Executive Summary

Introduction

The 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).[1] 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.

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).[1] 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.[2] 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

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.[3,4]

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,[a] 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 *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.[5] 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

a 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.

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

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

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.[5] 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 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.[b] 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.[6] 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.

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.

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.[7] 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.[8,9] 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.[8] 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.[10,11] The CDC recommends smoking bans and restrictions to decrease exposure to secondhand smoke. In May 2009, North Carolina passed Session Law

b 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.[c] 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.[7,12] In 2007, 56.8% of smokers in North Carolina stopped smoking for at least one day because they were trying to quit smoking.[13] 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.[12]

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.

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.[14] 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.[14-17] 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.[18] 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.[19] 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.[19] 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.[20] 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.[21] 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.[22]

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, 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.[23] 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.

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.[24] Meals eaten away from home are typically higher in calories and fat than meals prepared at home.[25] Most consumers underestimate the calorie and fat content in foods eaten away from home.[26] 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.

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

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.[27] 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.[28] 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.[29-31]

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.

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."[32] 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.[33] In addition, 1,943 new cases of HIV disease were diagnosed, and 953 new AIDS cases were reported.[33] Forty-five percent of all live births in 2006 resulted from unintended pregnancies.[34]

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.

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.[33] 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.[35] The primary ways HIV is transmitted are through sexual contact or sharing needles with an infected person.[36] 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.[33]

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.[37] North Carolina ranked 7th highest in the number of HIV-infected inmates in 2006.[38] Thus, prisons are important settings in which to provide HIV prevention, testing, and treatment.[39] 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.[40]

Almost half of all pregnancies in North Carolina are unintended.

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.[41] 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).[42] 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.[43] 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.[43] 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.

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.

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.

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.[44] 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.[45] 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.[46] 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.[47] 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.[48]

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.[49]

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.

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 6.1: 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.

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.[50] 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).[51] Water pollution has been linked to both acute poisonings and chronic effects. In addition, certain air and water pollutants have been linked to cancer.[51-54] 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

and to low-income and minority communities, which are disproportionately exposed to some environmental risks.[55] 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.[56] This project provides a science-based model that North Carolina can use to develop an environmental health strategic plan.

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.

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.[57-59] 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.[60,61] Exposure to airborne toxic substances in the home is also a well-established risk factor for health problems.[62] 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.[63] 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."[d] 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.[64,65] Schools can have

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.[65,66] 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.[e] 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.[67] 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

e 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.[68] 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.[69] 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.[71] 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.[70] Similarly, domestic violence includes physical violence, psychological violence, sexual violence, and stalking.[72] Children who are abused experience long-term physical and psychological effects beyond the immediate harm done to them as a result of maltreatment.[73,74] 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.

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.

Childhood and adolescent vaccinations are a hallmark of preventive care.

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.[75] 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 influenza tupe 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.[76] 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.[77] 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.[78,79] 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.[79,80] 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.

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.[81-83]

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.[78] 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.[84] 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.[85] 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.[f,78] However, within each income level, African Americans

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 affects 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.[86] 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.[87,88] 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.[g] SNAP helps families with monthly incomes less than or equal to 130% FPG purchase basic groceries.

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.

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.[62,89,90] 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.[91] 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.[92,93] 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.

Having inadequate income to meet basic living necessities can cause health problems.

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.[94] 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.[95] 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.[2] 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.[96,97] 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.[98]

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.

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.[99] Studies have shown that healthy employees miss fewer days of work, are more productive, and have lower health care costs.[100,101] 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.

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

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.[102,103] 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.

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%.

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.

Table ES.1 Task Force on Prevention Recommendations by Risk Factor and Socioecological Model Intervention Type

Intervention Type

Risk Factor	Individual	Clinical	Community and Environment					State Policies (Legislative or Administrative)	Research, Evaluation, Data
			Schools & Daycare Providers	Family/Home	Worksites	Insurers	Community at-large		
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 **3.2 PRIORITY Increase NC Tobacco Taxes** 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* **4.3 PRIORITY Implement Quality Physical Education and Healthful Living in Schools** *4.4 Expand Physical Activity and Nutrition in Child Care Centers and After-school Programs* ***4.5 PRIORITY Implement the Eat Smart, Move More North Carolina Obesity Plan and Raise Public Awareness*** 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* *4.4 Expand Physical Activity and Nutrition in Child Care Centers and After-school Programs* ***4.5 PRIORITY Implement the Eat Smart, Move More North Carolina Obesity Plan and Raise Public Awareness*** 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 **4.3 PRIORITY Implement Quality Physical Education and Healthful Living in Schools** 4.4 Expand Physical Activity and Nutrition in Child Care Centers and After-school Programs **4.5 PRIORITY Implement the Eat Smart, Move More North Carolina Obesity Plan and Raise Public Awareness** 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 *5.4 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 **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	
Substance Use and Abuse	Be free of dependence on alcohol, drugs, and other substances	***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	***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*	***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*

