants.<sup>74</sup> Moreover, numerous surveys show that menu labeling

**Consumers underestimate the calorie and fat content in foods eaten away from home...Having access to nutrition information enables individuals to make informed decisions about the foods they select.**

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ii Provided that physical activity remains constant.

jj King County (Seattle), Washington (passed July 2007, revised April 2008); New York City (passed December 2006, revised January 2008).

kk Cities with pending regulations: Chicago, District of Columbia, Philadelphia, Montgomery County, MD, and Westchester County, NY. States that have considered menu labeling legislation: Arizona, California, Connecticut, Hawaii, Illinois, Iowa, Kentucky, Maine, Massachusetts, Michigan, New Jersey, New Mexico, New York, Pennsylvania, Tennessee, Vermont, and Washington.

**Menu labeling has been shown to help consumers make informed choices and may have a long-term impact on reducing or preventing obesity.**

is positively received by consumers and that nutrition information impacts the decision-making process. In a nationwide online survey led by ARAMARK Corporation, 83% of respondents agreed that “restaurants should make nutrition information available for all menu items.” Another national survey led by Caravan Opinion Research Corporation in 2008 found that 78% of those polled agreed that “fast-food and other chain restaurants should list nutritional information, such as calories, fat, sugar, or salt content on menus and menu boards.” Other national and statewide polls have similar results to similar questions.<sup>75</sup> In April 2008, New York City began requiring restaurant chains with more than 15 locations nationwide to list calories on their menus or menu boards. A recent evaluation of New York City’s menu labeling policy found that 80% of consumers were aware of the policy, 86% of these individuals approved of the policy, 84% had used the nutrition information provided through menu labeling, 84% were surprised by the actual calorie contents (they believed calorie content would be lower), and 73% thought the provided nutrition information impacted what they ordered.<sup>76</sup>

Menu labeling has been shown to help consumers make informed choices and may have a long-term impact on reducing or preventing obesity. North Carolina can promote and protect public health and help arm consumers with the information they need to make informed nutrition choices when eating away from home by requiring restaurants to provide clearly labeled nutrition and calorie information. Thus, the Task Force recommends:

### **Recommendation 4.7: Promote Menu Labeling to Make Nutrition Information Available to Consumers**

- a) The North Carolina Division of Public Health (DPH) in collaboration with NC Prevention Partners should promote and offer technical assistance for menu labeling in restaurants through a collaborative effort with the North Carolina Restaurant and Lodging Association. If menu labeling is not implemented by a substantial proportion of restaurants within three years, the state should seek mandatory labeling laws.
- b) DPH should work with other organizations around the country to draft model legislation to promote national standards for menu labeling.

#### **Physical Activity in Communities**

An important factor influencing levels of physical activity for people of all ages is the built environment, which includes neighborhood design, land use patterns, and transportation systems.<sup>77</sup> The built environment can either be conducive to physical activity or a barrier preventing it. Studies show that enhanced access to places for physical activity increases frequency of activity and weight loss. Specifically, people with access to sidewalks and trails are more likely to be active, and people with easy access to neighborhood parks are nearly twice as likely to be physically active.<sup>78</sup> It is difficult for people to walk, jog, or ride bicycles if there are few sidewalks, bicycle lanes, or greenways, or if these sidewalks, lanes, and



greenways are disconnected from each other. Similarly, people living in residential neighborhoods isolated from shopping centers, schools, and community centers have a hard time incorporating physical activity into their daily routines.

Children are more likely to walk to school if there are sidewalks and greenways connecting their neighborhoods to their schools.<sup>79</sup> Enhancing the built environment to increase the number of pedestrians also reduces the injury rate.<sup>80</sup> From 2005-2009, federal funds were allocated to the Safe Routes to School (SRTS) program to help establish safe routes to school, including engineering projects such as sidewalk construction and community programs.<sup>81</sup> Utilizing these federal funds has enabled communities to save money that would be spent on transportation and reduces congestion related to school buses.<sup>82</sup>

Almost 60% of North Carolinians report they believe they would increase their physical activity if their community had more accessible trails for walking or bicycling.<sup>29</sup> Focusing new resources on low-income and minority communities is also important, as these communities generally have less access to places for physical activity than do other communities.<sup>83-85</sup> Therefore, the Task Force recommends:

**Almost 60% of North Carolinians report they believe they would increase their physical activity if their community had more accessible trails for walking or bicycling.**

## Recommendation 4.8: Build Active Living Communities

- a) The North Carolina General Assembly should authorize counties/municipalities to have the local option to hold a referendum to increase the sales tax by ½ cent for community transportation, parks, and sidewalks.
- b) The North Carolina Division of Parks and Recreation should expand the existing Adopt-a-Trail grant program, which provides grants to governmental agencies and nonprofit organizations for trail and greenway planning, construction, and maintenance projects. The North Carolina General Assembly should appropriate an additional \$1.5 million in recurring funds beginning in SFY 2011 to the North Carolina Division of Parks and Recreation for this program.

In addition to building communities that foster physical activity, it is important to find ways to maximize the use of existing recreational facilities. Recreational facilities exist on school property within many communities; however, these facilities are often not available for use by the general public or by school children past school hours. Creating additional recreational facilities requires funding and land—one or both of which are limited in many communities in North Carolina. Joint-usage agreements—which establish partnerships between communities and schools to provide community access to school facilities during after-school hours and on weekends and to allow schools access to parks and recreation facilities when needed—are a potential solution to this predicament.

Research shows that although school administrators are generally open to the idea, it is only sporadically done.<sup>86</sup> Preliminary evidence also shows elevated rates of physical activity for children able to use school facilities on evenings and weekends.<sup>87</sup> Some of the most common reasons given by administrators for not opening their facilities to the public include concerns of supervision, safety, liability, and overuse.<sup>86</sup> Fayetteville-Cumberland County Parks and Recreation

and the Cumberland County School System have relied on joint-use agreements for approximately 40 years. The parks and recreation department has joint-use of facilities at more than 60 schools in the county and 12 recreation centers located on school property. In addition, Parks and Recreation has been able to expand infrastructure and program capacity beyond what would have been possible without such agreements, and the school system has physical education facilities it would not otherwise have. Capital improvements at the schools are paid for by the Parks and Recreation Department. Further, when new schools are built, opportunities for joint-use are explored.<sup>11</sup> Joint-use agreements can also be structured to provide schools access to community facilities during school hours. In Cumberland County, the joint-use agreement provides schools and parks and recreation with a first-right of use of each other's facilities.<sup>11</sup>

In order to increase access to facilities for physical activity while being sensitive to the concerns of school administrators, the Task Force recommends:

### **Recommendation 4.9: Establish Joint-use Agreements to Expand Use of School and Community Recreational Facilities**

- a) The North Carolina School Boards Association should work with state and local organizations including but not limited to the North Carolina Recreation and Park Association, Local Education Agencies, North Carolina Association of Local Health Directors, North Carolina County Commissioners Association, North Carolina League of Municipalities, North Carolina High School Athletic Association, and Parent Teacher Associations to encourage collaboration among local schools, parks and recreation, faith organizations, and/or other community groups to expand the use of school facilities for after-hours community physical activity. These groups should examine successful local initiatives and identify barriers, if any, which prevent other local school districts from offering the use of school grounds and facilities for after-hour physical activity and develop strategies to address these barriers. In addition, this collective group should examine possibilities for making community facilities available to schools during school hours, develop model joint-use agreements, and address liability issues.
- b) The State Board of Education should encourage the School Planning Section, Division of School Support, North Carolina Department of Public Instruction to do the following:
  - 1) Provide recommendations for building joint park and school facilities.
  - 2) Include physical activity space in the facility needs survey for 2010 and subsequent years.

At the local level, it is important for stakeholders to work together to make the built environment more conducive to physical activity. To be most effective and comprehensive, this process should include local planning departments, local

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<sup>11</sup> Barefoot R. Director, Fayetteville-Cumberland Parks and Recreation Department. Written (email) communication. October 28, 2008.

government, public health, schools, parks and recreation, transportation, the faith community, developers, businesses, and other community partners. Planning should focus on identifying what infrastructure already exists and ways to maximize their use (e.g. joint-use agreements), creating policies to guide the development of new infrastructure, making physical/engineering changes, and creating programs to promote the use of these new facilities. To ensure that resources are being allocated in the most effective way, the community groups should regularly evaluate the impact of these facilities on physical activity levels in a given community. To facilitate this process, the Task Force recommends:

### **Recommendation 4.10: Expand Community Grants Program to Promote Physical Activity**

The North Carolina Division of Public Health (DPH) should expand the existing Community Grants Program to assist 15 local communities in developing and implementing Active Living Plans. Funding should be used to support community efforts that will expand the availability of sidewalks, bicycle lanes, parks, and other opportunities for physical activity and recreation. The North Carolina General Assembly should appropriate \$3.3 million annually for five years beginning in SFY 2011 to DPH to expand the existing Community Grants Program. If successful, the North Carolina General Assembly should expand funding to replicate successful efforts in other parts of the state.

- a) Funds should be used to support programs in both rural and urban areas.
- b) To qualify for Community Grants, local communities must collaborate with a wide consortium of community partners such as local planning departments, local government, public health, schools, parks and recreation, transportation, the faith community, developers, and businesses. Communities must have joint-use agreements in place.
- c) Grantees must use the funds to support:
  - 1) Planning to identify what active living infrastructure exists and what is needed.
  - 2) Development of public policies to guide public and private investment in active living infrastructure.
  - 3) Implementation of physical projects such as new sidewalks, bike paths, and parks to provide residents with places to be active and children with the ability to walk to school.
  - 4) Promotions and programs to encourage the use of these facilities.
- d) DPH should allocate 10% of the funds for an independent evaluation of these projects. Evaluation outcomes should include but not be limited to usage, costs, and the impact of these projects on economic development.

## Nutrition and Physical Activity in Clinical Care

### Adult Clinical Care

The health care delivery system also plays a critical role in addressing the growing prevalence of obesity. Despite evidence that obesity is linked to the top four leading causes of preventable death (cancer, heart disease, injury, chronic lower respiratory disease), doctors often fail to recognize and treat overweight and obesity. When interacting with obese patients, doctors tend to underemphasize the importance of weight loss and fail to explain the seriousness of the problems linked to obesity. Furthermore, research shows that fewer than half of obese adult patients receive counseling about weight loss methods from their doctors; patients who receive advice from their doctors are more likely to report trying to lose weight.<sup>88</sup>

The US Preventive Services Task Force recommends that providers screen all patients for obesity and offer intensive counseling and behavioral interventions to promote sustained weight loss for obese adults.<sup>89</sup> Screening for obesity involves a simple calculation of BMI using a patient's weight and height. An individual with a BMI less than 18.5 is considered underweight; a BMI of 18.5-24.9 is considered normal weight; a BMI of 25.0-29.9 is considered overweight; and a BMI equal to or greater than 30.0 is considered obese. Evidence shows that high-intensity counseling<sup>mm</sup> on nutrition education, diet, and/or exercise, combined with behavioral interventions to support skill development, strategies to change diet and physical activity, and motivation, can result in "modest, sustained" weight loss in adults whose BMI is greater than 30. Even modest weight loss can lead to positive changes in intermediate health outcomes, such as improved glucose metabolism, lipid levels, and blood pressure. Because research shows that BMI is a reliable and valid way in which to identify adults at increased risk for death and disability from overweight and obesity, clinicians should use BMI to screen for obesity and offer intensive counseling and behavioral interventions to promote sustained weight loss in adults.<sup>89</sup> Therefore, the Task Force recommends:

**The US Preventive Services Task Force recommends that providers screen all patients for obesity and offer intensive counseling and behavioral interventions to promote sustained weight loss for obese adults.**

### Recommendation 4.11: Increase the Availability of Obesity Screening and Counseling

- a) Insurers, payers, and employers should cover Body Mass Index (BMI) screening and counseling on nutrition and/or physical activity for adults who are identified as obese.
- b) Primary care providers should screen adult patients for obesity using a BMI and provide high-intensity counseling either directly or through referral on nutrition, physical activity, and other strategies to achieve and maintain a healthy weight.

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<sup>mm</sup> The US Preventive Services Task Force defines a "high-intensity" intervention as more than one person-to-person (individual or group) session per month for at least the first three months of the intervention.

### Pediatric Clinical Care

In light of the obesity epidemic in North Carolina and its impact on children, Community Care of North Carolina (CCNC)<sup>nn</sup> is conducting a two-year pilot project to develop systems of care for the prevention of obesity in Medicaid-enrolled children. The project, known as the Childhood Obesity Prevention Initiative, is being piloted with 187 primary care practices in 4 of the 14 CCNC networks reaching 102,000 children ages 2-18.<sup>oo</sup> The project's objectives are "to promote practice-based standardized screening with prevention messages for all children, to increase provider self-efficacy in treating childhood obesity, and to develop effective linkages between the child's primary care provider and existing community resources."<sup>90</sup>

Through the pilot, primary care providers receive practice toolkits to use with their patient. In addition, trainings focusing on guideline implementation and motivational interviewing are provided. Patients and families receive education about nutrition, and both patients and practices are linked to community resources. Targeted case management and participation incentives are also part of the pilot project.<sup>90</sup> The project is being evaluated through chart audits and by the percent of practices that are trained in the use of obesity screening tools, that are using BMI screening, and that have established linkages to community resources. The intervention project will end December 2009.

Given the prevalence of childhood obesity in North Carolina and among Medicaid-enrolled children, the Task Force recommends:

### Recommendation 4.12: Expand the CCNC Childhood Obesity Prevention Initiative

**If shown to be successful through program evaluations, Community Care of North Carolina (CCNC) should continue expansion of the Childhood Obesity Prevention Initiative including the dissemination and use of already developed clinical initiatives aimed at obesity reduction for Medicaid-enrolled and other children and their families. The North Carolina General Assembly should appropriate one-time funding of \$174,000 in SFY 2011 to the North Carolina Office of Rural Health and Community Care to support this effort.**

**In light of the obesity epidemic in North Carolina and its impact on children, Community Care of North Carolina (CCNC) is conducting a two-year pilot project to develop systems of care for the prevention of obesity in Medicaid-enrolled children.**

<sup>nn</sup> Community Care of North Carolina (CCNC) is a Medicaid program that helps link Medicaid recipients to primary care providers. Primary care providers serve as the patient's medical home and help coordinate all the care the person receives. Primary care providers, along with care and disease managers, help Medicaid recipients manage chronic illness and improve their overall health status.

<sup>oo</sup> The pilot project is supported by the Kate B. Reynolds Charitable Trust and has in-kind support from the Office of Rural Health and Community Care and the North Carolina Foundation for Advanced Health Programs. Access II Care of Western NC, Southern Piedmont Community Care Plan, Carolina Community Health Partnership, Partnership for Health Management, and Community Care of Wake and Johnston Counties are the participating networks.

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**R**isky sexual behaviors can lead to sexually transmitted diseases (STDs), human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), and unintended pregnancy. These potentially preventable conditions can lead to reduced quality of life, as well as premature death and disability, and result in millions of dollars in preventable health expenditures annually in North Carolina. In 1997 the estimated annual direct medical cost to North Carolina for all STDs, including HIV, was \$228.4 million.<sup>1</sup> Unintended pregnancy among the Medicaid population alone leads to over \$500 million in costs annually.<sup>1</sup> The National Campaign to Prevent Teen and Unplanned Pregnancy estimated teen pregnancy in North Carolina cost taxpayers more than \$312 million in 2004.<sup>a,2</sup> All of these costs are largely preventable.

While the financial impact of STDs, HIV, and unintended pregnancy is important, the most serious toll these have is on loss of life and disability. In 2007, nearly 54,000 cases of STDs (non-HIV) were reported in North Carolina.<sup>3</sup> In addition, 1,943 new cases of HIV disease were diagnosed, and 953 new AIDS cases were reported.<sup>3</sup> Forty-five percent of all live births in 2006 resulted from unintended pregnancies.<sup>4</sup> While unintended pregnancy does not usually result in loss of life or disability, it can lead to adverse social, economic, and health outcomes. As with many health diseases and conditions, the burden of STDs, HIV, and unintended pregnancy fall disproportionately on disadvantaged populations, young people, and minorities.

## Sexually Transmitted Diseases (Non-HIV)

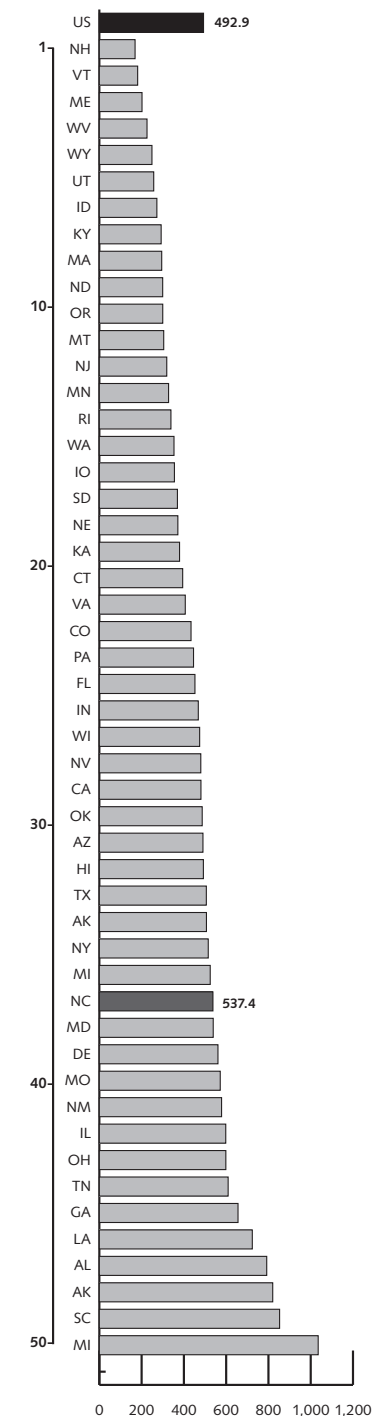
STDs are illnesses and infections that are transmitted by direct sexual contact. They include both bacterial and viral infections and can cause serious health problems.<sup>5</sup> In many cases individuals are infected but do not show symptoms and unknowingly infect others.<sup>5</sup> In North Carolina, 18 STDs and related conditions are reportable to state authorities.<sup>b,3</sup> The most prevalent reportable STDs in the state include chlamydia, gonorrhea, and syphilis.<sup>c,3</sup> Data show that North Carolinians contract gonorrhea and HIV at rates above the national average. (See Table 5.1.) High STD rates are particularly problematic as STD infection is associated with an increased risk for HIV infection.<sup>6</sup>

a The National Campaign to Prevent Teen and Unplanned Pregnancy includes public health care, child welfare, incarceration, and lost tax revenue in the calculation of total costs associated with teen parents and their children. Because all costs and outcomes cannot be measured, these estimates represent conservative predicted costs. (The National Campaign to Prevent Teen and Unplanned Pregnancy. By the numbers: the public costs of teen childbearing in North Carolina. <http://www.thenationalcampaign.org/costs/pdf/states/northcarolina/fact-sheet.pdf>. Published November 2006. Accessed June 29, 2009.)

b § 10A NCAC 41A 0.101 Reportable Diseases and Conditions. The 18 mentioned here do not include HIV and AIDS. Reportable diseases and conditions are those that laboratories and health care providers are legally required to report confirmed diagnoses to the North Carolina STD Surveillance data system. Reporting is for monitoring and reporting disease trends.

c 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.

**Syphilis, Gonorrhea, and Chlamydia Cases Per 100,000, 2007**



Source: North Carolina Institute of Medicine. Analysis of Centers for Disease Control and Prevention, Sexually Transmitted Disease Surveillance Data, 2007.

Risky sexual behaviors can lead to sexually transmitted diseases (STDs), human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), and unintended pregnancy.

**Table 5.1**  
Selected 2007 STD Incidence Rates per 100,000 Population in North Carolina and the United States

2007 STD Incidence Rates			
	North Carolina	United States	North Carolina Rank
Chlamydia	345.6	370.2	26th
Gonorrhea	188.2	118.9	45th
Syphilis	3.6	3.8	36th
HIV (2006)	32.2	22.8	*

\*North Carolina is ranked 19th of the 22 states participating in surveillance of HIV incidence estimates (with 1st being the state with the lowest rate).

Note: States were ranked in descending order by rate, with 1st being the state with the lowest rate.

Sources: Chlamydia, Gonorrhea, and Syphilis data from: Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance, 2007. Atlanta, GA: U.S. Department of Health and Human Services; December 2008. HIV data from: Engel J. HIV/STD and unintended pregnancy in North Carolina. Presented to: The North Carolina Institute of Medicine Task Force on Prevention; October 3, 2008; Cary, NC.

In many cases, treatments are available to reduce STD symptoms, decrease or eliminate the risk of STD transmission, and cure STDs. Two STDs, the hepatitis B virus and the human papillomavirus (HPV), are vaccine-preventable. However, the majority of STDs are not vaccine-preventable.<sup>7</sup> (See Chapter 9, Recommendation 9.1 for information about the HPV vaccine.)

**Chlamydia, Gonorrhea, and Syphilis**

*Chlamydia*

Chlamydia is the most frequently reported STD in North Carolina. In 2007, 30,612 cases of chlamydia were reported, and over 24,000 of these cases were in females. The gender disparity is generally believed to be due to the fact that women are screened for the disease more often than men, not because more women than men are infected.<sup>3</sup> Chlamydia infection can cause severe damage to the female reproductive tract, including infertility and pelvic inflammatory disease (PID). Although it is easily treated with antibiotics, approximately three-quarters of infected females and half of infected males have no symptoms, and therefore may not seek treatment.<sup>d,3,8</sup>

d For these reasons, the US Preventive Services Task Force recommends that all sexually active females age 24 years and under, as well as all pregnant women who are at increased risk, be screened for chlamydia. The Centers for Disease Control and Prevention recommends that men are tested for chlamydia when they visit STD clinics or attend the National Job Training Program. In addition, men under age 30 who are sexually active should be screened in the military and when they enter jail. (National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention, Centers for Disease Control and Prevention. Male Chlamydia screening consultation: meeting report. <http://www.cdc.gov/std/chlamydia/chlamydia-screening-males.pdf>. Published May 22, 2007. Accessed June 24, 2009.) Despite these recommendations, there is currently no state or federal funding for chlamydia screening in men. (Leone P. HIV, STDs and unintended pregnancy: what are we doing in NC to address these? Presented to the North Carolina Institute of Medicine Task Force on Prevention; October 3, 2008; Morrisville, NC.)

### *Gonorrhea*

Gonorrhea is the second most commonly reported STD in North Carolina, with 16,665 cases reported in 2007.<sup>3</sup> While the incidence of gonorrhea declined for many years in North Carolina, it increased 15% from 2005 to 2006.<sup>7</sup> Symptoms among infected males include discharge and burning upon urination. Women may or may not have symptoms, and symptoms may be mild. However, untreated gonorrhea can damage the female reproductive tract, causing PID and infertility.<sup>7</sup> Males are more likely than females to have symptoms associated with gonorrhea infection that would encourage them to visit an STD clinic. The state has not seen a gender bias in gonorrhea reporting, as with chlamydia, because males typically have symptoms that prompt them to receive care. About half of reported gonorrhea cases are in males.<sup>7</sup> However, females in publicly-funded prenatal care, family planning, and STD clinics are screened for gonorrhea, while males are screened at STD clinics only.

### *Syphilis*

Syphilis is a complex, multi-stage disease and the third most prevalent non-HIV reportable STD in North Carolina. In 2007, 1,103 cases were reported.<sup>3</sup> Primary and secondary syphilis—often called early syphilis—are the most infectious stages and are the stages where symptoms are most perceptible. Syphilis is identified by a single sore skin rash and lesions in the mucous membrane. Fever, sore throat, headaches, and weight loss characterize the second stage. Late and latent stages are marked by damage to internal organs, paralysis, blindness, and dementia.<sup>9</sup>

In 1999, a national syphilis eradication initiative, the Syphilis Elimination Effort (SEE), was launched in counties with particularly high rates of syphilis. Six of the 50 counties were in North Carolina.<sup>e</sup> Due to this effort, North Carolina's syphilis rates declined. However, since 2003, rates of early syphilis in the state have risen, and North Carolina's national ranking for cases of syphilis has increased. In 2003, North Carolina ranked 31st; however, by 2006, North Carolina ranked 38th (with only 12 states having higher rates of syphilis), as shown in Table 5.1.<sup>4,7</sup> Most of the infections (56%) reported in 2007 were found in the six SEE counties.<sup>3</sup>

North Carolina law requires that medical providers test all pregnant women who are between 28-30 weeks gestation for syphilis.<sup>f</sup> However, women who do not receive adequate prenatal care services often miss these opportunities for screening. Untreated syphilis is especially dangerous in pregnant women. The disease can infect the infant and cause severe complications, including premature birth and infant death.<sup>7</sup> Syphilis can generally be treated with antibiotics such as penicillin.<sup>10</sup>

**The most prevalent reportable STDs in the state include chlamydia, gonorrhea, and syphilis. Data show that North Carolinians contract these three STDs as well as HIV at rates above the national average.**

e Including Durham, Forsyth, Guilford, Mecklenburg, Robeson, and Wake

f 15A NCAC 19A.0204 Control Measures—Sexually Transmitted Disease

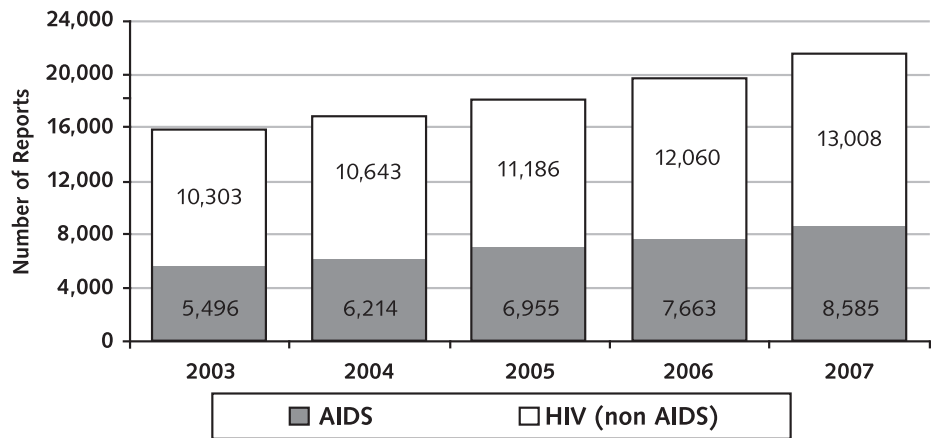
**In North Carolina in 2006, HIV/AIDS was the 10th leading cause of death among 13-24 year olds, the 7th leading cause of death among 25-44 year olds, and the 9th leading cause of death among African Americans in all age groups.**

**HIV/AIDS**

HIV is a virus that weakens the immune system and can lead to AIDS.<sup>g,11</sup> The primary ways in which HIV is transmitted are through sexual contact or sharing needles with an infected person.<sup>12</sup> HIV infection in humans is pandemic, and HIV/AIDS is estimated to have killed more than 25 million people worldwide to date.<sup>13</sup> In 2006, 56,300 people in the United States contracted HIV; of those new cases, 2,022 were in North Carolina.<sup>7,14</sup> In North Carolina in 2006, HIV/AIDS was the 10th leading cause of death among 13-24 year olds, the 7th leading cause of death among 25-44 year olds, and the 9th leading cause of death among African Americans in all age groups.<sup>3</sup>

According to the North Carolina Division of Public Health (DPH) HIV/STD Prevention & Care Branch, nearly 21,600 people in the state were known to be living with HIV/AIDS in 2007. (See Figure 5.1.) However, given that not all infected persons are aware of their status, it is estimated that 33,000 people in North Carolina are living with HIV or AIDS.<sup>3</sup> This is extremely troubling, as it is estimated that over half of new infections are caused by people who are unaware that they are infected.<sup>15</sup> Additionally, the most recent data (from 2006) show that only 62% of North Carolinians living with HIV who knew of their status were in care.<sup>3</sup>

**Figure 5.1**  
Total HIV/AIDS Cases in North Carolina, 2003-2007



Source: Division of Public Health, North Carolina Department of Health and Human Services. Epidemiologic profile for HIV/STD prevention & care planning. [http://www.epi.state.nc.us/epi/hiv/epiprofile1008/Epi\\_Profile\\_2008.pdf](http://www.epi.state.nc.us/epi/hiv/epiprofile1008/Epi_Profile_2008.pdf). Published October 2008. Revised May 2009. Accessed July 1, 2009.

<sup>g</sup> Human immunodeficiency virus (HIV) is a retrovirus that attacks the immune system and causes acquired immune deficiency syndrome (AIDS). AIDS is the final stage of an HIV infection, and a person may be infected with HIV for many years before AIDS develops. (Centers for Disease Control and Prevention. Living with HIV/AIDS. Centers for Disease Control and Prevention website. <http://www.cdc.gov/hiv/resources/brochures/livingwithhiv.htm>. Updated July 21, 2007. Accessed August 12, 2009.

Among adult and adolescent males in 2007, 76% of new HIV cases were from men having sex with men (MSM) and MSM who were injection drugs users (IDU).<sup>3</sup> Among adult and adolescent females, 86% of HIV cases were from heterosexual transmission and 9% were from IDU. Heterosexual transmission of HIV accounted for nearly 4 out of 10 of all new HIV reports in 2007; whereas MSM and MSM who inject drugs accounted for 5 out of 10 of all reports.<sup>h,3</sup>

## Unintended Pregnancy

The term *unintended pregnancy* refers to a pregnancy that was mistimed or unwanted at the time of conception. This term does not necessarily reflect parental perception of the child at the time of birth.<sup>16</sup> Nearly half of all pregnancies in North Carolina are unintended. Unintended pregnancy can result in serious health, social, and economic consequences for women, families, and communities. It is associated with delayed entry into prenatal care as well as low-birth weight babies and poor maternal nutrition.<sup>17</sup> Additionally, women giving birth resulting from unintended pregnancies are more likely to smoke and less likely to breastfeed.<sup>4</sup>

Approximately 45% of the 123,500 live births in North Carolina yearly from 2004-2006 were unintended. Of these, 11% of women indicated they did not want to become pregnant at that time or at any time in the future, and 34% indicated the timing of the pregnancy was not optimal.<sup>4</sup> In 2006, Medicaid covered 61,190 births at an average cost of \$12,874 for each pregnancy and first year of infant care.<sup>1</sup> According to the North Carolina Pregnancy Risk Assessment Monitoring System (PRAMS), 72% of women with unintended pregnancies in 2004-2006 were Medicaid recipients just before pregnancy, during pregnancy, or after delivery.<sup>4</sup> Significant cost savings for the state would result from the prevention of these unintended pregnancies (see cost information in Recommendation 5.4). An estimated 467,630 North Carolina women were in need of publicly financed family planning services in 2006; however, only 42% were served. Services that were delivered helped to prevent an estimated 45,300 unintended pregnancies across the state.<sup>18</sup>

Although the majority of unintended pregnancies occur in adults, most teen pregnancies are unintended.<sup>19</sup> While more than 3 out of 4 unintended pregnancies are among women ages 20 years and older, the risk of unintended pregnancy is higher among younger women.<sup>20</sup> North Carolina is ranked 37th in the country in teen pregnancy rates (with 50th being the state with the highest rate). Teen pregnancy rates in North Carolina have leveled off over the past 5 years following a 14-year period of decline. In 2007, the rate of teen pregnancy among girls ages 15-19 was 63 per 1,000, resulting in 19,615 pregnancies. Of teens in this age group that became pregnant in 2007, almost 30% were repeat pregnancies.<sup>i,22</sup> North

**Nearly half of all pregnancies in North Carolina are unintended.**

**Although the majority of unintended pregnancies occur in adults, most teen pregnancies are unintended.**

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h The other 10% of HIV reports were due to no information, identified source, or identifiable risk. (Leone P. Medical Director, HIV/STD Prevention and Care Branch, Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. August 4, 2009.)

Carolina's 2006 teen birth rate among girls ages 15-19 years was higher than the national rate (49.7 per 1,000 versus 41.9 per 1,000).<sup>21</sup>

North Carolina's relatively high rate of teen pregnancy is related to the sexual practices of the state's young people. In 2007 52.1% of high school students reported having ever had sexual intercourse, and 37.5% reported having sexual intercourse in the last three months.<sup>23</sup> As grade level increases, youth are more likely to be sexually active. Among high school students ages 15 and younger, 36.4% reported ever having had sexual intercourse; among those ages 18 and older, 69% had ever had sexual intercourse. Among students who had sexual intercourse during the past three months, one in five drank alcohol or used drugs before last sexual intercourse. Additionally, many youth report not using protection against STDs, HIV, and unintended pregnancy. Among sexually active high school students, 61.5% reported using a condom the last time they had sex and 17.4% said they used birth control pills.<sup>23</sup>

**In 2007 52.1% of high school students reported having ever had sexual intercourse, and 37.5% reported having sexual intercourse in the last three months.**

Compared with women who have their first child after age 19, adolescents who become mothers are more likely to suffer adverse social and health consequences.<sup>24</sup> Approximately 70% of young mothers drop out of high school, and the children of teenage mothers score lower on tests of mathematics and reading up to age 14.<sup>24</sup> In addition, these children are twice as likely as other children to repeat a grade in school and receive unfavorable ratings by teachers in high school. Children born to young teenage mothers are much more likely to be victims of abuse and neglect, and, if placed in foster care, spend a longer time there.<sup>25</sup> Further, the children of teenage mothers are three times more likely to spend time in a jail or prison during adolescence or their early twenties. It is estimated that if females delayed their first birth from age 17 and younger to age 20 or 21, there would be a 9% increase in the chance that their children would graduate from high school. Moreover, according to the North Carolina State Advisors on Adolescent Sexual Health, national savings in foster care spending would be approximately \$1 billion annually, while incarceration costs would be reduced by \$900 million.<sup>i,25</sup> As mentioned previously, the National Campaign to Prevent Teen and Unplanned Pregnancy estimated teen pregnancy in North Carolina cost taxpayers more than \$312 million in 2004, including \$36 million in child welfare costs and \$61 million in incarceration costs.<sup>2</sup> In FY 2009, only \$3.5 million in Temporary Assistance for Needy Families (TANF), Medicaid, and state appropriations was spent on teen pregnancy prevention initiatives in North Carolina.<sup>k</sup>

i The teen pregnancy rate is defined as the sum of live births and legal induced abortions per 1,000 women ages 15-19 years. The teen birth rate is defined as the number of live births per 1,000 women ages 15-19 years. (Centers for Disease Control and Prevention, US Department of Health and Human Services. Teenage pregnancy and birth rates—United States, 1990. <http://www.cdc.gov/mmwr/preview/mmwrhtml/00021930.htm>. Published September 19, 1998. Accessed July 6, 2009.)

j The North Carolina State Advisors on Adolescent Sexual Health is composed of representatives from the North Carolina Department of Public Instruction, North Carolina Department of Health and Human Services, and the Office of Minority Health and Health Disparities.

k Crownover R. Team Pregnancy Prevention Team Leader, Women's Health Branch, Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. July 13, 2009.



### Disparities in STDs, HIV, and Unintended Pregnancy

There are significant disparities in the infection rates of STDs and HIV and in the rate of unintended pregnancies by race/ethnicity, age, and gender.

#### Race and Ethnicity

Severe racial and ethnic disparities exist in STD and HIV infection rates as shown in Table 5.2. For example, African American men have a gonorrhea rate that is 24 times higher and an HIV rate that is six times higher than the rates of white men.<sup>7</sup> African American women have an HIV rate that is 16 times higher and a syphilis rate that is 11 times higher than those of white women. The HIV/AIDS disparity between African Americans and whites is one of the largest health disparities in the state. Approximately 70% of those infected with AIDS in North Carolina are African Americans, which is almost 25% higher than the national average.<sup>7</sup> Further, North Carolina has the 6th highest rate of African Americans living with AIDS in the country. African Americans in North Carolina also have higher rates of other STDs than whites, as shown in Table 5.2. American Indians also experience much higher rates of chlamydia, gonorrhea, and syphilis than whites in the state, although this is not shown in the table. Not only do African Americans have a higher rate of STDs and HIV/AIDS, the rate of unintended pregnancy among African American women is almost twice as high as that among white women.<sup>26</sup>

**Severe racial and ethnic disparities exist in STD and HIV infection rates.**

**Table 5.2**  
African Americans and Latinos are More Likely to have STDs and HIV than Whites

STD and HIV Rates per 100,000 in North Carolina, 2007						
	Males			Females		
	White	African American <small>(times (x) higher than white males)</small>	Latino <small>(times (x) higher than white males)</small>	White	African American <small>(times (x) higher than white females)</small>	Latino <small>(times (x) higher than white females)</small>
Chlamydia	34.8	385.3 <small>(11.1x higher)</small>	144.8 <small>(4.2x higher)</small>	202.6	1374.7 <small>(6.8x higher)</small>	711.2 <small>(3.5x higher)</small>
Gonorrhea	27.8	660.7 <small>(23.8x higher)</small>	68.6 <small>(2.5x higher)</small>	57.1	578.0 <small>(10.1x higher)</small>	65.7 <small>(1.2x higher)</small>
Syphilis	3.2	33.1 <small>(10.3x higher)</small>	7.1 <small>(2.2x higher)</small>	0.9	10.2 <small>(11.3x higher)</small>	5.1 <small>(5.7x higher)</small>
HIV	18.7	108.5 <small>(5.8x higher)</small>	51.2 <small>(2.7x higher)</small>	3.2	52.4 <small>(16.4x higher)</small>	18.2 <small>(5.7x higher)</small>

Source: Division of Public Health, North Carolina Department of Health and Human Services. Epidemiologic profile for HIV/STD prevention & care planning. [http://www.epi.state.nc.us/epi/hiv/epiprofile1008/Epi\\_Profile\\_2008.pdf](http://www.epi.state.nc.us/epi/hiv/epiprofile1008/Epi_Profile_2008.pdf). Published October 2008. Revised May 2009. Accessed July 1, 2009.

Risky sexual behavior cannot fully account for these racial disparities. Although African American women tend to have the highest STD rates, studies consistently show they do not have the highest levels of risky behavior.<sup>27</sup> According to data from the Centers for Disease Control and Prevention (CDC), African Americans report more risky behaviors on some measures, but whites appear to be more risky

**A multifaceted approach that includes outreach to high-risk groups, accessible screening and testing, appropriate care for infected people, comprehensive education, family planning, and pregnancy prevention programs holds significant promise for reducing the impact of STDs, HIV, and unintended pregnancy on North Carolinians and the state.**

on many measures.<sup>1,28</sup> A combination of access to health care services, socioeconomic factors, and the makeup of sexual networks, in addition to screening and reporting bias in some cases, may explain some of the disparities across race and ethnicity.<sup>3</sup>

Unintended pregnancy also varies dramatically by race and ethnicity. From 2004-2006 in North Carolina, 63% of pregnant African American women and 48% of pregnant Latino women reported unintended pregnancies compared to 38% of pregnant white women<sup>4</sup>

### Age and Gender

North Carolina's youth—especially young women—are at particularly high risk for STD and HIV infection. Nearly half of all new STD infections occur in youth between ages 15-24.<sup>3</sup> In 2007, youth ages 13-19 accounted for 37% of North Carolina's new chlamydia cases and 26% of new gonorrhea cases. People under age 30 accounted for 89% of new chlamydia cases and 77% of new gonorrhea cases, with women accounting for 60% of new gonorrhea cases and 84% of new chlamydia cases in this age group.<sup>29</sup> Estimates suggest that one in two new HIV infections occur among people younger than 25 years, with one in four infections occurring among youth ages 22 years or younger.<sup>30</sup>

As mentioned above, age is an important factor in the rate of unintended pregnancy in North Carolina. The overwhelming majority of teen pregnancies (70%) are unintended.<sup>4</sup> However, because teen pregnancies are actually a small percentage of all pregnancies (12.2%), most (five out of six) of the unintended pregnancies in North Carolina are to women who are older than age 20.<sup>4</sup>

### Prevention of STDs, HIV, and Unintended Pregnancy

There are many promising approaches to reduce STDs, HIV, and unintended pregnancy in North Carolina. Evidence-based educational programs have been shown to decrease risky sexual behavior and increase the use of contraception, which decreases the chances of both infection and unintended pregnancy. Screening for STD and HIV infection helps lower prevalence and reduce transmission. Pregnancy prevention programs have been shown to be extremely effective. A multifaceted approach that includes outreach to high-risk groups, accessible screening and testing, appropriate care for infected people, comprehensive education, family planning, and pregnancy prevention programs holds significant promise for reducing the impact of STDs, HIV, and unintended pregnancy on North Carolinians and the state.

1 Unmarried African American women of all ages are less likely to have had four or more partners in the past year than their white counterparts, and a lower percentage of African American women reported having had 15 or more partners in their lives than white women. Lower percentages of African Americans report ever having had anal sex than whites. Fewer white men report using a condom during their last sexual intercourse than Latino or African American men (35.1%, 45.9%, and 55.5% respectively). However, African American men are more likely (34%) than white (22%) or Latino men (18%) to report having had 15 or more female sexual partners in their lifetime. African American teenagers are more likely than white teenagers to have had vaginal intercourse. (Mosher WD, Chandra A, Jones J. Sexual behavior and selected health measures: men and women 15-44 years of age, United States, 2002. *Adv Data*. 2005;362:1-55.)

### Social Marketing and Screenings

Certain population groups are at high risk for contracting STDs and HIV and have an increased likelihood of transmitting these diseases. DPH and local health agencies are required to provide certain essential services including communicable disease control, health promotion, and risk reduction.<sup>m</sup> Educating and empowering individuals about health issues such as STDs and HIV are part of DPH's mission.

#### *Social Marketing*

One way DPH has acted to reduce the risk of STD and HIV and prevent the spread of these communicable diseases is through the *Get Real. Get Tested.* campaign. In 2006, DPH launched this statewide educational campaign to encourage North Carolinians to get tested to learn their HIV status. The HIV transmission rate is around 3.5 times higher for those undiagnosed compared to those who know their status, meaning increased knowledge of HIV status could lower transmission rates.<sup>31</sup> The campaign also provides HIV/AIDS prevention and education messages to the general public and helps identify persons living with HIV/AIDS in need of care. The campaign—executed in collaboration with community organizations, local health departments, and other partners—includes television spots, radio messages, and a 24/7 toll-free HIV/AIDS Hotline.<sup>n,32</sup> In 2007, *Get Real. Get Tested.* commercials aired during primetime shows to media markets statewide and reached over three million viewers across the state. During this time, HIV testing increased by 18.0%, which translates to an increase of 25,939 tests. Over 7,000 rapid HIV tests were administered at nontraditional testing sites, resulting in the identification of 71 new cases of HIV. Other *Get Real. Get Tested.* events led to more than 2,000 tests (part of the 25,939 tests noted above) and the identification of another 27 HIV-positive people. An additional 23 people tested positive for syphilis during these testing events.<sup>33</sup>

The effectiveness of the *Get Real. Get Tested.* campaign indicates that North Carolinians are receptive to messages regarding sexual health and behavior. Moreover, the success of this campaign shows that social marketing is an effective tactic for increasing screening rates among high-risk individuals in North Carolina. However, the reach of this campaign is limited due to finite funding. Encouraging high-risk North Carolinians to get tested can increase the proportion of individuals with STDs or HIV who know their status and receive proper treatment and can thereby lead to lower rates of transmission.

#### *STD and HIV Screening*

Providing access to screening is a necessary complement to such a campaign. DPH and local health departments play a vital role in providing access to STD and HIV screenings. All of the state's 100 local health departments offer no-cost, confidential STD and HIV/AIDS services including screening and counseling.<sup>34</sup> In an effort to increase screening among high-risk populations, DPH works with

**The effectiveness of the *Get Real. Get Tested.* campaign indicates that North Carolinians are receptive to messages regarding sexual health and behavior.**

<sup>m</sup> NCGS §130A-1.1(b)

<sup>n</sup> Additional partners include WRAZ/FOX 50 and Gilead Sciences.

Since HIV in young adults is almost always nonsymptomatic, there is little impetus for this population to get tested. Offering tests in nontraditional settings such as churches, chain stores, and college campuses may increase the number of young adults screened for the disease.

private providers and emergency departments to increase HIV screenings.<sup>o</sup> Since HIV in young adults is almost always nonsymptomatic, there is little impetus for this population to get tested.<sup>35</sup> Offering tests in nontraditional settings such as churches, chain stores, and college campuses may increase the number of young adults screened for the disease.

Although the benefits of STD and HIV screenings are clear, surveys show that STD screening levels are well below practice guidelines.<sup>36</sup> Even among populations for whom screening is covered by insurance, nonsymptomatic individuals rarely get screened for STDs including HIV.<sup>36</sup> In North Carolina, less than 50% of adults report ever having had an HIV test.<sup>37</sup> And as mentioned earlier, a large proportion of people do not know they are living with the HIV.

Reducing barriers to HIV and STD screening has consistently been shown to increase testing rates. Research indicates that HIV testing is infrequently performed because of multiple perceived barriers, including legally mandated counseling and the requirement for a separate, signed informed consent; lack of knowledge of STDs and available services; cost; shame associated with seeking services; long clinic waiting times; discrimination; and urethral specimen collection methods.<sup>35,38</sup>

### Opt-out HIV Testing

In 2006, the CDC changed its recommendations for HIV testing from opt-in to opt-out testing for all persons ages 13 to 64 in all health care settings.<sup>p</sup> That means that when a person signs a general consent for any health care procedure, she or he will also be considered to have given consent for HIV testing. A separate consent for HIV testing is no longer needed. People who do not want to be tested need to affirmatively “opt-out” of the testing. Other changes include recommending that all persons at high risk be screened annually and that pre-test counseling not be required.<sup>39</sup> In November 2007, changes were made to the North Carolina Administrative Code, which reflect the revised CDC recommendations regarding HIV testing. Changes that went into effect in North Carolina in April 2008 include the following:

- There is no longer a requirement for pre-test counseling prior to HIV testing.
- Post-test counseling is only required for positive test results.
- Opt-out HIV testing should be offered to pregnant women at the first prenatal visit and in the third trimester.

o Foust E. Branch head. Communicable Disease Branch, Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. September 24, 2008.

p There are two types of voluntary HIV testing: opt-in and opt-out. Under the opt-in approach, HIV testing can only be performed once informed consent has been obtained. (Committee on Perinatal Transmission of HIV and Commission on Behavioral and Social Sciences and Education, Institute of Medicine. *Reducing the odds: preventing perinatal transmission of HIV in the United States*. Washington, DC: National Academies Press; 1999.) (Branson BM, Handsfield, HH, Lampe MA, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health care settings. *MMWR Recomm Rep*. 2006; 55(RR-14):1-17.)

- A separate consent for HIV testing is not required, and testing can be included in a panel of tests using a general consent for treatment and routine laboratory testing. Patients must be notified and can opt-out of the testing.<sup>40,41</sup>

Given the novelty of these changes, many providers in the state may be unaware of the new guidelines set forth in the North Carolina Administrative Code. Opt-out testing increases HIV testing rates among at-risk populations. Pregnant women are also more comfortable with the opt-out testing model. In addition, the majority of adults in the United States (65.0%) think that HIV screening should be the same as for any other disease and that special procedures to gain consent are not necessary.<sup>39</sup>

### Rapid Testing for HIV

Rapid HIV testing procedures offer individuals in clinical and nonclinical settings an opportunity to learn their HIV status immediately. These types of HIV tests produce on-site results, which increases the chance that the individual being tested will actually learn their HIV status. Not learning test results is a considerable problem. The 1995 National Health Interview Survey found that 13.3% of people tested did not receive their HIV test results. Further, an estimated 30% of HIV-positive patients tested at public-sector testing sites in 2000 did not return to get their results according to the CDC.<sup>42</sup> A 1995-2000 study conducted in Wake County, North Carolina, showed that 55% of study subjects tested in publicly-funded STD clinics did not return for their HIV test results at their scheduled 2-week follow-up appointment.<sup>43</sup>

The North Carolina Division of Public Health Communicable Disease Branch currently offers nine HIV counseling, testing, and referral trainings each year. Rapid HIV testing is included in these trainings. Increasing the number of trainings will enable DPH to train more nontraditional providers and nonmedical professionals on the use of rapid HIV testing and accompanying procedures so that screenings can be offered at more nontraditional sites.

### Bridge Counseling for HIV-Positive Individuals

Bridge counseling services for HIV-positive individuals benefit not only the infected individual but can also protect the community by reducing the spread of the disease. Roughly 30% of individuals infected with HIV do not know their status and would need case management services if or when diagnosed. Another 20%-30% of those who do know their HIV-positive status are not in care and need case management.<sup>q</sup> Individuals who test positive for HIV—particularly those from marginalized populations—often have trouble accessing the services required for them to comply with prescribed medications. Having a bridge counselor has been associated with increased medication use.<sup>44</sup> In addition, bridge counseling services

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q Leone P. Medical Director, HIV/STD Prevention and Care Branch, Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. August 4, 2009.

**Many sex partners of persons with gonorrhea or chlamydia infections are not treated, which leads to frequent reinfections and further transmission.**

for HIV-infected individuals prevent transmission of disease by changing behaviors that spread the disease.<sup>45</sup> Unfortunately, research also indicates that the supportive service needs (e.g. income assistance, housing, health insurance, home health care) of people infected with HIV often go unmet.<sup>46</sup>

### **Evidence-Based Pregnancy Prevention Programs**

There are numerous pregnancy prevention programs in North Carolina. For example, many communities in North Carolina offer programs to prevent teen pregnancy. The Teen Outreach Program (TOP), a nationally-recognized evidence-based program, is one such program being implemented that has been shown through rigorous evaluation to reduce pregnancy rates among participants. The program helps teens to develop life management skills, a positive self-image, and goals. The main components of the program include service learning, curriculum-based classroom group exercises, and relationships between students and facilitators. In addition to reduced pregnancy rates, participants perform better academically and have lower rates of school dropout and suspension.<sup>33,47</sup>

The Nurse-Family Partnership is an evidence-based, home visiting program that has been shown to reduce or delay second pregnancies. The program provides first-time, low-income mothers with home visitation services from public health nurses. Numerous published research reports have demonstrated that the program significantly improves the health and well-being of low-income, first-time parents and their children. The program has also been shown to improve school readiness, reduce child abuse and neglect, improve economic self-sufficiency for parents, and decrease crime, substance abuse, and dependence on welfare.<sup>48-50</sup> In addition, the program provides an estimated \$5.70 return for every dollar directed towards higher-risk populations, with a \$2.88 return for the entire population served, not including cost savings attributable to reductions in subsequent pregnancies or preterm births.<sup>51</sup> The program currently serves parents and children in Guilford, Cleveland, McDowell, Mecklenburg, Polk, Robeson, Rutherford, Pitt, and Wake counties.<sup>52</sup> However, with its limited presence in the state, only a small percentage of women who would benefit from this program are being reached and served.

### **Expedited Partner Therapy**

Many sex partners of persons with gonorrhea or chlamydia infections are not treated, which leads to frequent reinfections and further transmission.<sup>53</sup> One way to reduce and prevent transmission is to ensure that both partners are treated. Typically, the standard medical practice is to ask infected individuals to refer their partners into treatment. However, studies have shown that Expedited Partner Therapy (EPT), which involves providing a prescription or medication to a patient identified with an STD to give to their sexual partner(s), is an effective way to reduce persistent or recurrent gonorrhea or chlamydia infections. According to the CDC, the benefits of EPT outweigh the risks, and it should be a clinical option for partner management in heterosexual men and women with chlamydia or gonorrhea.<sup>54</sup> Patient-delivered EPT is included in the CDC's treatment guidelines for sexually transmitted diseases in cases where "evaluation, counseling, and treatment" of partners is not possible.<sup>10</sup>

North Carolina regulations state that guidelines and recommendations from the CDC should become required communicable disease control measures.<sup>r</sup> As of April 2009, EPT is allowed in 15 states.<sup>s,55</sup> Currently, EPT is not the standard of care in North Carolina, and current legal uncertainty is likely to prevent physicians from prescribing EPT in North Carolina as recommended by the CDC. It is the position of the North Carolina Medical Board that “prescribing drugs to an individual the prescriber has not personally examined, or has never met based solely on answers to a set of questions, as is common on the Internet or toll-free telephone prescribing, is inappropriate and unprofessional.”<sup>56</sup> Further, North Carolina law requires that each prescription bear the name of the patient to whom it was prescribed.<sup>t</sup> However, the North Carolina Attorney General’s office has ruled that there are no legal barriers to EPT.<sup>u</sup>

The Task Force examined these and other evidence-based strategies to raise awareness, increase screenings and help link individuals into health care. Based on this review, the Task Force recommends:

## **Recommendation 5.1: Increase Awareness, Screening, and Treatment of Sexually Transmitted Diseases and Reduce Unintended Pregnancies**

- a) The North Carolina General Assembly should appropriate \$6.2 million in recurring funds beginning in SFY 2011 to the North Carolina Division of Public Health (DPH) to support efforts to reduce sexually transmitted diseases (STDs) and HIV infection and transmission and prevent unintended pregnancy. Of these funds, DPH should use:
  - 1) \$2.4 million to expand the *Get Real. Get Tested.* campaign for HIV prevention, create STD prevention messages, and collaborate with local health departments to offer nontraditional testing sites to increase community screenings for STDs such as chlamydia and syphilis and for HIV among adolescents, youth, and high-risk populations.
  - 2) \$300,000 to hire bridge counselors in high-prevalence-county local health departments to link individuals who test positive for HIV into medical care in order to prevent transmission.
  - 3) \$3.5 million to develop and disseminate an unintended pregnancy prevention campaign and expand community-based, evidence-based pregnancy prevention programs such as the Nurse Family Partnership, Teen Outreach Program, and other evidence-based pregnancy prevention programs to reach more adolescents and young adults.

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r 10A NCAC 41A.0201

s States where Expedited Partner Therapy (EPT) is permissible: Arizona, California, Colorado, Iowa, Louisiana, Minnesota, Mississippi, Nevada, New Mexico, New York, Pennsylvania, Tennessee, Utah, Washington, and Wyoming. In addition, Baltimore, MD, permits EPT.

t GS 106.134.1

u Leone P. Medical Director, HIV/STD Prevention and Care Branch, Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. August 4, 2009.

- b) DPH should also take the following additional steps to prevent STD and HIV transmission among high-risk populations:
- 1) Collaborate with academic health centers and other major health systems to promote the new rules that allow for opt-out HIV testing.
  - 2) Expand the training and certification of nontraditional providers to increase the use of rapid testing for HIV in high-risk populations.
  - 3) Work with the North Carolina Medical Board, the North Carolina Board of Pharmacy, and the North Carolina Medical Society to explore how to implement Expedited Partner Therapy for chlamydia and gonorrhea in North Carolina.

**Rates of infectious disease in general—and STDs in particular—in prisons and jails generally far exceed those in the general population.**

### HIV Testing in Prisons, Jails, and Juvenile Centers

Rates of infectious disease in general—and STDs in particular—in prisons and jails generally far exceed those in the general population.<sup>57</sup> In particular, HIV prevalence among the incarcerated population is much higher than it is for the general population. National estimates are that HIV prevalence is 8 to 10 times higher among prison inmates.<sup>7</sup> Further, it is estimated that 13%-19% of all HIV-positive individuals in the country are released from a correctional facility every year.<sup>58</sup> A 2001-2002 study found that an estimated 26% of released inmates who were HIV-positive in North Carolina were having sex with their main partners without using a condom.<sup>7</sup>

Correctional facilities are important settings because they provide a unique opportunity to reach high-risk individuals from a population that may otherwise only present for care after symptoms develop, and sometimes not even then.<sup>59,60</sup> For many offenders, incarceration may be the only time they access primary care.<sup>61</sup> Thus, prisons are important settings in which to provide HIV prevention, testing, and treatment.<sup>58</sup> Not only do inmates benefit from testing and treatment, but so do the communities to which they return.<sup>62</sup>

North Carolina ranked 7th highest in the number of HIV-infected inmates in 2006.<sup>63</sup> From 2002-2006, 636 people were diagnosed with HIV in state correctional facilities.<sup>7</sup> Approximately 3.4% of prisoners within the North Carolina Department of Correction (DOC) tested positive for HIV from January 2004 to May 2006, according to a 2009 University of North Carolina at Chapel Hill study. HIV rates among incarcerated males were 3.6% versus 2.6% for women; the majority (84.0%) of HIV positive inmates had been previously diagnosed.<sup>58</sup> Testing upon intake and prior to release is important given that some prisoners engage in risky sexual practices with other men while in prison.<sup>64</sup>

In November 2008, the DOC began providing opt-out HIV-testing to prisoners upon intake and annually during physical exams.<sup>63</sup> However, prisoners are not



tested prior to release.<sup>v</sup> Testing prisoners immediately prior to release would provide an opportunity to identify HIV-positive individuals prior to their assimilation back into communities. The benefits of this are two-fold: 1) individuals identified as HIV-positive can be referred into care, and 2) the risk of HIV transmission can be reduced through awareness of HIV status and behavior modification. Further, research indicates that intensive case management for HIV-positive ex-offenders being released into the community has many positive effects, including mental illness triage and referral, substance abuse assessment and treatment, appointments for HIV and other medical conditions, and referral for assistance to community programs that address basic survival needs. Additionally, ex-offenders will access HIV-related health care after release when given adequate support.<sup>61</sup>

In addition, expansion of HIV screening programs into county jails, youth development centers, and youth detention centers would likely detect a large number of HIV cases and contribute to decreases in transmission, as many individuals in these institutions are also at high risk for HIV transmission.<sup>7</sup> County jails are currently required to provide a comprehensive health exam to detainees who are incarcerated for at least 14 days, although they may provide these screenings earlier. Offering opt-out HIV screening upon intake to individuals in county jails, youth development centers, and youth detention centers provides another unique opportunity to reach a high-risk population.

Given that incarcerated individuals have a high prevalence of HIV and are at increased risk for contracting HIV and that correctional facilities can play an instrumental role in identification and coordination of care, the Task Force recommends:

## **Recommendation 5.2: Increase HIV Testing in Prisons, Jails and Juvenile Centers**

The North Carolina Department of Correction (DOC) should expand its existing HIV-testing policy to include opt-out testing for all prisoners upon release. The North Carolina General Assembly should provide \$1 million in recurring funding beginning in SFY 2011 to the DOC to support this effort.

- a) The North Carolina Department of Juvenile Justice and Delinquency Prevention (DJJDP) should offer opt-out HIV screening in their institutional facilities including youth development centers and youth detention centers. The North Carolina General Assembly should appropriate \$7,000 in recurring funds beginning in SFY 2011 to the DJJDP to support this effort.
- b) Counties should include opt-out HIV testing as part of the comprehensive exam given to inmates in county jails.

**Testing prisoners immediately prior to release would provide an opportunity to identify HIV-positive individuals prior to their assimilation back into communities.**

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<sup>v</sup> Leone P. Medical Director, HIV/STD Prevention and Care Branch, Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. August 4, 2009.

- c) The DOC and the North Carolina Division of Public Health should collaborate to ensure prisoners identified as HIV-positive are coordinated for outpatient care prior to release to help them manage their disease and prevent transmission.

**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.**

### **Ensuring Comprehensive Sexuality Education for More Young People in North Carolina**

In 1995 North Carolina passed a law requiring public schools to deliver an abstinence curriculum for sexuality education.<sup>w</sup> The major premise of North Carolina's abstinence-until-marriage education policy was that abstinence is the "only certain means of avoiding out-of-wedlock pregnancy and sexually transmitted diseases." Although abstinence until marriage is the goal of many abstinence policies and programs, few Americans wait until marriage to initiate sexual intercourse. As discussed, many of North Carolina's high school students report engaging in risky sexual behaviors such as engaging in sexual intercourse and having unprotected sex. (See page 134.) These behaviors indicate many young people in North Carolina are at risk for STD and HIV infection, pregnancy, or both. Since young people spend a considerable amount of time in schools and are accustomed to gaining information in the school setting, public schools are the ideal venue to reach a majority of young people in the state. Comprehensive sexuality education for youth is integral to a comprehensive statewide approach to prevent STDs, HIV, and pregnancy among North Carolinians because it can provide youth with the information and life skills needed to modify their sexual behavior and protect themselves.

Reviews and other scientific literature have found little evidence that abstinence-only programs are successful in encouraging teenagers to delay sexuality activity until marriage.<sup>65-68</sup> In addition, 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. In contrast, 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.<sup>67</sup> It is important to note that the evidence is very strong that these programs *do not* increase sexual behavior, even when they do encourage condom or other contraceptive use.<sup>69</sup> The American Psychological Association, American Medical Association, National Association of School Psychologists, Society for Adolescent Medicine, American Academy of Pediatrics, and American Public Health Association maintain that sexuality education needs to be comprehensive to be effective.<sup>70-75</sup>

In its interim report, the North Carolina Institute of Medicine Task Force on Prevention recommended that the North Carolina General Assembly amend the existing NCGS §115C-81(e1) to require that comprehensive sexuality education,

<sup>w</sup> NCGS §115C-81

which is complete and medically accurate sexuality education, be taught as part of the Healthful Living Standard Course of Study. Specifically, the Task Force's recommendation stated that the curriculum should be developmentally appropriate and include factually accurate information related to human reproduction, information on the benefits of abstinence, information on the effectiveness of condoms and other forms of contraceptives, skills-building exercises to avoid becoming pregnant and to avoid contracting HIV/AIDS and STDs, and information on community resources to reduce the risk of pregnancy, STDs, and HIV.

