HEALTHY NORTH CAROLINA 2020:
A Better State of Health

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HEALTHY CAROLINIANS

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

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

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INTRODUCTION

According to the World Health Organization, health is defined as a "state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity." North Carolina's 2020 health objectives address these components of health with the aim of improving the health status of every North Carolinian. The case for improving the health of individuals throughout the state is strong. People who are healthier tend to live longer, use fewer health care services, be generally happier, and be more productive at work.[1-3] In addition, the improvement of population health is an important economic development strategy, because health is a form of human capital and as such is a significant "input" into our economic system.[4] Thus, a healthy population signifies improved quality and quantity of life for individuals and is an essential contributor to industry and productivity in North Carolina as well.

Over the past dozen years, North Carolina has made noteworthy improvements in many health measures. For example, North Carolina's infant mortality rate decreased from 9.3 deaths per 1,000 live births in 1998 to 8.2 deaths per 1,000 live births in 2008[a]; the cardiovascular death rate decreased from 363 deaths per 100,000 population in 1999 to 257 deaths per 100,000 population in 2008[b]; and the percentage of high school youth who use any tobacco decreased from 38.3% in 1999 to 25.8% in 2009.[c] Despite these advancements, these statistics clearly show we still have a lot of work to do. Furthermore, North Carolina is currently nationally ranked in the bottom third of many health measures and 35th in overall health status (with the best state ranked 1st).[5] In fact, over the past two decades, North Carolina has ranked in, or close to, the bottom third of all states for many major health indicators, including but not limited to obesity, smoking, premature death, infant mortality, and cardiovascular death.[6] The state's low per capita income is a likely contributing factor to poor health in North Carolina and thus to the state's poor health rankings. Other factors, including health care access barriers, racial and ethnic disparities, and the high prevalence of unhealthy behaviors in North Carolina, are also important in explaining North Carolina's current and historically low health rankings.

People who are healthier tend to live longer, use fewer health care services, be generally happier, and be more productive at work.

Today in North Carolina, the rate of death due to the misuse of prescription drugs is on a steep rise. One in five adults smokes, two out of three adults are at an unhealthy weight, and nearly half of all adults have lost permanent teeth due to tooth decay or gum disease.[7-9] In addition, significant disparities—including racial and ethnic, income, and education level disparities—exist within these and many other public health measures. Disparities *must* be addressed to make meaningful improvements in population health. Although these and other public health challenges are daunting, they are not insurmountable. We know how to improve the health of our population. We can make a difference in the health of North Carolina's citizens by implementing multifaceted, evidence-based strategies, including programs and system and policy changes.

a North Carolina State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. July 9, 2010, and May 13, 2010.
b North Carolina State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. July 9, 2010.
c Tobacco Prevention and Control Branch, North Carolina Department of Health and Human Services. Written (email) communication. May 20, 2010.

HEALTHY NORTH CAROLINA 2020

2020 OBJECTIVES - DEVELOPMENT PROCESS

Every 10 years since 1990, North Carolina has set decennial health objectives with the goal of making North Carolina a healthier state. One of the primary aims of this objective-setting process is to mobilize the state to achieve a common set of health objectives. North Carolina had more than 100 objectives for the year 2010. Although these objectives formed a comprehensive list of health indicators, the large number of them made it difficult to focus attention on key objectives that could lead to overall health improvement. Thus, one of the goals of the Healthy NC 2020 project was to develop a limited number of health objectives. There are 40 objectives within 13 specific focus areas for the year 2020. An *objective* is what we aim to accomplish, such as a reduction in the percentage of people with diabetes. Each Healthy NC 2020 objective includes a discrete *target* that provides a quantifiable way to measure our success in achieving each Healthy NC 2020 objective, such as a 10% reduction in the percentage of people with diabetes. Thus, the Healthy NC 2020 objectives provide a common set of health indicators that we, as a state, can work to improve, while the targets assigned to each objective enable us to monitor our progress, or lack thereof, toward achieving these common health objectives.

The Healthy NC 2020 objectives were developed over a one-year period on behalf of the Governor's Task Force for Healthy Carolinians. (See page 38 for the Governor's Task Force member list.) The Governor's Task Force was charged by the Governor to develop these health objectives. According to the Executive Order, objectives "must be measurable, include measures to benefit the State's disparate populations, emphasize individual and community intervention, emphasize the value of health promotion and disease prevention in our society, and be achievable by the year 2020."[d] Due to the NCIOM's work in developing the state's Prevention Action Plan[e], the Governor's Task Force asked the NCIOM to facilitate the development of the 2020 objectives. The NCIOM, in collaboration with the Governor's Task Force for Healthy Carolinians; the Division of Public Health, North Carolina Department of Health and Human Services (NC DHHS); the Office of Healthy Carolinians and Health Education, NC DHHS; and the State Center for Health Statistics, NC DHHS, helped lead the development of the 2020 objectives. This work was generously supported by The Duke Endowment, the Kate B. Reynolds Charitable Trust, and the North Carolina Health and Wellness Trust Fund.

The overall work in developing the 2020 objectives and targets was led by a steering committee that comprised the State Health Director, Chair of the Governor's Task Force for Healthy Carolinians, and other public health and prevention experts. (See page 40 for the steering committee member list.) These experts provided guidance for the development of the objectives and the selection of targets. Building off the prior work of the NCIOM Prevention Task Force in developing the Prevention Action Plan, the steering committee identified 13 focus areas for the Healthy NC 2020 objectives. Nine of the 13 Healthy NC 2020 focus areas had been identified in the NCIOM Prevention Action Plan as major preventable risk factors contributing to the state's leading causes of death and disability. These nine Healthy NC 2020 focus areas are tobacco use, nutrition and physical activity, sexually transmitted disease and unintended pregnancy, substance abuse, environmental risks, injury and violence, infectious disease and foodborne illness, mental health, and social determinants of health.[f] The steering committee added four additional focus areas (for a total of 13): maternal and infant health, oral health, chronic disease, and a cross-cutting focus area. These focus areas were incorporated to capture other significant public health problems as well as summary measures for population health.

In addition to establishing the 13 focus areas, the steering committee identified different methods for establishing the targets for the 2020 objectives. The goal was to establish targets that were *aspirational* yet *achievable*. The steering committee examined several different target-setting methods for states.[10] Among those reviewed were using an absolute percentage change over time, using a compounded percentage change over time, and using current Healthy People targets.[g] The review of these methods helped to inform the specific methods ultimately used in the Healthy

d North Carolina Executive Order No. 26, Reestablishing the Governor's Task Force for Healthy Carolinians. October 8, 2009.
e For the full Prevention Task Force report: http://www.nciom.org/task-forces-and-projects/?task-force-on-prevention
f "Violence" was not part of the Prevention Task Force's injury study area, but was included for Healthy North Carolina 2020.
g The Healthy NC 2020 objectives were developed before the Healthy People 2020 national objectives were finalized, thus these processes were completed independently.

NC 2020 target-setting process. The most commonly used methods to set the Healthy NC 2020 targets were using the best-performing state in the nation (i.e., the state with the most improvement on a specific health measure over a specific period), using the best state in the nation (i.e., the state with the best current value on a specific health measure), maintaining or improving upon North Carolina's current value or pace of improvement, and reaching the top percentile of counties in the state.[h]

The NCIOM convened 11 different subcommittees to develop objectives and targets within each specific focus area. (See page 41 for a complete list of all subcommittee members.) Each subcommittee comprised subject matter experts charged with identifying three critical health objectives in a specific focus area. Subcommittees were also asked to identify one of the three objectives as the *key performance indicator* for that focus area. These specific indicators were selected for various reasons; however, in many cases, the key performance indicator was selected because it best represents the particular focus area. All selected objectives had to meet the criteria of being *actionable* and *measurable*. Thus, some potential objectives were rejected because of a lack of knowledge about how to intervene to make improvements or because data are not routinely collected to measure the specific health problem, and therefore a baseline measure and target could not be set. Subcommittees were also asked to help establish the targets for the objectives by using one of the recommended target-setting methods, whenever possible.[i] The steering committee developed the objectives and targets for the chronic disease and cross-cutting focus areas. In addition, the steering committee reviewed the proposed objectives and targets of the 11 subcommittees to ensure that the objectives, collectively, were balanced in form and that the level of aspiration was similar throughout all targets. The full set of objectives was then reviewed and ultimately approved by the Governor's Task Force for Healthy Carolinians. Additional information about objective development, target selection, data, and methods is available in the Healthy NC 2020 technical report available at www.nciom.org.

More than 150 North Carolinians—including public health and health professionals, state and local public health officials, representatives from Healthy Carolinians partnerships and nonprofits, community leaders, academic experts, and others—contributed their expertise, experience, and time to the development of the Healthy NC 2020 objectives. The consensus-based approach used in Healthy NC 2020 was vital to the selection of a limited number of robust objectives and to the establishment of aspirational yet achievable targets. In addition, this process was intended to generate greater ownership of the objectives. Such ownership is essential to inspiring action.

As part of the Healthy NC 2020 process, regional meetings were held in Pitt, Alamance, and Catawba counties to provide individuals from across the state with an opportunity to learn about the Healthy NC 2020 project. These regional meetings also enabled the state to gain valuable information regarding what is needed to help communities mobilize their efforts and resources to reach the 2020 targets. Nearly 100 people, representing local health departments, nonprofits, schools, hospitals, communities, Healthy Carolinians partnerships, and other organizations, attended these meetings.

This report presents the final 2020 objectives and targets for our state. Each of the 13 focus areas is presented in a two-page section. Each section lists the three objectives for the focus area, briefly describes the rationale for the selection of each objective, shows data on where North Carolina currently is in regards to each objective, and provides the 2020 target.[j] Where available, state or national data on key health disparities are provided for each objective. A table of evidence-based strategies concludes each section to provide all North Carolinians with evidence-based actions to take to achieve the objectives listed within each specific focus area.

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h For more detailed information about target-setting methods, refer to the Healthy NC 2020 technical report at www.nciom.org.

i Targets for a few objectives were set in accordance with pre-existing targets set outside the parameters of this project. These are noted in the Healthy NC 2020 technical report.

j The cross-cutting focus area has four objectives. All other focus areas have three objectives.

HEALTHY NORTH CAROLINA 2020
MOVING FORWARD

The North Carolina Division of Public Health (DPH), led by the State Health Director, will serve as the lead agency in the implementation of activities related to Healthy NC 2020. Over the next decade, DPH will use the objectives as a framework for its efforts to improve health in North Carolina.

The Division is taking a multipronged approach to improving the health of North Carolina's communities and reaching the Healthy NC 2020 objectives. First, DPH plans to share the vision for a healthier North Carolina across the state and to engage diverse sectors, agencies, and organizations in strategic partnerships. As part of this process, DPH will identify and encourage partners to adopt the 2020 objectives and to implement evidence-based strategies for population health improvement, such as those in the NCIOM's Prevention Action Plan. In addition, DPH plans to establish a mechanism to provide technical assistance and will work diligently to connect communities, health departments, and hospitals—all of which are at the core of community, and hence state, health. Furthermore, to measure the state's progress—or lack thereof—toward the 2020 objectives, DPH will produce annual progress reports.

Reaching the 2020 objectives and targets will be a statewide initiative, and success is possible only through concerted and coordinated state, regional, and local efforts. The Healthy NC 2020 objectives are intended to provide motivation, guidance, and focus for public health activities throughout the state. Because of the state's increased attention on prevention, we now have three integrated prevention resources to drive our health improvement and disease prevention efforts. These are the Healthy NC 2020 objectives, the annual progress reports, and the state Prevention Action Plan. The 2020 objectives are our destination; reaching them will mean that we have significantly improved population health in the state. The Prevention Action Plan is the state's roadmap, providing evidence-based strategies to guide the direction of many of our actions. To complete this analogy, the annual progress reports are the GPS navigation device that will help us to stay the course and to correct our direction if needed. Together, using these three tools and many other resources, we can create a *better state of health* in North Carolina.

TOBACCO USE

Tobacco use is the leading cause of preventable death in North Carolina. Approximately 30% of all cancer deaths and nearly 90% of lung cancer deaths—the leading cancer death among men and women—are caused by smoking.[11] In addition, those who smoke have increased risks for heart attack and stroke.[12] Other tobacco products also pose health risks. Smokeless tobacco, for example, is a known cause of human cancer.[13] Nonsmokers also are harmed by tobacco use through their exposure to secondhand smoke, which contains more than 7,000 chemicals. About 70 of these can cause cancer, and hundreds are toxic.[14] Tobacco use is a costly problem in the state leading to medical expenditures of $2.4 billion (in 2004), including $769 million to Medicaid.[15] In 2006, secondhand smoke exposure alone led to excess medical costs of approximately $293.3 million (in 2009 dollars).[16]

2020 Objectives

OBJECTIVE 1: DECREASE THE PERCENTAGE OF ADULTS WHO ARE CURRENT SMOKERS

(KEY PERFORMANCE INDICATOR)

Rationale for selection: An estimated 13,000 North Carolinians aged 35 years or older died from a smoking-related cause each year during 2005-2009. North Carolina has the 14th highest smoking prevalence in the nation. Although overall smoking rates among adults in the state have dropped in the past decade, North Carolina still lags behind the national average.[17]

CURRENT (2009)[18]	2020 TARGET
20.3%	13.0%

OBJECTIVE 2: DECREASE THE PERCENTAGE OF HIGH SCHOOL STUDENTS REPORTING CURRENT USE OF ANY TOBACCO PRODUCT[k]

Rationale for selection: Preventing youth from using tobacco is important to reducing the overall smoking rate. Most adults who use tobacco began smoking before the age of 18 years, with the average age of initiation between 12 and 14 years.[19] Smokers typically become addicted to nicotine before they reach age 20.[20] Youth who use other tobacco products (OTPs) are more likely to smoke.[13]

CURRENT (2009)[l]	2020 TARGET
25.8%	15.0%

OBJECTIVE 3: DECREASE THE PERCENTAGE OF PEOPLE EXPOSED TO SECONDHAND SMOKE IN THE WORKPLACE IN THE PAST SEVEN DAYS[m]

Rationale for selection: Secondhand smoke exposure causes heart disease and lung cancer. In fact, the risk to nonsmokers for heart disease increases by 25%-30% and for lung cancer by 20%-30%.[21] There is no safe level of exposure to secondhand smoke, and exposure for even a short duration is harmful to health.[22]

CURRENT (2008)[23]	2020 TARGET
14.6%	0%

k "Any tobacco product" includes cigarettes, cigars, smokeless tobacco, pipes, or bidis.
l Tobacco Prevention and Control Branch, North Carolina Department of Health and Human Services. Written (email) communication. May 20, 2010.
m Includes only individuals employed for wages or self-employed.

Disparities in Tobacco Use

Smoking among adults: Individuals with less education and those with lower incomes are more likely to smoke. People with less than a high school education are three times as likely to smoke as college graduates (30.9% versus 10.1% in 2009), and those with higher incomes are less likely to smoke (10.4% among those making $75,000 or more versus 29.4% among those making less than $15,000 in 2009). The smoking prevalence among American Indians of 41.6% is twice that of other racial/ethnic groups (2009).[24] In addition, particular subsets of the population are more likely to smoke, for example, individuals with certain lifetime mental illnesses and those with serious psychological distress.[25]

Tobacco use among high school students: Males are more likely to use tobacco products than females (30.8% versus 20.2% in 2009). Use increases as age and grade increase. Students in the 12th grade are nearly twice as likely to report use than students in the ninth grade (35.9% versus 18.2% in 2009). White students report the highest use among racial/ethnic groups (28.3% for whites versus 21.8% for African American and 18.5% for Hispanics in 2009).[n,o]

Secondhand smoke (SHS) exposure in the workplace: Males are approximately two times as likely to be exposed to SHS at the workplace than women (18.7% versus 9.5% in 2008). Individuals with lower incomes are more likely to report exposure. For example, 29.4% of those earning less than $15,000 report exposure versus 7.9% earning $75,000 or more (2008). Exposure is also inversely related to education; individuals with more education are more likely to not be exposed (2008).[23]

Strategies to Prevent and Reduce Tobacco Use

Level of the Socioecological Model	Strategies
Individual	Be tobacco free.[26]
Family/Home	Maintain a tobacco-free home.[27]
Clinical	Offer comprehensive cessation services (counseling and medication) to help smokers and other tobacco users quit[28]; stay up-to-date on evidence-based clinical preventive screenings, counseling, and treatment guidelines.[29]
Schools and Child Care	Enforce tobacco-free school laws[30]; enforce smokefree child care facility rules[p]; implement evidence-based healthful living curricula in schools.[17,31]
Worksites	Institute a worksite wellness program using interventions accompanied by incentives for cessation[32]; implement smoking bans or restrictions in worksites.[33]
Insurers	Provide coverage with no cost sharing for tobacco use screening and counseling for adolescents; and for screening, cessation counseling, and appropriate cessation interventions, including cessation medications, for adults; and for screening and pregnancy-tailored counseling for pregnant women[34,q]; provide coverage for drug use assessment for individuals aged 11-21 years.[35]
Community	Expand smoking bans or restrictions in community spaces[36]; encourage mass media campaigns (coupled with local laws directed at tobacco retailers)[36,37]; support school-based and school-linked health services.[31]
Public Policies	Expand tobacco-free policies to all workplaces and in community establishments[36]; increase the tobacco tax[38]; provide tax incentives to encourage worksite wellness programs[17]; fund and implement a Comprehensive Tobacco Control Program[17]; provide funding to support school-based and school-linked health services and achieve a statewide ratio of 1 school nurse for every 750 middle and high school students.[31]

n Tobacco Prevention and Control Branch, North Carolina Department of Health and Human Services. Written (email) communication. December 1, 2010.

o In this report, white and African American are racial categories and do not distinguish ethnicity unless otherwise noted. African American includes African Americans and other blacks living in the United States. Hispanic is an ethnic category and does not distinguish race.

p 10A NCAC § 09.0604(g)

q Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1001, 4105-4106, enacting §2713 of the Public Health Service Act, 42 USC §300gg.

PHYSICAL ACTIVITY AND NUTRITION

Overweight and obesity pose significant health concerns for both children and adults. Excess weight increases an individual's risk of developing type 2 diabetes, high blood pressure, heart disease, certain cancers, and stroke.[39] For the first time in two centuries, the life expectancy of children in the United States is predicted to be lower than that of their parents. The root cause of this phenomenon is the increase in obesity.[40] Increased physical activity and improved nutrition are among the many factors that can help individuals reach and maintain a healthy weight.

