Chronic Disease

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

Mental health, an integral component of individual health, is important throughout the lifespan. Individuals with poor mental health may have difficulties with interpersonal relationships, productivity in school or the workplace, and their overall sense of well-being. Depression is linked to lower productivity in the workplace, is a leading cause of suicide, and has been associated with increased use of health care services. Substance use and abuse are major contributors to death and disability in North Carolina.[1] Addiction to drugs or alcohol is a chronic health problem, and people who suffer from abuse or dependence are at risk for premature death, co morbid health conditions, injuries, and disability. Therefore, prevention of misuse and abuse of substances is critical. Furthermore, substance abuse has adverse consequences for families, communities, and society, contributing to family upheaval, the state's crime rate, and motor vehicle fatalities.[2]

This chapter includes:

Section 6.01 *Cancer*

Overview

According to the Centers for Disease Control and Prevention, cancer is the second leading cause of death in the United States, exceeded only by heart disease. In many communities, 'cancer' is one of the scariest words that can be spoken. Cancer typically means a serious medical illness and often has a poor prognosis. Many people know somebody who has struggled with cancer and have heard of the harsh side effects of chemotherapy and radiation. Often cancer patients lose the ability to earn a living and are unable to support or care for themselves or others. Along with illness, they must deal with changing family roles, conditions, and finances. Their lives are often completely transformed by the illness. In many parts of the world where there are limited medical resources, cancer is understood to be a death sentence. Even with the best care, cancer can be difficult to treat and creates a large burden on society.

The American Cancer Society estimates the 2010 overall annual cost of cancer at $263.8 billion dollars. Of this figure, $102.8 billion are direct medical costs; $20.9 billion are costs due to loss of productivity; and $140.1 billion are costs due to premature death.[3] The costs of cancer care are prohibitively expensive without health insurance. Even with health insurance, treatment can exceed the lifetime cost limit on insurance policies and expensive medications may not be covered.

Additionally, uninsured patients and minorities are more likely to be diagnosed with cancer at a later stage, making treatment more extensive and costly.[4] Morbidity and mortality are also often higher when cancer is caught at a later stage. As Durham County is very diverse and has a high proportion of uninsured population its total cancer burden is higher.

Healthy NC 2020 Objective

The North Carolina Institute of Medicine decided to specifically target colorectal cancer as one of its three objectives for chronic disease reduction in 2020. There are a few different reasons for this choice. Colorectal cancer, unlike breast and prostate cancer, affects both men and women. Lung cancer is highly correlated with smoking rates and smoking rate reduction is already a 2020 objective. Colorectal cancer can also be easily screened for and prevented if caught at an early stage. The 2020 target is based on a 10% improvement rate in North Carolina's 1998-2008 pace of improvement.

Colon cancer is the second leading cause of cancer death in the state; people between the ages of 45-64 are most affected by colon cancer.[5] The population of Durham County is growing in size and is at the same time getting older. Between 2004 and 2008, the age adjusted incidence rate for colon and rectum cancer in North Carolina was 46.8 per 100,000 persons per year; non-Hispanic African Americans had the highest incidence rate at 56.3 per 100,000 during this time.[6] The North Carolina State Center for Health Statistics shows that based on a combination of persons 50 or older, high poverty and late stage colorectal diagnosis, Durham has a medium need for colorectal cancer screening.[7]

Chronic Disease

Healthy NC 2020 Objective[8]	Current Durham	Current NC	2020 Target
1. Reduce the colorectal cancer death rate per 100,000	14.2 (2005-2009) [9]	16.5 (2005-2009) [10]	10.1

Secondary Data: *Major findings*

Cancer is the second leading cause of death in the United States, only trailing heart disease. Approximately one third of the risk of cancers can be prevented with lifestyle changes, another third is due to environmental effects and the final third is due to genetics and the natural aging process.[11] The most updated data available is the preliminary data for 2009 from the National Vital Statistics report. These data show that cancer deaths still are the second leading cause of mortality at 568,668; deaths from heart disease number 598,607.[12] Together, both cancer and heart disease account for almost half of all deaths in the United States.[13]

In 2007, more than 562,000 people died of cancer, and more than 1.45 million people had a diagnosis of cancer.[14] Figure 6.01(a) below depicts 2007 cancer death rates in the United States; based on this data, North Carolina's 2007 cancer mortality rates were 181-191.2 per 100,000 population.[15]