Since the release of the interim report, the North Carolina General Assembly enacted HB 88 (SL 2009-213), which accomplishes much of what the Task Force on Prevention recommended by requiring comprehensive sexuality education curricula to be offered by local education agencies. Specifically, the new law amends GS §115C-81, which mandated abstinence-based sexuality education only. The amended law requires each school to offer a reproductive health and safety education program starting in the seventh grade that includes, but is not limited to, information about abstinence; skills to resist engaging in sexual activity; factually accurate biological and pathological information related to the human reproductive system; information on the effectiveness and safety of all FDA-approved methods of birth control and methods to reduce the risk of contracting sexually transmitted diseases; information on local resources for testing and treatment of sexually transmitted diseases; and awareness of sexual assault, sexual abuse, and risk reduction. In addition, it states that the materials that are used must be age-appropriate and that the information presented in class must be objective and based upon scientific evidence. Also, schools must provide health education that meets the requirements of the statute but can expand on the subject areas that are taught.

The new legislation is an important improvement over the prior law in that it expands the health topics to be covered and includes a requirement that the content be objective, based upon peer-reviewed scientific evidence, and accepted by professionals in the field of sexual health education. However, this law does not require that all students receive this comprehensive sexuality education curriculum. Specifically, the new law does not change existing statute in 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 student's participation in any of this education. An opt-out consent process would ensure that more young people in North Carolina receive evidence-based, effective sexuality education.

A joint report by the North Carolina Department of Public Instruction and the North Carolina Department of Health and Human Services found that the overwhelming majority (90.5%) of North Carolina parents support sexuality education programs in public schools. Nearly 9 out of 10 (88.9%) parents believe it is important for sexuality education programs to include information about the effectiveness and failure rates of birth control methods, including condoms.<sup>76</sup> The results from the parent survey are corroborated by the experience of the New

**The North Carolina General Assembly enacted HB 88 (SL 2009-213), which requires comprehensive sexuality education curricula to be offered by local education agencies.**

**The overwhelming majority (90.5%) of North Carolina parents support sexuality education programs in public schools.**

Hanover County School District. The New Hanover County School Board allows parents to choose whether their children will receive abstinence-until-marriage or comprehensive sexuality education in grades 6, 7, and 8. In 2008, of the parents who chose for their children to receive sexuality education, 75% of parents of 7th graders and 80% of parents of 8th graders signed a permission form for their children to take comprehensive sexuality education.<sup>x,y</sup>

As noted above, studies have shown that providing students access to comprehensive sexuality education using an evidence-based curriculum results in delayed initiation of sex, reduced frequency of sexual intercourse, reduced number of sexual partners, increased contraceptive use, and reduced sexual behavior that increases risk. As a result of this evidence, the Task Force on Prevention members continue to support efforts to provide all students with comprehensive and medically accurate reproductive health information. Local Boards of Education should therefore enact opt-out provisions, so that students will automatically receive the more comprehensive reproductive health and safety education unless their parent specifically signs a form to request that that their child not receive this education.

To ensure that more students receive comprehensive sexuality education, the Task Force recommends:

### **Recommendation 5.3: Ensure Students Receive Comprehensive Sexuality Education in North Carolina Public Schools (PRIORITY RECOMMENDATION)**

- a) 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.
- b) The State Board of Education should require Local Education Agencies to report their consent procedures, as well as the number of students who receive comprehensive reproductive health and safety education and those who receive more limited sexuality education. Information should be reported by grade level and by school.

x Nine percent of parents of 7th graders and 13.0% of parents of 8th graders chose for their children to not receive any sexuality education, while 16.0% and 20.0%, respectively, did not respond.

y Family Life Education Department, New Hanover County Schools. Written (email) communication. January 21, 2009, and February 13, 2009.

### Increasing Access to Family Planning Resources

Unintended pregnancy is a serious concern in the state. Providing women with access to low-cost, highly effective birth control can help prevent unintended pregnancy.<sup>26</sup> North Carolina receives Title X federal funds to help pay for family planning services. These funds flow to health departments that provide family planning services. In addition, counties also contribute \$13.3 million in funding to help pay for family planning services. In total, these funds help pay for family planning services to 138,076 people through local health departments. However, the health departments are unable to provide family planning services to everyone in need, and many are not able to afford long-acting, reversible contraceptives, such as Implanon, and intrauterine devices (IUDs).<sup>z</sup>

In order to expand the availability of family planning services, North Carolina sought and obtained approval from the US Centers for Medicare and Medicaid Services (CMS) to operate a Medicaid family planning waiver. The state's Medicaid family planning waiver, *Be Smart*, provides Medicaid-funded family planning services to individuals who would not otherwise be eligible for Medicaid. In North Carolina, the waiver provides family planning services to men and women with incomes at or below 185% of the federal poverty line.<sup>aa</sup> States that have received the Medicaid family planning waiver are required to show budget neutrality to the federal government. That is, by reducing the number of unintended pregnancies, the state is able to save more money from averted prenatal and delivery expenses than it spends on family planning services. In North Carolina, the program is estimated to have averted approximately 1,139 unintended births in the state in FY 2007 at a cost of \$267 per participant. These averted pregnancies are estimated to have saved the state and federal government more than \$14 million over a 12-month period. Additionally, counties also benefit from the Medicaid family planning waiver, as the availability of federal and state Medicaid funding reduces the need for county funds to support family planning services. North Carolina will need to renew the family planning waiver in FY 2010.

Unfortunately, the current Medicaid family planning waiver has enrolled less than 15% of women who could be eligible for these services. North Carolina could do more to enroll eligible individuals by using some of the best practices from other states, including more targeted outreach and streamlined enrollment processes.<sup>77</sup> The federal government pays 90% of family planning services costs, a much higher percentage than it pays for other Medicaid-covered services. Additionally, 310,790 other low-income women in North Carolina do not qualify for Medicaid or the *Be Smart* Medicaid family planning waiver.

**The current Medicaid family planning waiver has enrolled less than 15% of women who could be eligible for these services.**

<sup>z</sup> Eleven of the 85 local health departments do not offer IUDs, and 68 do not offer Implanon. (Holliday J. Branch Head, Women's Health, Women's and Children's Health Section, Division of Public Health, North Carolina Department of Health and Human Services. Written communication (email). July 7, 2009.)

<sup>aa</sup> Family planning services are limited to family planning related clinical services and contraceptive methods.

Because access to family planning services is a cost effective and practical method for decreasing both STD and unplanned pregnancy in the state, the Task Force recommends:

### **Recommendation 5.4: Expand the Availability of Family Planning for Low-income Families**

- a) The North Carolina Division of Medical Assistance and North Carolina Division of Public Health should enhance access to and utilization of family planning services by low-income families, including providing access to the full range of contraceptives.
  - 1) Local health departments, in partnership with local social services departments, should have a dedicated intake specialist to take Medicaid applications, including the Medicaid *Be Smart* Family Planning Waiver applications.
  - 2) The North Carolina Division of Public Health should direct existing federal family planning funds towards increasing the number of low-income families that are provided services who do not qualify for Medicaid or the Medicaid *Be Smart* Family Planning Waiver program.
  - 3) The North Carolina Division of Medical Assistance should apply to the Centers for Medicare and Medicaid Services to extend the Medicaid *Be Smart* Family Planning Waiver program beyond October 2010 and should incorporate best practices from other states into the program.
- b) The North Carolina Division of Public Health should purchase long-acting, highly effective, reversible contraceptive methods for low-income women who do not qualify for Medicaid or the Medicaid *Be Smart* Family Planning Waiver. The North Carolina General Assembly should appropriate \$931,000 in recurring funds beginning in SFY 2011 to the North Carolina Division of Public Health to support these efforts.

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**A**lcohol and drug use and misuse are major contributors to death and disability. Together, they comprise the 8th largest cause of premature death and are risk factors contributing to years of life lived with a disability. Substance use/abuse is the fifth leading contributor to disability-adjusted life years (DALYs)—years of life lost plus years lived with a disability—in North Carolina. Depression is the second leading cause of life lived with a disability in North Carolina. It contributes to the high suicide rate found among individuals ages 10-44 and is the 10th leading contributor to DALYs in North Carolina.<sup>1</sup> (For more information about DALYs, see Chapter 2.)

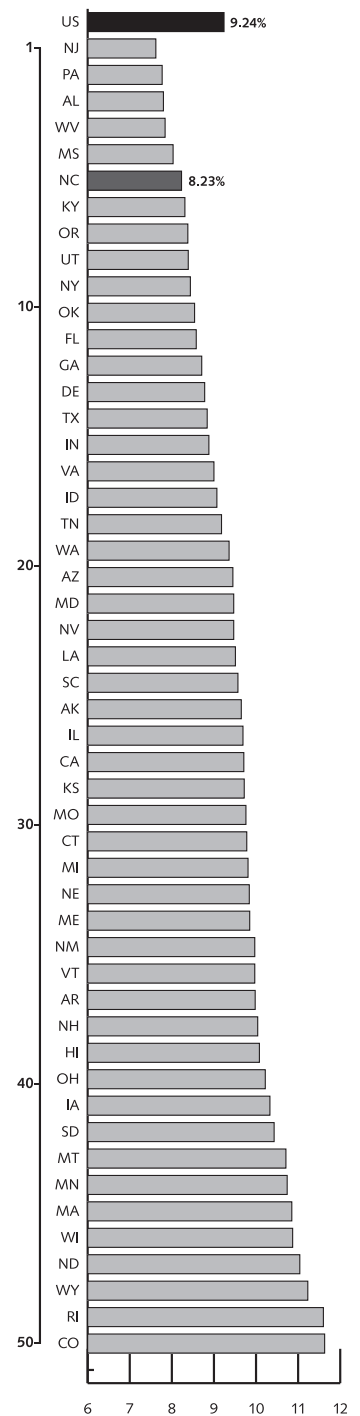
Addiction to alcohol and other drugs is a chronic illness, much like asthma, diabetes, or hypertension. Addiction cannot be “cured” in the sense that we can cure or fix someone with strep throat or a broken bone. However, substance use and addiction can be prevented—as can many of the other chronic illnesses discussed in this report. Further, addiction disorders can be managed to prevent more serious long-term health effects. While less is known about how to prevent mental illnesses, there are successful strategies for reducing or preventing stress and depression and for early intervention to successfully treat and mitigate exacerbation of mental health disorders.

## Substance Abuse

People with substance abuse problems or dependence are at risk for premature death, comorbid health conditions, and disability. Furthermore, substance abuse carries additional adverse consequences for the individual, his or her family, and society at large. People with addiction disorders are more likely than people with other chronic illnesses to end up in poverty, lose their job, or experience homelessness. Addiction to alcohol and drugs contributes to the state’s crime rate as well as to family upheaval and motor vehicle fatalities. Approximately 90% of the criminal offenders who enter the prison system have substance abuse problems.<sup>2</sup> More than two out of five youth in the state’s juvenile justice system are in need of further assessment or treatment services for substance abuse.<sup>3</sup> Substance abuse is also one of the primary causes for motor vehicle fatalities, contributing to more than one-quarter (26.8%) of all crash-related deaths.<sup>4</sup> In addition, alcohol or drug use is a major contributor to family disintegration. Nationally, parental use of alcohol or drugs contributes to more than 75% of cases in which children are placed in foster care.<sup>5</sup> The direct and indirect costs of alcohol and drug abuse in North Carolina totaled more than \$12.4 billion in 2004.<sup>6</sup>

The Substance Abuse and Mental Health Services Administration (SAMHSA) conducts a household survey of drug use and health each year. The 2006-2007 survey results showed that approximately 590,000 (8.1%) of North Carolinians

**Percent of Adults (18+) with Dependence On or Abuse of Illicit Drugs or Alcohol in Past Year, 2006-2007**



Source: Hughes A, Sathe N, Spagnola K. (2009). State Estimates of Substance Use from the 2006-2007 National Surveys on Drug Use and Health. Office of Applied Studies, Substance Abuse and Mental Health Services Administration, NSDUH Series H-35, HHS Publication No. SMA 09-4362. Rockville, MD. <http://www.oas.samhsa.gov/2k7/state/adultTabs.htm>.

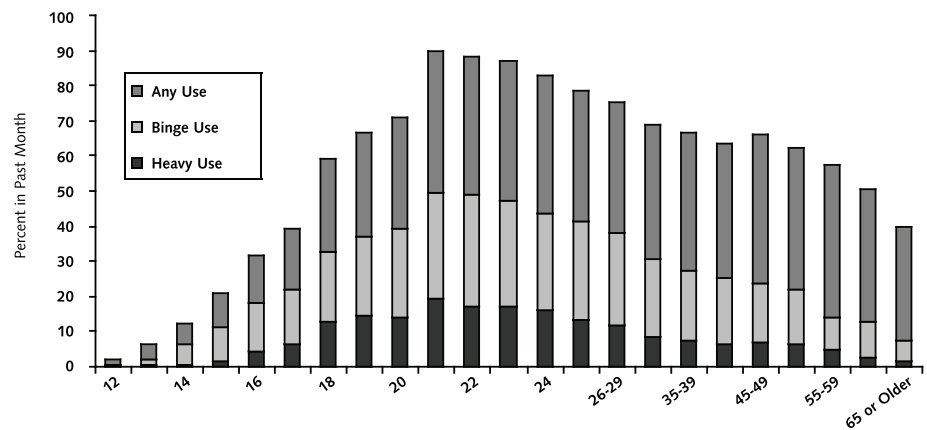
**Addiction to alcohol and other drugs is a chronic illness, much like asthma, diabetes, or hypertension.**

ages 12 or older reported alcohol or illicit drug dependence or abuse.<sup>a,7</sup> A large majority of these—470,000 North Carolinians—reported alcohol dependence or abuse, and 207,000 people reported illicit drug dependence or abuse. A much higher number of people reported binge alcohol use (1.5 million) and drug use (522,000).<sup>b</sup>

Youth are particularly susceptible to the influence of alcohol and drugs, as these substances affect the developing brain. Repeated exposure to alcohol and drugs can alter brain chemistry and microanatomy, making it harder for people to weigh the trade-offs of short-term pleasure derived from alcohol and drug use versus the longer term consequences to the individual and his/her family by the use or misuse of these substances.<sup>8</sup> Use and misuse of alcohol and other drugs is particularly problematic for youth and young adults under age 25, as the brain is still developing until that age.<sup>9</sup> Thus, the state should target prevention strategies to youth and adolescents.

North Carolina could be more effective in preventing the use of alcohol or drugs among youth and young adults. Nationally, we know that youth and young adults are the most likely individuals to use alcohol or illicit drugs. (See Figures 6.1 and 6.2.)

**Figure 6.1**  
Alcohol Use Peaks Among Young Adults in Their Early 20s (2006)

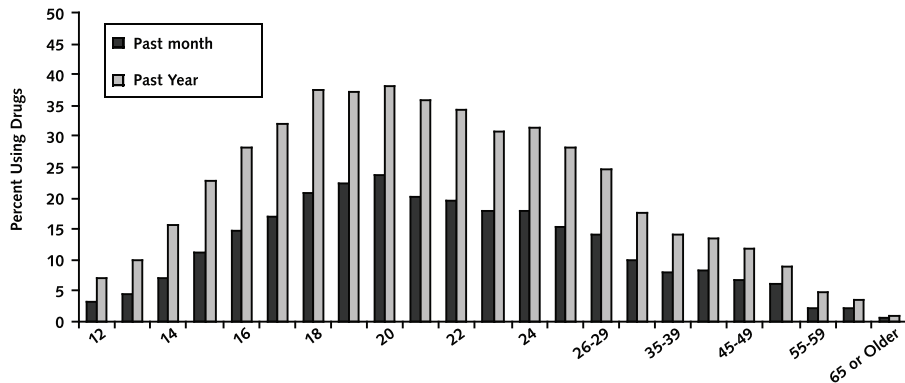


Source: Substance Abuse and Mental Health Services Administration. *Results From the 2006 National Survey on Drug Use and Health: National Findings*. Rockville, MD: Department of Health and Human Services; 2007. DHHS publication SMA 07-4293.

Almost 40% of North Carolina high school students reported having at least one drink in the last 30 days, and more than 20% reported binge drinking.<sup>10</sup> One in five high school students reported using marijuana in the last 30 days, and almost

a Illicit drugs include marijuana, hashish, cocaine, heroin, hallucinogens, inhalants, and prescription drugs that are used non-medically.  
 b Binge alcohol use is defined as having five or more drinks within a couple of hours of each other on at least one of the past 30 days.

**Figure 6.2**  
Use of Drugs is Highest Among Adolescents and Young Adults (2006)



Source: Substance Abuse and Mental Health Services Administration. *Results From the 2006 National Survey on Drug Use and Health: National Findings*. Rockville, MD: Department of Health and Human Services; 2007. DHHS publication SMA 07-4293.

North Carolina could be more effective in preventing the use of alcohol or drugs among youth and young adults.

as many (17%) reported that they took a prescription drug without a prescription. Further, more than one-fourth of all high school students reported that they were offered, sold, or given an illegal drug while on school premises. While not as large, a sizeable proportion of middle school students also report using these substances.<sup>10</sup> Studies have also shown that people who start using alcohol or drugs in childhood are more likely to be addicted as an adult than those who started using these substances later in life.<sup>11</sup> Thus, targeting youth and young adults for prevention efforts is particularly important in reducing the number of people who later have abuse or addiction problems.

### Mental Health

A large proportion of North Carolinians reported serious psychological distress in the past year, including 17% of adults ages 18-25 and 10% of adults ages 26 or older.<sup>7</sup> Serious psychological distress is a nonspecific indicator of mental health problems such as anxiety or mood disorders.<sup>c,12,13</sup> In addition, approximately 8% of North Carolinians ages 12 or older reported having a diagnosable major depressive episode.<sup>d</sup>

Mental health disorders can have a profound effect on an individual, their interpersonal relations, their functioning in schools or in the workplace, and their overall sense of well-being.<sup>14</sup> Depression has been linked to an increase in

c Serious psychological distress is diagnosed when a person scores 13 or higher on the K6 scale (used by the US National Health Interview Survey). Individuals are asked about their mental health symptoms during one of the past 12 months when they were feeling worse emotionally. This survey instrument asks respondents how frequently they experienced symptoms of psychological distress—for example, whether they were so sad that nothing could cheer them up, feeling hopeless, worthless, nervous, or that everything was an effort.

d A major depressive episode is defined as having a period of at least two weeks when the person experienced a depressed mood or loss of interest or pleasure in daily activities and experienced specified depression symptoms as defined in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV).

absenteeism in the workplace, as well as to lower productivity at work when the person is present, which is known as presenteeism.<sup>15</sup> Depression is also a leading cause of suicide and is associated with 60% of all suicides.<sup>16</sup> In 2007, suicide was the 6th leading cause of death for children ages 10-14 in North Carolina, the 4th leading cause of death for youth and adults ages 15-34, and the 5th leading cause of death for adults ages 35-44.<sup>17</sup>

Emerging research has also shown the impact of mental illness—particularly depression—on the use and cost of health services. People that are depressed or have anxiety disorders have more unexplained medical symptoms than do people without these mental health problems. Depression has been associated with a 50% increase in medical costs for other chronic illnesses, even after controlling for the type and severity of physical illness. Depression has also been linked to longer lengths of stays in the hospital, even after controlling for severity of medical illness, and it has been linked to higher mortality rates for people who have diabetes or heart disease.<sup>14</sup> It is likely that the relationship between chronic illnesses and depression is bidirectional. That is, depression may be a secondary reaction to the advent of the chronic illness (or a side-effect of the medications), and depression may be a risk factor for the development of certain diseases.

Depression also makes it more difficult to treat or manage chronic conditions, as people who are depressed are less likely to take their medications as prescribed or to otherwise follow their treatment regimens.<sup>14</sup> People who are depressed are also more likely to engage in risky health behaviors including smoking, overeating, and sedentary lifestyles. Thus, prevention of and early intervention for mental health disorders are critical to being able to effectively address some of the other preventable risk factors described in this report.

### Substance Abuse and Mental Health Prevention Plan

Effective programs, policies, and health care interventions are integral to a comprehensive substance abuse prevention plan in North Carolina. Programs that reach children, adolescents, young adults, and parents with the intention of preventing or delaying use of alcohol, tobacco, or other drugs are vital. Minimizing risk factors and maximizing protective factors, while increasing knowledge and skills, is critical, particularly for youth. In addition, a comprehensive substance abuse prevention plan should include tailored outreach targeted to different groups at various risk levels.

Evidence-based prevention strategies have been shown to be effective in delaying initiation and reducing use of alcohol and other drugs.<sup>e</sup> Many of these evidence-based programs have also demonstrated other positive effects, such as reduced depression, delinquency, teen pregnancy, risky sexual behavior, and violence among school-aged children and improved academic performance and sense of

**Percent of Adults (18+) with Serious Psychological Distress in Past Year, 2006-2007**



Source: Hughes, A., Sathe, N., & Spagnola, K. (2009). State Estimates of Substance Use from the 2006-2007 National Surveys on Drug Use and Health. Office of Applied Studies, Substance Abuse and Mental Health Services Administration, NSDUH Series H-35, HHS Publication No. SMA 09-4362. Rockville, MD. <http://www.oas.samhsa.gov/2k7/state/adultTabs.htm>.

e For more information on evidence-based strategies, see Appendix B.



well-being.<sup>f</sup> Different evidence-based programs or other strategies have been shown to be effective in different settings, including homes, schools, workplaces, or other community venues. In fact, communities can save four to five dollars for every one dollar spent on substance abuse prevention.<sup>18</sup> The most effective prevention strategies are those that involve multifaceted interventions that include the individual, family, schools, and community and are reinforced by supportive public policies. Less is known about effective depression prevention strategies. While there are studies that have shown reduced depressive symptoms resulting from universal, selective, and indicated mental health prevention programs, fewer studies have shown a reduction in the incidence of depression.<sup>19</sup>

The North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMHDDSAS) has two sources of funds to support community-based prevention efforts. DMHDDSAS receives Substance Abuse Prevention and Treatment block grant funds from SAMHSA. These funds are distributed to local mental health and substance abuse agencies called Local Management Entities (LMEs) and are used to support needs assessments and to implement evidence-based prevention programs, practices, and policies.<sup>20</sup> In addition to the federal funds, the North Carolina General Assembly also appropriated \$800,000 over two years (SFY 2006-2007) to support local substance abuse coalitions.<sup>21</sup> State funds were used to build eight community coalitions with the intent of implementing evidence-based prevention strategies. Despite these different funding sources, few communities have implemented comprehensive substance abuse prevention programs targeted at youth and young adults. The current funds are inadequate to support a statewide comprehensive substance abuse prevention plan that reaches all North Carolinians in need of prevention interventions. DMHDDSAS estimates that only about 42,000 of the more than 275,000 youth who were in need of prevention services (because of early use or specific risk factors) actually received prevention services in SFY 2007.<sup>g,22</sup> Unfortunately, there are no federal funds that specifically target the prevention of mental health disorders.

North Carolina public schools are required to teach information about substance use and abuse, mental health, and emotional well-being as part of the Healthful Living Standard Course of Study. However, one study that examined the type of substance abuse prevention programs being implemented in North Carolina

**Evidence-based prevention strategies have been shown to be effective in delaying initiation and reducing use of alcohol and other drugs.<sup>e</sup> Many of these evidence-based programs have also demonstrated other positive effects, such as reduced depression, delinquency, teen pregnancy, risky sexual behavior, and violence among school-aged children and improved academic performance and sense of well-being.**

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f Examples of substance abuse prevention initiatives with other demonstrated positive impacts include: Positive Action, a replicated school-based program that has shown to have positive effects on behavior and academic achievement ([http://ies.ed.gov/ncee/wwc/reports/character\\_education/pa/effectiveness.asp](http://ies.ed.gov/ncee/wwc/reports/character_education/pa/effectiveness.asp)); Family Behavior Therapy, an outpatient program shown to reduce use and initiation of alcohol and drug use and depression ([http://www.nrepp.samhsa.gov/programfulldetails.asp?PROGRAM\\_ID=73](http://www.nrepp.samhsa.gov/programfulldetails.asp?PROGRAM_ID=73)); Guiding Good Choices, a school-based initiative shown to reduce initiation of substance use and aid in reducing/preventing delinquency and symptoms of depression ([http://www.nrepp.samhsa.gov/programfulldetails.asp?PROGRAM\\_ID=123](http://www.nrepp.samhsa.gov/programfulldetails.asp?PROGRAM_ID=123)); and Life Skills Training, another school-based program designed to reduce substance use, violence, and delinquency ([http://www.nrepp.samhsa.gov/programfulldetails.asp?PROGRAM\\_ID=230](http://www.nrepp.samhsa.gov/programfulldetails.asp?PROGRAM_ID=230)).

g 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.

**Multifaceted interventions are generally more effective than single-pronged prevention programs.**

public schools found that most schools had not implemented evidence-based substance abuse prevention programs.<sup>23</sup> Evidence-based prevention programs generally are interactive and include a skills building or competency-based curricula.<sup>19,21</sup> Because these programs focus heavily on skills building, they generally take more time to implement than do courses that just aim to impart knowledge. For example, a meta-analysis of different mental illness prevention programs showed that the most effective programs were those that included more than eight sessions, with lengths of 60-90 minutes each. Evidence-based courses may also involve more costs to implement (due to cost of materials, teacher training, etc.). This is part of the reason that so few public schools implement these programs.<sup>24</sup>

Similarly, multifaceted interventions are generally more effective than single-pronged prevention programs. Thus, community-based and school-based substance abuse or mental health illness prevention programs should be augmented with supportive public policies. For example, anti-bullying laws can reduce bullying, and this helps reduce feelings of isolation or stress among bullying victims.<sup>h,25</sup> Similarly, increasing taxes on alcohol products has been shown to reduce use, just as increased tobacco taxes reduces use of tobacco. Both youth and heavy drinkers have been shown to respond to tax increases.<sup>26-28</sup> Taxes on beer are especially important as malt beverages (including beer) are popular alcoholic drinks among youth.<sup>29,30</sup> Although North Carolina has the 4th highest beer tax and the 18th highest wine tax in the country, 2009 was the first time either had been raised in 30 years.<sup>i</sup> Raising taxes on these alcoholic beverages to adjust for inflation would raise the beer tax to 29 cents per bottle (\$3.13 per gallon) and the wine tax to \$2.36 gallon.<sup>31</sup> In 2009, the North Carolina General Assembly increased the alcohol excise tax; for example, the beer excise tax was increased from 53.177 to 61.71 cents per gallon.<sup>j,k</sup> Table 6.1 shows projected increased revenues and decreased consumption from different levels of tax increases. Raising the alcohol tax should also help improve mental health and well-being. Alcohol acts as a depressant that lowers serotonin levels in the blood; therefore reducing alcohol consumption can help reduce feelings of depression.<sup>32,33</sup> In addition, part of the money raised from the increased revenues could be used for use for substance abuse and mental health prevention and treatment.

The state can and should do more to effectively prevent use of alcohol and drugs among youth and young adults and prevent depression and improve feelings of well-being among the general population. The Task Force recommends broad

h The North Carolina General Assembly passed an anti-bullying bill effective the 2009-2010 school year. The bill amends NCGS §115C-407.5 et. seq. Session Law 2009-212.

i The beer tax was last increased in 1969; the wine tax was last increased in 1979.

j Since finalizing the Task Force's work, the North Carolina General Assembly enacted the SFY 2009-2010 budget. The budget included an 16% increase on the beer tax (from 53.177¢ to 61.71¢ per gallon); an 25% increase on unfortified wine (from 21¢ to 26.34¢ per liter) and a 22% increase on fortified wine (from 24¢ to 29.34¢ per liter); and a 20% increase on distilled liquor (from 25% to 30% excise tax on the distiller's price plus the state ABC warehouse freight and bailment charges and markup for local ABC boards).

k NCGS § 105-113.80.

community-based approaches, as well as supportive public policies, to prevent the initiation, use, and abuse of alcohol and other drugs and to reduce feelings of depression. The state should initially focus on implementing evidence-based substance abuse prevention initiatives, particularly those that have also been shown to be effective in improving emotional well-being, reducing youth violence

**Table 6.1**  
**Projected Increased Revenues and Decreased Consumption Due to Tax**  
**Increases in Beer and Wine<sup>1</sup>**

Beer Tax		
2007 Tax Per Gallon		2007 Revenues
\$0.53		\$100,533,960
Potential New Tax Per Gallon	Increased Revenue	Decrease in Consumption
\$0.6171 (Effective 9/1/09)	\$19,304,437	0.22%
\$0.75	\$44,622,243	0.56%
\$1.00	\$91,776,514	1.19%
\$1.50	\$184,238,359	2.45%

Wine Tax (unfortified wine)		
2007 Tax Per Gallon		2007 Revenues
\$0.79		\$14,320,319
Potential New Tax Per Gallon	Increased Revenue	Decrease in Consumption
\$0.99 (Effective 9/1/09)	\$1,111,327	0.31%
\$1.50	\$8,875,532	1.10%
\$2.00	\$16,365,089	1.88%
\$2.36	\$21,682,526	2.43%

Notes: Calculations are based on 2007 North Carolina consumption and revenues (NC Beer and Wine Wholesalers Association). Calculations were performed using the calculator available through the Alcohol Policies Project, Center for Science in the Public Interest accessed at <http://www.cspinet.org/booze/taxguide/TaxCalc.htm>. National average beer and wine retail prices per gallon were used (\$14.87 per gallon of beer, \$40.22 per gallon wine) as provided by the Alcohol Policies Project (as of September 2009). The -0.35 was the price elasticity used for beer (Cook PJ. ITT/Terry Sanford Professor of Public Policy Studies; Professor of Economics and Sociology and Associate Director, Terry Sanford Institute of Public Policy, Duke University. Written communication. January 19, 2009). The price elasticity used for wine was -0.58. (Nelson JP. Economic and demographic factors in U.S. alcohol demand: a growth-accounting analysis. *Empirical Econ.* 2007;22(1):83-102.

Increasing taxes on alcohol products has been shown to reduce use, just as increased tobacco taxes reduces use of tobacco. Both youth and heavy drinkers have been shown to respond to tax increases.

<sup>1</sup> The predicted price increase (and implied consumption decrease) assumes that the price increases by 7.5% more than the excise tax increase, consistent with the findings by Young and Bielinska-Kwapisz, who find that retail price increases by an amount greater than the increase in excise tax. (Center for Science in the Public Interest. Beer consumption and taxes. [http://www.cspinet.org/booze/Fact Sheets/0308Beer & Taxes.pdf](http://www.cspinet.org/booze/Fact%20Sheets/0308Beer%20Taxes.pdf). Published August 2003. Accessed January 19, 2009.)

or delinquency, or reducing risky sexual behavior.<sup>m</sup> Therefore, the Task Force recommends:

### **Recommendation 6.1: Develop and Implement a Comprehensive Substance Abuse Prevention Plan (PRIORITY RECOMMENDATION)**

- a) The Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMHDDSAS) should develop a comprehensive substance abuse prevention plan for use at the state and local levels. The plan should increase the capacity at the state level and within local communities to implement a comprehensive substance abuse prevention system, prioritizing efforts to reach children, adolescents, young adults, and their parents. The goal of the prevention plan is to prevent or delay the onset of use of alcohol, tobacco, or other drugs; reduce the use of addictive substances among users; promote emotional and mental health well-being; identify those who need treatment; and help them obtain services earlier in the disease process.
  - 1) DMHDDSAS should pilot test this prevention plan in six counties or multi-county areas and evaluate its effectiveness. DMHDDSAS should develop a competitive process and select at least one rural pilot and one urban pilot in the three DMHDDSAS regions across the state. DMHDDSAS should provide technical assistance to the selected communities. If effective, the prevention plans should be implemented statewide.
  - 2) The pilot projects should involve multiple community partners, including but not limited to Local Management Entities, primary care providers, health departments, local education agencies, local universities and community colleges, and other appropriate groups.
  - 3) The pilots should incorporate evidence-based programs, policies, and practices that include a mix of strategies including universal and selected populations. Priority should be given to evidence-based programs that have been demonstrated to yield positive impacts on multiple outcomes, including but not limited to preventing or reducing substance use, improving emotional well-being, reducing youth violence or delinquency, or reducing teen pregnancy.
  - 4) The North Carolina General Assembly should appropriate \$1.95 million in recurring funds in SFY 2011 and \$3.72 million in recurring funds in SFY 2012 to DMHDDSAS to support and evaluate these efforts.
- b) The excise taxes on malt beverages and wine should be indexed to the consumer price index so they can keep pace with inflation.

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<sup>m</sup> Section 10.15 of the 2009 Appropriations Act “strongly encourages” Local Management Entities to fund substance abuse prevention and education activities.

- 1) The increased fees should be used to fund effective prevention and treatment efforts for alcohol, tobacco, and other drugs.
- 2) The North Carolina General Assembly should appropriate \$2.0 million in recurring funds in SFY 2011 to support a comprehensive alcohol awareness education and prevention campaign aimed at changing cultural norms to prevent initiation, reduce underage alcohol consumption, reduce alcohol abuse or dependence, offer early intervention, and support recovery among adolescents and adults.

## Early Intervention

Prevention should be the cornerstone of North Carolina's efforts to reduce inappropriate use, misuse, and dependence on alcohol and other drugs and to prevent the incidence and severity of stress, depression, or other anxiety disorders. Evidence-based prevention programs have been shown to help reduce use and misuse of substances as well as reduce symptoms of depression. However, no prevention intervention will totally eliminate all harmful use of alcohol or other drugs or feelings of isolation, depression, or stress. Thus, it is important to combine prevention with early intervention activities.

Many people with substance abuse or mental health problems are reluctant to admit they have a problem and thus are unlikely to seek care directly from treatment professionals. Even those who know they have a problem may not seek care because of the stigma or the costs attached to this condition.<sup>22,34,35</sup> Primary care practices are an optimal setting in which to provide early intervention services. Additionally, the faith community may be an appropriate and ideal place for early intervention, especially for people who are uncomfortable seeking help, unaware of needing help, or unsure of how to begin the help process.

## Primary Care Providers

While many people with behavioral health problems are reluctant to seek care from substance abuse or mental health treatment professionals, most people do seek care from primary care providers throughout the year. Nationally, 55% of the population visit a primary care provider during the year, whereas only 0.1% seeks care from an office-based provider for substance abuse services.<sup>n</sup> Screening, early intervention, and referral into more intensive treatment when appropriate has been found to be effective for both substance abuse and for mental health services.

**No prevention intervention will totally eliminate all harmful use of alcohol or other drugs or feelings of isolation, depression, or stress. Thus, it is important to combine prevention with early intervention activities.**

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<sup>n</sup> North Carolina Institute of Medicine calculations using the 2005 Medical Expenditures Panel Survey, Agency for Healthcare Research and Quality. Substance abuse visits are defined as visits with an ICD-9 code diagnosis 303, 304, or 305. This estimate is almost certainly low as both patients and providers may face incentives not to include billing codes related to substance abuse.

**Screening, brief intervention, and referral into treatment—also known as SBIRT—is effective in reducing the use of tobacco, alcohol, and other drugs.**

**Substance Abuse Services:** There is a robust body of literature that shows that screening, brief intervention, and referral into treatment—also known as SBIRT—is effective in reducing the use of tobacco, alcohol, and other drugs.<sup>36,37</sup> This model has been studied for more than 20 years in different settings, including primary care providers' offices, federally qualified health centers, health departments, school-based clinics, emergency departments, and hospitals.<sup>38-40</sup> It has been shown to be effective with adolescents as well as adults.<sup>41</sup> Primary care providers should screen their patients (using a validated screening instrument) to determine if they are beginning to abuse alcohol or are using other drugs. Individuals who are identified as having, or at risk of having, a substance abuse problem should be offered motivational counseling. Those with more significant problems should be referred into more specialized substance abuse treatment services.

Implementation of SBIRT within the primary care setting can halt substance use before it progresses to abuse and addiction. National studies show a four to seven dollar decline in overall health care costs (due to reduced hospitalizations and emergency department costs) for every one dollar spent on SBIRT.<sup>36</sup> However, many primary care practitioners are unaware of SBIRT, and as a result, most practitioners are not offering this evidence-based practice to their patients. The North Carolina Governor's Institute on Alcohol and Substance Abuse; the Area Health Education Centers (AHEC) program; and the Integrated, Collaborative, Accessible, Respectful and Evidence-Based care project (ICARE) are currently working together to provide training and technical assistance to North Carolina primary care providers and to encourage more practices to implement SBIRT. (ICARE is described more fully below.) However, more work is needed to increase the number of primary care practices equipped to identify people who have problems with alcohol, tobacco, and other drugs.

**Mental Health Services:** Early detection and treatment of mental health disorders can improve outcomes and lessen long-term disability.<sup>35</sup> However, many people with mental health disorders are not identified or provided with appropriate treatment.

The primary care office is an ideal place to screen and offer mental health services. About half of the care for mental health disorders occurs in the primary care setting. In fact, primary care providers prescribe the majority of psychotropic drugs for children and adults. Nonetheless, studies suggest that primary care providers fail to diagnose many people with mental health disorders including depression, anxiety, or suicide ideation. Further, many people with common mental health disorders do not receive appropriate care in the primary care setting.<sup>35</sup> Enhanced training for primary care providers is important but is unlikely to change practice patterns without other changes in the service delivery system.<sup>42</sup> Rather, to improve the quality of care and patient outcomes, primary care providers need training

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o For more information on SBIRT, visit the SAMHSA website at <http://sbirt.samhsa.gov/index.htm>.

(discussed more fully in Recommendation 12.5), effective tools to diagnose and treat, closer coordination of care with behavioral health specialists, and changes in the payment system.

Primary care providers should screen their patients to identify people with mental health disorders. The US Preventive Services Task Force (USPSTF) recommends that primary care providers screen adolescents (ages 12-18) and adults for major depressive disorder.<sup>43,44</sup> Just as with provider training, screening patients is insufficient in and of itself to ensure that people receive appropriate treatment. In fact, the USPSTF only recommends screening “when systems are in place to ensure accurate diagnosis, psychotherapy (cognitive-behavioral or interpersonal), and follow-up.”<sup>43</sup> Other studies have shown that it is not effective for primary care providers to merely screen and refer, as one-third to one-half of the people who are referred to mental health specialty care do not follow through with the referral.<sup>42</sup> Instead, a new collaborative care model should be developed in which the primary care provider can work with mental health specialists and care managers to provide appropriate treatment.

Studies have shown that effective collaborative care models have two key components: 1) care management by a nurse, social worker, or other clinical staff, and 2) consultation between the mental health specialist, care manager, and primary care provider.<sup>42</sup> North Carolina is working to develop a similar approach in its Medicaid program through the ICARE partnership.<sup>p</sup> ICARE, funded by the Kate B. Reynolds Charitable Trust, The Duke Endowment, and others, was created to improve collaboration and communication between primary care and behavioral health providers.<sup>q</sup> Another goal of the ICARE initiative is to increase the capacity of primary care physicians to provide appropriate, evidence-based behavioral health services. ICARE has developed and tested several models of integrating behavioral health and primary care. Initially, primary care providers in pilot sites were trained to provide better mental health services (particularly aimed at depression) and then to develop stronger linkages with the local LME for other more specialized behavioral health services. There are six sites covering 12 counties involved in these ICARE pilots. Later, ICARE staff worked with the North Carolina Office of Rural Health and Community Care (ORHCC) to develop co-location models, funded initially through the North Carolina General Assembly. In this model, mental health professionals are co-located in the primary care practices (often in pediatric practices). Individuals in need of mental health services can be referred “down the hall” to a mental health provider. There are currently over 50 practices involved in the co-location model. Integrated approaches such as ICARE also show improvements in behavioral health outcomes.<sup>45,46</sup>

**A new collaborative care model should be developed in which the primary care provider can work with behavioral health specialists and care managers to provide appropriate treatment [of behavioral health disorders].**

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<sup>p</sup> Information about ICARE is available at [www.icarenc.org](http://www.icarenc.org).

<sup>q</sup> ICARE is funded by the Kate B. Reynolds Charitable Trust, The Duke Endowment, AstraZeneca, North Carolina Area Health Education Centers Program, the North Carolina Department of Health and Human Services, and the North Carolina Foundation for Advanced Health Programs.

**Primary care providers' offices can be a very effective place to provide early intervention and treatment services for both substance abuse and mental health disorders. However, practitioners need enhanced training, and systems need to be changed to support high-quality behavioral health services.**

The initial experiences with the ICARE and co-location models in the Medicaid program have been positive, but there are problems replicating this model for people with other forms of insurance coverage. Historically, insurers did not cover mental health and substance abuse services to the same extent as they covered other physical illnesses. While this problem has largely been addressed for large employer groups of 50 or more people through the federal Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Equity Act of 2008, the law does not apply to smaller employer groups or to people who purchase insurance in the private non-group market.<sup>r</sup> North Carolina passed legislation mandating mental health parity in 2007, which requires insurers to provide the same coverage for certain mental health disorders as provided for other physical illnesses. This applies to all health insurance plans offered in North Carolina, including insurance sold to small-employer groups with fewer than 50 employees and non-group plans. However, the legislation does not provide parity for substance abuse services or for all mental illnesses.<sup>s</sup>

Further, there are other insurance barriers that deter primary care providers from offering mental health or substance abuse services. To reduce these barriers, insurers should provide reimbursement for the following:

- Screening and brief intervention in different health settings.
- Telephone and face-to-face consultations between primary care providers and psychiatrists or other behavioral health specialists.
- Care management to coordinate care for behavioral health services between the primary care provider and behavioral health specialist.
- Care provided by a behavioral health specialist and primary care provider on the same day in the same clinic (to support co-location models).<sup>31,42</sup>

Primary care providers' offices can be a very effective place to provide early intervention and treatment services for both substance abuse and mental health disorders. However, practitioners need enhanced training, and systems need to be changed to support high-quality behavioral health services. In addition, reimbursement systems should be modified to support the provision of these services in primary care practices and to further support co-location or integration efforts. To achieve this, the Task Force recommends:

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<sup>r</sup> Congress recently passed a mental health and substance abuse parity law that covers all employer groups with 50 or more employees that offer mental health coverage. Under the new statute, group health plans must generally provide mental health and substance abuse coverage in parity with medical and surgical benefits offered. Insurers may not have higher cost sharing or more restrictive treatment limits for mental health or substance abuse services than what is provided generally for other medical and surgical benefits. This new law becomes effective January 1, 2010. 29 USC §1185a, 42 USC §300gg-5.

<sup>s</sup> Session Law 2007-268.



## **Recommendation 6.2: Expand the Availability of Screening, Brief Intervention, and Treatment for People with Behavioral Health Problems in the Primary Care Setting**

- a) The Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMHDDSAS) should develop a Memorandum of Agreement with the North Carolina Office of Rural Health and Community Care (ORHCC), Governor's Institute on Alcohol and Substance Abuse, North Carolina Area Health Education Centers (AHEC) program, and other appropriate organizations to educate and encourage health care professionals to use evidence-based screening tools and offer counseling, brief intervention, and referral to treatment to help patients prevent, reduce, or eliminate the use of or dependency on alcohol, tobacco, and other drugs as outlined in the screening, brief intervention, and referral to treatment (SBIRT) model. The North Carolina General Assembly should appropriate \$1.5 million in SFY 2011 in recurring funds to the DMHDDSAS to support this effort.
- b) DMHDDSAS, in collaboration with the ORHCC, should work collaboratively with the Governor's Institute on Alcohol and Substance Abuse, North Carolina Academy of Family Physicians, North Carolina Pediatric Society, North Carolina Psychiatric Association, North Carolina Primary Health Care Association, ICARE, and other appropriate groups to identify and address barriers that prevent the implementation and sustainability of co-location models and to identify other strategies to promote evidence-based screening, counseling, brief intervention, and referral to treatment in primary care and other outpatient settings for substance abuse and mental health.
- c) Health professionals should screen adolescents and adults ages 12 or older for major depressive disorders and for substance abuse disorders using systems that ensure accurate diagnosis, effective treatment, and follow-up.
- d) The North Carolina General Assembly should mandate that insurers offer coverage for the treatment of addiction diseases with the same durational limits, deductibles, coinsurance, annual limits, and lifetime limits as provided for the coverage of physical illnesses.
- e) The North Carolina General Assembly should direct public and private insurers to review their reimbursement policies to ensure that primary care and other providers can be reimbursed to:
  - 1) Screen for tobacco, alcohol, drugs, and mental health disorders.
  - 2) Provide brief intervention and counseling and refer necessary patients for specialty services.
  - 3) Support co-location of behavioral health and primary care providers.
  - 4) Pay for case management services to coordinate services and follow-up between primary care and behavioral health specialists.
  - 5) Pay for telephone or in-person consults between primary care providers and behavioral health specialists.

- f) The Division of Medical Assistance should work with the ORHCC to develop an enhanced Community Care of North Carolina (CCNC) per member per month (PMPM) for co-located practices to support referral and care coordination for mental health, developmental disabilities, and substance abuse services.

**Faith communities represent a unique setting in which mental health illness and substance abuse prevention and early intervention can be incorporated.**

### **Faith Community**

Faith communities represent a unique setting in which mental health illness and substance abuse prevention and early intervention can be incorporated. The majority (53%) of North Carolinians attend church or synagogue once a week or almost every week.<sup>47</sup> Instead of seeking medical care, some people turn to their clergy or other faith leaders for help with mental health or substance abuse disorders. While physicians are trusted by the general population, they are less trusted by African Americans and other minority groups.<sup>48</sup> African Americans often rely on clergy for counseling, particularly when dealing with death and bereavement.<sup>49</sup> One study showed that African Americans who first turn to their clergy for assistance for depression or anxiety are less likely to seek help from health professionals. This may be due, in part, to their needs being met by their minister and also the stigma attached to treatment within the specialty medical system. However, it may also be due, in part, to the lack of relationships between health care professionals and clergy or other leaders in the faith community. This suggests that more outreach is needed to build relationships between members of the faith community and health professions—particularly as it relates to treatment of mental health and substance abuse problems. Working with the faith community has yielded positive impacts in other areas of primary prevention, such as cardiovascular health, cancer screenings, and general health maintenance.<sup>50</sup> For this reason, the Task Force recommends:

## **Recommendation 6.3: Expand Early Intervention Services in the Faith Community**

The North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services should partner with a variety of mental health and substance abuse organizations, faith-based institutions of higher education, and other faith leader training programs to develop and offer a training specifically designed to help leaders of all faiths recognize signs of stress, depression, and substance abuse in those they counsel and to develop linkages with outside referrals when appropriate. Faith communities at the local, regional, and state levels should encourage their faith leaders to attend these trainings.

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The environment in which we live affects our health. During the 20th century the majority of the advances in population health were the result of public health interventions focused on improving the physical environment.<sup>1</sup> Despite these advances, air and water pollution persist and produce negative effects on the health of the population. Air pollution has been shown to cause or worsen respiratory conditions (e.g. asthma and emphysema) and cardiovascular conditions (e.g. heart attack and stroke).<sup>a,2</sup> Water pollution has been linked to both acute poisonings as well as chronic effects. In addition, certain air and water pollutants have been linked to cancer.<sup>2-5</sup>

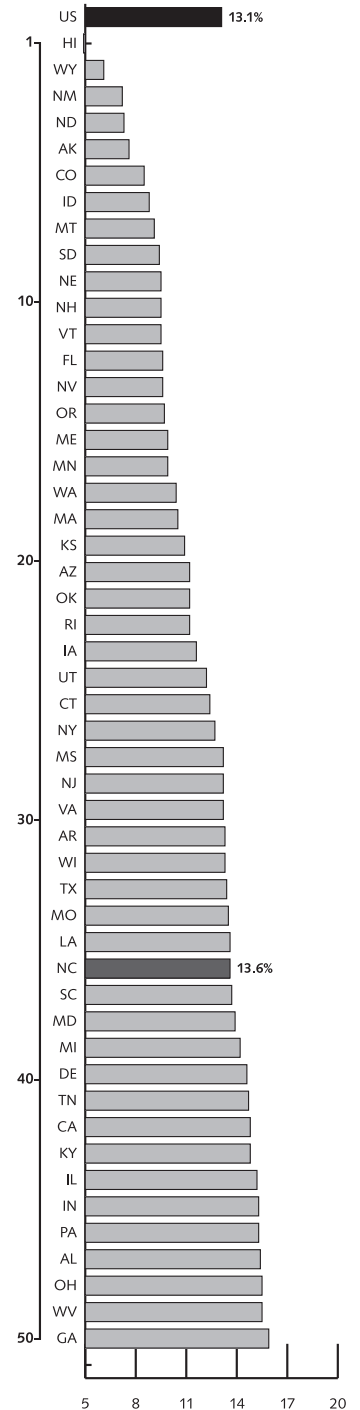
Although the term environment often refers to outdoor air and water quality, the Task Force took a broader view and incorporated other features of the space within which we live, work, and learn. The built environment influences health through differential access to sidewalks, parks, trails, and other open spaces for physical activity.<sup>6</sup> Homes and schools can have poor indoor air quality, affecting respiratory and cardiovascular health as well as the ability to learn.<sup>7</sup> The burden of environmental risks falls disproportionately on children, the elderly, and low-income North Carolinians. For example, low-income North Carolinians are more likely to live in sub-standard housing. (See Chapter 11, Table 11.2.) Even so, everyone in the state can experience the negative effects of an unhealthy environment; all North Carolinians stand to benefit from a cleaner, safer, and healthier environment.

## The Outdoor Environment

### Air quality

Both short-term and chronic exposure to ambient (outdoor) air pollution is a serious health risk. Such pollutants as particulate matter, ozone, carbon monoxide, lead, sulfur dioxide, and nitrogen dioxide are all linked to increased rates of death and disability.<sup>8,9</sup> In particular, these pollutants negatively affect respiratory and cardiovascular health.<sup>7</sup> Research has shown that air pollutants cause and/or exacerbate such respiratory conditions as asthma, bronchitis, emphysema, and respiratory infection.<sup>2,10,11</sup> Exposure to carbon monoxide has been linked to coronary heart disease, and both particulates and ozone affect cardiovascular health. Additionally, individuals with respiratory conditions, sensitive airways, and heart disease, as well as children and the elderly, are at a greater risk than others for adverse health effects due to exposure to air pollution.<sup>2</sup>

**Micrograms of Fine Particulate Matter per Cubic Meter of Air (Fine Particulates 2.5 Micron and Smaller), 2005-2007**



Source: United Health Foundation. America's Health Rankings: data tables. United Health Foundation website. <http://www.americashealthrankings.org/2008/tables.html>. Published 2008. Accessed December 4, 2008.

a Asthma is one of the most common health conditions for children. North Carolina's asthma rate is slightly higher than the national average (10.8% and 9.3%, respectively). (Yeats K. The environment and asthma: strategies for North Carolina. Presented to: the North Carolina Institute of Medicine Prevention Task Force; January 14, 2009; Morrisville, NC.)

**Both short-term and chronic exposure to ambient (outdoor) air pollution is a serious health risk.**

### *Air Pollutants*

Under the Clean Air Act, the Environmental Protection Agency (EPA) is required to regulate and set standards for six pollutants: particulate matter, ozone, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead.<sup>b,c</sup> These pollutants are considered “criteria” pollutants because they are commonly found across the United States, and they have negative effects on both public health and the environment.<sup>9</sup> While the EPA sets standards for each of the pollutant concentrations, states must develop the methods to attain the standards. Improvements have been made in lowering air pollution; however both North Carolina and the nation as a whole continue to experience levels of air pollution above the standards. North Carolina ranks 15th highest in the country for exposure to fine particulate matter. (See Figure page 173.)

**Particulate matter:** Particulate matter (especially matter less than 10  $\mu\text{m}$  in diameter) and ozone are the most widespread air pollutants in North Carolina.<sup>11</sup> Particulates are a mix of solid and liquid particles suspended in the air. These particles can contain many different chemicals, including carcinogens and metals. While the majority of larger particulates are coughed or sneezed out of the body,  $\text{PM}_{10}$  and smaller particulates infiltrate the lungs, and ultrafine particles (less than 0.1  $\mu\text{m}$  in diameter) can pass from the lungs into the blood stream. Short-term increases in particle matter have been linked to increased death due to respiratory and cardiovascular events (e.g. stroke), child mortality, number of heart attacks, and severity of asthma symptoms, and decreased lung function. The body reacts to particle matter similarly to how it reacts to secondhand cigarette smoke. The responses can lead to increased hospitalization and emergency department use. In addition, chronic exposure to particulates is linked to lung damage, slowed growth in lung function in children, and increased risk of death due to lung cancer and cardiovascular disease.<sup>2</sup> A 2006 study of the effects of air pollution on the health of North Carolinians estimated that particulate matter causes thousands of preventable deaths and cases of illness and disability in the state each year.<sup>7,11</sup> (See Table 7.1.) In the past several years, the particulate levels in Catawba, Davidson, and Mecklenburg counties have exceeded the annual EPA standards (15.0  $\mu\text{g}/\text{m}^3$  for matter less than 2.5  $\mu\text{m}$  in diameter).<sup>12</sup>

**Ozone:** As shown in Table 7.1, ground level ozone is also estimated to cause preventable illness and disability in North Carolina. Ground level ozone, the major component of smog, is an extremely reactive gas formed through the chemical reaction of volatile organic compounds and nitrogen oxides, fueled by sunlight and heat.<sup>13</sup> Because the reaction is catalyzed by sunlight and heat, ozone levels increase during the hot summer months prevalent in North Carolina. Ozone is the state’s most widespread air pollutant, and more than half of the state’s population lives in counties where ozone levels, at some time in the year, exceed

b 42 USC 85

c A table of the six priority pollutants and their air quality standards can be found at <http://epa.gov/air/criteria.html>.



**Table 7.1**  
**Particulate Matter and Ozone Lead to Considerable Death and Disability in North Carolina**

	Estimated yearly cases
<b>Particulate matter (&lt;10 µm in diameter)</b>	
<i>Premature deaths (adults)</i>	3,000
<i>Respiratory hospital admissions</i>	2,000
<i>Cardiovascular hospital admissions</i>	2,000
<i>New cases of chronic bronchitis</i>	2,500
<i>Asthma attacks</i>	200,000
<i>Missed work days</i>	500,000
<i>Restricted activity days</i>	5 million
<i>Increased symptom days</i>	15 million
<b>Ozone</b>	
<i>Adult onset asthma</i>	1,500
<i>Respiratory hospital admissions</i>	4,000
<i>Asthma attacks</i>	200,000
<i>Restricted activity days</i>	1 million
<i>Increased symptom days</i>	4 million

Source: Madsen T, Ouzts E; Environment North Carolina Research and Policy Center. Air pollution and public health in North Carolina. [http://www.environmentnorthcarolina.org/uploads/pi/gC/pigCWFDm1vcQysITtXzIPA/Air\\_Pollution\\_In\\_NC.pdf](http://www.environmentnorthcarolina.org/uploads/pi/gC/pigCWFDm1vcQysITtXzIPA/Air_Pollution_In_NC.pdf). Published February 2006. Accessed July 1, 2009.

**More than half the state’s population lives in counties where ozone levels, at some time in the year, exceed the EPA standard.**

the EPA standard (eight-hour average of 0.075 parts per million<sup>d</sup> or a code orange ozone day).<sup>12</sup> During the summer, ozone levels in many parts of central North Carolina exceed EPA standards. In 2009, the Charlotte-Gastonia-Salisbury metropolitan area ranked the 8th most ozone-polluted city in the nation.<sup>2</sup> The reactivity of ozone can damage the tissues of the lungs, reducing lung function and increasing lung sensitivity and susceptibility to other irritants, even after only a short exposure.<sup>13</sup> Ultimately, short-term exposure to elevated ozone levels can contribute to premature death.<sup>2</sup>

**Carbon monoxide, nitrogen oxides, sulfur dioxide, and lead:** Carbon monoxide, nitrogen oxides, sulfur dioxide, and lead are also regulated by the EPA; however, they are not as prevalent in North Carolina as particulate matter and ozone. Carbon monoxide is a colorless, odorless gas, and breathing it reduces oxygen delivery to organs and tissues in the body, such as to the brain and heart. As a result, carbon monoxide can cause cardiovascular effects (e.g. chest pain) as well

<sup>d</sup> In 2008, the Environmental Protection Agency tightened ozone level standards to 0.075 parts per million. Before 2008, the standard was 0.08. (Ozone air quality standards. Environmental Protection Agency website. <http://www.epa.gov/air/ozonepollution/standards.html>. Update October 14, 2008. Accessed July 2, 2009)

as nervous system effects (e.g. vision problems, reduced ability to learn, and reduced dexterity). In extremely high doses, a single exposure can cause death. In addition, carbon monoxide contributes to the formation of ground level ozone.<sup>9</sup>

Nitrogen oxides are extremely reactive gasses and include nitrogen dioxide, nitrous acid, and nitric acid. Short-term exposure to nitrogen oxides can cause airway inflammation and increased respiratory problems for people with asthma and other respiratory problems. Higher concentrations of nitrogen oxides (30%-100% higher) are typically found near roadways. Approximately 16% of housing units in the United States are located within 300 feet of a major highway, railway, or airport.<sup>14</sup> However, the largest impact from nitrogen oxides in North Carolina is as a precursor to ozone, which has significant effects on health as discussed above.

**Motor vehicles—especially diesel engines—are the largest source of air pollution in North Carolina.**

Sulfur dioxide produces both gas and fine particulate pollution. Exposure to sulfur dioxide causes particular problems for sensitive groups (i.e. people with asthma, heart disease, and lung disease as well as children and the elderly). Short-term increases in sulfur dioxide levels can cause breathing difficulty for people with existing respiratory problems, and long-term increases in sulfur dioxide particulates can cause respiratory illness, worsen heart disease, and cause premature death.<sup>9</sup> Sulfur dioxide can also move over long distances without dissipating, which can cause problems in areas far from the point of origin.

Due to the removal of lead from gasoline, between 1980 and 1999 the levels of lead in the air decreased 94%. However, lead can still be present in the air. Exposure to lead can affect the nervous, immune, cardiovascular, and reproductive and developmental systems. Infants and young children are particularly sensitive to exposure to lead, which may be linked to behavioral problems and learning deficits.<sup>15</sup>

#### *Sources of Air Pollution*

Motor vehicles—especially diesel engines—are the largest source of air pollution in North Carolina. Nearly half of both particulates as well as precursors to ozone (i.e. nitrogen oxides and volatile organic compounds) emissions come from mobile sources (i.e. cars, trucks, buses, and off-road equipment).<sup>11</sup> In addition, three-fourths of carbon monoxide emissions come from cars and trucks, and nitrogen oxides and sulfur dioxide are large components of auto emissions.<sup>16</sup> Motor vehicle emissions are especially problematic in large cities, which have greater numbers of vehicles and levels of traffic.

Coal-fired power plants are another source of air pollution, emitting 67 different pollutants and toxins, including particulates, precursors to ozone (including nitrogen oxides), lead, carbon monoxide, and sulfur dioxide.<sup>17</sup> Coal-fired power plants also release mercury, which settles into the water supply (discussed further in the section on water quality).<sup>e</sup> There are 14 major coal-fired power plants across

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<sup>e</sup> Coal-fired power plants are the largest source of mercury emissions (33%), followed by municipal/medical waste incinerators (29%) and commercial/industrial boilers (18%). (Palmer RF, Blanchard S, Wood R. Proximity to point sources of environmental mercury release as a predictor of autism prevalence. *Health and Place*. 2009;15:18-24)

North Carolina.<sup>18</sup> In 2002 the North Carolina General Assembly passed the Clean Smokestacks Act, which required coal-fired power plants in the state to reduce their emissions of nitrogen oxides by 77% by 2009 and sulfur dioxide emissions by 73% by 2013.<sup>f</sup> Nitrogen oxides are a main cause of ozone—one of North Carolina’s most prevalent air quality problems—and sulfur dioxide is the main cause of fine particle pollution. Measures used to reduce nitrogen oxides and sulfur dioxide emissions are also expected to reduce mercury emissions; the North Carolina Division of Air Quality estimates that the Clean Smokestacks Act will reduce total mercury emissions by 50%.<sup>19</sup> While steps have been taken in North Carolina to reduce power plant emissions, the state cannot regulate emissions in neighboring states, whose pollutants can migrate across state lines.