2020 Objectives

OBJECTIVE 1: INCREASE THE PERCENTAGE OF HIGH SCHOOL STUDENTS WHO ARE NEITHER OVERWEIGHT NOR OBESE[r,s]

(KEY PERFORMANCE INDICATOR)

Rationale for selection: Overweight and obese youth are more at risk to be overweight or obese adults.[41] They are also more likely to have high cholesterol and high blood pressure—both risk factors for cardiovascular disease. The percentage of youth with type 2 diabetes has increased significantly with the rise in overweight and obesity.[42]

CURRENT (2009)[43]	2020 TARGET
72.0%	79.2%

OBJECTIVE 2: INCREASE THE PERCENTAGE OF ADULTS GETTING THE RECOMMENDED AMOUNT OF PHYSICAL ACTIVITY[t]

Rationale for selection: Physical activity is an important factor affecting overall health as well as body weight. Regular physical activity reduces the risk of heart disease, stroke, hypertension, and type 2 diabetes.[41] Regular physical activity also reduces risk for certain cancers, strengthens bones and muscles, and improves mental health.[44]

CURRENT (2009)[45]	2020 TARGET
46.4%	60.6%

OBJECTIVE 3: INCREASE THE PERCENTAGE OF ADULTS WHO CONSUME FRUITS AND VEGETABLES FIVE OR MORE TIMES PER DAY

Rationale for selection: Good nutrition is essential to good health and healthy weight. Fruits and vegetables are nutritious foods that have been shown to guard against many chronic diseases, including cardiovascular disease, type 2 diabetes, and some cancers.[46]

CURRENT (2009)[47]	2020 TARGET
20.6%	29.3%

r The percentage of students who are neither overweight nor obese equals 100% minus the total percentage of students who are overweight or obese.
s The cross-cutting focus area contains an objective for adult overweight/obesity.
t Recommended physical activity is defined here as at least 30 minutes of moderate physical activity five or more days per week or vigorous physical activity for at least 20 minutes three or more days per week.

Disparities in Physical Activity and Nutrition

Overweight/obesity among high school students: Non-Hispanic white high school students are more likely to not be overweight or obese than non-Hispanic African American and Hispanic students (77.4% versus 62.2% and 71.8% in 2009). In addition, younger high school students are generally more likely to not be overweight or obese (2009).[48]

Physical activity levels among adults: Males are more likely than females to get the recommended amount of physical activity (51.1% versus 41.9% in 2009). Income and education are also related to physical activity levels. For example, individuals with the least income are the least likely to get the recommended level. The recommended level is achieved by 33.9% among individuals making $15,000 or less and by 54% among those making $75,000 or more (2009).[49]

Fruit and vegetable consumption among adults: Increasing education and income are both positively associated with fruit and vegetable intake. College graduates are more than 1.5 times as likely to eat five fruits and vegetables a day as those with a high school diploma or GED (2009). Similarly, individuals earning more than $75,000 are more than 1.5 times as likely to eat five or more fruits and vegetables a day than those earning less than $15,000 (2009).[50]

Strategies to Prevent and Reduce Obesity by Promoting Healthy Eating and Physical Activity

Level of the Socioecological Model	Strategies
Individual	Eat more fruits and vegetables; increase physical activity level.[51]
Family/Home	Serve fruits and vegetables with meals[51]; reduce screen time at home.[52]
Clinical	Offer obesity screening for children aged more than 6 years and for adults, and offer counseling and behavioral interventions for those identified as obese[34]; expand childhood obesity prevention initiatives for children[51]; stay up-to-date on evidence-based clinical preventive screening, counseling, and treatment guidelines.
Schools and Child Care	Offer high-quality physical education and healthy foods and beverages[17,51,53]; implement evidence-based healthful living curricula in schools[17,31]; expand physical activity and healthy eating in after-school and child care programs[17,53]; support joint use of recreational facilities.[17]
Worksites	Institute worksite wellness programs and promote healthy foods and physical activity[54]; assess health risks and offer feedback and intervention support to employees.[55]
Insurers	Offer coverage at no cost sharing for obesity screening for children aged more than 6 years and adults and for counseling and behavioral interventions for those identified as obese.[34,u]
Community	Implement *Eat Smart, Move More* community-wide obesity prevention strategies[17]; promote menu labeling in restaurants[53]; build active living communities[51]; support joint use of recreational facilities[17]; support school-based and school-linked health services.[31]
Public Policies	Require schools to offer high-quality physical education and healthy foods and beverages[17,51,53]; require schools to implement evidence-based healthful living curricula in schools[17,31]; fund *Eat Smart, Move More* community-wide obesity prevention plans[17]; provide community grants to promote physical activity and healthy eating[17,51]; support community efforts to build active living communities[51]; provide tax incentives to encourage comprehensive worksite wellness programs[17]; and provide funding to support school-based and school-linked health services and achieve a statewide ratio of 1 school nurse for every 750 middle and high school students.[31]

u Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1001, 4105-4106, enacting §2713 of the Public Health Service Act, 42 USC §300gg.

INJURY AND VIOLENCE

Injury is a leading cause of death and disability in North Carolina. In 2007, injury in North Carolina resulted in more than 154,000 hospitalizations, 812,000 emergency department visits, and 6,200 deaths. Injury is the leading cause of death among people aged 1 to 49 years, and homicide in particular is the second leading cause of death for people aged 15 to 24 years. The annual cost of injury to the state is greater than $27 billion.[56]

2020 Objectives

OBJECTIVE 1: REDUCE THE UNINTENTIONAL POISONING MORTALITY RATE (PER 100,000 POPULATION)

(KEY PERFORMANCE INDICATOR)

Rationale for selection: Most unintentional poisoning deaths occur because of the misuse of prescription narcotics.[56] North Carolina has experienced dramatic increases in the percentage of unintentional deaths due to poisoning in the past three decades, including a 139% increase from 2000 to 2007.[v] In 2007, unintentional poisoning was the second leading cause of injury deaths in the state.[56]

CURRENT (2008)[w]	2020 TARGET
11.0	9.9

OBJECTIVE 2: REDUCE THE UNINTENTIONAL FALLS MORTALITY RATE (PER 100,000 POPULATION)

Rationale for selection: In 2007, falls yielded the third leading cause of unintentional injury deaths in the state and the leading cause of injury-related hospitalization and emergency department visits. More than 75% of falls occur in adults aged more than 65 years. Fall-related deaths are expected to increase as the population in the state increases and ages.[56]

CURRENT (2008)[x]	2020 TARGET
8.1	5.3

OBJECTIVE 3: REDUCE THE HOMICIDE RATE (PER 100,000 POPULATION)

Rationale for selection: Homicide is a completely preventable cause of death. Arguments, abuse or conflict, intimate partner violence, drug involvement, and serious crimes are the most common event circumstances for homicides.[57]

CURRENT (2008)[y]	2020 TARGET
7.5	6.7

v Injury Prevention and Control Branch, North Carolina Department of Health and Human Services. Written (email) communication. December 21, 2010.
w Injury Prevention and Control Branch, North Carolina Department of Health and Human Services. Written (email) communication. September 3, 2010.
x Injury Prevention and Control Branch, North Carolina Department of Health and Human Services. Written (email) communication. September 3, 2010.
y Injury Prevention and Control Branch, North Carolina Department of Health and Human Services. Written (email) communication. September 3, 2010.

Disparities in Injury and Violence

Unintentional poisoning mortality: Men are twice as likely to die from unintentional poisoning as women; the rate for men is 14.8 deaths per 100,000 population, whereas for women it is 7.4 deaths per 100,000 population (2008). Also, American Indians and whites are more likely to die from this cause than other racial/ethnic groups, with rates of 13.3 and 13.2 deaths per 100,000 population, respectively, compared with the overall state rate of 11.0 deaths per 100,000 population (2008). The risk for death due to poisoning is greatest for individuals aged 25-54 years (2008).[z]

Falls mortality: Whites are at greatest risk of a fall-related death (9.7 deaths per 100,000 population versus 3.1 deaths per 100,000 population for African Americans in 2008). Furthermore, the risk of death from falls increases with age; individuals aged at least 65 years are most likely to die from a fall (2008).[aa]

Homicide: Of all racial/ethnic groups, African Americans and American Indians are most at risk of homicide, with rates of 15.9 and 20.8 deaths per 100,000 population, respectively, versus 4.4 deaths per 100,000 population for whites (2008). The highest homicide rates are among individuals aged 15-34 years (2008).[bb]

Strategies to Prevent and Reduce Injury and Violence

Level of the Socioecological Model	Strategies
Individual	Practice common sense safety; older adults should exercise regularly and reduce tripping hazards[58]; follow directions on medication/chemical labels[59]; be safe at work; take breaks to stretch your muscles; get enough sleep.[60]
Family/Home	Reduce potential hazards in the home; supervise children at home and on the playground[61]; store medicines and chemicals in locked cabinets.[62]
Clinical	Offer counseling to prevent injuries[63]; learn about evidence-based strategies to prevent and to reduce injuries; collect and report injury data; cross-train home-visit staff to assist the elderly, individuals with disabilities and their caregivers, and low-income families with fall prevention measures.[63]
Schools and Child Care	Establish a social environment that promotes safety and prevents unintentional injuries, violence, and suicide[64,65]; maintain safe playgrounds, school grounds, and school buses; provide health, counseling, psychological, and social services to meet the needs of students[65]; implement evidence-based healthful living curricula in schools.[17,31]
Worksites	Meet Occupational Safety and Health Act requirements to provide a workplace that is "free from recognized hazards that are causing or are likely to cause death or serious physical harm."[cc]
Insurers	Provide coverage for screening and anticipatory guidance for children and adolescents to reduce injury and violence.[35]
Community	Support adoption of healthy, safe, accessible, affordable, and environmentally friendly homes[63]; inform older adults, people with disabilities, and housing and health care professionals about eligibility and coverage in existing home modification services and products (e.g., Medicare and Medicaid)[63]; promote a community of violence prevention[66]; support school-based and school-linked health services.[31]
Public Policies	Enforce housing code requirements to prevent injury[63]; fund injury surveillance and intervention[17]; create a statewide task force to prevent injury and violence[17]; fund injury prevention training for health professionals[17]; enforce housing and sanitary code requirements[63]; promote policies that ensure gender and social equity to prevent violence[66]; provide funding to support school-based and school-linked health services and achieve a statewide ratio of 1 school nurse for every 750 middle and high school students.[31]

z Injury Prevention and Control Branch, North Carolina Department of Health and Human Services. Written (email) communication. December 2, 2010.
aa Injury Prevention and Control Branch, North Carolina Department of Health and Human Services. Written (email) communication. December 2, 2010.
bb Injury Prevention and Control Branch, North Carolina Department of Health and Human Services. Written (email) communication. December 2, 2010.
cc 29 USC §654.

MATERNAL AND INFANT HEALTH

Maternal health is an important predictor of newborn health and well-being, and addressing women's health is essential to improving birth outcomes. Many factors affect women's health, including individual health behaviors, access to appropriate care, and socioeconomic factors. Focusing on the health of a woman *before* and *during* her pregnancy is essential to the reduction of poor birth outcomes such as low birthweight, pre-term birth, and infant death.[67,68]

2020 Objectives

OBJECTIVE 1: REDUCE THE INFANT MORTALITY RACIAL DISPARITY BETWEEN WHITES AND AFRICAN AMERICANS

(KEY PERFORMANCE INDICATOR)

Rationale for selection: Infant mortality refers to the death of a baby in its first year of life. Racial and ethnic disparities in infant mortality in North Carolina persist. The death rate of African American babies is nearly 2.5 times the death rate of white babies. Of all infant mortality racial/ethnic disparities in the state, this disparity is the greatest.[69]

CURRENT (2008)[dd]	2020 TARGET
2.45	1.92

OBJECTIVE 2: REDUCE THE INFANT MORTALITY RATE (PER 1,000 LIVE BIRTHS)

Rationale for selection: Over 1,000 babies (under age 1) died in 2009 in North Carolina.[70] The most prevalent causes of infant mortality are birth defects, prematurity, low birth weight, and Sudden Infant Death Syndrome (SIDS).[71]

CURRENT (2008)[ee]	2020 TARGET
8.2	6.3

OBJECTIVE 3: REDUCE THE PERCENTAGE OF WOMEN WHO SMOKE DURING PREGNANCY

Rationale for selection: Smoking during pregnancy is associated with multiple adverse birth outcomes, including low-birth-weight babies and pre-term deliveries.[72] Women who smoke during pregnancy are more likely to have a baby who is premature, who has a low birth weight, or who dies because of SIDS.[73]

CURRENT (2008)[74]	2020 TARGET
10.4%	6.8%

dd State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. May 13, 2010.
ee State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. May 13, 2010.

Disparities in Maternal and Infant Health

Infant mortality: Whites have the lowest infant mortality rate (6.0 deaths per 1,000 live births), versus a rate of 13.5 deaths per 1,000 live births for all minorities (2008).[75] As described in the objective, the greatest racial/ethnic disparity exists between whites and African Americans.[ff]

Smoking during pregnancy: Education, age, and race/ethnicity are associated with maternal smoking. White, non-Hispanic women with less education and who are younger are more likely to smoke during pregnancy, as are American Indian women.[76]

Strategies to Improve Maternal and Infant Health

Level of the Socioecological Model	Strategies
Individual	Plan your pregnancy[77]; enter into pregnancy healthy[78]; be tobacco free during pregnancy[79]; access pre- and postnatal care[80,81]; breastfeed your baby[82]; space apart pregnancies by 2 to 3 years.[83]
Family/Home	Maintain a tobacco-free home[27]; put children on their backs to sleep[79]; do not use soft bedding.[79]
Clinical	Promote reproductive life planning[84]; screen all pregnant women for tobacco use and provide counseling[34]; screen for postpartum depression[34]; encourage women in good health to breastfeed.[82]
Schools and Child Care	Put children on their backs to sleep[79]; do not use soft bedding.[79]
Worksites	Encourage employers to provide time and space for their employees to breastfeed.[82,gg]
Insurers	Provide coverage with no copays for breastfeeding and smoking cessation counseling for pregnant women.[34,82,hh,ii]
Community	Expand availability of family planning services and community-based pregnancy prevention programs for low-income families, such as the Nurse Family Partnership[17,85]; support the "Back to Sleep" campaign[79]; offer age-appropriate education to student and parent groups.[82]
Public Policies	Create policies that encourage formal training on breastfeeding and lactation in medical schools and residency programs[82]; fund expansion of family planning services and community-based pregnancy prevention programs for low-income families, such as the Nurse Family Partnership.[17,85]

ff State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. May 13, 2010.
gg Patient Protection and Affordable Care Act, Pub L No. 111-148, §4207.
hh Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1001, 4105-4106, enacting §2713 of the Public Health Service Act, 42 USC §300gg.
ii Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1001, 4105-4106, enacting §2713 of the Public Health Service Act, 42 USC §300gg.

SEXUALLY TRANSMITTED DISEASE AND UNINTENDED PREGNANCY

Sexually transmitted diseases (STDs), including human immunodeficiency virus (HIV) infection, and unintended pregnancy affect tens of thousands of North Carolinians every year. These preventable conditions can lead to reduced quality of life as well as premature death and disability and result in millions of dollars in preventable health expenditures annually.[17] As with many diseases and health conditions, the burden of sexually transmitted diseases and unintended pregnancy falls disproportionately on disadvantaged populations, young people, and minorities.[86-88]

2020 Objectives

OBJECTIVE 1: DECREASE THE PERCENTAGE OF PREGNANCIES AMONG ADULTS THAT ARE UNINTENDED

(KEY PERFORMANCE INDICATOR)

Rationale for selection: The term *unintended pregnancy* refers to a pregnancy that was mistimed or unwanted at the time of conception. Nearly half of all pregnancies in North Carolina are unintended, which is associated with delayed entry into prenatal care as well as low-birth-weight babies and poor maternal nutrition.[89]

CURRENT (2007)[90]	2020 TARGET
39.8%	30.9%

OBJECTIVE 2: REDUCE THE PERCENTAGE OF POSITIVE RESULTS AMONG INDIVIDUALS AGED 15-24 YEARS TESTED FOR CHLAMYDIA

Rationale for selection: Chlamydia is the most prevalent reportable STD in North Carolina. This infection can cause infertility and pelvic inflammatory disease (PID) in females. In 2008, individuals under the age of 30 years accounted for approximately 85% of new chlamydia cases across the state.[86]

CURRENT (2009)[jj]	2020 TARGET
9.7%	8.7%

OBJECTIVE 3: REDUCE THE RATE OF NEW HIV INFECTION DIAGNOSES (PER 100,000 POPULATION)[kk]

Rationale for selection: An estimated 35,000 North Carolinians have HIV/AIDS (including those who are unaware of their status). Furthermore, HIV/AIDS was the seventh leading cause of death among 25- to 44-year-olds in 2007.[86]

CURRENT (2008)[91]	2020 TARGET
24.7	22.2

jj Communicable Disease Branch, North Carolina Department of Health and Human Services. Written (email) communication. July 19, 2010.
kk Diagnosis rate includes children, adolescents, and adults.