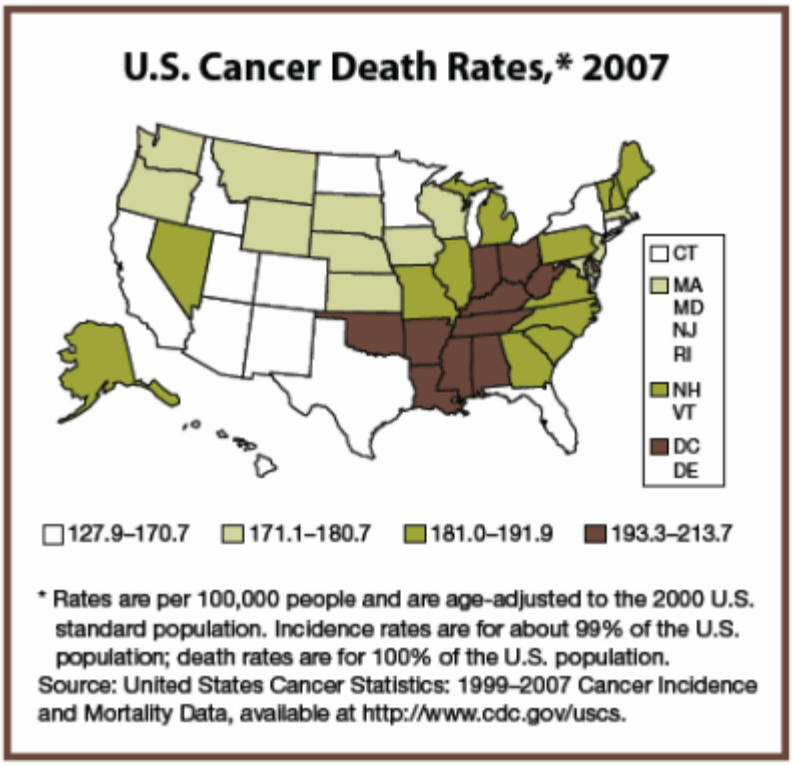


Figure 6.01(a) 2007 U.S. Cancer Death Rates

Cancer is the leading cause of death in Durham County. Durham County has an age-adjusted cancer rate of 188.1 per 100,000 people from 2005-2009, which is higher than the rate of heart disease at 161.9 per 100,000 people.[16]

Figure 6.01(b) below summarizes cancer death rates per 100,000 individuals in Durham County from 2005-2009. Trachea, bronchus and lung cancer are the most common causes of cancer deaths followed by breast; colon, rectum, anus; prostate; and pancreatic cancer.[17]

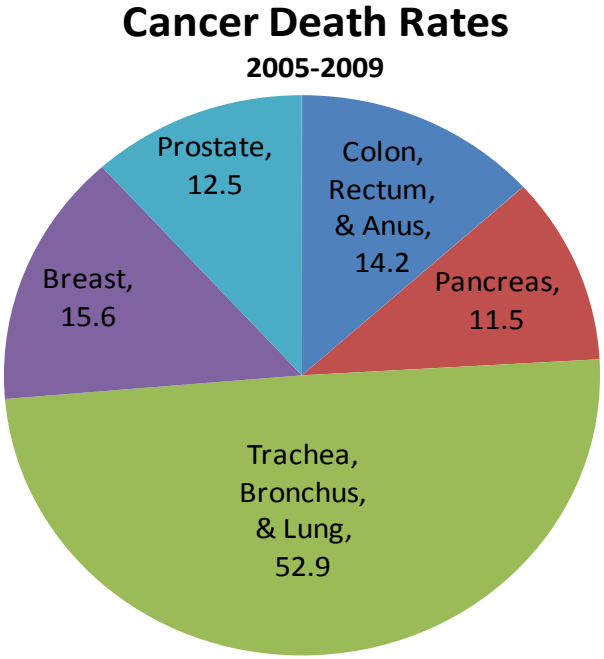


Figure 6.01(b) 2005-2009 Cancer Death Rates in Durham County[18]

There are many reasons why cancer may be more prevalent in Durham than heart disease while the rest of the United States demonstrates the opposite trend. There are several high quality cancer centers in and around Durham, and people may move to Durham in order to access specialized cancer care. Public health programs for healthy diets and exercise may have disproportionately lowered the heart disease burden in the area. Additionally, cancer is often detected late in minority populations, and since Durham has a large minority presence, cancer may be responsible for more deaths. The trend in the United States is that heart disease rates are decreasing to levels approaching cancer rates; Durham County may show an accelerated trend which reflects the national data.