Task Force on Prevention Recommendations by Risk Factor and Socioecological Model Intervention Type

Table ES.1

Intervention Type

Risk Factor	Individual	Clinical	Community and Environment					State Policies (Legislative or Administrative)	Research, Evaluation, Data
			Schools & Daycare Providers	Family/Home	Worksites	Insurers	Community at-large		
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*	8.1 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	
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 Practicies 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.

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.

3 Centers for Disease Control and Prevention. *The Guide to Community Preventive Services: What Works to Promote Health.* Atlanta, GA: Oxford University Press; 2005.

4 US Preventive Services Task Force, Agency for Healthcare Research and Quality, US Department of Health and Human Services. The guide to clinical preventive services 2007: recommendations of the US Preventive Services Task Force. http://tars.rollins.edu/hr/OE2008/Preventivebenefits07USPS.pdf. Published 2007. Accessed June 24, 2008.

5 Institute of Medicine of the National Academies Committee on Assuring the Health of the Public in the 21st Century. *The Future of the Public's Health in the 21st Century.* Washington, DC: National Academies Press; 2002.

6 American Cancer Society. Cancer facts & figures 2007. http://www.cancer.org/docroot/STT/content/STT_1x_Cancer_Facts__Figures_2007.asp. Published 2007. Accessed November 4, 2008.

7 Centers for Disease Control and Prevention, US Department of Health and Human Services. Best practices for comprehensive tobacco control programs—2007. http://www.cdc.gov/tobacco/tobacco_control_programs/stateandcommunity/best_practices/. Published October 2007. Accessed November 5, 2008.

8 Centers for Disease Control and Prevention, US Department of Health and Human Services. Guide to community preventive services: reducing tobacco use initiation. http://www.thecommunityguide.org/tobacco/. Published November 5, 2008. Accessed November 5, 2008.

9 Campaign for Tobacco-Free Kids. Benefits from an 84-Cent Cigarette Tax Rate by 84 Cents Per Pack. Washington, DC: Campaign for Tobacco-Free Kids; 2009.

10 National Cancer Institute. NCI health information tip sheet for writers: secondhand smoke. National Institutes of Health website. http://www.cancer.gov/newscenter/tip-sheet-secondhand-smoke. Published July 27, 2005. Accessed November 7, 2008.

11 Campaign for Tobacco-Free Kids. The toll of tobacco in North Carolina. Campaign for Tobacco-Free Kids website. http://www.tobaccofreekids.org/reports/settlements/toll.php?StateID=NC. Accessed November 7, 2008.

12 Public Health Service, US Department of Health and Human Services. Treating tobacco use and dependence: 2008 update (to *Treating Tobacco Use and Dependence*). http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=hstat2.chapter.28163. Published May 2008. Accessed November 4, 2008.

13 North Carolina State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2007. http://www.schs.state.nc.us/SCHS/brfss/2007/nc/all/stopsmk2.html. Accessed November 4, 2008.

14 Office of the Surgeon General. Overweight and obesity: health consequences. US Department of Health and Human Services website. http://www.surgeongeneral.gov/topics/obesity/calltoaction/fact_consequences.htm. Published January 11, 2007. Accessed September 19, 2009.

15 Centers for Disease Control and Prevention. Childhood obesity. Centers for Disease Control and Prevention website. http://www.cdc.gov/HealthyYouth/obesity/index.htm. Published August 20, 2008. Accessed September 19, 2008.

16 Flegal KM, Graubard BI, Williamson DF, Gail MH. Cause-specific excess deaths associated with underweight, overweight, and obesity. *JAMA.* 2007;298(17):2028-2037.

17 Field AE, Coakley EH, Must A, et al. Impact of overweight on the risk of developing common chronic diseases during a 10-year period. *Arch Intern Med.* 2001;161(13):1581-1586.

18 Centers for Disease Control and Prevention. Physical activity and health. Centers for Disease Control and Prevention website. http://www.cdc.gov/physicalactivity/everyone/health/index.html. Published October 7, 2008. Accessed October 22, 2008.