Disparities in Sexually Transmitted Disease and Unintended Pregnancy

Unintended pregnancy: Education, income, race, and marital status are all associated with unintended pregnancy. Women with less than a high school education are 1.6 times as likely to have an unintended pregnancy than women with greater than a high school education, and women making less than $15,000 are 3.4 times as likely as women making $50,000 or more (2007). In addition, African American women are 1.7 times as likely as white women to report their pregnancy was unintended (59.6% versus 33.9% in 2007). Unmarried women, as well as women on Medicaid, are more likely than their counterparts to report unintended pregnancy (2007).[92]

Chlamydia: The highest rates of chlamydia are found among females aged 15-24 years and males aged 20-24 years (2008). Non-Hispanic African American females are at particular risk for infection, with infection rates seven times that of non-Hispanic white females (2008). These disparities can partially be explained by screening and reporting bias. Most cases are among women because they are tested more frequently. In addition, data are biased toward public clinics.[86]

HIV: New HIV infections, pediatric cases, AIDS cases, and AIDS-related death place a great burden on non-Hispanic African Americans in North Carolina. Nearly two-thirds (64%) of all new adult/adolescent HIV diagnoses are among non-Hispanic African Americans, with a rate of 79.5 new diagnoses per 100,000 population (2008). The second highest rate is among Hispanics (35.8 new diagnoses per 100,000 population in 2008). These two rates are 8.3 times higher and 3.7 times higher, respectively, than the non-Hispanic white diagnosis rate of 9.6 new cases per 100,000 population (2008). According to 2008 data, males in all racial/ethnic categories are more likely than women to receive a diagnosis of HIV infection. Injecting drug users and men who have sex with men also are at increased risk for contracting HIV (2008).[86]

Strategies to Prevent and Reduce Sexually Transmitted Disease and Unintended Pregnancy

Level of the Socioecological Model	Strategies
Individual	Use protection to prevent STDs and unintended pregnancy; get screened for human immunodeficiency virus (HIV) if at increased risk for HIV infection (or if pregnant)[93]; get the HPV vaccine if you are a female aged 11-26 years.[94]
Family/Home	Talk to your children about the consequences of risky sexual behavior; encourage females aged 11-26 years to get the HPV vaccine.[94]
Clinical	Provide screening, counseling, and treatment of STDs/HIV infection as recommended by the US Preventive Services Task Force[93]; screen women younger than 25 years and others at risk for chlamydia[95]; use provider-referral partner notification to identify people with HIV[96]; counsel injecting drug users (IDUs) who are at increased risk for HIV[97]; offer HPV vaccine to females aged 11-26 years[94] and to males aged 9-26 years[98]; provide interventions for men who have sex with men.[99]
Schools and Child Care	Ensure that all students receive comprehensive sexuality education[17,100]; implement evidence-based healthful living curricula in schools[17,31]; deliver group-based comprehensive risk reduction (CRR) to adolescents to promote behaviors that prevent or reduce the risk of pregnancy, HIV, and other STDs.[101]
Insurers	Provide coverage for STD/HIV screening and counseling for sexually active adolescents and high-risk adults; provide screening for chlamydia among women younger than 25 years and for others at increased risk, with no cost sharing.[34,ll]
Community	Expand availability of family planning services and community-based pregnancy prevention programs, such as the Nurse Family Partnership[17,85]; educate youth about the importance of sexual health[100]; support school-based and school-linked health services[31]; provide youth development-focused behavioral interventions coordinated with community service components[102]; create sterile needle exchange programs for IDUs[97]; provide group and community-level interventions for men who have sex with men.[99]
Public Policies	Pass policies that ensure comprehensive sexuality education for all students[17,100]; provide funding to support school-based and school-linked health services and achieve a statewide ratio of 1 school nurse for every 750 middle and high school students[31]; fund community education campaigns to increase awareness of sexual health[100]; fund expansion of family planning services and community-based pregnancy prevention programs for low-income families, such as the Nurse Family Partnership.[17,85]

ll Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1001, 4105-4106, enacting §2713 of the Public Health Service Act, 42 USC §300gg.

SUBSTANCE ABUSE

Substance use and abuse are major contributors to death and disability in North Carolina.[17] Addiction to drugs or alcohol is a chronic health problem, and people who suffer from abuse or dependence are at risk for premature death, comorbid health conditions, injuries, and disability. Therefore, prevention of misuse and abuse of substances is critical. Furthermore, substance abuse has adverse consequences for families, communities, and society, contributing to family upheaval, the state's crime rate, and motor vehicle fatalities.[103]

2020 Objectives

OBJECTIVE 1: REDUCE THE PERCENTAGE OF HIGH SCHOOL STUDENTS WHO HAD ALCOHOL ON ONE OR MORE OF THE PAST 30 DAYS

(KEY PERFORMANCE INDICATOR)

Rationale for selection: One in three high school students in North Carolina reports having at least one drink of alcohol in the past 30 days.[104] Youth are more likely to drink in larger quantities and to engage in binge drinking than adults. Youth are also particularly susceptible to the influence of alcohol because it affects the developing brain.[105] Furthermore, early onset of drinking increases the risk of alcohol addiction.[106]

CURRENT (2009)[107]	2020 TARGET
35.0%	26.4%

OBJECTIVE 2: REDUCE THE PERCENTAGE OF TRAFFIC CRASHES THAT ARE ALCOHOL-RELATED

Rationale for selection: Motor vehicle injury is the leading cause of injury death in North Carolina.[108] In 2008, one of every 18 crashes involved alcohol, and one of every 3 alcohol-related crashes was fatal.[109]

CURRENT (2008)[110]	2020 TARGET
5.7%	4.7%

OBJECTIVE 3: REDUCE THE PERCENTAGE OF INDIVIDUALS AGED 12 YEARS AND OLDER REPORTING ANY ILLICIT DRUG USE IN THE PAST 30 DAYS

Rationale for selection: Illicit drugs include marijuana/hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used for nonmedical purposes.[111] Because addiction is a disease that often begins in childhood and adolescence, it is particularly important to prevent and to reduce use among youth.[103]

CURRENT (2007-08)[112]	2020 TARGET
7.8%	6.6%

Disparities in Substance Abuse

Youth alcohol use: Age and grade are positively associated with alcohol use. Students in grades 10-12 are approximately 1.5 to 1.8 times as likely to use alcohol as ninth grade students (2009). Similarly, 16- and 17-year-olds are approximately 1.5 times as likely to report drinking in the past 30 days than students 15 years and younger (2009).[113]

Alcohol-related traffic crashes: Young people—at all levels of blood alcohol concentration—are at increased risk of being involved in a crash. Nationally in 2008, approximately one in three fatal crashes involving alcohol blood levels of 0.08% or greater involved young adults aged 21-24 years.[114]

Illicit drug use: Young adults aged 18-25 years are more likely to report illicit drug use than people of other ages (19.5% versus 9.8% for those aged 12-17 and 5.6% for those aged 26 and older in 2007-2008).[112]

Strategies to Prevent and Reduce Substance Abuse

Level of the Socioecological Model	Strategies
Individual	Be free from substance abuse, and seek help for substance abuse problems[115,116]; use prescription medication as prescribed and be aware of prescription drug misuse.[117]
Family/Home	Talk to your children about the dangers of substance use and help family members with substance use problems get into treatment[118,119]; parents should serve as positive role models for children by neither drinking excessively nor using drugs.[17,118,119]
Clinical	Offer screening and behavioral counseling interventions to reduce alcohol misuse by adults and pregnant women[34]; offer drug and alcohol use assessments for adolescents aged 11-21 years.[35]
Schools and Child Care	Implement evidenced-based substance abuse prevention programs[118,120]; implement evidence-based healthful living curricula in schools[17,31]; establish, review, and enforce rules about underage drinking with sufficient consequences.[118]
Worksites	Offer employee assistance programs that include screening and referrals for substance use[121]; combat stigma against seeking help for substance abuse[121]; offer facts on the harmful health effects of excessive use of alcohol.[121]
Insurers	Offer coverage for substance abuse services in parity with other services[103]; cover screening and behavioral counseling interventions to reduce alcohol and drug misuse by adolescents with no cost sharing[35,122]; cover screening and behavioral counseling interventions to reduce alcohol misuse by adults and pregnant women with no cost sharing.[34,123,mm]
Community	Invest in alcohol-free youth programs and volunteer opportunities[118]; widely publicize alcohol laws[118]; develop and implement a comprehensive substance abuse prevention plan[17]; support school-based and school-linked health services.[31]
Public Policies	Increase the tax on beer and wine[17,124]; enforce legal liability of places where alcohol is sold for actions/harms caused by customers[125]; expand funding to support regular, well-publicized sobriety checkpoints[17]; enforce blood alcohol content and "zero tolerance" laws for drunk driving[126]; require appropriate therapeutic interventions for parents with substance use disorders who are before courts because children are at heightened risk for underage drinking and drug use[118]; develop comprehensive systems of care that include prevention, treatment, and recovery supports[103]; provide funding to support school-based and school-linked health services and achieve a statewide ratio of 1 school nurse for every 750 middle and high school students.[31]

mm Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1001, 4105-4106, enacting §2713 of the Public Health Service Act, 42 USC §300gg.

MENTAL HEALTH

Mental health, an integral component of individual health, is important throughout the lifespan. Individuals with poor mental health may have difficulties with interpersonal relationships, productivity in school or the workplace, and their overall sense of well-being.[127] Depression is linked to lower productivity in the workplace, is a leading cause of suicide, and has been associated with increased use of health care services.[17]

2020 Objectives

OBJECTIVE 1: REDUCE THE SUICIDE RATE (PER 100,000 POPULATION)

(KEY PERFORMANCE INDICATOR)

Rationale for selection: In 2008, suicide was the fourth leading cause of injury death in North Carolina and was among the top five leading causes of injury death for North Carolinians aged 10 years and older.[108] Depression, which is the second leading cause of life lived with a disability in the state, is a leading cause of suicide.[17,128]

CURRENT (2008)[nn]	2020 TARGET
12.4	8.3

OBJECTIVE 2: DECREASE THE AVERAGE NUMBER OF POOR MENTAL HEALTH DAYS AMONG ADULTS IN THE PAST 30 DAYS

Rationale for selection: The number of poor mental health days within the past 30 days is used as one measurement of a person's health-related quality of life. Poor mental health includes stress, depression, and other emotional problems and can prevent a person from successfully engaging in daily activities, such as self-care, school, work, and recreation.[127]

CURRENT (2008)[129]	2020 TARGET
3.4	2.8

OBJECTIVE 3: REDUCE THE RATE OF MENTAL HEALTH-RELATED VISITS TO EMERGENCY DEPARTMENTS (PER 10,000 POPULATION)[oo]

Rationale for selection: Although the emergency department setting may be appropriate in crisis situations, it is not the ideal setting in which to address mental health problems. However, the use of emergency departments for mental health care is growing.[130] Individuals with mental health needs are best treated with regular and comprehensive care, such as that offered through a coordinated system of care.

CURRENT (2008)[pp]	2020 TARGET
92.0	82.8

nn State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. July 9, 2010.
oo This objective refers to child and adult visits in which a mental health diagnosis was the primary diagnosis.
pp The North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT). Written (email) communication. December 23, 2010.

Disparities in Mental Health

Suicide: Men are almost four times as likely to commit suicide as women (19.9 versus 5.6 suicides per 100,000 population in 2008). Whites have higher suicide rates than African Americans and individuals of other racial/ethnic groups. Suicide rates in the western part of the state are higher than in the Piedmont or eastern parts of the state (17.6 versus 11.4 and 12.2 suicides per 100,000 population, respectively, in 2008).[qq]

Poor mental health days: Females report more poor mental health days in the previous 30 days than men (4.0 versus 2.8 days, in 2008). Hispanics report having the fewest poor mental health days (2.2 days), compared with non-Hispanic whites (3.4 days) and non-Hispanic African Americans (3.8 days), whereas American Indians report the most poor mental health days (5.8 days) (2008).[131]

Strategies to Improve Mental Health

Level of the Socioecological Model	Strategies
Individual	Seek help for mental health problems[132]; older adults aged 60 years and older should have depression care management at home.[133]
Family/Home	Respond sensitively to family members with mental health conditions; know what community resources exist; help family members make contact with appropriate services[134]; safely store firearms.[135,136]
Clinical	Offer screening for depression in adults and adolescents (aged 12-18 years) when treatment and follow-up services are available[137,138]; offer developmental screening of young children[35]; use collaborative care for the management of depressive disorders[139]; deliver culturally competent care[134]; develop crisis plans for persons with mental illness[140]; stay up-to-date on evidence-based clinical preventive screening, counseling, and treatment guidelines.
Schools and Child Care	Implement evidenced-based mental health programs, staff members should be trained to identify stress in children that leads to mental health problems, as well as signs of mental illness[120,141]; implement evidence-based healthful living curricula in schools[17,31]; staff should know which community resources exist, offer appropriate referrals, and act sensitively[134]; mental health professionals working at schools should have specific training in child and adolescent mental health.[141]
Worksites	Employers should conduct assessments of office stress, health, and job satisfaction and use interventions to target office stressors.[142]
Insurers	Provide coverage for developmental screenings and psychosocial behavioral assessments for children and adolescents with no cost sharing[35]; provide coverage for depression screening and intervention services offered in primary care settings for adolescents and adults with no cost sharing[34,rr]; provide coverage of mental health services in parity with other services.[ss]
Community	Services should take into account age, gender, race, and culture[134]; facilitate "portals to entry" to services and treatment in the community[134]; publicize ways to access mental health crisis services outside of emergency departments and create partnerships among emergency personnel, school, community hospitals, law enforcement, and behavioral health crisis service providers to improve coordination and communication[140]; support school-based and school-linked health services.[31]
Public Policies	Expand the availability of mental health services in outpatient and community settings[134]; provide funding to support school-based and school-linked health services and achieve a statewide ratio of 1 school nurse for every 750 middle and high school students[31]; develop comprehensive systems of care that include prevention, treatment, and recovery supports[132,134]; provide tax incentives to encourage comprehensive worksite wellness programs[17]; implement a surveillance system to promote developmental screenings[143]; provide funding for research on support and prevention strategies.[134]

qq State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. November 24, 2010.
rr Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1001, 4105-4106, enacting §2713 of the Public Health Service Act, 42 USC §300gg.
ss North Carolina Session Law 2007-268.

ORAL HEALTH

An individual's oral health plays a very important role in their overall health. Studies have shown direct links between oral infections and other conditions, such as diabetes, heart disease, stroke, and poor pregnancy outcomes.[144] Dental caries is the most common chronic infectious disease among children; if untreated, dental caries can result in problems with speaking, playing, learning, and receiving proper nutrition.[144,145] In addition, untreated oral health problems in children and adults can cause severe pain and suffering, and those who delay care often have higher treatment costs when they finally receive it.[146]

2020 Objectives

OBJECTIVE 1: INCREASE THE PERCENTAGE OF CHILDREN AGED 1-5 YEARS ENROLLED IN MEDICAID WHO RECEIVED ANY DENTAL SERVICE DURING THE PREVIOUS 12 MONTHS

(KEY PERFORMANCE INDICATOR)

Rationale for selection: Children of low-income families are more likely to have tooth decay. One reason is that many children with public coverage lack access to dental care.[147] On average, fewer than half of all North Carolinians aged 1-5 years enrolled in Medicaid receive any dental care in a year.[148]

CURRENT (2008)[148]	2020 TARGET
46.9%	56.4%

OBJECTIVE 2: DECREASE THE AVERAGE NUMBER OF DECAYED, MISSING, OR FILLED TEETH AMONG KINDERGARTNERS

Rationale for selection: Dental decay in children can be measured by the number of teeth affected by decay, the number of teeth that have been extracted, or the number of teeth successfully filled. The prevalence of decayed, missing, or filled teeth in young children is higher in low-income populations and in rural communities without fluoridated water.[149]

CURRENT (2008-09)[tt]	2020 TARGET
1.5	1.1

OBJECTIVE 3: DECREASE THE PERCENTAGE OF ADULTS WHO HAVE HAD PERMANENT TEETH REMOVED DUE TO TOOTH DECAY OR GUM DISEASE

Rationale for selection: Untreated tooth decay and gum disease can lead to permanent tooth loss among adults. According to the Centers for Disease Control and Prevention (CDC), nationally, one in three adults has untreated tooth decay, and one in seven adults has gum disease.[150]

CURRENT (2008)[151]	2020 TARGET
47.8%	38.4%

tt North Carolina Division of Public Health, North Carolina Department of Health and Human Services. Written (email) communication. April 28, 2010.

Disparities in Oral Health

Dental service among Medicaid-enrolled children: A higher percentage of Hispanic children enrolled in Medicaid receive annual dental care than non-Hispanic white or non-Hispanic African American children. Among children aged 2-3 years, 59.3% of Hispanics receive such care versus 45.2% for non-Hispanic whites and 47.1% for non-Hispanic African Americans (2007). Similarly, among children aged 4-6 years, 68.4% of Hispanics, 55.7% of non-Hispanic whites, and 56.4% of non-Hispanic African Americans receive annual dental care (2007).[152] Generally, access to dental care is more challenging for Medicaid recipients in the northeast and far western parts of the state because of the lack of dentists and enrolled Medicaid providers in those areas.[uu]

Decayed, missing, or filled teeth among kindergartners: Although North Carolina-specific data are not yet available, national data indicate that the greatest disparity in tooth decay is seen in non-Hispanic African American children and Mexican American children aged 2-4 and 6-8 years.[153]

Adults with permanent teeth removed: Individuals with greater income and those with more years of education are more likely to have had no teeth removed because of tooth decay or gum disease (2008). People with incomes of $15,000 or less are twice as likely to have had teeth removed than those with incomes of $75,000 or greater (2008). Similarly, those with less than a high school education are twice as likely as those with a college education (2008). Older North Carolinians are also more likely to have had permanent teeth removed (2008).[151]

Strategies to Improve Oral Health

Level of the Socioecological Model	Strategies
Individual	Brush using fluoridated toothpaste and floss your teeth appropriately; visit the dentist regularly[154]; avoid tobacco use.[155]
Family/Home	Promote good quality oral health[155]; help children to avoid frequent snacking between meals[156]; ensure that children receive regular dental care from a pediatrician or dentist.[157]
Clinical	Apply dental sealants[155]; primary care clinicians should prescribe oral fluoride supplementation at currently recommended doses to preschool children older than 6 months whose primary water source is deficient in fluoride[158]; offer education to families or caregivers on prevention methods for dental caries[157]; pediatricians should offer oral health risk assessments for patients beginning at 6 months if the child does not have a regular dentist.[143]
Schools and Child Care	Establish school-based and school-linked dental sealant delivery programs[159]; offer referrals to providers[155]; offer fluoride supplements in schools[155]; implement evidence-based healthful living curricula in schools.[17,31]
Insurers	Cover preventive and restorative care, including fluoride treatment, sealants, and oral surgery, if necessary, for children[157,vv]; cover fluoride treatment for children with a fluoride-deficient water source[34,ww]; cover oral health assessments starting at 6 months if the child does not have a dental home.[35]
Community	Increase access to dental care for those most at risk for oral health problems[155]; support community water flouridation[160,161]; support school-based and school-linked health services.[31]
Public Policies	Increase dental provider participation in the North Carolina Medicaid program[149]; increase the supply of dentists in underserved areas and across North Carolina[149,162]; create policies that require community water fluoridation[160,161]; encourage greater diversity in dental schools[155]; provide funding to support school-based and school-linked health services and achieve a statewide ratio of 1 school nurse for every 750 middle and high school students.[31]

uu Division of Medical Assistance, North Carolina Department of Health and Human Services. Written (email) communication. December 10, 2010.

vv The Patient Protection and Affordable Care Act requires the Secretary of the US Department of Health and Human Services to develop an essential health benefits package which shall include oral health services for children. Patient Protection and Affordable Care Act, Pub L No. 111-148, §1302(b)(J).

ww Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1001, 4105-4106, enacting §2713 of the Public Health Service Act, 42 USC §300gg.