Primary Data

Cancer screening is an important tool of the medical community to decrease morbidity and mortality. It is a proven aid in identifying cancers and helps to guide treatment decisions.

Because cancer screening rates are measured and reported, they are a good indicator to monitor and compare cancer treatment and prevention strategies.

BRFSS Data[19]

Data from the Behavioral Risk Factor Surveillance Survey (BRFSS) is depicted in Figure 6.01(c), which compares the percentage of people who have been screened for colorectal cancer within the past five years between Durham and its peer counties and the state. Durham surpasses the state in screening for colorectal cancer; yet, the percentage of people getting screened in Durham has *decreased* over the years. This decrease in screening is cause for concern as chances of survival are better when cancer is detected at its earliest stages. Targeted efforts must be made in Durham County to increase the amount of residents being screened for colorectal cancer.

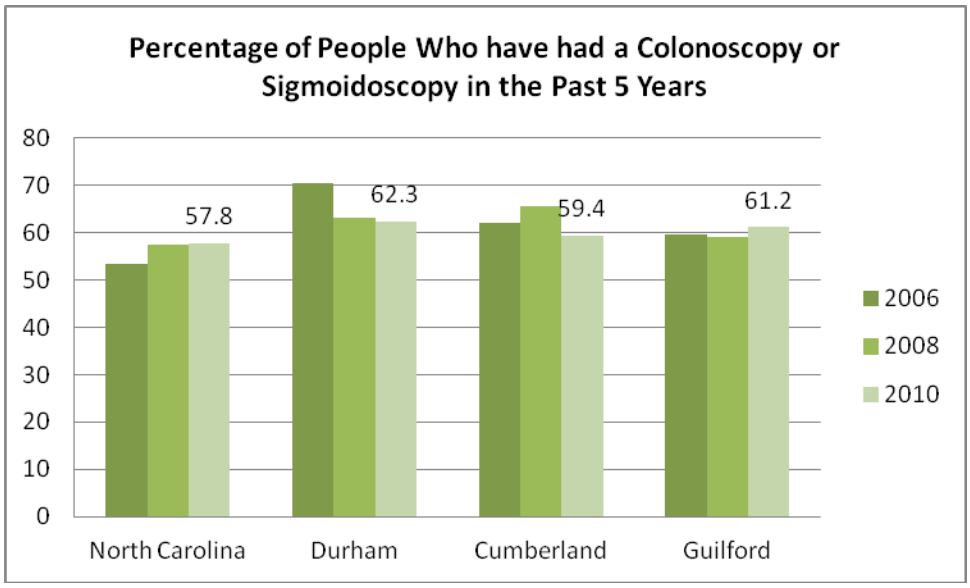


Figure 6.01(c) Percentage of People who have been Screened for Colorectal Cancer in the Past Five Years[20]

2010 Durham County Community Health Opinion Survey[21]

According to 2010 Durham County Community Health Opinion Survey results, cancer is a priority health issue in Durham County. When residents were asked to cite their top three health problems that impacted the overall health of Durham County, 25% of respondents chose cancer as one of their top three. The top 10 community-ranked health problems are depicted in Figure 6.01(d) below.