There are also several new and growing sources of air pollution. These include poultry waste incineration, hog waste, medical waste incineration, and waste from energy incineration. While the emissions produced from these sources have not been well-characterized, some (e.g. poultry manure incineration) could be worse than coal-fired power plants.<sup>7</sup> Living in close proximity to hog operations has been associated with heightened levels of certain reported health problems, including headaches, runny nose, sore throat, excessive coughing, diarrhea, asthma, and burning eyes.<sup>20</sup> These findings are consistent with a later study conducted in 16 North Carolina communities which found that levels of hydrogen sulfide particulate matter, pollutants produced by hog operations, were elevated at times when community residents reported hog odor.<sup>21</sup> Another study found higher prevalence of wheezing symptoms and doctor-diagnosed asthma reported by children attending North Carolina public middle schools where staff noticed livestock odor inside school building twice per month or more.<sup>22</sup> In North Carolina, industrial swine operations are located disproportionately near low income schools and schools attended by students of color, meaning that local air pollution from these sources has the greatest potential to impact populations of children that suffer from higher rates of asthma and have poor access to medical services.<sup>23</sup>

Indoor air quality also influences health. Mold, radon, carbon monoxide, humidity, and other indoor pollutants can cause or worsen asthma, allergic reactions, the ability to concentrate and learn, and lung cancer.<sup>7</sup> Indoor air quality in homes and school-based risks are discussed in more detail below.

### Water Quality

Water pollution is caused by both naturally occurring contaminants (e.g. arsenic in bedrock and algal toxins) and human activities (e.g. use of petroleum, agriculture, and industry) and can affect both groundwater and source water.<sup>7</sup> Drinking water in North Carolina comes from both groundwater (through private wells and aquifers) and source water (from lakes, rivers, and streams). More than half of North Carolinians rely on groundwater for drinking, through both private wells and public aquifers.<sup>24</sup> The water quality of public water systems is regulated

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by the North Carolina Department of Environment and Natural Resources, Division of Environmental Health. In contrast to public water supplies, private wells are not subject to inspection. As a result, North Carolinians using privately supplied drinking water are at a greater risk for drinking contaminated water. This is a considerable population in our state: according to the US Geological Survey, there are approximately 2.7 million people in North Carolina that rely on private wells for their drinking water. A higher percentage of people in North Carolina rely on privately supplied drinking water than nationally (34% and 15%, respectively).<sup>25</sup>

**In contrast to public water supplies, private wells are not subject to inspection. As a result, North Carolinians using privately supplied drinking water are at a greater risk for drinking contaminated water.**

Arsenic and algal toxins are naturally occurring contaminants. Algae blooms of blue-green algae (i.e. cyanobacteria) in freshwater lakes and ponds can release toxins into the water, which can cause illness and death in humans if ingested.<sup>26</sup> Arsenic is an element found in many geological formations and is released into groundwater as water flows across rocks and soil containing arsenic. Geological events and stresses, such as earthquakes and droughts, can cause the release of excess levels of arsenic.<sup>27</sup> Regular consumption of high levels of arsenic in water has been linked to bladder, lung, skin, liver, kidney, and prostate cancer.<sup>3,5</sup> Arsenic exposure can also cause skin lesions, stomach pain, nausea, vomiting, diarrhea, numbness of the hands and feet, partial paralysis, and blindness. There is some evidence that low levels are associated with cardiovascular health, diabetes, and adverse reproductive outcomes.<sup>28</sup> Arsenic is also used in pesticides and other agricultural products as well as in wood treatment. Run-off from pesticides can introduce arsenic into groundwater; arsenic in treated wood can leach into the soil and seep down into groundwater. The EPA's maximum contaminant level for arsenic is 0.010 parts per million.<sup>8</sup> Due to the geological rock formations in the North Carolina Piedmont, this area has the greatest probability of increased arsenic levels in groundwater, with several areas experiencing arsenic levels in water above the EPA standard.<sup>29</sup> The Charlotte-Mecklenburg area has some of the highest levels of groundwater arsenic concentrations in the state.<sup>30</sup>

Agriculture can introduce multiple types of pollutants into the water. Pesticides used on crops can run-off or seep into water supplies. Industrial animal farming generates large amounts of animal waste which harbors pathogens and chemical contaminants. Animal waste can be a source of groundwater contamination when used as sprayed fertilizer or when it is improperly disposed.<sup>31</sup> The health effects of drinking contaminated water depend on the contaminant. Some pesticides may irritate the skin or eyes, some affect the nervous system, and some have been linked to cancer.<sup>4</sup> Nitrates from agricultural fertilizers, as well as human and animal waste, can seep into groundwater or run-off into surface waters. Ingestion of nitrates (levels exceeding about 10%) reduces the ability of red blood cells to carry oxygen, a condition known as methemoglobinemia (or blue baby syndrome, as babies are particularly susceptible to developing the condition). This acute effect

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g In 2001, the Environmental Protection Agency adopted a new standard for arsenic in drinking water at 10 parts per billion (ppb), replacing the old standard of 50 ppb.

can be serious and can even result in death. Nitrates are also the precursor to N-nitroso compounds (NOC), a class of cancer causing agents. Several studies have linked drinking nitrate contaminated water with increased levels of certain types of cancer; however, results are mixed.<sup>32</sup>

Old, unlined solid waste facilities (i.e. landfills) can also be sources of groundwater contamination. Hazardous substances can leach from the waste and seep into groundwater. In North Carolina, many of these older sites have a house, school, day care, church, or drinking water source within 1,000 feet of the landfill or a well within 500 feet.<sup>33</sup> Studies of the effect of contaminated water supplies on health have been mixed and depend on the contaminant. However, in 1991 the National Research Council concluded that contamination of drinking water from solid waste facilities could lead to adverse health effects.<sup>34</sup>

Industry, such as power plants and pharmaceutical manufacturers, can dump pollutants into the water supply as well. Mercury naturally occurs in coal, and when coal is burned in power plants, it is released into the air and can settle into surrounding water formations. The mercury is absorbed by fish and shellfish, which can accumulate very high levels of mercury (methylmercury in fish). Consumption of high levels of methylmercury can cause adverse health effects in the brain, heart, kidneys, lungs, and immune system.<sup>35</sup> In addition, high levels of methylmercury can impair the development of the nervous system in children. Mercury has been linked to increased rates of autism in children living in close proximity to power plants.<sup>36</sup> Pharmaceuticals can enter the water supply through both industrial waste from pharmaceutical manufacturers and individual waste. Some research suggests that certain pharmaceuticals in the water supply can produce ecological harm.<sup>37</sup> However, further research is needed to determine if pharmaceutical contamination has negative effects on human health.

In addition, underground gasoline storage tanks can leak and contaminate groundwater. Methyl-t-butyl ether (MTBE) is a volatile organic compound added to gasoline to reduce carbon monoxide and ozone caused by auto emissions.<sup>38</sup> While the health effects of exposure to MTBE are still being examined, the EPA is considering drinking water standards for MTBE. Benzene, a known carcinogen, is also a component of gasoline which can seep into and contaminate groundwater.<sup>39</sup>

### **Built Environment**

The built environment—including neighborhood design, land use patterns, and transportation systems—affects health, because it influences the levels of physical activity that people engage in.<sup>6</sup> Physical activity is an important part of a healthy lifestyle. Regular physical activity reduces the risk of premature death, prevents against feelings of depression, and helps to prevent obesity. Even small amounts of regular exercise are beneficial to health and produce financial savings by reducing medical expenses.<sup>40</sup>

Access to more places for physical activity, particularly sidewalks, trails, and parks, has been shown to increase activity levels.<sup>41</sup> In North Carolina, it is important to make the built environment more conducive to physical activity, as nearly 60% of

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North Carolinians report they would increase their physical activity if their community had more accessible trails for walking or bicycling.<sup>42</sup> As such, the Task Force recommends building active living communities and expanding the Community Grants Program. A more thorough discussion of the built environment and physical activity, as well as the recommendations in this area, can be found in Chapter 4.

### **Reducing Environmental Risks**

Reducing environmental risks is an important component to preventing death and disability. North Carolina needs to address the major pollutants and causes of pollution in the state, as well as the built environment, to build healthy, active communities. Promoting healthy communities requires creating solutions for all of these environmental risks. Improving the built environment will provide people with increased access to areas to participate in physical activity. However, if the air is polluted and unhealthy, people will not utilize the improved built environment to the extent possible. In addition, the state should emphasize the protection of vulnerable populations such as children, the elderly, and low-income and minority North Carolinians. Children and the elderly are more susceptible to the negative health effects of an unhealthy environment, and low-income and minority individuals are disproportionately exposed to some environmental risks.<sup>10</sup> For example, both solid waste facilities and intensive hog operations are more likely to be located in minority and low-income communities than non-minority, higher income communities. Minority and low-income populations may be at greater risk for consuming nitrates as solid waste facilities are 2.8 times more likely to be located in majority-minority communities (i.e. communities with more than 50% minority populations) than in communities with less than 10% people of color. This group is also 1.5 times more likely to live in communities with median household values of less than \$60,000, as compared to communities with median household values of \$100,000 or more.<sup>h,43</sup> A North Carolina study found that there are 7.2 times as many intensive hog operations in communities in the highest quintile of poverty compared to the lowest; communities in the three highest quintiles of percentage non-white population have approximately five times as many intensive hog operations as compared to the lowest quintile.<sup>h,44</sup> In addition, people living near major highways, railways, and airports are more likely to be low-income and minorities.

To reduce air pollution, the state needs to examine ways to reduce emissions from mobile sources—particularly those with diesel engines—such as the development and improvement of mass transportation systems in urban areas, strengthening of vehicle emissions standards, increasing the use of alternative energy/fuel sources, and decreasing vehicle idling. The use of alternative energy sources and stricter emissions standards could also further reduce emissions from coal-fired power plants. Water quality can be improved by reducing the release of pollutants into the water supply and by improving the detection and treatment of already contaminated water. The American Recovery and Reinvestment Act of 2009

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<sup>h</sup> These findings adjust for population density.

provides funding for states to reduce environmental risks, promote sustainability, and support “green” initiatives.<sup>i</sup> As of July 13, 2009, North Carolina has received over \$148 million in funding through the EPA.<sup>45</sup> (See Table 7.2.) However, North Carolina needs a statewide plan for how to use these and other resources to promote healthy communities, minimize environmental risks, and promote sustainability and “green” initiatives that will support and improve the public’s health and safety. Agencies and stakeholders across disciplines need to work together to devise and implement evidence-based, workable strategies for reducing environmental risks in North Carolina.

**Agencies and stakeholders across disciplines need to work together to devise and implement evidence-based, workable strategies for reducing environmental risks in North Carolina.**

**Table 7.2**  
**American Recovery and Reinvestment Act Funding to Reduce Environmental Risks in North Carolina (July 13, 2009)**

Project	Funding
Reduce underground petroleum leaks	\$7.5 million
Reduce school bus diesel emissions	\$509,000
Improve water quality	\$714,400
Clean up brownfields	\$1.6 million
Reduce emissions from diesel engines	\$1.73 million
Drinking water infrastructure	\$65.5 million
Clean water infrastructure	\$70.7 million

Source: Environmental Protection Agency. Region 4: EPA Southeast information related to the American Recovery and Reinvestment Act of 2009 (Recovery Act). Environmental Protection Agency website. <http://www.epa.gov/region4/eparecovery/newsroom.html>. Updated July 10, 2009. Accessed July 13, 2009.

Therefore, the Prevention Task Force recommends:

### **Recommendation 7.1: Create an Interagency Leadership Commission to Promote Healthy Communities, Minimize Environmental Risks, and Promote Green Initiatives**

The Governor or the North Carolina General Assembly should create an Interagency Leadership Commission to develop a statewide plan to promote healthy communities, minimize environmental risks, and promote sustainability and “green” initiatives that will support and improve the public’s health and safety. The Interagency Leadership Commission should create an implementation plan that includes the roles that each agency will play in implementing the plan, the costs of the plan, and potential funding sources. The plan should emphasize local sustainability, environmental justice, protection of vulnerable populations, and precaution. Contents of the plan should include, but not be limited to, statewide efforts to promote active, walkable, livable

i Pub L. 111-005

communities; reduce environmental exposures and risks that negatively impact population health; promote clean, renewable energy, green technology, and local production of food, energy, goods, and services; and increase opportunities for mass transportation.

- a) The Interagency Leadership Commission should include senior level agency staff from the North Carolina Department of Transportation, Department of Health and Human Services, Department of Public Instruction, Department of Environment and Natural Resources, Department of Commerce, State Board of Education, Board of Transportation, Department of Insurance, North Carolina Community College System, and University of North Carolina System. The Commission should also include representatives from the League of Municipalities, North Carolina Association of County Commissioners, North Carolina Association of Metropolitan Planning Organizations, North Carolina Association of Local Health Directors, North Carolina Recreation and Park Association, North Carolina State Society for Human Resource Management, the North Carolina Chamber, and at-large members of the public.
- b) The Interagency Leadership Commission should oversee the environmental assessment described in Recommendation 7.2 and should lead the development of a communications campaign to educate and inform North Carolinians of the findings and implications and actions being taken as a result of the assessment.
- c) The Interagency Leadership Commission should present the plan to the Governor and the Joint Legislative Commission on Governmental Operations no later than January 1, 2011, and should report progress on implementation of the plan at least once annually thereafter.

It will be hard to create a statewide plan without sufficient data on environmental risks in North Carolina and their effects on health. The Department of Environmental Sciences and Engineering in the University of North Carolina (UNC) Gillings School of Global Public Health is currently the lead institution working to produce an environmental health strategy for the United Arab Emirates (UAE), including a systematic assessment of environmental risks in the country and the effects on health. UNC is building a model to quantify the public health effects of the top environmental risks in the UAE, which will be later used to determine the public health benefits of strategies to control the key risk factors.<sup>46</sup> This project provides a science-based model that North Carolina can use to develop an environmental health strategic plan. Therefore, the Task Force recommends:

### **Recommendation 7.2: Develop an Environmental Assessment for North Carolina that Links Environmental Exposures to Health Outcomes**

The Department of Environmental Sciences and Engineering in the University of North Carolina (UNC) Gillings School of Global Public Health should collaborate with the North Carolina Division of Public Health, North Carolina Department of Environment and Natural Resources, North Carolina Department of Agriculture and Consumer Services, and North Carolina Agromedicine Institute (East Carolina University, North



Carolina State University, and North Carolina Agricultural and Technical State University) to develop an environmental assessment for the state that links environmental exposures/risks and health outcomes and includes strategies to address the exposures/risks. This environmental assessment should be conducted to address the priorities and needs of the state as identified by the Recommendation regarding an Interagency Leadership Commission. The North Carolina General Assembly should appropriate \$3 million in non-recurring funds in SFY 2011 to the UNC Gillings School of Global Public Health to support this effort.

## The Indoor Environment

### Reduce Environment Hazards in Homes

Damp houses with poor ventilation and/or water or plumbing leaks provide a fertile environment for mold growth as well as for insect or rodent infestations. Mold has been found to be associated with asthma and other chronic respiratory problems, as well as such conditions as chronic headache and sore throat.<sup>47-49</sup>

Uncontrolled pest infestations can aggravate asthma and increase the risk of hospitalization for asthma symptoms, particularly in children.<sup>50</sup>

Low-income households and older homes have been found to have the highest concentrations of mouse and cockroach allergens.<sup>51</sup> Studies have also shown that children with asthma who are allergic to cockroaches and live in cockroach-infested homes have a 3.4 times heightened risk of hospitalization compared to children with asthma exposed to other allergens, such as dust mites or cat dander.<sup>52</sup>

Old dirty carpeting, which is often found in substandard housing, can also contain dust, allergens, or other toxic chemicals which can cause allergic, respiratory, neurological, or hematological illnesses.<sup>53</sup> Research suggests that nationally almost 40% of the asthma diagnosed in children younger than age six is due to environmental health risks from the home.<sup>54</sup> In North Carolina, a statewide survey of parents reported that 14.2% of children under the age of 18 had at some point been diagnosed with asthma, and 8.2% have a current asthma diagnosis.<sup>55</sup> More than 15% of children with a current asthma diagnosis have missed one or more weeks of day care or school within the past 12 months due to their asthma.

Exposure to lead, through both lead-based paint and lead in water pipes, is another health risk present in housing, especially in older homes. Exposure to lead and lead contamination is particularly problematic for very young children. A single high-dose exposure to lead can cause serious health problems, but more commonly, the harm occurs from repeated exposure to low levels of lead.<sup>56,57</sup> Exposure to lead can result in behavioral, cognitive, and developmental problems. It can also lead to seizures and, in some instances, death.<sup>58,59</sup> Although lead pipes were banned for use for drinking water in 1986, and lead solder was banned by the North Carolina Building Code Council in 1985, many older homes still contain lead.<sup>60</sup> Lead paint can be found in houses built before 1978, which includes about

**Damp houses with poor ventilation and/or water or plumbing leaks provide a fertile environment for mold growth as well as for insect or rodent infestations... Research suggests that nationally almost 40% of the asthma diagnosed in children younger than age six is due to environmental health risks from the home.**

**Exposure to airborne toxic substances in the home is also a well-established risk factor for health problems.**

44% of the housing stock in North Carolina.<sup>j,61</sup> Older homes are the most likely to have lead paint; about 87% of homes built before 1940 have lead paint, as do 69% of houses built between 1940 and 1960, and 24% of homes built between 1960 and 1978.<sup>62</sup> The US Department of Housing and Urban Development (HUD) estimates that 27% of American homes and 34% of those with one or more children under age six, have significant lead-based paint hazards.<sup>63</sup> The North Carolina Division of Public Health operates a lead abatement program that tests children for potential lead poisoning. Lead abatement is generally required when a child less than age six, living in housing with lead poisoning hazards, has a blood lead level of 20 µg/dL (micrograms per deciliter) or greater.<sup>k,l</sup> Of the more than 650,000 children tested between 2003-2007, 1% were determined to have elevated blood lead levels of more than 10 µg/dL, and one-tenth of one percent (877 children) were found to have blood lead levels of greater than 20 µg/dL. In 2008, out of nearly 150,000 children tested for lead poisoning (>20 µg/dL) in North Carolina, 38 children were confirmed to have lead poisoning.<sup>m</sup> Abatement must be conducted by certified contractors, and a permit for abatement must be obtained from the North Carolina Division of Public Health's Occupational and Environmental Epidemiology Branch. While the property owner is responsible for remediating lead hazards, the Division of Environmental Health implements the Lead Hazard Control grant from HUD to address lead hazards in pre-1978 housing.<sup>n</sup> These funds may also be used to help address lead hazards for low-income property owners. In addition, children with blood lead levels of 45 µg/dL or higher, and adults with levels approximately 70-80 µg/dL or greater, may need to undergo chelation therapy (i.e. a chemical treatment to flush lead out of the body) to reduce blood lead levels.<sup>o</sup>

Exposure to airborne toxic substances in the home is also a well-established risk factor for health problems.<sup>57</sup> These toxic substances can come from a number of sources, including poisons released from building materials, toxic gases that enter through the basement or are emitted from appliances, and exposure to household chemicals.<sup>64-66</sup> Carbon monoxide and asbestos are two notable toxic substances. Carbon monoxide poisoning is a significant health risk, particularly for homes with poor ventilation. This odorless, colorless gas is one of the leading causes of death by poisoning in the United States. Eighty-six North Carolinians are known

j Lead paint for residential use was banned in 1978.

k N.C.G.S. 130A-131.9C(a)

l An environmental investigation is conducted once a lead-poisoned child is identified. The investigation is conducted by the local health department and a regional specialist from the Division of Environmental Health, North Carolina Department of Environment and Natural Resources. If lead contamination is present, either abatement or interim controls to address deteriorated surfaces is conducted. Interim controls require annual monitoring. (Norman E. Division of Environmental Health, North Carolina Department of Environment and Natural Resources. Written (email) communication. June 26, 2009.)

m Norman E. Division of Environmental Health, North Carolina Department of Environment and Natural Resources. Written (email) communication. June 26, 2009.

n The Lead Hazard Control grant was awarded in 2006. It is a three-year, \$3 million grant for the remediation of 202 homes in North Carolina. (Norman E. Division of Environmental Health, North Carolina Department of Environment and Natural Resources. Written (email) communication. June 26, 2009.)

o Langley R. Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. June 23, 2009.

to have died from accidental, non fire-related carbon monoxide poisoning between 1999 and 2004, although the true number may be higher since carbon monoxide deaths are not required to be reported to authorities.<sup>67</sup> Chronic exposure to carbon monoxide can also lead to health issues.<sup>68</sup> Asbestos is a group of naturally occurring minerals comprised of small fibers and is used in many different building supplies, including those used in homes. These small fibers can cause cancer when inhaled into the lungs.<sup>69</sup> Many other building materials, furnishings, and paint can also be sources of harmful indoor air pollution.<sup>70</sup>

Radon, a naturally occurring radioactive element, can also invade homes, typically through soil or groundwater.<sup>p</sup> It is estimated that one in ten North Carolina homes has an airborne radon level above the EPA action level. Extended exposure to radon can increase the risk of lung cancer.<sup>71,72</sup> Because of the potential health risks, the EPA recommends that people make changes to their homes to reduce the radon levels if the indoor levels are four or more picocuries per liter of air (pCi/L). According to the EPA, there are eight North Carolina counties that have a predicted indoor radon level of greater than four pCi/L: Alleghany, Buncombe, Cherokee, Henderson, Mitchell, Rockingham, Transylvania, and Watauga. There are an additional 31 counties with an elevated risk of between two and four pCi/L.<sup>q,73</sup> North Carolina also recommends that homes with radon levels above the EPA action level seek radon mitigation. Abatement and mitigation should be performed by a certified radon contractor. As with lead abatement, the homeowner is required to pay for radon mitigation and abatement.

The sources of unhealthy household environments are many and varied. Natural factors, often exacerbated by older or substandard homes, contribute to household health problems. Poorly designed and maintained homes can also increase injury risk due to falls, burns, and poisonings (as described more fully in Chapter 8). Those who experience these acute problems often require costly, long-term care.<sup>74-76</sup>

The Centers for Disease Control and Prevention (CDC), HUD, and EPA are all working together to improve housing conditions and create healthier homes.<sup>51</sup> The goal of the Healthy Homes Initiative is to “identify health, safety, and quality-of-life issues in the home environment and to act systematically to eliminate or mitigate problems.”<sup>s</sup> As part of this initiative, CDC and its partner agencies are working to broaden the capacity of the different professionals who inspect homes to address multiple housing problems that can affect health or safety, including mold, lead, allergens, asthma, carbon monoxide, home safety, pesticides, and

**The sources of unhealthy household environments are many and varied. Natural factors, often exacerbated by older or substandard homes, contribute to household health problems.**

p Radon is a naturally occurring gas that comes from the decay chain of uranium or thorium founds in some soil, rocks or water.

q Alexander, Ashe, Avery, Burke, Caldwell, Caswell, Catawba, Clay, Cleveland, Forsyth, Franklin, Gaston, Graham, Haywood, Iredell, Jackson, Lincoln, Macon, Madison, McDowell, Polk, Rutherford, Stokes, Surry, Swain, Vance, Wake, Warren, Wilkes, Yadkin, Yancey

r Rosfjord C. Western Radon Coordinator, North Carolina Radon Program. Oral communication. June 29, 2009.

s Centers for Disease Control and Prevention. Healthy Homes Initiative. <http://www.cdc.gov/healthyplaces/healthyhomes.htm>. The Healthy Housing Reference Manual is available at: <http://www.cdc.gov/nceh/publications/books/housing/housing.htm>

radon. The federal agencies have also identified low-cost strategies that families and home owners can use to reduce health and safety risks in substandard housing. (Substandard housing is discussed more fully in Chapter 11, and injuries are covered in Chapter 8.) For example, some falls can be prevented through home modifications, including the installation of grab bars in bathtubs or showers or adding lighting or railings to stairwells. The number of fire or burn-related injuries that occur in the home can be reduced through the installation of smoke alarms or reducing the temperature of hot water heaters. Carbon monoxide poisoning can be averted through the installation of a carbon monoxide monitor. In addition, some unintentional poisonings can be averted by safe storage of hazardous household products.

**The goal of the Healthy Homes Initiative is to “identify health, safety, and quality-of-life issues in the home environment and to act systematically to eliminate or mitigate problems.”**

As part of the Healthy Homes initiative, the CDC, HUD, and EPA are helping state centers provide interdisciplinary training for housing, health, environmental, and other professionals. For example, the North Carolina State University Cooperative Extension/Advanced Energy Healthy Homes Training Center for North Carolina was established in 2008 to offer the Essentials Healthy Homes Practitioners Course. The course was developed by the CDC, HUD, and EPA and leads to a national certification.<sup>t</sup>

The Task Force on Prevention supports the goals of the Healthy Homes Initiative. There are many different types of health, environmental, or housing inspectors who work in North Carolina homes and who could be cross-trained to identify and help mitigate multiple health, environmental, and safety risks while in a home. For example, the Division of Public Health runs the childhood lead abatement program, which helps reduce lead contaminants in households when elevated blood lead levels have been detected in children. Most houses are also inspected before they can be sold.<sup>u</sup> Housing inspectors are licensed by the North Carolina Home Inspector Licensure Board. These inspectors could be trained to comprehensively examine household environmental and health risks when they inspect homes. Similarly, public health professionals sometimes visit homes to identify asthma triggers for children or to eliminate fall risks for older adults, and fire marshals may visit homes to reduce fire risks. These professionals could be cross-trained to identify all housing hazards when they are in the home and to help families reduce these health risk factors.

### **Recommendation 7.3: Ensure Healthy Homes**

**The North Carolina Division of Public Health, the North Carolina Division of Water Quality, the North Carolina Department of Environment and Natural Resources, Office of the State Fire Marshal, and North Carolina Department of Insurance should expand**

<sup>t</sup> The Essential Health Homes Practitioners course is a 2- day training. People need to pass a national certification exam. The course fee is \$75 for nonprofit, government and \$245 for private, for-profit. An additional fee for the National Environmental Health Association’s (NEHA) Healthy Homes Specialist credential is \$150 for NEHA members and \$200 for non members.

<sup>u</sup> Warner D. Executive Director, North Carolina Home Inspector Licensure Board, North Carolina Department of Insurance. Oral communication. July 7, 2009.

and enhance efforts to create healthy homes. These efforts should address, but not be limited to, the following: indoor air quality, mold and moisture, carbon monoxide, lead-based paint, radon, asbestos, drinking water, hazardous household products, pesticide exposure, pest management, and home safety (includes injury prevention of falls, etc). As part of this initiative:

- a) The Building Code Council should revise the state building code to require all residences with fossil fuel burning appliances or attached garages to have carbon monoxide alarms.
- b) The North Carolina Home Inspector Licensure Board should require licensed home inspectors to have the National Environmental Health Association's Healthy Homes Specialist Credential and to inspect homes comprehensively for environmental health and safety hazards any time the home is required to be inspected.
- c) Individuals such as state and local public health and fire marshal staff and building inspectors, who regularly visit homes to provide advice regarding health and safety and to conduct building inspections and environmental inspections, should have the National Environmental Health Association's Healthy Homes Specialist Credential. Agency staff who are so certified should conduct comprehensive health and safety assessments when visiting homes and provide families with information about existing environmental or safety hazards and how identified hazards can be abated. Building inspectors and staff of state and local public health departments and the fire marshal should have their Healthy Homes Specialist Credential certification by the end of 2012.

### Reduce School-Based Risks

As mentioned above, children are especially sensitive to environmental pollutants and toxins. Children and adolescents spend a large proportion of their time in school.<sup>77</sup> In addition, in North Carolina, nearly 9,000 young children are enrolled in Child Care Centers and Family Childcare Homes.<sup>78</sup> Approximately 1.6 million children in North Carolina are enrolled in school, nearly 89% in public schools.<sup>79</sup> However, about one-third of schools in the United States are believed to have significant environmental risk issues and are in need of extensive repair or renovation.<sup>80,81</sup> Studies have shown that these school-based environmental risks are linked to decreased performance; students attending schools in poor condition (i.e. with environmental hazards) score approximately 11% lower on standardized tests than students who attend schools in good condition.<sup>81,82</sup>

Schools can have indoor air quality problems similar to those in homes. Mold and mildew thrive in buildings with moisture and ventilation issues and can accumulate in the building heating, ventilation, and air conditioning (HVAC) systems.<sup>83</sup> Poorly operating HVAC systems can also result in overly hot or cold buildings that are uncomfortable for students and staff. Pest infestations are also common in damp buildings. Infestations can aggravate asthma symptoms, and pesticides used to reduce infestations can irritate the skin or eyes, affect the nervous system, or cause cancer.<sup>4,50</sup>

**Studies have shown that these school-based environmental risks are linked to decreased performance.**

**The EPA has created the *Indoor Air Quality Tools for Schools* Program as a means of reducing exposure to indoor environmental contaminants in schools by identifying, correcting, and preventing indoor air quality problems.**

In addition, schools may have problems with exposures to toxic substances such as radon, arsenic, asbestos, carbon monoxide, and lead-based paint. A nationwide survey of radon levels in schools estimates that approximately one in five schools have at least one room with a short-term radon level above the action level of 4 pCi/L (picoCuries per liter).<sup>84</sup> Arsenic from treated wood (such as wood used for playground equipment) can leach from the wood and be picked up by children. Arsenic exposure can cause skin lesions, stomach pain, nausea, vomiting, diarrhea, numbness of the hands and feet, partial paralysis, and blindness.<sup>28</sup> While the EPA banned the use of arsenic in wood treatments in 2003, children can still be exposed to wood structures treated prior to 2003. Asbestos are used in building materials such as floor tile, linoleum, sheet vinyl, cement siding, roofing, pipe insulation, sprayed-on fireproofing, and decorative ceiling treatments. If inhaled due to damage of asbestos-containing products, asbestos can cause cancer.<sup>69</sup> Carbon monoxide may be a particular problem for schools with poor ventilation. In addition, chronic exposure to lead dust, from buildings with lead-based paint, can cause behavioral, cognitive, and developmental problems.<sup>58,59</sup>

In 2006, the North Carolina General Assembly passed the School Children's Health Act to reduce student and staff exposures to several pollutants in schools: pesticides, mercury, arsenic, diesel fumes, and mold/mildew.<sup>v</sup> The bill require schools to use integrated pest management to reduce the use of pesticides in schools; seal arsenic treated wood; reduce exposure to idling school bus diesel emissions; prevent mold and mildew; and prohibits the use of bulk elemental mercury in science classrooms. However, more can be done to improve indoor air quality in schools. The EPA has created the *Indoor Air Quality Tools for Schools (TfS)* Program as a means of reducing exposure to indoor environmental contaminants in schools by identifying, correcting, and preventing indoor air quality problems. The program works through the voluntary adoption of indoor air quality management practices and uses existing staff to execute simple and inexpensive improvement measures. Schools can use the *TfS Action Kit* (available from the EPA at no charge), which outlines best practices, industry guidelines, sample policies, and a sample indoor air quality management plan. Schools that have implemented the *TfS Action Kit* have seen increases in comfort levels and reductions in absenteeism, headaches, stomach aches, bronchitis, asthma inhaler use, visits to the school nurse for asthma symptoms, and symptoms of other respiratory illnesses.<sup>85</sup> In addition, the costs to implement the program have been minimal. Decreasing environmental risks in schools will support the NC Healthy Schools Initiative (discussed in Chapter 12). To further improve the indoor air quality in schools, the Task Force recommends:

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v S.L. 2006-143

## Recommendation 7.4: Reduce Environmental Risks in Schools and Child Care Settings

The North Carolina Division of Public Health (DPH), in conjunction with the North Carolina Department of Public Instruction (DPI), North Carolina Department of Environment and Natural Resources (DENR), and North Carolina Cooperative Extension, should train elementary and secondary school staff to conduct inspections and identify potential environmental hazards in accordance with the US Environmental Protection Agency's Tools for Schools Program. The North Carolina General Assembly should appropriate \$400,000 in recurring funds beginning in SFY 2011 to DPH to support this effort.

- a) DPH and the North Carolina Division of Environmental Health, in conjunction with the North Carolina Division of Child Development, should adapt the Tools for Schools assessment for child care centers and include the assessment in the child care center inspection by local environmental health specialists. The North Carolina General Assembly should appropriate \$28,000 annually for four years beginning in SFY 2011 to DPH to support this effort.
- b) DPI and the North Carolina Division of Child Development, in collaboration with DPH and DENR, should develop an implementation plan to phase in the Tools for Schools assessments in all schools and licensed child care centers over a four-year period. Child care centers would be required to complete the assessment as part of child care center licensure requirements.

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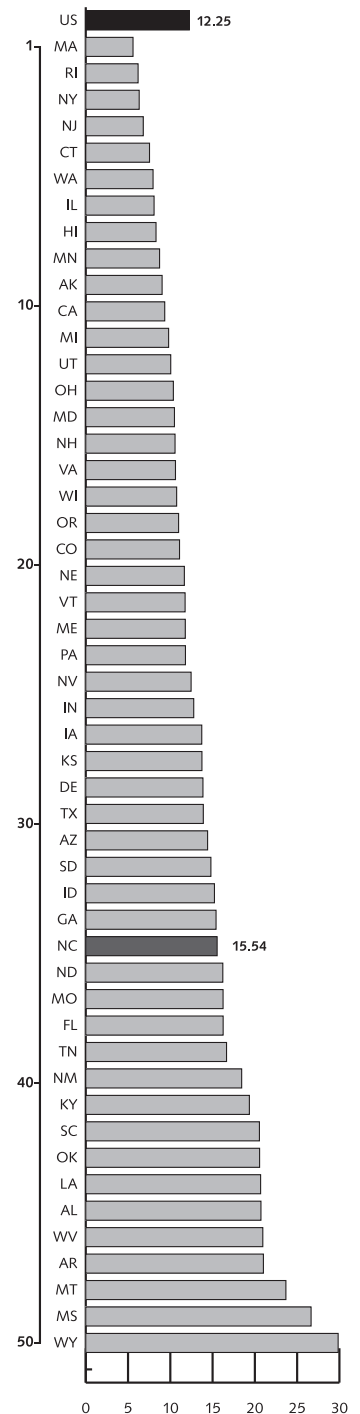
**I**njury and violence are significant problems in North Carolina, leading to death and disability for thousands each year. Unintentional injuries, which account for more than two-thirds of all injury deaths nationwide, are defined as injuries in which a harmful outcome was not sought.<sup>1</sup> These include injuries from motor vehicle collisions, falls, and unintentional poisonings. Violence, on the other hand, is defined as intentional injury resulting from the active, deliberate use of force against another person or oneself. This includes family violence, homicide, suicide, partner violence, and child maltreatment. Many injuries are preventable; they have known risk factors and should not be considered random, accidental, or unavoidable.<sup>1</sup>

Injury is a serious cause of disability, resulting in more than 148,000 hospitalizations, 819,000 emergency department (ED) visits, and an unknown number of outpatient visits and medically unattended injuries in North Carolina each year.<sup>2</sup> For every injury resulting in death, there are 24 hospitalizations and 131 ED visits in North Carolina.<sup>1</sup> The effects of these injuries are very costly. It is estimated that injury and violence cost \$80 billion in medical costs and \$326 billion in lost productivity throughout the United States each year.<sup>3</sup> One study put the medical cost of North Carolina fatal injuries at \$57 million (2004 dollars), but this figure omits all nonfatal injuries as well as nonmedical costs.<sup>4</sup>

Motor vehicle-related crashes and other unintentional injuries are the fourth leading cause of death in North Carolina, resulting in more than 4,300 fatalities in 2007. Because such injuries tend to occur among younger populations, they result in more years of life lost than any other leading cause of death. Among unintentional deaths in North Carolina, those from motor vehicle-related injuries result in an average of 35.6 years of life lost, whereas other unintentional injuries result in an average of 22.5 years of life lost. Overall, in 2007 in North Carolina, there were more than 121,300 total years of life lost as a result of unintentional injury, surpassing years of life lost due to all other diseases except cancer.<sup>5</sup> To focus the scope of its work, the Task Force decided to concentrate on the three leading causes of unintentional injury due to their high prevalence and economic impact in North Carolina. These include motor vehicle collisions, unintentional poisonings, and falls. (See Figure 8.1.) The Task Force also decided to focus on family violence, such as domestic violence and child maltreatment. While medical errors, homicide, suicide,<sup>a</sup> and other forms of injury are very important public health and social problems, these issues were not specifically addressed by the Task Force.

a While the Task Force did not focus specifically on suicides, it did discuss strategies to prevent depression. Depression is one of the underlying causes of suicide. See Chapter 6.

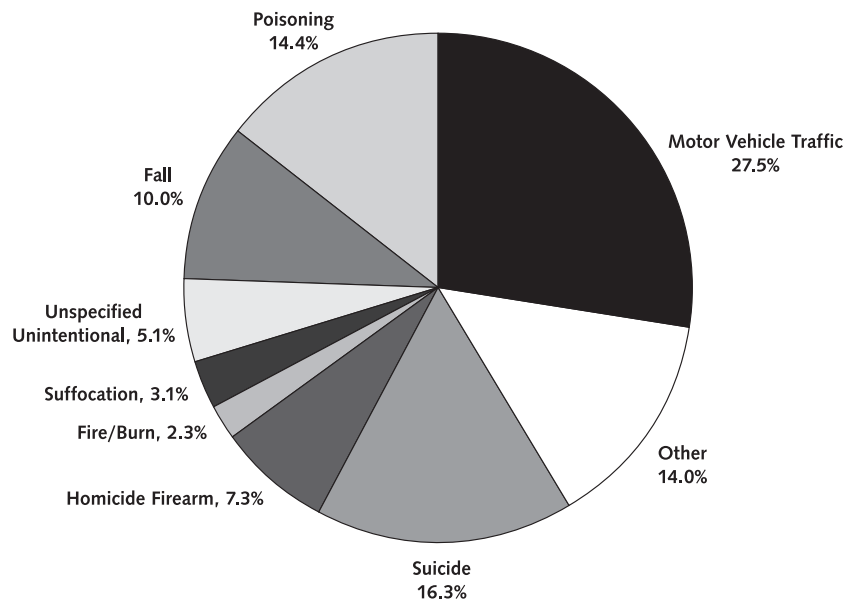
**Motor Vehicle Fatality Rate Per 100,000 Population, 2008**



Source: National Highway Traffic Safety Administration. State Traffic Safety Information for Year 2008 website. <http://www-nrd.nhtsa.dot.gov/departments/nrd-30/nca/STSI/USA%20WEB%20REPORT.HTM>. Accessed July 16, 2009.

Motor vehicle injuries were the leading cause of death for all age groups between 5-34 years of age and the fourth leading cause of death for adults ages 35-54 in 2007.

**Figure 8.1**  
Leading Causes of Injury Deaths in North Carolina, All Ages, 2006



Note: Except for homicide, suicide, and other, all categories are unintentional injuries.  
Source: North Carolina State Center for Health Statistics, Injury, Epidemiology, and Surveillance Unit. Death file 2006.

### Motor Vehicle Collisions

Motor vehicle injuries are the leading cause of unintentional injury death in North Carolina and the eighth leading cause of death overall, resulting in 1,787 fatalities in 2007.<sup>6</sup> This represents more than a quarter of all injury-related deaths. Motor vehicle injuries were the leading cause of death for all age groups between 5-34 years of age and the fourth leading cause of death for adults ages 35-54 in 2007.<sup>1</sup>

Motor vehicle injuries are the third leading cause of injury-related hospitalizations and the second leading cause of ED visits in North Carolina. In particular, motor vehicle injuries resulted in nearly 8,000 hospitalizations in 2006 and more than 92,000 ED visits in 2007 in North Carolina. The problem is particularly acute for younger populations. Motor vehicle injuries were one of the top three causes of injury-related hospitalizations in North Carolina in 2006, for individuals ages 5-44." It was the leading cause of hospitalization for individuals ages 15-24.<sup>1</sup> Motor vehicle injuries were also the leading cause of injury-related ED visits for people ages 15-34 and the third leading cause for people ages 35-64.<sup>1</sup>

### Unintentional Poisonings

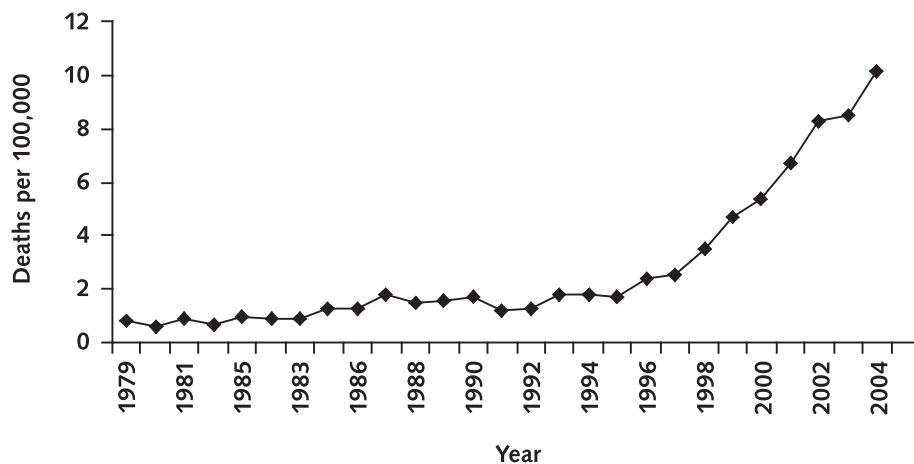
Unintentional poisonings are the second leading cause of injury-related death, accounting for 22.2% of injury fatalities in North Carolina in 2006.<sup>7-9</sup> (See Figure 8.1.) When causes of death are aggregated into the World Health Organization's 113 mortality groups, the age-adjusted death rate for accidental poisoning and exposure to noxious substances for North Carolinians ages 15-44 in 2003-2005 was 13.4 per 100,000, a little more than half the death rate of motor vehicle

crashes (26.0 per 100,000). This was the second most common cause of death for this age group, roughly four times the rate of breast cancer (2.9 per 100,000) and the rate of heart attack (2.7 per 100,000).<sup>10</sup> The bulk of fatalities in this age group for accidental poisonings—roughly 80%—are due to exposure to narcotics and psychodysleptics—substances like cocaine, heroin, and methadone. North Carolina experienced a five-fold increase in deaths due to methadone from 1997 to 2001.<sup>11</sup> This pattern echoes the national trend; the rate of fatal medication errors in the United States increased 360% from 1983 to 2004, an increase that one researcher called “astonishing.”<sup>12,13</sup> North Carolina’s fatality rate for accidental poisonings increased from 3.5 per 100,000 in 1999 to 10.1 per 100,000 in 2005—a nearly three-fold increase in six years.<sup>10</sup>

Unintentional poisonings include overdoses from the use or misuse of drugs or chemicals for recreational or nonrecreational purposes and from adverse drug events. According to the United States Health Resources and Services Administration, poisoning is defined as the use of a substance “that can harm someone if it is used in the wrong way, by the wrong person, or in the wrong amount.”<sup>14</sup> North Carolina has experienced dramatic increases in the percentage of unintentional deaths due to poisoning in the last three decades, including a 103.7% increase between 2000 and 2006 (from 10.9% to 22.2%). Unintentional deaths due to poisoning are more prevalent in western North Carolina.<sup>8</sup> (See Figure 8.2 and Figure 8.3.) Unintentional poisonings are also the third leading cause of injury-related hospitalizations in the state, with more than 3,300 occurring in 2006.<sup>1</sup> It is estimated that the national medical costs associated with unintentional poisonings is \$2 billion, while the costs associated with lost productivity totals \$25 billion.<sup>3</sup>

**North Carolina has experienced dramatic increases in the percentage of unintentional deaths due to poisoning in the last three decades.**

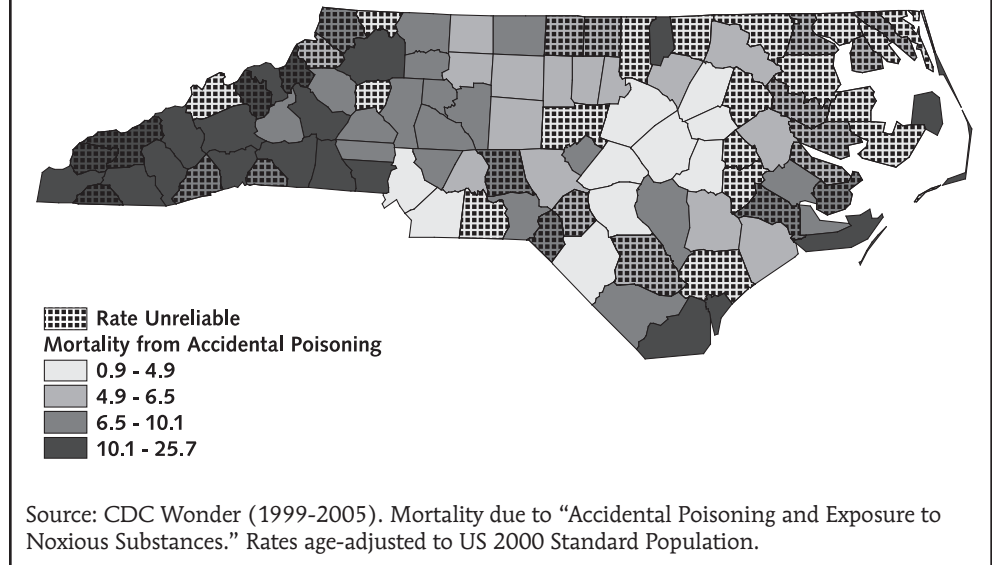
**Figure 8.2**  
Age-adjusted Mortality from Accidental Poisonings and Exposures to Noxious Substances, North Carolina (per 100,000 population)



Source: CDC Wonder (1979-2005) data. Mortality for 1979-1998 based on ICD-9, while 1999-2005 rates are based on ICD-10 mortality codes. Rate age-adjusted to US 2000 population.

Falls are a particularly acute problem for adults over 65 years of age. The death rate from falls for older adults is 23 times greater than the rate for those younger than 65 and 16 times greater than the death rate from motor vehicle injuries.

**Figure 8.3**  
Mortality Rates from Accidental Poisoning are Higher in Western North Carolina



### Falls

Unintentional falls are the third leading cause of injury-related deaths in North Carolina, accounting for nearly 10% of injury fatalities in 2007.<sup>15</sup> Unintentional falls are the second leading cause of injury hospitalizations in North Carolina, with almost 25,000 such cases in 2006.<sup>1</sup> Unintentional falls are also the leading cause of injury-related ED visits, with more than 168,000 visits in 2006. In fact, unintentional falls account for more than 20% of all injury related ED visits in the state.<sup>1</sup> The national costs associated with unintentional falls are \$26 billion in medical costs and \$54 billion in lost productivity. Taken together, the costs associated with unintentional falls are second only to the costs associated with motor vehicle injuries.<sup>3</sup>

Falls are a particularly acute problem for adults over 65 years of age. The death rate from falls for older adults is 23 times greater than the rate for those younger than 65 and 16 times greater than the death rate from motor vehicle injuries. This problem is magnified in North Carolina, as the percentage of the population over 65 years of age is increasing and is expected to increase further over the next decades. By 2030, the average county in North Carolina will have almost one-fifth of its population over the age of 65.<sup>16</sup>



### Family Violence<sup>b</sup>

Family violence includes both child maltreatment and domestic violence. Child maltreatment can take a number of forms, including neglect, physical violence, psychological violence, sexual assault, and witnessing partner violence, and typically occurs with other forms of family violence like domestic violence.<sup>17</sup> Similarly, domestic violence includes physical violence, psychological violence, sexual violence, and stalking.<sup>18</sup>

Unfortunately, the evidence for the prevalence and incidence of family violence is incomplete. Accurate and complete data on the extent of family violence, including child maltreatment, are difficult to obtain due to under-reporting, reliance on retrospective surveys, and a lack of well-established definitions and measures. The majority of perpetrators are parents (68%). The child maltreatment rate in North Carolina is slightly higher than the nation; in North Carolina in 2007, 11.7 children per 1,000 (25,976) were abused or neglected. Of these, 78.5% were neglected, 9.8% were physically abused, 7.5% were sexually abused, and 4.2% suffered other forms of abuse.<sup>19</sup> National and state level data on abuse and neglect are helpful but do not provide a complete picture of the prevalence of child maltreatment. Studies show that official statistics of child maltreatment underestimate its prevalence.<sup>20</sup> For example, in self-reported, retrospective surveys, between 20%-28% of respondents report having been physically abused by a parent or caregiver, and approximately 20% report having been sexually abused by anyone.<sup>21-23</sup> It is important to note that estimates of sexual abuse by a parent or caregiver are much lower, ranging from less than one percent to five percent.<sup>19-21</sup>

Children who are abused experience long-term physical and psychological effects beyond the immediate harm done to them as a result of maltreatment. Child physical abuse has been associated with suicidal behavior, risk-taking, psychiatric disorders, altered brain development, hormonal changes, and impaired sleep.<sup>24</sup> Child sexual abuse has been associated with major depression, dysthymia, and sexualized behaviors, which can lead to an increased risk of sexually transmitted diseases.<sup>25</sup>

As with data on the prevalence and incidence of child maltreatment, evidence on the extent of domestic violence is also incomplete due to underreporting and gender bias. In a 2000 nationwide survey, 21.7% of females and 7.3% of males reported being the victim of partner violence in their lifetime, and 1.4% of women and 0.8% of men reported being the victim of partner violence in the previous 12 months.<sup>26</sup> Some estimates suggest that one-quarter of women in North Carolina have reported experiencing physical or sexual violence since turning 18 years of age. Of those who had been victims of physical violence, 82% reported victimization by their current or former partner. Of those who had been victims of sexual violence, 69% reported victimization by their current or former partner.<sup>27</sup>

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<sup>b</sup> There are many types of violence including family violence, dating violence, gang violence, and violent crime. Due to time constraints, the Task Force had to limit the scope of its work. In doing so, it chose to focus on family violence. Dating violence and gang violence will be discussed in the North Carolina Institute of Medicine's Task Force on Adolescent Health report, which will be published in December 2009.

**Partner violence is also associated with long-term health problems.**

**Children who are abused experience long-term physical and psychological effects beyond the immediate harm done to them as a result of maltreatment.**

**A number of strategies can be used to prevent motor vehicle-related injuries such as those related to increasing seat belt use, reducing speeding, reducing driving while impaired (DWI), and encouraging motorcycle safety.**

Partner violence is also associated with long-term health problems. Physical health problems, such as chronic pain, sexually transmitted infections, gastrointestinal illness, heart disease, and hearing loss, as well as mental health problems including depression, anxiety, post-traumatic stress disorder, suicidal thoughts and behaviors, and substance abuse, play a role in long-term health, particularly when violence is chronic and when revictimization occurs at different points in life. Studies have estimated that child maltreatment and adult domestic violence are co-occurring in 30%-60% of families where at least one of these forms of family violence is occurring.<sup>28-33</sup>

### **Enforcement and Review of All Traffic Safety Laws and Enhanced Surveillance**

A number of strategies can be used to prevent motor vehicle-related injuries such as those related to increasing seat belt use, reducing speeding, reducing driving while impaired (DWI), and encouraging motorcycle safety.<sup>c</sup> It is estimated that in North Carolina in 2007, 37% of traffic fatalities involved someone who was speeding, 32% involved someone who was not wearing a seatbelt, 29% involved a driver with a blood alcohol level of at least 0.08, and 12% involved motorcyclists.<sup>34</sup>

*Increasing seat belt use:* Increased seat belt use has been shown to be an effective method for reducing traffic fatalities. For example, seat belt use has been shown to reduce fatality risk by 45% in cars and 60% in light trucks, and to reduce the risk of serious injury by 50% in cars and 65% in light trucks.<sup>34,35</sup> It is estimated that 177 lives would have been saved in 2007 with 100% seat belt use in North Carolina. Observational studies indicate that 88% of drivers in North Carolina wear a seat belt while driving. Although this is an increase of eight percentage points from 1996, North Carolina went from having the third highest percentage of seat belt use in the country to the 15th highest percentage during that period.<sup>34</sup>

One strategy that has been shown to increase seat belt use is to strengthen enforcement of seat belt laws. Under current law, all drivers and passengers must wear seat belts; however, law enforcement personnel cannot stop vehicles solely in order to enforce the seat belt laws for passengers in the rear seat (called a “primary” enforcement law).<sup>d</sup> Instead, drivers can only be ticketed for failure of rear seat passengers to wear their seat belt if they are being stopped for another purpose (called a “secondary” law). According to the Centers for Disease Control and Prevention (CDC), “secondary laws are less effective at increasing safety belt use and decreasing fatalities than primary laws.”<sup>35</sup> Primary seat belt laws, in which police officers can pull drivers over for not wearing seat belts, have led to 12-18 percentage point increases in usage where implemented. High visibility enforcement, including the state’s “Click It or Ticket” campaign, is associated with another six to eight percentage point increase in usage.<sup>34</sup> In addition to its primary

c North Carolina recently enacted legislation (SL 2009-135) banning texting and emailing while driving, effective December 1, 2009.

d NCGS § 20-135.2A

belt law for drivers and passengers in the front seat, North Carolina would benefit from a primary belt law for all occupants.

North Carolina would also benefit from increasing the fine for belt use noncompliance.<sup>34</sup> Under current law, drivers and front seat occupants ages 16 years and older face a penalty of \$25, in addition to \$75 in court costs, for failure to wear a seat belt. Rear seat occupants face a penalty of \$10 for failure to wear a seat belt.<sup>e</sup> In comparison, 13 states have fines over \$25 for the first seat belt use offense in either the front or the back seat.<sup>36</sup> Because North Carolina set penalties for failure to wear a seat belt in the front seat nearly two decades ago, the state should reexamine fines associated with its primary belt law to determine what appropriate increases should be made.<sup>f</sup>

**Reducing DWIs:** The number of fatalities resulting from alcohol-impaired driving in North Carolina increased 33.8% between 2001 and 2007, from 334 to 447.<sup>37</sup> Fines associated with the revocation and consequent reinstatement of a driver's license due to DWI need review. Under current law, restoration of a revoked license costs \$50-\$75, in addition to the \$100 processing fee associated with obtaining limited driving privileges (i.e. driving for specific purposes and at certain times of the day).

A number of strategies have been shown to reduce alcohol-impaired driving. For example, regular, well-publicized, and highly-visible sobriety checking stations, also known as sobriety checkpoints, serve as the primary deterrent for people driving while drunk. According to the National Cooperative Highway Research Program of the National Academies, DWI checking stations “may be the single most beneficial drinking-driving countermeasure currently known,” but “it is critical that the checkpoint be widely publicized” to be most effective.<sup>38</sup> Despite the relatively small number of arrests made at DWI checking stations, their very existence “discourages impaired driving by increasing the perceived risk of arrest” for the entire driving population. Checking stations not only result in the apprehension of drunk drivers but also significantly deter individuals from driving after drinking if they know a check point is underway.<sup>38</sup>

Several states have shown effective DWI enforcement through the use of community-based, high visibility enforcement programs. In 1993, the National Highway Traffic Safety Administration (NHTSA) partnered with the state of Tennessee on Checkpoint Tennessee, a statewide, highly-publicized impaired driving checkpoint program. Over the course of 12 months, 882 sobriety checkpoints were conducted, versus the 10-15 typically conducted in a year, resulting in 773 DWI arrests.<sup>39</sup> This translated to a 20.4% reduction over the projected number of impaired-driving fatal crashes that would have happened without the program in place. In addition, this well-publicized program continued

**The number of fatalities resulting from alcohol-impaired driving in North Carolina increased 33.8% between 2001 and 2007.**

e NCGS § 20-135.2A

f Avery IT. Traffic Safety Resource Prosecutor, North Carolina Conference of District Attorneys. Written (email) communication. June 17, 2009.

**Ignition interlocks  
have been shown  
to decrease the  
number of DWIs by  
at least 50% when  
installed.**

to have a significant effect on reducing alcohol-related traffic fatalities for nearly two years after the end of the program's initial 12 months.<sup>39</sup>

The role of the media in publicizing the Tennessee program involved extensive television, radio, and print coverage, a statewide billboard campaign, and regular press releases and follow-up reports regarding individual checkpoints. Furthermore, *Checkpoint Tennessee*, funded in part by federal and state matching dollars, was implemented at a relatively low-cost. According to the NHTSA, "the routine use of high-visibility checkpoints would reduce alcohol-related fatalities by 15%, at a cost savings of nearly \$62,000 per checkpoint."<sup>38</sup>

One of the North Carolina Governor's Highway Safety Program initiatives, the "Booze It & Lose It" anti-drunk driving campaign, uses innovative and extensive DWI enforcement and education to focus attention on drunk drivers. The campaign has resulted in nearly 102,000 DWI arrests since 2001. Most recently, the Booze It & Lose It St. Patrick's Day 2009 campaign conducted 370 checking stations, which resulted in 836 DWI charges, 2,026 seat belt charges, and 6,224 speeding violations.<sup>g</sup> In North Carolina, checking stations, whose placement under current state law should be random or statistically indicated, could reduce alcohol-related crashes, injuries, and fatalities by 20%.<sup>h,34</sup>

In addition, current law requires a functioning ignition interlock (i.e. a device similar to a breathalyzer that must be passed before a car's motor will start) for certain individuals who have a DWI offense. Specifically, people who have lost their license as a result of a DWI conviction with blood alcohol concentration of 0.15 or more, and those who have been convicted of another offense involving DWI within the previous seven years, must have a functioning ignition interlock before they can regain their drivers license.<sup>i</sup> These ignition interlocks have been shown to decrease the number of DWIs by at least 50% when installed. Therefore, making ignition interlocks mandatory for anyone convicted of a DWI would potentially further reduce DWI rates.<sup>34</sup>

**Reducing the number of people who speed:** In 2007 speeding was involved in 37% of all North Carolina motor vehicle fatalities resulting in 620 deaths.<sup>34</sup> In 2004 the North Carolina General Assembly strengthened state law regarding reckless driving. Specifically, the legislature approved legislation that prohibits speeding and driving carelessly and heedlessly in willful or wanton disregard of the rights or safety of others while committing at least two of the following violations: running a red light or stop sign, illegal passing, failing to yield right of way, or following too closely.<sup>j</sup> Effective speed limit enforcement strategies include the use of speed and red light cameras, high visibility enforcement of speed limits, and meaningful penalties. Speed and red-light cameras have been shown to be effective

g Horner B. Public Information Officer, North Carolina Governor's Highway Safety Program. Written (email) communication. June 16, 2009.

h NCGS § 20-16.3A

i NCGS § 20-17.8

j NCGS § 20-141.6

in some locations. In Arizona, the use of speed and red-light cameras on multi-lane 65mph highways reduced speeding over 75mph from 50% to 0.5% and crashes with injuries by 40%.<sup>34</sup> Another key to reducing speeding-related injury is effective speed limit enforcement, especially at dangerous intersections and on dangerous roads. Currently, North Carolina laws limit the use of automated enforcement mechanisms such as speed and red-light cameras.<sup>k</sup> To mount a high-visibility speed limit enforcement campaign, state and local law enforcement would need additional funding.<sup>34</sup>

**Enhancing training and skills of motorcycle users:** The fatality rate among motorcyclists in North Carolina per 100,000 registered motorcyclists increased 53.1% (from 113 to 173) between 2003 and 2007.<sup>34</sup> An important strategy to reduce motorcyclist fatalities is to enhance the training and licensure requirements for motorcycle users. Currently, motorcyclists can obtain a learners' permit and then renew it indefinitely.<sup>34</sup> In order to obtain a motorcycle learner's permit, an individual must pass vision, road sign, and written tests. However, current law does not require a demonstration of road or riding skills.<sup>l</sup> The laws should be changed to require that motorcyclists obtain their licenses and to encourage all motorcyclists—both beginners and returning riders—to be properly trained. Motorcycle riding courses that emphasize skills are available in North Carolina but are not required. For example, the North Carolina Motorcycle Safety Education Program, which provides courses in basic and experienced riding, is currently offered at 37 of the 58 colleges in the North Carolina Community College System's.<sup>40</sup>

**Improving traffic injury data:** Access to relevant and accurate traffic injury data will also be important for policymakers in the development and implementation of effective prevention strategies. Accurate data make it possible to identify problem traffic locations and areas within the state, as well as track progress relating to implementation of prevention strategies. North Carolina should implement the Crash Outcome Data Evaluation System (CODES), a tool being used in 29 states, to link crash and medical data such as costs, outcomes, and diagnoses.<sup>34</sup> Specifically, CODES can be used to obtain inpatient charges and estimates of other costs of care related to motor vehicle and motorcycle crashes. These data are critical in informing highway safety and injury control decision making.