ENVIRONMENTAL HEALTH

The environment in which individuals live and work affects their health. Contaminants in water and air can have adverse health consequences. Both short-term and chronic exposure to pollution can be serious health risks. Air pollution from ozone can lead to respiratory symptoms, disruption in lung function, and inflammation of airways.[163] Water pollution has been linked to both acute poisonings and chronic effects.[164,165] The worksite is another aspect of the environment that is important to consider in the public's health. Unsafe work conditions can lead to poor health and even to extreme outcomes such as death.

2020 Objectives

OBJECTIVE 1: INCREASE THE PERCENTAGE OF AIR MONITOR SITES MEETING THE CURRENT OZONE STANDARD OF 0.075 PPM[xx]

(KEY PERFORMANCE INDICATOR)

Rationale for selection: People with asthma are especially sensitive to ozone exposure. Ozone has been linked to increased frequency of asthma attacks and use of health care services. Ozone exposure may also affect respiratory system development in very young children.[163]

CURRENT (2007-09)[yy]	2020 TARGET
62.5%	100%

OBJECTIVE 2: INCREASE THE PERCENTAGE OF THE POPULATION BEING SERVED BY COMMUNITY WATER SYSTEMS (CWS) WITH NO MAXIMUM CONTAMINANT LEVEL VIOLATIONS (AMONG PERSONS ON CWS)

Rationale for selection: A community water system is a type of public water system that provides water to the same population year-round.[166] Approximately three out of four North Carolinians reside in areas serviced by community water systems.[167] Reducing contaminants protects the public's health by ensuring that those on CWS receive safe drinking water.

CURRENT (2009)[zz]	2020 TARGET
92.2%	95.0%

OBJECTIVE 3: REDUCE THE MORTALITY RATE FROM WORK-RELATED INJURIES (PER 100,000 POPULATION)

Rationale for selection: Although the actual number of North Carolinians who die from work-related injuries is not large, these deaths are unnecessary and preventable. Agriculture, forestry, fishing, and hunting; construction; and transportation and utilities are among the industries with the highest death rates in North Carolina.[aaa]

CURRENT (2008)[bbb]	2020 TARGET
3.9	3.5

xx Parts per million.
yy Division of Air Quality, North Carolina Department of Environment and Natural Resources. Written (email) communication. June 21, 2010.
zz Public Water Supply Section, North Carolina Department of Environment and Natural Resources. Written (email) communication. May 18, 2010.
aaa Bureau of Labor Statistics, US Department of Labor. Written (email) communication. September 16, 2010.
bbb Bureau of Labor Statistics, US Department of Labor. Written (email) communication. September 16, 2010.

Disparities in Environmental Health

Ozone: Urban and rural areas have ground-level ozone, although it tends to be higher in urban areas. In addition, particular individuals are at increased risk from the deleterious effects of ozone exposure, including children, people with asthma and lung disease, older adults, infants, and active people of all ages.[168]

Fatalities from work-related injuries: Certain industries are more hazardous and therefore have increased rates of occupational fatality compared with rates of other industries. Compared with the overall 2008 state mortality rate of 3.9 fatalities per 100,000 population, the rate is 41.7 fatalities (per 100,000 population) for agriculture, forestry, fishing, and hunting; 10.2 fatalities (per 100,000 population) for transportation and utilities; and 9.7 fatalities (per 100,000 population) for construction.[ccc] In addition, national data show that certain groups are more at risk for fatal occupational injuries, including men, individuals aged at least 65 years, and Hispanic workers.[169,170]

Strategies to Improve Environmental Health

Level of the Socioecological Model	Strategies
Individual	Carpool, use public transportation, combine errands, conserve electricity, set your air conditioner to a higher temperature[171]; properly use and dispose of hazardous materials like motor oil and pesticides and use pesticides and fertilizers in moderation.[172]
Clinical	Work with community coalitions for strong state air pollution control measures[173]; advocate for energy-saving and pollution-minimizing practices.[173]
Schools and Child Care	Encourage students to take part in the Youth at Work: Talking Safety occupational safety training program[174]; enforce a "no idling" policy to improve air quality.[175]
Worksites	Reduce environmental risks in the workplace[176]; inform all employees of applicable safety and health standards and protect all employees who work with hazardous materials[177]; meet Occupational Safety and Health Act requirements to provide a workplace that is "free from recognized hazards that are causing or are likely to cause death or serious physical harm."[ddd]
Community	Establish carpools, public transportation, or bike-friendly community transportation systems[171]; implement low-impact development requirements by zoning boards[178]; follow best available technology for specific contaminants in community water systems, and refer to Environmental Protection Agency (EPA) guidance for simultaneous compliance when making treatment changes[179]; perform regular monitoring of the water supply as required by the Safe Drinking Water Act and the North Carolina Drinking Water Act.[eee,fff]
Public Policies	Encourage implementation of fuel alternatives[173]; support policies that promote stronger emission standards for vehicles[180,181]; support policies that promote reduction of power plant emissions[182]; develop water rates that support future community water system infrastructure needs.[183]

ccc Bureau of Labor Statistics, US Department of Labor. Written (email) communication. September 16, 2010.
ddd 29 USC §654.
eee 42 USC §300g.
fff NCGS §130A-311.

INFECTIOUS DISEASE AND FOODBORNE ILLNESS

The prevention of infectious diseases is part of the historic bedrock of public health practice. Fortunately, many infectious diseases such as chicken pox, measles, influenza, and hepatitis B can now be prevented through immunizations. However, people do not always receive the recommended vaccinations and therefore still become sick, become disabled, or die from infectious diseases that are entirely preventable. Foodborne illnesses are among the most common of infectious diseases. They can lead to acute illnesses, hospitalizations, and even deaths.[184] Foodborne illnesses are not vaccine preventable but nonetheless are potentially preventable through safe food preparation and storage tactics.[185]

2020 Objectives

OBJECTIVE 1: INCREASE THE PERCENTAGE OF CHILDREN AGED 19-35 MONTHS WHO RECEIVE THE RECOMMENDED VACCINES

(KEY PERFORMANCE INDICATOR)

Rationale for selection: Vaccines are described as one of the 10 great public health achievements of the 20th century.[186] For every dollar spent on the US childhood immunization program, 5 dollars in direct costs and 11 dollars in additional costs to society are saved.[187]

CURRENT (2007)[188]	2020 TARGET
77.3%	91.3%

OBJECTIVE 2: REDUCE THE PNEUMONIA AND INFLUENZA MORTALITY RATE (PER 100,000 POPULATION)

Rationale for selection: In 2008, pneumonia and influenza yielded the eighth leading cause of death among North Carolinians, causing approximately 1,750 deaths.[189] Individuals aged more than 65 years, those with chronic health conditions, pregnant women, and young children are at higher risk of developing complications such as pneumonia from the flu.[190]

CURRENT (2008)[ggg]	2020 TARGET
19.5	13.5

OBJECTIVE 3: DECREASE THE AVERAGE NUMBER OF CRITICAL VIOLATIONS PER RESTAURANT/FOOD STAND[hhh]

Rationale for selection: Foodborne diseases cause about 47.8 million illnesses, 127,839 hospitalizations, and 3,037 deaths every year in the United States.[191] Improper holding temperatures, poor personal hygiene of food handlers, unsafe food sources, inadequate cooking, and contaminated equipment are the top five food safety risk factors identified by the Centers for Disease Control and Prevention (CDC).[185] Critical violations are based upon these identified risk factors.

CURRENT (2009)[iii]	2020 TARGET
6.1	5.5

ggg State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. May 13, 2010.
hhh As defined in 15A NCAC §18A.2601, a restaurant is a food service establishment which prepares or serves food and provides seating. A food stand is a food service establishment, which prepares or serves foods, but does not provide seating for customers to use while eating or drinking.
iii Food Protection Branch, North Carolina Department of Environment and Natural Resources. Written (email) communication. September 29, 2010.

Disparities in Infectious Disease and Foodborne Illness

Vaccines among children aged 19-35 months: National data indicate that poverty is a contributing factor to disparities seen in immunization rates. The immunization rate among children living below the poverty threshold is 75% versus the national rate of 77.4% (for children receiving the 4:3:1:3:3:1 series in 2007).[192]

Pneumonia and influenza mortality: Pneumonia and influenza mortality most greatly affects individuals aged 65 years or more. The mortality rate for this age group is 127.5 deaths per 100,000 population versus 9.0 deaths per 100,000 population in the 45- to 64-year-old age group and 1.2 deaths per 100,000 population in the 20- to 44-year-old age group (2008).[jjj]

Strategies to Prevent and Reduce Infectious Disease and Foodborne Illness

Level of the Socioecological Model	Strategies
Individual	Get the recommended immunizations[193]; wash your hands often.[194,195]
Family/Home	Make sure your children are immunized.[193]
Clinical	Offer patients age-appropriate immunizations and counsel them to receive age-appropriate immunizations[193,194,196]; offer home visits for vaccination delivery; vaccinate health care workers against influenza.[197]
Schools and Child Care	Offer vaccination programs in schools or organized child care centers that include education and promotion, assessment and tracking of vaccination status, referral of school or child care attendees to vaccination providers when needed, and provision of vaccines.[198]
Worksites	Offer worksite immunizations for influenza[199]; restaurants should reduce risk factors for food-borne illness identified by the CDC and as outlined in North Carolina Administrative Code.[200,kkk]
Insurers	Provide coverage with no cost sharing for all vaccinations recommended by the Advisory Committee on Immunization Practices.[193,lll]
Community	Provide community interventions in combination to increase vaccine use among targeted populations[201]; create programs to improve access to influenza vaccines for children aged 6 months to 18 years, individuals more than 50 years old, and those at high risk because of medical conditions.[202]
Public Policies	Fund outreach efforts to increase immunization rates for all recommended vaccines[17]; strengthen laws and procedures to prevent foodborne illnesses, particularly in food service and retail establishments.[203]

jjj State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. November 24, 2010.
kkk 15A NCAC §18A.2601.
lll Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1001, 4105-4106, enacting §2713 of the Public Health Service Act, 42 USC §300gg.

SOCIAL DETERMINANTS OF HEALTH

Poverty, education level, and housing are three important social determinants of health. These three factors are strongly correlated with individual health. People with higher incomes, more years of education, and a healthy and safe environment to live in have better health outcomes and generally have longer life expectancies. Although these factors affect health independently, they also have interactive effects on each other and thus on health.[17] For example, people in poverty are more likely to engage in risky health behaviors, and they are also less likely to have affordable housing.[204] In turn, families with difficulties in paying rent and utilities are more likely to report barriers to accessing health care, higher use of the emergency department, and more hospitalizations.[205]

2020 Objectives

OBJECTIVE 1: DECREASE THE PERCENTAGE OF INDIVIDUALS LIVING IN POVERTY[mmm]

(KEY PERFORMANCE INDICATOR)

Rationale for selection: In general, increasing income levels correspond with gains in health and health outcomes–especially at the lower end of the income scale. People in poverty have the worst health, compared to people at higher income levels. For example, compared with their counterparts, poor adults are more likely to have chronic illnesses such as diabetes and heart disease, and poor children are more likely to be in poor or fair health.[206]

CURRENT (2009)[207]	2020 TARGET
16.9%	12.5%

OBJECTIVE 2: INCREASE THE FOUR-YEAR HIGH SCHOOL GRADUATION RATE

Rationale for selection: Adults who do not graduate from high school are more likely to suffer from health conditions such as heart disease, high blood pressure, stroke, high cholesterol, and diabetes.[17] Individuals with less education are also more likely to engage in risky health behaviors, such as smoking and being physically inactive.[208]

CURRENT (2008-09)[209]	2020 TARGET
71.8%	94.6%[nnn]

OBJECTIVE 3: DECREASE THE PERCENTAGE OF PEOPLE SPENDING MORE THAN 30% OF THEIR INCOME ON RENTAL HOUSING

Rationale for selection: Housing affordability is a problem that affects mostly low-income individuals and families. People with limited income may have problems paying for basic necessities, such as food, heat, and medical needs.[205] In addition, people with limited incomes may be forced to live in substandard housing in an unsafe environment.[17]

CURRENT (2008)[210]	2020 TARGET
41.8%	36.1%

mmm This objective refers to individuals living in households with a total income below the Federal Poverty Threshold. For example, the official federal poverty guideline for one person is $10,830 and for a family of four is $22,050 in 2010. http://aspe.hhs.gov/poverty/10poverty.shtml. Accessed January 4, 2010.

nnn The 2020 high school graduation target was set to correspond with targets set forth in North Carolina Session Law 2010-111 (Senate Bill 1246). The law directs the State Board of Education to establish a model to improve the four-year high school graduation rate to 90% by 2018. The 2020 target is an extrapolation of the 2018 target.

Disparities in Social Determinants of Health

Poverty: Racial and ethnic minorities are more likely to live in poverty than non-Hispanic whites. Nationally, African Americans and Hispanics experience the highest rates of poverty. Both groups are nearly three times as likely as non-Hispanic whites to live in poverty.[211] Higher levels of education are positively associated with higher incomes; thus, people with less education are more likely to live in poverty.[31]

Four-year high school graduation: African Americans, Hispanics, and American Indians have the lowest four-year graduation rates in the state at 63.2%, 59%, and 60%, respectively (2008-2009). Whites and Asian students have the highest graduation rates in the state: 77.7% and 83.7%, respectively (2008-2009). In addition, the graduation rate of economically disadvantaged students is 61.8%, a full 10 percentage points less than the overall state rate of 71.8% (2008-2009).[209]

Strategies to Address Social Determinants of Health

Level of the Socioecological Model	Strategies
Individual	*Education, poverty:* Finish high school and pursue higher education.[206]
Family/Home	*Education, poverty:* Encourage everyone in the family to get his or her high school diploma or GED and to pursue higher education.[206]
Clinical	*Education, poverty:* Counsel parents and children about the importance of school and youth about taking responsibility for school work.[212]
Schools and Child Care	*Education:* Expand the North Carolina Positive Behavior Support Initiative to include all schools in order to reduce the number of short- and long-term suspensions and expulsions[213]; develop *Learn and Earn* partnerships between community colleges and high schools[214]; support publicly funded, center-based, comprehensive early childhood development programs for low-income children aged 3 to 5 years (eg More at Four and Smart Start)[215]; help low-wealth or underachieving districts meet state proficiency standards[31]; expand alternative learning programs for students who have been suspended from school that support continuous learning, behavior modifications, appropriate youth development, and school success.[31]
Worksites	*Poverty, housing:* Provide outreach to employees regarding applying for the Earned Income Tax Credit[216]; provide health insurance coverage.[ooo]
Community	*Poverty:* Conduct outreach to help people enroll in Supplemental Nutrition Assistance Programs (SNAP).[17] *Education:* Use proven school-community collaboration models to keep students in school.[217] *Housing:* Create tenant-based rental assistance programs that offer vouchers or direct cash assistance for low-income renters.[218]
Public Policies	*Poverty:* Increase the state Earned Income Tax Credit[219,220]; make the state's child and dependent tax credit refundable.[221] *Education:* Raise the compulsory school attendance age[222]; pass policies and provide funding to support the strategies listed in the schools and child care section above. *Housing:* Increase funding to support affordable housing, such as the North Carolina Housing Trust Fund.[17] *Poverty, housing:* Support public policies that create new jobs[223] and provide worker education and training and work supports (eg child care)[224]; coordinate housing and transportation policies to reduce transportation burdens to worksites and target job development in low- and moderate-income neighborhoods.[225]

ooo Patient Protection and Affordable Care Act, Pub L No. 111-148, §1513.

CHRONIC DISEASE

Chronic diseases such as heart disease, cancer, and diabetes are major causes of death and disability in North Carolina.[17] Although genetics and other factors contribute to the development of these chronic health conditions, individual behaviors play a major role. As much as 50% of individual health can be attributed to behavior alone.[226] Physical inactivity, unhealthy eating, smoking, and excessive alcohol consumption are four behavioral risk factors underlying much of the burden caused by chronic disease.[227]

2020 Objectives

OBJECTIVE 1: REDUCE THE CARDIOVASCULAR DISEASE MORTALITY RATE (PER 100,000 POPULATION)

(KEY PERFORMANCE INDICATOR)

Rationale for selection: Heart disease is the second leading cause of death for men and women in North Carolina.[228] The risk for heart disease increases as a person ages. In addition to behavioral risk factors, obesity, high blood pressure, high cholesterol, and diabetes are other known risk factors for heart disease.[229]

CURRENT (2008)[ppp]	2020 TARGET
256.6	161.5

OBJECTIVE 2: DECREASE THE PERCENTAGE OF ADULTS WITH DIABETES

Rationale for selection: The majority (90%-95%) of all people diagnosed with diabetes have type 2 diabetes, formerly known as non-insulin dependent or adult-onset diabetes. Diabetes can lead to serious and costly health problems such as heart disease, stroke, and kidney failure. Overweight/obesity and being older are risk factors for diabetes.[230]

CURRENT (2009)[231]	2020 TARGET
9.6%	8.6%

OBJECTIVE 3: REDUCE THE COLORECTAL CANCER MORTALITY RATE (PER 100,000 POPULATION)

Rationale for selection: Colorectal cancer is the third leading cause of cancer death in both men and women in the country. Screening can reduce the number of deaths because the disease is very treatable if found early.[232] However, one in three North Carolinians (33.4%) aged 50 or more years report they have never been screened (by sigmoidoscopy or colonoscopy) for colorectal cancer.[233]

CURRENT (2008)[qqq]	2020 TARGET
15.7	10.1

ppp State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. July 9, 2010.
qqq State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. August 10, 2010.