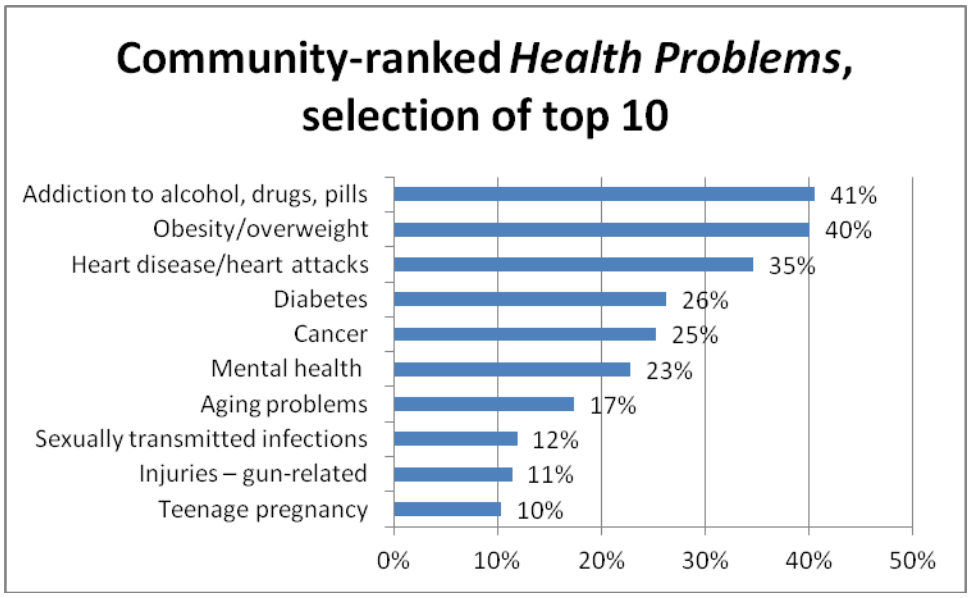


Figure 6.01(d) Top 10 Community-Ranked Health Problems

Interpretations: *Disparities, gaps, emerging issues*

Although cancer affects people from every class and ethnicity, its burden is not evenly shared. People from higher socio-economic classes do not develop as much cancer and are more often cured of it when they do. They have more access to education about healthy lifestyle behaviors, nutritious food and workout facilities and areas free of contamination. If they do develop cancer, they are more likely to find it in screenings and better able to afford specialized treatment.

Cancer rates and mortality also vary by ethnic group. In both North Carolina and Durham County, African Americans are more likely to suffer the greatest burden from the most common forms of cancer than any other racial or ethnic group. This is depicted in Figures 6.01 (e) and (f).

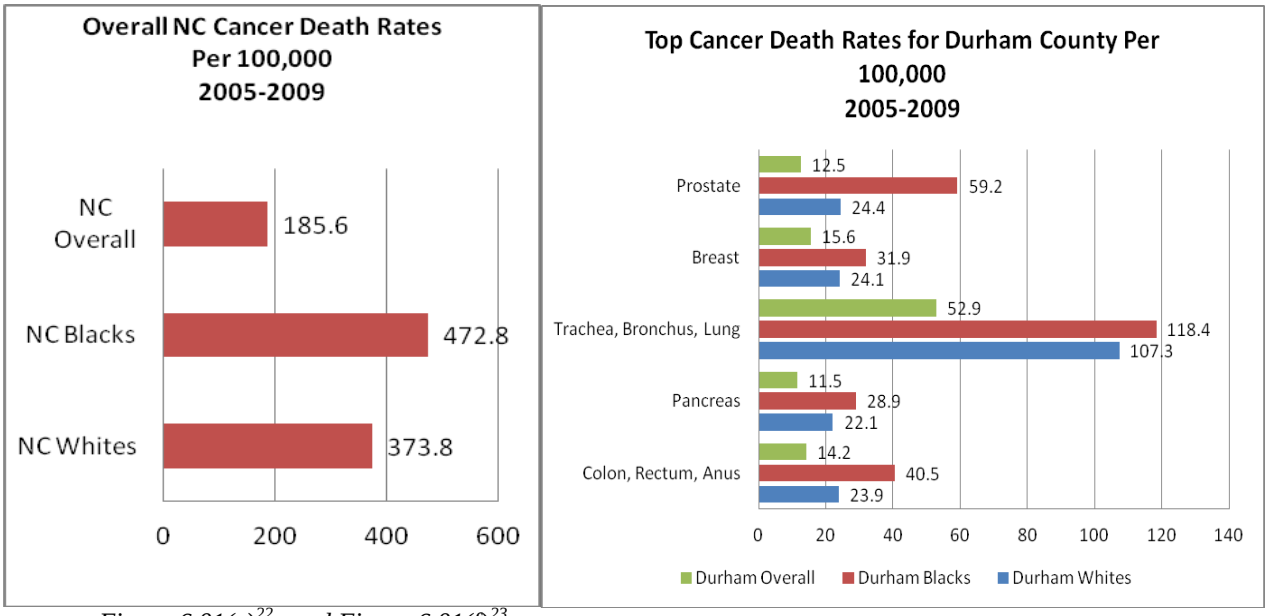


Figure 6.01(e)[22] *and Figure 6.01(f)*[23]