In order to reduce the number of traffic-related fatalities and injuries in North Carolina, the Task Force recommends:

**The fatality rate among motorcyclists in North Carolina per 100,000 registered motorcyclists increased 53.1% (from 113 to 173) between 2003 and 2007. An important strategy to reduce motorcyclist fatalities is to enhance the training and licensure requirements for motorcycle users.**

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k Some municipalities tried to use speed and red light cameras, using the fines paid from increased tickets to pay for the installation and monitoring costs. However, Article IX, Section 7 of the North Carolina Constitution requires that all fines be used to support local school districts. As a result, many of the municipalities have shut down their speeding and red light camera programs. "Raleigh North Carolina Prepares to Dump Red Light Cameras." *TheNewspaper.com*. July 25, 2007. Available at: <http://www.thenewspaper.com/news/18/1879.asp> (accessed June 25, 2009).

l NCGS § 20-7

## Recommendation 8.1: Review and Enforce All Traffic Safety Laws and Enhance Surveillance

- a) North Carolina law enforcement agencies should actively enforce traffic safety laws, especially those pertaining to seat belt usage, driving while impaired (DWI), speeding, and motorcycles. All North Carolina state and local law enforcement agencies with traffic responsibilities should actively enforce DWI laws throughout the year and should conduct regular checking stations. State and local law enforcement agencies should report to the North Carolina General Assembly at the beginning of each biennium their efforts to increase enforcement of DWI.
- b) The North Carolina General Assembly should change existing state laws or appropriate new funds to strengthen traffic safety laws and enforcement efforts. The North Carolina General Assembly should:
  - 1) Enact a primary belt use law for rear seat occupants.
  - 2) Require alcohol interlocks for all DWI offenders.
  - 3) Appropriate \$750,000 in recurring funds beginning in SFY 2011 to the North Carolina Division of Public Health to work with the Governor's Highway Safety Program, the University of North Carolina (UNC) Highway Safety Research Center, and other appropriate groups to expand checking stations and to develop and implement highly-publicized, ongoing strategic communication plans to broadly disseminate the existing Booze It and Lose It campaign.
  - 4) Appropriate \$1 million in recurring funds beginning in SFY 2011 to the Governor's Highway Safety Program to provide support to state and local law enforcement agencies with traffic responsibilities to enhance their enforcement of speeding and aggressive driving laws, with special emphasis on dangerous roads and intersections.
  - 5) Institute graduated licensure and training requirements for all people who operate motorcycles and amend the existing motorcycle permit provision so that permits cannot be renewed indefinitely.
  - 6) Create a legislative study commission to examine all motor vehicle fees and fines in NCGS §20 and recommend changes to strengthen motor vehicle safety laws. Priority should be given to an examination of the adequacy of the fines for violations of the seat belt laws and to examine reinstatement fees for DWI offenders. Funds from the increased DWI fees should be used to support DWI programs including training, maintenance of checking station vehicles and equipment, and expanding the operation of DWI checking stations to additional locations and times.
- c) The North Carolina Division of Motor Vehicles should ensure that all motorcyclists are properly licensed and trained.
  - 1) The North Carolina Division of Motor Vehicles should work with the North Carolina Community College System to develop a system of training for new motorcyclists.

- 2) The North Carolina Division of Motor Vehicles should match motorcycle operator licenses and vehicle registration files.
- d) The Governor's Highway Safety Program, in conjunction with the National Highway Traffic Safety Administration, should work to ensure implementation of the Crash Outcome Data Evaluation System (CODES) in North Carolina. Access to CODES data should be provided to all participants on the North Carolina Traffic Records Coordinating Committee, including, at a minimum, the North Carolina Division of Public Health, UNC Highway Safety Research Center, UNC Injury Prevention Research Center, North Carolina Department of Justice Administrative Office of the Courts, North Carolina Department of Transportation, North Carolina Division of Motor Vehicles, North Carolina Office of Emergency Medical Services, and North Carolina State Highway Patrol.

### **Injury Surveillance, Intervention, and Evaluation**

Historically, the North Carolina General Assembly has not given the same priority to injury prevention as it has to other public health activities. The North Carolina General Assembly has not specifically identified injury and violence prevention as one of the essential public health services. Currently, the statutes enumerate the essential public health services that are needed to contribute to the highest level of health possible for all North Carolinians. Specifically, these public health responsibilities include assessment of health status, health needs, and environmental health risks; water and food safety and sanitation; personal health services including chronic and communicable disease control, child and maternal health, family planning, health promotion and risk reduction; and dental public health.<sup>m</sup> Prevention of injury and violence is not listed as an essential public health service, although injury and violence are both major causes of death and disability in the state. North Carolina should make injury and violence prevention explicit in the list of essential public health services at the state-level.

There are several different evidence-based programs that have been shown to be effective in reducing falls, child maltreatment, and family violence. These programs should be supported and disseminated in communities across the state. For example, research conducted by the CDC on the benefits of Tai Chi exercise has demonstrated improved balance and a reduction in the number of falls among older people. The Matter of Balance program, which is designed to reduce fear of falling and promote physical and social activity, has proven to be an effective intervention in addressing fall risk among older people.<sup>41</sup> In addition, the North Carolina Institute of Medicine, in a prior Task Force on child abuse prevention, identified several evidence-based programs that have demonstrated reductions in child maltreatment. The Nurse Family Partnership program is a prenatal and early childhood home visitation program that helps improve the parental caregiver skills of first time, low-income mothers. Strengthening Families is a skills building initiative designed to improve family relationships and parenting skills for parents

**Historically, the North Carolina General Assembly has not given the same priority to injury prevention as it has to other public health activities...North Carolina should make injury and violence prevention explicit in the list of essential public health services at the state-level.**

<sup>m</sup> NCGS § 130A-1.1

**There are different evidence-based programs that have been shown to be effective in reducing falls, child maltreatment, and family violence.**

of children ages 6-12 years. Both programs have been shown in numerous studies to reduce child maltreatment as well as other positive outcomes for both the parents and children.<sup>17</sup> The Domestic Violence Prevention Enhancement & Leadership Through Alliances (DELTA) program is an innovative intervention funded through the CDC. The goal of DELTA is to reduce the incidence of domestic violence in funded communities through the involvement of multiple sectors such as law enforcement, the faith community, and public health.<sup>42</sup> The recognition of poisonings as a significant cause of injury-related deaths and hospitalizations is a relatively recent development. Evidence-based public health programs to reduce poisonings have not been identified. As prevention strategies are developed and substantiated, they should also be supported and disseminated.

Good data also are important to establish targeted and effective injury prevention initiatives. Currently, the state has different systems to monitor unintentional and intentional injuries, including deaths, nonfatal injuries, and trauma care outcomes. Health care providers need to report E codes (cause of injury codes), in order to capture meaningful injury data in health records. North Carolina, along with 26 other states, mandate that hospitals report E codes in their emergency department surveillance system but not as part of the hospital discharge records.<sup>43</sup> The state could improve injury surveillance by requiring hospitals to report the underlying cause of a particular injury case as patients are discharged from the hospital setting. Capturing better injury data will help the state design appropriate injury prevention strategies.<sup>44</sup>

In order to enhance the role of injury and violence prevention services in North Carolina, the Task Force recommends:

## **Recommendation 8.2: Enhance Injury Surveillance, Intervention, and Evaluation**

- a) The North Carolina General Assembly should amend the Public Health Act § 130A-1.1 to include injury and violence prevention as an essential public health service.
- b) The North Carolina General Assembly should appropriate \$3.9 million in recurring funds beginning in SFY 2011 to the North Carolina Division of Public Health (DPH) to identify and implement pilot programs and other community-based activities to prevent unintentional injury and violence. Priority should be given to evidence-based programs or best and promising practices that prevent motor vehicle crashes, falls, unintentional poisonings, and family violence. Funds should be allocated as follows:
  - 1) \$168,000 to DPH, to work in collaboration with North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services; Carolinas Poison Center; and other appropriate groups, to prevent unintentional poisonings.
  - 2) \$363,000 to DPH for falls prevention.
  - 3) \$163,000 to DPH for family violence prevention. Priority should be given to research and program implementation that integrates multiple types of family violence such as domestic violence and child maltreatment.



- 4) \$2.5 million to DPH for other injury prevention activities.
  - 5) \$668,000 to DPH to support nine full-time employees (eight of whom would be regional staff) to support state and local capacity for the dissemination of evidence-based injury and violence prevention programs and policies in North Carolina communities.
- c) The North Carolina General Assembly should appropriate \$175,000 in recurring funds beginning in SFY 2011 to DPH to develop an enhanced intentional and unintentional injury surveillance system with linkages. This work should be led by the State Center for Health Statistics and done in collaboration with the North Carolina Medical Society; North Carolina Hospital Association; North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services; Governor’s Highway Safety Program within the North Carolina Department of Transportation; UNC Injury Prevention Research Center; Carolinas Poison Center (state poison control center) at Carolinas Medical Center; and North Carolina Office of the Chief Medical Examiner. The collaborative should examine the need and feasibility for linkages to electronic health records and enhanced training in medical record coding using E codes (injury) and ICD-9/10 codes (disease).

### **Training of State and Local Public Health Professionals in Injury Control**

A 1999 report published by the Institute of Medicine of the National Academies indicated a significant gap between what is already known about injury and violence prevention and translating that knowledge into practice.<sup>44</sup> A primary reason for this challenge is due to limited training in injury control by the existing public health workforce and insufficient academic preparation provided to students by schools of public health and medicine.

According to a 2002 survey conducted by the Association of Schools of Public Health and the CDC, none of the 33 accredited schools of public health nationwide required an injury course for master’s degree students. In addition, fewer than 15% of graduates—both master’s and doctoral—will have taken an injury-specific course during their academic careers.<sup>45</sup> A 2005 report issued by the Association of American Medical Colleges also noted that less than a quarter of accredited allopathic medical schools require any coursework or significant training in injury.<sup>46</sup>

Roughly 40% of employees in public health departments throughout the United States are not trained in public health. Other health professionals, including nurses, social workers, first responders, and law enforcement, are even less likely to receive any training in injury or violence prevention.<sup>43</sup> Consequently, the pool of qualified individuals in public health is severely limited in its capability to address injury and violence prevention effectively. Having a public health workforce trained and competent in injury control is critical in addressing injury and violence issues statewide.

**Having a public health workforce trained and competent in injury control is critical in addressing injury and violence issues statewide.**

The University of North Carolina Injury Prevention Research Center (UNC IPRC) can play an important role in developing a curriculum and leading injury and violence prevention trainings. UNC IPRC is funded by the CDC's National Center for Injury Prevention and Control. It is one of 11 such centers in the nation. Its mission is to support the field of injury prevention and control through research, intervention, evaluation, and training.<sup>n</sup> Because part of its mission is to provide training to the next generation of researchers, practitioners, and other health professionals, UNC IPRC is well-positioned to enhance its current operation to include a curriculum in injury and violence prevention. Trainings would take place through the North Carolina Area Health Education Centers (AHEC) program, as discussed in the Task Force Recommendation 12.5 "Provider Training Through AHEC." (See Chapter 12, Recommendation 12.5.)

In an effort to strengthen the public health workforce and maximize the number of health care providers trained in injury and violence prevention, the Task Force recommends:

### **Recommendation 8.3: Enhance Training of State and Local Public Health Professionals, Social Workers, and Others**

The University of North Carolina (UNC) Injury Prevention Research Center should develop curricula and train state and local public health professionals, physicians, nurses, allied care workers, social workers, and others responsible for injury and violence prevention so they can achieve or exceed competency in injury control consistent with national guidelines developed by the National Training Initiative for Injury and Violence Prevention. The North Carolina General Assembly should appropriate \$200,000 in recurring funds beginning in SFY 2011 to the UNC Injury Prevention Research Center to support this effort.

### **Statewide Task Force or Committee on Injury and Violence**

Multiple agencies and organizations address injury and violence issues in the state, including the Department of Transportation, Department of Labor, Department of Agriculture and Consumer Services, Department of Public Instruction, Department of Health and Human Services, and business and health care providers. Yet, support for injury and violence prevention is grossly inadequate when compared to other public health issues and their impact.

Stakeholders from these sectors can play an important role in developing consensus solutions to the broad array of injury issues facing the state. Convening a statewide task force on injury and violence prevention, comprised of experts from across North Carolina, would be an ideal mechanism for reviewing and strengthening the state's current capacity for addressing injury and violence issues.

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<sup>n</sup> More information can be found at <http://www.iprc.unc.edu>

Specifically, the task force could examine North Carolina's workforce trained in injury and violence prevention; evidence-based injury and violence prevention programs; and capability for measuring, monitoring, and evaluating injury and violence prevention efforts to reduce the incidence and prevalence of injury and violence among North Carolinians. Such collaboration would provide renewed focus on an issue that is currently receiving inadequate attention given its significant impact on the state's population.

Recently, the North Carolina 2009-2014 State Strategic Plan for Injury and Violence Prevention was developed with input from 25 key stakeholders. The development process, led by the Injury Violence and Prevention Branch, North Carolina Division of Public Health, resulted in a plan that has goals, objectives, and action steps. The plan is intended to be useful to any group in the state working on injury and violence prevention and control.<sup>47</sup>

Given the range of injury problems facing North Carolinians, the Task Force recommends:

**A statewide task force on injury and violence prevention would be an ideal mechanism to review and strengthen the state's capacity to address injury and violence.**

### **PRIORITY RECOMMENDATION 8.4: Create a Statewide Task Force or Committee on Injury and Violence**

- a) The North Carolina General Assembly should create an Injury and Violence Prevention Task Force to examine data, make evidence-based policy and program recommendations, monitor implementation, and examine outcomes to prevent and reduce injury and violence. The work of the Task Force should build on the work of the North Carolina 2009-2014 State Strategic Plan for Injury and Violence Prevention and should examine data around motor vehicle crashes, falls, unintentional poisonings, occupational injuries, family violence including child maltreatment and domestic violence, other forms of unintentional injuries such as fires and drowning, and intentional injuries such as homicide and suicide. The Task Force should be charged with identifying strategies to enhance the statewide injury and violence prevention infrastructure, including expanding the numbers of trained personnel at the state and local levels, implementing evidence-based programs and policies, and improving the existing injury surveillance system. The Task Force should provide an annual report back to the North Carolina General Assembly.
- b) The Task Force should include legislators and representatives from the North Carolina Division of Public Health; North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services; North Carolina Division of Aging and Adult Services; North Carolina Department of Juvenile Justice and Delinquency Prevention; Governor's Highway Safety Program within the North Carolina Department of Transportation; North Carolina Department of Insurance; North Carolina Department of Labor; North Carolina Trauma System; North Carolina Office of Emergency Medical Services; North Carolina Department of Agriculture and Consumer Services; North Carolina Department of Public Instruction; North Carolina Cooperative Extension within North Carolina State University; North Carolina Department of Environment and Natural Resources; UNC Injury Prevention Research Center; Carolinas Poison Center; North Carolina Medical Society; North Carolina Hospital Association; and local and state law enforcement.

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### Infectious Disease

Evidence of infectious diseases has been documented in ancient Egyptian mummies, and infectious diseases continue to affect people across the world. An infectious, or communicable,<sup>a</sup> disease is an illness due to a specific infectious agent that is transmitted from a source to a susceptible host. The source can be an infected person, animal, or inanimate source, such as peanut butter in recent salmonella outbreaks. The modes of transmission include direct contact and droplet spread (i.e. sneezing and coughing) or indirect transmission through a vector (i.e. mosquito or person), common vehicle (i.e. food), or the air.<sup>1</sup>

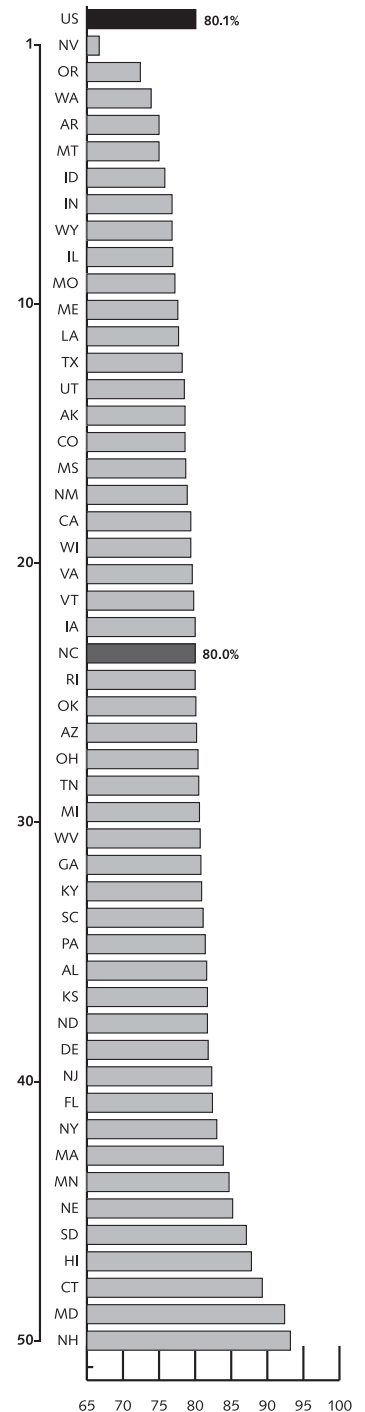
Over the last century, the number of deaths from infectious diseases in the United States generally decreased until the 1980s. With the exception of the influenza pandemic in 1918, the number of deaths decreased steadily until a number of factors including HIV/AIDS related deaths and antibiotic resistance caused the number to increase again.<sup>2</sup> Public health and prevention methods are useful tools to help reduce the number of deaths from infectious diseases. The Task Force on Prevention chose to focus on two particular classes of infectious diseases, vaccine preventable diseases and foodborne illnesses, as prevention efforts are especially effective in preventing these health problems.

### Vaccine Preventable Disease

Many diseases, such as chicken pox, measles, influenza, and hepatitis B, can be prevented by vaccines. However, every year people become sick, disabled, or die because of the lack of vaccinations. Nationally, influenza causes 36,000 deaths and 226,000 hospitalizations each year, while hepatitis B causes 2,000 to 4,000 deaths yearly.<sup>3-5</sup> Infectious diseases, including pneumonia and influenza, were the 10th leading cause of death among North Carolinians in 2007, causing 1,644 deaths.<sup>6</sup> Deaths from pneumonia and influenza were the reason for the loss of more than 50,000 disability-adjusted life years (DALYs) for North Carolinians.<sup>b</sup> (See Figure 2.3 in Chapter 2.) These diseases can and should be prevented with vaccines.

Vaccines are excellent tools, proven both to prevent disease and save money. Described as one of the ten great public health achievements of the 20th century, vaccines helped eradicate smallpox worldwide, eliminate polio in the Americas, and control many infectious diseases.<sup>7</sup> More recently, the United States' childhood immunization program saved almost \$10 billion in direct health care costs and more than \$40 billion in additional costs to society, including lost productivity from missed days of work. For every dollar spent on childhood vaccination, the program saves five dollars in direct costs and eleven dollars in additional costs to society.<sup>8</sup>

Percent of Children Ages 19-35 Months Who Have Received the Suggested Early Childhood Immunizations, 2007



Source: United Health Foundation. America's Health Rankings: data tables. United Health Foundation website. <http://www.americahealthrankings.org/2008/tables.html>. Published 2008. Accessed December 4, 2008.

a "Infectious" diseases can potentially be transmitted from person to person, while a "communicable disease" is an infectious disease that is readily transferred from person to person. Although they have slightly different meanings, they are used interchangeably here.  
 b See Chapter 2 for an explanation of DALYs.

Childhood and adolescent vaccinations are a hallmark of preventive care.

Despite the immense benefits, some parents chose not to vaccinate their children. The American Academy of Pediatrics notes that during a 12-month period, 85% of pediatricians reported encountering a parent who refused or delayed one or more vaccines, and 54% reported encountering a parent who refused all vaccines.<sup>9</sup> Parents may choose not to vaccinate their children for religious or philosophical reasons. There is also concern over the link between vaccination and autism spectrum disorders. The Institute of Medicine of the National Academies conducted a series of reports on the topic of vaccination safety. In the final report in the series, expert panels agreed that autism is not caused by vaccination.<sup>c</sup>

**Recommended Vaccination Schedules**

Childhood and adolescent vaccinations are a hallmark of preventive care. The recommended vaccination schedule for children ages 0-18 is approved by the Advisory Committee on Immunization Practices, the American Academy of Pediatrics, and the American Academy of Family Physicians.<sup>10</sup> It includes three vaccine schedules: one for children ages 0-6, one for children and adolescents ages 7-18, and a catch-up schedule for children and adolescents ages 4 months-18 years who start late or are more than one month behind on their vaccinations.<sup>d</sup>

*Vaccines for Young Children Ages 0-6 Years*

The recommended vaccines for children ages 0-6 include hepatitis B (HepB); rotavirus (RV); combined diphtheria and tetanus toxoids and acellular pertussis (DTaP); Haemophilus influenzae type b (Hib); pneumococcal (PCV or PPSV); influenza (TIV or LAIV); measles, mumps, and rubella (MMR); varicella; hepatitis A (HepA); and meningococcal for children up to age 6. (See Table 9.1.)

**Table 9.1**  
Recommended Immunization Schedule for Persons Ages 0-6 Years, United States, 2009.

Vaccine ▼	Age ►	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	19-23 months	2-3 years	4-6 years
Hepatitis B <sup>1</sup>		HepB	HepB	see footnote 1	HepB							
Rotavirus <sup>2</sup>			RV	RV	RV <sup>2</sup>							
Diphtheria, Tetanus, Pertussis <sup>3</sup>			DTaP	DTaP	DTaP	see footnote 3	DTaP					DTaP
Haemophilus influenzae type b <sup>4</sup>			Hib	Hib	Hib <sup>4</sup>		Hib					
Pneumococcal <sup>5</sup>			PCV	PCV	PCV	PCV					PPSV	
Inactivated Poliovirus			IPV	IPV		IPV						IPV
Influenza <sup>8</sup>							Influenza (Yearly)					
Measles, Mumps, Rubella <sup>7</sup>							MMR	see footnote 7				MMR
Varicella <sup>6</sup>							Varicella	see footnote 8				Varicella
Hepatitis A <sup>9</sup>							HepA (2 doses)					HepA Series
Meningococcal <sup>10</sup>												MCV

Source: Centers for Disease Control and Prevention. Recommended immunization schedules for persons ages 0-18 years—United States 2009. *MMWR*. 2009;57(51&52)

c The final report focused on the measles, mumps, and rubella (MMR) vaccine and thimerosal-containing vaccines.  
 d More information on the catch-up vaccination schedule is available online at [http://www.cdc.gov/vaccines/recs/schedules/downloads/child/2009/09\\_catch-up\\_schedule\\_pr.pdf](http://www.cdc.gov/vaccines/recs/schedules/downloads/child/2009/09_catch-up_schedule_pr.pdf)



*Vaccines for Children and Adolescents Ages 7-18 Years*

Combined tetanus and diphtheria toxoids and acellular pertussis (Tdap); human papillomavirus (HPV); meningococcal (MCV); influenza, pneumococcal (PPSV); hepatitis A (HepA); hepatitis B (HepB); inactivated polio (IPV); measles, mumps, and rubella (MMR); and varicella are recommended vaccines for children and adolescents through age 18. (See Tables 9.1 and 9.2.) Nationally, among adolescents ages 13-18, the vaccination and immunity rates vary widely from 91.7% for varicella (either having the disease or receiving the vaccine) to 25.1% for HPV vaccination.

**Table 9.2**  
Recommended Immunization Schedule for Persons Ages 7-18 Years, United States, 2009.

Vaccine ▼	Age ►	7-10 years	11-12 years	13-18 years
Tetanus, Diphtheria, Pertussis <sup>1</sup>	see footnote 1		<b>Tdap</b>	<b>Tdap</b>
Human Papillomavirus <sup>2</sup>	see footnote 2		<b>HPV (3 doses)</b>	<b>HPV Series</b>
Meningococcal <sup>3</sup>		<b>MCV</b>	<b>MCV</b>	<b>MCV</b>
Influenza <sup>4</sup>			<b>Influenza (Yearly)</b>	
Pneumococcal <sup>5</sup>			<b>PPSV</b>	
Hepatitis A <sup>6</sup>			<b>HepA Series</b>	
Hepatitis B <sup>7</sup>			<b>HepB Series</b>	
Inactivated Poliovirus <sup>8</sup>			<b>IPV Series</b>	
Measles, Mumps, Rubella <sup>9</sup>			<b>MMR Series</b>	
Varicella <sup>10</sup>			<b>Varicella Series</b>	

Range of recommended ages  
Catch-up immunization  
Certain high-risk groups

Source: Centers for Disease Control and Prevention. Recommended immunization schedules for persons ages 0-18 years—United States 2009. *MMWR*. 2009;57(51&52)

North Carolina provides DTaP, Hep A, Hep B, Hib, IPV, MMR, Tdap, and varicella vaccines to both public and private medical providers at no charge to cover all children ages 0-18.

*Disparities in Vaccination Rates*

Vaccination rates vary among children of different racial and ethnic backgrounds, even after accounting for differences in socioeconomic status.<sup>11</sup> A recent Tennessee study showed that white children are more likely to receive the complete recommended vaccination series by age 24 months than their African American counterparts.<sup>12</sup> Timely vaccinations may be achieved by improving health providers' reminder systems, implementing educational interventions that address barriers to vaccination, and increasing parents' awareness of the Vaccines for Children program.<sup>13</sup>

*North Carolina Vaccination Programs*

North Carolina is making strides toward vaccinating all children appropriately. The North Carolina Immunization Branch of the North Carolina Department of Health and Human Services operates the Universal Childhood Vaccine Distribution Program (UCVDP). The program was designed to remove financial barriers, assure vaccination access to all children, and simplify the vaccination process for health care providers. North Carolina UCVDP provides DTaP, Hep A, Hep B, Hib, IPV, MMR, Tdap, and varicella vaccines to both public and private medical providers at

Virtually all cervical cancer cases result from infection with HPV...The vaccine prevents a person from contracting HPV types 16 and 18 (which are responsible for about 70% of cervical cancers).

no charge to cover all children ages 0-18.<sup>e,14</sup> (See Table 9.3.) All children of appropriate age are eligible to receive state supplied vaccines, and any immunization provider may participate in the program. In 2007, the Immunization Branch purchased and distributed vaccines to more than 1,250 private providers and local health departments.<sup>15</sup> The current state appropriation for the UCVDP is \$20 million. That funding is not adequate to provide all the vaccines for children and adolescents recommended by the Centers for Disease Control and Prevention (CDC).

Children who are eligible for Medicaid or who are uninsured, underinsured, or an Alaskan Native or American Indian may receive additional vaccinations through the federal Vaccines for Children Program (VFC). In North Carolina, VFC provides MCV4, HPV, rotavirus, and PCV7 to children in the program, in addition to those universally available. The CDC annually provides approximately \$118 million in federal vaccine funding for the North Carolina Immunization Branch VFC.

**Table 9.3**  
North Carolina's Universal Childhood Vaccine Distribution Program Covers Many Recommended Immunizations for Children

	DTaP, Hep A, Hep B, Hib, IPV, MMR, Tdap, and varicella	MCV4, HPV, rotavirus, and PCV7
Medicaid, uninsured, underinsured, or Alaskan native or American Indian	COVERED BY UCVDP	COVERED BY VFC (federal funds)
All other children	COVERED BY UCVDP	Not covered

Source: North Carolina Immunization Branch, North Carolina Department of Health and Human Services

Because North Carolina generally does a good job in vaccinating children with vaccines covered through the UCVDP, the Task Force on Prevention chose to focus on the vaccines that are recommended by the CDC but are not currently included in North Carolina's UCVDP. Those vaccines prevent human papillomavirus (HPV), influenza, meningococcal diseases (MCV4), and pneumococcal diseases (PCV7). The Task Force also focused on the combined tetanus, diphtheria, and pertussis (Tdap) vaccine, as fewer children receive the recommended booster shot.

**Specific Vaccines**

**Human Papillomavirus Vaccination (HPV)**

Virtually all cervical cancer cases result from infection with HPV.<sup>16</sup> Although the death rate has been falling steadily, cervical cancer was responsible for about 130 deaths in North Carolina in 2006.<sup>17</sup> In 2006 a vaccine became available that is effective in preventing both moderate and severe precancerous lesions of the cervix and genital and laryngeal warts. The vaccine prevents a person from contracting

<sup>e</sup> Grimshaw A. Data Collection and Analysis Unit Supervisor, Immunization Branch, North Carolina Department of Health and Human Services. Written (email) communication. June 30, 2009.

HPV types 16 and 18 (which are responsible for about 70% of cervical cancers), and HPV types 6 and 11 (which are responsible for about 90% of genital warts).<sup>18,16</sup> The vaccine is most effective when given to girls before they become sexually active; however, it is also effective for women who are sexually active but have not been exposed to the targeted strains of HPV.

The Advisory Committee on Immunization Practices of the CDC recommends that girls ages 11-12 years be routinely vaccinated against HPV. Additionally, the committee recommends that girls as young as age 9 receive the vaccine at a physician's discretion and that females ages 13-26 also be vaccinated.<sup>19</sup> However, the current cost of the vaccination is approximately \$350, which is cost-prohibitive to many families. There is no state funding in the UCVPD for the HPV vaccine.

### ***Influenza Vaccination***

Influenza (or "the flu") is a contagious disease spread by coughing, sneezing, or nasal secretions. It can cause fever, sore throat, chills, headache, fatigue, and muscle aches, while lasting only a few days. Although many illnesses have similar symptoms, true cases of influenza are only caused by the influenza virus. It can affect anyone, but children have higher rates of influenza infection. In children, influenza can lead to high fever, diarrhea, and seizures. In people with weakened immune systems, influenza can also lead to pneumonia. Nationally each year, influenza causes 226,000 hospitalizations and 36,000 deaths, primarily among the elderly.<sup>20</sup> In North Carolina, pneumonia and influenza cause 6,000-10,000 hospitalizations each year and led to approximately 1,700 deaths in 2007.<sup>6</sup>

The Advisory Committee on Immunization Practices recommends that all children and adolescents ages 6 months to 18 years and all adults over the age of 50 should be vaccinated against the flu. The committee also recommends that anyone at risk of complications from influenza or who cares for someone at risk for complications should also be vaccinated. These include people who are pregnant, have weakened immune systems, have certain specific nerve or muscle disorders, use long-term aspirin treatment, or live in a nursing or other chronic care facility. The influenza vaccine is not currently included in North Carolina's universal vaccine program.<sup>20</sup>

### ***Meningococcal Vaccination (MCV4)***

Meningococcal disease is rare but can have fatal outcomes. The most common forms of invasive meningococcal disease include meningitis (49%), blood infections (33%), and meningococcal pneumonia (9%). The disease can have abrupt onset and progress rapidly. It occurs most often in the first year of life and during late adolescence. Annually, 1,400 to 2,800 cases of invasive meningococcal disease occur in the United States. Of those, 20% of cases occur among adolescents and young adults ages 14-24 and 16% of cases occur among infants under one year of age. College freshmen living in dormitories are at higher risk than the general population of similar age.<sup>f</sup> Although meningitis is a communicable disease, the majority of cases (97%) affect specific individuals but not large groups.<sup>21</sup>

**In North Carolina, pneumonia and influenza cause 6,000-10,000 hospitalizations each year and led to approximately 1,700 deaths in 2007.**

**Meningococcal disease is rare but can have fatal outcomes.**

**Pneumococcal disease is one of the most common causes of serious illness in both children and adults.**

**Immunity to pertussis wanes approximately 5-10 years after completion of childhood pertussis vaccination, leaving adolescents and adults susceptible to the disease.**

The meningococcal vaccine is recommended by the CDC for adolescents (ages 11-12 or at high school entry if not previously vaccinated) and for those at elevated risk of meningococcal disease (college freshmen living in dorms, military recruits, people with compromised immune systems, and people who come in contact with the bacteria *Neisseria meningitides*).<sup>21</sup> From 2004-2008, there were 138 cases and 13 deaths from meningococcal disease in North Carolina.<sup>8</sup> This vaccine is not currently covered in North Carolina's universal vaccine program.

#### ***Pneumococcal Vaccination (PCV7)***

Pneumococcal disease is one of the most common causes of serious illness in both children and adults. Associated illnesses can range from ear infections and sinusitis to pneumococcal pneumonia, blood infections, and pneumococcal meningitis. Each year more than 175,000 people are hospitalized with pneumococcal pneumonia, with 50,000 cases of blood infections and 3,000-6,000 cases of meningitis. More than half of the deaths from pneumococcal diseases involve people for whom the CDC recommends the pneumococcal vaccine.<sup>22</sup> In North Carolina, there were 173 cases of pneumococcal meningitis and 25 reported deaths between 2004 and 2008.<sup>23</sup>

The pneumococcal vaccine is recommended in four doses for children under two years of age. For those between ages 2-5 who have not received the vaccine, it is recommended if there is serious risk of pneumococcal disease due to other complications.<sup>h</sup> The vaccine should also be considered for all children under five years of age, especially those at increased risk for pneumococcal disease, including children who are of Alaskan native, American Indian, or African American descent, or who attend group daycare.<sup>24</sup> This vaccine is not included in North Carolina's universal vaccine program.

#### ***Tetanus, Diphtheria, and Pertussis Vaccination (Tdap)***

Pertussis, an acute, infectious cough illness, remains endemic in the United States despite routine childhood pertussis vaccination for more than 50 years and high coverage levels in children for more than a decade. One of the primary reasons for the continued circulation of *Bordetella pertussis* is that immunity to pertussis wanes approximately 5-10 years after completion of childhood pertussis vaccination, leaving adolescents and adults susceptible to the disease. Among all of the diseases for which universal childhood vaccination has been recommended, pertussis is the least well-controlled in the United States. Tetanus is unique in that it is the only noncommunicable disease for which vaccination is routinely recommended. It cannot be passed from person to person, but can have very devastating effects such as respiratory failure and neurological damage resulting in death. Diphtheria

f College students other than freshmen have risk similar to the general population.

g Maillard JM. Acting State Epidemiologist, Communicable Disease Branch, Epidemiology Section, Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. March 23, 2009

h PCV7 is recommended for children between 2-5 with sickle cell disease, damaged or no spleen, HIV/AIDS, or weakened immune systems from diabetes, cancer, or liver disease; take medication that affects the immune system (like chemotherapy or steroids), or have chronic heart or lung disease.

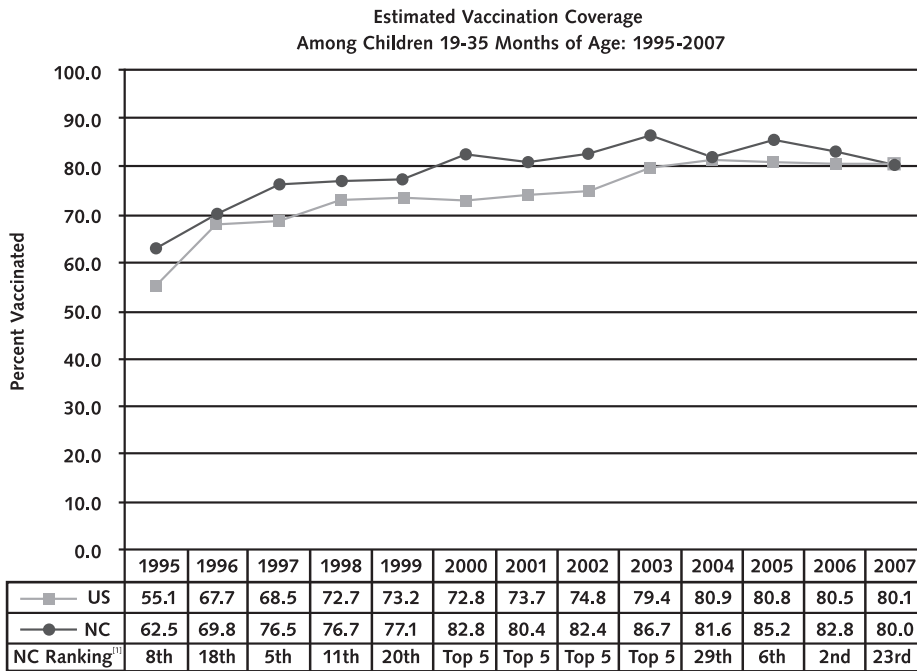
can cause a range of diseases from acute respiratory infections to heart and nervous system complications. The disease is rare in the United States, but exposure is possible when travelling to places where it is still common.<sup>25</sup>

Vaccination against tetanus, diphtheria, and pertussis is recommended by the CDC for young children in the DTap form and then for adolescents as a booster in the Tdap form. Both vaccines are currently covered by North Carolina’s universal vaccine program, but many adolescents do not receive the Tdap booster.

With few exceptions, North Carolina has ranked among the top ten states for childhood vaccination rates over the past ten years. Figure 9.1 shows that North Carolina had immunization rates higher than the national average in nearly every year since 1995.<sup>26</sup>

Vaccination against tetanus, diphtheria, and pertussis is recommended by the CDC for young children in the DTap form and then for adolescents as a booster in the Tdap form.

**Figure 9.1**  
North Carolina’s Childhood Vaccination Rates Higher than United States



[1] Grimshaw A. Data Collection and Analysis Unit Supervisor, Immunization Branch, North Carolina Department of Health and Human Services. Written (email) communication. July 9, 2009 and August 17, 2009

Source: State Center for Health Statistics. Health Profile of North Carolinians 2009 Update. May 2009. Available at <http://www.schs.state.nc.us/SCHS/pdf/HealthProfile2009.pdf>. Accessed June 29, 2009

In order to ensure the negative effects of vaccine preventable diseases are as limited as possible, the Task Force recommends

### **Recommendation 9.1: Increase Immunization Rates (PRIORITY RECOMMENDATION)**

- a) The North Carolina Division of Public Health (DPH) should aggressively seek to increase immunization rates for all vaccines recommended by the Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices (ACIP), including the pneumococcal (PCV7), rotavirus, meningococcal (MCV4), human papillomavirus (HPV), and influenza vaccines which are not currently covered through the state's universal childhood vaccine distribution program (UCDVP).
- b) All public and private insurers should provide first dollar coverage (no co-pay or deductible) for all CDC recommended vaccines that the state does not provide through the UCDVP, and should provide adequate reimbursement to providers to cover the cost and administration of the vaccines.
- c) Health care providers should offer and actively promote the recommended vaccines, including educating parents about the importance of vaccinations.
  - 1) The influenza vaccination should be actively promoted for children ages 5-18.
  - 2) The HPV vaccination should be made available to females ages 9-26; however, vaccine delivery should be targeted toward adolescents ages 11-12, as recommended by the CDC's Advisory Committee on Immunization Practices (ACIP).
- d) Parents should ensure that their children receive age appropriate vaccinations.
- e) DPH should monitor the vaccination rate for the PCV7, MCV4, HPV and influenza vaccines not currently covered through the UCDVP to determine whether the lack of coverage through the UCDVP leads to lower immunization rates. If so, the DPH should seek recurring funds from the North Carolina General Assembly to cover these vaccines through the UCDVP, work with insurers to ensure first dollar coverage and adequate reimbursement for these recommended vaccines, or seek new financial models to cover vaccines for children not adequately covered through the UCDVP.
- f) DPH should conduct an outreach campaign to promote immunizations of the flu, the new Tdap vaccine and all the recommended childhood vaccines among all North Carolinians. Emergency rooms patients and newborn contacts should be targeted specifically for Tdap immunizations. The North Carolina General Assembly should appropriate \$1.5 million in recurring funds in SFY 2011 to support this effort.

#### **Pandemic Influenza**

Pandemic influenza preparedness has been an ongoing effort in the North Carolina Division of Public Health for many years, with increased efforts made possible by federal funding beginning in 2006. The public health response to an influenza pandemic involves every aspect of public health and will impact all other

public health issues. During the preparation of this Task Force report, a novel strain of influenza, H1N1, was identified in the United States by the CDC. By the beginning of August 2009, H1N1 had infected over 160,000 people in 138 countries worldwide, with over 430 deaths in the United States, eight of which were in North Carolina.<sup>i,27</sup>

North Carolina's response to this influenza pandemic, declared by the World Health Organization in June 2009, has involved all branches of government at the state and local level. Public health mitigation efforts will be calibrated based on the severity of illness and are focused in three areas: 1) vaccination, 2) targeted antiviral treatment and prophylaxis, and 3) nonpharmaceutical interventions consisting of hand hygiene, respiratory etiquette, isolation and quarantine, and social distancing (e.g. school closures, cancellation of large gatherings, teleworking).

## Foodborne Illness

Foodborne illnesses are among the most common infectious diseases. Foodborne diseases cause a total of approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths each year in the United States.<sup>28</sup> One study estimated the cost of foodborne illness in 1985 was \$8.4 billion, or roughly \$700 per case, while a more recent study put the costs at \$1.4 trillion.<sup>29,30</sup>

Foodborne illnesses can often be prevented with proper food safety and defense. Food can be contaminated either intentionally or unintentionally. Intentional contamination occurs when someone deliberately tampers with food or the food production system, so as to cause harm to the end user.<sup>j</sup> The Rajneeshee cult spreading salmonella in restaurant salad bars in 1984 was an example of intentional food/drug contamination or agroterrorism.<sup>31</sup> Typically, however, foodborne illnesses are caused by accidental contamination.<sup>k</sup> For example, bacteria can grow on some foods that are left in warm temperatures for several hours. Some food pathogens, such as salmonella or *E. coli*, can survive in foods if the food is not prepared properly (i.e. cooked for the proper length of time or at an appropriate temperature). Illness can also result from other types of contamination.<sup>l</sup>

It is often difficult to determine the exact cause of foodborne illness. There are more than 200 known diseases transmitted through food. They can be caused by viruses, bacteria, parasites, toxins, metals, and prions.<sup>m</sup> Of the total number of foodborne illnesses, known pathogens cause only an estimated 14 million of the 76 million illnesses, 60,000 of the 325,000 hospitalizations, and 1,800 of the

**Foodborne illnesses are among the most common infectious diseases.**

**Foodborne illnesses can often be prevented with proper food safety and defense.**

i Davies M. State Epidemiologist and Section Chief, Epidemiology Section, Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. August 13, 2009.

j Preventing intentional contamination is referred to as food defense.

k Preventing unintentional contamination is referred to as food safety.

l Contamination by direct contact with a pathogen from an animate or inanimate host is not an example of foodborne illness.

m A prion is an abnormal infectious agent that is composed of protein that causes rapidly progressive, fatal brain damage. (Centers for Disease Control and Prevention. Prion Diseases. US Department of Health and Human Services website. Available at <http://www.cdc.gov/ncidod/dvrd/prions/>. Accessed July 20, 2009.)

5,000 deaths.<sup>28</sup> Salmonella, listeria, and toxoplasma are the most common pathogens, causing more than 75% of those foodborne illnesses caused by known pathogens. The symptoms of foodborne illness range from mild gastrointestinal discomfort to life-threatening problems in the brain, liver, and kidneys.

### Food Safety & Defense

Keeping food safe and protecting the food supply is a multifaceted process. There are 12 different federal agencies with more than 35 laws affecting food safety.<sup>32</sup> The United States Department of Agriculture (USDA) inspects and regulates meat, poultry, and processed egg products. The Food and Drug Administration (FDA) has regulatory responsibility for all other foods.<sup>33</sup> In North Carolina, the agency responsible for oversight depends on the step in the food process chain. When food is at the ingredient stage or located on the farm, the North Carolina Department of Agriculture (NCDA) and the North Carolina Department of Environment and Natural Resources (NCDENR) are responsible. In transit by rail or truck, the North Carolina Department of Transportation and North Carolina Division of Motor Vehicles are responsible for food safety. When food is in processing or distribution centers, the NCDA and NCDENR resume responsibility. Local health departments, under the authority of NCDENR, are responsible for routinely inspecting food stands, meat markets, restaurants, and school cafeterias. Other federal and state agencies may be involved depending on the route and processing of the food. A performance review of the North Carolina food safety system noted that the system is fragmented and might be better served by consolidating some responsibilities. In comparison, almost half of all states have only two agencies with major food safety responsibilities.<sup>32</sup>

**The food safety system needs common standards to ensure quality.**

### Food Industry Regulation

The food safety and defense system is very complex. The GAO listed revamping federal oversight of food safety on its high-risk list in July 2009.<sup>34</sup> The food safety system needs common standards to ensure quality. Most industries have some type of quality control measures. Food safety and defense has three major initiatives aimed at protecting the food supply, from the farm or plant through delivery and preparation: Hazard Analysis and Critical Control Points system (HACCP), Voluntary National Retail Food Regulatory Standards Program, and the Manufactured Food Regulatory Standards Program.<sup>n</sup>

#### *Hazard Analysis and Critical Control Points system (HACCP)*

The HACCP system is a quality control measure that has been used in many different industries and can be adapted to most any process. HACCP is based on a set of principles that begins with analyzing possible hazards, determines critical points at which those hazards might occur, establishes preventive procedures and strategies for mitigating the hazards, and makes proper documentation of the entire process. HACCP was first introduced into law for the food safety and

<sup>n</sup> Jenkins P. Director, Center for Lifelong Learning, University of North Carolina at Chapel Hill School of Nursing; Consultant, Foodborne Disease Epidemiology, Institute of Food Technologists. Oral Communication. July 16, 2009.



defense industry through the United States Department of Agriculture (USDA) in 1998.<sup>o</sup> The law gives the USDA the authority to sanction or close any meat, poultry, or egg product industry or organization that does not have HACCP plans, update them, or have them readily available during their daily inspections. The USDA provides half of the funding for the North Carolina Department of Agriculture and requires its adherence to the federal HACCP standards.<sup>p</sup> More recently, the FDA began recommending HACCP plans for the sectors of the food safety and defense industry that it regulates. There are specialized HACCP versions for dairy, retail and food service, and seafood.<sup>35</sup> NCDENR has no authority to enforce HACCP plans, but does recommend them for certain high risk processes (e.g. reduced oxygen processing for cook-chill foods, in which warm food is flash frozen in an impermeable container).<sup>q</sup> Due to the broad scope of food products under its regulation and limited resources, NCDENR does not have daily inspections that might help facilitate statewide HACCP plan implementation.

#### ***FDA Voluntary National Retail Food Regulatory Standards Program***

NCDENR is taking other steps to improve food safety and defense. The Food Protection Branch of NCDENR enrolled in the FDA Voluntary National Retail Food Regulatory Standards Program in 2007. The program serves as a guide for retail and food service managers in many settings (e.g. restaurants, grocery stores, and institutions like nursing homes) to improve food safety by implementing a common set of standards. These standards focus on reducing and managing risk factors known to contribute to foodborne illness by implementing Hazard Analysis and Critical Control Points (HACCP) plans and adopting the FDA Food Code.<sup>36</sup> The FDA Food Code is a model that helps the members of the retail and food service industry develop their own food safety rules based on national food regulatory policy.<sup>37</sup> Adopting the FDA Food Code allows states and territories to update their codes and ensure the same level of food safety and security across state and regional lines. The new code is available and has been adopted by 48 states and 3 territories. North Carolina is among the two states yet to adopt the code, although it is currently pursuing Food Code adoption through rulemaking.<sup>38</sup>

#### ***Manufactured Food Regulatory Standards Program***

One of six states selected, the North Carolina Department of Agriculture is participating in a national pilot of the Manufactured Food Regulatory Standards Program, designed to bring all states to a national standard for regulation of food plants. These program standards describe best practices of a high quality regulatory program for manufactured food (only meat, poultry, or egg products). The 10 standards are designed to focus on the critical areas of a program that protect the public from foodborne illness and injury.<sup>39</sup> These programs along with the experience and expertise of the workforce form the strengths of the North Carolina food safety program.

**One of six states selected, the North Carolina Department of Agriculture is participating in a national pilot of the Manufactured Food Regulatory Standards Program, designed to bring all states to a national standard for regulation of food plants.**

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o 9CFR417

p Delozier D. State Director, Meat and Poultry Division, North Carolina Department of Agriculture. Oral communication. July 17, 2009

q Michael L. Food Protection Branch Head, Division of Environmental Health, North Carolina Department of Environment and Natural Resources. Oral Communication. July 17, 2009.

**Local public health agencies are usually the first line of defense in large outbreak investigations, food protection efforts, or other natural or man-made public health emergencies.**

### *Managing Outbreaks*

In addition to the systems that North Carolina has in place to protect food safety in the production, distribution, and preparation stages, North Carolina also has a system to detect and respond to outbreaks. The North Carolina Disease Event Tracking and Epidemiological Collection Tool (NC DETECT) can help with outbreak detection. It can also be used to identify non-foodborne illness epidemics such as the H1N1 virus. NC DETECT collects data from emergency departments, the North Carolina Poison Center, the statewide Emergency Management System data collection system, and a regional wildlife center at least daily. It then uses CDC recommended algorithms to monitor patterns in the data to detect outbreaks, emerging diseases, or other public health hazards. As of May 2008, 110 of the 112 North Carolina emergency departments open 24 hours a day were reporting patient symptoms into the system. NC DETECT may be accessed by hospital-based and public health users at local, regional, and state levels.<sup>40</sup>

Recent outbreaks<sup>r</sup> of foodborne illness, including the recent outbreaks of salmonella from spinach and peanut butter, have received a lot of media attention. Outbreaks of foodborne illnesses, or the spread of communicable and infectious diseases, are usually investigated by local and state health departments. Typically, the CDC does not get involved in local outbreak investigations. The CDC only becomes involved when an outbreak is sufficiently large or covers multiple states, or in the event of a novel and virulent strain of an infectious disease.<sup>33</sup> Local public health agencies are usually the first line of defense in large outbreak investigations, food protection efforts, or other natural or man-made public health emergencies that require a coordinated and unified national, statewide, or regional response. However, these efforts can be very labor intensive.

In order to better protect the safety of the food we eat and to ensure that the state has the necessary resources to detect and respond to outbreaks of foodborne illnesses, new and emerging infectious agents, or other public health emergencies, the Task Force recommends:

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<sup>r</sup> Two or more cases of similar illness related to ingesting a common food is an outbreak.

## Recommendation 9.2: Strengthen Laws to Prevent Foodborne Illnesses

The North Carolina General Assembly should enact laws to strengthen North Carolina's ability to prevent and respond to foodborne illnesses by

- a) Directing the North Carolina Department of Agriculture and Consumer Services, the North Carolina Department of Environment and Natural Resources, and the North Carolina Department of Health and Human Services to create a committee to develop a "single-agency" approach for addressing foodborne illness in North Carolina. The committee should work to
  - 1) Develop a unified proactive, scientifically-based strategy to prevent, detect, and respond to foodborne illness.
  - 2) Identify ways to maintain adequate funding for a holistic food safety and defense program at the state and local level.
  - 3) Strengthen industry ties.
  - 4) Educate policy makers.
- b) Appropriating \$1.6 million in non-recurring funds in SFY 2011 and \$300,000 in recurring funds beginning in SFY 2012 to the North Carolina Division of Public Health to develop and maintain an enhanced surveillance system that facilitates sharing of data from the North Carolina Department of Environment and Natural Resources and North Carolina Department of Agriculture and Consumer Services complaint lines, public health surveillance systems, US Department of Agriculture, Centers for Disease Control and Prevention, and Food and Drug Administration (FDA) when needed to detect or prevent the spread of foodborne illnesses.
- c) Requiring all industries to develop Hazard Analysis Critical Control Point (HACCP) plans or use government risk-based inspections. HACCP plans should be made available to government agencies with jurisdiction.
- d) Ensuring that the Governor can use the state's rainy day funds to pay for the additional personnel or other costs needed to address public health emergencies. Funds should be made available, when needed, to help pay for the additional costs involved in large outbreak investigations, food protection efforts, or other natural or man-made public health emergencies that require a coordinated and unified national, statewide, or regional response.
- e) The North Carolina Department of Agriculture and Consumer Services and Department of Environment and Natural Resources should adopt, through regulations, the current FDA Food Code and maintain it in such a manner as to continually address updates to the Code.

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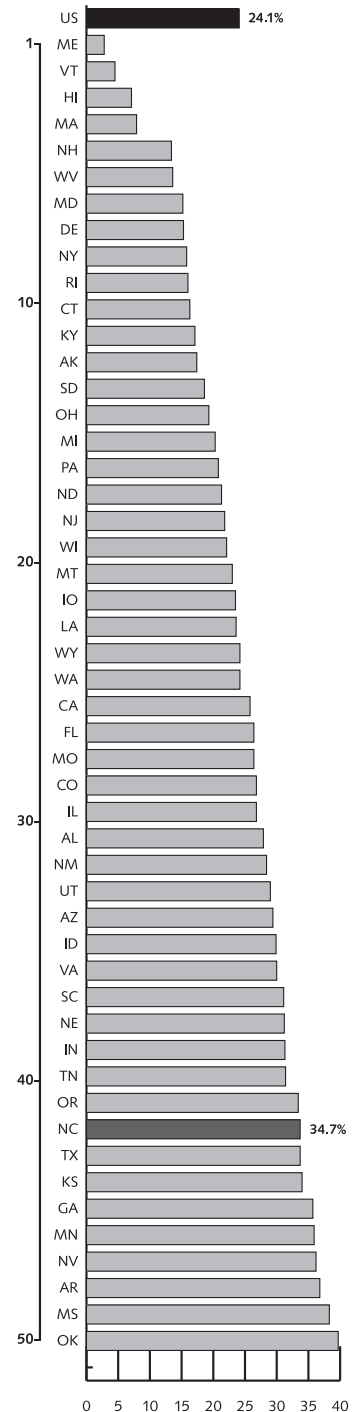
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Differences in health by race and ethnicity have been consistently observed across a range of health indicators. As a general rule, racial and ethnic minorities<sup>a</sup> have poorer health status and experience poorer health outcomes than non-minorities.<sup>1,2</sup> Health disparities<sup>b</sup> by race and ethnicity are also noted in health care access and quality, with minorities generally having less access to health care and health insurance and experiencing lower quality of health care than non-minorities.<sup>2,3</sup> These health disparities are not new, and while some disparities are slowly shrinking (e.g. life expectancy (US)), a few are actually increasing (e.g. health status as fair/poor for African Americans (US)).<sup>4</sup> To achieve a healthier North Carolina, the health of our entire population must improve; thus, addressing health disparities is an important strategy to improve the overall health of the state.

The United States is becoming increasingly diverse. In 2008 racial and ethnic minorities comprised approximately 34% of the United States' population; by 2050, it is projected that these once "minorities" will account for more than half of the United States population.<sup>9</sup> In 2006 14 of North Carolina's 100 counties were "majority-minority" counties, in which whites made up less than half of the population.<sup>10</sup> In 2007 North Carolina had a higher proportion of African Americans than the nation as a whole (21.7% and 12.8%, respectively). North Carolina had the seventh highest proportion of African Americans compared to other states.<sup>11,12</sup> While the percentage of Latinos is lower in North Carolina than the nation as a whole (7% and 15% in 2008, respectively), between 1990 and 2000 this population grew faster in North Carolina than in any other state and has since more than doubled.<sup>13</sup> In addition, the population of American Indians in the state is one of the largest in the nation (1.2%, or approximately 106,000 people).<sup>14,11</sup> Because of the large and growing numbers of racial and ethnic minorities in North Carolina, our state will not be able to make significant improvements in overall population health without addressing racial and ethnic health disparities.

In North Carolina, minorities are more likely to report that their health status is fair or poor compared to whites. In 2008 American Indians had the worst self-reported health, with 30% reporting fair/poor health, followed by Latinos (28%),

**Race and Ethnicity Equity Ranking, 2007<sup>c</sup>**



Source: JC Cantor, C Schoen, D Belloff, SKH How, D McCarthy, Aiming Higher: Results from a State Scorecard on Health System Performance, The Commonwealth Fund Commission on a High Performance Health System, June 2007

a Throughout this section, "minorities" and "people of color" are used interchangeably with "racial and ethnic minorities" to refer to all people other than whites.  
 b There is no consensus definition for health disparities in the literature. In this chapter, health disparities are racial/ethnic gaps in health (health status, health outcomes, health care access, and health care quality).  
 c The race and ethnicity equity rank is the average of each state's rank across the following indicators: uninsured, not visited a doctor in past two years, did not go to doctor when needed to because of cost, did not receive recommended screening and preventive care, children without both a medical and dental preventive care visit in the past year, adults without a usual source of care, children without a medical home, mortality amenable to health care. States were ranked by the size of the gap between the US average for each indicator and their most vulnerable non-white group. The race/ethnicity equity ranking was calculated by comparing gaps in performance among subgroups of patients by income level, insurance coverage, and race/ethnicity. The analysis compares performance levels among each state's most vulnerable populations to the national average for selected scorecard indicators for which data are available.

## Measuring Race and Ethnicity

Many alternative terms are used to refer to diverse racial and ethnic communities. The terms *race* and *ethnicity* are social constructs used to categorize people by various characteristics including physical appearance, culture, nationality group, and country of birth of a person or their parents or ancestors before their arrival in the United States. The American Anthropological Association (AAA) does not distinguish between race and ethnicity; in a policy statement, the AAA says “race and ethnicity both represent social or cultural constructs for categorizing people based on perceived differences in biology (physical appearance) and behavior. Although popular connotations of race tend to be associated with [appearance] and those of ethnicity with culture, the two concepts are not clearly distinct from one another...populations with similar physical appearance may have different ethnic identities, and populations with different physical appearances may have a common ethnic identity.”<sup>5</sup>

Although the two terms are often used interchangeably in discussion, for data collection purposes, the federal government, pursuant to an Office of Management and Budget directive, uses the terms “race” and “ethnicity” in distinct ways. The federal government distinguishes “races” from “ethnicities” according to the following: when race-specific data are presented, data should be categorized into at least five categories consisting of 1) American Indian or Alaska Native, 2) Asian, 3) Black or African American, 4) Native Hawaiian or Other Pacific Islander, and 5) White. The two categories for data on ethnicity are 1) Hispanic or Latino and 2) Not Hispanic or Not Latino. When self-reporting is used, respondents can select more than one race category. These categories were developed to help standardize federal data collection. These categories “represent a social-political construct designed for collecting data on the race and ethnicity of broad population groups in this country and are not anthropologically or scientifically based.”<sup>6</sup>

In practice, when these categories are used to collect data, data often treat Hispanic or Latino origin as a separate race; anyone reporting they are of Hispanic or Latino origin, regardless of their race, is categorized as Latino (or Hispanic) and those not reporting Latino origin are reported by their race. Often “non-Latino/Hispanic” is implied but not expressly indicated. Furthermore because data are typically collected according to these guidelines, most research on racial/ethnic disparities uses the same terms to classify racial/ethnic differences. The terms *Hispanic* and *Latino* refer to slightly different subgroups but are often used interchangeably. In North Carolina, most groups prefer the term Latino.<sup>7</sup> Throughout this report, we use the term Latino regardless of the original term used when collecting data.

In 2008, approximately 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.<sup>8</sup> Due to the relative size of Asian, Native Hawaiian, and Pacific Islander populations in North Carolina, these groups were combined in the data presented in this report. Furthermore, at times the size of the Asian, Native Hawaiian, Pacific Islander, and American Indian populations are so small that separate subgroup analyses may not have sufficient numbers to be statistically meaningful. Although these groups have varying cultures and characteristics, data availability often leads to collapsing these groups into one group, often called “Other.” To simplify the discussion related to race and ethnicity, the North Carolina Institute of Medicine uses the following terms: American Indian, Asian (which includes Asian, Native Hawaiian, and other Pacific Islander), African American, white, and Latino. Unless otherwise noted, all categories except Latino are non-Latino.



other races (25%), African Americans (20%), and whites (15%).<sup>15</sup> (See Table 10.1.) In addition, the difference in life expectancy between minorities and the state's white population is 4.7 years (72.1 years and 76.8 years, respectively), with minority men having the lowest life expectancy, 68 years.<sup>14</sup>

Minorities experience health disparities from birth. African Americans, American Indians, and Latinos in North Carolina have higher infant mortality rates per 1,000 live births than whites (15.2 %, 12.0%, and 6.5% vs. 6.1% respectively), with African Americans having the highest rate.<sup>14</sup> Minorities, particularly African Americans and Native Americans, also have higher mortality rates than whites for the majority of conditions listed in Table 10.1. Moreover, African Americans generally have a higher risk of mortality compared to whites and other racial/ethnic groups. (See Figure 10.1.) Of note is that the mortality rates and health status indicators for Latinos are generally better than for whites. This is often referred to as the “healthy immigrant effect” and may be due to the fact that people who immigrate to the United States are generally healthier than their peers born in the United States (e.g. beneficial selection effects). For example, birth outcomes for some Latino immigrant populations are better than those for Latinos born in the United States. However, as Latinos or other immigrant populations acculturate, their health status deteriorates on many health indicators.<sup>16,2</sup>

People of color in North Carolina are also more likely to have risk factors for some of the underlying causes of poor health. (See Table 10.2.) African Americans are significantly more likely to have high blood pressure, be obese, have lower levels of physical activity, and be diagnosed with diabetes than whites. American Indians are more likely than whites to be current smokers, be obese, and have lower levels of physical activity. Latinos are significantly more likely than whites to have lower levels of physical activity and participate in binge drinking.<sup>14,15,17</sup> However, African Americans are less likely to binge drink or drink heavily than whites and are less likely to be depressed.<sup>17</sup> Furthermore, racial and ethnic minorities have less access to health care than non-minorities. People of color are significantly less likely than whites to have health insurance and are more likely to delay necessary medical care due to costs. In addition, Latinos and American Indians are less likely than whites to have a personal health care provider.<sup>15</sup> Minorities in North Carolina are also less likely to have ever had a colonoscopy, prostate-specific antigen test, or mammogram to screen for cancer.<sup>18</sup>

### Factors Influencing Health Disparities

The cause of these racial and ethnic disparities is not completely understood. The role of unavoidable biological aspects and differences is limited, with only a few diseases (e.g. sickle cell anemia) having any distinct genetic basis.<sup>19</sup> Differing levels of access to health care may also affect disparities in health status and health outcomes. People of color are less likely than whites to have health insurance or to have a primary care physician.<sup>2</sup> In addition, they have more difficulty accessing care and as a result, are more likely to receive care in emergency departments. In North Carolina, many racial and ethnic minorities live in rural areas; lack of

**North Carolina will not be able to make significant improvements in overall population health without addressing racial and ethnic disparities.**

**People of color in North Carolina are more likely to have risk factors for some of the underlying causes of poor health.**

Racial and ethnic disparities often persist even after controlling for factors such as insurance status, income, age, co-morbid conditions, and symptom expression.

