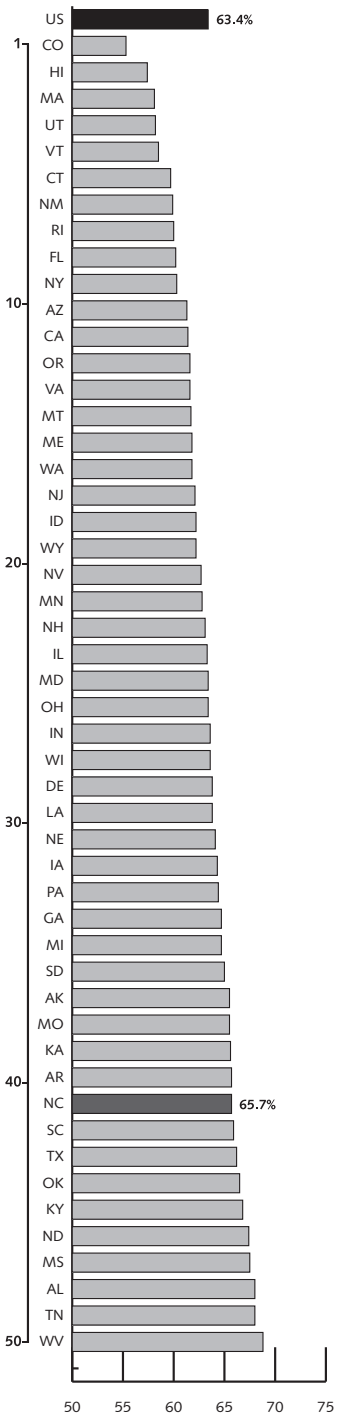
Overweight and obesity pose significant health concerns for both children and adults. Excess weight is not only a risk factor for several serious health conditions, but it also exacerbates existing conditions.[1] For the first time in two centuries, the life expectancy of children in the United States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

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

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

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

Percent of Adults Who Are Obese (BMI>30)

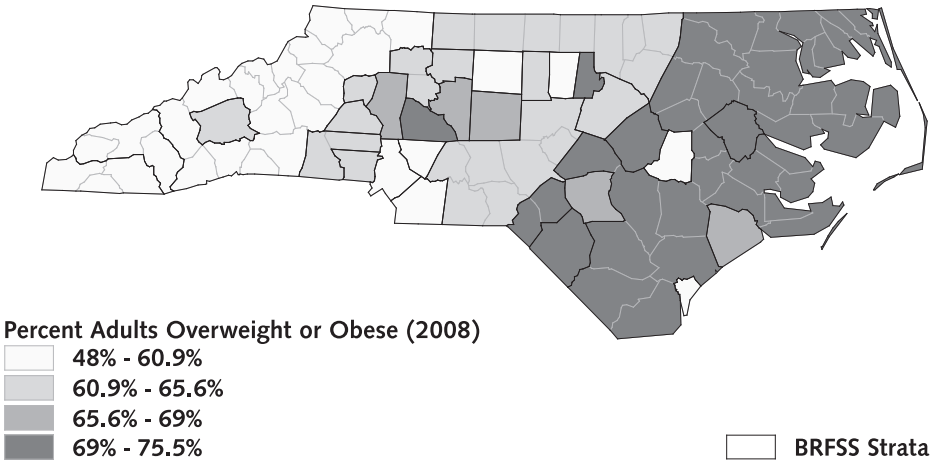


Source: Centers for Disease Control and Prevention (CDC), US Department of Health and Human Services. Behavioral Risk Factor Surveillance System Survey Data website. www.cdc.gov/brfss. Published May 22, 2009. Accessed July 16, 2009.

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

b Including all 50 states and the District of Columbia.