Disparities in Chronic Disease

Cardiovascular disease (CVD) mortality: African Americans have the highest CVD mortality rate: 316.4 deaths per 100,000 population, compared with 237.9 deaths per 100,000 population for whites (2008). In addition, men are more susceptible to CVD mortality than women, as indicated by rates of 303.7 and 209.5 deaths per 100,000 population, respectively (2008).[rrr]

Diabetes: African Americans are nearly twice as likely to have diabetes, compared with whites (15.6% versus 8.4% in 2009). Compared with whites, American Indians are more likely to have diabetes (11.7% in 2009). In general, individuals with less education and with lower incomes are also more likely to have diabetes (2009). Among individuals with less than a high school education, 15.3% report diabetes, compared with 5.5% of college graduates (2009). Of those with annual incomes less than $15,000, 14.6% report diabetes, compared with 4.9% of individuals with incomes of $75,000 or greater (2009).[234]

Colorectal cancer mortality: The burden of death due to colorectal cancer is greatest among African Americans. The mortality rate is 23.2 per 100,000 population for African Americans versus 14.0 per 100,000 population for whites (2008). As expected, colorectal cancer death rates increase with age. The mortality rate jumps from 1.6 per 100,000 population for individuals aged 20-44 years to 19.3 per 100,000 population for individuals aged 45-64 years (2008). The rate more than quadruples in the group aged 65 years or more (2008).[sss]

Strategies to Prevent and Reduce Chronic Disease

Level of the Socioecological Model	Strategies
Individual	Eat more fruits and vegetables, increase physical activity level[51]; be tobacco free.[26]
Family/Home	Reduce screen time[52]; encourage eating healthy and physical activity[51]; maintain a tobacco-free home.[27]
Clinical	Screen for colorectal cancer (in adults beginning at age 50 years), type 2 diabetes in adults with high blood pressure, cholesterol abnormalities; screen and offer intensive counseling and behavioral health interventions for obese adults; offer dietary counseling for those at risk of cardiovascular disease or other diet-related chronic diseases; prescribe aspirin for men and women aged 45-79 years to reduce the number of heart attacks[34]; offer blood pressure management to individuals with diabetes[235]; offer a follow-up colonoscopy within 15 months of diagnosis and treatment of an individual with colorectal cancer[236]; prescribe beta-blockers for individuals with prior myocardial infarction.[237]
Schools and Child Care	Offer high-quality physical education and healthy foods and beverages[17,51,53]; implement evidence-based healthful living curricula in schools.[17]
Worksites	Offer worksite wellness programs intended to improve diet and amount of physical activity.[238]
Insurers	With no cost sharing, cover colorectal cancer and diabetes screening as recommended by the USPSTF; cover obesity screening for children aged more than 6 years and adults and for counseling and behavioral interventions for those identified as obese; offer nutrition counseling for adults with hyperlipidemia and other known risk factors for cardiovascular disease[34,ttt]; offer diabetes case management by appointing a professional case manager who oversees and coordinates all of the services received by someone with diabetes.[239]
Community	Offer diabetes self-management education programs[240]; implement *Eat Smart, Move More* community-wide obesity prevention strategies[17]; promote menu labeling in restaurants[53]; build active living communities[53]; support joint use of recreational facilities[17]; support school-based and school-linked health services.[31]
Public Policies	Provide community grants to promote physical activity and healthy eating[53]; support community efforts to build active living communities[53]; fund *Eat Smart, Move More* community-wide obesity prevention plans[17]; provide funding to support school-based and school-linked health services and achieve a statewide ratio of 1 school nurse for every 750 middle and high school students.[31]

rrr State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. November 24, 2010.
sss State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. November 24, 2010.
ttt Patient Protection and Affordable Care Act, Pub L No. 111-148, § § 1001, 4105-4106, enacting §2713 of the Public Health Service Act, 42 USC §300gg.

CROSS-CUTTING

These cross-cutting objectives represent measures of population health in North Carolina that span the other focus areas. Average life expectancy and self-reported health status offer a proxy measure of the health of North Carolina's population. The percentage of non-elderly uninsured individuals provides an indication of the percentage of people with improved access to health care, including preventive services.

2020 Objectives

OBJECTIVE 1: INCREASE AVERAGE LIFE EXPECTANCY (YEARS)

(KEY PERFORMANCE INDICATOR)

Rationale for selection: Life expectancy is a summary measure for population health because it summarizes mortality rates across all age groups.[241] North Carolina ranks 39th in the most recent national rankings (2005) for average life expectancy.[242]

CURRENT (2008)[uuu]	2020 TARGET
77.5	79.5

OBJECTIVE 2: INCREASE THE PERCENTAGE OF ADULTS REPORTING GOOD, VERY GOOD, OR EXCELLENT HEALTH

Rationale for selection: Self-reported health is often used as a measure of overall population health.[243] In 2009, North Carolina ranked 41st among all states for this measure.[244]

CURRENT (2009)[245]	2020 TARGET
81.9%	90.1%

OBJECTIVE 3: REDUCE THE PERCENTAGE OF NON-ELDERLY UNINSURED INDIVIDUALS (AGED LESS THAN 65 YEARS)

Rationale for selection: There are an estimated 1.7 million uninsured individuals aged less than 65 years living in North Carolina.[246] The Patient Protection and Affordable Care Act (PPACA), passed by Congress in April 2010, will extend affordable care to millions of uninsured individuals across the country. However, each state is tasked with implementation of the PPACA, which includes educating uninsured individuals about insurance options available to them and helping them to enroll. Increasing health insurance coverage will increase access to care, including clinical preventive services.

CURRENT (2009)[247]	2020 TARGET
20.4%	8.0%

OBJECTIVE 4: INCREASE THE PERCENTAGE OF ADULTS WHO ARE NEITHER OVERWEIGHT NOR OBESE[vvv]

Rationale for selection: Obesity increases an individual's risk for a host of chronic diseases, including heart disease, stroke, and certain cancers. It also increases the risk for premature death. The CDC calls obesity a "national health threat" and "a major public health challenge."[248]

CURRENT (2009)[249]	2020 TARGET
34.6%	38.1%

uuu State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. July 9, 2010.
vvv The percentage of adults who are neither overweight nor obese equals 100% minus the total percentage of adults who are overweight or obese.

Disparities in the Cross-cutting Objectives

Life expectancy: Females have higher life expectancies than males (80 versus 74.5 years) (2000-2008). Whites have higher life expectancies than African Americans (78.1 versus 73.8 years). Gender disparities persist between whites and African Americans. The life expectancies is 80.7 years for white women versus 77.2 years for African American women, and 75.5 years for white men versus 70.1 years for African American men (2000-2008).[250] In addition, certain subgroups of the population have life expectancies lower than the average. For example, the life expectancy of people with serious mental illness is an average of 25 years less than that of the general population.[251]

Health status: Individuals with higher incomes or more education are more likely to report having good health. Among individuals with annual incomes between $50,000 and $75,000, 91.8% report having good health, whereas only 54.5% with incomes less than $15,000 report having good health. More than 93% of people with college educations report having good health, whereas only 61.6% of those without a high school diploma report having good health. Also, African Americans and Hispanics are less likely than whites to report having good health.[252]

Uninsured: Individuals earning less than 138% of the federal poverty line (FPL) are more likely to be uninsured than those earning more than 400% of the FPL (38.7% versus 6.0% in 2009). Between different age groups, the highest uninsured rates are among individuals aged 19-29 years (36.0%), compared with those aged 45-54 years (17.4%). More than 35% of individuals employed, part-time or full-time, by small firms (1 to 24 employees) were uninsured, compared with only 10% of those employed by very large firms (more than 1,000 employees)(2009).[253]

Overweight/obesity among adults: Compared to women, men are more likely to be overweight or obese (70.7% versus 60.3% in 2009). In addition, African Americans and Hispanics are more likely to report being overweight or obese than whites. Individuals with higher incomes or more education are also less likely to report being overweight or obese (2009).[254]

Note about strategies to address cross-cutting objectives: All strategies listed in this publication affect life expectancy and/or health status. Examples of strategies from other focus areas are included in this table. In addition, specific strategies for increasing insurance coverage are provided. For additional strategies to address overweight/obesity among adults, refer to the Physical Activity and Nutrition Focus Area's strategy table on page 11.

Strategies to Address the Cross-cutting Objectives

Level of the Socioecological Model	Strategies
Individual	*Improve health status and life expectancy:* Be tobacco free[26]; be substance abuse free[17]; eat healthy and exercise regularly[51]; finish high school and pursue higher education.[206] *Increase health insurance coverage:* Enroll in public or private health insurance coverage.[www]
Family/Home	*Improve health status and life expectancy:*Maintain a safe and tobacco-free home[26]; immunize children[255]; promote good nutrition and an active lifestyle.[51] *Increase health insurance coverage:* Enroll all family members in public or private health insurance coverage; explore new options that may become available in 2014 with the implementation of The Patient Protection and Affordable Care Act (PPACA).[xxx]
Clinical	*Improve health status and life expectancy:* Provide all screenings and services recommended by the US Preventive Services Task Force (USPSTF) and provide all immunizations recommended by the Advisory Committee on Immunization Practices (ACIP)[256,257,yyy]; provide all additional services recommended by the Health Resources and Services Administration (HRSA) for children and women[258,zzz]; help educate the public about health risks. *Increase health insurance coverage:* Help uninsured patients enroll in public or private health insurance.[aaaa]

www Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1103, 3510.
xxx Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1103, 3510.
yyy Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1001, 4105-4106, enacting §2713 of the Public Health Service Act, 42 USC §300gg.
zzz Patient Protection and Affordable Care Act, Pub L No. 111-148, §1001, enacting §2713(a)(3),(4) of the Public Health Service Act, 42 USC §300gg.
aaaa Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1103, 2202, 3510.

Strategies to Improve the Cross-cutting Objectives

Level of the Socioecological Model	Strategies
Schools and Child Care	*Improve health status and life expectancy:* Promote school and organized child care center-located vaccination programs[259]; enforce tobacco-free policies[30]; offer high-quality physical education and healthy foods and beverages[17,51]; implement evidence-based healthful living classes in schools[17,31]; ensure that all students receive comprehensive sexuality education.[17,100] *Increase health insurance coverage:* Identify uninsured students and assist with health insurance enrollment.[260]
Worksites	*Improve health status and life expectancy:* Offer worksite wellness programs[54]; make worksites tobacco free[33]; conduct assessments of office stress, health, and job satisfaction and use interventions to target office stressors[142]; inform all employees of applicable safety and health standards and protect all employees who work with hazardous materials.[177] *Increase health insurance coverage:* Offer health insurance and help employees enroll in public and private health insurance coverage.[bbbb]
Insurers	*Improve health status and life expectancy:* Provide coverage with no cost sharing for all USPSTF-recommended preventive screening, counseling, and treatment, and for all ACIP-recommended immunizations.[34,cccc]
Community	*Improve health status and life expectancy:* Implement *Eat Smart, Move More* community-wide obesity prevention strategies[17]; build active living communities[51]; provide community interventions in combination to increase vaccination among targeted populations[201]; expand smoking bans or restrictions in community spaces[36]; support school-based and school-linked health services[31]; support adoption of healthy, safe, accessible, affordable, and environmentally friendly homes[63]; reduce the stigma related to mental illness[134]; fund expansion of family planning services and community-based pregnancy prevention programs for low-income families, such as the Nurse Family Partnership[17,85]; support community water fluoridation.[160,161] *Increase health insurance coverage:* Actively promote new health insurance options made available under the Patient Protection and Affordable Care Act; help individuals enroll in public and private coverage.[dddd]
Public Policies	*Improve health status and life expectancy:* Increase tax on beer and wine[17,124]; enforce blood alcohol content and "zero tolerance" laws for drunk driving[126]; fund injury surveillance and intervention[17]; expand tobacco-free policies to all workplaces and in community establishments[36]; increase the tobacco tax[38]; fund *Eat Smart, Move More* community obesity prevention plans[17]; build active living communities[51]; require schools to offer high-quality physical education and healthy foods and beverages[17,51,53]; require schools to implement evidence-based healthful living curricula in schools[17,31]; pass policies that ensure comprehensive sexuality education for all students[17,100]; provide funding to support school-based and school-linked health services and achieve a statewide ratio of 1 school nurse for every 750 middle and high school students[31]; develop comprehensive systems of mental health care that include prevention, treatment, and recovery supports.[132,134] *Increase health insurance coverage:* Simplify the eligibility and enrollment process for public insurance programs; conduct aggressive outreach to inform people about public and private insurance[261]; employ patient navigators to help enroll people in public and private coverage.[eeee]

bbbb Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1103, 3510.
cccc Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1001, 4105-4106, enacting §2713 of the Public Health Service Act, 42 USC §300gg.
dddd Patient Protection and Affordable Care Act, Pub L No. 111-148, § §1103, 3510.
eeee Patient Protection and Affordable Care Act, Pub L No. 111-148, §3510.

HEALTHY NORTH CAROLINA 2020
OBJECTIVES

	Current	2020 Target
Tobacco Use		
1. Decrease the percentage of adults who are current smokers	20.3% (2009)	13.0%
2. Decrease the percentage of high school students reporting current use of any tobacco product	25.8% (2009)	15.0%
3. Decrease the percentage of people exposed to secondhand smoke in the workplace in the past seven days	14.6% (2008)	0%
Physical Activity and Nutrition		
1. Increase the percentage of high school students who are neither overweight nor obese	72.0% (2009)	79.2%
2. Increase the percentage of adults getting the recommended amount of physical activity	46.4% (2009)	60.6%
3. Increase the percentage of adults who report they consume fruits and vegetables five or more times per day	20.6% (2009)	29.3%
Injury and Violence		
1. Reduce the unintentional poisoning mortality rate (per 100,000 population)	11.0 (2008)	9.9
2. Reduce the unintentional falls mortality rate (per 100,000 population)	8.1 (2008)	5.3
3. Reduce the homicide rate (per 100,000 population)	7.5 (2008)	6.7
Maternal and Infant Health		
1. Reduce the infant mortality racial disparity between whites and African Americans	2.45 (2008)	1.92
2. Reduce the infant mortality rate (per 1,000 live births)	8.2 (2008)	6.3
3. Reduce the percentage of women who smoke during pregnancy	10.4% (2008)	6.8%
Sexually Transmitted Disease and Unintended Pregnancy		
1. Decrease the percentage of pregnancies among adults that are unintended	39.8% (2007)	30.9%
2. Reduce the percentage of positive results among individuals aged 15 to 24 tested for chlamydia	9.7% (2009)	8.7%
3. Reduce the rate of new HIV infection diagnoses (per 100,000 population)	24.7 (2008)	22.2
Substance Abuse		
1. Reduce the percentage of high school students who had alcohol on one or more of the past 30 days	35.0% (2009)	26.4%
2. Reduce the percentage of traffic crashes that are alcohol-related	5.7% (2008)	4.7%
3. Reduce the percentage of individuals aged 12 years and older reporting any illicit drug use in the past 30 days	7.8% (2007-08)	6.6%
Mental Health		
1. Reduce the suicide rate (per 100,000 population)	12.4 (2008)	8.3
2. Decrease the average number of poor mental health days among adults in the past 30 days	3.4 (2008)	2.8
3. Reduce the rate of mental health-related visits to emergency departments (per 10,000 population)	92.0 (2008)	82.8

HEALTHY NORTH CAROLINA 2020
OBJECTIVES

	Current	2020 Target
Oral Health		
1. Increase the percentage of children aged 1-5 years enrolled in Medicaid who received any dental service during the previous 12 months	46.9% (2008)	56.4%
2. Decrease the average number of decayed, missing, or filled teeth among kindergartners	1.5 (2008-09)	1.1
3. Decrease the percentage of adults who have had permanent teeth removed due to tooth decay or gum disease	47.8% (2008)	38.4%
Environmental Health		
1. Increase the percentage of air monitor sites meeting the current ozone standard of 0.075 ppm	62.5% (2007-09)	100.0%
2. Increase the percentage of the population being served by community water systems (CWS) with no maximum contaminant level violations (among persons on CWS)	92.2% (2009)	95.0%
3. Reduce the mortality rate from work-related injuries (per 100,000 population)	3.9 (2008)	3.5
Infectious Disease and Foodborne Illness		
1. Increase the percentage of children aged 19-35 months who receive the recommended vaccines	77.3% (2007)	91.3%
2. Reduce the pneumonia and influenza mortality rate (per 100,000 population)	19.5 (2008)	13.5
3. Decrease the average number of critical violations per restaurant/ food stand	6.1 (2009)	5.5
Social Determinants of Health		
1. Decrease the percentage of individuals living in poverty	16.9% (2009)	12.5%
2. Increase the four-year high school graduation rate	71.8% (2008-09)	94.6%
3. Decrease the percentage of people spending more than 30% of their income on rental housing	41.8% (2008)	36.1%
Chronic Disease		
1. Reduce the cardiovascular disease mortality rate (per 100,000 population)	256.6 (2008)	161.5
2. Decrease the percentage of adults with diabetes	9.6% (2009)	8.6%
3. Reduce the colorectal cancer mortality rate (per 100,000 population)	15.7(2008)	10.1
Cross-cutting		
1. Increase average life expectancy (years)	77.5 (2008)	79.5
2. Increase the percentage of adults reporting good, very good, or excellent health	81.9% (2009)	90.1%
3. Reduce the percentage of non-elderly uninsured individuals (aged less than 65 years)	20.4% (2009)	8.0%
4. Increase the percentage of adults who are neither overweight nor obese	34.6% (2009)	38.1%

HEALTHY NORTH CAROLINA 2020
ACKNOWLEDGMENTS

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HEALTHY NORTH CAROLINA 2020

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HEALTHY NORTH CAROLINA 2020
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REFERENCES

1. Graham C. Happiness and health: lessons—and questions—for public policy. *Health Aff.* 2008;27(1):72-87.
2. Centers for Disease Control and Prevention. Workplace health promotion: benefits of health promotion programs. http://www.cdc.gov/workplacehealthpromotion/businesscase/benefits/index.html. Accessed November 17, 2010.
3. Agency for Healthcare Research and Quality, US Department of Health and Human Services. Medical Expenditure Panel Survey, 2007. http://www.meps.ahrq.gov/mepsweb/data_stats/MEPSnetHC.jsp. Accessed December 10, 2010.
4. Mirvis DM, Bloom DE. Population health and economic development in the United States. *JAMA.* 2008;300(1):93-95.
5. United Health Foundation. America's health rankings: North Carolina (2010). http://www.americashealthrankings.org/yearcompare/2009/2010/NC.aspx. Accessed December 28, 2010.
6. United Health Foundation. America's health rankings. Rankings by state. http://www.americashealthrankings.org/. Accessed November 17, 2010.
7. State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2009. http://www.schs.state.nc.us/SCHS/brfss/2009/nc/all/_rfsmok3.html. Accessed November 18, 2010.
8. Centers for Disease Control and Prevention, US Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2009. http://apps.nccd.cdc.gov/BRFSS/display.asp?cat=OB&yr=2009&qkey=4409&state=NC. Accessed November 18, 2010.
9. 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/RMVTETH3.html. Accessed November 18, 2010.
10. Public Health Foundation. Setting target levels for objectives. http://www.phf.org/pmqi/HPtools/state/DE_setting_targets_for_objectives.pdf. Published November 2000. Accessed November 18, 2010.
11. American Cancer Society. Cancer facts and figures 2007. http://www.cancer.org/docroot/STT/content/STT_1x_Cancer_Facts__Figures_2007.asp. Published 2007. Accessed November 4, 2008.
12. Centers for Disease Control and Prevention, US Department of Health and Human Services. Smoking and tobacco use: health effects of cigarette smoking. http://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/effects_cig_smoking/index.htm. Accessed November 4, 2008.
13. Centers for Disease Control and Prevention, US Department of Health and Human Services. Smoking and tobacco use: smokeless tobacco. http://www.cdc.gov/tobacco/data_statistics/fact_sheets/smokeless/smokeless_facts/index.htm#effects. Accessed September 3, 2010.
14. Centers for Disease Control and Prevention. A report of the Surgeon General: how tobacco smoke causes disease. http://www.cdc.gov/tobacco/data_statistics/sgr/2010/consumer_booklet/pdfs/consumer.pdf. Published 2010. Accessed December 31, 2010.
15. Centers for Disease Control and Prevention. Sustaining state programs for tobacco control, data highlights 2006. http://www.cdc.gov/tobacco/data_statistics/state_data/data_highlights/2006/pdfs/dataHighlights06rev.pdf. Accessed December 30, 2010.
16. Plescia M, Wansink D, Waters HR, Herndon SP. Medical costs of second hand smoke exposure in North Carolina. *NC Med J.* In press.
17. North Carolina Institute of Medicine Task Force on Prevention. *Prevention for the Health of North Carolina: Prevention Action Plan.* Morrisville, NC: North Carolina Institute of Medicine; 2009.
18. Centers for Disease Control and Prevention, US Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2009. http://apps.nccd.cdc.gov/BRFSS/list.asp?cat=TU&yr=2009&qkey=4396&state=All. Accessed October 29, 2010.
19. Malek SH, Hopking DP, Molloy M, McGloin T. The public health challenge of youth smoking in North Carolina: putting what we know into practice. N C Med J. 2002;63(3):153-161.
20. White HR, Pandina RJ, Chen P. Developmental trajectories of cigarette use from early adolescence into young adulthood. *Drug Alcohol Depend.* 2002;65:167-178.