**Table 10.1**  
**Minorities in North Carolina Generally Have Higher Mortality Rates than Whites, North Carolina<sup>d</sup>**

	White	African American	American Indian	Other Races	Latino	Total
<b>Mortality rates<sup>[1]</sup> 2003-2007</b>						
Infant deaths per 1,000 live births	6.1	15.2	12.0	6.0	6.5	8.4
Heart disease	200.3	247.8	230.6	85.7	70.3	206.5
Stroke	52.2	78.1	61.2	36.1	20.8	56.4
Diabetes	20.5	53.1	50.2	13.6	11.4	25.9
Nephritis, nephrosis	14.6	36.0	23.0	9.4	9.7	18.1
Chronic lower respiratory disease	50.7	29.8	32.0	8.5	9.7	46.5
HIV	1.3	17.6	NA*	NA*	2.8	4.7
Cancer	187.0	226.5	161.5	95.2	78.5	191.4
Lung cancer	59.9	57.1	54.8	21.8	14.6	58.5
Colorectal cancer	16.5	23.6	12.3	9.8	8.2	17.5
Breast cancer	22.9	33.8	21.1	9.8	9.5	24.7
Prostate cancer	22.2	61.0	31.5	NA*	NA*	27.5
Unintentional motor vehicle injury	18.6	18.4	39.4	10.5	26.9	19.3
Other unintentional injury	29.9	22.0	28.1	8.3	13.4	27.5
Homicide	3.6	16.3	19.0	4.7	10.2	7.2
Suicide	14.1	5.0	8.3	6.0	4.8	11.6

[1] Except for infant mortality, mortality rates are age-adjusted per 100,000 population. Data from the 2007 National Center for Health Statistics Bridged Population Estimate file.

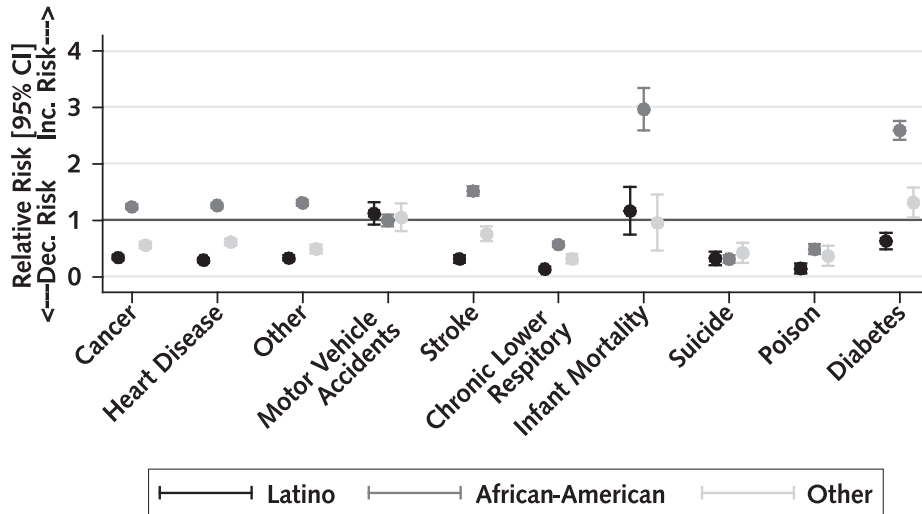
\*Rates based on less than 20 deaths are statistically unstable.

Source: State Center for Health Statistics. Health profile of North Carolinians: 2009 update. <http://www.schs.state.nc.us/SCHS/pdf/HealthProfile2009.pdf>. Published May 2009. Accessed May 20, 2009.

transportation and a lack of health care providers in rural areas can add to access barriers.<sup>14</sup> A 2007 study by the Commonwealth Fund found that having a medical home eliminated disparities in terms of access to medical care.<sup>20</sup> However, other racial and ethnic disparities often persist even after controlling for factors such as insurance status, income, age, co-morbid conditions, and symptom expression.<sup>2</sup> Socioeconomic factors (discussed in more detail in Chapter 11), such as income, education, and housing, also affect health disparities, as a larger proportion of minorities than non-minorities are represented in lower socioeconomic tiers. Research has shown that income and education can account for approximately 3%

<sup>d</sup> Mortality rates have not been adjusted for socioeconomic factors such as income and education.

**Figure 10.1**  
**African Americans Have Higher Relative Risk<sup>e</sup> of Mortality than Whites,**  
**North Carolina 2006-2007**



Source: North Carolina Institute of Medicine. Analysis of the North Carolina Vital Records, 2006-2007 North Carolina Vital Statistics.

Remaining gaps in health between people of color and white populations can be partly explained by their unique social experiences.

to more than 50% of the minority/non-minority gaps in mortality rates for certain conditions.<sup>21</sup> However, even after controlling for socioeconomic factors, health disparities by race and ethnicity remain. For example, Figure 10.2 illustrates that for each increasing income level the percentage of people who report fair/poor health decreases.<sup>1</sup> It also shows that for each income level, African Americans are more likely to report fair/poor health than whites. Figure 10.2 also illustrates the healthy immigrant effect for Latinos, with Latinos reporting better health than both white and blacks below 200% Federal Poverty Guidelines (FPG). Therefore, while differences in income can explain some of the disparity in health status, gaps by race and ethnicity remain.

Remaining gaps in health between people of color and white populations can be partly explained by their unique social experiences. The United States has a long history of racial/ethnic segregation and inequality, and while the country has made an effort to diminish and erase these racial and ethnic inequalities, some subtle (and sometimes blatant) interpersonal and institutional bias remains. This bias shapes and restricts economic and social opportunities. Research has indicated that perceived racial/ethnic bias contributes to health disparities even after controlling for income and education.<sup>1</sup> Perceived bias and social status also affect stress levels. High stress levels, which have been shown to have negative effects on health, are more prevalent in minority populations compared to non-minority

<sup>e</sup> Relative risk is a measure of the risk of an event occurring in one group compared to another. A relative risk of one means that there is no difference in risk. A relative risk greater than one means that the group has a higher risk compared to the other group. Relative risk less than one means less risk of an event occurring.

Trust in the health system is important to health and is closely related to utilization of medical services, medication/treatment compliance, and establishment of long-term relationships with health care providers.

**Table 10.2**  
**Minorities in North Carolina are Generally More Likely than Whites to Have Risk Factors for Disease/Illness**

	White	African American	American Indian	Asian	Other Races	Latino	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 <sup>[2]</sup>	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%

Note: Shaded cell denotes after adjustment for age and income, significantly different from average for white at 5%.

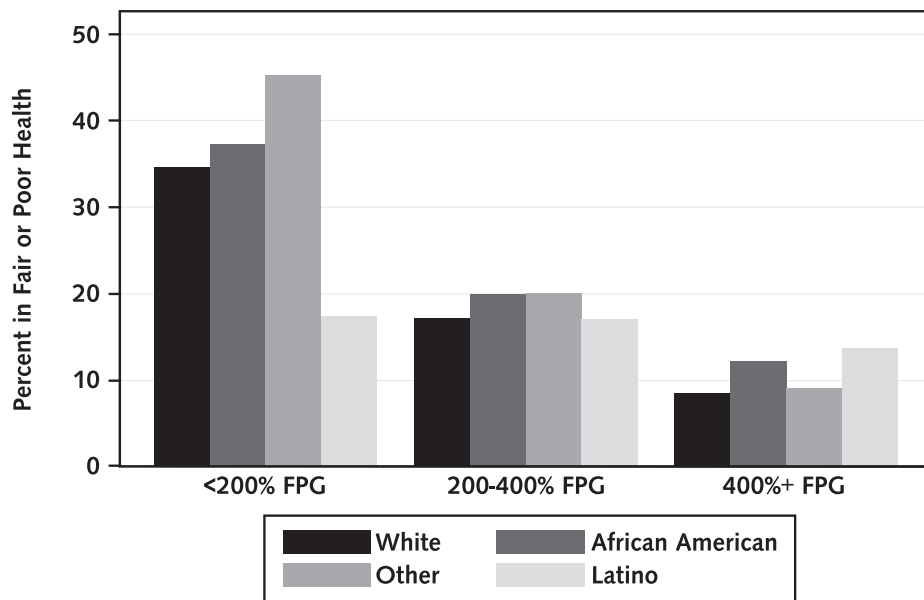
\* Denotes unadjusted (sample average) significantly different from average for white at 5%.

Source: North Carolina Institute of Medicine. Analysis of North Carolina Behavioral Risk Factor Surveillance System, 2008 data except for High Blood Pressure (2005 data).

populations.<sup>1,22</sup> In addition, patient segregation across hospitals is still observed due to the lingering patient referral patterns used during segregation.<sup>23</sup>

Due to past discrimination, there is also documented mistrust in medical care and the health care system among racial/ethnic minorities.<sup>1,24,25</sup> The most notable example of discrimination in medicine is the Tuskegee Study of Untreated Syphilis in the Negro Male. In 1932, the United States Public Health Service began a 40-year study of the natural course of syphilis in African American men. Investigators intentionally deceived participants and withheld treatment, even after penicillin became available in the 1940s.<sup>26</sup> Furthermore, until 1974 it was common practice to conduct medical research in prisons and hospitals for the mentally disabled with predominately minority populations.<sup>f,27</sup> Between 1933 and 1974, North Carolina conducted forced sterilizations of "mentally diseased, feeble minded or epileptic" individuals as part of the eugenics movement in the state. Many of these sterilizations were performed on racial and ethnic minorities, especially African American women.<sup>28,29</sup> These incidents, along with decades of segregation and discrimination, have made some racial and ethnic populations, particularly African Americans, distrustful of the American health care system. Trust in the health system is important to health and is closely related to utilization of medical services, medication/treatment compliance, and establishment of long-term relationships with health care providers.<sup>24</sup> As a result of distrust, people of color are less likely than whites to utilize health services.<sup>24,25,30</sup> Distrust of the health

**Figure 10.2**  
**Racial and Ethnic Health Disparities Remain after Controlling for Income**



Note: 100% of the Federal Poverty Guidelines is \$22,050/year for a family of four in 2009. Rates are age-adjusted.

Source: North Carolina Institute of Medicine. Analysis of US Census Bureau’s Community Population Survey, 2000-2007.

care system is also strongly associated with worse self-reported health status, even after adjusting for age, sex, race, education, income, and insurance coverage.<sup>31</sup> Minority patients are more likely to go to a provider with a similar racial and ethnic background as themselves.<sup>32,33</sup> Previous reports by the North Carolina Institute of Medicine have recommended training more minority health care providers to meet the needs of an increasingly diverse state.<sup>33</sup>

### Addressing Racial and Ethnic Disparities

With the disproportionate burden of disease and mortality experienced by minorities and the diversity of the state and nation growing, more and more people will be at risk for poor health. Increasing numbers of people with poor health will lead to a less healthy state and higher health care costs. To reduce health disparities while improving population health, large scale public policy and public health interventions should be structured so that the effects of the interventions are independent of motivation, resources, or actions of individuals.<sup>34,35</sup> In other words, programs need to be appropriate for everyone, independent of race, ethnicity, culture, income, education, or geography (e.g. water fluoridation and mandatory seat belt use).

f In 1974 the National Research Act was passed, creating a Commission to identify and develop guidelines for ethical research involving human subjects. The Commission created the Belmont Report, the basis for ethical research practices in the United States.

**To reduce racial and ethnic health disparities and create effective health activities for at-risk populations, researchers and public health professionals need to understand the ways in which the unique experiences of racial and ethnic populations affect the health of that population.**

In addition, an understanding of disparities and their sources is important for targeting prevention activities for at risk populations, such as those experiencing racial/ethnic disparities. Race and ethnicity are socially constructed categories based on individual and collective histories as well as disproportionate levels of access to social and economic opportunities.<sup>22</sup> In other words, belonging to a particular racial/ethnic group represents a unique set of social experiences that have an effect on health. These social experiences influence predictors of health such as income, education, housing, and trust in the medical system (discussed above). To reduce racial and ethnic health disparities and create effective health activities for at-risk populations, researchers and public health professionals need to understand the ways in which the unique experiences of racial and ethnic populations affect the health of that population. The practice of considering these experiences and incorporating them into health care activities is known as cultural competence.<sup>36</sup> Increasing the cultural and linguistic competency of health care providers can increase quality of care.<sup>33</sup> The national Office of Minority Health has created standards for cultural competence, focusing on health care organizations and providers. The North Carolina Academy of Family Physicians is conducting a three-year initiative aimed at improving cultural competence among physicians delivering family medicine and primary care services.<sup>37</sup> Partnerships within the community and the involvement of community members can provide researchers and public health professionals with valuable insights into the experiences of a community; community-based partnerships combine the knowledge of providers, researchers, and community members to structure effective programs for a particular community.

Strategies that promote community involvement and empowerment have been shown to improve health seeking behaviors.<sup>38</sup> One model for community participation is the use of lay health advisors (also known as community health workers). Lay health advisors are community members who are trained to advise and assist other members of their community with health issues.<sup>h</sup> They also act as liaisons between the community and health professionals. Lay health advisors are a part of the community and therefore are a trusted source of health information. Studies have shown that the use of lay health advisors has increased utilization of services, fostered consumer activation (i.e. a person's ability to manage his or her own health and health care), and produced changes in health behavior in racial and ethnic communities.<sup>38-40</sup> One example of an effective lay health advisor program is the North Carolina Breast Cancer Screening Program (NC-BCSP), which utilized a lay health advisor intervention to increase breast cancer screening among rural African American women ages 50 and older.<sup>41</sup> Over two years (1993-1994 and 1995-1996) 170 trained lay health advisors provided one-on-one sessions with local African American women to reinforce the promotion of breast cancer

g The National Standards on Culturally and Linguistically Appropriate Services (CLAS) can be found at <http://www.omhrc.gov/templates/browse.aspx?lvl=2&lvlid=15>.

h In order for lay health advisors to be effective, they must be adequately trained and supervised. (Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care. *Unequal treatment: confronting racial and ethnic disparities in health care*. National Academies Press: Washington, DC. 2003.)

screening using culturally sensitive materials. Evaluation of the intervention showed a statistically significant six percentage point increase in community-wide, self-reported mammography use; low-income women experienced an even larger increase, 11 percentage points.<sup>41</sup>

Some lay health advisor programs are setting-specific, such as faith-based or salon-based interventions. These programs recognize the importance of particular settings in the lives of different populations. For example, the majority of Americans are members of some form of religious institution, with more than 90% of North Carolinians reporting a religious affiliation.<sup>42</sup> The resources and followings of faith institutions make them advantageous settings for health interventions. While faith-based lay health advisor programs have been described in the literature, only a few used study designs that allow for outcome evaluation. Nonetheless, evidence points to the potential for these programs to effectively change health behaviors.<sup>42,43</sup> Beauty salons are another innovative setting for interventions, as they provide a safe and trusted place to socialize and discuss beauty and health. Like faith-based programs, few studies of using cosmetologists as lay health advisors to effect health behavior change have evaluated outcomes, yet some have shown positive results (e.g. North Carolina BEAUTY and Health Project described below).<sup>44</sup>

Community-based participatory research (CBPR), utilizing community partnerships between researchers, providers, and the community, is another method used to increase cultural competence and reduce racial/ethnic disparities. This method focuses on the local relevance of public health problems and aims to identify and implement effective health promotion strategies built on the strengths and resources of a community.<sup>34</sup> These programs also tend to use lay health advisors.<sup>34,45</sup> The North Carolina BEAUTY and Health Project used CBPR to develop a lay health advisor intervention to increase awareness of cancer and promote health behavior change. Members of the community were involved in creating research questions, intervention priorities and strategies, and evaluating the results of the program.<sup>44</sup> The study showed that cosmetologists were able to successfully deliver locally informed, culturally competent messages and that over half of customers reported health behavior changes due to conversations with their cosmetologist. While there are only a few studies evaluating the effectiveness of CBPR, initial results are promising.<sup>45,46</sup> CBPR has the potential to reduce disparities by producing research that more effectively addresses the needs and strengths identified by at-risk communities.

An important resource for community partnerships and involvement is the North Carolina Office of Minority Health and Health Disparities (OMHHD), which advocates for policies and programs to increase access to public health services for racial and ethnic minorities in the state. The OMHHD conducts a lay health advisor program as well as provides grants to community-based organizations supporting lay health advisors. The Community Health Ambassador Program trains African American, American Indian, and Latino Community Health Ambassadors (i.e. lay health advisors) from all over the state to educate

**Lay health advisors are a part of the community and therefore are a trusted source of health information.**

community members about the prevention of illness and access to health care services.<sup>47</sup> In addition, the OMHHD provides grants through the Community Focused Eliminated Health Disparities Initiatives to build the capacity of community-based organizations to address and improve the health of racial and ethnic minorities.<sup>47</sup>

To improve the effectiveness of interventions designed to reduce health disparities and improve the health of racial and ethnic minorities, the Task Force recommends:

### **Recommendation 10.1: Fund Evidence-Based Programs to Meet the Needs of Diverse Populations**

- a) Public and private funders supporting prevention initiatives in North Carolina should place priority on funding evidence-based programs and practices. Intervention selection should take into account the racial, ethnic, cultural, geographic, and economic diversity of the population being served. When evidence-based programs are not available for a specific population, public and private funders should give funding priority to best and promising practices/programs and to those that are theory-based and incorporate elements identified in the research literature as critical elements of effective programs.
- b) The North Carolina Division of Public Health (DPH) should examine racial and ethnic disparities in all of its health promotion and disease prevention activities. To increase the effectiveness of prevention initiatives targeting racial and ethnic disparities, DPH should involve community members, including faith-based health ministries, beauty salons/barber shops, civic and senior citizen groups, and other community leaders or lay health advisors.
- c) North Carolina foundations should provide funding to support and expand evidence-based initiatives targeting racial and ethnic disparities, and expand funding for community-based participatory research.



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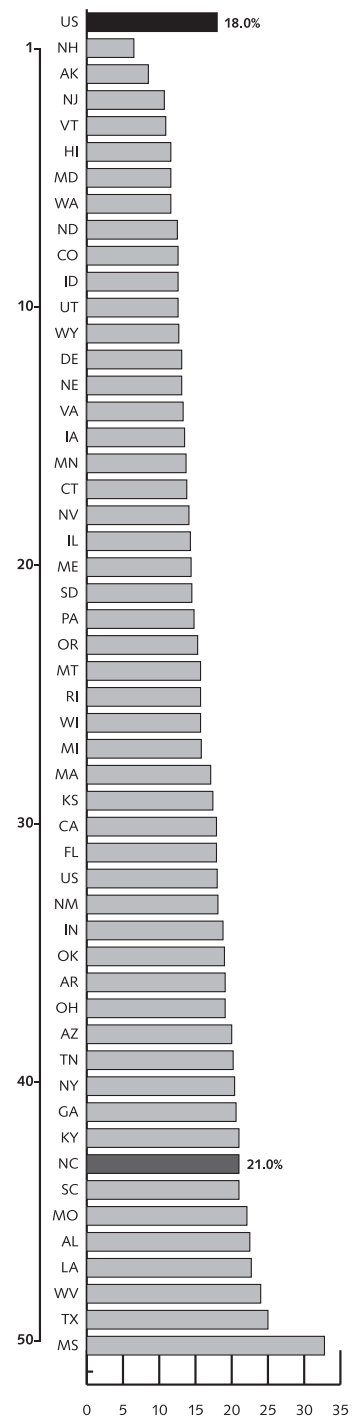


**A**s noted in Chapters 3-6, certain health behaviors, such as smoking, drinking, poor nutrition, or lack of exercise, can have significant effects on a person's health. Similarly, a person's income, wealth, educational achievement, race and ethnicity, workplace, and community can also have profound health effects. The Task Force examined the affect of racial and ethnic disparities more fully in Chapter 10. A person's race and ethnicity, along with their income, educational achievement, and other social determinants are among the best predictors of health status. There is a strong correlation between health outcomes and income, wealth, income inequality, community environment and housing conditions, educational achievement, and race/ethnicity. People with higher incomes or personal wealth, more years of education, and who live in a healthy and safe environment have, on average, longer life expectancies and better overall health outcomes. Conversely, those with fewer years of education, lower incomes, less accumulated wealth, living in poorer neighborhoods, or substandard housing conditions have worse health outcomes. It is not only the abject lack of resources (income and assets) that contribute to health outcomes but also the income inequality in a community that predicts poorer health outcomes. Similarly, for most measures, racial and ethnic minorities have worse health outcomes than do whites.

Many of the social factors that affect health have both independent and interactive effects. For example, people with higher incomes have more opportunities to live in safe and healthy homes, good communities, and near high quality schools. They are also generally better able to purchase healthy foods and afford time for physical activity. Health insurance and health care also become more accessible with more monetary resources. All of these factors combine to shape a person's health. Conversely, people who are poor are more likely to live in substandard housing or in unsafe communities. Their communities may lack grocery stores that sell fresh fruits and vegetables or lack access to outdoor recreational facilities where they can exercise. Children who grow up in poverty generally fare worse in school and end up, on average, with fewer years of education than those in families with higher incomes. There is also a correlation between race/ethnicity and poverty, with racial and ethnic minorities more likely than whites to live in poverty. Further, there is a correlation between poverty, stress, and health behaviors. People who are poor are more likely to engage in risky health behaviors (e.g. drinking, smoking, eating unhealthy foods or being inactive) and experience greater levels of stress than more affluent individuals.

While many of these factors are interrelated, there is a growing body of literature that suggests some of these factors are also independent determinants of health. For example, in the United States health status for all racial and ethnic groups

**Percent of Population Living in Low-Income Families 2007-2008<sup>a</sup>**



Source: The Kaiser Family Foundation. <http://www.statehealthfacts.org>. Data Source: Urban Institute and Kaiser Commission on Medicaid and the Uninsured estimates based on the Census Bureau's March 2007 and 2008 Current Population Survey. Accessed August 21, 2009.

<sup>a</sup> Low-income is defined as earning an income at or below 200% of the federal poverty guidelines, or \$44,100/year for a family of four in 2009.

**People with higher incomes or personal wealth, more years of education, and who live in a healthy and safe environment have, on average, longer life expectancies and better overall health outcomes.**

**In the United States, some people live, on average, 20 years less than others, depending on their race and/or ethnicity, socioeconomic status, or where they live.**

decreases with income level; individuals with incomes less than 100% of the federal poverty guidelines (FPG) have worse self-reported health in comparison to all other income levels.<sup>b,c,1</sup> However, within each income level, African Americans have worse health than whites and Latinos, and Latinos generally have worse health than whites. Income and race/ethnicity interact to influence health status. Yet differences by income level and race/ethnicity remain even when taking the other into account. Other factors, including but not limited to, housing and education have similar independent and interactive effects on health. Research varies on which socioeconomic factor is the most important predictor of health. The Task Force did not attempt to try to answer which of these factors has the most important impact on health, recognizing that all of these factors should be addressed in order to improve the health of North Carolinians.

In the United States, some people live, on average, 20 years less than others, depending on their race and/or ethnicity, socioeconomic status, or where they live.<sup>2</sup> Some studies suggest that for every life saved through medical intervention, we could save five lives if African Americans experienced the same mortality rates as whites or eight lives if adults with inadequate education had the same mortality rates as those with some college education.<sup>3-5</sup>

Marked differences between racial and ethnic populations and between groups of differing socioeconomic status have been repeatedly observed across a wide range of health indicators.<sup>1,6</sup> In addition, differing levels of access to schools and education, housing, safe living and work environments, health care, and opportunities for healthful living affect the health status of a person and a population.

North Carolina consistently ranks at the bottom of most state health comparisons. To improve population health, we need to improve the health of *all* of our residents, including racial and ethnic minorities, those living in poverty, or other marginalized or vulnerable populations. As the state moves forward to address the preventable risk factors discussed in this report, special attention should be focused on at-risk individuals and communities. Further it is important to also address socioeconomic risk factors directly, including strategies to reduce racial and ethnic disparities and poverty, and to increase decent affordable housing and improve educational outcomes for all North Carolinians. Identifying and creating policies and interventions aimed at reducing disparities—whether they are related to income, education, or race and ethnicity—will aid in improving the health of all North Carolinians.

This chapter describes the interplay between socioeconomic factors and health in three areas: 1) poverty, wealth, and income inequality; 2) community and housing conditions; and 3) educational achievement. The relationship between race/ethnicity and health was described in Chapter 10. This link between

b 100% of the federal poverty guidelines is \$22,050/year for a family of four in 2009.

c Based on percent of people in each income group reporting poor/fair health on the National Health Interview Survey, 2001-2006.

socioeconomic status and health status is one that is not always recognized or incorporated into public health prevention programs.

### **Income, Wealth, and Income Inequality**

Income is positively related to health, with increasing income level corresponding to gains in health and health outcomes.<sup>7</sup> This relationship between income and health is not linear. Differences in income generally make the greatest difference for health at the lower end of the income scale; increases in income for the highest income groups may not produce significant gains in health. While the relationship between income and health has been shown across a range of health indicators, the association is not well understood. Money, in itself, does not produce good health. Instead, income is generally considered a marker for a person's relative position in society, which is related to the social conditions and the social and economic opportunities to which a person is exposed.<sup>8</sup> More affluent individuals have greater opportunities for healthful living through greater access to health-protecting resources such as the ability to live in safe and healthy communities with access to better equipped schools, places to exercise and play, and grocery stores. In addition, higher income individuals can more easily afford health insurance coverage. They may also have greater wealth (assets) including a home, savings, and low credit card debt, and, as a consequence, may have more disposable assets to use to meet basic necessities or pay for needed health services. Conversely, people who are poor have restricted opportunities for healthful living and may be exposed to health-damaging environments. They may live in poor housing in unsafe communities. Further, they may have less access to grocery stores or outdoor recreational facilities. In addition, poor individuals are much less likely to be insured.<sup>9</sup> People in lower socioeconomic levels may also lack social relationships and supports; lack self-esteem, optimism, or sense of control; and/or experience chronic or acute stress.<sup>10</sup> These psychosocial factors are predictive of morbidity and mortality. There may also be a degree of reverse causality in the association between income and health (e.g. poor health can lead to lower income when an individual is unable to work due to illness or health disability).<sup>8</sup> The relationship between income and health is particularly salient in the current economic crisis. As the numbers of unemployed people grow and more people move into lower income levels, more and more people will be at risk for poor health. Therefore, in order to improve the health of its residents, North Carolina needs to help increase the economic security of the population, especially low-income people.

#### **Income**

Most studies examining the relationship between income and health have used annual family income for the measure of income, as this measure is routinely collected and easy to access. Income level is associated with almost every indicator of health, including infant and adult mortality, morbidity, disability, health behaviors, and access to health care. Individuals in poverty have the worst health, though even people in middle income levels have worse health than people in the highest income level. Low income is associated with many other factors contributing to poor health outcomes, including risky health behaviors, lower

**The relationship between income and health is particularly salient in the current economic crisis. As the numbers of unemployed people grow and more people move into lower income levels, more and more people will be at risk for poor health.**

levels of education, substandard housing, food insecurity, and lack of health insurance coverage. However, income is independently associated with health outcomes, even after controlling for most of these other factors.<sup>10</sup>

In 2007, 14.8% of North Carolinians lived in a family with a household income below the poverty level (\$20,650/year for a family of four in 2007), and a total of 35.1% lived in low-income households with incomes below 200% FPG (\$41,300 for a family of four in 2007).<sup>11</sup> (See Table 11.1.) In fact, in 2006-2007 North Carolina had the 11th highest percentage of its population living below 200% FPG in the nation (only 10 states had higher proportions of low-income people).<sup>12</sup> Although current income data are not available, it is probable that the percentage of people living in poverty has increased further with the downturn in the economy. North Carolinians are likely to have been hit harder than most other states by the downturn in the economy, as the increase in the state's unemployment rate between 2007 and January 2009 was the second largest increase in the nation (5 percentage points, from 4.7% to 9.7%).<sup>13</sup>

The use of the federal poverty guidelines (FPG)<sup>d</sup> as a measure for economic security and hardship is widely regarded as outmoded and flawed, as it fails to capture the true extent of economic hardship. In fact, a study by the National Research Council's Panel on Poverty and Family Assistance in 1996 determined that FPG

**Low income is associated with many other factors contributing to poor health outcomes, including risky health behaviors, lower levels of education, substandard housing, food insecurity, and lack of health insurance coverage.**

**Table 11.1**  
Percentage of Families at Different Percentages of the Federal Poverty Guidelines (NC, US)

	Low-Income			Middle Income (200-399% FPG)	Higher Income 400%+ FPG
	Poor (<100% FPG)	Near Poor (100%-199% FPG)	Total (<200% FPG)		
Total					
NC	14.8%	20.3%	35.1%	32.8%	32.2%
US	12.5%	18.1%	30.6%	31.1%	38.3%
Adults					
NC	12.5%	19.4%	31.9%	33.4%	34.6%
US	10.5%	17.0%	27.5%	31%	41.5%
Children <19					
NC	21.2%	22.8%	44%	30.8%	25.2%
US	18.0%	21.1%	39.1%	31.3%	29.6%

Source: North Carolina Institute of Medicine analysis of the US Census Bureau's Current Population Survey, 2007.

<sup>d</sup> The federal poverty guidelines were developed in the mid 1960's using Department of Agriculture budget data detailing how much a family in an emergency/temporary situation would need to keep from starving. Results were modified by family size, multiplied by three, and adjusted for inflation. (Quinterno J, Gray M, Shofield J; North Carolina Justice Center. Making ends meet on low wages: the 2008 North Carolina Living Income Standard. [http://www.ncjustice.org/sites/default/files/2008%20LIS%20report%20\(Final%20March%2025\).pdf](http://www.ncjustice.org/sites/default/files/2008%20LIS%20report%20(Final%20March%2025).pdf). Published March 2008. Accessed June 11, 2009).



no longer provided an accurate picture of differences in poverty or trends over time and may lead to underestimates of the number of individuals in economic hardship. For example, work by researchers at the North Carolina Budget and Tax Center conclude that the 1.4 million North Carolinians did not earn enough income to cover seven basic necessities in 2008; this was 10% higher than the estimate obtained using the FPG measure.<sup>14</sup> Furthermore, even this measure understates family income needs; when savings and debt are included in the Living Income Standard (LIS), the monthly income needs of families increases by 15%-16%.<sup>e</sup> No matter which particular definition is used to gauge the number of low-income people in North Carolina, it easily exceeds one million.

### *Effect of Income on the Health of Children*

Living in poverty or having a lower income affects a person's health throughout their lifetime. However, the impact is especially important for infants and children, as the conditions that shape health in childhood influence opportunities for health throughout life.<sup>15</sup> North Carolina has one of the highest infant mortality rates in the country, ranking 45th in the nation in 2005. Infant mortality rates are greater for babies born to low-income mothers compared to high-income mothers.<sup>16</sup> Low-income mothers are also more likely to give birth to a low-birthweight baby (less than 2,500 grams), which can result in mental and physical impairments in the child.<sup>16</sup> This effect remains after controlling for race/ethnicity.

Economic deprivation and hardship in childhood have been demonstrated to be significant factors for adult health, with economic hardship experienced in childhood resulting in significantly higher risk of poor health in adulthood.<sup>15,17</sup> Children in poverty are more likely to experience nutritional deficiencies, and poor nutrition in childhood can have a lasting effect on health.<sup>7</sup> Many conditions, such as obesity, cardiovascular disease, cancer, and mental health problems are linked to health in the early years of life.<sup>18</sup> In addition, children living in families with low incomes are restricted in their opportunities for health through reduced access to good schools, healthy and safe living conditions, healthy food, exercise, and health insurance.<sup>15</sup> These factors combine to produce accumulated risk for poor health in the future. A study in Pitt County, North Carolina compared working and middle class African American men to determine the effect of childhood socioeconomic status (including education, occupation, employment status, and home ownership) on risk factors for hypertension.<sup>19</sup> The study found that low childhood socioeconomic status was associated with 60% greater odds of hypertension in adulthood.

Compared to other states, North Carolina has one of the largest gaps in children's self-reported health status between lower and higher-income children (ranking 32nd of the 50 states and the District of Columbia).<sup>20</sup> In North Carolina, children (under age 18) in poor families are four times more likely than children in higher-income families to report being in less than very good health, with 26.9% of

**Economic hardship experienced in childhood results in significantly higher risk of poor health in adulthood.**

**North Carolina has one of the largest gaps in children's self-reported health status between lower and higher-income children.**

<sup>e</sup> Data on inclusion of savings and debt and the effect on LIS are based on three counties: Graham, Mecklenburg, and Washington.

**Poor children are more likely to have a chronic illness and have higher rates of accidental injuries than higher income children.**

children with family incomes below 100% FPG reporting being in less than very good health compared to 6.5% for children with family incomes greater than 400% FPG.<sup>20</sup> While children living in poverty have the worst health, children in near-poor and middle income families report worse health than children in higher income families (17% and 11%, respectively). In 2008 approximately 8% of parents with household incomes below \$25,000 reported that their child's health was poor/fair, compared to only 0.3% in households with income greater than \$75,000.<sup>21</sup> Poor children are also more likely to have a chronic illness and have higher rates of accidental injuries than higher income children.<sup>22,23</sup> One potential cause is that children in families with incomes less than 200% FPG are more likely to be uninsured. Low-income children made up 14% of the uninsured in North Carolina in 2008, even though these children are eligible for public coverage through Medicaid or NC Health Choice (North Carolina's Children's Health Insurance Program).<sup>9</sup> In addition, children in families with incomes below \$25,000 are more likely than children in families with incomes greater than \$75,000 to lack a personal provider (21% and 10%, respectively), miss school due to illness or injury (5 days a year and 3 days year, respectively), and watch more television (2.1 hours a day and 1.5 hours a day, respectively).<sup>21</sup>

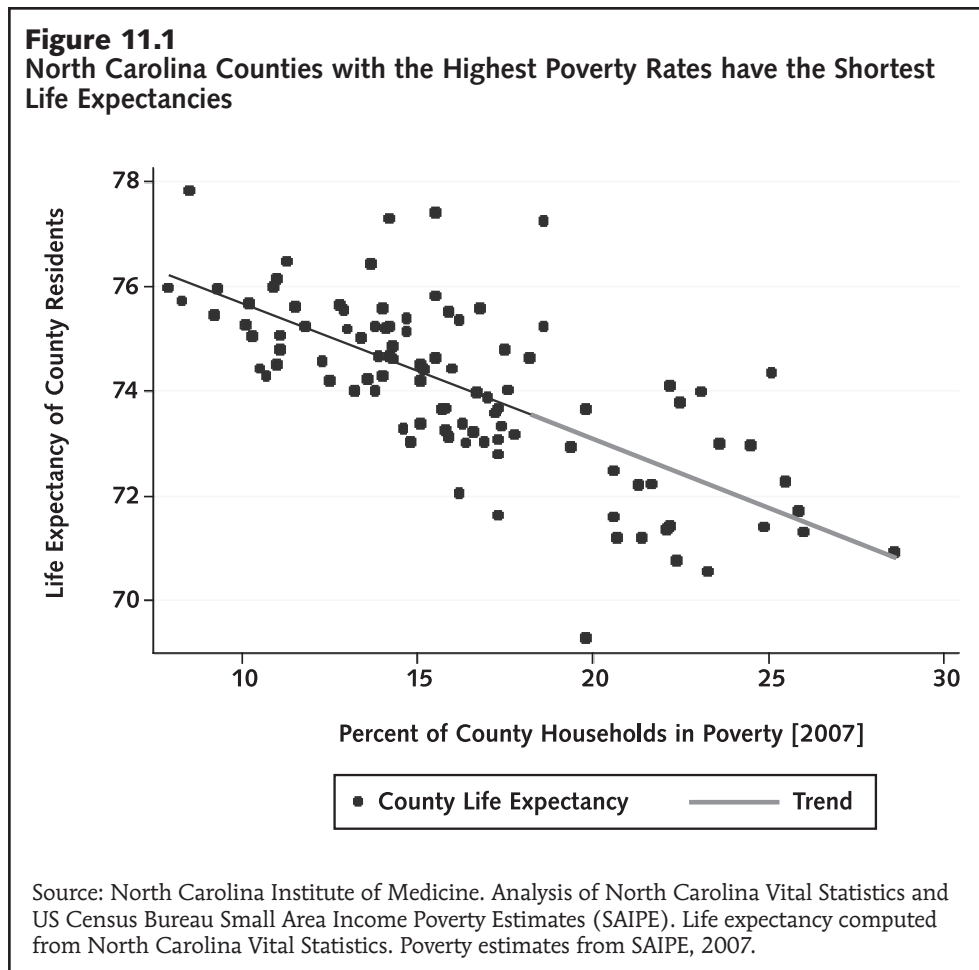
#### *Effect of Income on the Health of Adults*

Individuals with higher incomes have a longer life expectancy than people with lower incomes. In the United States, men with incomes greater than 400% FPG are expected to live an average of eight years longer than men in poverty (78.5 years and 70.5 years, respectively), and women with incomes greater than 400% FPG are expected to live an average of 6.7 years longer than women in poverty (83.2 years and 76.5 years, respectively).<sup>7</sup> As with children, North Carolina has a higher proportion of adults who are low-income than nationally. (See Table 11.1.)

**In the United States, men with incomes greater than 400% FPG are expected to live an average of eight years longer than men in poverty.**

Low family income is also associated with significantly higher all-cause mortality rates, even when controlling for age, sex, race, urbanicity, education, base-line health status, and health behaviors.<sup>10</sup> Individuals with incomes less than \$10,000 per year have a 177% increased risk of premature death compared to people with incomes greater than \$30,000 per year. In addition, people with incomes between \$10,000 and \$29,000 have a 114% increased chance of dying prematurely compared to individuals in the highest income group.<sup>10</sup> Figure 11.1 plots the life expectancy of residents in each North Carolina county against the percent of county residents living in poverty, along with a trend line. Not surprisingly, counties with the highest poverty rates have the shortest life expectancy. The effect size is meaningful—a four percentage point increase in a county's poverty rate is associated with one less year of life expectancy.

Poor adults are also more likely to report being in poor/fair health than high-income adults.<sup>7</sup> In North Carolina in 2006-2007, individuals with household incomes in the lowest income group (<100% of FPG) were three times more likely to report being in fair or poor health than individuals with household incomes above 300% FPG (\$75,000+) (21.1% and 6.8%, respectively).<sup>24</sup> (See Figure 11.2.) Low-income adults are also more likely than high-income adults to have chronic illnesses such as diabetes, coronary heart disease, kidney disease, or a chronic



Low-income adults are also more likely than high-income adults to have chronic illnesses such as diabetes, coronary heart disease, kidney disease, or a chronic illness that limits activity.

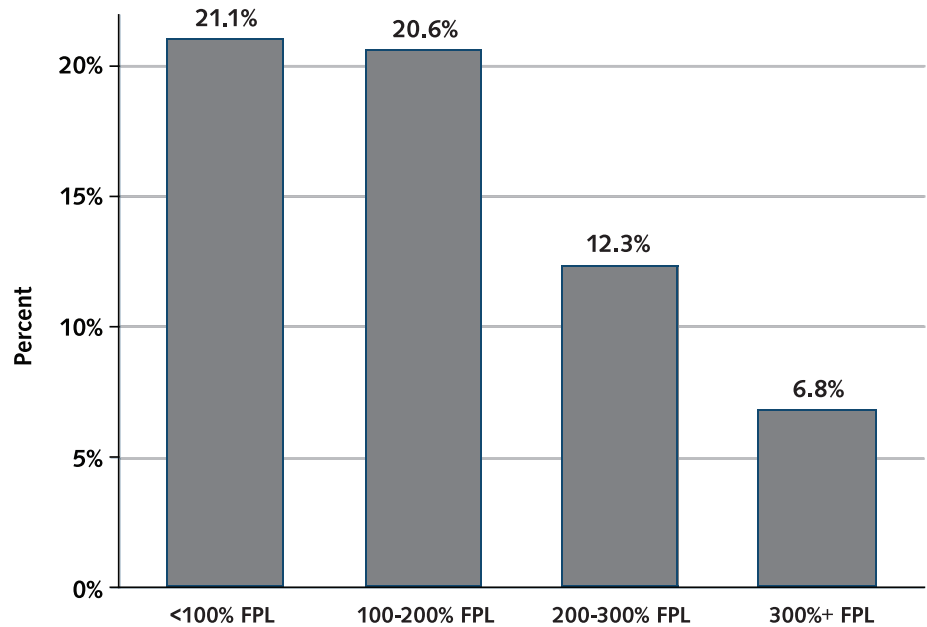
illness that limits activity. In 2008 North Carolinians in the lowest income level were approximately three times more likely to be diagnosed with diabetes than people in the highest income group (16.7% and 5.4%, respectively) and nearly three and a half times more likely to be diagnosed with coronary heart disease (8.1% and 2.3%, respectively).<sup>25</sup> Low income is also associated with higher prevalences of mental health and psychiatric conditions.<sup>26</sup>

Poor individuals are also more likely to engage in certain risky health behaviors than more affluent individuals.<sup>10</sup> In North Carolina, individuals in the lowest income group (<\$15,000) had significantly higher prevalences of tobacco use, physical inactivity, lack of social support, and disability than people in higher income groups.<sup>25</sup> As noted throughout the report, these risky health behaviors increase a person’s chances of premature death or disability.

Low-income individuals are also more likely to face barriers to accessing health care and health care services. In 2008, 46% of the non-elderly uninsured were low-income adults (with incomes below 200% FPG).<sup>9</sup> Poor individuals in the state are also significantly more likely to report delaying needed care due to costs; 34.7% of people with incomes below \$15,000 reported delaying care compared to 5.1% of people with incomes over \$75,000.<sup>25</sup>

Wealth (i.e. total financial resources accumulated over a lifetime) may have an even greater relationship with health than income.

**Figure 11.2**  
Higher Income Individuals are Less likely to Report Fair/Poor Health, North Carolina 2008



Source: North Carolina Institute of Medicine. Analysis of the US Census Bureau’s Current Population Survey, Annual Social and Economic Supplement, 2007 and 2008.

**Wealth**

Wealth (i.e. total financial resources accumulated over a lifetime) may have an even greater relationship with health than income. Annual income is a rather unstable measure, as incomes vary from year to year. Some households experience sharp losses or increases in income with the loss or gain of a job. Wealth can buffer temporary financial changes. For example, sudden or temporary losses in income could be mitigated by using assets to cover income deficits. In addition, wealth can vary dramatically within income levels; whites in the bottom income group have nearly 400 times the net worth of African Americans in the same income group.<sup>27</sup> While there are conceptual and empirical grounds for measuring wealth in health studies, it has not been widely used as an economic indicator for economic status. Wealth is generally more difficult to measure, as it may require information on stocks, retirement accounts, pensions, real estate, automobiles, and taxes. The market values for these assets may be more time-consuming or difficult to determine, and accuracy in reported assets can be problematic.<sup>28</sup>

While the number of studies using wealth as an indicator of economic position is small, studies that have examined the relationship between wealth and health have shown an association with mortality, self-reported health status, chronic conditions, mental health, and some risky health behaviors.<sup>28</sup> Greater wealth is generally associated with decreased mortality, even after controlling for education,

income, and occupation. When controlling for education and income, having greater levels of assets, absence of credit card debt, home ownership, and greater net worth are associated with better self-reported health. Conversely, people with less wealth are more likely to have a greater number of chronic conditions than people with more wealth.<sup>28</sup> Low wealth is also associated with increased depression, less leisure-time, physical activity, and increased use of alcohol and drugs. Wealth has an independent effect on health, after controlling for other socioeconomic measures such as income, education, or occupation.

In North Carolina in 2004, 11.3% of households had zero or negative net worth (i.e. household debt is equal to or greater than household financial assets). In addition, 17.5% of households in North Carolina were asset poor and did not have sufficient net worth to subsist at the poverty level for three months in the absence of income. North Carolina ranked 26th (out of the 50 states and the District of Columbia) in net worth of households, 36th in median credit card debt, and 30th in the rate of home ownership in 2004 (with one being the best performing state).<sup>29</sup> The accumulated wealth of North Carolinians, along with other people in the country, is likely to have suffered given the recent downturn in the economy. This, in turn, is likely to exacerbate existing health disparities in health outcomes.

### Income inequality

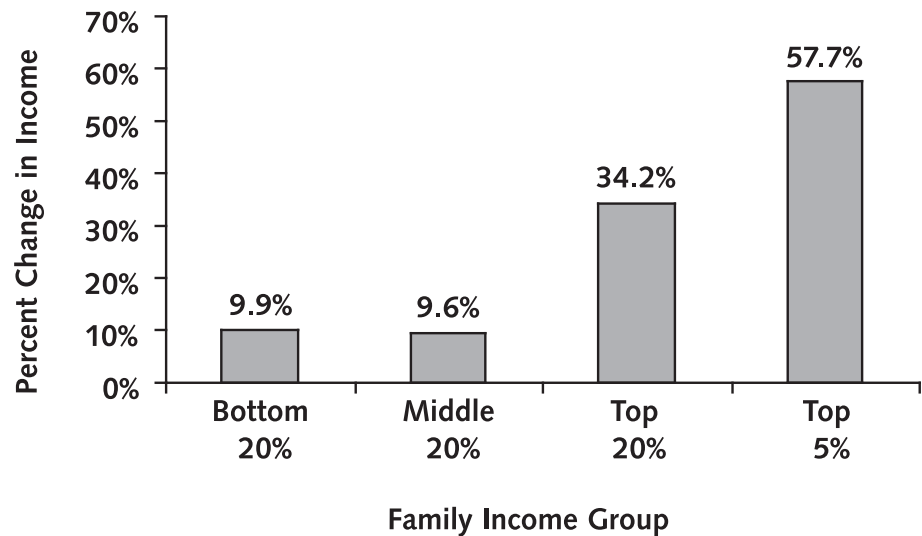
Based on the positive relationship between income and health, one would expect that since the United States is the wealthiest country in the world, it would have the best health in the world. However, the United States ranks 25th among industrialized nations in infant mortality and 23rd in life expectancy.<sup>7</sup> Researchers have suggested that instead of average income, it is the extent of income inequality in society that influences health. However, results on income inequality and health have been mixed, with some of the smaller studies unable to detect any differences based on the level of income inequality. However, the majority of studies that included larger sample sizes indicate a relationship between income inequality and different health indicators. In particular, state-level income inequality is associated with mortality, self-reported health, depression, hypertension, smoking, and lack of physical activity, with higher income inequality resulting in worse health.<sup>30</sup> These results suggest that the effect of income inequality on health may have an overarching effect beyond that of individual income. In other words, individual income affects individual health, but income inequality affects societal health so that individuals, regardless of individual income, living in a state or country with greater income inequality have worse health than states or countries with more equitable income distribution.<sup>31</sup>

Income inequality has increased in North Carolina over the past two decades. In 2004-2006 the richest 20% of families in North Carolina had average incomes 7.2 times the size of the poorest 20%, up from 5.9 in 1987-1989. The growth in the income gap between North Carolina's richest and poorest families was the 21st largest in the nation. The growth in income inequality in the state is due to the fact that rich families have experienced much greater gains in income in the past

**North Carolina ranked 26th (out of the 50 states and the District of Columbia) in net worth of households, 36th in median credit card debt, and 30th in the rate of home ownership in 2004 (with one being the best performing state).**

20 years than low-income or middle-income families. (See Figure 11.3.) While the average income of the richest 5% of North Carolinians increased by 57.7% between 1987-1989 and 2004-2006, a gain of approximately \$4,249 a year, the income of the poorest 20% of families only increased by 9.9%, or approximately \$87 per year.<sup>31,32</sup>

**Figure 11.3**  
**The Highest Income Families in North Carolina had the Greatest Gains in Income Over the Last 20 Years**



Source: Center on Budget and Policy Priorities and Economic Policy Institute. Pulling apart: a state by state analysis of income trends. <http://www.cbpp.org/4-9-09sfp.htm>. Published April 2008. Accessed June 17, 2009.

In 2008 more than a million North Carolinians lived in a family that did not earn enough money to afford basic, necessary expenses, even though 61% of adults in these families worked. Economic insecurity forces families to choose between purchasing health care and other basic necessities.

**Increasing Economic Security**

As discussed above, in 2008 more than a million North Carolinians lived in a family that did not earn enough money to afford basic, necessary expenses, even though 61% of adults in these families worked.<sup>14</sup> Economic insecurity forces families to choose between purchasing health care and other basic necessities. The constant prioritization and struggle to make ends meet can produce chronic stress. Research has shown that stressful experiences have a negative impact on health and can damage immune defenses and vital organs, especially with repeated stresses over time.<sup>33</sup> Stress can also lead to chronic illnesses, such as cardiovascular disease, and accelerated aging.

Economic insecurity may also lead to food insecurity, where individuals/families have limited access to nutritionally adequate and/or safe foods.<sup>34</sup> Adequate nutrition, both while in the womb and after birth, is critical for the healthy development of children. Increasing evidence indicates that the environment in the womb influences the development of type 2 diabetes, high blood pressure, and heart disease both in childhood and adulthood.<sup>18</sup> Households in North Carolina

with lower incomes are significantly more likely to experience food insecurity. In 2008, 15.8% of parents with incomes below \$25,000 reported cutting their child's meal size due to a lack of money to purchase food, compared to less than 1% in households with incomes greater than \$75,000.<sup>21</sup> Food insecurity can also cause adults to prioritize food over medications or medical care. In fact, food insecurity has been shown to be independently associated with postponing needed medical care and medications, as well as increased use of the emergency department. During 2007 the number of children with food insecurity increased by more than 60%, to 691,000.<sup>18</sup> With the continued decline in the US economy, it is likely that many more children and families are currently experiencing food insecurity.

One way to increase economic security for low- and moderate-income families and thus allow for greater opportunity for healthful living is through increasing the state Earned Income Tax Credit (EITC), as the majority of poor and low-income families has at least one worker. The federal EITC is one of the most effective anti-poverty measures for low- and moderate-income working families in the United States and lifts approximately 4.5 million people, more than half of whom are children, out of poverty each year.<sup>35,36</sup> The federal credit is a refundable earned income tax credit (i.e. after offsetting for taxes owed, the remaining credit is provided as a refund) for people earning less than approximately \$40,000 a year (depending on family size) and provides low-income and middle-income workers with additional funding to pay for the difference between what they earn and the income they need to meet their basic needs.<sup>f</sup> Research has shown that families use the credit to buy basic necessities, pay down debt, and finance education and housing, all of which promote economic security.<sup>14</sup> Using the EITC is also attractive politically as it rewards work, is administered as a universal benefit, and reaches 95% of eligible people. The importance of the EITC is even greater at the state level. State and local taxes are generally regressive, so that low-income taxpayers use more of their income to pay for taxes than high income taxpayers.<sup>37</sup> In 2002 the poorest fifth of North Carolinians paid 10.6% of their income on state and local taxes while the highest-income North Carolinians paid only 6.1%.<sup>38</sup> During the 2007 Session, the North Carolina General Assembly created a state EITC. Originally set at 3.5% of the federal EITC for tax year 2008, the credit was increased to 5% during the 2008 Session (for tax year 2009).<sup>g</sup> Low-income and middle-income workers who qualify for the federal credit are eligible for the state EITC.<sup>h</sup> The EITC became effective in 2009 and is expected to provide approximately

**Food insecurity has been shown to be independently associated with postponing needed medical care and medications, as well as increased use of the emergency department.**

**One way to increase economic security for low- and moderate-income families and thus allow for greater opportunity for healthful living is through increasing the state Earned Income Tax Credit (EITC), as the majority of poor and low-income families has at least one worker.**

f The federal Earned Income Tax Credit (EITC) varies by family size and income level, providing greater refunds for lower incomes and larger families. The federal credit is also administered so that the credit phases out gradually as income increases over a certain point. In 2008, a single parent with two children received a credit of 40% for every dollar earned up to approximately \$12,000. Between \$12,000 and around \$16,000, no additional credit was received. The credit began to phase out after approximately \$16,000, falling to zero for earned incomes over \$38,646. (Institute on Taxation and Economic Policy. Policy brief #15: rewarding work through earned income tax credits. <http://www.itepnet.org/pb15eitc.pdf>. Published 2008. Accessed June 18, 2009.

g NCGS 105-151.31(a). The 3.5% credit is effective for taxable year 2008. The 5% credit will be effective for taxable year 2009.

h The state EITC estimator calculates how much a person/family can generally expect to receive from the EITC. The Estimator is available at <http://www.cbpp.org/eic2009/calculator/>.

**An additional measure to increase economic security—by decreasing food insecurity—would be to increase the use of the Supplemental Nutrition Assistance Program (SNAP) by low-income individuals and families.**

\$50 million annually to more than 825,000 low- and moderate-income working North Carolinians.<sup>39</sup> The combined federal and state EITCs could be worth close to \$5,000 for families with two or more children.<sup>37</sup> However, the current level of the state EITC may not be sufficient to fully lift working families out of poverty, especially during the current recession. A bill has been proposed in the North Carolina General Assembly to increase the state EITC to 6.5% of the federal EITC.<sup>i</sup> The increase will provide further support to low-income working families and families who have lost jobs or been forced to work in lower paying jobs due to the recession.<sup>j</sup> The Task Force supports this increase of the state EITC.

An additional measure to increase economic security—by decreasing food insecurity—would be to increase the use of the Supplemental Nutrition Assistance Program (SNAP) by low-income individuals and families.<sup>k</sup> SNAP helps families with monthly incomes less than or equal to 130% FPG purchase basic groceries.<sup>l</sup> SNAP may only be used to purchase food products. While monthly assistance is modest (about half of participating households received less than \$200 a month in 2008), the benefit has helped increasing numbers of low-income North Carolinians weather the recession. In April 2009, approximately 1.2 million North Carolinians, or 13% of the population, lived in a family receiving SNAP, an increase of more than 21% since 2007.<sup>40</sup> In addition, SNAP payments are fully federally funded and generate an important economic stimulus in the state. Between December 2007 and March 2009, families in North Carolina received over \$1.6 billion in assistance.<sup>m</sup> These funds were used to purchase food locally, generating an estimated \$2.8 billion in economic activity in the state.<sup>n,41</sup> However, SNAP may not be reaching everyone in need. Expanding outreach to individuals and families could increase the number of households aware of SNAP and raise program participation. In addition, the more people receiving the benefit, the greater the purchasing power of low-income community residents and the greater the economic benefit to the state.

To increase the economic security and health of North Carolinians, the Task Force recommends:

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- i NCGA House Bill 1415 (2009).
  - j As long as a person earned income at some point in the year, they are still eligible for the EITC.
  - k SNAP benefits were formerly called Food Stamps.
  - l Gross income must not exceed 130% of the federal poverty guidelines. Net income may not exceed 100% of the federal poverty guidelines. Resources must not exceed \$2,000 per household (unless a household member is 60 years old or more, in which case resources can be up to \$3,000). Food Stamp recipients must meet Temporary Assistance for Needy Families (TANF) work requirements.
  - m Total amount in inflation-adjusted dollars.
  - n Research indicates that every \$1 in SNAP benefits generates \$1.73 of additional spending. (North Carolina Justice Center. BTC Brief. Reversing the decline: food stamps bolster local economies, help households weather economic storm. <http://www.ncjustice.org/sites/default/files/2009-BTC%20Brief%20FNS%20Impact.pdf>. Published May 2009. Accessed June 18, 2009.)



## Recommendation 11.1: Promote Economic Security (PRIORITY RECOMMENDATION)

- a) The North Carolina General Assembly should increase the state Earned Income Tax Credit (EITC) to 6.5% of the federal EITC.
- b) 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) by low-income individuals and families.

### Neighborhoods and Housing

The links between housing and health are complex, but it is now clear that substandard, unhealthy, overcrowded, and unaffordable home environments contribute to a large number of health problems.<sup>42-44</sup> Many of these problems fall disproportionately on lower income individuals, who are more likely to live in older or substandard housing, in overcrowded conditions, and spend excessive amounts of their income on housing.<sup>45</sup>

### Neighborhood Characteristics

Most people understand the link between individual socioeconomic characteristics (i.e. income, wealth or education) and health. However, the communities in which a person lives can also have an effect on health.<sup>46</sup> Studies have shown that people who live in poorer neighborhoods have higher mortality rates, worse birth outcomes, more chronic illnesses, and poorer reported health status than people living in higher income neighborhoods. For example, a study in Wake County, North Carolina, found that living in poorer neighborhoods is associated with higher odds of having a pre-term birth, even when controlling for individual characteristics and risk factors.<sup>47</sup> Communities with higher concentrated poverty and lower social cohesion have also been associated with greater rates of depression and higher rates of teen pregnancy or conduct disorders among adolescents.<sup>o</sup> Moreover, many of these adverse health impacts persist, even after adjusting for individual-level characteristics of the people living in the different neighborhoods.<sup>48</sup> As discussed more fully in other chapters, the neighborhoods in which we live can impact health in a number of different ways. Different neighborhoods offer different access to healthy food choices (discussed more fully in Chapter 4) or the availability of sidewalks, parks, and other open spaces (discussed in Chapter 4). In addition, the health of a community can be affected by the proximity of environmental hazards (discussed in Chapter 7).

**Substandard, unhealthy, overcrowded, and unaffordable home environments contribute to a large number of health problems.**

<sup>o</sup> North Carolina has a smaller percentage of its population living in high poverty concentration communities in 1999, with 14.6% of the state population lived in high-poverty communities (defined as having 20% or more of the community in poverty) compared to 18.4% nationally. (Bishaw A. US Census Bureau. Areas with Concentrated Poverty: 1999. <http://www.census.gov/prod/2005pubs/censr-16.pdf> . Published July 2005. Accessed June 18, 2009)

Many falls, poisonings, and fire-or-burn related deaths and injuries occur in the home.

Overcrowding could also create serious health problems in the event of a particularly virulent influenza pandemic.

**Housing**

Housing that is damp, poorly ventilated, overly hot or cold, or overcrowded, as well as housing that lacks hot water, adequate food storage, or sufficient waste disposal has been linked to infection, disease, and other illness.<sup>43</sup> Inability to maintain a comfortable temperature in the home can be a risk factor for poor health, particularly for the young and old, and can also lead to increased mold growth.<sup>49-52</sup> Young children, many of whom spend more than 90% of their time in the home, may be at especially high risk for problems caused by unhealthy home environments.<sup>53</sup> Although unhealthy home environments tend to be more prevalent in older or substandard housing, environmental health hazards can be present in homes of any age.<sup>54</sup> The relationship between environmental hazards in the home and health is described more fully in Chapter 7.

Unfortunately, there is no estimate of the number of people in North Carolina living in substandard housing, broadly defined. The US Census Bureau only collects state level data on the number of people living without cooking or plumbing facilities. In 2007 there were very few occupied housing units in North Carolina that lacked plumbing (<12,000 units) or kitchen facilities (<16,000).<sup>55,56</sup> However, the problem of substandard housing is much larger than just the lack of plumbing or kitchen facilities. The US Census Bureau’s American Housing Survey collects more detailed housing information but does not report state-specific data. Nationally, and in the south, low-income households are more likely to be older homes, those with holes or cracks in the floor or foundation, homes with rodents, and those without smoke detectors.<sup>57</sup> (See Table 11.2.)

**Table 11.2**  
**Low-Income Households are More Likely to Live in Housing with Potential Health Issues (Southern Region, US 2007)**

Family Income	Rodents in last 3 months	Hole or crack in floor or foundation	No smoke Detector	Built before 1978 (prohibition of lead paint)
<100% FPG	10%	9%	16%	67%
100%-200% FPG	7%	7%	12%	63%
200%-300% FPG	6%	5%	9%	55%
>300% FPG	4%	3%	5%	47%

Source: North Carolina Institute of Medicine. Analysis of 2007 American Housing Survey, US Census Bureau. Houses in South region only.

Poor housing conditions can also lead to unintentional injuries. Many falls, poisonings, and fire-or-burn related deaths and injuries occur in the home. National estimates suggest that 50% of all deaths due to falls, 25% of all poisoning-related deaths, and 90% of all fire- or burn-related deaths occur in the home.<sup>58</sup> In addition to deaths, injuries in the home contributed to 16% of all non-fatal injuries that resulted in a visit to a physician’s office, 22% of the injuries that resulted in a visit to a hospital outpatient department, and 33% of the injuries

that resulted in a visit to the emergency department.<sup>59</sup> (Unintentional injuries are described in more detail in Chapter 8).

Many of the environmental hazards, injuries, and accidents that occur in the home can be prevented. The Centers for Disease Control and Prevention (CDC), the US Department of Housing and Urban Development (HUD), and the Environmental Protection Agency (EPA) have created the Healthy Homes Initiative to improve housing conditions and create healthier homes. This is described more fully in Chapter 7.