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



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

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

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

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

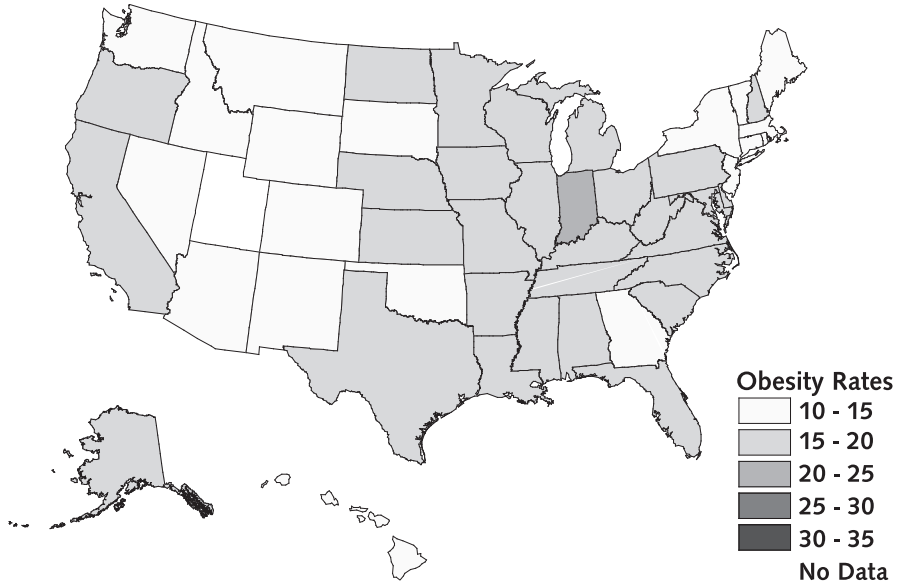
c The Nutrition Services Branch, North Carolina Division of Public Health maintains the North Carolina Nutrition and Physical Activity Surveillance System (NC-NPASS) and note that "NPASS data are limited to children seen in North Carolina Public Health Sponsored WIC and Child Health Clinics and some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

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

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

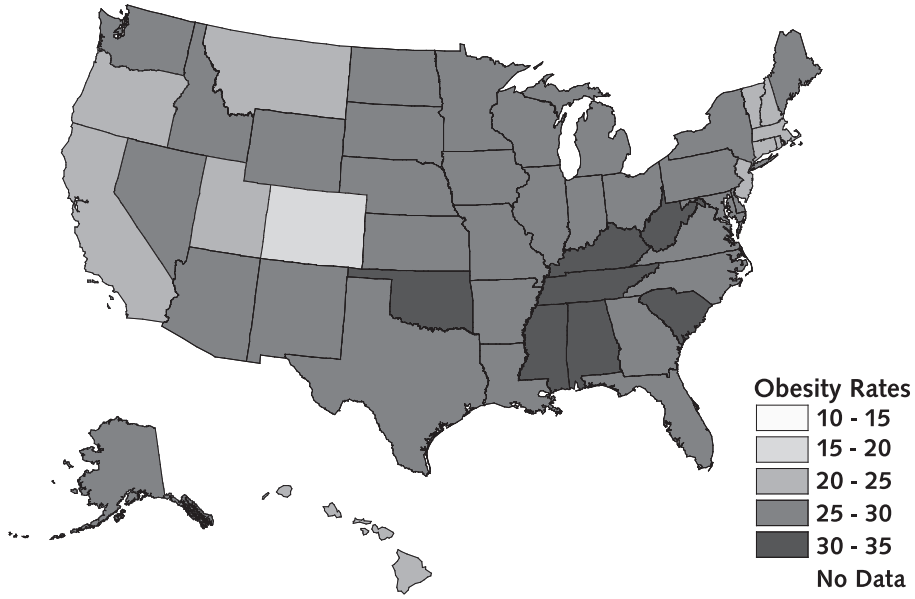
f The 2009 Studies Act creates a Legislative Task Force on Childhood Obesity, which is to report its findings to the General Assembly for the 2010 regular session.