REFERENCES

21. Centers for Disease Control and Prevention, US Department of Health and Human Services. Heart disease and stroke. http://www.cdc.gov/tobacco/basic_information/health_effects/heart_disease/index.htm. Accessed September 3, 2010.

22. Office of the Surgeon General, US Department of Health and Human Services. The health consequences of involuntary exposure to tobacco smoke: a report of the Surgeon General. What is secondhand smoke? http://www.surgeongeneral.gov/library/secondhandsmoke/factsheets/factsheet1.html. Accessed November 4, 2008.

23. State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance Survey, 2008. http://www.epi.state.nc.us/SCHS/brfss/2008/nc/all/SHSINWRK.html. Accessed November 4, 2010.

24. State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance Survey, 2009. http://www.epi.state.nc.us/SCHS/brfss/2009/nc/all/_rfsmok3.html. Accessed December 2, 2010.

25. McClave AK, McKnight-Eily LR, Davis SP, Dube SR. Smoking characteristics of adults with selected lifetime mental illnesses: results from the 2007 National Health Interview Survey. *Am J Public Health.* 2010;100(12):2464-2472.

26. Centers for Disease Control and Prevention, US Department of Health and Human Services. Smoking and tobacco use. http://www.cdc.gov/tobacco/quit_smoking/index.htm. Accessed December 1, 2010.

27. Office of the Surgeon General, US Department of Health and Human Services. The health consequences of involuntary exposure to tobacco smoke: a report of the Surgeon General. http://www.surgeongeneral.gov/library/secondhandsmoke/factsheets/factsheet4.html. December 14, 2010.

28. US Preventive Services Task Force. Counseling and interventions to prevent tobacco use and tobacco-caused disease in adults and pregnant women. http://www.uspreventiveservicestaskforce.org/uspstf/uspstbac2.htm#supporting. Accessed December 13, 2010.

29. Centers for Disease Control and Prevention, US Department of Health and Human Services. Increasing tobacco use cessation: provider reminders with provider education. Guide to Community Preventive Services. http://www.thecommunityguide.org/tobacco/cessation/providerreminderedu.html. Accessed December 1, 2010.

30. Centers for Disease Control and Prevention, US Department of Health and Human Services. Guidelines for school health programs to prevent tobacco use and addiction. *MMWR Morb Mortal Wkly Recomm Rep.* 1994;43(RR-2):1-18.

31. North Carolina Institute of Medicine Task Force on Adolescent Health. *Healthy Foundations for Healthy Youth: A Report of the NCIOM Task Force on Adolescent Health.* Morrisville, NC: North Carolina Institute of Medicine; 2009.

32. Centers for Disease Control and Prevention, US Department of Health and Human Services. Decreasing tobacco use among workers: incentives and competitions to increase smoking cessation. Guide to Community Preventive Services. www.thecommunityguide.org/tobacco/worksite/incentives.html. Accessed December 1, 2010.

33. Centers for Disease Control and Prevention, US Department of Health and Human Services. Reducing exposure to environmental tobacco smoke: smoking bans and restrictions. Guide to Community Preventive Services. http://www.thecommunityguide.org/tobacco/environmental/smokingbans.html. Accessed December 1, 2010.

34. US Preventive Services Task Force, US Department of Health and Human Services. USPSTF A and B recommendations. http://www.uspreventiveservicestaskforce.org/uspstf/uspsabrecs.htm. Accessed December 10, 2010.

35. Bright Futures. Recommendations for preventive pediatric health care. American Academy of Pediatrics. http://brightfutures.aap.org/. Accessed December 8, 2010.

36. Centers for Disease Control and Prevention, US Department of Health and Human Services. Reducing exposure to environmental tobacco smoke: smoking bans and restrictions. Guide to Community Preventive Services. www.thecommunityguide.org/tobacco/environmental/smokingbans.html. Accessed December 1, 2010.

37. Centers for Disease Control and Prevention, US Department of Health and Human Services. Increasing tobacco use cessation: mass media campaigns when combined with other interventions. Guide to Community Preventive Services. www.thecommunityguide.org/tobacco/cessation/massmediacampaigns.html. Accessed December 1, 2010.

38. Centers for Disease Control and Prevention, US Department of Health and Human Services. Increasing tobacco use cessation: increasing unit price of tobacco products. Guide to Community Preventive Services. http://www.thecommunityguide.org/tobacco/cessation/increasingprice.html. Accessed December 1, 2010.

39. Centers for Disease Control and Prevention, US Department of Health and Human Services. Overweight and obesity: health consequences. http://www.cdc.gov/obesity/causes/health.html. Accessed September 9, 2010.

REFERENCES

40. Olshansky SJ, Passaro DJ, Hershow RC, et al. A potential decline in life expectancy in the United States in the 21st century. *N Engl J Med.* 2005;352(11):1138-1145.

41. Centers for Disease Control and Prevention, US Department of Health and Human Services. Overweight and obesity: childhood overweight and obesity. http://www.cdc.gov/obesity/childhood/index.html. Accessed June 19, 2009.

42. Office of the Surgeon General, US Department of Health and Human Services. Overweight in children and adolescents. http://www.surgeongeneral.gov/topics/obesity/calltoaction/fact_adolescents.htm. Accessed September 9, 2010.

43. Centers for Disease Control and Prevention, US Department of Health and Human Services. Youth Risk Behavior Surveillance, 2009. *MMWR Morb Mortal Wkly Rep.* http://www.cdc.gov/mmwr/pdf/ss/ss5905.pdf. Accessed November 1, 2010.

44. Centers for Disease Control and Prevention, US Department of Health and Human Services. Physical activity for everyone. http://www.cdc.gov/physicalactivity/everyone/health/index.html. Accessed October 10, 2008.

45. Centers for Disease Control and Prevention, US Department of Health and Human Services. Behavioral Risk Factor Surveillance Survey, 2009. http://apps.nccd.cdc.gov/brfss/list.asp?cat=PA&yr=2009&qkey=4418&state=All. Accessed October 29, 2010.

46. US Department of Health and Human Services and US Department of Agriculture. Dietary guidelines for Americans, 2005. http://www.health.gov/dietaryguidelines/dga2005/document/pdf/DGA2005.pdf. Published January 2005. Accessed September 18, 2008.

47. Centers for Disease Control and Prevention, US Department of Health and Human Services. Behavioral Risk Factor Surveillance Survey, 2009. http://apps.nccd.cdc.gov/brfss/list.asp?cat=FV&yr=2009&qkey=4415&state=All. Accessed October 29, 2010.

48. North Carolina Department of Public Instruction. Youth Risk Behavior Survey, 2009. http://www.nchealthyschools.org/docs/data/yrbs/2009/highschool/statewide/tables.pdf. Accessed December 8, 2010.

49. State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance Survey, 2009. http://www.epi.state.nc.us/SCHS/brfss/2009/nc/all/_RFPAREC.html. Accessed December 2, 2010.

50. State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2009. http://www.epi.state.nc.us/SCHS/brfss/2009/nc/all/_FV5SRV.html. Accessed December 2, 2010.

51. Office of the Surgeon General, US Department of Health and Human Services. The Surgeon General's vision for a healthy and fit nation: fact sheet. http://www.surgeongeneral.gov/library/obesityvision/obesityvision_factsheet.html. Accessed December 1, 2010.

52. Centers for Disease Control and Prevention, US Department of Health and Human Services. Obesity prevention and control: behavioral interventions to reduce screen time. Guide to Community Preventive Services. http://www.thecommunityguide.org/obesity/behavorial.html. Accessed December 1, 2010.

53. Khan LK, Sobush K, Keener D, et al. Recommended community strategies and measurements to prevent obesity in the United States. *MMWR Morb Mortal Recomm Rep.* 2009;58(RR07):1-26. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5807a1.htm?s_cid=rr5807a1_e. Accessed December 23, 2010.

54. Centers for Disease Control and Prevention, US Department of Health and Human Services. Obesity prevention and control: worksite program. Guide to Community Preventive Services. http://www.thecommunityguide.org/obesity/workprograms.html. Accessed December 1, 2010.

55. Centers for Disease Control and Prevention, US Department of Health and Human Services. Assessment of health risks with feedback to change employees' health. Guide to Community Preventive Services. http://www.thecommunityguide.org/worksite/ahrf.html. Accessed December 3, 2010.

56. Injury and Violence Prevention Branch, North Carolina Department of Health and Human Services. Building for strength: North Carolina's Strategic Plan for Preventing Injuries and Violence 2009-2014. http://www.injuryfreenc.ncdhhs.gov/ForHealthProfessionals/StrategicPlan.htm. Accessed September 9, 2010.

57. Injury and Violence Prevention Branch, North Carolina Department of Health and Human Services. 2007 NC Violent Death Reporting System Annual Report. http://www.injuryfreenc.ncdhhs.gov/About/2007NVDRSReportLoRez.pdf. Updated July 2010. Accessed October 28, 2010.

REFERENCES

58. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, US Department of Health and Human Services. Falls among older adults: an overview. http://www.cdc.gov/HomeandRecreationalSafety/Falls/adultfalls.html. Accessed December 3, 2010.

59. American Association of Poison Control Centers. Poison prevention tips for adults. http://www.aapcc.org/dnn/PoisoningPrevention/Adults.aspx. Accessed December 3, 2010.

60. National Health Information Center. Workplace safety: quick guide to healthy living. http://www.healthfinder.gov/prevention/. Accessed December 8, 2010.

61. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, US Department of Health and Human Services. Protect the ones you love: child injuries are preventable. http://www.cdc.gov/safechild/. Accessed December 3, 2010.

62. American Association for Poison Control Centers. Tips for babysitters or other caregivers. http://www.aapcc.org/dnn/PoisoningPrevention/TipsforBabysittersorotherCaregivers.aspx. Accessed December 3, 2010.

63. Office of the Surgeon General, US Department of Health and Human Services. Surgeon General's call to action to promote healthy homes. http://www.surgeongeneral.gov/topics/healthyhomes/actions.pdf. Accessed December 3, 2010.

64. Centers for Disease Control and Prevention, US Department of Health and Human Services. School-based programs to reduce violence. http://www.thecommunityguide.org/violence/schoolbasedprograms.html. Accessed November 22, 2010.

65. Centers for Disease Control and Prevention, US Department of Health and Human Services. School health guidelines to prevent unintentional injuries and violence. *MMWR Recomm Rep.* 2001;58(RR2):1-46. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5022a1.htm. Accessed December 10, 2010.

66. World Health Organization. Preventing violence: a guide to implementing the recommendations of the World report on violence and health. http://www.who.int/violence_injury_prevention/media/news/08_09_2004/en/index.html. Accessed December 3, 2010.

67. Centers for Disease Control and Prevention, US Department of Health and Human Services. Why is preconception care a public health concern? http://www.cdc.gov/ncbddd/preconception/whypreconception.htm. Accessed November 18, 2010.

68. Centers for Disease Control and Prevention, US Department of Health and Human Services. Using surveillance to promote public health examples from the Pregnancy Risk Assessment Monitoring System (PRAMS): executive summary publication year 2002. http://www.cdc.gov/prams/dataact2002/prenatal_care.htm. Accessed November 18, 2010.

69. Office of Minority Health and Health Disparities and State Center for Health Statistics, North Carolina Department of Health and Human Services. Racial and ethnic health disparities in North Carolina: Report Card 2010. http://www.schs.state.nc.us/SCHS/pdf/MinRptCard_WEB_062210.pdf. Accessed November 18, 2010.

70. State Center for Health Statistics, North Carolina Department of Health and Human Services. 2009 North Carolina infant mortality report, table 3. http://www.schs.state.nc.us/SCHS/deaths/ims/2009/table3.html. Accessed October 29, 2010.

71. DeClerque JL, Freeman JA, Verbiest S, Bondurant S. North Carolina's infant mortality problems persist: time for a paradigm shift. *N C Med J.* 2004;65(3):138-142.

72. Rosenburg DC, Buescher PA. The association of maternal smoking with infant mortality and low birth weight in North Carolina, 1999. State Center for Health Statistics, North Carolina Department of Health and Human Services. 2002, Special Report No. 135. http://www.epi.state.nc.us/SCHS/pdf/SCHS-135.pdf. Accessed October 29, 2010.

73. Centers for Disease Control and Prevention, US Department of Health and Human Services. Tobacco use and pregnancy: home. http://www.cdc.gov/reproductivehealth/tobaccousepregnancy/index.htm. Accessed September 9, 2010.

74. State Center for Health Statistics, North Carolina Department of Health and Human Services. 2008 NC vital statistics, volume 1: population, births, deaths, marriages, divorces. http://www.epi.state.nc.us/SCHS/vitalstats/volume1/2008/Vol1_2008_PRT.pdf. Accessed November 5, 2010.

75. State Center for Health Statistics, North Carolina Department of Health and Human Services. 2009 North Carolina infant mortality report, table 4. http://www.schs.state.nc.us/SCHS/deaths/ims/2009/table4.html. Accessed December 3, 2010.

76. Centers for Disease Control and Prevention, US Department of Health and Human Services. Tobacco use and pregnancy: home. http://www.cdc.gov/reproductivehealth/tobaccousepregnancy/index.htm. Accessed December 3, 2010.

77. Centers for Disease Control and Prevention, US Department of Health and Human Services. Before your pregnancy. http://www.cdc.gov/ncbddd/pregnancy_gateway/before.html. Accessed December 13, 2010.

REFERENCES

78. Centers for Disease Control and Prevention, US Department of Health and Human Services. Preconception care questions and answers. http://www.cdc.gov/ncbddd/preconception/QandA.htm. Accessed December 13, 2010.

79. Task Force on Sudden Infant Death Syndrome, American Academy of Pediatrics. The changing concept of sudden infant death syndrome: diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics.* 2005;116(5):1245-1255.

80. Agency for Healthcare Research and Quality, US Department of Health and Human Services. Guideline summary: routine prenatal care. http://www.guideline.gov/content.aspx?id=15205. Accessed December 13, 2010.

81. Agency for Healthcare Research and Quality, US Department of Health and Human Services. Guideline summary: postnatal care. Routine postnatal care of women and their babies. http://www.guidelines.gov/content.aspx?id=9630#Section432. Accessed December 13, 2010.

82. Section on Breastfeeding, American Academy of Pediatrics. Breastfeeding and the use of human milk. *Pediatrics.* 2005;115(2):496-506.

83. World Health Organization. Report of a WHO technical consultation on birth spacing. http://www.who.int/making_pregnancy_safer/documents/birth_spacing.pdf. Accessed December 14, 2010.

84. Centers for Disease Control and Prevention, US Department of Health and Human Services. Preconception care questions and answers. http://www.cdc.gov/ncbddd/preconception/QandA.htm. Accessed December 13, 2010.

85. Dawley K, Loch J, Bindrich I. The nurse-family partnership. *Am J Nurs.* 2007;107(11):60-67.

86. Communicable Disease Branch, North Carolina Department of Health and Human Services. North Carolina epidemiologic profile for HIV/STD prevention and care planning, December 2009. http://www.epi.state.nc.us/epi/hiv/epiprofile1209.html. Accessed September 9, 2010.

87. Office of Disease Prevention and Health Promotion, US Department of Health and Human Services. Healthy People 2020. 9. Family planning. http://www.healthypeople.gov/Document/HTML/Volume1/09Family.htm. Accessed November 18, 2010.

88. Centers for Disease Control and Prevention, US Department of Health and Human Services. Pregnancy Risk Assessment Monitoring System (PRAMS): PRAMS and unintended pregnancy. http://www.cdc.gov/PRAMS/UP.htm. Accessed November 18, 2010.

89. State 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. Accessed July 1, 2010.

90. Centers for Disease Control and Prevention, US Department of Health and Human Services. Pregnancy Risk Assessment Monitoring System (PRAMS): CPONDER, 2007. http://apps.nccd.cdc.gov/cPONDER/default.aspx?page=DisplayAllStates&state=0&year=8&category=17&variable=16. Accessed November 5, 2010.

91. Centers for Disease Control and Prevention, US Department of Health and Human Services. HIV surveillance report. Table 19. Diagnoses of HIV infection, by area of residence, 2008—United States and 5 US-dependent areas. http://www.cdc.gov/hiv/surveillance/resources/reports/2008report/table19.htm. Accessed November 4, 2010.

92. State Center for Health Statistics, North Carolina Department of Health and Human Services. North Carolina Pregnancy Assessment Risk Monitoring System, 2007. http://www.schs.state.nc.us/SCHS/prams/2007/FEEL_PG.html/. Accessed December 3, 2010.

93. US Preventive Services Task Force, US Department of Health and Human Services. Screening for HIV: recommendation statement. http://www.uspreventiveservicestaskforce.org/uspstf05/hiv/hivrs.htm. Accessed November 10, 2010.

94. Centers for Disease Control and Prevention, US Department of Health and Human Services. Quadrivalent human papillomavirus vaccine: recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep*. 2007;56:1-24. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr56e312a1.htm. Accessed December 10, 2010.