### **Overcrowding**

Living in close proximity to others makes it easier to transmit certain infectious diseases, including tuberculosis and respiratory infections.<sup>43,60</sup> Overcrowding could also create serious health problems in the event of a particularly virulent influenza pandemic.

Low-income people are more likely than others to live in overcrowded conditions. In 2007 more than 70,000 housing units in the United States were overcrowded (2% of all housing units).<sup>p</sup> In North Carolina, rented units are almost four times more likely to be overcrowded than owned units (4.0% vs. 1.1%).<sup>61</sup> More families are facing evictions or foreclosures due to the downturn in the economy. This, in turn, has led to increased doubling-up or sharing housing with other family or friends.<sup>62</sup> Thus, the number of people living in overcrowded conditions is likely to have increased since the 2007 American Community Survey.

### **Housing Affordability**

In addition to overcrowding, housing affordability is a particular problem in North Carolina. Families, especially low-income families, that spend a large amount of their income on housing (rent or mortgage), have less disposable income to spend on food, heating, medical needs, transportation, or other basic needs. Studies have shown that families that report having difficulty paying rent or utilities have greater reported barriers to accessing health care, higher use of the emergency department, and more hospitalizations.<sup>34</sup>

In general, housing is considered to be unaffordable (high cost burden) if the individual or family has to spend more than 30% of their income on housing. Housing is considered to be extremely unaffordable if the person has to spend more than 50% of their income on housing. In North Carolina, approximately 1.1 million households spent more than 30% of their household income on housing costs in 2007.<sup>63,64</sup> Of these, 18% (more than 624,000 households) spent between 30%-49% of their household income on housing, and 13% (more than 460,000 households) paid more than 50% of their income on housing. (See Figure 11.4.)

Low-income families are much more likely to rent than to live in owner occupied housing. For example, more than half of renters in North Carolina have incomes below \$35,000 (37% of the renters have incomes less than \$20,000 and 25% have

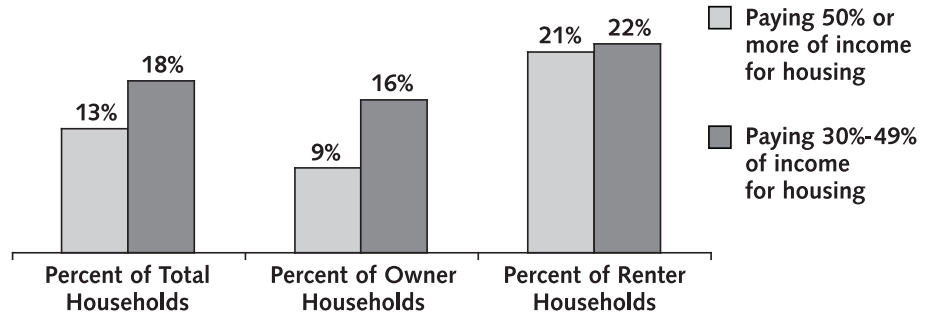
**Studies have shown that families that report having difficulty paying rent or utilities have greater reported barriers to accessing health care, higher use of the emergency department, and more hospitalizations.**

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p Overcrowded housing is defined as having more than one person per room.

**Housing affordability is a problem which predominantly affects lower income families.**

**Figure 11.4**  
**Almost One-Third of North Carolina Households Live in Unaffordable Housing (2007)**



Source: US Census Bureau. 2007 American Community Survey, Table B25070 and B25091.

incomes between \$20,000 and \$34,999). In contrast, only 29% of people living in owner occupied houses have incomes in the same range (14% of people living in owner occupied housing have incomes of less than \$20,000, and another 15% have incomes between \$20,000 and \$34,999).<sup>66</sup>

Perhaps not surprisingly, low-income renters are more likely than people with higher incomes to live in “unaffordable” housing, spending more than 30% of their income on housing costs. For example, 73% of North Carolina renters with incomes below \$20,000 a year spend 30% or more on rent, in comparison to 51% of those with incomes between \$20,000 and \$34,999 a year, 13% of those with incomes between \$35,000 and \$49,999 a year, and only 2% of those with incomes above \$50,000 a year.<sup>67</sup> Thus, housing affordability is a problem which predominantly affects lower income families.

Because of the high cost of housing, people who have limited incomes have less choice about where to live. They may be forced to live in overcrowded or substandard housing or in unsafe neighborhoods. People who have problems paying their housing costs move more frequently; some experience periods of homelessness. Residential instability is linked to poorer health outcomes among adolescents, including higher levels of behavioral and emotional problems, increased rates of teen pregnancy, earlier initiation of drug use, and increased depression.<sup>65</sup> Some studies suggest a causal relationship between increased residential mobility and worse health outcomes. There are also numerous studies which show links between homelessness and health status. In North Carolina, there are an estimated 10,000-12,000 people who are homeless on any particular day.<sup>4</sup> Individuals living on the street or in temporary shelters are more likely to report mental health problems, suicide, alcohol and drug dependency, respiratory infections, accidents, and violence than others with more stable housing. Some of

q Are M. Homeless Policy Specialist, North Carolina Department of Health and Human Services. Written (email) communication. June 18, 2009.

these conditions may have contributed to the person's homelessness, whereas other health problems may have been caused or exacerbated by the lack of housing.<sup>45</sup>

In 1987, the North Carolina General Assembly established the Housing Trust Fund. Since 1987, the General Assembly has appropriated differing levels of annual funding to the North Carolina Housing Finance Agency to support the Housing Trust Fund. Funding levels have ranged from \$0 to almost \$19 million, largely in non-recurring funds.<sup>r</sup> Funds from the Housing Trust Fund are used to leverage other private development funds and to lower the costs of building single, multi-unit, and apartment complexes so that they are affordable to low-income families, seniors, and people with disabilities. In addition, some of the funding is used to develop housing options for people with mental illness, developmental disabilities, or other disabilities, as well as homeless individuals and victims of domestic violence.<sup>68</sup> Historically, Housing Trust Funds have been used to develop more than 19,000 affordable homes and apartments. Eighty percent of the funds are used to support families with incomes below 50% of the local median household income (approximately \$22,400/year on a statewide basis in 2007), and almost half (48%) are used to help increase affordable housing options for families below 30% of the local median income (about \$13,400/year on a statewide basis).<sup>s</sup>

North Carolina can do more to expand affordable housing options. The major constraint is the lack of funding through the Housing Trust Fund. Since its inception, funding for the Trust Fund has varied. Over the last five years, non-recurring funding has ranged between \$3 million and \$10 million.<sup>t</sup> The North Carolina General Assembly began appropriating recurring funds in FY 2006, which have ranged between \$3 million and \$10 million. The North Carolina General Assembly should expand the amount of recurring funds appropriated to the Housing Trust Fund. One option would be to capture the interest from housing security deposits and dedicate the funds for the Housing Trust Fund.<sup>u</sup> Regardless of the funding source, the Task Force supports increased funding to the Housing Trust Fund to expand the availability of affordable housing. In addition, the Task Force supports strategies to reduce utility expenses for low-income families, in order to ensure that these families can afford heating and cooling costs.<sup>v</sup> Thus, the Task Force recommends:

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r Estes C. Executive Director, North Carolina Housing Coalition. Written (email) communication. June 19, 2009.

s The median household income was \$44,772 in 2007. (North Carolina Quick Facts. US Census Bureau. American Community Survey 2007. <http://quickfacts.census.gov/qfd/states/37000.html>.)

t Estes C. Executive Director, North Carolina Housing Coalition. Written (email) communication. June 19, 2009.

u In 2007, the North Carolina Supreme Court mandated that the State Bar implement a mandatory program capturing interest on the general client trust accounts maintained by attorneys. This IOLTA (interest on lawyer's trust accounts) is used to support pro bono services for low-income populations. [http://www.ncbar.gov/programs/iolta\\_banks.asp](http://www.ncbar.gov/programs/iolta_banks.asp)

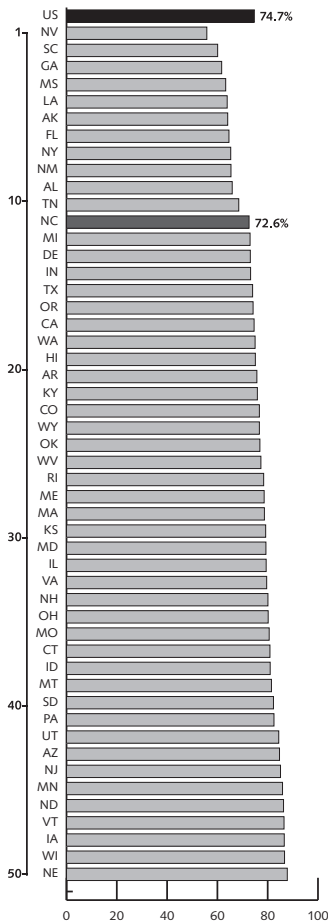
v For example, the Task Force on Prevention heard about the North Carolina Saves Energy bill (HB 1050) that was introduced in the 2009 General Assembly. The proposed legislation would set up an NC SAVES ENERGY fund to promote energy conservation and energy efficiencies, and would promote low-income weatherization programs. Priority in funding would be given, in part, to housing owned or occupied by low- and moderate-income residents.

## Recommendation 11.2: Increase the Availability of Affordable Housing and Utilities

To help economically disadvantaged North Carolinians better afford housing and utilities, the North Carolina General Assembly should:

- a) Appropriate \$10 million in additional recurring funding beginning in SFY 2011 to the North Carolina Housing Finance Agency to increase funding to the North Carolina Housing Trust Fund.
- b) Enact legislation to help all North Carolinians and especially low-income North Carolinians lower their energy expenses.

Percent of Incoming Ninth Graders Who Graduate Within Four Years, 2004-2005



Source: United Health Foundation. America's Health Rankings: data tables. United Health Foundation website. <http://www.americashealthrankings.org/2008/tables.html>. Published 2008. Accessed December 4, 2008.

## Educational Achievement

Academic achievement and education seem to be strongly correlated with health across the lifespan. In general, those with less education have more chronic health problems and shorter life expectancies. In contrast, people with more years of education are likely to live longer, healthier lives. This education-health link is one that seems to result from the overall amount of time spent in school rather than from any particular content area studied or the quality of education. Further, these health disparities based on years of education are seen in every ethnic group.<sup>69</sup>

Unfortunately, North Carolina does not fare well in educational achievement. According to the North Carolina Department of Public Instruction (DPI) data for 2007-2008, the four-year cohort graduation rate was 70.3%. This four-year cohort graduation rate shows how many students who began high school in the 2003-2004 academic year graduated four years later. The graduation rate increases slightly (71.8%) when examining the five-year graduation rate. While these statistics are disappointingly low, the numbers are even lower for minority and disadvantaged students.<sup>70</sup> Nationally, North Carolina ranks 39th in the percentage of incoming ninth graders who graduate within four years.<sup>71</sup> The state has a long way to go to ensure that more of its students graduate from high school and, in turn, are healthier. Access to affordable, quality health care is important when considering ways to improve the health of North Carolinians, but health care alone is not enough to improve long-term health. We must also focus on schools and education policies to improve the health of our state.<sup>1</sup>

## The Impact of Education on Health

Adults who have not finished high school are more likely to be in poor or fair health than college graduates. The age-adjusted mortality rate of high school dropouts ages 25-64 is twice as large as the rate of those with some college education. They are also more likely to suffer from the most acute and chronic health conditions, including heart disease, hypertension, stroke, elevated

cholesterol, emphysema, diabetes, asthma attacks, and ulcers.<sup>w</sup> College graduates live, on average, five years longer than those who do not complete high school. In addition, people with more education are less likely to report functional limitations and are also less likely to miss work due to disease.<sup>71</sup>

Educational achievement is not only correlated with the health of the individual, but also with that of his or her offspring. For example, maternal education is strongly linked to infant and child health. Babies born to women who dropped out of high school are nearly twice as likely to die before their first birthday as babies born to college graduates.<sup>2</sup> More educated mothers are less likely to have babies with low- or very low-birth weight, which is correlated with infant death within the first year of life. Children whose parents have not finished high school are more than six times as likely to be in poor or fair health as children whose parents are college graduates.<sup>7</sup>

It is difficult to determine whether the effect of education on health is causal. It is possible that there is an inverse relationship between the two—that is, that poor health affects educational achievement. Alternatively, it is also possible that poor educational achievement has mediating effects that are harmful to a person's health. For example, people with less education earn, on average, less than those with higher levels of schooling. Living in poverty has been shown to have adverse impacts on health. Additionally, there are data to show that people with less education are more likely to engage in risky behaviors which can lead to worse health outcomes. All of these factors—educational achievement, income, wealth, and health behaviors—are interrelated and, together, can have significant health impacts. However, existing evidence does suggest some degree of causality running from education to health.<sup>72</sup>

### The Impact of Education on Health Behaviors

Not only does education shape health outcomes, it also influences health behaviors. Data indicate that individuals with more education lead healthier lives and engage in fewer risky behaviors. Studies have examined health risks by years of added education. Table 11.3 summarizes the findings of one study. The table includes two columns—the implied change in percentage points due to four additional years of education and this effect relative to the mean. For example, those with four more years of education are eight percentage points less likely to smoke; evaluated at the average prevalence, this is a 35% reduction in the prevalence of smoking (from 23% prevalence to 15% prevalence).

Individuals with four more years of education are less likely to smoke, binge drink, or use illegal drugs than are those with less education. The better educated are also less likely to be overweight or obese. Additionally, they are significantly more likely to engage in protective health behaviors. People with more education are more likely to get preventive care such as flu shots, mammograms, pap smears,

**Adults who have not finished high school are more likely to be in poor or fair health than college graduates. They are also more likely to suffer from the most acute and chronic health conditions, including heart disease, hypertension, stroke, elevated cholesterol, emphysema, diabetes, asthma attacks, and ulcers.**

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<sup>w</sup> Cancer, chicken pox, and hay fever are exceptions, possibly due to increased rates of reporting, screening and diagnosis, or cancer survival. Physical and mental functioning are improved for those with more education, as they are less likely to self-report poor health, anxiety or depression.

and colonoscopies. Additionally, individuals with chronic conditions, such as hypertension or diabetes, are more apt to have their condition under control if they have more years of education. The probability of always using a seat belt, as well as having a house with a smoke detector, and one that has been tested for radon, is higher among those with more years of education. Moreover, these positive health impacts associated with increased years of education persist, even after controlling for income, family size, marital status, urbanicity, race, Hispanic origin, coverage by health insurance, occupation, and industry.<sup>69</sup>

After controlling for exercise, smoking, drinking, seat belt usage, and use of preventive services, the effect of education on mortality is reduced by only 30%.

**Table 11.3**  
**Measure of Effects (in percentage points and relative to the mean) of Four More Years of Schooling on Health Risk and Health Protective Behaviors**

Health Behavior	Percentage point change	Percentage change relative to overall mean
<Smoking	-8	-35%
Consume Alcohol (number of days of 5 or more drinks)	-7	-64%
Overweight/Obese	-5	-22%
Use Illegal Drugs	-6	-12%
Get flu shots	+7	23%
Get mammograms	+10	19%
Get pap smears	+10	17%
Get colonoscopies	+2.4	27%
Always use seat belt	+12	18%
Have house with smoke detector	+10.8	14%
Have house tested for radon	+2.6	65%

Source: Cutler D, Lleras-Muney A. National Bureau of Economic Research. Education and health: evaluating theories and evidence. <http://www.nber.org/papers/w12352>. Published 2006.

While it is very likely that that the positive health outcomes associated with education are at least partially due to differences in health behaviors, the behavioral differences do not explain all of the differences. After controlling for exercise, smoking, drinking, seat belt usage, and use of preventive services, the effect of education on mortality is reduced by only 30%. This relatively moderate reduction suggests that there are other reasons or behaviors that contribute to the lower mortality rate among those with more education.<sup>69</sup> These results support the concept that dropping out of high school is itself a risk behavior. Thus, policies that promote greater educational achievement (e.g. higher graduation rates or more years of education) are also health promoting policies. Education matters for health and may be an underutilized arena for health interventions.



### Early Childhood Interventions

As noted previously, low-income families generally have worse health outcomes than families with higher incomes. Furthermore, on average, poor children often have parents with lower educational achievement than those children in higher income families. In North Carolina, 23% of low-income parents never completed high-school, compared to 2% of those earning more than 200% FPG. In households where parents earn more than 200% FPG, 16% have completed some high school and 82% some college. Of parents in households earning less than 200% FPG, 37% have completed some high school and 39% some college. In addition, many parents in low-income households are working more than one job to make ends meet.<sup>73</sup> As a result, children in lower income families often come to school less prepared and with fewer parental resources to help bridge the educational gap.

Children who live in poverty lag behind more affluent children in cognitive, language, and socioemotional skills as early as three years of age. The gaps are wide at kindergarten and for African American children increase with each year of schooling.<sup>74</sup> Gaps in behavioral and academic skills at the start of schooling have an impact on both short- and long-term achievement. Interventions and support, such as high quality child care and preschool programs can help low-income children start school on more equal footing. High-quality early education programs boost the achievement of African American and Latino children and narrow the school readiness and later achievement gaps.<sup>75</sup> Other research has demonstrated that the long-term effects (e.g. lower crime rates and higher graduation rates) produce a positive return on investment for high-quality early childhood programs.<sup>76</sup> A cost-benefit analysis of one North Carolina program has shown a tremendous rate of return on the investment. For every dollar that was invested in quality early child care, approximately four dollars were generated. This high rate of return can be attributed to increases in earning potential of over \$143,000 over the lifetime of the participants, savings to school districts over \$11,000 per child due to decreased need for services, and improved health benefits partially attributed to lower rates of smoking.<sup>77</sup>

There is no one strategy that works for all children, as interventions should match a child's or family's needs.<sup>78</sup> Fortunately, there are different evidence-based programs which have been found to increase parental bonding, identify children with or at risk of developmental delays, and increase school readiness. Smart Start,<sup>x</sup> North Carolina's early childhood initiative that helps ensure that young children enter school healthy and ready to learn, is investing in research-based programs that produce outcomes that young children need, including:

- Incredible Years: a program that improves parenting skills and decreases children's behavior problems.<sup>79</sup>

**Children who live in poverty lag behind more affluent children in cognitive, language, and socioemotional skills as early as three years of age. Gaps in behavioral and academic skills at the start of schooling have an impact on both short- and long-term achievement.**

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x More information about Smart Start and North Carolina Partnership for Children is available at: <http://www.smartstart-nc.org/>.

- Assuring Better Child Health and Development (ABCD): a program that incorporates developmental screening into primary health care practices to identify children with developmental problems as early as possible.<sup>80</sup>
- High-quality early education programs: programs that increase children's learning skills and school readiness.<sup>81</sup>

North Carolina should invest more in high quality early childhood programs.<sup>y</sup> High-quality early childhood health and education programs can improve parent-child bonding, identify children at risk of learning delays, contribute to greater academic success, increase earning potential, and lead to healthier life outcomes. Therefore, the Task Force recommends:

### **Recommendation 11.3: Expand Opportunities for High Quality Early Childhood Education and Health Programs**

North Carolina Smart Start should further disseminate the Incredible Years program, the Assuring Better Child Health and Development program, and high-quality education programs to promote healthy social and emotional development among children in need in all North Carolina counties. The North Carolina General Assembly should appropriate \$1.2 million in recurring funds to the North Carolina Partnership for Children, Inc. to support this effort.

**Youth development programs that promote school connectedness are very important for both academic success and long-term health.**

#### **Interventions during Adolescence**

After the early years, an intensified focus on youth and adolescent development is essential for increasing school success for middle- and high-school students. Schools play a vital role in helping young people achieve the competence, confidence, character, and connectedness that they require to interact with appropriate social behaviors, to have a zest for life, and to succeed in school. Positive school climates that help build these life-enhancing skills will keep kids in school for longer periods of time. Connectedness to school, followed by family and community, has been found in some studies to be the most powerful protective factor for increasing the likelihood of positive outcomes for youth, including staying in school and its correlate, improved health. Therefore, youth development programs that promote school connectedness are very important for both academic success and long-term health.<sup>82</sup>

Not surprisingly, children perform better on standardized tests and hence are more likely to graduate when they have fewer absences, fewer office referrals, and fewer short- and long-term suspensions. These students have more time in the classroom to learn. There is also an association between school crime and violence, suspensions and expulsions, and dropouts in North Carolina.<sup>83</sup> Therefore, evidence-based strategies that are effective at improving behavior and keeping

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<sup>y</sup> The 2009 Appropriations Act cut funding for both Smart Start and More at Four, and the 2009 Studies Act includes a provision to study, among other items, consolidating these programs.

children in school should be implemented to decrease suspensions and to increase achievement outcomes.

Fortunately, there are evidence-based programs in North Carolina that are effective at improving educational outcomes. Schools that are doing a better job at reducing suspensions, drop-out rates, and crimes have generally been more proactive in their approach. Schools that have implemented Positive Behavior Support, ninth grade academies, alternative programs and schools, and innovative high school models such as early college programs (such as Learn and Earn) are seeing positive early results.

It was beyond the scope of work for this Task Force to delve into details of these particular programs, but because education can have an impact on health throughout life and across generations, the Task Force recognized the importance of improving the high school graduation rate. Investments aimed at increasing educational attainment can decrease society's health-related costs, increase earnings, boost tax revenues for governments, decrease welfare expenditures, and decrease crime and incarceration rates.<sup>z</sup> Thus, the Task Force recommended that North Carolina focus on increasing educational attainment within the K-12 years, with a particular focus on increasing the high school graduation rate. To do this, the Task Force recommended:

### **Recommendation 11.4: Increase the High School Graduation Rate (PRIORITY RECOMMENDATION)**

- a) The North Carolina State Board of Education (SBE) and the North Carolina Department of Public Instruction (DPI) should 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. The SBE should implement evidence-based or best and promising policies, practices, and programs that will strengthen interagency collaboration (community partnerships), improve student attendance rates/decrease truancy, foster a student-supportive school culture and climate that promotes school connectedness, explore and implement customized learning options for students, and more fully engage students in learning. Potential evidence-based or promising policies, practices, and programs might include, but are not limited to:
  - 1) Learn and Earn partnerships between community colleges and high schools.
  - 2) District and school improvement interventions to help low-wealth or underachieving districts meet state proficiency standards.

**Because education can have an impact on health throughout life and across generations, the Task Force recognized the importance of improving the high school graduation rate.**

<sup>z</sup> Section 7.13.(a) of SL2007-451 increased state appropriation for dropout prevention grants by \$13 million. Specific evaluation components include programs aimed at teen pregnancy prevention and pregnant and parenting teens. Furthermore, additional appropriations boosted recurring funding for Learn and Earn and North Carolina Virtual Public Schools by \$3.6 million and \$2 million, respectively.

- 3) Alternative learning programs, for students who have been suspended from school, that will support continuous student learning, behavior modifications, appropriate youth development, and increased school success.
  - 4) Expansion of the NC Positive Behavior Support Initiative to include all schools in order to reduce short- and long-term suspensions and expulsions.
  - 5) Establishment of a committee to study the potential impact of raising the compulsory school attendance age from 16 to 17 and 17 to 18 in successive years.
- b) The SBE should work with appropriate staff members in DPI, including curriculum and finance representatives, and staff from the North Carolina General Assembly Fiscal Research Division, to examine the experiences of other states and develop cost estimates for the implementation of the initiatives to increase the high school graduation rate. These cost estimates will be reported to the research division of the North Carolina General Assembly and the Education Oversight Committee by April 1, 2010 so that they can appropriate recurring funds.

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**M**any of the leading causes of premature death and disability can be prevented through healthier lifestyle choices. Children can be encouraged to adopt these health-promoting behaviors through promotion of exercise, providing healthy and nutritious meals, promoting social connections to school and community, and helping them gain the knowledge and skills to make healthy choices. Health care professionals can influence health choices of both children and adults through the advice they give in the clinical setting. In addition, the state can help people in making healthy choices by ensuring they have healthy places to work and play.

Multifaceted prevention efforts that promote healthy behaviors at the individual, interpersonal, clinical, community, and policy level have a better chance of positively impacting the health of a population than solitary interventions.<sup>1</sup> In the preceding chapters, we have focused on evidence-based strategies to reduce specific risk factors (i.e. tobacco use, lack of exercise, substance use or abuse). However, the Task Force also wanted to examine site-specific strategies to improve population health across multiple risk factors.

School-aged children spend approximately one-third of their waking time per week in schools; thus, schools are a good place to intervene to improve the health of school children.<sup>2</sup> Adults who work spend approximately one-half of their waking hours in the workplace on workdays.<sup>3</sup> Additionally, the clinical setting—and specifically a primary care office—is also an important intervention point. Thus, this chapter focuses on those health-promoting strategies that cut across multiple risk factors in schools, worksites, or clinical settings.

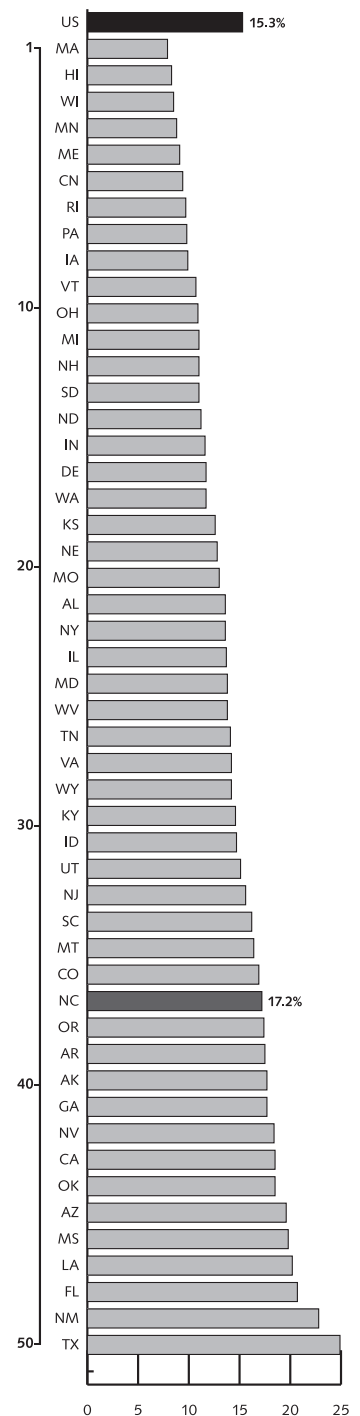
## Healthy Schools

One of the five goals of the North Carolina State Board of Education (SBE) is to ensure that North Carolina public school students are healthy and responsible. Healthy children and adolescents are better learners and are likely to do better in school.<sup>4,5</sup> Not only are healthy children more likely to do better in school, but those youth who succeed in school and have more years of education are more likely to be healthy adults.<sup>6</sup> While the core mission of public education is academic achievement, schools can and must play an important role in positively shaping health behaviors in the state’s youth. The North Carolina Healthy Schools Initiative promotes the union of health and learning within the public school setting.<sup>7</sup>

## Coordinated School Health Program

The Centers for Disease Control and Prevention (CDC) promotes an integrated approach to student and staff well-being through the use of the Coordinated School Health Program (CSHP). The CSHP model has eight components including 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. The CDC provides funding to 22 states, including North Carolina, to implement the CSHP.

**Percent Uninsured, 2006-2007**



Source: The Kaiser Family Foundation. statehealthfacts.org. Data Source: Urban Institute and Kaiser Commission on Medicaid and the Uninsured estimates based on the Census Bureau’s March 2007 and 2008 Current Population Survey. Accessed August 21, 2009.

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**The CSHP model has eight components including 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.**

To effectively meet the health needs of students and staff requires support from multiple state agencies. The North Carolina Healthy Schools Initiative is a collaboration of the North Carolina Department of Public Instruction (DPI) and the North Carolina Department of Public Health (DPH). Together, staff in both departments work to design, implement, and sustain CSHPs throughout the state. This interdepartmental partnership bolsters the cooperative working relationship between education and health at both the state and local levels.<sup>8</sup> The North Carolina School Health Forum was created in 1998 to convene top-level leadership in DPI and the North Carolina Department of Health and Human Services (DHHS), along with representatives of key DPI and DHHS leaders, to discuss and maintain support for coordinated school health.<sup>a,b</sup> In addition to DPI and DPH, other state agencies play important roles in the implementation of the CSHP. For example, the North Carolina Department of Environment and Natural Resources (DENR) is responsible for environmental safety in schools and day care settings. DENR sets the sanitation rules, which are enforced through authorized environmental health specialists in local health departments.<sup>9</sup> Similarly, the Department of Juvenile Justice and Delinquency Prevention has helped fund programs in the school to improve student behavior and thus reduce delinquency and violence.<sup>10</sup>

In addition to state level support, local support is also needed for the successful implementation of CSHPs. In 2003 the SBE mandated that local school districts create and maintain a School Health Advisory Council (SHAC).<sup>c</sup> SHACs are supposed to be composed of community and school representatives, including representatives of local health departments, who represent the eight areas of the coordinated health model. SHACs are charged with assessing school district needs and resources, establishing program goals, developing a district/community plan, coordinating school programs with community programs and resources, providing leadership and assistance for local schools, and assuring continuous improvement through evaluation and quality assurance. In addition to providing advice about policy, program, or environmental changes that encourage healthy schools, the SHAC is also required to report annually on the implementation of the Healthy Active Children Policy to DPI.<sup>11</sup>

In the past, many school districts (50 of 117 Local Education Agencies (LEAs)) had trained and certified school health coordinators.<sup>11</sup> These staff were dedicated to promote school health and student wellness. They were not responsible for other curricula or administrative duties and could provide focused and sustained support to schools for wellness initiatives and health-related curriculum programs.

a The North Carolina School Health Forum is composed of leaders of the North Carolina Department of Health and Human Services (DHHS) and the North Carolina Department of Public Instruction (DPI) as well as representatives from DHHS and DPI divisions. This group was not meeting while key positions were vacant but is expected to begin meeting again soon.

b Gardner D. Section Chief, North Carolina Healthy Schools, North Carolina Department of Public Instruction. Oral communication. July 15, 2009.

c North Carolina State Board of Education. HSP-S-000. Available at: <http://sbepolicy.dpi.state.nc.us> (Accessed July 13, 2009).

However, over time the state funding that was used to support these positions was reallocated to other purposes. Today, while all 115 LEAs still have personnel responsible for the Healthful Living curriculum, they are also responsible for a number of other health-related programs.<sup>d</sup> Most districts that choose to fund a local school health coordinator do so with local dollars.<sup>e</sup>

In order for school districts to effectively teach a health curriculum that has evidence of causing behavior changes in youth and to successfully integrate school health into the instructional and operational components of a school, there needs to be strong leadership and an infrastructure in place for administering funds, selecting evidence-based curricula, providing technical assistance for implementation, and monitoring for compliance and improvement.<sup>12</sup> In addition, local healthy schools coordinators would help LEAs by providing the infrastructure to meet these goals and assisting local teachers and school administrators in selecting and implementing evidence-based health education curricula (described more fully below). Additionally, local healthy schools coordinators could support schools in collecting the data needed for the Youth Risk Behavior Survey (YRBS),<sup>f</sup> School Health Profiles,<sup>g</sup> and School Level Impact Measures.<sup>h</sup> 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 school health coordinator.<sup>13</sup> This may be a critical school district position for the successful infusion of healthier environments, practices, and policies in North Carolina public schools.

To ensure the effective implementation of the coordinated school health program, the Task Force recommends:

## Recommendation 12.1: Enhance North Carolina Healthy Schools (PRIORITY RECOMMENDATION)

- a) The North Carolina School Health Forum should be reconvened and expanded to ensure implementation and expansion of the North Carolina Healthy Schools

**Local healthy school coordinators can help school districts select evidence-based curricula and provide technical assistance to help schools implement a coordinated school health program.**

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d Gardner D. Section Chief, North Carolina Healthy Schools, North Carolina Department of Public Instruction. Oral communication. July 15, 2009.

e Collins P. Senior Policy Advisor, Healthy Responsible Students, North Carolina State Board of Education. Written (email) communication. June 22, 2009.

f The Youth Risk Behavior Survey (YRBS) is a school-based survey of middle school and high school students. It is conducted to assess the extent to which different students are engaging in certain health risk behaviors, particularly those that contribute to the leading causes of death and disability among children and adolescents. (<http://www.dpi.state.nc.us/newsroom/news/2007-08/20080215-01>)

g School Health Profiles is a survey of states and large education systems that assesses school health policies and programs in health education, physical education and activity, health services, nutrition services, healthy and safe school environment and family and community involvement. (Centers for Disease Control and Prevention. School Health Profiles. <http://www.cdc.gov/healthyYouth/profiles/index.htm>)

h School Level Impact Measures (SLIMs) measures the percentage of secondary schools in the state or community that adopted a CDC recommended policies or practices that have been demonstrated to be effective in reducing health problems facing children and adolescents. Schools must select at least 3 HIV measures, 3 coordinated school health measures, 1 physical education and activity, 1 nutrition, 1 tobacco-use prevention measures, and 3 asthma management measures. Schools must determine a target percentage of schools that will have adopted the selected policy or practice by 2012. (Centers for Disease Control and Prevention. Program Guidance. Tips on Selecting, Monitoring, and Using School Level Impact Measures (SLIMs). [http://www.cdc.gov/DASH/program\\_mgt/docs\\_pdfs/slimstips.pdf](http://www.cdc.gov/DASH/program_mgt/docs_pdfs/slimstips.pdf))

Initiative. The North Carolina School Health Forum should be expanded to include the Department of Juvenile Justice and Delinquency Prevention, Department of Environment and Natural Resources, and other partners as needed to implement the eight components of the Coordinated School Health program.

- b) The North Carolina School Health Forum should develop model policies in each of the eight components of a Coordinated School Health System. This would include reviewing and modifying existing policies as well as identifying additional school-level policies that could be adopted by schools to make them healthier environments for students. When available, evidence-based policies should be adopted. The North Carolina School Health Forum and the North Carolina Healthy Schools Initiative should develop a system to recognize schools that adopt model policies in each of the eight components.
- c) The North Carolina Department of Public Instruction (DPI) should expand the North Carolina Healthy Schools Initiative to include a local healthy schools coordinator in each Local Education Agency (LEA). The North Carolina General Assembly should appropriate \$1.5 million in recurring funds beginning in SFY 2011 increased by an additional \$1.5 million in recurring funds in each of the following five years (SFY 2012-2017) for a total of \$12 million recurring funds to support these positions.
  - 1) The North Carolina School Health Forum should identify criteria to prioritize funding to LEAs during the first five years. The criteria should include measures to identify LEAs with the greatest adolescent health and educational needs.
  - 2) In order to qualify for state funding, the LEA must show that new funds will supplement existing funds through the addition of a local healthy schools coordinator and will not supplant existing funds or positions. To maintain funding, the LEA must show progress towards implementing evidence-based programs, practices, and policies in the eight components of the Coordinated School Health system.
  - 3) Local healthy schools coordinator will work with the School Health Advisory Council, schools, local health departments, primary care and mental health providers, and community groups in their LEAs to increase the use of evidence-based practices, programs, and policies to provide a coordinated school health system and will work towards eliminating health disparities.
- d) The North Carolina Healthy Schools Section of DPI should provide monitoring, evaluation, and technical assistance to the LEAs through the school health coordinator. The North Carolina General Assembly should appropriate \$225,000 in recurring funds in SFY 2011 to DPI to support the addition of three full-time employees to do this work. Staff would be responsible for:
  - 1) Implementing the monitoring system (including gathering data, measuring compliance, and reporting to the North Carolina State Board of Education (SBE)) for the Healthy Active Children Policy).
  - 2) Implementing the monitoring system (including gathering data, measuring compliance, and reporting to the SBE) for the School Health Profiles survey.

- 3) Providing technical assistance and professional development to LEAs for coordinated school health system activities and implementing evidence-based programs and policies with fidelity.
- 4) Implementing, analyzing, and disseminating the Profiles survey, including reporting on school-level impact measures (SLIMs).
- 5) Working with the PTA and other partners as appropriate to develop additional resources and education materials for parents of middle and high school students for the Parent Resources section of the North Carolina Healthy Schools website. Materials should include information for parents on how to discuss material covered in the Healthful Living Standard Course of Study with their children as well as evidence-based family intervention strategies when available. Information on how to access the materials should be included in the Student Handbook.

### Evidence-Based Curricula

North Carolina schools are required to teach health education to students in kindergarten through ninth grade.<sup>i</sup> By statute, health education is required to include age-appropriate instruction covering mental and emotional health, drug and alcohol prevention, nutrition, dental health, environmental health, family living, consumer health, disease control growth and development, first aid and emergency care, preventing sexually transmitted diseases, abstinence-until-marriage education, and bicycle safety. The SBE is charged with developing a comprehensive school health education program that meets these standards and accomplishes this by establishing competency goals and objectives for health education and physical education. These are included in the *Healthful Living Standard Course of Study* (HLSCOS), which is a curriculum guide that includes content areas and skills to be taught in each grade level. It is reviewed and revised as needed every five years.<sup>j,14</sup>

The SBE approves the HLSCOS, but the selection of the specific curriculum used to teach these objectives is a decision made at the local level by school districts. While there are evidence-based curricula for some of the subject areas that have been shown to produce behavioral changes, schools are not required to use these curricula.<sup>k,15</sup> Although the state does not collect data on the health education curricula used by each school district, one study that examined the curricula used to prevent use of alcohol or drugs showed that most schools have not implemented evidence-based substance abuse prevention curricula.<sup>16</sup>

**North Carolina schools are required to teach health education to students in kindergarten through ninth grade.**

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i NCGS §115C-81(e1).

j More detailed information about the Healthful Living Standard Course of Study is available at: <http://www.ncpublicschools.org/docs/curriculum/healthfulliving/scos/2006healthfullivingscos.pdf>

k Examples of evidence-based health education include: Making a Difference (covers HIV/STD/teen pregnancy prevention); Life Skills Training and Project TNT (covers drug/alcohol and tobacco prevention), and Second Step and Victims, Aggressors, and Bystanders (covers violence prevention). (Breitenstein D. North Carolina standard course of study in healthful living. Presented to: the North Carolina Institute of Medicine Task Force on Substance Abuse Services; October 10, 2008; Morrisville, NC.)

**To the extent possible, the health education curricula used in North Carolina's middle and high schools should have evidence of effectiveness in the adoption of health-promoting behaviors by adolescents.**

It is difficult to meet the current yearly requirements in the HLSCOS and still have the time needed to dedicate to evidence-based programs, as implementing evidence-based curricula often requires a greater investment in time, costs (to purchase the curricula if proprietary), and teacher training. DPI is in the process of reviewing the HLSCOS, and is examining ways to streamline the required annual curricula to provide the time needed to implement evidence-based curricula. To the extent possible, the health education curricula used in North Carolina's middle and high schools should have evidence of effectiveness in the adoption of health-promoting behaviors by adolescents. DPI can promote the use of evidence-based curricula by reviewing and selecting specific curricula that have been shown to be effective in health-promoting behavioral changes in adolescents across multiple dimensions (i.e. violence prevention, teen pregnancy prevention, and prevention of substance use) and providing grants to local school systems to help them offset the additional costs in using these curricula. To help ensure that such curricula are implemented with fidelity, DPI should provide training and technical assistance to the schools.

In addition to the grants to implement specific evidence-based curricula, DPI can assist schools in selecting evidence-based curricula by helping to train school personnel in the use of the Health Education Curriculum Analysis Tool (HECAT)<sup>l</sup> and Physical Education Curriculum Analysis Tool (PECAT).<sup>m</sup> CDC developed the HECAT and PECAT for school systems to identify effective health education and physical education curricula. The HECAT and PECAT contain guidance and analysis tools to improve curriculum selection, strengthen health and physical education instruction, and improve the ability of Healthful Living educators to have a positive effect on health behaviors and healthy outcomes in adolescents.<sup>n</sup>

<sup>l</sup> The Health Education Curriculum Analysis Tool (HECAT) is based on the National Health Education Standards and the CDC's Characteristics of Effective Health Education Curricula. These standards and characteristics have been identified based on reviews of effective programs and curricula and inputs from experts in the field of health education. (Division of Adolescent School Health, National Center for Chronic Disease Prevention and Health Promotion. Health education curriculum analysis tool. Centers for Disease Control and Prevention website. <http://www.cdc.gov/healthyyouth/HECAT/index.htm>. Accessed June 16, 2009.)

<sup>m</sup> The Physical Education Curriculum Analysis Tool (PECAT) is designed, based on national physical education standards, to provide the structure for a complete, clear and consistent review of a written physical education curriculum and to help districts develop new curricula, enhance current curricula, or select a published curriculum, as well as to strengthen the delivery of physical education instruction. (Centers for Disease Control and Prevention, US Department of Health and Human Services. Physical education curriculum analysis. <http://www.cdc.gov/HealthyYouth/PECAT/pdf/PECAT.pdf>. Published 2006. Accessed June 16, 2009.)

<sup>n</sup> These tools can greatly assist curriculum committees and educators at the school district level by being used in conjunction with the North Carolina Standard Course of Study as a framework for the development of new or improved courses of study and learning objectives. The resources can also help in the selection of curricula for purchase and in the scrutiny of curriculum currently in use. At the state level, the HECAT and PECAT could assist staff in the North Carolina Department of Public Instruction in the development of a list of recommended health and physical education curricula for Local Education Agencies to use in selecting their curricula. (Centers for Disease Control and Prevention, US Department of Health and Human Services. Health education curriculum analysis tool: an overview. [http://www.cdc.gov/healthyyouth/HECAT/pdf/HECAT\\_Overview.pdf](http://www.cdc.gov/healthyyouth/HECAT/pdf/HECAT_Overview.pdf). Accessed June 16, 2009.)



Using evidence-based curricula to teach health and physical education courses has great potential to improve the health and well-being of the state's adolescents. However, the teaching of Healthful Living is often given short shrift in North Carolina public schools.<sup>15</sup> The Task Force supports DPI's Accountability and Curriculum Reform Effort (ACRE) to address learning standards, student tests, and school accountability for all courses in the standard course of study, including Healthful Living.

Additionally, the state should encourage students to take additional health education or physical education classes past the ninth grade. Currently, most students complete their high school requirement in the ninth grade.<sup>17</sup> Although the teenage years are formative in developing life-long health habits, most students do not take additional health education classes after they complete their required unit of Healthful Living. As noted in Recommendation 4.3, the state should expand the high school graduation requirements to require two units of Healthful Living. Additionally, high schools should offer honors-level health education or physical education classes, as many of the high school students who are preparing for college self-select into these classes to be competitive for college admission. Thus, to encourage students to take additional Healthful Living electives, the curriculum should be expanded to include honors level high school courses such as exercise physiology or socio-cultural and historical perspectives of sports and exercise.

To ensure that North Carolina schools implement evidence-based health and physical education curricula that will give students the knowledge and skills needed to adopt and maintain healthy behaviors and active lifestyles, the Task Force recommends:

### **Recommendation 12.2: Require the Use of Evidence-based Curricula for Healthful Living Standard Course of Study**

The North Carolina General Assembly should require schools to use evidence-based curricula when available to teach the objectives of the Healthful Living Standard Course of Study.

- a) The North Carolina General Assembly should appropriate \$1.2 million in recurring funds in SFY 2011 to the North Carolina Department of Public Instruction (DPI) to provide grants to Local Education Agencies (LEAs) to implement evidence-based curricula. To implement this provision, the DPI Healthy Schools Section should identify three to five evidence-based curricula that demonstrate positive change in behavior across multiple health risk behaviors (i.e. substance use, violence, sexual activity) and provide grants (of up to \$10,000 per LEA) for implementation and technical assistance to ensure curricula are implemented with fidelity.
- b) The North Carolina State Board of Education (SBE) and DPI should work together to ensure that middle and high schools are effectively teaching the Healthful Living Standard Course of Study objectives.

**Using evidence-based curricula to teach health and physical education courses has great potential to improve the health and well-being of the state's adolescents.**

- 1) The DPI Healthy Schools Section should coordinate trainings<sup>o</sup> for local school health professionals on the Centers for Disease Control and Prevention's Health Education Curriculum Assessment Tool (HECAT) and the Physical Education Curriculum Assessment Tool (PECAT) so that they are able to assess and evaluate health and physical education programs and curricula.
  - 2) The SBE should require every LEA to complete the HECAT and PECAT for middle and high schools every three years beginning in 2013 and submit them to the DPI Healthy Schools Section. The Superintendent should ensure the involvement of the local healthy schools coordinator and the School Health Advisory Council.
  - 3) Tools to assess the implementation of health education should be developed as part of DPI's Accountability and Curriculum Reform Effort (ACRE).
- c) The SBE should encourage DPI to develop healthful living electives beyond the required courses, including academically rigorous honors-level courses. Courses should provide more in-depth coverage of Healthful Living Course of Study Objectives. DPI and health partners should identify potential courses and help schools identify evidence-based curricula to teach Healthful Living electives.

**Common health risks, such as physical inactivity and poor nutrition, account for up to 35% of annual medical costs among the employed population.**

### Worksite Wellness

Approximately one-half of chronic disease results from preventable lifestyle behaviors among the United States population.<sup>18</sup> These common health risks, such as physical inactivity and poor nutrition, account for up to 35% of annual medical costs among the employed population.<sup>19</sup> The most common health risks among employees include the following: body mass index (BMI) over 27.5 (41.8%), stress (31.8%), physical inactivity (23.3%), smoking (14.4%), poor perception of health (13.7%), and having more than five illness days per year (10.9%).<sup>20</sup> Increasing health risks are associated with increasing health care costs. Employees with five or more health risks have over \$3,000 more medical and pharmacy expenses per year than those with zero to two health risks.<sup>20</sup> However, medical and pharmacy costs are just a small part (23.0%) of the costs to employers for their employees with excess health risks. Absenteeism, presenteeism, and short-term and long-term disability contribute up to 75% of the costs to employers for employees with excess health risks.<sup>p,20-23</sup>

<sup>o</sup> The CDC provides trainings on using these tools free of charge. Funding is needed to cover substitutes, food and facilities for trainings.

<sup>p</sup> *Presenteeism* refers to decreased job productivity due to a health problem or health risk, while *absenteeism* refers to being absent from work due to these problems.

Given that the majority of adults spend at least eight hours a day in the workplace, this environment is an ideal site for intervening on lifestyle behaviors that lead to chronic disease and related death and disability. Comprehensive worksite health promotion programs have been shown to be effective in improving health outcomes and reducing risky health behaviors such as tobacco use, lack of physical activity, excessive use of alcohol, high blood pressure, and high cholesterol.<sup>24</sup>

*Healthy People 2010* defined comprehensive worksite health promotion programs to include five components:

- 1) Health education and health promotion programs including the education and skills to support lifestyle behavior change.
- 2) Supportive social and physical environment including worksite policies that support healthy behaviors and reduce risks.
- 3) Integration of the worksite wellness program into the organizational structure.
- 4) Linkages between the comprehensive worksite health promotion program and other related worksite programs (such as employee assistance programs).
- 5) Worksite screening and education with appropriate referrals.<sup>25</sup>

Evidence has shown that specific worksite policy interventions have led to improved health outcomes. For example, based on the Guide to Community Preventive Services (Community Guide), there is sufficient evidence to recommend specific worksite policy changes when combined with informational outreach strategies. Specific worksite policy changes include smoke-free policies to reduce tobacco use among workers, incentives or competitions among workers to increase smoking cessation, point-of-decision prompts to encourage the use of stairs in the worksite, and access to places for physical activity, such as walking trails, on-site exercise facilities, or access to nearby facilities. In addition, the Community Guide notes that the use of a health risk assessment (HRA), when combined with employee feedback, has led to positive changes in employee health behaviors and outcomes such as tobacco use, excessive alcohol use, seat belt use, dietary fat intake, blood pressure control, reducing high cholesterol level, and reducing the number of days lost from work due to illness or disability.<sup>24</sup>

Implementing comprehensive worksite health promotion programs takes commitment and leadership. The National Business Group on Health has identified steps to integrate worksite wellness programs into the organizational structure.<sup>9</sup> Business leaders must start by defining a strategy for improving employee health, including clarifying the purpose of improving health, setting expectations, and fostering buy-in among key decision makers. The firm must also

**Comprehensive worksite health promotion programs have been shown to be effective in improving health outcomes and reducing risky health behaviors such as tobacco use, lack of physical activity, excessive use of alcohol, high blood pressure, and high cholesterol.**

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q The National Business Group on Health is a non-profit organization that represents large employers' perspective on national health policy issues. Members are primarily Fortune 500 companies and large public sector employers. For more information: <http://www.businessgrouphealth.org/>.

be willing to allocate funds to implement health improvement and risk reduction policies and programs. Firms should also implement evidence-based worksite health promotion strategies. In addition, the organizational leaders must communicate worksite health promotion efforts throughout the firm and should support healthy behaviors in the worksite. Finally, firms should measure their progress through process measures (e.g. whether employees are participating in the initiative) and outcome measures (e.g. changes in health expenditures, reduced absenteeism, improved productivity, and/or changes in health status of the employees).<sup>26</sup> A positive return on investment has been found for evidence-based worksite wellness interventions with a mean return on investment of \$3.93 for medical cost savings and \$5.07 for absenteeism savings.<sup>27</sup>

**A positive return on investment has been found for evidence-based worksite wellness interventions with a mean return on investment of \$3.93 for medical cost savings and \$5.07 for absenteeism savings.**

In 2004, only 6.9% of worksites nationally offered a comprehensive program—with all five elements described by *Healthy People 2010*. Large firms were much more likely to offer such programs than were smaller firms. For example, 24.0% of firms with more than 750 employees provided a comprehensive worksite health promotion program, compared to only 4.6% of firms with 50 to 99 employees.<sup>25</sup> Large firms generally have more internal resources to apply towards these initiatives, including dedicated staff, financial resources, opportunities for flexible time schedules to accommodate wellness initiatives, and in-house expertise in wellness, implementation, and evaluation. It is much more difficult for small firms—with 50 or fewer employees—to implement comprehensive worksite wellness programs. In North Carolina, approximately 28.0% of employees who work for private firms work in firms with 50 or fewer employees.<sup>28</sup>

There is an increased interest in implementing effective health promotion activities in the worksite at the state and national levels. However, the cost is prohibitive to many, especially to small employers. In Congress, there is bipartisan support for offering a tax credit to businesses that offer comprehensive health promotion programs. One bill being considered, the Healthy Workforce Act of 2009,<sup>r</sup> would provide a tax credit of up to \$200 per employee for the first 200 employees, and up to \$100 per employee thereafter, for firms that have comprehensive employee wellness programs. Firms would be eligible for the tax credit by establishing programs that raise health awareness among employees, encourage employee behavioral changes, and prompt employee participation through an incentive. In addition, employers who establish qualified programs would be eligible to receive a tax credit for 10 years. While there is bipartisan support for this bill, it has been introduced without enactment in each of the last two Congresses.

Because of the delay in implementing a federal tax credit, some states have considered similar legislation. Between 2001 and 2006, 13 states introduced legislation to offer a state tax credit to support worksite health promotion programs, similar to the Healthy Workforce Act of 2009. Despite interest in many

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<sup>r</sup> Senators Tom Harkin (D-IA) and John Cornyn (R-TX), and Representatives Earl Blumenauer (D-OR) and Mary Bono (D-CA), have introduced the Healthy Workforce Act of 2009. S 803/HR 1987.

states to encourage worksite wellness approaches, none of the 34 tax credit bills introduced in 13 states have been enacted.<sup>30</sup>

North Carolina can do more to assist employers in offering comprehensive worksite health promotion programs. As workers spend more than one-third of their day on the job, employers are in a unique position to promote the health of their employees. The use of effective, evidence-based worksite policies and programs can reduce health risks and improve the quality of life for employees. Further, studies have shown that healthy employees miss fewer days of work, are more productive, and have lower health care costs.<sup>20,27</sup> To encourage broader implementation of comprehensive worksite health promotion programs, the Task Force recommends the creation of a statewide collaborative that would offer technical assistance to small firms, nonprofits, and state and local government for implementing evidence-based strategies and best practices. The collaborative should also monitor federal legislation. If it is enacted, the collaborative should help employers with comprehensive health promotion programs to qualify for the tax credit. Further, the state should consider implementing a state tax credit for small firms if the Healthy Workforce Act of 2009 is not enacted at the federal level.

**North Carolina  
can do more to  
assist employers  
in offering  
comprehensive  
worksite health  
promotion  
programs.**

### **Recommendation 12.3: Create the North Carolina Worksite Wellness Collaborative and Tax Incentives for Small Businesses**

- a) **The North Carolina Worksite Wellness Collaborative should include, but not be limited to, representatives of state and local government, organizations with expertise in worksite wellness, insurers, small and large employers, Chambers of Commerce, and other natural groupings of employers. Initially, the Collaborative should focus on providing assistance to state and local governments, small businesses with 50 or fewer employees, and nonprofit organizations.**
- b) **The Collaborative should lead efforts to implement the following four components of a statewide worksite wellness effort using evidence-based strategies (and best and promising practices when necessary):**
  - 1) **Assessment of organizational-level worksite indicators such as policies, benefits, and workplace environments that influence employee health, and development of an organizational-level worksite action plan for workplaces to make improvements.**
  - 2) **Individual employee assessments via Health Risk Appraisals (HRAs) tied to personal feedback and an actionable and specific plan for employees.**
  - 3) **Technical assistance to worksites to help them implement evidenced-based strategies to address needs identified in both organizational and individual employee-level assessments and to assist worksites in meeting criteria for comprehensive employee wellness programs.**

- 4) A data collection system that includes both organizational and individual employee indicators, tracks progress, and evaluates outcomes at the organizational and employee level.
- c) The North Carolina General Assembly should appropriate annual funding for five years as shown below to support this effort as the Collaborative develops a sustainable business plan that will eliminate the need for funding after five years.
  - 1) \$800,000 in SFY 2011
  - 2) \$700,000 in SFY 2012
  - 3) \$500,000 in SFY 2013
  - 4) \$500,000 in SFY 2014
  - 5) \$250,000 in SFY 2015
- d) The North Carolina General Assembly should provide a tax credit to small businesses with employees of 50 or fewer that offer and promote comprehensive wellness programs for their employees. Eligible businesses should be provided a tax credit of up to \$200 per employee for establishing or maintaining a wellness program that is certified under a process established by the Collaborative.
- e) The Collaborative should develop a process and set of criteria to certify businesses as eligible to receive state or federal tax credits.

**Certain clinical preventive services serve as primary prevention help[ing] ...prevent disease and disability... Other[s] serve as secondary prevention help[ing] identify health conditions early in the progress of the disease, making it easier to treat or manage.**

**High Quality Clinical Care**

As noted in Chapter 2, there are many factors which contribute to personal health. Clearly, our own individual behaviors—whether we smoke, exercise, or engage in other risky health behaviors—affect our health status. However, people do not operate in a vacuum. Our health behaviors are influenced by our families, peers, and other social influences, community and environmental factors, public policies, and clinical care.

Certain clinical preventive services serve as primary prevention—that is they help prevent disease and disability. Other clinical preventive services serve as secondary prevention; these services help identify health conditions early in the progress of the disease, making it easier to treat or manage. Congress has charged the US Preventive Services Task Force (USPSTF) with identifying which screening, counseling, and preventive medications should be offered routinely to different populations in a primary care setting. (See Chapter 2.)

The USPSTF currently recommends 30 preventive services for all or a subpart of the population. Some of these recommendations are targeted to the early identification of cancer (e.g. mammograms for women age 40 or older or colorectal screenings for adults ages 50-75). Others are aimed at preventing or

reducing the risk factors that contribute to disability and death. The Task Force on Prevention did not specifically address all the areas covered by the USPSTF. However, the Task Force did adopt USPSTF recommendations in the areas of overlap, including screening and counseling for specific risk factors and screening and treatment to prevent the spread of sexually transmitted diseases (STDs) or other communicable diseases. For example, the Task Force specifically endorsed the following recommendations:

*Screening and counseling for risk factors:*

- Counseling for tobacco use and tobacco-caused disease (Chapter 3).
- Obesity screening for adults and intensive counseling and behavioral interventions to promote sustained weight loss for obese adults (Chapter 4).
- Screening and behavioral interventions for alcohol misuse (Chapter 6).
- Screening for depression (Chapter 6).

*Screening and treatment for STDs/HIV or other communicable diseases (Chapter 5):*

- Screening for chlamydial infection
- Screening and prophylactic medications for gonorrhea
- HIV screening
- Screening for syphilis

In addition to the clinical preventive services identified by the USPSTF, there are other clinical services that have been shown to be highly effective in treating specific health problems. While not primary prevention per se (i.e. these services do not prevent individuals from contracting the disease or health problem), they are nonetheless highly effective in helping patients manage their health problems and can help prevent health problems from escalating into more serious health conditions. For example, Hemoglobin A1c monitoring can help patients manage their diabetes so they are not at increased risk of heart disease, stroke, and diabetic neuropathies.

Typically, individuals receive preventive clinical services or the health services and health education needed to manage their health problem through their primary care practice. The most effective primary care practices operate as a patient-centered medical home, where physicians work with a team of other providers who collectively help manage the care of their patient population. Ideally, each patient has an ongoing relationship with a primary care provider (i.e. physician, nurse practitioner, or physician assistant) who provides comprehensive health services and coordinates the care that the patient receives from other professionals. The individual and his or her family are actively engaged in care and decision making. Further, the primary care practitioners offer high quality care and are engaged in continuous quality improvement efforts to ensure that the care they provide is optimal.<sup>31</sup> Research generally shows that people who have a regular source of primary care are more likely to receive preventive services and have fewer

**Research generally shows that people who have a regular source of primary care are more likely to receive preventive services and have fewer avoidable hospitalizations, even after controlling for several other potentially confounding factors.**

avoidable hospitalizations, even after controlling for several other potentially confounding factors. Some studies also indicate that communities with a higher primary care provider to population ratio have better health outcomes, including lower infant mortality rate and higher life expectancy.<sup>32</sup>

Unfortunately, many people lack access to preventive screenings, preventive services, or primary care—generally when they lack health insurance coverage. Currently, there are an estimated 1.75 million non-elderly people in North Carolina who lack insurance coverage. North Carolina has been hit harder by the downturn in the economy than many other states. As a result, North Carolina experienced one of the largest increases in the number and percent uninsured of any state in the country.<sup>33</sup>

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**Table 12.1**  
**The Uninsured are Generally Less Likely to Receive Preventive Screenings or Have a Regular Source of Care (North Carolina, 2008)**

	<b>Insured</b>	<b>Uninsured</b>
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%

<http://www.schs.state.nc.us/SCHS/brfss/2008/nc/risk/topics.html>

Source: North Carolina State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2008.

The lack of health insurance creates barriers which prevent people from obtaining some of the recommended clinical preventive services. (See Table 12.1.) In addition, the uninsured are also less likely to have a regular source of care.

Because of the importance of having insurance coverage to obtain preventive screenings and other primary care services, the Task Force recommended that everyone in the country have health insurance coverage. As this report is being written, Congress is currently debating national health reform that would expand coverage to most of the uninsured. In the absence of action at the federal level, there are specific actions that the state or state agencies can take to expand coverage. Currently, the three groups that are most likely to lack insurance coverage in North Carolina are:

- Children in families with incomes below 300% of the federal poverty guidelines (17%). Most uninsured children have family incomes below 200% FPG (68% of uninsured children). Of these, most are already eligible, but not enrolled in, publicly-sponsored insurance coverage such



as Medicaid or NC Health Choice (North Carolina's State Children's Health Insurance Program).

- Adults with incomes below 200% FPG (46%).
- People with a family connection to a small employer with 25 or fewer employees (36%).

Together, these groups constitute almost four-fifths (79%) of all the uninsured in the state.<sup>34</sup> The North Carolina Institute of Medicine recently completed a study which identified options to expand coverage to the uninsured. These options included more outreach and administrative simplification to enroll low-income children who are currently eligible, but not enrolled, in public programs; expanding subsidized health insurance coverage to children with family incomes below 300% FPG; expanding Medicaid coverage to provide a primary care focused, limited benefits package to uninsured low-income adults; and developing a subsidized health insurance product for small employers.<sup>s</sup> In addition, North Carolina should explore other options to expand coverage to children and young adults, including changes in state law to require insurance companies to offer parents the option of covering their children up to the age of 26 (regardless of the child's student status)<sup>t</sup> and encouraging the University of North Carolina (UNC) System to require students who are enrolled full-time in one of its universities to obtain insurance coverage.<sup>u,35</sup>

In addition, existing benefit packages should be expanded to ensure coverage of all the recommended preventive screenings. Currently, state law requires that insurers offer coverage for mammograms and pap smears, similar to what is recommended by the USPSTF. However, it is unclear whether existing insurers offer coverage for other highly recommended preventive screenings. There are no existing data which show which insurers cover which screenings. Therefore, the Task Force also endorsed the goal of obtaining information to determine which of the recommended preventive screenings are currently covered by North Carolina insurers and to expand covered services to include the recommended screenings and treatment if not currently covered.