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



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

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



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

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

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

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

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

Increased Caloric Consumption

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

Decreased Physical Activity

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

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

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

Nutrition

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

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

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

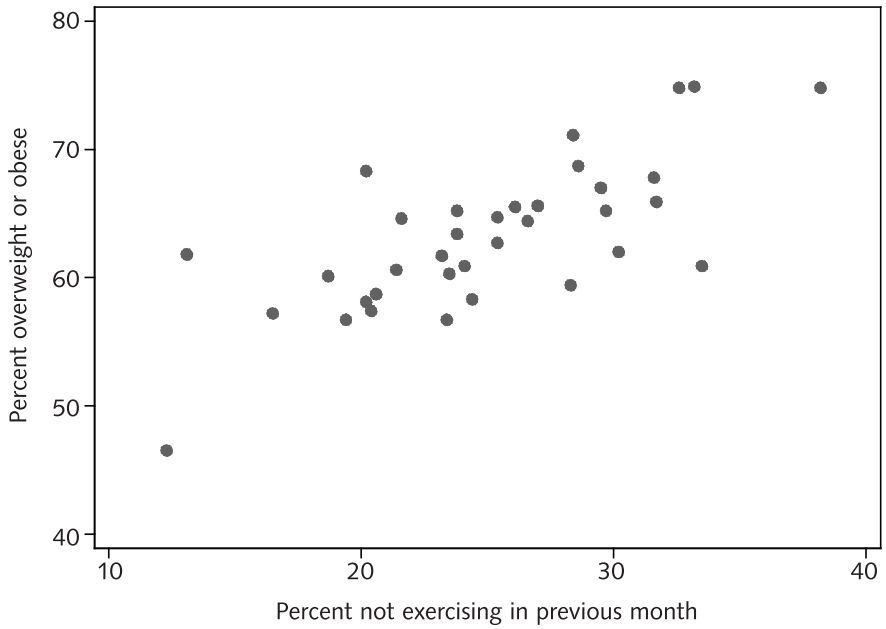
Physical Activity

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

g Body Mass Index (BMI) is weight in kilograms / height in meters2. BMI is a measure used to determine an individual's weight status. In most individuals, it correlates to the amount of body fat. An individual with a BMI <18.5 is considered underweight; a BMI of 18.5-24.9 is considered normal weight; a BMI of 25.0-29.9 is considered overweight; and a BMI ≥30.0 is considered obese. It should be noted that BMI is a good measure to use on a population basis and that individuals with high muscle mass may have a high BMI even though they are not actually overweight or obese.

h Including all 50 states and the District of Columbia.

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



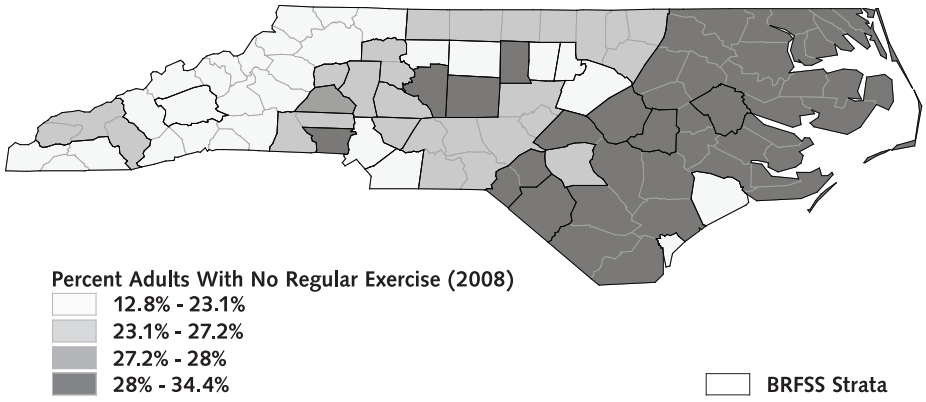
Source: North Carolina State Center for Health Statistics, North Carolina Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2008.