19 Centers for Disease Control and Prevention. Physical activity for everyone. Centers for Disease Control and Prevention website. http://www.cdc.gov/physicalactivity/everyone/guidelines/index.html. Published October 7, 2008. Accessed October 10, 2008.

20 Centers for Disease Control and Prevention. Guidelines for school health programs to promote lifelong healthy eating. *MMWR Recomm Rep.* 1996 Jun 14;45(RR-9):1-33.

21 Ballard K, Caldwell D, Dunn C, et al; North Carolina Division of Public Health, North Carolina Department of Health and Human Services. Move More: North Carolina's recommended standards for physical activity in school. http://www.eatsmartmovemorenc.com/MoveMoreSchoolStds/Texts/MMPAStandards.pdf. Published 2005. Accessed October 10, 2008.

22 National Association for Sport and Physical Education. No time to lose in physical education class. National Association for Sport and Physical Education website. http://www.aahperd.org/naspe/template.cfm?template=pr07_1106.htm. Published November 6, 2007. Accessed Oct 10, 2008.

23 Nutrition Services Branch, Division of Public Health, North Carolina Department of Health and Human Services. North Carolina Nutrition and Physical Activity Surveillance System, 2008. http://www.nutritionnc.com/pdfPregPed/PedNSS/2008/2008StatePedNSS0to5.pdf. Accessed June 16, 2009.

24 North Carolina State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2007. http://www.schs.state.nc.us/SCHS/brfss/2007/nc/all/nc19q01.html. Published 2008. Accessed September 18, 2008.

25 Guthrie JF, Lin BH, Frazao E. Role of food prepared away from home in the American diet, 1977-78 versus 1994-96: changes and consequences. *J Nutr Educ Behav.* 2002;34(3):140-150.

26 Berman M, Lavizzo-Mourey R. Obesity prevention in the information age: caloric information at the point of purchase. *JAMA.* 2008;300(4):433-435.

27 Transportation Research Board, Institute of Medicine of the National Academies. *Does the Built Environment Influence Physical Activity? Examining the Evidence.* Washington, DC: National Academies Press; 2005.

28 Brownson RC, Baker EA, Housemann RA, Brennan LK, Bacak SJ. Environmental and policy determinants of physical activity in the United States. *Am J Public Health.* 2001;91(12):1995-2003.

29 Ammerman A, Leung MM, Cavallo D. Addressing disparities in the obesity epidemic. *NC Med J.* 2006;67(4):301-304.

30 Kumanyika S, Grier S. Targeting interventions for ethnic minority and low-income populations. *Future Child.* 2006;16(1):187-207.

31 Moore LV, Diez Roux AV, Evenson KR, McGinn AP, Brink SJ. Availability of recreational resources in minority and low socioeconomic status areas. *Am J Prev Med.* 2008;34(1):16-22.

32 Community Care of North Carolina. Community care of North Carolina: KBR childhood obesity prevention pilot. Unpublished material.

33 North Carolina Division of Public Health, North Carolina Department of Health and Human Services. NC epidemiologic profile for HIV/STD prevention and care planning. http://www.epi.state.nc.us/epi/hiv/epiprofile1008/Epi_Profile_2008.pdf. Published October 2008 (revised May 2009). Accessed July 1, 2009.

34 North Carolina Center for Health Statistics, North Carolina Department of Health and Human Services. North Carolina PRAMS fact sheet: unintended pregnancies. http://www.schs.state.nc.us/SCHS/pdf/UnintendedPregnancies.pdf. Published March 2009. Accessed July 1, 2009.

35 Centers for Disease Control and Prevention, US Department of Health and Human Services. HIV and AIDS: are you at risk? http://www.cdc.gov/hiv/resources/brochures/pdf/at-risk.pdf. Published July 2007. Accessed July 1, 2009.

36 Centers for Disease Control and Prevention, US Department of Health and Human Services. HIV and its transmission. http://www.cdc.gov/hiv/resources/factsheets/PDF/transmission.pdf. Published July 1999. Accessed July 1, 2009.

37 Calzavara L, Ramuscak N, Burchell AN, et al. Prevalence of HIV and hepatitis C virus infections among inmates of Ontario remand facilities. *CMAJ.* 2007;177(3):257-261.

38 North Carolina Department of Health and Human Services. Division of Public Health partners with the Department of Correction to test prison inmates for HIV. North Carolina Department of Health and Human Services website. http://www.dhhs.state.nc.us/pressrel/2008/2008-12-15-testinmateshiv.htm. Published December 15, 2008. Published December 16, 2008. Accessed July 6, 2009.