95. US Preventive Services Task Force, US Department of Health and Human Services. US Preventive Services Recommendations for STI screening. http://www.uspreventiveservicestaskforce.org/uspstf08/methods/stinfections.htm#other. Accessed December 1, 2010.

96. Centers for Disease Control and Prevention, US Department of Health and Human Services. Interventions to identify HIV-positive people through partner counseling and referral services. Guide to Community Preventive Services. http://www.thecommunityguide.org/hiv/partnercounseling.html. Accessed December 1, 2010.

REFERENCES

97. Centers for Disease Control and Prevention. Drug-associated HIV transmission continues in the United States. http://www.cdc.gov/hiv/resources/factsheets/idu.htm. Accessed December 10, 2010.

98. Centers for Disease Control and Prevention. FDA licensure of quadrivalent human papillomavirus vaccine (HPV4, Gardasil) for use in males and guidance from the Advisory Committee on Immunization Practices (ACIP). *MMWR Morb Mortal Wkly Rep.* 2010;59(20):630-632.

99. Centers for Disease Control and Prevention, US Department of Health and Human Services. Interventions to prevent acquisition of HIV in adult men having sex with men: person-to-person provision of information. Guide to Community Preventive Services. http://www.thecommunityguide.org/hiv/mensexmen.html. Accessed November 22, 2010.

100. Office of the Surgeon General, US Department of Health and Human Services. Surgeon General's call to action to promote sexual health and responsible sexual behavior. At-a-glance: vision for the future. http://www.surgeongeneral.gov/library/sexualhealth/glancetable.htm. Accessed December 1, 2010.

101. Centers for Disease Control and Prevention, US Department of Health and Human Services. Group-based comprehensive risk reduction interventions for adolescents. Guide to Community Preventive Services. http://www.thecommunityguide.org/hiv/riskreduction.html. Accessed December 6, 2010.

102. Centers for Disease Control and Prevention, US Department of Health and Human Services. Youth development behavioral interventions coordinated with community service to reduce sexual risk behaviors in adolescents. Guide to Community Preventive Services. http://www.thecommunityguide.org/hiv/youthdev-community.html. Accessed November 20, 2010.

103. North Carolina Institute of Medicine Task Force on Substance Abuse Services. *Building a Recovery-Oriented System of Care: A Report of the NCIOM Task Force on Substance Abuse Services.* Morrisville, NC: North Carolina Institute of Medicine; 2009.

104. Centers for Disease Control and Prevention, US Department of Health and Human Services. Mortality and Morbidity Weekly Report: Youth Risk Behavior Surveillance—United States, 2009. http://www.cdc.gov/mmwr/pdf/ss/ss5905.pdf. Accessed September 10, 2010.

105. Weinberger DR, Elvevag B, Giedd JN. The adolescent brain: a work in progress. The National Campaign to Prevent Teen Pregnancy. June 2005. http://www.thenationalcampaign.org/resources/pdf/BRAIN.pdf. Accessed October 29, 2010.

106. Office of Applied Studies, Substance Abuse and Mental Health Services Administration. Results from the 2007 National Survey on Drug Use and Health: national findings. Figure 7.3. http://www.oas.samhsa.gov/NSDUH/2k7NSDUH/2k7results.cfm#Ch5. Accessed December 2, 2010.

107. Centers for Disease Control and Prevention, US Department of Health and Human Services. Youth Risk Behavior Surveillance—United States, 2009. Surveillance summaries. 2010;59(SS-5). http://www.cdc.gov/mmwr/pdf/ss/ss5905.pdf. Accessed October 29, 2010.

108. Injury and Violence Prevention Branch, North Carolina Department of Health and Human Services. 10 Leading causes of injury death (all races, both sexes) by age groups, North Carolina: 2008. http://www.injuryfreenc.ncdhhs.gov/DataSurveillance/2008LCInjuryDeath.pdf. Accessed September 10, 2010.

109. Highway Safety Research Center, University of North Carolina at Chapel Hill. North Carolina alcohol facts: all NC injury data. http://www.hsrc.unc.edu/ncaf/injuries.cfm. Accessed June 11, 2010.

110. Highway Safety Research Center, University of North Carolina at Chapel Hill. North Carolina alcohol facts. http://www.hsrc.unc.edu/ncaf/. Accessed October 29, 2010.

111. Office of Applied Studies, Substance Abuse and Mental Health Services Administration. State estimates of substance abuse from the 2007-2008 National Surveys on Drug Use and Health. http://www.oas.samhsa.gov/2k8state/AppB.htm#TabB-1. Accessed September 10, 2010.

112. Office of Applied Studies, Substance Abuse and Mental Health Services Administration. State estimates of substance abuse from the 2007–2008 National Surveys on Drug Use and Health. Table B1. http://www.oas.samhsa.gov/2k8state/AppB.htm#TabB-1. Accessed October 29, 2010.

113. North Carolina Department of Public Instruction. Youth Risk Behavior Survey, 2009. http://www.nchealthyschools.org/docs/data/yrbs/2009/highschool/statewide/tables.pdf. Accessed December 2, 2010.

114. Centers for Disease Control and Prevention, US Department of Health and Human Services. Injury prevention and control: motor vehicle safety, impaired driving. http://www.cdc.gov/MotorVehicleSafety/Impaired_Driving/impaired-drv_factsheet.html. Accessed December 10, 2010.

REFERENCES

115. Substance Abuse and Mental Health Administration (SAMHSA). Leading change: a plan for SAMHSA's roles and actions. http://www.samhsa.gov/about/siDocs/introduction.pdf. Revised October 1, 2010. Accessed January 3, 2011.

116. National Institute of Drug Abuse, National Institutes of Health. NIDA InfoFacts: treatment approaches for drug addiction. http://www.nida.nih.gov/infofacts/treatmeth.html. Accessed December 15, 2010.

117. Fact sheet: prescription drug use—a DEA focus. US Drug Enforcement Agency Web site. http://www.justice.gov/dea/concern/prescription_drug_fact_sheet.html. Accessed January 3, 2011.

118. Office of the Surgeon General, US Department of Health and Human Services. The Surgeon General's call to action to prevent and reduce underage drinking. Accessed December 1, 2010. http://www.cdc.gov/MotorVehicleSafety/Impaired_Driving/impaired-drv_factsheet.html.

119. National Youth Anti-Drug Media Campaign's Behavior Change Expert Panel. Be a good role model for teens. TheAntiDrug.com Web site. http://www.theantidrug.com/advice/safeguarding-and-monitoring/monitoring-skills/role-model-for-teens.aspx. Accessed January 3, 2011..

120. National Registry of Evidence-based Programs and Practices (NREPP). Substance Abuse and Mental health Services Administration Web site. http://www.nrepp.samhsa.gov/. Updated December 20, 2010. Accessed January 3, 2011.

121. National Business Group on Health. An employer's guide to workplace substance abuse. http://www.businessgrouphealth.org/pdfs/SubAb_report_FINAL.pdf. Accessed December 3, 2010.

122. Madras BK, Compton WM, Avula D, Stegbauer T, Stein JB, Clark HW. Screening, brief interventions, referral to treatment (SBIRT) for illicit drug and alcohol use at multiple healthcare sites: comparison at intake and 6 months later. *Drug Alcohol Depend.* 2009;99(1-3):280-295.

123. Substance Abuse and Mental Health Services Administration. Screening, brief intervention, and referral to treatment: what is SBIRT? http://sbirt.samhsa.gov/index.htm. Accessed December 13, 2010.

124. Centers for Disease Control and Prevention, US Department of Health and Human Services. Preventing excessive alcohol consumption: increasing alcohol taxes. Guide to Community Preventive Services. http://www.thecommunityguide.org/alcohol/increasingtaxes.html. Accessed November 28, 2010.

125. Centers for Disease Control and Prevention, US Department of Health and Human Services. Preventing excessive alcohol consumption: dram shop liability. Guide to Community Preventive Services. http://www.thecommunityguide.org/alcohol/dramshop.html. Accessed November 20, 2010.

126. Centers for Disease Control and Prevention, US Department of Health and Human Services. Injury prevention and control: motor vehicle safety. National Drunk and Drugged Driving Prevention Month. http://www.cdc.gov/MotorVehicleSafety/Impaired_Driving/3d.html. Accessed December 13, 2010.

127. Katon WJ. Clinical and health services relationships between major depression, depressive symptoms, and general medical illness. *Biol Psychiatry.* 2003;54(3):216-226.

128. Mann JJ, Apter A, Bertolote J. Suicide prevention strategies: a systematic review. *JAMA.* 2005;294(16):2016-2074.

129. Centers for Disease Control and Prevention, US Department of Health and Human Services. Health-related quality of life, 2003-2008. Behavioral Risk Factor Surveillance System. http://apps.nccd.cdc.gov/HRQOL/. Accessed November 8, 2010.

130. Larkin GL, Beautrais AL, Spirito A, Kirrane BM, Lippmann MJ, Milzman DP. Mental health and emergency medicine: a research agenda. *Acad Emerg Med.* 2009;16(11):1110-1119.

131. Centers for Disease Control and Prevention, US Department of Health and Human Services. Health-Related Quality of Life, 1993-2008. Behavioral Risk Factor Surveillance System. http://apps.nccd.cdc.gov/HRQOL/. Accessed December 1, 2010.

132. President's New Freedom Commission on Mental Health, US Department of Health and Human Services. Achieving the promise: transforming mental health care in America. July 2003. http://www.mentalhealthcommission.gov/reports/FinalReport/downloads/FinalReport.pdf. Accessed December 13, 2010.

133. Centers for Disease Control and Prevention, US Department of Health and Human Services. Interventions to reduce depression among older adults: home-based depression care management. Guide to Community Preventive Services. http://www.thecommunityguide.org/mentalhealth/depression-home.html. Accessed November 20, 2010.

134. Office of the Surgeon General, US Department of Health and Human Services. Mental health: a report of the Surgeon General. http://www.surgeongeneral.gov/library/mentalhealth/home.html. Accessed November 29, 2010.

REFERENCES

135. North Carolina Division of Public Health. Saving tomorrows today. http://www.injuryfreenc.ncdhhs.gov/About/YouthSuicidePreventionPlan.pdf. Published October 2004. Accessed December 30, 2010.

136. Centers for Disease Control and Prevention. Source of firearms used by students in school-associated violent deaths—United States, 1992-1999. *MMWR Morb Mortal Wkly Rep.* 2003;52(9):169-172.

137. US Preventive Services Task Force, US Department of Health and Human Services. Screening and treatment for major depressive disorder in children and adolescents: recommendation statement. http://www.uspreventiveservicestaskforce.org/uspstf09/depression/chdeprrs.htm. Accessed November 20, 2010.

138. US Preventive Services Task Force, US Department of Health and Human Services. Screening for depression in adults. http://www.uspreventiveservicestaskforce.org/uspstf/uspsaddepr.htm. Accessed December 3, 2010.

139. Centers for Disease Control and Prevention, US Department of Health and Human Services. Mental health and mental illness: collaborative care for the management of depressive disorders. Guide to Community Preventive Services. http://www.thecommunityguide.org/mentalhealth/collab-care.html. Accessed December 12, 2010.

140. Substance Abuse and Mental Health Services Administration. Practice guidelines: core elements in responding to mental health crises. http://store.samhsa.gov/shin/content//SMA09-4427/SMA09-4427.pdf. HHS Publication No. SMA-09-4427. Published 2009. Accessed January 3, 2011.

141. Committee on School Health, American Academy of Pediatrics. School-based mental health services. *Pediatrics.* 2004;113(6):1839-1845.

142. National Institute of Occupational Safety and Health, Centers for Disease Control and Prevention, US Department of Health and Human Resources. Stress...at work. http://www.cdc.gov/niosh/docs/99-101/. Accessed December 13, 2010.

143. Committee on Children with Disabilities, American Academy of Pediatrics. Developments in surveillance and screening of infants and young children. *Pediatrics.* 2001;108(1):192-195.

144. Office of the Surgeon General, US Department of Health and Human Services. Oral health in America: a report of the Surgeon General. http://www.surgeongeneral.gov/library/oralhealth/. Accessed October 20, 2010.

145. Centers for Disease Control and Prevention, US Department of Health and Human Services. Children's oral health. http://www.cdc.gov/OralHealth/topics/child.htm. Accessed October 20, 2010.

146. Office of Disease Prevention and Health Promotion, US Department of Health and Human Services. Healthy People 2010: oral health. http://www.healthypeople.gov/Document/HTML/Volume2/21Oral.htm#_ednref4. Accessed October 29, 2010.

147. The Henry J. Kaiser Family Foundation. Dental coverage and care for low-income children: the role of Medicaid and SCHIP. http://www.kff.org/medicaid/upload/7681-02.pdf. Accessed October 20, 2010.

148. Centers for Medicaid and Medicare Services. Annual early and periodic screening and diagnostic treatment report: form CMS-416. http://www.cms.gov/medicaidEarlyPeriodicScrn/03_StateAgencyResponsibilities.asp. Accessed October 29, 2010.

149. North Carolina Institute of Medicine Task Force on Dental Care Access. *Report to the North Carolina General Assembly and to the Secretary of the North Carolina Department of Health and Human Services.* Durham, NC: North Carolina Institute of Medicine; 1999.

150. Centers for Disease Control and Prevention, US Department of Health and Human Services. Adult oral health. http://www.cdc.gov/oralhealth/topics/adult.htm. Accessed October 20, 2010.

151. State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2008. http://www.epi.state.nc.us/SCHS/brfss/2008/nc/all/RMVTETH3.html. Accessed November 1, 2010.

152. Division of Medical Assistance, North Carolina Department of Health and Human Services. DMA 2008 HEDIS annual dental visit with PCP oral health care services. http://www.ncdhhs.gov/dma/quality/index.htm. Accessed December 12, 2010.

153. Centers for Disease Control and Prevention, US Department of Health and Human Services. Disparities in oral health. http://www.cdc.gov/oralhealth/oral_health_disparities.htm. Accessed December 8, 2010.

154. American Dental Association. Oral health topics: cleaning your teeth and gums. http://www.ada.org/2624.aspx. Accessed December 13, 2010.

REFERENCES

155. Office of the Surgeon General, US Department of Health and Human Services. Oral health in America: a report of the Surgeon General. http://www2.nidcr.nih.gov/sgr/sgrohweb/home.htm. Accessed November 28, 2010.

156. Children's oral health. Centers for Disease Control and Prevention Web site. http://www.cdc.gov/oralhealth/topics/child.htm. Updated December 15, 2009. Accessed January 3, 2011.

157. Section on Pediatric Dentistry, American Academy of Pediatrics. Oral health risk assessment timing and establishment of the dental home. *Pediatrics.* 2003;111(5):1113-1116.

158. US Preventive Services Task Force, US Department of Health and Human Services. Prevention of dental carries in preschool children: recommendations and rationale. http://www.uspreventiveservicestaskforce.org/3rduspstf/dentalchild/dentchrs.htm. Accessed November 20, 2010.

159. Centers for Disease Control and Prevention, US Department of Health and Human Services. Preventing dental caries: dental school-based or -linked sealant delivery programs. http://www.thecommunityguide.org/oral/schoolsealants.html. Accessed November 20, 2010.

160. Centers for Disease Control and Prevention, US Department of Health and Human Services. Preventing dental caries: community water fluoridation. Guide to Community Preventive Services. http://www.thecommunityguide.org/oral/fluoridation.html. Accessed November 20, 2010.

161. Centers for Disease Control and Prevention, US Department of Health and Human Services. Community water fluoridation. http://www.cdc.gov/fluoridation/. Accessed December 13, 2010.

162. Health Resources and Services Administration. Shortage designation: Health Professional Shortage Areas (HPSAs), dental designation overview. http://bhpr.hrsa.gov/shortage/dental.htm. Accessed December 13, 2010.

163. US Environmental Protection Agency. Ozone and your patients' health. Training for health care providers: health effects of ozone in the general population. http://www.epa.gov/o3healthtraining/population.html. Accessed October 20, 2010.

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

165. Environmental Protection Agency. Pesticides: health and safety, human health issues. http://www.epa.gov/pesticides/health/human.htm. Accessed November 4, 2010.

166. US Environmental Protection Agency. Public drinking water systems: facts and figures. http://water.epa.gov/infrastructure/drinkingwater/pws/factoids.cfm. Accessed December 1, 2010.

167. Public Water Supply Section, North Carolina Department of the Environment and Natural Resources. About the public water supply section. http://www.deh.enr.state.nc.us/pws/about.htm. Accessed October 20, 2010.

168. Centers for Disease Control and Prevention, US Department of Health and Human Services. National Environmental Public Health Tracking Network, outdoor air, air contaminants. http://ephtracking.cdc.gov/showAirContaminants.action. Updated April 13, 2010. Accessed December 10, 2010.

169. Bureau of Labor Statistics. Census of fatal occupational injuries, 1992-2009 (preliminary data). http://www.bls.gov/iif/oshwc/cfoi/cfch0008.pdf. Accessed December 10, 2010.

170. Centers for Disease Control and Prevention, US Department of Health and Human Services. Work-related injury deaths among Hispanics—United States, 1992-2006. *MMWR Morb Mortal Wkly Rep.* 57(22);597-600. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5722a1.htm. Accessed December 10, 2010.

171. US Environmental Protection Agency. Reducing ground-level ozone. http://www.epa.gov/oar/ozonepollution/reducing.html. Accessed December 20, 2010.

172. Source water protection, quick things you can do! US Environmental Protection Agency Web site. http://water.epa.gov/infrastructure/drinkingwater/sourcewater/protection/whatyoucando.cfm. Updated March 8, 2010. Accessed December 30, 2010.

173. Committee on Environmental Health, American Academy of Pediatrics. Ambient air pollution: health hazards to children. Pediatrics. 2004;114(6):1699-1707.

174. US Environmental Protection Agency. Resources for schools. http://www.epa.gov/iaq/schools/casestudies.html#Case_Studies_by_Topic. Accessed December 7, 2010.

REFERENCES

175. US Environmental Protection Agency. Clean school bus USA: what you can do. http://www.epa.gov/cleanschoolbus/antiidling.htm. Accessed December 13, 2010.

176. National Institute of Occupational Safety and Health, Centers for Disease Control and Prevention, US Department of Health and Human Services. Essential elements of effective workplace programs and policies for improving worker health and well-being. http://www.cdc.gov/niosh/worklife/essentials.html. Accessed December 13, 2010.

177. Occupational Safety and Health Administration. Employee workplace rights. http://www.osha.gov/Publications/osha3021.pdf. Published 2005. Accessed January 3, 2011.