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

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

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

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



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

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

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

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

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

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

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

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

Nutrition and Physical Activity in Schools

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

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Nutrition in Elementary and Secondary Schools

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

School Nutrition Standards

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

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

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

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

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

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

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

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

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

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

m § 115C-264.3.

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

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

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

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

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

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

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

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

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

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

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

r Sackin B. B. Sackin and Associates. Written (email) communication. September 25, 2008.
s Hoggard L. Section Chief, Child Nutrition Services, North Carolina Department of Public Instruction. Written (email) communication. October 30, 2008.
t Hoggard L. Section Chief, Child Nutrition Services, North Carolina Department of Public Instruction. Written (email) communication. October 14, 2008.

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

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

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

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

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

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

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

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

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

Table 4.3
2008-2009 Meal Price Information

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

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

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

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

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

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

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

1) **The school district is in full compliance with SBE policy on nutrition standards in elementary schools (GS 115C-264.3).**
2) **The school district is not charging indirect costs to the Child Nutrition Program until such time as the Child Nutrition Program achieves and sustains a three-month operating balance.**

b) **The North Carolina General Assembly should appropriate $20 million in recurring funds beginning in SFY 2011 to the North Carolina Department of Public Instruction (DPI) to support the full and consistent implementation of the SBE-adopted nutrition standards in elementary schools.**

c) **North Carolina funders should develop a competitive request for proposals to fund a collaborative effort between DPI and other partners to test the potential for innovative strategies to deliver healthy meals in middle and high schools while protecting/maintaining revenue for the Child Nutrition Program. Funders should require grant recipients to conduct an independent rigorous evaluation that includes cost.**

Selling and Marketing of Unhealthy Foods and Beverages in Schools

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

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

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

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

x § 115C-264.2.

2) Sugared carbonated soft drinks, including mid-calorie carbonated soft drinks, are not offered for sale in middle schools;

3) Not more than fifty percent (50%) of the offerings for sale to students in high schools are sugared carbonated soft drinks;

4) Diet carbonated soft drinks are not considered in the same category as sugared carbonated soft drinks; and

5) Bottled water products are available in every school that has beverage vending."

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

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

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

Further, federal regulations, general statutes, and SBE policies "prohibit North Carolina public schools from selling soft drinks or any other 'food of minimum nutritional value' anywhere in the schools before the end of the lunch period."[y] However, there is minimal enforcement of these laws and there are no reporting requirements.[z]

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

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

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

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

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

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

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

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

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

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

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

a) The North Carolina General Assembly should direct local Boards of Education to require all principals whose schools operate vending machines outside of the Child Nutrition Program to sign a Memorandum of Agreement (MOA) with beverage and snack vendors to ensure vending machines contain only those foods and beverages that are consistent with the new nutrition standards or with current law GS 115C-264.2 until the new standards are developed. The MOA should be submitted to the North Carolina Department of Public Instruction annually to indicate full compliance.

b) The North Carolina General Assembly should enact a law to remove advertising and marketing of unhealthy foods and beverages in schools that do not meet standards of GS 115C-264.3.

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

Physical Activity in Elementary and Secondary Schools

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

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

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

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

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

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

dd §HSP-S-000

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

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

a) The North Carolina General Assembly should require the State Board of Education (SBE) to implement a five-year phase-in requirement of the following:

1) Quality physical education that includes 150 minutes of elementary school physical education weekly.

2) 225 minutes weekly of Healthful Living curriculum in middle schools, and 2 units of Healthful Living curricula as a graduation requirement for high schools. The new requirement for middle and high school should require equal time for health and physical education.

b) The SBE shall be required to report annually to the Education Oversight Committee regarding the Healthful Living education program, physical education program, and Healthy Active Children policy.

c) The SBE should work with appropriate staff members in the North Carolina Department of Public Instruction, including curriculum and finance representatives, and staff from the North Carolina General Assembly Fiscal Research Division to examine the experiences of other states and develop cost estimates for the five-year phase-in, which will be reported to the research division of the North Carolina General Assembly and the Education Oversight Committee by April 1, 2010.