39 Rosen DL, Schoenbach VJ, Wohl DA, White BL, Stewart PW, Golin CE. Characteristics and behaviors associated with HIV infection among inmates in the North Carolina prison system. *Am J Public Health.* 2009;99(6):1123-1130.

40 Division of Public Health, North Carolina Department of Health and Human Services. Epidemiologic profile for HIV/STD prevention and care planning. http://www.epi.state.nc.us/epi/hiv/epiprofile0707/Epi_Profile_2007.pdf. Published July 2007 (Revised September 2007). Accessed November 21, 2008.

41 Ayoola AB, Nettleman M, Brewer J. Reasons for unprotected intercourse in adult women. *J Women's Health.* 2007;16(3):302-310.

42 The National Campaign to Prevent Teen and Unplanned Pregnancy. Teen birth rates in the United States. http://www.thenationalcampaign.org/resources/birthdata/TBR_RankbyState.pdf. Published January 2009. Accessed July 6, 2009.

43 Kirby D. *Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy.* Washington, DC: National Campaign to Prevent Teen Pregnancy; 2001.

44 North Carolina Division of Alcoholism and Chemical Dependency Programs, North Carolina Department of Correction. Annual legislative report, 2006-2007. http://www.doc.state.nc.us/Legislative/2008/2006-07_Annual_Legislative_Report.pdf. Published March 2008. Accessed October 14, 2008.

45 North Carolina Department of Juvenile Justice and Delinquency Prevention. 2007 annual report. http://www.ncdjjdp.org/resources/pdf_documents/annual_report_2007.pdf. Published March 2007. Accessed July 31, 2008.

46 University of North Carolina Highway Safety Research Center. North Carolina alcohol facts. University of North Carolina Highway Safety Research Center website. http://www.hsrc.unc.edu/index.cfm. Accessed February 28, 2008.

47 Hughes A, Sathe N, Spagnola K; Office of Applied Studies, Substance Abuse and Mental Health Services Administration, US Department of Health and Human Services. State estimates of substance use from the 2006-2007 National Surveys on Drug Use and Health. http://www.oas.samhsa.gov/2k7state/2k7State.pdf. Published May 2009. Accessed June 22, 2009.

48 North Carolina Department of Public Instruction. North Carolina Youth Risk Behavior Survey, 2007. http://www.nchealthyschools.org/data/yrbs/. Accessed January 23, 2009.

49 Center for Substance Abuse Prevention, Substance Abuse and Mental Health Services Administration, US Department of Health and Human Services. Frequently asked questions. Center for Substance Abuse Prevention website. http://prevention.samhsa.gov/about/faq.aspx. Accessed March 5, 2008.

50 Shea KM. Changing environment, changing health. Presented to: the North Carolina Institute of Medicine Task Force on Prevention; January 14, 2009; Morrisville, NC.

51 American Lung Association. State of the air 2009. http://www.lungusa2.org/sota/2009/SOTA-2009-Full-Print.pdf. Published 2009. Accessed July 1, 2009.

52 Subcommittee on Arsenic in Drinking Water, National Research Council. *Arsenic in Drinking Water.* Washington, DC: National Academies Press; 1999.

53 Environmental Protection Agency. Pesticides: health and safety, human health issues. Environmental Protection Agency website. http://www.epa.gov/pesticides/health/human.htm. Published May 11, 2009. Accessed July 10, 2009.

54 Environmental Protection Agency. Arsenic in drinking water. Environmental Protection Agency website. http://www.epa.gov/safewater/arsenic/index.html. Published September 14, 2006. Accessed July 10, 2009.

55 Evans GW, Kantrowitz E. Socioeconomic status and health: the potential role of environmental risk exposure. *Annu Rev Public Health.* 2002;23:303-331.

56 MacDonald JA. Strategic planning for environmental health using UNC's United Arab Emirates model. Presented to: the North Carolina Institute of Medicine Task Force on Prevention; January 14, 2009; Morrisville, NC.

57 Richardson G, Eick S, Jones R. How is the indoor environment related to asthma?: literature review. *J Adv Nurs.* 2005;52(3):328-339.

58 Peat JK, Dickerson J, Li J. Effects of damp and mould in the home on respiratory health: a review of the literature. *Allergy.* 1998;53(2):120-128.

59 Platt SD, Martin CJ, Hunt SM, Lewis CW. Damp housing, mould growth, and symptomatic health state. *BMJ.* 1989;298(6689):1673-1678.