Recommended Strategies

Risk of Cancer and Targeted Preventive Efforts

One third of the risk of cancer is due to modifiable effects such as smoking, lack of exercise, and unhealthy diet.[24] Cancer is a great target for public health initiatives because many cancers are preventable with lifestyle modification; these measure may include: tobacco control, reduction in alcohol consumption, increased physical activity, healthy diet initiatives, safe sex promotion, vaccinations for hepatitis B and human papillomavirus (HPV), and screening and awareness. Another third of cancer risk is due to environmental effects like radiation, chemical contaminants, pollution, and infection.[25] Early warning systems and preventive control measures are important for monitoring nuclear plants and other possible sources of radiation and chemical contamination. Environmental regulations and laws limit the amount of pollution. Vaccines, isolation and other infection control measures, and disease monitoring all contribute to lowered cancer incidence. The final third of cancer risk is due to genetics and the natural aging process. These cancers can be prevented by documented family histories which prompt early and regular screenings.[26]

Table 6.01(a) **Evidence-based and Promising Practices Resources**[27]

Setting	Name	Description / Website	Matching 2020 Objective
Workplace	The Next Step: Worksite Cancer Screening and Nutrition Intervention	Next Step is a workplace program that aims to increase colorectal cancer screening and promote healthy dietary behaviors. The screening promotion component consists of an invitation flyer and a personalized educational booklet. http://rtips.cancer.gov/rtips/programDetails.do?programId=264649	Chronic Disease Objective 3
Community	Relationship Model for Accessing and Assessing Underserved Communities	The ultimate goal of the relationship model was to increase colorectal cancer screening. By developing trusting relationships and sharing assessments with community leaders, staff was able to generate collaborations to increase access to colonoscopy, increase understanding of its importance to detecting cancer and; thus, increase colorectal screening among the people of this community. http://www.naccho.org/topics/modelpractices/database/practice.cfm?PracticeID=49	Chronic Disease Objective 3
Individual	Prevention Care Management	Prevention Care Management (PCM) is a centralized telephone care management system designed to increase cancer screenings among women aged 50-69. Women who are not up-to-date for cancer screenings receive phone calls from prevention care managers who facilitate the screening process by addressing barriers that prevent or delay cancer screenings. http://rtips.cancer.gov/rtips/programDetails.do?programId=295722	Chronic Disease Objective 3

Current Initiatives & Activities

- ***American Cancer Society***

The American Cancer Society is a nationwide, community-based voluntary health organization dedicated to eliminating cancer as a major health problem. Headquartered in Atlanta, Georgia, the ACS has 12 chartered Divisions, more than 900 local offices nationwide, and a presence in more than 5,100 communities

Website: http://www.cancer.org/
Phone Number: 1 (800) 227-2345

- ***Duke Cancer Institute***

The Duke Cancer Institute (DCI) is a single entity—the first of its kind at Duke—that brings cancer care and research even closer together. By uniting hundreds of cancer physicians, researchers, educators, and staff across the medical center, medical school, and health system under a shared administrative structure, the DCI offers unprecedented opportunities for teamwork among the scientists in our labs and caregivers in our hospitals and clinics.

Website: http://www.cancer.duke.edu/
Phone Number: (888) ASK-DUKE (275-3853)

- ***National Cancer Institute: Cancer Information Service (CIS)***

The CIS is a program of the National Cancer Institute that provides accurate, up-to-date information on cancer detection, treatment, prevention, and on survivorship issues.

Website: http://www.cancer.gov/aboutnci/cis
Phone Number: (800) 4-CANCER (422-6237)

- ***Durham County Health Department: Breast and Cervical Cancer Control Program* (BCCCP)**

The Breast and Cervical Cancer Control Program provides an annual physical exam, which includes pap smear test and mammogram free of charge to women ages 40 to 64 who are not covered by Medicare or Medicaid and have little or no insurance; proof of income required; exam also includes screening for blood pressure, obesity, diabetes, and additional diagnosis and treatment of sexually transmitted diseases. By appointment only on Tuesdays and Thursdays, 8:30-11am and 1-4pm.

Website: http://durham.nc.networkofcare.org/mh/services/advanced-search.aspx?k=cancer
Phone Number: (919) 560-7658

- ***Duke Cancer Support Group Programs***

Cancer Support Groups is a support group focusing on Cancers, for victims and supporting partners. Please call for meeting times and locations.

Website: http://durham.nc.networkofcare.org/mh/services/advanced-search.aspx?k=cancer
Phone Number: (919) 684-4497

- ***UNC Lineberger Comprehensive Cancer Center NC Cancer Hospital***

The center brings together some of the most exceptional physicians and scientists in the country to investigate and improve the prevention, early detection and treatment of cancer.