178. US Environmental Protection Agency. Protecting water quality from urban runoff. http://www.epa.gov/owow_keep/nps/urban_facts.html. Accessed December 7, 2010.

179. US Environmental Protection Agency. Simultaneous compliance guidance manual for the long term 2 and stage 2 DBP rules. March 2007. http://www.epa.gov/safewater/disinfection/stage2/pdfs/guide_st2_pws_simultaneous-compliance.pdf. Accessed December 14, 2010.

180. US Environmental Protection Agency. Automobiles and ozone. http://www.epa.gov/oms/consumer/04-ozone.pdf. Published January 1993. Accessed January 3, 2011.

181. Mobile source emissions—past, present, and future. US Environmental Protection Agency Web site. http://www.epa.gov/oms/invntory/overview/solutions/fuels.htm. Updated July 9, 2007. Accessed January 3, 2011.

182. US Environmental Protection Agency. Proposed transport rule would reduce interstate transport of ozone and fine particle pollution. http://www.epa.gov/airtransport/pdfs/FactsheetTR7-6-10.pdf. Published July 6, 2010. Accessed December 30, 2010.

183. US Environmental Protection Agency. Water and wastewater pricing—introduction. http://water.epa.gov/infrastructure/sustain/Water-and-Wastewater-Pricing-Introduction.cfm. Accessed December 14, 2010.

184. Scallan E, Hoekstra RM, Angulo FJ, et al. Foodborne illness acquired in the United States—major pathogens. *Emerg Infect Dis.* 2011;17(1):7-15. doi:10.3201/eid1701.P11101.

185. Office of Disease Prevention and Health Promotion, US Department of Health and Human Services. Healthy People 2010. 10. Food safety. http://www.healthypeople.gov/document/html/volume1/10food.htm. Accessed October 20, 2010.

186. Centers for Disease Control and Prevention, US Department of Health and Human Services. Morbidity and Mortality Weekly Report: ten great public health achievements–United States, 1900-1999. http://www.cdc.gov/mmwr/preview/mmwrhtml/00056796.htm. Published April 2, 1999. Accessed October 20, 2010.

187. Zhou F, Santoli J, Messonnier ML, et al. Economic evaluation of the 7-vaccine routine childhood immunization schedule in the United States, 2001. *Arch Pediatr Adolesc Med.* 2005;159(12):1136-1144.

188. Centers for Disease Control and Prevention, US Department of Health and Human Services. National Immunization Survey (NIS), January-December 2007. http://www.cdc.gov/vaccines/stats-surv/nis/data/tables_2007.htm. Accessed November 5, 2010.

189. State Center for Health Statistics, North Carolina Department of Health and Human Services. NC vital statistics, volume 2: leading causes of death–2008. Table A: leading causes of death by age group, North Carolina residents, 2008. http://www.schs.state.nc.us/SCHS/deaths/lcd/2008/pdf/TblsA-F.pdf. Accessed October 20, 2010.

190. Centers for Disease Control and Prevention, US Department of Health and Human Services. Flu symptoms and severity: influenza symptoms. http://www.cdc.gov/flu/about/disease/symptoms.htm. Accessed October 20, 2010.

191. Morris JG Jr. How safe is our food? *Emerg Infect Dis.* 2011;17(1):126-128. doi:10.3201/eid1701101821.

192. Centers for Disease Control and Prevention, US Department of Health and Human Services. National Immunization Survey, 2007. http://www.cdc.gov/vaccines/stats-surv/nis/tables/07/tab32_pov_race.xls. Accessed December 8, 2010. 193178.

193. Centers for Disease Control and Prevention, US Department of Health and Human Services. General recommendations on immunizations: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Morb Mortal Wkly Rep.* 2006;55(RR15):1-48. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5515a1.htm. Accessed December 13, 2010.

194. American Academy of Pediatrics. Healthy Child Care America: health and safety e-news for caregivers and teachers. http://www.healthychildcare.org/ENewsApr06.html. Accessed December 8, 2010.

REFERENCES

195. Centers for Disease Control and Prevention, US Department of Health and Human Services. Handwashing: clean hands save lives. http://www.cdc.gov/cleanhands/. Accessed December 14, 2010.

196. Centers for Disease Control and Prevention, US Department of Health and Human Services. National Center for Immunization and Respiratory Disease, Association for Prevention, Teaching and Research. Increasing adult vaccination rates: what works. http://www2a.cdc.gov/vaccines/ed/whatworks/strategies_other.asp#one. Accessed December 8, 2010.

197. Centers for Disease Control and Prevention, US Department of Health and Human Services. Immunization of health-care workers: recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC). *MMWR Morb Mortal Wkly Rep.* 1997;46(RR-18):1-42. http://www.cdc.gov/mmwr/preview/mmwrhtml/00050577.htm. Accessed December 12, 2010.

198. Centers for Disease Control and Prevention, US Department of Health and Human Services. Universally recommended vaccinations: home visits to increase vaccination rates. http://www.thecommunityguide.org/vaccines/universally/homevisits.html. Accessed November 22, 2010.

199. Centers for Disease Control and Prevention, US Department of Health and Human Services. Interventions to promote seasonal influenza vaccinations among healthcare workers. http://www.thecommunityguide.org/worksite/flu-hcw.html. Accessed November 21, 2010.

200. Bean NH, Goulding JS, Lao C, Angulo FJ. Surveillance for food-borne-disease outbreaks—United States, 1998-1992. *MMWR CDC Surveill Summ.* 1996;45(SS-5):1-55.

201. Centers for Disease Control and Prevention, US Department of Health and Human Services. Universally recommended vaccinations: community-based interventions implemented in combination. Guide to Community Preventive Services. http://www.thecommunityguide.org/vaccines/universally/communityinterventions.html. December 13, 2010.

202. Fiore AE, Shay DK, Broder K, et al. Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP) 2009. *MMWR Morb Mortal Wkly Recomm Rep.* 2009;58(RR-08):1-52.

203. US Food and Drug Administration. Retail food protection: a cooperative program. http://www.fda.gov/Food/FoodSafety/RetailFoodProtection/default.htm. Accessed January 5, 2011.

204. Lantz PA, House JS, Lepkowski JM, Williams DR, Mero RP, Chen J. Socioeconomic factors, health behaviors, and mortality: results from a nationally representative prospective study of US adults. *JAMA.* 1998;279(21):1703-1708.

205. 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.

206. Braveman P, Egeter S. Robert Wood Johnson Foundation. Overcoming obstacles to health. http://www.rwjf.org/files/research/obstaclestohealth.pdf. Accessed May 15, 2008.

207. US Census Bureau. Current population survey annual social and economic supplements. Historical tables: table 21, number of poor and poverty rate, by state. http://www.census.gov/hhes/www/poverty/data/historical/people.html. Accessed October 29, 2010.

208. Freudenberg N, Ruglis J. Reframing school dropout as a public health issue. *Prev Chronic Dis.* 2007;4(4). http://www.cdc.gov/pcd/issues/2007/oct/07_0063.htm. Accessed October 21, 2010.

209. North Carolina Department of Public Instruction. 4-Year cohort graduation rate report, North Carolina graduation results. http://accrpt.ncpublicschools.org/app/2009/cgr/. Accessed October 29, 2010.

210. US Census Bureau. American Community Survey, 2008. Table R2515. http://fastfacts.census.gov/servlet/GRTTable?_bm=y&-_box_head_nbr=R2515&-ds_name=ACS_2008_1YR_G00_&-format=US-30. Accessed November 1, 2010.

211. US Census Bureau. Table 4. People and families in poverty by selected characteristics: 2008 and 2009. http://www.census.gov/hhes/www/poverty/data/incpovhlth/2009/table4.pdf. Accessed January 3, 2011.

212. Bright Futures. Adolescence: 11-21 years. In: Hagan JF, Shaw JS, Duncan PM, ed. *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents.* 3rd ed. Elk Grove Village, IL: American Academy of Pediatrics; 2008:518-575. http://brightfutures.aap.org/pdfs/Guidelines_PDF/18-Adolescence.pdf. Accessed December 14, 2010.

REFERENCES

213. Reynolds H, Irwin D, Algozzine B. North Carolina Department of Public Instruction and National Technical Assistance Center for Positive Behavior Support, University of North Carolina at Charlotte. North Carolina positive behavior support initiative: evaluation report 2007-2008. http://www.dpi.state.nc.us/docs/positivebehavior/data/evaluation/2007-08/ncevaluationreport.pdf. Accessed December 12, 2010.

214. North Carolina New Schools Project. Promising early success. http://newschoolsproject.org/page.php?p=5.0. Accessed December 12, 2009.

215. Centers for Disease Control and Prevention, US Department of Health and Human Services. Promoting health through the social environment: early childhood development programs. Guide to Community Preventive Services. http://www.thecommunityguide.org/social/childhooddev.html. Accessed December 12, 2010.

216. Center on Budget and Policy Priorities. Outreach strategies complete guide 2010. http://eitcoutreach.org/wp-content/uploads/2009/12/Strategies-Guide-final-12-03-092.pdf. Accessed December 15, 2010.

217. National Dropout Prevention Center/Network, Clemson University. School-community collaboration. http://www.dropoutprevention.org/effective-strategies/school-community-collaboration. Accessed December 15, 2010.

218. Centers for Disease Control and Prevention, US Department of Health and Human Services. Promoting health through the social environment: housing. Guide to Community Preventive Services. http://www.thecommunityguide.org/social/housing.html. Accessed December 14, 2010.

219. Institute on Taxation and Economic Policy. Policy brief 15: rewarding work through earned income tax credits. http://www.itepnet.org/pb15eitc.pdf. Accessed December 14, 2010.

220. Levitis J, Koulish J. State earned income tax credits: 2008 legislative update. http://www.cbpp.org/files/6-6-08sfp1.pdf. Accessed December 14, 2010.

221. National Women's Law Center. State child and dependent care tax provisions, tax year 2010. http://www.nwlc.org/sites/default/files/pdfs/statetaxprovisionstcocty10.pdf. Published October 2010. Accessed January 4, 2011.

222. Bridgeland JM, DiIulio JJ, Streeter R. Raising the compulsory school attendance age: the case for reform. http://www.civicenterprises.net/pdfs/raisingschoolage.pdf. Accessed December 12, 2009.

223. Policy guide on housing. American Planning Association Web site. http://www.planning.org/policy/guides/adopted/housing.htm. Published April 2006. Accessed December 30, 2010.

224. Basic skills and workforce training. Center for Law and Social Policy Web site. http://www.clasp.org/issues?type=basic_skills_and_workforce_training. Accessed January 4, 2011.

225. Center for Housing Policy. A heavy load: the combined housing and transportation burdens of working families. http://www.nhc.org/media/documents/pub_heavy_load_10_06.pdf. Published October 2006. Accessed December 30, 2010.

226. Office of the Surgeon General, US Department of Health and Human Services. Healthy people: the Surgeon General's report on health promotion and disease prevention. 1979. http://profiles.nlm.nih.gov/NN/B/B/G/K/. Accessed November 18, 2010.

227. Centers for Disease Control and Prevention, US Department of Health and Human Services. Chronic disease and health promotion. http://www.cdc.gov/chronicdisease/overview/index.htm. Accessed October 21, 2010.

228. State Center for Health Statistics, North Carolina Department of Health and Human Services. Table A: leading causes of death by age group, North Carolina residents, 2008. http://www.schs.state.nc.us/SCHS/deaths/lcd/2008/pdf/TblsA-F.pdf. Accessed October 21, 2010.

229. Centers for Disease Control and Prevention, US Department of Health and Human Services. Heart disease facts. http://www.cdc.gov/heartdisease/facts.htm. Accessed November 4, 2010.

230. National Diabetes Information Clearinghouse. Diabetes overview. http://www.diabetes.niddk.nih.gov/dm/pubs/overview/index.htm#scope. Accessed October 21, 2010.

231. Centers for Disease Control and Prevention, US Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2009. http://apps.nccd.cdc.gov/brfss/list.asp?cat=DB&yr=2009&qkey=1363&state=All. Accessed October 27, 2010.

232. Centers for Disease Control and Prevention, US Department of Health and Human Services. The power of prevention: chronic disease...the public health challenge of the 21st century. http://www.cdc.gov/chronicdisease/pdf/2009-Power-of-Prevention.pdf. Accessed October 21, 2010.

REFERENCES

233. 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/hadsigm3.html. Accessed October 21, 2010.

234. State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance Survey, 2009. http://www.epi.state.nc.us/SCHS/brfss/2009/nc/all/diabete2.html. Accessed October 27, 2010.

235. National Quality Forum. Diabetes: blood pressure management. http://www.qualityforum.org/MeasureDetails.aspx?SubmissionID=377. Accessed December 13, 2010.

236. National Quality Forum. Follow-up after initial diagnosis and treatment of colorectal cancer: colonoscopy. http://www.qualityforum.org/MeasureDetails.aspx?SubmissionID=932. Accessed December 13, 2010.

237. National Quality Forum. CAD: beta-blocker therapy—prior myocardial infarction (MI). http://www.qualityforum.org/MeasureDetails.aspx?SubmissionID=377. Accessed December 13, 2010.

238. Centers for Disease Control and Prevention, US Department of Health and Human Services. Obesity prevention and control: worksite programs. Guide to Community Preventive Services. http://www.thecommunityguide.org/obesity/workprograms.html. Accessed November 20, 2010.

239. Centers for Disease Control and Prevention, US Department of Health and Human Services. Diabetes prevention and control: case management interventions to improve glycemic control. Guide to Community Preventive Services. http://www.thecommunityguide.org/diabetes/casemgmt.html. Accessed November 20, 2010.

240. Centers for Disease Control and Prevention, US Department of Health and Human Services. Diabetes self-management education program: self-management education interventions. Guide to Community Preventive Services. http://www.thecommunityguide.org/diabetes/selfmgmteducation.html. Accessed November 20, 2010.

241. Molla MT, Madans JH, Wagener DK, Crimmins EM. Summary measures of population health: report of findings on methodologic and date issues. http://www.cdc.gov/nchs/data/misc/pophealth.pdf. Accessed October 21, 2010.

242. The Henry J. Kaiser Family Foundation. State health facts: life expectancy at birth (in years), 2005. http://www.statehealthfacts.org/comparetable.jsp?ind=784&cat=2&sub=17&yr=60&typ=1&o=a&sortc=1. Accessed November 4, 2010.

243. Population Health Institute, University of Wisconsin. County health rankings: health-related quality of life. http://www.countyhealthrankings.org/health-outcomes/health-related-quality-life. Accessed October 21, 2010.

244. Centers for Disease Control and Prevention, US Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2009. Health status. http://apps.nccd.cdc.gov/BRFSS/list.asp?cat=HS&yr=2009&qkey=1100&state=All. Accessed November 4, 2010.

245. Centers for Disease Control and Prevention, US Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2009. http://apps.nccd.cdc.gov/brfss/list.asp?cat=HS&yr=2009&qkey=4414&state=All. Accessed October 27, 2010.

246. US Census Bureau. Table H105: health insurance coverage status and type of coverage by state and age for all people, 2009. http://www.census.gov/hhes/www/cpstables/032010/health/h05_000.htm. Accessed November 12, 2010.

247. US Census Bureau. Current population survey, annual social and economic supplements. HIA-6. Health insurance coverage status and type of coverage by state—persons under 65: 1999 to 2009. http://www.census.gov/hhes/www/hlthins/data/historical/index.html. Accessed October 27, 2010.

248. Centers for Disease Control and Prevention, US Department of Health and Human Services. Vital signs: state-specific obesity prevalence among adults—United States, 2009. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm59e0803a1.htm. Accessed October 21, 2010.

249. Centers for Disease Control and Prevention, US Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2009. http://apps.nccd.cdc.gov/brfss/list.asp?cat=OB&yr=2009&qkey=4409&state=All. Accessed October 27, 2010.

250. State Center for Health Statistics, North Carolina Department of Health and Human Services. Life expectancy: North Carolina 1990-1992 and 2006-2008, state and county. http://www.schs.state.nc.us/SCHS/data/lifexpectancy/. Accessed December 3, 2010.

REFERENCES

251. Parks J, Svendsen D, Singer P, Foti ME. Morbidity and mortality in people with serious mental illness. http://www.nasmhpd.org/general_files/publications/med_directors_pubs/Mortality%20and%20Morbidity%20Final%20Report%208.18.08.pdf. Published October 2006. Accessed January 4, 2011.

252. State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2009. http://www.epi.state.nc.us/SCHS/brfss/2009/nc/all/genhlth.html. Accessed December 3, 2010.

253. North Carolina Institute of Medicine; The Cecil B. Sheps Center for Health Services Research, the University of North Carolina at Chapel Hill. Characteristics of uninsured North Carolinians: 2008-2009 data snapshot. http://riversdeveloper.com/wp-content/uploads/2010/08/Uninsured-Snapshot_08091.pdf. Accessed December 10, 2010.

254. State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2009. http://www.epi.state.nc.us/SCHS/brfss/2009/nc/all/rf2.html. Accessed December 3, 2010.

255. American Academy of Pediatrics. Children's health topics: immunizations/vaccines. http://www.aap.org/healthtopics/immunizations.cfm. Accessed December 8, 2010.

256. US Preventive Services Task Force. US Preventive Services Task Force clinical practice guidelines. http://www.ahrq.gov/clinic/cpgsix.htm. Accessed December 10, 2010.

257. Centers for Disease Control and Prevention, US Department of Health and Human Services. Advisory Committee on Immunization Practices (ACIP) recommendations. http://www.cdc.gov/vaccines/pubs/ACIP-list.htm. Accessed December 12, 2010.

258. American Academy of Pediatrics. Recommendations for preventive pediatric health care. http://brightfutures.aap.org/pdfs/AAP%20Bright%20Futures%20Periodicity%20Sched%20101107.pdf. Accessed December 10, 2010.

259. Centers for Disease Control and Prevention, US Department of Health and Human Services. Universally recommended vaccinations: vaccination programs in schools and organized child care centers. Guide to Community Preventive Services. http://www.thecommunityguide.org/vaccines/universally/schools_childcare.html. Accessed November 25, 2010.

260. Kaiser Commission on Medicaid and the Uninsured. Opening doorways to health care for children: 10 steps to ensure eligible but uninsured children get health insurance. http://www.allhealth.org/briefingmaterials/OpeningDoorways_FullDoc-333.pdf. Accessed December 13, 2010.

261. Kaiser Commission on Medicaid and the Uninsured. Optimizing Medicaid enrollment: perspectives on strengthening Medicaid's reach under health care reform. http://www.kff.org/healthreform/upload/8068_ES.pdf. Accessed December 14, 2010.

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