60 Needleman HL, Schell A, Bellinger D, Leviton A, Allred EN. The long-term effects of exposure to low doses of lead in childhood. An 11-year follow-up report. *N Engl J Med.* 1990;322(2):83-88.

61 Needleman HL. The neurobehavioral consequences of low lead exposure in childhood. *Neurobehav Toxicol Teratol.* 1982;4(6):729-732.

62 Krieger J, Higgins DL. Housing and health: time again for public health action. *Am J Public Health.* 2002;92(5):758-768.

63 Office of the Surgeon General. US Department of Health and Human Services. The Surgeon General's call to action to promote healthy homes. http://www.surgeongeneral.gov/topics/healthyhomes/calltoactiontopromotehealthyhomes.pdf. Published 2009. Accessed June 16, 2009.

64 Daisey JM, Angell WJ, Apte MG. Indoor air quality, ventilation and health symptoms in schools: an analysis of existing information. *Indoor Air.* 2003;13(1):53-64.

65 Environmental Protection Agency. IAQ Tools for Schools Program: schools, IAQ, and health. Environmental Protection Agency website. http://www.epa.gov/iaq/schools/environmental.html. Published June 18, 2008. Accessed June 13, 2009.

66 Apte MG, Fisk WJ, Daisey JM. Associations between indoor CO2 concentrations and sick building syndrome symptoms in US office buildings: an analysis of the 1994-1996 BASE study data. *Indoor Air.* 2000;10(4):246-257.

67 Environmental Protection Agency. Indoor Air Quality Tools for Schools Program: benefits of improving air quality in the school environment. http://www.epa.gov/iaq/schools/pdfs/publications/tfsprogram_brochure.pdf. Published October 2002. Accessed July 13, 2009.

68 Proescholdbell S. State of the state: injury and violence overview. Presented to: the North Carolina Institute of Medicine Task Force on Prevention; February 20, 2009; Morrisville, NC.

69 North Carolina Division of Public Health and University of North Carolina at Chapel Hill School of Medicine Department of Emergency Medicine. NC DETECT. NC DETECT website. www.ncdetect.org. Accessed April 29, 2009.

70 North Carolina Institute of Medicine Task Force on Child Abuse Prevention, North Carolina Institute of Medicine. New directions for North Carolina: a report of the North Carolina Institute of Medicine Task Force on Child Abuse Prevention. http://www.nciom.org/projects/childabuse/2008update.pdf. Published 2008.

71 Hedlund J. Motor vehicle injury. Presented to: the North Caroline Institute of Medicine Task Force on Prevention; February 20, 2009; Morrisville, NC.

72 Macy R. Preventing family violence. Presented to: the North Carolina Institute of Medicine Task Force on Prevention; February 20, 2009; Morrisville, NC.

73 Kaplan SJ, Pelcovitz D, Labruna V. Child and adolescent abuse and neglect research: a review of the past 10 years. part I: Physical and emotional abuse and neglect. *J Am Acad Child Adolesc Psychiatry.* 1999;38(10):1214-1222.

74 Putnam FW. Ten-year research update review: child sexual abuse. *J Am Acad Child Adolesc Psychiatry.* 2003;42(3):269-278.

75 North Carolina State Center for Health Statistics, North Carolina Department of Health and Human Services. 2007 NC Vital Statistics, volume 2: leading causes of death. Table A-F. http://www.schs.state.nc.us/SCHS/deaths/lcd/2007/pdf/TblsA-F.pdf. Published December 4, 2008. Accessed August 10, 2009.

76 Mead PS, Slutsker L, Dietz V, et al. Food-related illness and death in the United States. *Emerging Infectious Diseases.* 1999;5(5):607-625.

77 Office of the State Audito, State of North Carolina. Performance review North Carolina food safety system. Published November 2002. Accessed July 17, 2009.

78 Braveman P, Egerter S, An J, Williams D. Robert Wood Johnson Foundation Commission to Build a Healthier America, Robert Wood Johnson Foundation. Issue brief 5: race and socioeconomic factors. Race and socioeconomic factors affect opportunities for better health. http://www.commissiononhealth.org. Published April 2009. Accessed May 13, 2009.

79 Board on Health Sciences Policy, Institute of Medicine of the National Academies Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care.* Eds. Smedley BD, Stith AY, Nelson AR. Washington, DC: National Academies Press; 2003.