**Existing benefit packages should be expanded to ensure coverage of all the recommended preventive screenings.**

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s Section 10.53 of the 2009 Appropriations Act charges the Division of Medical Assistance, among other North Carolina Department of Health and Human Services' agencies, with increasing outreach to identify populations eligible for state and county assistance.

t Currently, North Carolina laws require insurance companies to continue to cover children on their parents' policies up through the age of 23 if the child is a full-time student or until they graduate. Thirty other states require insurance companies to offer parents the opportunity of covering their dependent children, regardless of student status.

u Since the Task Force completed its work the UNC Board of Governors has instituted a policy requiring all full-time students to have health insurance coverage (either through their parents or other private coverage, or by purchasing the policy available through the University). (UNC General Administration. Board of Governors Meeting August 14, 2009 minutes. <http://www.northcarolina.edu>. Published September 2009. Accessed September 11, 2009.)

## Recommendation 12.4: Expand Health Insurance Coverage to More North Carolinians (PRIORITY RECOMMENDATION)

- a) The Task Force believes that everyone should have health insurance coverage. In the absence of such, the North Carolina General Assembly should begin expanding coverage to groups that have the largest risk of being uninsured. Such efforts could include, but not be limited to:
  - 1) Provide funding to the North Carolina Division of Medical Assistance to do the following:
    - i) Expand outreach efforts and simplify the eligibility determination and recertification process to identify and enroll people who are already eligible for Medicaid or NC Health Choice.
    - ii) Expand coverage to children with incomes up to 300% of the federal poverty guidelines (FPG) on a sliding scale basis.
    - iii) Develop a limited benefits package to provide coverage to adults with incomes up to 100% FPG, with a phase in of coverage of adults up to 200% FPG.
  - 2) Change state laws to require insurance companies to offer parents the option to continue dependent coverage until the child reaches age 26, regardless of student status.
  - 3) Develop a subsidized health insurance product targeted to small businesses that employ a low-wage work force.
- b) The North Carolina Division of Public Health (DPH) should collaborate with NC Prevention Partners to include the coverage of all the US Preventive Services Task Force's (USPSTF) recommended screenings and treatment, including but not limited to screenings, counseling, and treatment for STD/HIV, obesity, alcohol and substance use, and depression in the existing annual Preventive Benefits Profile survey of public and private health insurers in the state. If coverage is found to be inadequate or lacking, then public and private health insurers should expand coverage to include all the USPSTF recommended screenings, counseling, and treatment. The North Carolina General Assembly should appropriate \$75,000 in recurring funds to DPH to support these efforts.

Expanding access to clinical services can improve health outcomes. Nonetheless, just guaranteeing access to a provider does not ensure that individuals will receive all the recommended health services. Studies have shown that adults and children generally only receive about half of the recommended health services.<sup>36,37</sup> Part of the reason for this is the difficulty of both keeping up with all the changes in recommended treatment guidelines and in delivering all the care recommended.

For example, at the time this report was being written, there were more than 2,111 evidence-based clinical guidelines for the treatment of certain diseases, although many of these recommended guidelines are for specialists rather than primary

care providers.<sup>v</sup> Because medical care is constantly evolving, health care professionals need help keeping up with changes in medicine, as recommended guidelines change as new treatments are developed or new evidence suggests a better or different course of action.

The North Carolina Area Health Education Centers (AHEC) program provides educational programs in partnership with health professional associations, academic institutions, and other health agencies. These trainings are intended to enhance the quality of care and improve health outcomes. The Task Force identified the need to enhance health professional training around clinical preventive services in order to help patients reduce their health risks leading to poor health outcomes. During the course of the 17 months the Task Force met, the Task Force identified specific areas where greater training was needed, including screening, counseling, and treatment of sexually active youth and adults (Chapter 5); substance abuse screening, counseling, and brief intervention (Chapter 6); training for evidence-based strategies to reduce injuries (Chapter 8); information about the impact of socioeconomic status on health outcomes (Chapter 11); and training on evidence-based clinical preventive services.

Although an important component, provider education is not sufficient *per se* to affect substantive change. A more effective strategy is a comprehensive intervention involving not only education but also incentives, quality improvement, patient empowerment, and other similar activities. For example, health information technology offers great promise to provide provider point-of-care decision prompts as well as quality assurance activities tracking provider's performance on clinical prevention measures. The North Carolina Healthcare Quality Alliance (NCHQA), building off the Improving Performance in Practice (IPIP) program, is providing technical assistance to physician practices across the state to help improve performance on a select group of quality measures. AHEC is the lead agency on the practice support arm of the NCHQA. Finally, as pay for performance and other payer incentives become more prevalent, there may be opportunities for incentives to foster improvement. Thus, although there are many necessary components to bringing about change, provider education is an important step.

Because of the importance of practitioner education in bringing about real change, the Task Force recommends:

## **Recommendation 12.5: Improve Provider Training To Promote Evidence-based Practices**

- a) **The Area Health Education Centers (AHEC) Program should offer training courses to enhance the training of health professionals, including physicians, nurses, allied health, and other health care practitioners; increase the use of**

**The Task Force identified the need to enhance health professional training around clinical preventive services in order to help patients reduce their health risks leading to poor health outcomes.**

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<sup>v</sup> The National Guideline Clearinghouse™ is a comprehensive database of evidence-based clinical practice guidelines developed by provider associations, governmental agencies, or health care organizations. It is supported by the US Agency for Healthcare Research and Quality, within the US Department of Health and Human Services. More information about the National Guideline Clearinghouse is available at: <http://www.guideline.gov/about/about.aspx> (Accessed July 1, 2009).

evidence-based prevention, screening, early intervention, and treatment services to reduce certain high-risk behaviors; and address other factors that contribute to the state's leading causes of death and disability. Training courses should be expanded into academic and clinical settings, residency programs, and other continuing education programs. AHEC should:

- 1) Partner with the North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services, the Governor's Institute on Alcohol and Drug Abuse, and other appropriate organizations and professional associations to offer trainings to do the following:
    - i. Educate and encourage health care professionals to use evidence-based screening tools and to offer screening, brief intervention, and referral to treatment (i.e. SBIRT) to help patients prevent, reduce, or eliminate the use of or dependency on alcohol, tobacco, or other drugs.
    - ii. Educate health care providers to ensure accurate diagnosis, effective treatment, and follow up for major depressive disorder in youth ages 12-18 and adults.
  - 2) Partner with the North Carolina Division of Public Health (DPH) and other appropriate organizations and health professional associations to offer training on screening, assessing, and counseling to all sexually active youth and adults, especially high-risk individuals, and to promote STD, HIV, and unintended pregnancy risk reduction, including the use of appropriate and effective contraception.
  - 3) Partner with the UNC Center for Injury Prevention Research Center (IPRC), DPH, and other appropriate organizations and health professional associations to offer trainings in evidence-based strategies to prevent motor vehicle crash injuries, unintentional poisoning (including the appropriate use of pain medications), falls, family violence, and other injuries to state and local public health professionals, physicians, nurses, allied care workers, social workers, and others responsible for injury and violence prevention as well as proper use of e-codes to document injuries and ICD codes to document disease.
  - 4) Partner with other appropriate organizations and health professional organizations to offer training to primary care providers and other providers about the screenings, counseling, and treatment recommended by the US Preventive Services Task Force.
  - 5) Help providers better understand how social issues such as housing, poverty, and education impact health so that this knowledge can be integrated into medical practice
- b) The North Carolina General Assembly should appropriate \$250,000 in recurring funds beginning in SFY 2011 to AHEC to support these efforts.

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## Enhance Data to Support Prevention Efforts

**T**hroughout its deliberations, the Task Force focused on identifying evidence-based practices that would address North Carolina's most pressing health needs most effectively. Data plays a critical role in this process both by helping to identify North Carolina's most immediate health concerns and the health risks contributing to these problems, as well as by measuring the progress—or lack thereof—in improving the health of the state's population. North Carolina needs information both about the prevalence of certain types of diseases or health conditions (e.g. data on specific types of cancer), as well as the number of people engaging in certain risky health behaviors. While North Carolina has many different data systems that collect specific health data, these data systems are not well-integrated. They often operate in silos, making it difficult to capture a complete understanding of the health problems facing the state. Additionally, there are significant gaps in the data that are collected.

The state and community groups also need information about evidence-based interventions which have been shown to be effective in addressing certain health problems. However, evidence-based interventions do not exist for every health problem. In these instances, community groups need access to best or promising practices which they can employ or modify to address their specific health concern. More needs to be done to disseminate both evidence-based strategies as well as those best or promising practices that have been identified in North Carolina. Development of a clearinghouse of options well-suited to North Carolina communities would make this information-gathering more efficient.

### Health Data

Currently, there are many different state agencies that collect or have access to data that can help monitor one or more aspects of the health of the state's population. For example, the State Center for Health Statistics within the North Carolina Division of Public Health (DPH) collects information on pregnancies, births, and deaths; health risks for adults and pregnant women; and some child health data. It also receives hospital discharge data, emergency department data, poison center data, and ambulatory surgery data. The Epidemiology Section of DPH collects information on HIV and other communicable diseases (e.g. sexually transmitted diseases (STDs)). The North Carolina Department of Public Instruction collects information on youth risk behaviors and broader school health data. The North Carolina Division of Medical Assistance has the claims data for Medicaid recipients, including utilization and diagnoses information. There are also various registries, including the cancer and birth defects registries, which collect data on the number of people affected by cancer or birth defects and the type of cancer or birth defect. The State Center for Health Statistics has primary responsibility for either collecting the data or for linking different health data systems across the state. However, the State Center for Health Statistics does not currently have access to all the different health-related data in the state. Further, there are gaps in the data that are currently collected.

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**A strong data infrastructure system is vital to ensuring that policymakers have access to the most current information on the state of the population's health.**

A strong data infrastructure system is vital to ensuring that policymakers have access to the most current information on the state of the population's health.<sup>a</sup> During the Task Force's deliberations, specific data gaps were identified in the data collected to identify youth risk behaviors, school health, environmental health hazards, and the prevalence of certain types of cancers.

#### ***Youth Risk Behavior Survey and School Health Profiles***

Health data on adolescents in school and the school environment typically come from two major data sources: the Youth Risk Behavior Survey (YRBS) collects data on student risk behavior and the School Health Profiles Survey collects data on the school environment from surveys of school administrators and health educators. Both surveys were designed by the Centers for Disease Control and Prevention (CDC) in order to help schools plan and implement effective health strategies, policies, and programs that meet the needs of their community in order to improve health outcomes.<sup>1</sup>

YRBS is a biannual survey of middle and high school students sponsored by the CDC to collect data on health risk behaviors for adolescents. The priority health behaviors monitored include tobacco use, unhealthy dietary behaviors, physical inactivity, alcohol and other drug use, mental health behaviors, sexual behaviors that can lead to unintended pregnancy and sexually transmitted diseases, and risk behaviors for unintentional injury and violence. These behaviors often begin in early adolescence and can have immediate health-impairing effects, as well as effects that impact health into adulthood. The YRBS also tracks the prevalence of asthma, obesity, and the general health status of adolescents; therefore, the results have widespread applications.<sup>1</sup> The YRBS is the only data source for most of this information at the state level.

To obtain meaningful data for the state, students are selected randomly within schools that have been identified by the CDC to participate in the survey.<sup>b,2</sup> Local Education Agencies (LEAs) and schools have historically had the option of refusing to participate if selected. If many schools refuse to participate, the validity of statewide estimates is threatened. Reasons for declining to participate include the loss of instructional time and an increasing number of survey requests.<sup>c</sup>

The School Health Profiles Survey collects data from principals and lead health teachers. The survey covers a wide range of school-level health policies, including the health education curriculum, tobacco policies, and violence prevention programs. Again, schools often refuse to participate. As a result, the statewide estimates are being based on a more selective sample of LEAs from across the state.

a The March/April 2008 issue of the *North Carolina Medical Journal* outlines the importance of various data systems in shaping health policy. Available online at <http://ncmedicaljournal.org>

b The survey design involves stratification of schools, randomly selecting schools within each stratum, and then random selection of students within the selected schools.

c Langer S. Physical Activity and Nutrition Branch, Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. July 30, 2009.



The results from this more limited sample of schools may, or may not, reflect the experience of the state as a whole. A critical connection between these two data systems is the ability to link school-level policies with student risk behavior. In order to best inform state-level policy, the North Carolina State Board of Education needs to have comprehensive and complete information on the linkages between local policy and local behavior and outcomes.

### ***Environmental Risks***

As noted in Chapter 7, environmental hazards can cause significant health risks. Yet data on some specific environmental hazards—particularly interior environmental hazards in buildings including schools and homes—are limited. Without such data, it is difficult to ascertain the risks of certain diseases and conditions resulting from these factors. For example, the prevalence of lead paint in homes is usually estimated based on the age of the home. County-level data on the risk for radon are based on the geology of the county; however, risk will vary depending on the particulars of home construction. Collecting data on environmental risk more systematically—from households via the Behavioral Risk Factors Surveillance System (BRFSS) and from schools via the Profiles survey—will allow better prevalence estimates and more targeted interventions aimed at mitigating these risks. The CDC has already developed environmental risk questions for both surveys; North Carolina has never chosen to use the BRFSS optional questions on environmental risks and the Profiles survey part II (which has the questions on environmental risks) is not always used. By periodically collecting these data, policymakers would have more complete information on the environmental hazards faced by North Carolinians.

### ***Central Cancer Registry***

The North Carolina Central Cancer Registry (CCR), housed in the State Center for Health Statistics, is charged with collecting and analyzing data on all North Carolina cancer diagnoses. All providers licensed in North Carolina are legally required to report all new cancer diagnoses to the CCR;<sup>d</sup> reported data include information on the tumor itself, treatment, and patient demographics. Registry data are combined with other data sources (such as geographic data on environmental hazards and death certificates) for various purposes including identifying emerging “cancer clusters,” reporting burden of disease, and informing health planning. Despite the legal requirement to report data on cancer diagnoses, there are some barriers to timely, complete reporting by providers. For example, there are some challenges with collecting data from urologist offices and laboratories, which often provide the information necessary to diagnose prostate cancer.<sup>3</sup> Incomplete data can diminish the utility of the CCR to inform the cancer prevention and treatment strategies of the state.

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d NCGS §130A-209.

Based on these gaps in current data collection, the Task Force recommends:

### **Recommendation 13.1: Enhance Existing Data Systems**

- a) North Carolina agencies should enhance specific existing data collection systems to ensure that the state has adequate data for health and risk assessment including:
  - 1) The North Carolina State Board of Education (SBE) should support and promote the participation of Local Education Agencies (LEAs) in the Youth Risk Behavior Survey (YRBS) and the School Health Profiles Survey (Profiles). As part of this effort, the SBE should:
    - i) Identify strategies to improve participation in the YRBS and the Profiles survey. Options should include, but not be limited to, training for superintendents and local school boards, changing the time of year the survey is administered, financial incentives, giving priority for grant funds to schools that participate, a legislative mandate, and convening a clearinghouse to reduce duplicative surveys of youth risk behaviors and other school health surveys.
    - ii) Expect any LEA selected by the Centers for Disease Control and Prevention to participate in the YRBS and/or the Profiles survey to implement both surveys in their entirety unless a waiver to not participate is requested by the LEA and granted by the SBE.
    - iii) Develop policies addressing the ability of schools, parents, and students to opt out of the YRBS and Profiles surveys, over-sampling for district-level data, and any additional data that needs to be added to the surveys.
  - 2) The North Carolina Department of Health and Human Services and the North Carolina Department of Public Instruction should periodically collect environmental risk data using the Behavioral Risk Factor Surveillance System and Profiles survey, respectively.
- b) The North Carolina General Assembly should appropriate \$165,000 in recurring funds beginning in SFY 2011 to the North Carolina Cancer Registry to improve data collection and compliance with required reporting.

#### **Clearinghouse of Evidence-Based Programs and Practices**

When possible, the Task Force identified evidence-based programs, policies, practices, and clinical interventions that have been shown to be effective in preventing or reducing certain health risks. Furthermore, the Task Force recommends that all public and private funders place a priority on funding evidence-based strategies (See Recommendation 10.1.).

There are numerous organizations that have been charged with, or have taken on, the responsibility of reviewing and evaluating interventions to determine whether

the interventions have been shown to be effective. (See Appendix B.)<sup>f</sup> Generally, these organizations focus on specific health risks (e.g. violence or substance abuse prevention) or on different settings (e.g. in primary care offices or schools). For example, the US Preventive Services Task Force is charged by Congress with reviewing the effectiveness of screening, counseling, and preventive medications that should be routinely offered to large groups of the population in the primary care setting. The CDC's US Task Force on Community Preventive Services is charged with identifying evidence-based, community-based prevention initiatives that cover a variety of health risks. In addition, the Center for the Study of Prevention of Violence at the University of Colorado at Boulder examines programs aimed at decreasing violence, and the Center for Excellence in Training and Research Translation, managed by the University of North Carolina Center for Health Promotion and Disease Prevention, includes information, toolkits, and case studies on interventions targeting obesity.

As noted throughout this Prevention Action Plan, priority should be given to funding evidence-based strategies, including clinical interventions, school-based curricula, programs, and policies which have been shown to be effective in reducing health risks and improving population health. Further, organizations that are implementing these interventions should be provided the technical assistance and oversight to ensure that evidence-based programs are implemented with fidelity. To the extent possible, the programs implemented should be those which produce positive outcomes across a variety of measures, rather than focusing on one particular outcome or health behavior.

While many evidence-based interventions exist, there are not evidence-based strategies to address every type of health risk or health problem for every demographic. Additionally, implementing evidence-based strategies with fidelity is generally more difficult and more costly than other interventions. Although the use of evidence-based strategies should be a priority, in cases where this is not possible—due to lack of evidence-based strategies, funding limitations, or other restraints—community-based interventions are often used. North Carolina's state and private philanthropic organizations have funded many community-based interventions. Some of these community-based interventions show promising results.

There are numerous web-based resources for identifying evidence-based programs (See Appendix B.), however, there are no efforts to review and evaluate these North Carolina specific community-based interventions. Community-based programs funded by the state or local foundations on a pilot basis that have not been subject to evaluation should be evaluated and the results disseminated. This would help to incubate further innovation, identify barriers to effective implementation, and disseminate lessons learned so that subsequent efforts can be improved. When programs are shown to be ineffective, sharing such

**Community-based programs funded by the state or local foundations on a pilot basis that have not been subject to evaluation should be evaluated and the results disseminated.**

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<sup>f</sup> Appendix B includes a list of organizations that have compiled data evaluating the strength of the evidence for different interventions aimed at reducing certain health risks or problems.

information will help ensure they are not duplicated in other communities. Community-based interventions that are shown to be effective should be submitted to national repositories for evidence-based practices so that they can be disseminated nationally. Community-based programs that are not evidence-based are being implemented across the state for a variety of reasons, having a system for evaluating these programs and disseminating the results will help improve the quality of programs and services in North Carolina communities.

The UNC Center for Health Promotion and Disease Prevention, using funding from the CDC, manages a website that contains information on evidence-based and best intervention strategies to prevent obesity, heart disease, stroke, and other chronic diseases. With the existing infrastructure, expansion to reviews of North Carolina community-based programs could be accomplished with modest additional investment. This would leverage the infrastructure developed by national investment to create a compendium of programs well-suited to North Carolina efforts. If the Center were to partner with the North Carolina Division of Public Health to ensure technical assistance is available to community partners, the information contained in the compendium could be customized and adapted to North Carolina communities. Furthermore, foundations could include on their websites lists of funded projects as well as technical assistance in implementing these projects. Therefore, the Task Force recommends:

### **Recommendation 13.2: Identify and Disseminate Effective Nutrition, Physical Activity, Obesity, and Chronic Disease Prevention Practices in North Carolina**

The UNC Center for Health Promotion and Disease Prevention should work with North Carolina foundations to identify effective practice-level nutrition, physical activity, obesity, and chronic disease prevention interventions within the state.

- a) North Carolina foundations should provide \$50,000 annually beginning in SFY 2011 to the UNC Center for Health Promotion and Disease Prevention to use an existing systematic process to review five foundation-funded prevention interventions within North Carolina that have not been formally evaluated and disseminate these interventions through a web-based interface designed for, and accessible to, all public health practitioners and community partners.
- b) The website should be used:
  - 1) To provide toolkits for users to replicate interventions at the community practice level.
  - 2) As a resource for potential grantees.
  - 3) As a mechanism for sharing the results of funded and reviewed projects with other grantees.

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- 1 Center for Disease Control and Prevention, US Department of Health and Human Services. Youth Risk Behavior and Surveillance System, 2007. [http://www.cdc.gov/HealthyYouth/yrbs/pdf/yrbss07\\_overview.pdf](http://www.cdc.gov/HealthyYouth/yrbs/pdf/yrbss07_overview.pdf). Published 2008. Accessed June 14, 2009.
- 2 Eaton DK, Kann L, Kinchen S, et al. Methodology of the youth risk behavior surveillance survey. *MMWR Surveill Summ.* 2004;53:RR-12.
- 3 Knight K. Cancer and the environment in North Carolina. Presented to: the North Carolina Institute of Medicine Task Force on Prevention; January 14, 2009; Morrisville, NC.



Compared to other states, the health of North Carolinians is poor. The state's national ranking in terms of overall health is 36th and 38th for premature death.<sup>a,1</sup> Compounding this is the exponentially increasing burden of chronic diseases and other preventable conditions in the state. Further, North Carolina fares poorly on many other health comparisons, including health outcomes, health behaviors, access to care, and socioeconomic measures. The most practical approach to decreasing disease and disability in North Carolina is through prevention. Yet, health care spending in North Carolina, as elsewhere in the country, is drastically skewed toward paying for therapeutic procedures to manage or treat acute or chronic health problems and not towards the prevention of these conditions.

Prevention as a basic strategy can save lives, reduce disability, improve quality of life, and potentially decrease costs. Research has shown that several modifiable factors impact health, including personal behaviors, interpersonal relations, clinical care, community and the environment, and public health policies.<sup>2</sup> Furthermore, there are evidence-based, prevention-focused strategies that can address these modifiable factors. Working to address these factors will improve the health and well-being of North Carolinians in both the short- and long-term.

Together, 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 asked the North Carolina Institute of Medicine (NCIOM) to assemble a task force to develop a comprehensive, evidence-based, statewide prevention plan to improve population health and reduce health care costs. In collaboration with the North Carolina Division of Public Health, the NCIOM convened the Prevention Task Force in April 2008. The Task Force met a total of 14 times between April 2008 and August 2009. The Task Force examined the preventable, underlying causes of the ten leading causes of death and disability in the state as well as health disparities and socioeconomic factors. Recommending the use of evidence-based strategies and interventions when possible, the Task Force developed a comprehensive prevention plan for North Carolina, including strategies to address the modifiable factors (i.e. personal behaviors, interpersonal relations, clinical care, the community and environment, and public and health policies) that affect health outcomes. This final report will serve as a roadmap to improved population health if implemented.

Below is an abridged list of the Task Force recommendations, along with the agency or organization charged with addressing the recommendation. A complete list of the full Task Force recommendations can be found in Appendix A. Eleven of the 45 recommendations were considered by the Task Force to be priority recommendations. However, all the recommendations are important.

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a All rankings reported in Chapter 1 are based upon the best state ranked as 1st. A higher ranking indicates poor performance for a particular measure compared to the best state. It is noted when a ranking includes Washington, DC.

**Prevention as a basic strategy can save lives, reduce disability, improve quality of life, and potentially decrease costs.**

	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
<b>Tobacco Use Recommendations</b>							
<b>3.1: Fund and Implement a Comprehensive Tobacco Control Program</b> The North Carolina General Assembly should provide additional funding to the North Carolina Division of Public Health (DPH) to prevent and reduce tobacco use in North Carolina. DPH should work collaboratively with the North Carolina Health and Wellness Trust Fund and other stakeholders to ensure funds are used in accordance with best practices as recommended by the Centers for Disease Control and Prevention.	✓	✓					✓ HWTF
<b>PRIORITY 3.2: Increase North Carolina Tobacco Taxes</b> The North Carolina General Assembly should increase the tax on cigarettes and other tobacco products to match the national average, and use funds from the revenues to support prevention efforts.	✓						
<b>3.3: Expand Smoke-free Policies in North Carolina</b> The North Carolina General Assembly should amend existing laws to require all worksites and public places to be smoke-free. In the absence of a comprehensive smoke-free law, local Boards of County Commissioners should adopt and enforce laws to restrict or prohibit smoking in public places.	✓						✓ Board of County Comm.
<b>3.4: Expand Access to Cessation Services, Counseling, and Medications for Smokers Who Want to Quit</b> Insurers, payers, and employers should cover evidence-based tobacco cessation services, including counseling and appropriate medications. Providers should provide comprehensive evidence-based tobacco cessation counseling services and appropriate medications.				✓	✓	✓	
<b>Obesity, Nutrition, and Physical Activity Recommendations</b>							
<b>4.1: Implement Child Nutrition Standards in All Elementary Schools and Test Strategies to Deliver Healthy Meals in Middle and High Schools</b> The North Carolina General Assembly should appropriate \$20 million in recurring funds to the North Carolina Department of Public Instruction to fully implement the nutrition standards in elementary schools. Additionally, North Carolina funders should provide funding to test innovative strategies to deliver	✓ \$20M (SFY 2011) (R)		DPI, schools				✓ Funders



	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
healthy meals in middle and high schools while protecting revenues for the child nutrition program.							
<p><b>4.2: Ensure that All Foods and Beverages Available in Schools are Healthy</b></p> <p>The North Carolina General Assembly should direct the State Board of Education to establish statewide nutrition standards for foods and beverages available in school operated vending machines, school stores, and other school operations, and should enact a law prohibiting the advertising or marketing of unhealthy foods or beverages in North Carolina schools.</p>	✓		✓ SBE				
<p><b>PRIORITY 4.3: Implement Quality Physical Education and Healthful Living in Schools</b></p> <p>The North Carolina General Assembly should require the State Board of Education to implement a five-year phase-in of increased physical education including 150 minutes per week of physical education in elementary schools, 225 minutes of Healthful Living curriculum (including both physical education and health education) in middle schools, and 2 units of Healthful Living curricula in high schools.</p>	✓		✓ SBE				
<p><b>4.4: Expand Physical Activity and Nutrition in Child Care Centers and After-school Programs</b></p> <p>The North Carolina Division of Public Health and the North Carolina Partnership for Children, Inc. (NCPC) should expand dissemination of evidenced-based approaches for improved physical activity and nutrition standards in preschools. Further, the North Carolina Child Care Commission should assess the process needed to include healthy eating and physical activity in the quality indicators in North Carolina’s Star Rated License system. After-school programs should incorporate recommended standards for after-school physical activity into their programming.</p>	✓ \$395K (SFY 2011) (R)	✓	✓ DPI				✓ NCPC, NCCCC After school programs
<p><b>PRIORITY 4.5: Implement the <i>Eat Smart, Move More North Carolina Obesity Plan</i> and Raise Public Awareness</b></p> <p>The North Carolina General Assembly should appropriate \$6.5 million in recurring funds to the Division of Public Health to implement evidence-based strategies or best and promising practices in local communities to improve nutrition and increase physical activity. Additionally, the North Carolina General Assembly should appropriate \$3.5 million over five</p>	✓ \$6.5M (SFY 2011) (R) \$500K (ann. for 6 years) \$3.5M (ann. for 6 years)	✓	✓ DPI				✓ HWTf

	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
years to support more comprehensive demonstration projects aimed at promoting multi-faceted interventions in preschools, local communities, faith communities, and health care settings, and \$500,000 to fund pilot programs to reduce overweight and obesity among adolescents. The General Assembly should appropriate additional funds to support a social marketing campaign.	\$16M (by SFY 2020) (R)						
<b>4.6: Expand the Availability of Farmers Markets and Farm Stands at Worksites and Faith-based Organizations</b> Employers and faith-based organizations should help facilitate farmers markets/farm stands at the workplace and in the faith community with a focus on serving low-income individuals and neighborhoods.						✓	✓ Faith-based orgs.
<b>4.7: Promote Menu Labeling to Make Nutrition Information Available to Consumers</b> The North Carolina Division of Public Health (DPH) and North Carolina Prevention Partners should work with the North Carolina Restaurant and Lodging Association to promote menu labeling. If voluntary menu labeling is not implemented by a substantial proportion of the restaurants within three years, the North Carolina General Assembly should mandate labeling laws.		✓					✓ NC Prev. Partners, NC Rest. & Lodging Assoc.
<b>4.8: Build Active Living Communities</b> The North Carolina General Assembly should authorize counties and municipalities to have the local option to raise revenues for community transportation, parks, and sidewalks and should appropriate \$1.5 million in recurring funds to the North Carolina Division of Parks and Recreation to expand trail and greenway planning, construction and maintenance projects.	✓ \$1.5M (NR)						✓ DPR
<b>4.9: Establish Joint-use Agreements to Establish use of School and Community Recreational Facilities</b> Local governmental agencies, including schools, parks and recreation, health departments, county commissioners and municipalities, and other relevant organizations should work together to develop joint-use agreements which would expand the use of school facilities for after-hours community physical activity and which would make community facilities available to schools.			NC School Boards Assoc.				✓ Other state and local orgs.

	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
<p><b>4.10: Expand Community Grants Program to Promote Physical Activity</b>                      The North Carolina General Assembly should appropriate \$3.3 million annually for five years to the North Carolina Division of Public Health (DPH) to expand the community grants program to support community efforts to expand the availability of sidewalks, bicycle lanes, parks, and other opportunities for physical activity and recreation.</p>	✓ \$3.3M (SFY 2011) (ann. for 5 years)	✓					
<p><b>4.11: Increase the Availability of Obesity Screenings and Counseling</b>                      Primary care providers should screen adult patients for obesity using a Body Mass Index (BMI) and provide high intensity counseling either directly, or through referrals, on nutrition, physical activity, and other strategies to achieve and maintain a healthy weight. Insurers, payers, and employers should cover screenings and counseling on nutrition and/or physical activity for adults who are identified as obese.</p>				✓ PCP	✓	✓	
<p><b>4.12: Expand the Community Care of North Carolina (CCNC) Childhood Obesity Prevention Initiative</b>                      If the Community Care of North Carolina Childhood Obesity Prevention Initiative pilots are shown to be successful, the initiative should be expanded throughout the state. The North Carolina General Assembly should appropriate \$174,000 in non-recurring funds to the North Carolina Office of Rural Health and Community Care to support this effort.</p>	✓ \$174K (NR)						✓ CCNC, ORHCC
<b>STDs, HIV, and Unintended Pregnancy Recommendations</b>							
<p><b>5.1: Increase Awareness, Screening and Treatment of Sexually Transmitted Diseases and Reduce Unintended Pregnancies</b>                      The North Carolina General Assembly should appropriate \$6.2 million in recurring funds to the North Carolina Division of Public Health (DPH) to support social marketing campaigns around sexually transmitted diseases (STD) and HIV prevention and to reduce unintended pregnancies. Funds should also be used to offer nontraditional testing sites to increase screening for HIV and STDs among high-risk populations and should be used to support teen pregnancy prevention programs. DPH should also work with health care professionals and other nontraditional providers to increase screenings and treatment.</p>	✓ \$6.2M (SFY 2011) (R)	✓		✓ NCBM, NCMD, NCMS			

	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
<p><b>5.2: Increase HIV Testing in Prisons, Jails, and Juvenile Centers</b>                      The North Carolina Department of Correction, North Carolina Department of Juvenile Justice and Delinquency Prevention, and North Carolina county jails should include opt-out HIV testing of prisoners and other detainees prior to release back to the public. These agencies should collaborate with the North Carolina Division of Public Health to coordinate outpatient care for individuals who are identified as HIV-positive. The North Carolina General Assembly should appropriate \$1,007,000 in recurring funds for this effort.</p>	✓ \$1M (SFY 2011) (R) \$6.7K (SFY 2011) (R)	✓					✓ DOC, DJJDP
<p><b>PRIORITY 5.3: Ensure Students Receive Comprehensive Sexuality Education in North Carolina Public Schools</b>                      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.</p>			✓ SBE, LEAs				✓ DOC, DJJDP
<p><b>5.4: Expand the Availability of Family Planning for Low-Income Families</b>                      The North Carolina Division of Medical Assistance and Division of Public Health (DPH) should enhance access to family planning services for low-income families, including implementation of best practices for the Medicaid family planning waiver. The North Carolina General Assembly should appropriate \$931,000 in recurring funds to DPH to purchase long-acting contraceptives for low-income women who do not qualify for the Medicaid family planning waiver.</p>	✓ \$931K (SFY 2011) (R)	✓					✓ DMA
<b>Substance Abuse and Mental Health Recommendations</b>							
<p><b>PRIORITY 6.1: Develop and Implement a Comprehensive Substance Abuse Prevention Plan</b>                      The North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMHDDSAS) should develop a comprehensive substance abuse prevention plan for use at the state and local levels. The plan should increase capacity at the state level and within local communities to implement a comprehensive substance abuse prevention system, prioritizing efforts to reach children, adolescents, young adults, and their parents. The plan should be pilot tested in six</p>	✓ \$1.95M (SFY 2011) (R) \$3.7M (SFY 2012) (R)	✓					✓ DMHDDSAS

	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
counties or multi-county areas, and if effective, should be implemented statewide. The North Carolina General Assembly should appropriate \$1.95 million in recurring funds and \$3.7 million in recurring funds to DMHDDSAS to support this initiative. In addition, the North Carolina General Assembly should raise the alcohol tax on beer and wine and should use some of these funds for prevention, early intervention, and treatment to support recovery among adolescents and adults.							
<p><b>6.2: Expand the Availability of Screening, Brief Intervention and Treatment for People with Behavioral Health Problems in the Primary Care Setting</b></p> <p>The North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMHDDSAS) should work with the other appropriate organizations to educate and encourage health care professionals to use evidence-based screening tools and offer counseling, brief intervention, and referral to treatment (SBIRT) to help patients prevent, reduce, or eliminate the use of or dependency on alcohol, tobacco, and other drugs. The North Carolina General Assembly should appropriate \$1.5 million in recurring funds to DMHDDSAS to support this effort and should mandate that insurers offer the same coverage for the treatment of addiction disorders as for the treatment of other physical illnesses. The North Carolina Division of Medical Assistance should work with the Office of Rural Health and Community Care to develop an enhanced payment to support co-location of primary care, mental health, developmental disabilities, and substance abuse services.</p>	<p>✓</p> <p>\$1.5 M (SFY 2011) (R)</p>			✓	✓		<p>✓</p> <p>DMHDDSAS, ORHCC, AHEC, Governor's Institute, on Alcohol and Other Drugs, DMA</p>
<p><b>6.3: Expand Early Intervention Services in the Faith Community</b></p> <p>The North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services should partner with faith-based organizations to develop and offer training specifically designed to help leaders of all faiths recognize signs of stress, depression, and substance abuse in those they counsel and to develop linkages with outside referrals when appropriate.</p>							<p>✓</p> <p>DMHDDSAS, Faith comm., MH and SA orgs.</p>

	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
<b>Environmental Risks Recommendations</b>							
<p><b>7.1: Create an Interagency Leadership Commission to Promote Healthy Communities, Minimize Environmental Risks, and Promote Green Initiatives</b></p> <p>The Governor or the North Carolina General Assembly should create an Interagency Leadership Commission, including senior level agency staff from different state and local agencies, to develop a statewide plan to promote healthy communities, minimize environmental risks, and promote sustainability and “green” initiatives that will support and improve the public’s health and safety. The plan should include statewide efforts to: promote active, walkable, livable communities; reduce environmental exposures and risks that negatively impact population health; promote clean, renewable energy, green technology, and local production of food, energy, goods, and services; and increase opportunities for mass transportation.</p>	✓						✓ Governor
<p><b>7.2: Develop an Environmental Assessment for North Carolina that Links Environmental Exposures to Health Outcomes</b></p> <p>The Department of Environmental Sciences and Engineering in the University of North Carolina at Chapel Hill (UNC) Gillings School of Global Public Health should work with appropriate state agencies and other university partners to develop an environmental assessment for the state that links environmental exposures/risks and health outcomes and includes strategies to address the exposures/risks. The North Carolina General Assembly should appropriate \$3 million in non-recurring funds to the UNC Gillings School of Global Public Health to support this effort.</p>	✓ \$3 M (SFY 2011) (NR)						✓ UNC Dept. of Envr. Sci. and Eng.
<p><b>7.3: Ensure Healthy Homes</b></p> <p>The North Carolina Division of Public Health, North Carolina Division of Water Quality, North Carolina Department of Environment and Natural Resources, Office of the State Fire Marshal, and North Carolina Department of Insurance should expand and enhance efforts to create healthy homes. These efforts should address, but not be limited to, the following: indoor air quality, mold and moisture, carbon monoxide, lead-based paint, radon, asbestos, drinking water, hazardous household products, pesticide exposure, pest management, and home safety (e.g. injury prevention of falls).</p>		✓					✓ NCDWQ, DENR, DOI, Office of State Fire Marshall

	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
<p><b>7.4: Reduce Environmental Risks in Schools and Child Care Settings</b></p> <p>The North Carolina Department of Public Instruction and the North Carolina Division of Child Development, in collaboration with other appropriate state agencies, should develop an implementation plan to phase in the Tools for Schools assessments in all schools and licensed child care centers over a four-year period. In addition, the North Carolina Division of Public Health (DPH) should work with other state agencies to train child care, elementary, and secondary school staff to identify potential environmental hazards. The North Carolina General Assembly should appropriate \$4278,000 DPH to support training activities.</p>	<p>✓</p> <p>\$400K (SFY 2011) (R)</p> <p>\$26K (SFY 2011 ann. for 4 years)</p>	✓	<p>✓</p> <p>DPI</p>				<p>✓</p> <p>DENR, NC Coop. Ext., NC Div. Child Develop.</p>
<b>Injury Recommendations</b>							
<p><b>8.1: Review and Enforce All Traffic Safety Laws and Enhance Surveillance</b></p> <p>North Carolina law enforcement agencies should actively enforce traffic safety laws, especially those pertaining to seat belt usage, driving while impaired (DWI), speeding, and motorcycles. The North Carolina General Assembly should strengthen traffic safety laws and enforcement including rear seat occupant seat belt laws, the licensure and training for motorcyclists, and enforcement of speeding and aggressive driving laws, as well as require alcohol interlocks for DWI offenders, and expand Booze It and Lose It checking stations. The North Carolina General Assembly should appropriate \$1 million in recurring funds to the Governor’s Highway Safety Program to support these efforts.</p>	<p>✓</p> <p>\$1.75M (R)</p>	✓					<p>✓</p> <p>NC Law Enforce. Agencies, NC DMV, Governor’s Highway Safety Program</p>
<p><b>8.2: Enhance Injury Surveillance, Intervention, and Evaluation</b></p> <p>The North Carolina Division of Public Health (DPH) should identify and implement pilot programs and other community-based activities to prevent unintentional injury and violence. Priority should be given to evidence-based programs or best and promising practices that prevent motor vehicle crashes, falls, unintentional poisonings, and family violence. In addition, DPH should work with other public and private agencies to enhance the current intentional and unintentional surveillance systems. The North Carolina General Assembly should appropriate \$4 million in recurring funds to DPH to support these efforts.</p>	<p>✓</p> <p>\$4M (SFY 2011) (R)</p>	✓					

	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
<p><b>8.3: Enhance Training of State and Local Public Health Professionals, Social Workers, and Others</b>                      The University of North Carolina (UNC) Injury Prevention Research Center should develop curricula and train state and local public health professionals, physicians, nurses, allied care workers, social workers, and others responsible for injury and violence prevention so they can achieve or exceed competency in injury control. The North Carolina General Assembly should appropriate \$200,000 in recurring funds to the UNC Injury Prevention Research Center to support this effort.</p>	✓ \$200K (SFY 2011) (R)						✓ UNC Injury Prev. Res. Center
<p><b>PRIORITY 8.4: Create a Statewide Task Force or Committee on Injury and Violence</b>                      The North Carolina General Assembly should create an Injury and Violence Prevention Task Force to examine data, make evidence-based policy and program recommendations, monitor implementation, and examine outcomes to prevent and reduce injury and violence. The work of the Task Force should build on the work of the North Carolina 2009-2014 State Strategic Plan for Injury and Violence Prevention and should examine data around motor vehicle crashes; falls; unintentional poisonings; occupational injuries; family violence including child maltreatment and domestic violence; other forms of unintentional injuries such as fires and drowning; and intentional injuries such as homicide and suicide.</p>	✓						
<b>Vaccine Preventable Disease and Foodborne Illness Recommendations</b>							
<p><b>PRIORITY 9.1: Increase Immunization Rates</b>                      The North Carolina General Assembly should appropriate \$1.5 million in recurring funds to the North Carolina Division of Public Health (DPH) to conduct an aggressive outreach campaign to increase the childhood immunization rates for all the vaccines recommended by the Centers for Disease Control and Prevention. DPH should monitor the immunization rates, especially for those vaccines not currently covered through the state's Universal Childhood Vaccine Distribution Program, and determine if additional strategies are needed to increase childhood and adolescent vaccination rates.</p>	✓ \$36.5M (R) \$1.5M (SFY 2011) (R)	✓			✓		



	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
<p><b>9.2: Strengthen Laws to Prevent Foodborne Illnesses</b>                      The North Carolina General Assembly should direct different state agencies that are involved in protecting food at different points of the food supply chain to develop a unified proactive, scientifically-based strategy to prevent, detect, and respond to foodborne illness. The North Carolina General Assembly should appropriate \$1.6 million in non-recurring funds and \$300,000 in recurring funds to the North Carolina Division of Public Health to develop and maintain an enhanced surveillance system that facilitates sharing of data from different state and federal agencies when needed to detect or prevent the spread of foodborne illnesses, and should ensure that the Governor can use rainy day funds to pay for additional personnel needed in large outbreak investigations, food protection efforts, or other natural or man-made public health emergencies.</p>	✓ \$1.6M (SFY 2011) (NR)  \$300K (SFY 2012) (R)						DENR, DHHS, Dept. Agricult. and Consumer Serv. Dept.
<b>Racial and Ethnic Disparity Recommendations</b>							
<p><b>10.1: Fund Evidence-Based Programs to Meet the Needs of Diverse Populations</b>                      Public and private funders supporting prevention initiatives in North Carolina should place priority on funding evidence-based programs and practices. Interventions should take into account the racial, ethnic, cultural, geographic, and economic diversity of the population being served. The North Carolina Division of Public Health should involve community leaders in prevention activities, especially those targeting racial and ethnic minorities.</p>		✓					✓ Funders, NC Foundations
<b>Socioeconomic Determinants of Health Recommendations</b>							
<p><b>PRIORITY 11.1: Promote Economic Security</b>                      The North Carolina General Assembly should increase the state Earned Income Tax Credit. In addition, the North Carolina Division of Social Services should conduct outreach to encourage low-income individuals and families to apply for the Supplemental Nutrition Assistance Program.</p>	✓						✓ DSS
<p><b>11.2: Increase the Availability of Affordable Housing and Utilities</b>                      The North Carolina General Assembly should appropriate \$10 million in recurring funds to the North Carolina Housing Finance Agency to increase funding to the North Carolina Housing Trust Fund and should enact legislation to help low-income North Carolinians lower their utility bills.</p>	✓ \$10M (R)						✓

	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
<p><b>11.3: Expand Opportunities for High Quality Early Childhood Education and Health Programs</b>                      North Carolina Smart Start should further disseminate high quality health and education programs to promote healthy social and emotional development among children in need in all North Carolina counties. The North Carolina General Assembly should appropriate \$1.2 million in recurring funds to the North Carolina Partnership for Children, Inc. to support this effort.</p>	✓ \$1.2M (R)						✓ NC Smart Start
<p><b>PRIORITY 11.4: Increase the Graduation Rate</b>                      The North Carolina State Board of Education (SBE) and the North Carolina Department of Public Instruction should 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. The SBE should implement evidence-based strategies to improve student attendance rates and decrease truancy, foster a student-supportive school climate that promotes school connectedness, explore and implement customized learning options for students, and more fully engage students in learning. The SBE should examine the experiences of other states, develop cost estimates to implement evidence-based initiatives to increase high school graduation, and report their findings to the Joint Legislative Education Oversight Committee by April, 2010.</p>			✓ SBE, DPI				
<p><b>Cross-Cutting Strategies in Schools, Worksites, and Clinical Settings Recommendations</b></p>							
<p><b>PRIORITY 12.1: Enhance North Carolina Healthy Schools</b>                      The North Carolina Department of Public Instruction (DPI) should expand the NC Healthy Schools Initiative to include a local healthy schools coordinator in each Local Education Agency (LEA). Healthy school coordinators would help schools implement evidence-based programs, practices, and policies to support Coordinated School Health programs. The North Carolina General Assembly should appropriate \$1.5 million in recurring funds increased by an additional \$1.5 in recurring funds in each of the following five years for a total of \$12 million recurring to support these positions. The NC Healthy Schools Section of DPI should provide monitoring, evaluation, and technical assistance to the LEAs through the local healthy schools coordinators. The North Carolina General Assembly</p>	✓ \$12M (\$1.5M from SFY 2011-SFY 2017) (R) \$225K (SFY 2011) (R)		✓ DPI				✓

	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
should appropriate \$225,000 in recurring funds to DPI to support the addition of 3 full-time employees to do this work.							
<p><b>12.2: Require the Use of Evidence-based Curricula for Healthful Living Standard Course of Study</b></p> <p>The North Carolina General Assembly should require schools to use evidence-based curricula when available to teach the objectives of the Healthful Living Standard Course of Study. The North Carolina General Assembly should appropriate \$1.2 million in recurring funds to the North Carolina Department of Public Instruction (DPI) to provide grants to Local Education Agencies (LEAs) to implement evidence-based curricula. To implement this provision, the DPI Healthy Schools Section should identify 3-5 evidence-based curricula that demonstrate positive change in behavior across multiple health risk behaviors (i.e. substance use, violence, sexual activity) and provide grants (of up to \$10,000 per LEA) for implementation and technical assistance to ensure curricula are implemented with fidelity. DPI should provide training to school staff to help them assess and evaluate health and physical education programs and curricula. In addition, DPI should develop additional academically rigorous health education and physical education honors courses at the high school level.</p>	<p>✓</p> <p>\$1.2 M (SFY 2011) (R)</p>		✓	✓			
<p><b>12.3: Create the North Carolina Worksite Wellness Collaborative and Tax Incentives for Small Businesses</b></p> <p>The North Carolina General Assembly should direct the North Carolina Public Health Foundation to establish the North Carolina Worksite Wellness Collaborative to promote evidence-based strategies to support the optimal health and well-being of North Carolina’s workforce. The collaborative should help businesses implement healthy workplace policies and benefits, implement health risk appraisals, develop comprehensive employee wellness programs, and implement data systems that track outcomes and the organizational and employee level. The General Assembly should provide start-up funding of \$800,000, with a reduced amount over the next four years, to support this collaborative. In addition, the General Assembly should provide a tax credit to businesses with 50 or fewer employees that have implemented a comprehensive worksite wellness program for their employees.</p>	<p>✓</p> <p>\$2.7 M (NR) over 5 years</p>						<p>✓</p> <p>NC Public Health Foundation</p>

	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
<p><b>PRIORITY 12.4: Expand Health Insurance Coverage to More People</b>                      The Task Force believes that everyone should have health insurance coverage. In the absence of such, the North Carolina General Assembly should begin expanding coverage to groups that have the largest risk of being uninsured. Additionally, insurers should expand coverage to include the screenings, counseling and treatment recommended by the US Preventive Services Task Force.</p>	✓	✓			✓		✓ DMA, NC Prev. Partners
<p><b>12.5: Improve Provider Training To Enhance Knowledge of Evidence-based Practices</b>                      The Area Health Education Centers (AHEC) Program should offer training courses to enhance the training of health professionals, including physicians, nurses, allied health, and other health care practitioners, to increase the use of evidence-based prevention, screening, early intervention, and treatment services to reduce certain high-risk behaviors and other factors that contribute to the state’s leading causes of death and disability. Training courses should be expanded into academic and clinical settings, residency programs, and other continuing education programs. The North Carolina General Assembly should appropriate \$250,000 in recurring funds to AHEC to support these efforts.</p>	✓ \$250K (SFY 2011) (R)	✓					✓ AHEC, DMHDDSAS, Governor’s Institute on Alcohol and Drugs Others
<b>Data Recommendations</b>							
<p><b>13.1: Enhance Existing Data Systems</b>                      North Carolina agencies should enhance specific existing data collection systems to ensure that the state has adequate data for health and risk assessment, including youth risk data, school health profiles, environmental risks, and improved data collected in the cancer registry.</p>	✓ \$250K (SFY 2011) (R)	✓					✓ AHEC, DMHDDSAS, Governor’s Institute on Alcohol and Drugs Others

	NCGA	DPH	Education (DPI, LEA, SBE)	Health Professionals	Insurers	Employers	Others
<p><b>13.2: Identify and Disseminate Effective Nutrition, Physical Activity, Obesity, and Chronic Disease Prevention Practices in North Carolina</b></p> <p>The UNC Center for Health Promotion and Disease Prevention (HPDP) should work with North Carolina foundations to identify effective practice-level nutrition, physical activity, obesity, and chronic disease prevention interventions within the state. Foundations should provide HPDP with \$50,000 per year to review five foundation- funded prevention initiatives and should help disseminate effective practices to other communities.</p>	<p>✓ \$250K (SFY 2011) (R)</p>	<p>✓</p>					<p>✓ AHEC, DMHDDSAS, Governor's Institute on Alcohol and Drugs Others</p>

Abbreviations: NCGA (North Carolina General Assembly), DPH (Division of Public Health), DPI (Division of Public Instruction), LEA (Local Education Agency), SBE (State Board of Education), AHEC (Area Health Education Centers), CCNC (Community Care of North Carolina), DENR (Division of Environment and Natural Resources), DHHS (Department of Health and Human Services), DJJDP (Division of Juvenile Justice and Delinquency Prevention), DMA (Division of Medical Assistance), DMHDDSAS (Division of Mental Health Developmental Disabilities and Substance Abuse Services), DOC (Department of Correction), DOT (Department of Transportation), DPR (Division of Parks and Recreation), DSS (Division of Social Services), HWTF (Health and Wellness Trust Fund), LME (Local Management Entity), ORHCC (Office of Rural Health and Community Care), NCBP (North Carolina Board of Pharmacy), NCMB (North Carolina Medical Board), NCMS (North Carolina Medical Society), PCP (Primary Care Providers), NCPC (North Carolina Partnership for Children, Inc.), NCCCC (North Carolina Child Care Commission), NCDWQ (North Carolina Division of Water Quality), DOI (Department of Insurance), NC DMV (North Carolina Division of Motor Vehicles), HPDP (UNC Center for Health Promotion and Disease Prevention)

**References**

- 1 United Health Foundation. America's Health Rankings: data tables. United Health Foundation website. <http://www.americashealthrankings.org/2008/tables.html>. Published 2008. Accessed December 4, 2008.
- 2 Glanz K, Rimer B, Lewis MF, eds. Health Behavior and Health Education. 3rd ed. San Francisco, CA: Jossey-Bass; 2002.

## **Chapter 3: Tobacco Use**

### **Recommendation 3.1: Fund and Implement a Comprehensive Tobacco Control Program**

- a) The North Carolina General Assembly should support the state's Comprehensive Tobacco Control Program by protecting the North Carolina Health and Wellness Trust Fund's (HWTF) ability to continue to prevent and reduce tobacco use in North Carolina by:
  - 1) Ensuring that no additional funds are diverted from HWTF's share of the Master Settlement Agreement (MSA).
  - 2) Releasing HWTF from its obligation to use over 65% of its annual MSA receipts to underwrite debt service for the State Capital Facilities Act, 2004.
- b) The North Carolina General Assembly should better enable the North Carolina Division of Public Health (DPH) and HWTF to prevent and reduce tobacco use in North Carolina by appropriating additional funding to DPH so that this new state funding, combined with HWTF's annual allocation for tobacco prevention (based on provision A), reaches \$106.8 million in recurring funds by SFY 2020. The total amount of the funds available for Tobacco Control in North Carolina should be increased as follows:
  - 1) \$26.7 million in recurring funds by SFY 2011
  - 2) \$53.4 million in recurring funds by SFY 2015
  - 3) \$90.8 million in recurring funds by SFY 2018
  - 4) \$106.8 million in recurring funds by SFY 2020
- c) DPH should work collaboratively with the HWTF and other stakeholders to ensure that the funds are spent in accordance with best practices as recommended by the Centers for Disease Control and Prevention.

### **Recommendation 3.2: Increase North Carolina Tobacco Taxes (PRIORITY RECOMMENDATION)**

- a) The North Carolina General Assembly should increase the tax on a pack of cigarettes to meet the current national average. The cigarette tax should be regularly indexed to the national average whenever there is a difference of at least 10% between the national average cost of a pack of cigarettes (both product and taxes) and the North Carolina average cost of a pack of cigarettes.
- b) The North Carolina General Assembly should increase the tax on all other tobacco products to be comparable to the current national cigarette tax average, which would be 55% of the product wholesale price.

- c) These new revenues should be used for a broad range of prevention activities including preventing and reducing dependence on tobacco, alcohol, and other substances.

### **Recommendation 3.3: Expand Smoke-free Policies in North Carolina**

- a) The North Carolina General Assembly should amend current smoke-free laws to mandate that all worksites and public places are smoke-free.
- b) In the absence of a comprehensive state smoke-free law, local governments, through their Boards of County Commissioners, should adopt and enforce ordinances, board of health rules, and policies that restrict or prohibit smoking in public places in accordance with GS 130A-497.

### **Recommendation 3.4: Expand Access to Cessation Services, Counseling, and Medications for Smokers Who Want to Quit**

- a) Insurers, payers, and employers should cover comprehensive, evidence-based tobacco cessation services and benefits including counseling and appropriate medications.
- b) Providers should deliver comprehensive, evidence-based tobacco cessation services including counseling and appropriate medications.

## **Chapter 4: Obesity, Nutrition, And Physical Activity Recommendations**

### **Recommendation 4.1: Implement Child Nutrition Standards in All Elementary Schools and Test Strategies to Deliver Healthy Meals in Middle and High Schools**

- a) Elementary schools should fully implement the State Board of Education (SBE)-adopted nutrition standards. Districts should receive support for implementation from the North Carolina General Assembly under the following conditions:
  1. The school district is in full compliance with SBE policy on nutrition standards in elementary schools (GS 115C-264.3).
  2. The school district is not charging indirect costs to the Child Nutrition Program until such time as the Child Nutrition Program achieves and sustains a three-month operating balance.



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- b) The North Carolina General Assembly should appropriate \$20 million in recurring funds beginning in SFY 2011 to the North Carolina Department of Public Instruction (DPI) to support the full and consistent implementation of the SBE-adopted nutrition standards in elementary schools.
- c) North Carolina funders should develop a competitive request for proposals to fund a collaborative effort between DPI and other partners to test the potential for innovative strategies to deliver healthy meals in middle and high schools while protecting/maintaining revenue for the Child Nutrition Program. Funders should require grant recipients to conduct an independent rigorous evaluation that includes cost.

### **Recommendation 4.2: Ensure All Foods and Beverages Available in Schools are Healthy**

The North Carolina General Assembly should direct the State Board of Education to establish statewide nutrition standards for foods and beverages available in school-operated vending machines, school stores, and all other operations on the school campus during the instructional day. These standards should meet or exceed national standards.

- a) The North Carolina General Assembly should direct local Boards of Education to require all principals whose schools operate vending machines outside of the Child Nutrition Program to sign a Memorandum of Agreement (MOA) with beverage and snack vendors to ensure vending machines contain only those foods and beverages that are consistent with the new nutrition standards or with current law GS 115C-264.2 until the new standards are developed. The MOA should be submitted to the North Carolina Department of Public Instruction annually to indicate full compliance.
- b) The North Carolina General Assembly should enact a law to remove advertising and marketing of unhealthy foods and beverages in schools that do not meet standards of GS 115C-264.3.

### **Recommendation 4.3: Implement Quality Physical Education and Healthful Living in Schools (PRIORITY RECOMMENDATION)**

- a) The North Carolina General Assembly should require the State Board of Education (SBE) to implement a five-year phase-in requirement of the following:
  - 1) Quality physical education that includes 150 minutes of elementary school physical education weekly.
  - 2) 225 minutes weekly of Healthful Living curriculum in middle schools, and two units of Healthful Living curricula as a graduation requirement for high schools. The new requirement for middle and high school should require equal time for health and physical education.

- b) The SBE shall be required to report annually to the Education Oversight Committee regarding the Healthful Living education program, physical education program, and Healthy Active Children policy.
- c) The SBE should work with appropriate staff members in the North Carolina Department of Public Instruction, including curriculum and finance representatives, and staff from the North Carolina General Assembly Fiscal Research Division to examine the experiences of other states and develop cost estimates for the five-year phase-in, which should be reported to the research division of the North Carolina General Assembly and the Education Oversight Committee by April 1, 2010.

#### **Recommendation 4.4: Expand Physical Activity and Nutrition in Child Care Centers and After-school Programs**

- a) The North Carolina Division of Public Health (DPH) and the North Carolina Partnership for Children, Inc. (NCPC) should expand dissemination of evidenced-based approaches for improved physical activity and nutrition standards in preschools using Nutrition and Physical Activity Self-Assessment for Child Care (NAP-SACC). Beginning in SFY 2011, the North Carolina General Assembly should appropriate \$70,000 in recurring funds to the DPH and \$325,000 in recurring funds to NCPC for these activities.
- b) The North Carolina Child Care Commission should assess the funding needed for child care centers to incorporate healthy eating and physical activity practices and the process to include healthy eating and physical activity as quality indicators in North Carolina's Star Rated License system for licensed childcare centers.
- c) After-school programs should use the *Move More North Carolina: Recommended Standards for After-School Physical Activity*. Specifically:
  - 1) State agencies should require after-school programs that receive state funding or federal funding administered by the state to use the standards.
  - 2) The North Carolina Department of Public Instruction and the North Carolina Center for Afterschool Programs should encourage other after-school programs that do not receive state or federal funds to use the standards.

#### **Recommendation 4.5: Implement the *Eat Smart, Move More North Carolina Obesity Prevention Plan* and Raise Public Awareness (PRIORITY RECOMMENDATION)**

- a) 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

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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 this effort. Funding should be allocated as follows:

- 1) \$5 million (\$50,000 per county) to support local capacity (1 FTE) for the dissemination of evidence-based prevention programs and policies in North Carolina communities.
  - 2) \$1 million to *Eat Smart, Move More North Carolina* to expand community competitive grants. Communities should be limited to grants of up to \$40,000 to support evidence-based strategies or best and promising practices that improve nutrition and/or physical activity behavior, thereby promoting healthy weight and reducing chronic disease.
  - 3) \$500,000 to DPH to provide technical assistance for the implementation of the *Eat Smart, Move More North Carolina Obesity Prevention Plan* and/or the competitive grants and to conduct an independent evaluation.
- b) The North Carolina General Assembly should appropriate \$500,000 annually in non-recurring funds for six years beginning in SFY 2011 to DPH for pilot programs of up to \$100,000 per year to reduce overweight and obesity among adolescents.
- c) The North Carolina General Assembly should appropriate \$3.5 million annually for six years beginning in SFY 2011 to DPH to continue the demonstration projects initially funded by the North Carolina General Assembly in 2008. Funding will be distributed to the five current demonstration counties and to three additional counties (on a competitive basis) for interventions in preschools, schools, local communities, faith organizations, worksites, and health care settings to promote and support physical activity and healthy eating. DPH should work in collaboration with *Eat Smart, Move More North Carolina* partners, NC Prevention Partners, the UNC Center for Health Promotion and Disease Prevention, and others to provide technical support and disseminate best practices.
- d) DPH, the North Carolina Health and Wellness Trust Fund (HWTF), and the North Carolina Department of Public Instruction (DPI) should raise public awareness and implement a statewide social marketing campaign to promote healthy physical activity and nutrition behaviors and environments in schools, homes, and the community. Campaign messages should be based on behaviors identified by the Centers for Disease Control and Prevention to guide state efforts against obesity. DPH should work with the HWTF and DPI on the expansion and evaluation of this social marketing campaign. The North Carolina General Assembly should appropriate recurring funds beginning in SFY 2011 to DPH until the funding level reaches \$16 million annually to support this effort. A portion of the funding will be used for evaluation. Funding should be increased as follows:
- 1) \$5.0 million in recurring funds by SFY 2011
  - 2) \$8.0 million in recurring funds by SFY 2015
  - 3) \$12.0 million in recurring funds by SFY 2018
  - 4) \$16.0 million in recurring funds by SFY 2020

### **Recommendation 4.6: Expand the Availability of Farmers Markets and Farm Stands at Worksites and Faith-based Organizations**

Employers and faith-based organizations should help facilitate farmers markets/farm stands at the workplace and in the faith community with a focus on serving low-income individuals and neighborhoods.

### **Recommendation 4.7: Promote Menu Labeling to Make Nutrition Information Available to Consumers**

- a) The North Carolina Division of Public Health (DPH) in collaboration with NC Prevention Partners should promote and offer technical assistance for menu labeling in restaurants through a collaborative effort with the North Carolina Restaurant and Lodging Association. If menu labeling is not implemented by a substantial proportion of restaurants within three years, the state should seek mandatory labeling laws.
- b) DPH should work with other organizations around the country to draft model legislation to promote national standards for menu labeling.