Website: http://unclineberger.org/
Phone Number: 1 (866) 869-1856

Section 6.02 *Diabetes*

Overview

Diabetes mellitus ("diabetes") is a group of metabolic diseases characterized by hyperglycemia (high blood sugar) resulting from defects in insulin secretion, insulin action, or both. Insulin is the hormone in the body that regulates blood sugar levels. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs in the body including the eyes, kidneys, nerves, heart, and blood vessels.[28] There are two main classifications of diabetes: Type 1 and Type 2. Type 1 diabetes, formally called juvenile diabetes, generally occurs in children and younger adults. It occurs when the pancreas in the body stops producing insulin, so this type of diabetes can only be controlled with insulin injections. Type 2 diabetes was formally known as adult onset diabetes. It results when the body makes some insulin, but not enough to keep blood sugars under control and/or the body becomes resistant to the insulin, so insulin does not work properly and the blood sugar becomes too high. Type 2 diabetes can be controlled with diet, exercise, and diabetic medications including insulin injections. The majority (90-95%) of all people diagnosed with diabetes have Type 2 diabetes.[29]

Diabetes is a major public health problem in North Carolina, affecting all socio-demographic population groups. Additionally, diabetes is a major contributor to other health conditions including heart disease, stroke, blindness, kidney disease, non-traumatic leg and foot amputations, neuropathy, gum disease and depression.[30]

Healthy NC 2020 Objective

Chronic Disease

Healthy NC 2020 Objective[31]	Current Durham	Current NC	2020 Target
1. Decrease the percentages of adults with diabetes.	7.0% (2010)[32]	9.8% (2010)[33]	8.6%

Secondary Data: *Major findings*

The economic costs of diabetes are significant. Approximately $1 in $10 of health care dollars is attributed to diabetes.[34] People with diagnosed diabetes, on average, have medical expenditures that are approximately 2.3 times higher than the medical expenditures of those without diabetes.[35] On average, persons with diabetes have approximately 2.3 times higher medical costs than those without diabetes.[36] The financial burden of diabetes likely exceeds the $174 billion estimate because it does not take into account the pain and suffering care provided by non-paid caregivers, and costs due to undiagnosed diabetes.[37]

Diabetes is the 5th leading cause of death in Durham County and is also a significant risk factor for heart disease and cerebrovascular disease, the second and third leading causes of death in Durham, respectively.[38]

Overweight/obesity, another major public health problem in North Carolina is a risk factor for developing diabetes and affects diabetes control for those individuals living with diabetes. The majority of individuals with Type 2 diabetes are overweight or obese;[39] 65% of adults in Durham County are overweight or obese.[40]

Smoking also affects diabetes. Smoking raises blood glucose and reduces the body's ability to use insulin, resulting in poor diabetes control. Smokers with diabetes experience more nerve and kidney damage than nonsmokers.[41]

Primary Data

BRFSS Data

According to 2010 BRFSS data (Behavioral Risk Factor Surveillance Survey), Durham has a lower percentage of residents living with diabetes than its peer counties and the State. This data is depicted in Figure 6.02(a) below. 2010 BRFSS data show that 7% of Durham residents report having diabetes, which not only meets the Healthy NC 2020 Objective, but also surpasses by 1.6% it.[42] This must be interpreted with caution however, because the confidence intervals for this survey are wide; while the survey estimates 7%, it also states that the true number of individuals with diabetes is between 5.1%- 9.7%.