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

Child Care Programs

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

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

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

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

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

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

After-School Programs

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

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

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

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

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

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

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

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

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

a) The North Carolina Division of Public Health (DPH) and the North Carolina Partnership for Children, Inc. (NCPC) should expand dissemination of evidenced-based approaches for improved physical activity and nutrition standards in preschools using Nutrition and Physical Activity Self-Assessment for Child Care (NAP-SACC). Beginning in SFY 2011, the North Carolina General Assembly should appropriate $70,000 in recurring funds to the DPH and $325,000 in recurring funds to NCPC for these activities.

b) The North Carolina Child Care Commission should assess the funding needed for child care centers to incorporate healthy eating and physical activity practices and the process to include healthy eating and physical activity as quality indicators in North Carolina's Star Rated License system for licensed childcare centers.

c) After-school programs should use the *Move More North Carolina: Recommended Standards for After-School Physical Activity.* Specifically:

1) State agencies should require after-school programs that receive state funding or federal funding administered by the state to use the standards.

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

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

Nutrition and Physical Activity in Communities

Eat Smart, Move More Obesity Plan

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

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

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

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

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

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

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

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

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

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

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

gg See Chapter 3 for more information.

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

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

a) The North Carolina Division of Public Health (DPH) along with its partner organizations should fully implement the *Eat Smart, Move More North Carolina Obesity Prevention Plan* to combat obesity in selected local communities and identify best practices for improving nutrition and increasing physical activity that will ultimately be adopted across the state. The North Carolina General Assembly should appropriate $6.5 million in recurring funds beginning in SFY 2011 to DPH to support this effort. Funding should be allocated as follows:

   1) $5 million ($50,000 per county) to support local capacity (1 full-time employee) for the dissemination of evidence-based prevention programs and policies in North Carolina communities.

   2) $1 million to *Eat Smart, Move More North Carolina* to expand community competitive grants. Communities should be limited to grants of up to $40,000 to support evidence-based strategies or best and promising practices that improve nutrition and/or physical activity behavior, thereby promoting healthy weight and reducing chronic disease.

   3) $500,000 to DPH to provide technical assistance for the implementation of the *Eat Smart, Move More North Carolina Obesity Prevention Plan* and/or the competitive grants and to conduct an independent evaluation.

b) The North Carolina General Assembly should appropriate $500,000 annually in non-recurring funds for six years beginning in SFY 2011 to DPH for pilot programs of up to $100,000 per year to reduce overweight and obesity among adolescents.

c) The North Carolina General Assembly should appropriate $3.5 million annually for six years beginning in SFY 2011 to DPH to continue the demonstration projects initially funded by the North Carolina General Assembly in 2008. Funding will be distributed to the five current demonstration counties and to three additional counties (on a competitive basis) for interventions in preschools, schools, local communities, faith organizations, worksites, and health care settings to promote and support physical activity and healthy eating. DPH should work in collaboration with Eat Smart, Move More North Carolina partners, NC Prevention Partners, the UNC Center for Health Promotion and Disease Prevention, and others to provide technical support and disseminate best practices.

d) DPH, the North Carolina Health and Wellness Trust Fund (HWTF), and the North Carolina Department of Public Instruction (DPI) should raise public awareness and implement a statewide social marketing campaign to promote healthy physical activity and nutrition behaviors and environments in schools, homes, and the community. Campaign messages should be based on behaviors identified by the Centers for Disease Control and Prevention to guide state efforts against obesity. DPH should work with the HWTF and DPI on the expansion and evaluation of this social marketing campaign. The North Carolina General Assembly should appropriate recurring funds beginning in SFY 2011 to DPH until the funding level reaches $16 million annually to support this effort.

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

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

Access to Healthy Foods in Communities

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

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

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

Table 4.4
Many North Carolina Students Do Not Get the Recommended Level of Physical Activity Each Week

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

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

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

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

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

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

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

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

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

Menu Labeling

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

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

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

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

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

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

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

ii Provided that physical activity remains constant.