### **Recommendation 4.8: Build Active Living Communities**

- a) The North Carolina General Assembly should authorize counties/municipalities to have the local option to hold a referendum to increase the sales tax by ½ cent for community transportation, parks, and sidewalks.
- b) The North Carolina Division of Parks and Recreation should expand the existing Adopt-a-Trail grant program, which provides grants to governmental agencies and nonprofit organizations for trail and greenway planning, construction, and maintenance projects. The North Carolina General Assembly should appropriate an additional \$1.5 million in recurring funds beginning in SFY 2011 to the North Carolina Division of Parks and Recreation for this program.

### **Recommendation 4.9: Establish Joint-use Agreements to Expand Use of School and Community Recreational Facilities**

- a) The North Carolina School Boards Association should work with state and local organizations including but not limited to the North Carolina Recreation and Park Association, Local Education Agencies, North Carolina Association of Local Health Directors, North Carolina County Commissioners Association, North Carolina League of Municipalities, North Carolina High School Athletic Association, and Parent Teacher Associations to encourage collaboration among

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local schools, parks and recreation, faith organizations, and/or other community groups to expand the use of school facilities for after-hours community physical activity. These groups should examine successful local initiatives and identify barriers, if any, which prevent other local school districts from offering the use of school grounds and facilities for after-hour physical activity and develop strategies to address these barriers. In addition, this collective group should examine possibilities for making community facilities available to schools during school hours, develop model joint-use agreements, and address liability issues.

- b) The State Board of Education should encourage the School Planning Section, Division of School Support, North Carolina Department of Public Instruction to do the following:
  - 1) Provide recommendations for building joint park and school facilities.
  - 2) Include physical activity space in the facility needs survey for 2010 and subsequent years.

## Recommendation 4.10: Expand Community Grants Program to Promote Physical Activity

The North Carolina Division of Public Health (DPH) should expand the existing Community Grants Program to assist 15 local communities in developing and implementing Active Living Plans. Funding should be used to support community efforts that will expand the availability of sidewalks, bicycle lanes, parks, and other opportunities for physical activity and recreation. The North Carolina General Assembly should appropriate \$3.3 million annually for five years beginning in SFY 2011 to DPH to expand the existing Community Grants Program. If successful, the North Carolina General Assembly should expand funding to replicate successful efforts in other parts of the state.

- a) Funds should be used to support programs in both rural and urban areas.
- b) To qualify for Community Grants, local communities must collaborate with a wide consortium of community partners such as local planning departments, local government, public health, schools, parks and recreation, transportation, the faith community, developers, and businesses. Communities must have joint-use agreements in place.
- c) Grantees must use the funds to support:
  - 1) Planning to identify what active living infrastructure exists and what is needed.
  - 2) Development of public policies to guide public and private investment in active living infrastructure.
  - 3) Implementation of physical projects such as new sidewalks, bike paths, and parks to provide residents with places to be active and children with the ability to walk to school.
  - 4) Promotions and programs to encourage the use of these facilities.

- d) DPH should allocate 10% of the funds for an independent evaluation of these projects. Evaluation outcomes should include but not be limited to usage, costs, and the impact of these projects on economic development.

### **Recommendation 4.11: Increase the Availability of Obesity Screening and Counseling**

- a) Insurers, payers, and employers should cover Body Mass Index (BMI) screening and counseling on nutrition and/or physical activity for adults who are identified as obese.
- b) Primary care providers should screen adult patients for obesity using a BMI and provide high-intensity counseling either directly or through referral on nutrition, physical activity, and other strategies to achieve and maintain a healthy weight.

### **Recommendation 4.12: Expand the CCNC Childhood Obesity Prevention Initiative**

If shown to be successful through program evaluations, Community Care of North Carolina (CCNC) should continue expansion of the Childhood Obesity Prevention Initiative including the dissemination and use of already developed clinical initiatives aimed at obesity reduction for Medicaid-enrolled and other children and their families. The North Carolina General Assembly should appropriate one-time funding of \$174,000 in SFY 2011 to the North Carolina Office of Rural Health and Community Care to support this effort.

## **Chapter 5: STDs, HIV, and Unintended Pregnancy**

### **Recommendation 5.1: Increase Awareness, Screening, and Treatment of Sexually Transmitted Diseases and Reduce Unintended Pregnancies**

- a) The North Carolina General Assembly should appropriate \$6.2 million in recurring funds beginning in SFY 2011 to the North Carolina Division of Public Health (DPH) to support efforts to reduce sexually transmitted diseases (STDs) and HIV infection and transmission and prevent unintended pregnancy. Of these funds, DPH should use:
  - 1) \$2.4 million to expand the *Get Real. Get Tested.* campaign for HIV prevention, create STD prevention messages, and collaborate with local health departments to offer nontraditional testing sites to increase community screenings for STDs such as chlamydia and syphilis and for HIV among adolescents, youth, and high-risk populations.

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- 2) \$300,000 to hire bridge counselors in high-prevalence-county local health departments to link individuals who test positive for HIV into medical care in order to prevent transmission.
  - 3) \$3.5 million to develop and disseminate an unintended pregnancy prevention campaign and expand community-based, evidence-based pregnancy prevention programs such as the Nurse Family Partnership, Teen Outreach Program, and other evidence-based pregnancy prevention programs to reach more adolescents and young adults.
- b) DPH should also take the following additional steps to prevent STD and HIV transmission among high-risk populations:
- 1) Collaborate with academic health centers and other major health systems to promote the new rules that allow for opt-out HIV testing.
  - 2) Expand the training and certification of nontraditional providers to increase the use of rapid testing for HIV in high-risk populations.
  - 3) Work with the North Carolina Medical Board, the North Carolina Board of Pharmacy, and the North Carolina Medical Society to explore how to implement Expedited Partner Therapy for chlamydia and gonorrhea in North Carolina.

## Recommendation 5.2: Increase HIV Testing in Prisons, Jails and Juvenile Centers

The North Carolina Department of Correction (DOC) should expand its existing HIV-testing policy to include opt-out testing for all prisoners upon release. The North Carolina General Assembly should provide \$1 million in recurring funding beginning in SFY 2011 to the DOC to support this effort.

- a) The North Carolina Department of Juvenile Justice and Delinquency Prevention (DJJDP) should offer opt-out HIV screening in their institutional facilities including youth development centers and youth detention centers. The North Carolina General Assembly should appropriate \$7,000 in recurring funds beginning in SFY 2011 to the DJJDP to support this effort.
- b) Counties should include opt-out HIV testing as part of the comprehensive exam given to inmates in county jails.
- c) The DOC and the North Carolina Division of Public Health should collaborate to ensure prisoners identified as HIV-positive are coordinated for outpatient care prior to release to help them manage their disease and prevent transmission.

### **Recommendation 5.3: Ensure Students Receive Comprehensive Sexuality Education in North Carolina Public Schools (PRIORITY RECOMMENDATION)**

- a) 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.
- b) The State Board of Education should require Local Education Agencies to report their consent procedures, as well as the number of students who receive comprehensive reproductive health and safety education and those who receive more limited sexuality education. Information should be reported by grade level and by school.

### **Recommendation 5.4: Expand the Availability of Family Planning for Low-income Families**

- a) The North Carolina Division of Medical Assistance and North Carolina Division of Public Health should enhance access to and utilization of family planning services by low-income families, including providing access to the full range of contraceptives.
  - 1) Local health departments, in partnership with local social services departments, should have a dedicated intake specialist to take Medicaid applications, including the Medicaid *Be Smart* Family Planning Waiver applications.
  - 2) The North Carolina Division of Public Health should direct existing federal family planning funds towards increasing the number of low-income families that are provided services who do not qualify for Medicaid or the Medicaid *Be Smart* Family Planning Waiver program.
  - 3) The North Carolina Division of Medical Assistance should apply to the Centers for Medicare and Medicaid Services to extend the Medicaid *Be Smart* Family Planning Waiver program beyond October 2010 and should include best practices from other states in the program.
- b) The North Carolina Division of Public Health should purchase long-acting, highly effective, reversible contraceptive methods for low-income women who do not qualify for Medicaid or the Medicaid *Be Smart* Family Planning Waiver. The North Carolina General Assembly should appropriate \$931,000 in recurring funds beginning in SFY 2011 to the North Carolina Division of Public Health to support these efforts.



## **Chapter 6: Substance Abuse and Mental Health**

### **Recommendation 6.1: Develop and Implement a Comprehensive Substance Abuse Prevention Plan (PRIORITY RECOMMENDATION)**

- a) The Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMHDDSAS) should develop a comprehensive substance abuse prevention plan for use at the state and local levels. The plan should increase the capacity at the state level and within local communities to implement a comprehensive substance abuse prevention system, prioritizing efforts to reach children, adolescents, young adults, and their parents. The goal of the prevention plan is to prevent or delay the onset of use of alcohol, tobacco, or other drugs; reduce the use of addictive substances among users; promote emotional and mental health well-being; identify those who need treatment; and help them obtain services earlier in the disease process.
  - 1) DMHDDSAS should pilot test this prevention plan in six counties or multi-county areas and evaluate its effectiveness. DMHDDSAS should develop a competitive process and select at least one rural pilot and one urban pilot in the three DMHDDSAS regions across the state. DMHDDSAS should provide technical assistance to the selected communities. If effective, the prevention plans should be implemented statewide.
  - 2) The pilot projects should involve multiple community partners, including but not limited to Local Management Entities, primary care providers, health departments, local education agencies, local universities and community colleges, and other appropriate groups.
  - 3) The pilots should incorporate evidence-based programs, policies, and practices that include a mix of strategies including universal and selected populations. Priority should be given to evidence-based programs that have been demonstrated to yield positive impacts on multiple outcomes, including but not limited to preventing or reducing substance use, improving emotional well-being, reducing youth violence or delinquency, or reducing teen pregnancy.
  - 4) The North Carolina General Assembly should appropriate \$1.95 million in recurring funds in SFY 2011 and \$3.7 million in recurring funds in SFY 2012 to DMHDDSAS to support and evaluate these efforts.
- b) The excise taxes on malt beverages and wine should be indexed to the consumer price index so they can keep pace with inflation.
  - 1) The increased fees should be used to fund effective prevention and treatment efforts for alcohol, tobacco, and other drugs.

- 2) The North Carolina General Assembly should appropriate \$2.0 million in recurring funds in SFY 2011 to support a comprehensive alcohol awareness education and prevention campaign aimed at changing cultural norms to prevent initiation, reduce underage alcohol consumption, reduce alcohol abuse or dependence, offer early intervention, and support recovery among adolescents and adults.

**Recommendation 6.2: Expand the Availability of Screening, Brief Intervention, and Treatment for People with Behavioral Health Problems in the Primary Care Setting**

- a) The Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMHDDSAS) should develop a Memorandum of Agreement with the North Carolina Office of Rural Health and Community Care (ORHCC), Governor's Institute on Alcohol and Substance Abuse, North Carolina Area Health Education Centers (AHEC) program, and other appropriate organizations to educate and encourage health care professionals to use evidence-based screening tools and offer counseling, brief intervention, and referral to treatment to help patients prevent, reduce, or eliminate the use of or dependency on alcohol, tobacco, and other drugs as outlined in the screening, brief intervention, and referral to treatment (SBIRT) model. The North Carolina General Assembly should appropriate \$1.5 million in SFY 2011 in recurring funds to the DMHDDSAS to support this effort.
- b) DMHDDSAS, in collaboration with the ORHCC, should work collaboratively with the Governor's Institute on Alcohol and Substance Abuse, North Carolina Academy of Family Physicians, North Carolina Pediatric Society, North Carolina Psychiatric Association, North Carolina Primary Health Care Association, ICARE, and other appropriate groups to identify and address barriers that prevent the implementation and sustainability of co-location models and to identify other strategies to promote evidence-based screening, counseling, brief intervention, and referral to treatment in primary care and other outpatient settings for substance abuse and mental health.
- c) Health professionals should screen adolescents and adults age 12 or older for major depressive disorders and for substance abuse disorders using systems that ensure accurate diagnosis, effective treatment, and follow-up.
- d) The North Carolina General Assembly should mandate that insurers offer coverage for the treatment of addiction diseases with the same durational limits, deductibles, coinsurance, annual limits, and lifetime limits as provided for the coverage of physical illnesses.
- e) The North Carolina General Assembly should direct public and private insurers to review their reimbursement policies to ensure that primary care and other providers can be reimbursed to:
  - 1) Screen for tobacco, alcohol, drugs, and mental health disorders.
  - 2) Provide brief intervention and counseling and refer necessary patients for specialty services.
  - 3) Support co-location of behavioral health and primary care providers.

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- 4) Pay for case management services to coordinate services and follow-up between primary care and behavioral health specialists.
- 5) Pay for telephone or in-person consults between primary care providers and behavioral health specialists.
- f) The Division of Medical Assistance should work with the ORHCC to develop an enhanced Community Care of North Carolina (CCNC) per member per month (PMPM) for co-located practices to support referral and care coordination for mental health, developmental disabilities, and substance abuse services.

### **Recommendation 6.3: Expand Early Intervention Services in the Faith Community**

The North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services should partner with a variety of mental health and substance abuse organizations, faith-based institutions of higher education, and other faith leader training programs to develop and offer a training specifically designed to help leaders of all faiths recognize signs of stress, depression, and substance abuse in those they counsel and to develop linkages with outside referrals when appropriate. Faith communities at the local, regional, and state levels should encourage their faith leaders to attend these trainings.

## **Chapter 7: Environmental Risks**

### **Recommendation 7.1: Create an Interagency Leadership Commission to Promote Healthy Communities, Minimize Environmental Risks, and Promote Green Initiatives**

The Governor or the North Carolina General Assembly should create an Interagency Leadership Commission to develop a statewide plan to promote healthy communities, minimize environmental risks, and promote sustainability and “green” initiatives that will support and improve the public’s health and safety. The Interagency Leadership Commission should create an implementation plan that includes the roles that each agency will play in implementing the plan, the costs of the plan, and potential funding sources. The plan should emphasize local sustainability, environmental justice, protection of vulnerable populations, and precaution. Contents of the plan should include, but not be limited to, statewide efforts to promote active, walkable, livable communities; reduce environmental exposures and risks that negatively impact population health; promote clean, renewable energy, green technology, and local production of food, energy, goods, and services; and increase opportunities for mass transportation.

- a) The Interagency Leadership Commission should include senior level agency staff from the North Carolina Department of Transportation, Department of Health and Human Services, Department of Public Instruction, Department of Environment and Natural Resources, Department of Commerce, State Board of Education, Board of Transportation, Department of Insurance, North Carolina Community College System, and University of North Carolina System. The Commission should also include representatives from the League of Municipalities, North Carolina Association of County Commissioners, North Carolina Association of Metropolitan Planning Organizations, North Carolina Association of Local Health Directors, North Carolina Recreation and Park Association, North Carolina State Society for Human Resource Management, the North Carolina Chamber, and at-large members of the public.
- b) The Interagency Leadership Commission should oversee the environmental assessment described in Recommendation 7.2 and should lead the development of a communications campaign to educate and inform North Carolinians of the findings and implications and actions being taken as a result of the assessment.
- c) The Interagency Leadership Commission should present the plan to the Governor and the Joint Legislative Commission on Governmental Operations no later than January 1, 2011, and should report progress on implementation of the plan at least once annually thereafter.

### **Recommendation 7.2: Develop an Environmental Assessment for North Carolina that Links Environmental Exposures to Health Outcomes**

The Department of Environmental Sciences and Engineering in the University of North Carolina (UNC) Gillings School of Global Public Health should collaborate with the North Carolina Division of Public Health, North Carolina Department of Environment and Natural Resources, North Carolina Department of Agriculture and Consumer Services, and North Carolina Agromedicine Institute (East Carolina University, North Carolina State University, and North Carolina Agricultural and Technical State University) to develop an environmental assessment for the state that links environmental exposures/risks and health outcomes and includes strategies to address the exposures/risks. This environmental assessment should be conducted to address the priorities and needs of the state as identified by the Recommendation regarding an Interagency Leadership Commission. The North Carolina General Assembly should appropriate \$3 million in non-recurring funds in SFY 2011 to the UNC Gillings School of Global Public Health to support this effort.

### **Recommendation 7.3: Ensure Healthy Homes**

The North Carolina Division of Public Health, the North Carolina Division of Water Quality, the North Carolina Department of Environment and Natural Resources, Office of the State Fire Marshal, and North Carolina Department of Insurance should expand

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and enhance efforts to create healthy homes. These efforts should address, but not be limited to, the following: indoor air quality, mold and moisture, carbon monoxide, lead-based paint, radon, asbestos, drinking water, hazardous household products, pesticide exposure, pest management, and home safety (includes injury prevention of falls, etc).

As part of this initiative:

- a) The Building Code Council should revise the state building code to require all residences with fossil fuel burning appliances or attached garages to have carbon monoxide alarms.
- b) The North Carolina Home Inspector Licensure Board should require licensed home inspectors to have the National Environmental Health Association's Healthy Homes Specialist Credential and to inspect homes comprehensively for environmental health and safety hazards any time the home is required to be inspected.
- c) Individuals such as state and local public health and fire marshal staff and building inspectors, who regularly visit homes to provide advice regarding health and safety and to conduct building inspections and environmental inspections, should have the National Environmental Health Association's Healthy Homes Specialist Credential. Agency staff who are so certified should conduct comprehensive health and safety assessments when visiting homes and provide families with information about existing environmental or safety hazards and how identified hazards can be abated. Building inspectors and staff of state and local public health departments and the fire marshal should have their Healthy Homes Specialist Credential certification by the end of 2012.

### **Recommendation 7.4: Reduce Environmental Risks in Schools and Child Care Settings**

The North Carolina Division of Public Health (DPH), in conjunction with the North Carolina Department of Public Instruction (DPI), the North Carolina Division of Child Development (DCD), North Carolina Department of Environment and Natural Resources (DENR), and North Carolina Cooperative Extension, should train child care center and elementary and secondary school staff to conduct inspections and identify potential environmental hazards in accordance with the US Environmental Protection Agency's (EPA) Tools for Schools Program. The North Carolina General Assembly should appropriate \$400,000 in recurring funds beginning in SFY 2011 to DPH to support this effort.

- a) DPH and the North Carolina Division of Environmental Health, in conjunction with the North Carolina Division of Child Development, should adapt the Tools for Schools assessment for child care centers and include the assessment in the child care center inspection by local environmental health specialists. The North Carolina General Assembly should appropriate \$28,000 annually for four years beginning in SFY 2011 to DPH to support this effort.

- b) DPI and DCD, in collaboration with DPH and DENR, should develop an implementation plan to phase in the Tools for Schools assessments in all schools and licensed child care centers over a four-year period. Child care centers would be required to complete the assessment as part of child care center licensure requirements.

## Chapter 8: Injury

### Recommendation 8.1: Review and Enforce All Traffic Safety Laws and Enhance Surveillance

- a) North Carolina law enforcement agencies should actively enforce traffic safety laws, especially those pertaining to seat belt usage, driving while impaired (DWI), speeding, and motorcycles. All North Carolina state and local law enforcement agencies with traffic responsibilities should actively enforce DWI laws throughout the year and should conduct regular checking stations. State and local law enforcement agencies should report to the North Carolina General Assembly at the beginning of each biennium their efforts to increase enforcement of DWI.
- b) The North Carolina General Assembly should change existing state laws or appropriate new funds to strengthen traffic safety laws and enforcement efforts. The North Carolina General Assembly should:
  - 1) Enact a primary belt use law for rear seat occupants.
  - 2) Require alcohol interlocks for all DWI offenders.
  - 3) Appropriate \$750,000 in recurring funds beginning in SFY 2011 to the North Carolina Division of Public Health to work with the Governor's Highway Safety Program, the University of North Carolina (UNC) Highway Safety Research Center, and other appropriate groups to expand checking stations and to develop and implement highly-publicized, ongoing strategic communication plans to broadly disseminate the existing Booze It and Lose It campaign.
  - 4) Appropriate \$1 million in recurring funds beginning in SFY 2011 to the Governor's Highway Safety Program to provide support to state and local law enforcement agencies with traffic responsibilities to enhance their enforcement of speeding and aggressive driving laws, with special emphasis on dangerous roads and intersections.
  - 5) Institute graduated licensure and training requirements for all people who operate motorcycles and amend the existing motorcycle permit provision so that permits cannot be renewed indefinitely.
  - 6) Create a legislative study commission to examine all motor vehicle fees and fines in NCGS §20 and recommend changes to strengthen motor vehicle safety laws. Priority should be given to an examination of the adequacy of the fines for violations of the seat belt laws and to examine reinstatement fees for DWI offenders. Funds from the increased DWI

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fees should be used to support DWI programs including training, maintenance of checking station vehicles and equipment, and expanding the operation of DWI checking stations to additional locations and times.

- c) The North Carolina Division of Motor Vehicles should ensure that all motorcyclists are properly licensed and trained.
  - 1) The North Carolina Division of Motor Vehicles should work with the North Carolina Community College System to develop a system of training for new motorcyclists.
  - 2) The North Carolina Division of Motor Vehicles should match motorcycle operator licenses and vehicle registration files.
- d) The Governor's Highway Safety Program, in conjunction with the National Highway Traffic Safety Administration, should work to ensure implementation of the Crash Outcome Data Evaluation System (CODES) in North Carolina. Access to CODES data should be provided to all participants on the North Carolina Traffic Records Coordinating Committee, including, at a minimum, the North Carolina Division of Public Health, UNC Highway Safety Research Center, UNC Injury Prevention Research Center, North Carolina Department of Justice Administrative Office of the Courts, North Carolina Department of Transportation, North Carolina Division of Motor Vehicles, North Carolina Office of Emergency Medical Services, and North Carolina State Highway Patrol.

## Recommendation 8.2: Enhance Injury Surveillance, Intervention, and Evaluation

- a) The North Carolina General Assembly should amend the Public Health Act § 130A-1.1 to include injury and violence prevention as an essential public health service.
- b) The North Carolina General Assembly should appropriate \$3.9 million in recurring funds beginning in SFY 2011 to the North Carolina Division of Public Health (DPH) to identify and implement pilot programs and other community-based activities to prevent unintentional injury and violence. Priority should be given to evidence-based programs or best and promising practices that prevent motor vehicle crashes, falls, unintentional poisonings, and family violence. Funds should be allocated as follows:
  - 1) \$168,000 to DPH, to work in collaboration with North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services; Carolinas Poison Center; and other appropriate groups, to prevent unintentional poisonings.
  - 2) \$363,000 to DPH for falls prevention.
  - 3) \$163,000 to DPH for family violence prevention. Priority should be given to research and program implementation that integrates multiple types of family violence such as domestic violence and child maltreatment.
  - 4) \$2.5 million to DPH for other injury prevention activities.

- 5) \$668,000 to the DPH to support 9 full-time employees (8 of whom would be regional staff) to support state and local capacity for the dissemination of evidence-based injury and violence prevention programs and policies in North Carolina communities.
- c) The North Carolina General Assembly should appropriate \$175,000 in recurring funds beginning in SFY 2011 to DPH to develop an enhanced intentional and unintentional injury surveillance system with linkages. This work should be led by the State Center for Health Statistics and done in collaboration with the North Carolina Medical Society; North Carolina Hospital Association; North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services; Governor's Highway Safety Program within the North Carolina Department of Transportation; UNC Injury Prevention Research Center; Carolinas Poison Center (state poison control center) at Carolinas Medical Center; and North Carolina Office of the Chief Medical Examiner. The collaborative should examine the need and feasibility for linkages to electronic health records and enhanced training in medical record coding using E codes (injury) and ICD-9/10 codes (disease).

### **Recommendation 8.3: Enhance Training of State and Local Public Health Professionals, Social Workers, and Others**

The University of North Carolina (UNC) Injury Prevention Research Center should develop curricula and train state and local public health professionals, physicians, nurses, allied care workers, social workers, and others responsible for injury and violence prevention so they can achieve or exceed competency in injury control consistent with national guidelines developed by the National Training Initiative for Injury and Violence Prevention. The North Carolina General Assembly should appropriate \$200,000 in recurring funds beginning in SFY 2011 to the UNC Injury Prevention Research Center to support this effort.

### **Recommendation 8.4: Create a Statewide Task Force or Committee on Injury and Violence (PRIORITY RECOMMENDATION)**

- a) The North Carolina General Assembly should create an Injury and Violence Prevention Task Force to examine data, make evidence-based policy and program recommendations, monitor implementation, and examine outcomes to prevent and reduce injury and violence. The work of the Task Force should build on the work of the North Carolina 2009-2014 State Strategic Plan for Injury and Violence Prevention and should examine data around motor vehicle crashes, falls, unintentional poisonings, occupational injuries, family violence including child maltreatment and domestic violence, other forms of unintentional injuries such as fires and drowning, and intentional injuries such as homicide and suicide. The Task Force should be charged with identifying strategies to enhance the statewide injury and violence prevention infrastructure, including expanding



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the numbers of trained personnel at the state and local levels, implementing evidence-based programs and policies, and improving the existing injury surveillance system. The Task Force should provide an annual report back to the North Carolina General Assembly.

- b) The Task Force should include legislators and representatives from the North Carolina Division of Public Health; North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services; North Carolina Division of Aging and Adult Services; North Carolina Department of Juvenile Justice and Delinquency Prevention; Governor's Highway Safety Program within the North Carolina Department of Transportation; North Carolina Department of Insurance; North Carolina Department of Labor; North Carolina Trauma System; North Carolina Office of Emergency Medical Services; North Carolina Department of Agriculture and Consumer Services; North Carolina Department of Public Instruction; North Carolina Cooperative Extension within North Carolina State University; North Carolina Department of Environment and Natural Resources; UNC Injury Prevention Research Center; Carolinas Poison Center; North Carolina Medical Society; North Carolina Hospital Association; and local and state law enforcement.

## Chapter 9: Vaccine Preventable Disease and Foodborne Illness

### Recommendation 9.1: Increase Immunization Rates (PRIORITY RECOMMENDATION)

- a) The North Carolina Division of Public Health (DPH) should aggressively seek to increase immunization rates for all vaccines recommended by the Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices (ACIP), including the pneumococcal (PCV7), rotavirus, meningococcal (MCV4), human papillomavirus (HPV), and influenza vaccines which are not currently covered through the state's universal childhood vaccine distribution program (UCVDP).
- b) All public and private insurers should 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.
- c) Health care providers should offer and actively promote the recommended vaccines, including educating parents about the importance of vaccinations.
  - 1) The influenza vaccination should be actively promoted for children ages 5-18.
  - 2) The HPV vaccination should be made available to females ages 9-26; however, vaccine delivery should be targeted toward adolescents ages 11-12, as recommended by the CDC's Advisory Committee on Immunization Practices (ACIP).
- d) Parents should ensure that their children receive age appropriate vaccinations.

- e) DPH should monitor the vaccination rate for the PCV7, MCV4, HPV and influenza vaccines not currently covered through the UCVDP to determine whether the lack of coverage through the UCVDP leads to lower immunization rates. If so, the DPH should seek recurring funds from the North Carolina General Assembly to cover these vaccines through the UCVDP, work with insurers to ensure first dollar coverage and adequate reimbursement for these recommended vaccines, or seek new financial models to cover vaccines for children not adequately covered through the UCVDP.
- f) DPH should conduct an outreach campaign to promote immunizations of the flu, the new Tdap vaccine and all the recommended childhood vaccines among all North Carolinians. Emergency rooms patients and newborn contacts should be targeted specifically for Tdap immunizations. The North Carolina General Assembly should appropriate \$1.5 million in recurring funds in SFY 2011 to support this effort.

## Recommendation 9.2: Strengthen Laws to Prevent Foodborne Illnesses

The North Carolina General Assembly should enact laws to strengthen North Carolina's ability to prevent and respond to foodborne illnesses by

- a) Directing the North Carolina Department of Agriculture and Consumer Services, the North Carolina Department of Environment and Natural Resources, and the North Carolina Department of Health and Human Services to create a committee to develop a "single-agency" approach for addressing foodborne illness in North Carolina. The committee should work to
  - 1) Develop a unified proactive, scientifically-based strategy to prevent, detect, and respond to food-borne illness.
  - 2) Identify ways to maintain adequate funding for a holistic food safety and defense program at the state and local level.
  - 3) Strengthen industry ties.
  - 4) Educate policy makers.
- b) Appropriating \$1.6 million in non-recurring funds in SFY 2011 and \$300,000 in recurring funds beginning in SFY 2012 to the North Carolina Division of Public Health to develop and maintain an enhanced surveillance system that facilitates sharing of data from the North Carolina Department of Environment and Natural Resources and North Carolina Department of Agriculture and Consumer Services complaint lines, public health surveillance systems, US Department of Agriculture, Centers for Disease Control and Prevention, and Food and Drug Administration (FDA) when needed to detect or prevent the spread of foodborne illnesses.
- c) Requiring all industries to develop Hazard Analysis Critical Control Point (HACCP) plans or use government risk-based inspections. HACCP plans should be made available to government agencies with jurisdiction.

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- d) Ensuring that the Governor can use the state's rainy day funds to pay for the additional personnel or other costs needed to address public health emergencies. Funds should be made available, when needed, to help pay for the additional costs involved in large outbreak investigations, food protection efforts, or other natural or man-made public health emergencies that require a coordinated and unified national, statewide, or regional response.
- e) The North Carolina Department of Agriculture and Consumer Services and Department of Environment and Natural Resources should adopt, through regulations, the current FDA Food Code and maintain it in such a manner as to continually address updates to the Code.

**Chapter 10: Racial and Ethnic Disparities****Recommendation 10.1: Fund Evidence-Based Programs to Meet the Needs of Diverse Populations**

- a) Public and private funders supporting prevention initiatives in North Carolina should place priority on funding evidence-based programs and practices. Intervention selection should take into account the racial, ethnic, cultural, geographic, and economic diversity of the population being served. When evidence-based programs are not available for a specific population, public and private funders should give funding priority to best and promising practices/programs and to those that are theory-based and incorporate elements identified in the research literature as critical elements of effective programs.
- b) The North Carolina Division of Public Health (DPH) should examine racial and ethnic disparities in all of its health promotion and disease prevention activities. To increase the effectiveness of prevention initiatives targeting racial and ethnic disparities, DPH should involve community members, including faith-based health ministries, beauty salons/barber shops, civic and senior citizen groups, and other community leaders or lay health advisors.
- c) North Carolina Foundations should provide funding to support and expand evidence-based initiatives targeting racial and ethnic disparities, and expand funding for community-based participatory research.

## **Chapter 11: Socioeconomic Determinants of Health**

### **Recommendation 11.1: Promote Economic Security (PRIORITY RECOMMENDATION)**

- a) The North Carolina General Assembly should increase the state Earned Income Tax Credit (EITC) to 6.5% of the federal EITC.
- b) 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) by low-income individuals and families.

### **Recommendation 11.2: Increase the Availability of Affordable Housing and Utilities**

To help economically disadvantaged North Carolinians better afford housing and utilities, the North Carolina General Assembly should:

- a) Appropriate \$10 million in additional recurring funding beginning in SFY 2011 to the North Carolina Housing Finance Agency to increase funding to the North Carolina Housing Trust Fund.
- b) Enact legislation to help all North Carolinians and especially low-income North Carolinians lower their energy expenses.

### **Recommendation 11.3: Expand Opportunities for High Quality Early Childhood Education and Health Programs**

North Carolina Smart Start should further disseminate the Incredible Years program, the Assuring Better Child Health and Development program, and high-quality education programs to promote healthy social and emotional development among children in need in all North Carolina counties. The North Carolina General Assembly should appropriate \$1.2 million in recurring funds to the North Carolina Partnership for Children, Inc. to support this effort.

### **Recommendation 11.4: Increase the High School Graduation Rate (PRIORITY RECOMMENDATION)**

- a) The North Carolina State Board of Education (SBE) and the North Carolina Department of Public Instruction (DPI) should 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. The SBE should implement evidence-based or best and promising policies, practices, and programs that will strengthen interagency collaboration (community partnerships), improve

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student attendance rates/decrease truancy, foster a student-supportive school culture and climate that promotes school connectedness, explore and implement customized learning options for students, and more fully engage students in learning. Potential evidence-based or promising policies, practices, and programs might include, but are not limited to:

- 1) Learn and Earn partnerships between community colleges and high schools.
  - 2) District and school improvement interventions to help low-wealth or underachieving districts meet state proficiency standards.
  - 3) Alternative learning programs, for students who have been suspended from school, that will support continuous student learning, behavior modifications, appropriate youth development, and increased school success.
  - 4) Expansion of the NC Positive Behavior Support Initiative to include all schools in order to reduce short- and long-term suspensions and expulsions.
  - 5) Establishment of a committee to study the potential impact of raising the compulsory school attendance age from 16-17 and 17-18 in successive years.
- b) The SBE should work with appropriate staff members in DPI, including curriculum and finance representatives, and staff from the North Carolina General Assembly Fiscal Research Division, to examine the experiences of other states and develop cost estimates for the implementation of the initiatives to increase the high school graduation rate. These cost estimates should be reported to the research division of the North Carolina General Assembly and the Education Oversight Committee by April 1, 2010 so that they can appropriate recurring funds.

## Chapter 12: Cross-Cutting Strategies in Schools, Worksites, and Clinical Settings

### Recommendation 12.1: Enhance North Carolina Healthy Schools (PRIORITY RECOMMENDATION)

- a) The North Carolina School Health Forum should be reconvened and expanded to ensure implementation and expansion of the North Carolina Healthy Schools Initiative. The North Carolina School Health Forum should be expanded to include the Department of Juvenile Justice and Delinquency Prevention, Department of Environment and Natural Resources, and other partners as needed to implement the eight components of the Coordinated School Health program.
- b) The North Carolina School Health Forum should develop model policies in each of the eight components of a Coordinated School Health System. This would include reviewing and modifying existing policies as well as identifying additional

- school-level policies that could be adopted by schools to make them healthier environments for students. When available, evidence-based policies should be adopted. The North Carolina School Health Forum and the North Carolina Healthy Schools Initiative should develop a system to recognize schools that adopt model policies in each of the eight components.
- c) The North Carolina Department of Public Instruction (DPI) should expand the North Carolina Healthy Schools Initiative to include a local healthy schools coordinator in each Local Education Agency (LEA). The North Carolina General Assembly should appropriate \$1.5 million in recurring funds beginning in SFY 2011 increased by an additional \$1.5 in recurring funds in each of the following five years (SFY 2012-2017) for a total of \$12 million recurring funds to support these positions.
- 1) The North Carolina School Health Forum should identify criteria to prioritize funding to LEAs during the first five years. The criteria should include measures to identify LEAs with the greatest adolescent health and educational needs.
  - 2) In order to qualify for state funding, the LEA must show that new funds will supplement existing funds through the addition of a local Healthy Schools Coordinator and will not supplant existing funds or positions. To maintain funding, the LEA must show progress towards implementing evidence-based programs, practices, and policies in the eight components of the Coordinated School Health system.
  - 3) Local healthy schools coordinators will work with the School Health Advisory Council, schools, local health departments, primary care and mental health providers, and community groups in their LEAs to increase the use of evidence-based practices, programs, and policies to provide a coordinated school health system and will work towards eliminating health disparities.
- d) The North Carolina Healthy Schools Section of DPI should provide monitoring, evaluation, and technical assistance to the LEAs through the local healthy schools coordinators. The North Carolina General Assembly should appropriate \$225,000 in recurring funds in SFY 2011 to DPI to support the addition of three full-time employees to do this work. Staff would be responsible for:
- 1) Implementing the monitoring system (including gathering data, measuring compliance, and reporting to the North Carolina State Board of Education (SBE)) for the Healthy Active Children Policy).
  - 2) Implementing the monitoring system (including gathering data, measuring compliance, and reporting to the SBE) for the School Health Profiles survey.
  - 3) Providing technical assistance and professional development to LEAs for coordinated school health system activities and implementing evidence-based programs and policies with fidelity.
  - 4) Implementing, analyzing, and disseminating the Profiles survey, including reporting on school-level impact measures (SLIMs).

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- 5) Working with the PTA and other partners as appropriate to develop additional resources and education materials for parents of middle and high school students for the Parent Resources section of the North Carolina Healthy Schools website. Materials should include information for parents on how to discuss material covered in the Healthful Living Standard Course of Study with their children as well as evidence-based family intervention strategies when available. Information on how to access the materials should be included in the Student Handbook.

## Recommendation 12.2: Require the Use of Evidence-based Curricula for Healthful Living Standard Course of Study

The North Carolina General Assembly should require schools to use evidence-based curricula when available to teach the objectives of the Healthful Living Standard Course of Study.

- a) The North Carolina General Assembly should appropriate \$1.2 million in recurring funds in SFY 2011 to the North Carolina Department of Public Instruction (DPI) to provide grants to Local Education Agencies (LEAs) to implement evidence-based curricula. To implement this provision, the DPI Healthy Schools Section should identify three to five evidence-based curricula that demonstrate positive change in behavior across multiple health risk behaviors (i.e. substance use, violence, sexual activity) and provide grants (of up to \$10,000 per LEA) for implementation and technical assistance to ensure curricula are implemented with fidelity.
- b) The North Carolina State Board of Education (SBE) and DPI should work together to ensure that middle and high schools are effectively teaching the Healthful Living Standard Course of Study objectives.
  - 1) The DPI Healthy Schools Section should coordinate trainings<sup>a</sup> for local school health professionals on the Centers for Disease Control and Prevention's Health Education Curriculum Assessment Tool (HECAT) and the Physical Education Curriculum Assessment Tool (PECAT) so that they are able to assess and evaluate health and physical education programs and curricula.
  - 2) The SBE should require every LEA to complete the HECAT and PECAT for middle and high schools every three years beginning in 2013 and submit them to the DPI Healthy Schools Section. The Superintendent should ensure the involvement of the local healthful schools coordinator and the School Health Advisory Council.
  - 3) Tools to assess the implementation of health education should be developed as part of DPI's Accountability and Curriculum Reform Effort (ACRE).

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a The CDC provides trainings on using these tools free of charge. Would need funding to cover substitutes, food and facilities for trainings- would be a one-time cost.

- c) The SBE should encourage DPI to develop healthful living electives beyond the required courses, including academically rigorous honors-level courses. Courses should provide more in-depth coverage of Healthful Living Course of Study Objectives. DPI and health partners should identify potential courses and help schools identify evidence-based curricula to teach Healthful Living electives.

### **Recommendation 12.3: Create the North Carolina Worksite Wellness Collaborative and Tax Incentives for Small Businesses**

- a) The North Carolina Worksite Wellness Collaborative should include, but not be limited to, representatives of state and local government, organizations with expertise in worksite wellness, insurers, small and large employers, Chambers of Commerce, and other natural groupings of employers. Initially, the Collaborative should focus on providing assistance to state and local governments, small businesses with 50 or fewer employees, and nonprofit organizations.
- b) The Collaborative should lead efforts to implement the following four components of a statewide worksite wellness effort using evidence-based strategies (and best and promising practices when necessary):
  - 1) Assessment of organizational-level worksite indicators such as policies, benefits, and workplace environments that influence employee health, and development of an organizational-level worksite action plan for workplaces to make improvements.
  - 2) Individual employee assessments via Health Risk Appraisals (HRAs) tied to personal feedback and an actionable and specific plan for employees.
  - 3) Technical assistance to worksites to help them implement evidenced-based strategies to address needs identified in both organizational and individual employee-level assessments and to assist worksites in meeting criteria for comprehensive employee wellness programs.
  - 4) A data collection system that includes both organizational and individual employee indicators, tracks progress, and evaluates outcomes at the organizational and employee level.
- c) The North Carolina General Assembly should appropriate annual funding for five years as shown below to support this effort as the Collaborative develops a sustainable business plan that will eliminate the need for funding after five years.
  - 1) \$800,000 in SFY 2011
  - 2) \$700,000 in SFY 2012
  - 3) \$500,000 in SFY 2013
  - 4) \$500,000 in SFY 2014
  - 5) \$250,000 in SFY 2015



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- d) The North Carolina General Assembly should provide a tax credit to small businesses with employees of 50 or fewer that offer and promote comprehensive wellness programs for their employees. Eligible businesses should be provided a tax credit of up to \$200 per employee for establishing or maintaining a wellness program that is certified under a process established by the Collaborative.
- e) The Collaborative should develop a process and set of criteria to certify businesses as eligible to receive state or federal tax credits.

### **Recommendation 12.4: Expand Health Insurance Coverage to More North Carolinians (PRIORITY RECOMMENDATION)**

- a) The Task Force believes that everyone should have health insurance coverage. In the absence of such, the North Carolina General Assembly should begin expanding coverage to groups that have the largest risk of being uninsured. Such efforts could include, but not be limited to:
  - 1) Provide funding to the North Carolina Division of Medical Assistance to do the following:
    - i) Expand outreach efforts and simplify the eligibility determination and recertification process to identify and enroll people who are already eligible for Medicaid or NC Health Choice.
    - ii) Expand coverage to children with incomes up to 300% of the federal poverty guidelines (FPG) on a sliding scale basis.
    - iii) Develop a limited benefits package to provide coverage to adults with incomes up to 100% FPG, with a phase in of coverage of adults up to 200% FPG.
  - 2) Change state laws to require insurance companies to offer parents the option to continue dependent coverage until the child reaches age 26, regardless of student status.
  - 3) Develop a subsidized health insurance product targeted to small businesses that employ a low-wage work force.
- b) The North Carolina Division of Public Health (DPH) should collaborate with NC Prevention Partners to include the coverage of all the US Preventive Services Task Force's (USPSTF) recommended screening and treatment, including but not limited to screenings, counseling, and treatment for STD/HIV, obesity, alcohol and substance use, and depression in the existing annual Preventive Benefits Profile survey of public and private health insurers in the state. If coverage is found to be inadequate or lacking, then public and private health insurers should expand coverage to include all the USPSTF recommended screenings, counseling, and treatment. The North Carolina General Assembly should appropriate \$75,000 in recurring funds to DPH to support these efforts.

## Recommendation 12.5: Improve Provider Training To Promote Evidence-based Practices

- a) The Area Health Education Centers (AHEC) Program should offer training courses to enhance the training of health professionals, including physicians, nurses, allied health, and other health care practitioners; increase the use of evidence-based prevention, screening, early intervention, and treatment services to reduce certain high-risk behaviors; and address other factors that contribute to the state's leading causes of death and disability. Training courses should be expanded into academic and clinical settings, residency programs, and other continuing education programs. AHEC should:
- 1) Partner with the North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services, the Governor's Institute on Alcohol and Drug Abuse, and other appropriate organizations and professional associations to offer trainings to do the following:
    - i. Educate and encourage health care professionals to use evidence-based screening tools and to offer screening, brief intervention, and referral to treatment (i.e. SBIRT) to help patients prevent, reduce, or eliminate the use of or dependency on alcohol, tobacco, or other drugs.
    - ii. Educate health care providers to ensure accurate diagnosis, effective treatment, and follow up for major depressive disorder in youth ages 12-18 and adults.
  - 2) Partner with the North Carolina Division of Public Health (DPH) and other appropriate organizations and health professional associations to offer training on screening, assessing, and counseling to all sexually active youth and adults, especially high-risk individuals, and to promote STD, HIV, and unintended pregnancy risk reduction, including the use of appropriate and effective contraception.
  - 3) Partner with the UNC Center for Injury Prevention Research Center (IPRC), DPH, and other appropriate organizations and health professional associations to offer trainings in evidence-based strategies to prevent motor vehicle crash injuries, unintentional poisoning (including the appropriate use of pain medications), falls, family violence, and other injuries to state and local public health professionals, physicians, nurses, allied care workers, social workers, and others responsible for injury and violence prevention as well as proper use of e-codes to document injuries and ICD 9/10 codes to document disease.
  - 4) Partner with other appropriate organizations and health professional organizations to offer training to primary care providers and other providers about the screenings, counseling, and treatment recommended by the US Preventive Services Task Force.

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- 5) Help providers better understand how social issues such as housing, poverty, and education impact health so that this knowledge can be integrated into medical practice.
- b) The North Carolina General Assembly should appropriate \$250,000 in recurring funds beginning in SFY 2011 to AHEC to support these efforts.

**Chapter 13: Data****Recommendation 13.1: Enhance Existing Data Systems**

- a) North Carolina agencies should enhance specific existing data collection systems to ensure that the state has adequate data for health and risk assessment including:
  - 1) The North Carolina State Board of Education (SBE) should support and promote the participation of Local Education Agencies (LEAs) in the Youth Risk Behavior Survey (YRBS) and the School Health Profiles Survey (Profiles). As part of this effort, the SBE should:
    - i) Identify strategies to improve participation in the YRBS and the Profiles survey. Options should include, but not be limited to, training for superintendents and local school boards, changing the time of year the survey is administered, financial incentives, giving priority for grant funds to schools that participate, a legislative mandate, and convening a clearinghouse to reduce duplicative surveys of youth risk behaviors and other school health surveys.
    - ii) Expect any LEA selected by the Centers for Disease Control and Prevention to participate in the YRBS and/or the Profiles survey to implement both surveys in their entirety unless a waiver to not participate is requested by the LEA and granted by the SBE.
    - iii) Develop policies addressing the ability of schools, parents, and students to opt out of the YRBS and Profiles surveys, over-sampling for district-level data, and any additional data that needs to be added to the surveys.
    - iv) The North Carolina Department of Health and Human Services and the North Carolina Department of Public Instruction should periodically collect environmental risk data using the Behavioral Risk Factor Surveillance System and Profiles survey, respectively.
  - b) The North Carolina General Assembly should appropriate \$165,000 in recurring funds beginning in SFY 2011 to the North Carolina Cancer Registry to improve data collection and compliance with required reporting.

## **Recommendation 13.2: Identify and Disseminate Effective Nutrition, Physical Activity, Obesity, and Chronic Disease Prevention Practices in North Carolina**

The UNC Center for Health Promotion and Disease Prevention should work with North Carolina foundations to identify effective practice-level nutrition, physical activity, obesity, and chronic disease prevention interventions within the state.

- a) North Carolina foundations should provide \$50,000 annually beginning in SFY 2011 to the UNC Center for Health Promotion and Disease Prevention to use an existing systematic process to review five foundation-funded prevention interventions within North Carolina that have not been formally evaluated and disseminate these interventions through a web-based interface designed for, and accessible to, all public health practitioners and community partners.
- b) The website should be used:
  - 1) To provide toolkits for users to replicate interventions at the community practice level.
  - 2) As a resource for potential grantees.
  - 3) As a mechanism for sharing the results of funded and reviewed projects with other grantees.

Prevention Interventions

Organization Name, Description, and Website	Prevention Areas	Population Studied	Evaluation of Research
<b>Government Organizations</b>			
<p><b>Agency for Healthcare Research and Quality US Preventive Services Task Force (USPSTF)</b> Sponsored by the Agency for Healthcare Research and Quality, USPSTF assesses and recommends preventative clinical services routinely offered to populations in primary care settings. <a href="http://www.ahrq.gov/CLINIC/uspstf/fix.htm">http://www.ahrq.gov/CLINIC/uspstf/fix.htm</a></p>	<p>Preventive clinical services (ie screening tests, counseling, immunizations, and preventive medications)</p>	<p>Different age groupings, race, ethnicity, gender, SES, rural/urban, disabilities, chronic and end of life care</p>	<p>Recommends preventative services based on: research design, internal validity, generalizability and applicability, consistency of results, and overall effectiveness of services.</p>
<p><b>Centers for Disease Control and Prevention Guide to Community Preventive Services (Community Guide)</b> Developed by the US Task Force on Community Preventive Services, the Community Guide recommends evidence-based interventions to improve public health. <a href="http://www.thecommunityguide.org/index.html">http://www.thecommunityguide.org/index.html</a></p>	<p>Adolescent health, alcohol, mental health, chronic conditions, HIV/AIDS, injury and violence prevention, cancer, tobacco, and obesity prevention.</p>	<p>Different age groupings, race, ethnicity, gender, medical conditions</p>	<p>The Community Guide evaluates interventions based on: the quality each study, body of evidence, applicability, barriers to implementation, cost and benefits to society, and economic efficiency. The Community Guide then defines each intervention as recommended, recommended against, or insufficient evidence.</p>
<p><b>Adolescent Health Registries of Programs Effective in Reducing Youth Risk Behaviors</b> A resource guide developed by the Centers for Disease Control and Prevention that identifies effective youth-related programs for reducing youth risk behaviors. <a href="http://www.cdc.gov/HealthyYouth/AdolescentHealth/registries.htm">http://www.cdc.gov/HealthyYouth/AdolescentHealth/registries.htm</a></p>	<p>Mental health promotion, substance abuse prevention, alcohol, criminal/juvenile justice, diet and nutrition, physical activity, sun safety, HIV/AIDS, homelessness, suicide prevention, tobacco/smoking, and violence prevention</p>	<p>Different age groupings (ranging from early childhood to older adults), race, ethnicity, gender, urban/rural, different intervention settings (home, schools, worksite, outpatient, and other community settings)</p>	<p>The CDC evaluates these youth-related programs based on: expert opinion, study design, and research evidence.</p>
<p><b>Model Programs Guide (MPG)</b> A program of the US Department of Justice Office of Juvenile Justice and Delinquency Prevention that maintains an online database of evidence-</p>	<p>Substance abuse, mental health, behavioral problems, violence prevention, and education outcomes</p>	<p>Adolescents, different race, ethnicities, gender, problem behaviors, offender status (ie first time, mentally ill,</p>	<p>MPG rates programs effectiveness based on: conceptual framework, fidelity, evaluation design,</p>

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<p>based programs for youth in the juvenile justice system. <a href="http://www2.dsgonline.com/mpg/">http://www2.dsgonline.com/mpg/</a></p>		<p>serious, and/or sex offenders), rural/urban, interventions settings (school, community-based, group homes, juvenile justice, and residential treatment centers)</p>	<p>and empirical evidence supporting effectiveness of program. Program effectiveness is also categorized as exemplary, effective, or promising.</p>
<p><b>National Registry of Evidence-Based Programs and Practices (NREPP)</b> A program of the US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration that maintains an online registry for evidence-based mental health and substance abuse interventions. <a href="http://www.nrepp.samhsa.gov/find.asp">http://www.nrepp.samhsa.gov/find.asp</a></p>	<p>Mental health promotion, substance abuse prevention, alcohol, criminal/juvenile justice, HIV/AIDS, homelessness, suicide prevention, tobacco/smoking, and violence prevention</p>	<p>Different age groupings (ranging from early childhood to older adults), race, ethnicity, gender, urban/rural, different intervention settings (ie home, schools, worksite, outpatient, and other community settings)</p>	<p>NREPP rates the evaluation studies based on: reliability and validity of measures, fidelity, missing data, confounding variables, and quality of data analysis. Also includes an assessment of the ability to replicate and disseminate similar interventions in other settings.</p>
<p><b>Research Tested Intervention Programs (RTIPs)</b> A program of the National Cancer Institute and the Substance Abuse and Mental Health Services Administration that maintains a searchable database of cancer control interventions and program materials and is designed to provide program planners and public health practitioners easy and immediate access to research-tested materials. <a href="http://rtips.cancer.gov/rtips/index.do">http://rtips.cancer.gov/rtips/index.do</a></p>	<p>Preventive clinical and community services programs for breast cancer screening, diet/nutrition, sun safety, cervical cancer screening, colorectal cancer screening, physical activity, and tobacco control</p>	<p>Different age groupings, race, ethnicity, gender, medical conditions</p>	<p>RTIPs reviews studies that meet the following criteria: developed and tested through a peer-reviewed research grant; outcomes of the intervention are published in a peer-reviewed journal; and includes messages, materials, and other intervention components that can be applied in a community or clinical setting.</p>
<p><b>Teaching our Youngest</b> A report by the US Department of Education that is a scientifically based research guide for</p>	<p>Early childhood education (language development, listening and speaking</p>	<p>Children ages 0-5, different genders</p>	<p>N/A</p>

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<p>preschool teachers, child care, and family providers.</p> <p><a href="http://www.ed.gov/teachers/how/early/teachingouryoungest/index.html">http://www.ed.gov/teachers/how/early/teachingouryoungest/index.html</a></p>	<p>skills, and building thinking skills)</p>		
<p><b>What Works Clearing House (WWC)</b>                      A program of the US Department of Education's Institute of Education Sciences that produces, assesses, and develops evidence-based educational interventions.</p> <p><a href="http://ies.ed.gov/ncee/wwc/">http://ies.ed.gov/ncee/wwc/</a></p>	<p>Educational outcomes (adolescent literacy, beginning reading, middle school math, elementary school math, early childhood education, dropout prevention, English language learners, character education), behavioral problems, substance abuse and violence prevention</p>	<p>Different age groupings (early childhood, elementary, middle, and high school ages), race, ethnicity, gender, SES, and different intervention school settings (location, type, SES, class size, school size, student characteristics, and teacher characteristics)</p>	<p>WWC rates interventions based on: study design, evidence of effectiveness, reliability and validity of measures, attrition, confounding factors, and equivalence (intervention and comparison groups are alike).</p>
<b>Non-Government Organizations</b>			
<p><b>The Best Evidence Encyclopedia</b>                      Project of the Johns Hopkins University School of Education's Center for Data-Driven Reform in Education (CDDRE) that presents reliable, unbiased information on high-quality evaluations of educational programs.</p>	<p>Education (reading, math, comprehensive school reform)</p>	<p>Students in grades K-12.</p>	<p>The Best Evidence Encyclopedia rates programs according to the overall strength of the evidence support in their effects.</p>
<p><b>Blueprint for Violence Prevention (Blueprints)</b>                      Project of the Center for Study and Prevention Violence at the University of Colorado that identifies and evaluates violence prevention programs.</p> <p><a href="http://www.colorado.edu/cspv/blueprints/">http://www.colorado.edu/cspv/blueprints/</a></p>	<p>Violence prevention and substance abuse</p>	<p>Different age groupings (ranging from early-to late adolescents), gender, family structures, at-risk youth, foster youth, juvenile offenders, SES, different intervention settings (community-based, schools, homes, clinics, juvenile courts)</p>	<p>Blueprints evaluates program effectiveness based on: evidence of deterrent effect, research design, sustained effects, multiple site replication, mediating factors, and cost-effectiveness.</p>

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<p><b>Child Welfare Information Gateway</b> Website that identifies resources that evaluate effectiveness child abuse prevention programs. <a href="http://www.preventchildabusenc.org/resourcecenter/evb/index_html">http://www.preventchildabusenc.org/resourcecenter/evb/index_html</a></p>	<p>Child abuse and neglect, domestic violence, family support services, substance abuse, and sexual abuse prevention.</p>	<p>Different age groupings, gender, race, ethnicity, culture, and disadvantaged areas</p>	<p>N/A</p>
<p><b>Child Trends What Works</b> Child Trends What Works identifies and evaluates promising programs for children of all ages. <a href="http://www.childtrends.org/index.cfm">http://www.childtrends.org/index.cfm</a></p>	<p>Academic achievement, mentoring, civic engagement, and employment programs</p>	<p>Different age groupings, gender, race, ethnicity, culture, program characteristics, outcomes</p>	<p>N/A</p>
<p><b>National Resource Center for Health and Safety in Child Care and Early Education</b> Program of the American Academy of Pediatrics that publishes “Caring for our Children: National Health and Safety Performance Standards for Out-of-home Child Care.” <a href="http://nrc.uchsc.edu/CFOC/index.html">http://nrc.uchsc.edu/CFOC/index.html</a></p>	<p>Health promotion in childcare, infectious disease prevention, child abuse and neglect, primary care (immunization schedule, nutrition and physical activity guidelines)</p>	<p>Different age groupings (infants, young children, and school aged children), gender, developmental needs, and cultures.</p>	<p>Programs evaluated are based on: individual needs of child, have written policies and procedures, confidentiality of records.</p>
<p><b>Prevention Resource Center</b> Website maintained by the Prevent Child Abuse North Carolina that lists evidence-based and promising programs for the prevention of child abuse and maltreatment. <a href="http://www.preventchildabusenc.org/resourcecenter/evb/index_html">http://www.preventchildabusenc.org/resourcecenter/evb/index_html</a></p>	<p>Child abuse and maltreatment, and emotional/behavioral disorders</p>	<p>Parents and children, different interventions settings (home, school, and group)</p>	<p>N/A</p>
<p><b>Promising Practices Network</b> A RAND Corporation program that provides information on evidence-based practices for improving the lives of children, youth, and families. <a href="http://www.promisingpractices.net/programs_outcome_area.asp?outcomeid=4">http://www.promisingpractices.net/programs_outcome_area.asp?outcomeid=4</a></p>	<p>Adolescent behavioral problems, child abuse and neglect, school performance, juvenile justice, mental and physical health, substance abuse, teen pregnancy, and violence prevention</p>	<p>Different age groupings (early childhood, middle childhood, and adolescence), different intervention settings (school, home, and child care), different service types (family and instructional</p>	<p>PPN evaluates programs based on: outcomes, impact size, statistical significance, comparison groups, sample size, and availability of program evaluation documentation.</p>



Organization Name, Description, and Website	Prevention Areas	Population Studied	Evaluation of Research
<p><b>Social Programs that Work</b>                      Website maintained by the Coalition for Evidence-Based Policy that identifies social interventions shown in rigorous studies to produce sizable, sustained benefits to participants and/or society  <a href="http://evidencebasedprograms.org/wordpress/">http://evidencebasedprograms.org/wordpress/</a></p>	<p>Early childhood, education, youth development, crime/violence prevention, substance abuse prevention and treatment, mental health, and employment and welfare.</p>	<p>support, mentoring, parent education, risk prevention, and youth development)                      Different age groupings, genders, and cultures.</p>	<p>Social Programs that Work includes interventions that have been shown, in well-designed and implemented randomized controlled trials, preferably conducted in typical community settings, to produce sizeable, sustained benefits to participants and/or society.</p>
<p><b>UNC Center of Excellence for Training and Research Translation (Center TRT)</b>                      Program of the UNC Center for Health Promotion and Disease Prevention that provides best practices for preventing obesity, heart disease, stroke, and other chronic conditions.  <a href="http://www.center-trt.org/">http://www.center-trt.org/</a></p>	<p>Obesity prevention, heart disease and stroke, and prevention of chronic diseases</p>	<p>Different age groupings, gender, and intervention settings (childcare, school, worksite, healthcare, and community setting)</p>	<p>Center TRT reviews and evaluates interventions based on: effectiveness, public health impact, feasibility, dissemination readiness, and implementation protocols.</p>



## Risk Factors that Contribute to the Top Ten Causes of Preventable Death and Disability in North Carolina

### Cancer

- Breast cancer: risk factors. Mayo Clinic website. <http://www.mayoclinic.com/health/breast-cancer/DS00328/DSECTION=risk-factors>. Accessed February 15, 2008.
- Colon cancer: risk factors. Mayo Clinic website. <http://www.mayoclinic.com/health/colon-cancer/DS00035/DSECTION=risk-factors>. Accessed February 15, 2008.
- Hodgkin's lymphoma: risk factors. Mayo Clinic website. <http://www.mayoclinic.com/health/hodgkins-disease/DS00186/DSECTION=risk-factors>. Accessed February 15, 2008.
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- Pancreatic cancer: risk factors. Mayo Clinic website. <http://www.mayoclinic.com/health/pancreatic-cancer/DS00357/DSECTION=risk-factors>. Accessed February 15, 2008.
- Prostate cancer: risk factors. Mayo Clinic website. <http://www.mayoclinic.com/health/prostate-cancer/DS00043/DSECTION=risk-factors>. Accessed February 15, 2008.

### Heart Disease

- ABCs of preventing heart disease, stroke and heart attack. American Heart Association website. <http://www.americanheart.org/presenter.jhtml?identifier=3035374>. Accessed March 3, 2008.
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- Falls among older adults: an overview. Centers for Disease Control and Prevention website. <http://www.cdc.gov/HomeandRecreationalSafety/Falls/adultfalls.html>. Accessed February 19, 2008.
- Fire deaths and injuries: fact sheet. Centers for Disease Control and Prevention website. <http://www.cdc.gov/ncipc/factsheets/fire.htm>. Accessed February 14, 2008.
- Keeping kids safe from home falls. National Safety Council website. [http://downloads.nsc.org/pdf/factsheets/Keeping\\_Kids\\_Safe\\_from\\_Home\\_Falls.pdf](http://downloads.nsc.org/pdf/factsheets/Keeping_Kids_Safe_from_Home_Falls.pdf). Accessed February 19, 2008.
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## Factors That Contribute To The Top Ten Causes Of Preventable Death And Disability In North Carolina

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- Sepsis: risk factors. Mayo Clinic website. <http://www.mayoclinic.com/health/sepsis/DS01004/DSECTION=risk-factors>. Accessed February 15, 2008.

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- Depression (major depression): risk factors. Mayo Clinic website. <http://www.mayoclinic.com/health/depression/DS00175/DSECTION=risk-factors>. Accessed February 15, 2008.

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