80 Agency for Healthcare Research and Quality, US Department of Health and Human Services. National healthcare disparities report. http://www.ahrq.gov/qual/nhdr08/nhdr08.pdf. Published March 2009. Accessed May 22, 2009.

81 North Carolina State Center for Health Statistics, North Carolina Department of Health and Human Services. Health profile of North Carolinians: 2009 update. http://www.schs.state.nc.us/SCHS/pdf/HealthProfile2009.pdf. Published May 2009. Accessed May 18, 2009.

82 North Carolina State Center for Health Statistics. North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2007. http://www.schs.state.nc.us/SCHS/brfss/2007/nc/all/topics.html. Published June 2, 2008. Accessed January 5, 2009.

83 North Carolina State Center for Health Statistics. North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2008. http://www.schs.state.nc.us/SCHS/brfss/2008/nc/all/topics.html. Accessed June 11, 2009.

84 Boulware LE, Cooper LA, Ratner LE, LaVeist TA, Powe NR. Race and trust in the health care system. *Public Health Rep.* 2003;118:358-365.

85 Plescia M, Groblewski M, Chavis L. A lay health advisor program to promote community capacity and change among change agents. *Health Promot Pract.* 2008;9:434-439.

86 Quinterno J, Gray M, Schofield J; North Carolina Budget and Tax Center, North Carolina Justice Center. Making ends meet on low wages: the 2008 North Carolina Living Income Standard. http://www.ncjustice.org. Published March 2008. Accessed June 11, 2009.

87 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.

88 Levitis J, Koulish J; Center on Budget and Policy Priorities. State earned income tax credits: 2008 legislative update. http://www.cbpp.org/files/6-6-08sfp1.pdf. Published October 8, 2008. Accessed June 18, 2009.

89 Northridge ME, Sclar ED, Biswas P. Sorting out the connections between the built environment and health: a conceptual framework for navigating pathways and planning healthy cities. J Urban Health. 2003;80(4):556-568.

90 Shaw M. Housing and public health. *Annu Rev Public Health.* 2004;25:397-418.

91 Kushel MB, Gupta R, Gee L, Haas JS. Housing instability and food insecurity as barriers to health care among low-income Americans. *J Gen Intern Med.* 2006;21(1):71-77.

92 US Census Bureau. 2007 American Community Survey: table B25070. US Census Bureau website. http://factfinder.census.gov. Accessed June 19, 2009.

93 US Census Bureau. 2007 American Community Survey: table B25091. US Census Bureau website. http://factfinder.census.gov. Accessed June 19, 2009.

94 National Forum on Early Childhood Program Evaluation, National Scientific Council on the Developing Child, Center on the Developing Child at Harvard University. A science-based framework for early childhood policy: using evidence to improve outcomes in learning, behavior and health for vulnerable children. http://developingchild.net/pubs/persp/pdf/Policy_Framework.pdf. Published August 2007. Accessed June 22, 2009.

95 United Health Foundation. American's Health Rankings 2008: high school graduation rates. United Health Foundation website. http://www.americashealthrankings.org/2008/graduation.html. Published 2008. Accessed June 2, 2009.

96 Action for Healthy Kids. The learning connection: the value of improving physical activity and nutrition in our schools. http://www.actionforhealthykids.org/pdf/LC_Color_120204_final.pdf. Published 2008. Accessed June 22, 2009.

97 Llewallen T. Healthy learning environments. Association for Supervision and Curriculum Development website. http://www.ascd.org/publications/newsletters/infobrief/aug04/num38/toc.aspx. Published August 2004. Published 2009. Accessed June 22, 2009.

98 Greenberg T, Weissberg R, O'Brien MU, et al. Enhancing school-based prevention and youth development through coordinated social, emotional, and academic learning. *Am Psychol.* June/July 2003;58(6/7):466-474.

99 Centers for Disease Control and Prevention. *The Guide to Community Preventive Services: What Works to Promote Health.* Atlanta, GA: Oxford University Press; 2005.

100 Aldana SG. Financial impact of health promotion programs: a comprehensive review of the literature. *Am J Health Promot.* 2001;15(5):296-320.

101 Edington DW. *Zero Trends: Health as a Serious Economic Strategy.* Ann Arbor, MI: University of Michigan; 2009. 162.

102 McGlynn EA, Asch SM, Adams J, et al. The quality of health care delivered to adults in the United States. *N Engl J Med.* 2003;348(26):2635-2645.

103 Mangione-Smith R. The quality of ambulatory care delivered to children in the United States. *N Engl J Med.* 2007;357:1515-1523.