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

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

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

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

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

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

a) **The North Carolina Division of Public Health (DPH) in collaboration with NC Prevention Partners should promote and offer technical assistance for menu labeling in restaurants through a collaborative effort with the North Carolina Restaurant and Lodging Association. If menu labeling is not implemented by a substantial proportion of restaurants within three years, the state should seek mandatory labeling laws.**

b) **DPH should work with other organizations around the country to draft model legislation to promote national standards for menu labeling.**

Physical Activity in Communities

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

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

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

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

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

Recommendation 4.8: Build Active Living Communities

a) The North Carolina General Assembly should authorize counties/municipalities to have the local option to hold a referendum to increase the sales tax by ½ cent for community transportation, parks, and sidewalks.

b) The North Carolina Division of Parks and Recreation should expand the existing Adopt-a-Trail grant program, which provides grants to governmental agencies and nonprofit organizations for trail and greenway planning, construction, and maintenance projects. The North Carolina General Assembly should appropriate an additional $1.5 million in recurring funds beginning in SFY 2011 to the North Carolina Division of Parks and Recreation for this program.

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

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

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

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

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

a) The North Carolina School Boards Association should work with state and local organizations including but not limited to the North Carolina Recreation and Park Association, Local Education Agencies, North Carolina Association of Local Health Directors, North Carolina County Commissioners Association, North Carolina League of Municipalities, North Carolina High School Athletic Association, and Parent Teacher Associations to encourage collaboration among local schools, parks and recreation, faith organizations, and/or other community groups to expand the use of school facilities for after-hours community physical activity. These groups should examine successful local initiatives and identify barriers, if any, which prevent other local school districts from offering the use of school grounds and facilities for after-hour physical activity and develop strategies to address these barriers. In addition, this collective group should examine possibilities for making community facilities available to schools during school hours, develop model joint-use agreements, and address liability issues.

b) The State Board of Education should encourage the School Planning Section, Division of School Support, North Carolina Department of Public Instruction to do the following:

1) Provide recommendations for building joint park and school facilities.

2) Include physical activity space in the facility needs survey for 2010 and subsequent years.

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

ll Barefoot R. Director, Fayetteville-Cumberland Parks and Recreation Department. Written (email) communication. October 28, 2008.

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

Recommendation 4.10: Expand Community Grants Program to Promote Physical Activity

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

a) **Funds should be used to support programs in both rural and urban areas.**

b) **To qualify for Community Grants, local communities must collaborate with a wide consortium of community partners such as local planning departments, local government, public health, schools, parks and recreation, transportation, the faith community, developers, and businesses. Communities must have joint-use agreements in place.**

c) **Grantees must use the funds to support:**

    1) **Planning to identify what active living infrastructure exists and what is needed.**

    2) **Development of public policies to guide public and private investment in active living infrastructure.**

    3) **Implementation of physical projects such as new sidewalks, bike paths, and parks to provide residents with places to be active and children with the ability to walk to school.**

    4) **Promotions and programs to encourage the use of these facilities.**

d) **DPH should allocate 10% of the funds for an independent evaluation of these projects. Evaluation outcomes should include but not be limited to usage, costs, and the impact of these projects on economic development.**

Nutrition and Physical Activity in Clinical Care

Adult Clinical Care

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

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

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

Recommendation 4.11: Increase the Availability of Obesity Screening and Counseling

a) Insurers, payers, and employers should cover Body Mass Index (BMI) screening and counseling on nutrition and/or physical activity for adults who are identified as obese.

b) Primary care providers should screen adult patients for obesity using a BMI and provide high-intensity counseling either directly or through referral on nutrition, physical activity, and other strategies to achieve and maintain a healthy weight.

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

Pediatric Clinical Care

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

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

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

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

Recommendation 4.12: Expand the CCNC Childhood Obesity Prevention Initiative

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

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

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

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