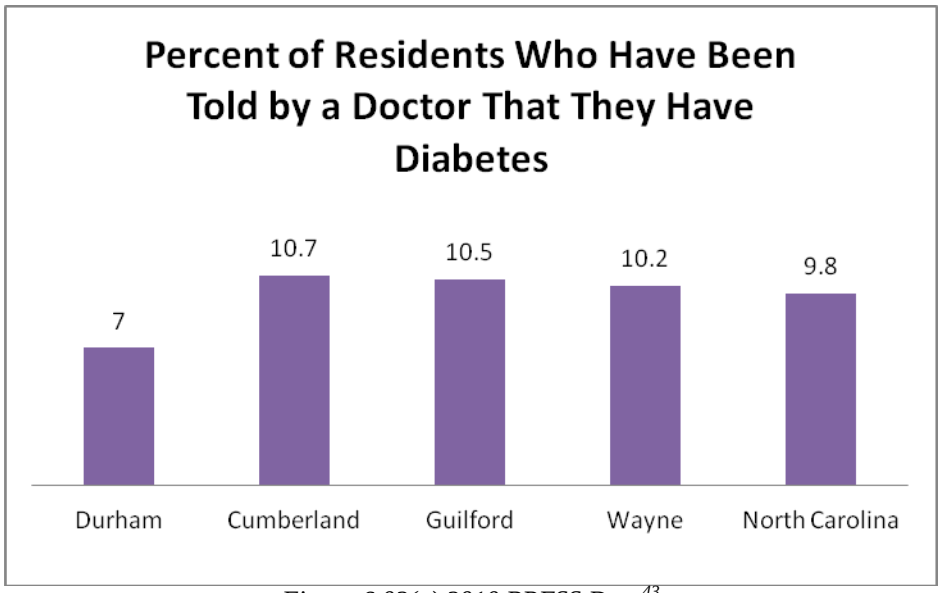


Figure 6.02(a) 2010 BRFSS Data[43]

DHI Data[44]

The Diabetes Project of the Durham Health Innovations (DHI) diabetes team (Partnership IMPACTS Diabetes Outcomes) conducted focus groups, key informant interviews and community advisory board meetings to identify issues related to diabetes care in Durham County. Findings showed that in Durham:

- Access to care is an issue, especially for the uninsured and those without a medical home.
- There is a desire for education and clinical care resources at sites within the community or closer to the patient's home.
- Affordability of supplies, medications, healthy lifestyle, primary or specialty care is a barrier for some residents living with diabetes.
- There is a lack of awareness and knowledge of how to access existing appropriate resources.

2010 Durham County Community Health Opinion Survey Data[45]

According to data from the 2010 Durham County Community Health Opinion Survey, when asked what they felt was the most important health concern in Durham County, respondent's ranked diabetes 4th out of 19 health issues. Additionally, participants ranked obesity/overweight a close second and heart disease/heart attacks a not too distant third. This is significant because obesity/overweight is a risk factor for diabetes and heart disease can be a complication of diabetes. When survey respondents were asked what one thing would make their neighborhood a healthier place to live, the top response to this open-ended question related to eating/nutrition/exercise, as shown in Figure 6.02(b) below. These lifestyle factors are very influential in both preventing and controlling obesity, cardiovascular disease and diabetes.

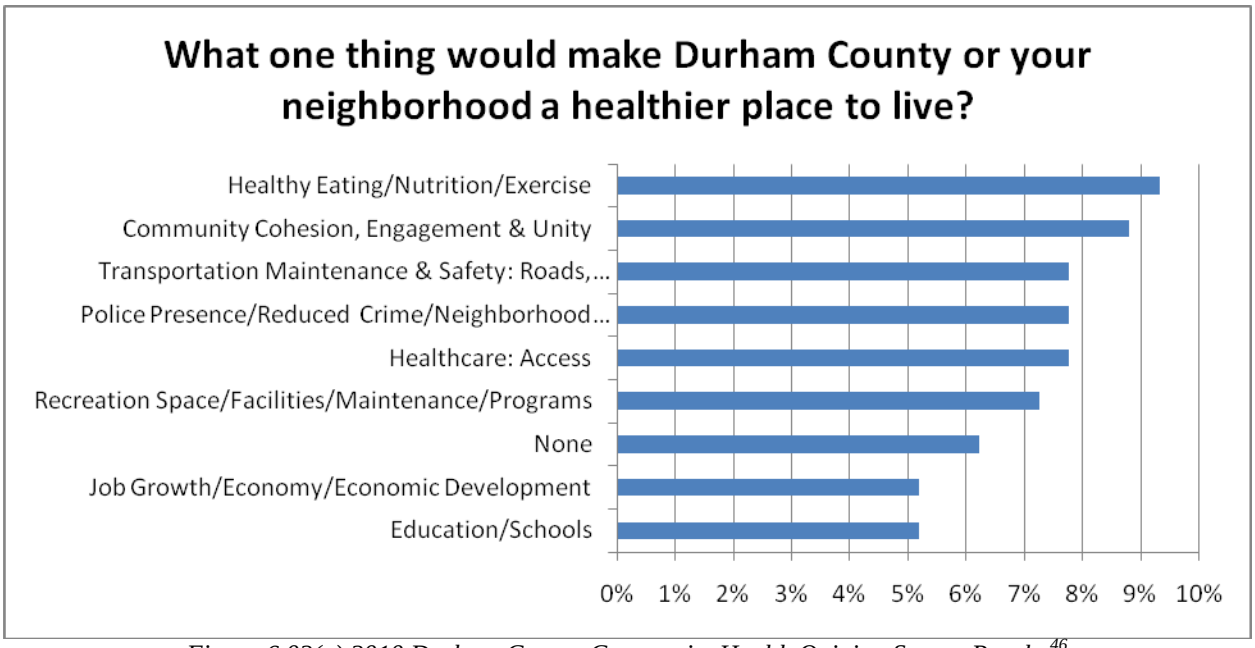


Figure 6.02(a) 2010 Durham County Community Health Opinion Survey Results[46]

Additionally, through community events sponsored by the Durham County Health Department, evaluations revealed the need for additional educational opportunities and strategies for affordable means in which to learn about proper diet and physical activity.

Interpretations: *Disparities, gaps, emerging issues*

Diabetes affects minorities and low income populations disproportionately. *Healthy North Carolina 2020: A Better State of Health* states the following disparities related to diabetes in North Carolina:[47]

- African Americans are nearly twice as likely to have diabetes when compared with whites (15.6% versus 8.4% in 2009).
- Compared with whites, American Indians are more likely to have diabetes (11.7% in 2009).
- In general, individuals with less education and with lower incomes are more likely to have diabetes (2009). Among individuals with less than a high school education, 15.3% reported having diabetes, compared with 5.5% of college graduates (2009). Of those with annual incomes of less than $15,000, 14.6% reported having diabetes, compared with 4.9% of individuals with incomes of $75,000 or greater (2009).[48]

Additionally, Hispanic ethnicity is a risk factor for diabetes; 13.5% of Durham County residents are Hispanic.[49] Interventions that are accessible and culturally appropriate are required for addressing diabetes in the Hispanic population in Durham County.

Healthy lifestyle and self-care practices are an essential component of any diabetes management plan. However, data from the 2010 BRFSS indicate gaps exist in Durham County related to optimal self-care practices. Close to 40% of Durham County residents with diabetes reported never attending a class or course on diabetes self management**,** and only 42% of respondents

reported checking their feet one or more times a day, the frequency recommended.[50] Thirty-seven percent had had their HbA1c tested fewer than two times in the prior year, and 30.4% had not had a dilated eye exam during that same time period.[51] 2009 BRFSS data indicated that only 21.8% of Durham County respondents ate five or more servings of fruits and vegetables a day and 57.1% did not engage in physical activity.[52]

Recommended Strategies

Table 6.02(a) **Evidence-based Resources and Promising Practices**[53]

Category	Name	Description	Website	Matching 2020 Objective
Community	Project DIRECT	Project DIRECT was a large community-based intervention for diabetes. The project was conducted through a cooperative agreement between the Centers for Disease Control and Prevention, the North Carolina Department of Health and Human Services, Wake County Human Services and the local community of Southeast (SE) Raleigh. Project DIRECT still exists in southeast Raleigh.	http://www.ncdiabetes.org/programs/projectDirect/index.asp	Chronic Disease Objective 2
Individual	Closing the GAP Diabetes Program	The main goal is to provide clients with a system of care through diabetes education and self-management training, enhancing the quality of their lives through prevention or reduction of disease complications.	http://www.naccho.org/topics/modelpractices/database/practice.cfm?PracticeID=350	Chronic Disease Objective 2
Workplace, School, & Community	In Motion	In Motion uses public awareness, education and motivation strategies, in combination with target audience strategies and constant evaluation to reach all corners of the community. In motion and its champions are successfully creating opportunities for physical activity in six targeted community areas.	http://cbpp-pcpe.phac-aspc.gc.ca/intervention_pdf/en/541.pdf	Chronic Disease Objectives 1, 2, & 3

Recommended Strategy 1: *Diabetes Self Management Education*[54]

Diabetes self-management education (DSME) is the process of teaching people to manage their diabetes. The goals of DSME are to control the rate of metabolism (which affects diabetes-related health), to prevent short- and long-term health conditions that result from diabetes, and to achieve the best possible quality of life for clients while keeping costs at an acceptable level. DSME can be provided in a variety of community settings, including community gathering places, the home, healthcare facilities, recreational camps, worksites, and schools.

The Task Force on Community Preventive Services recommends that diabetes self-management education (DSME) interventions be implemented in:

- **Community gathering places** on the basis of sufficient evidence of effectiveness in improving glycemic control for adults with Type 2 diabetes

- **Homes of children and adolescents who have Type 1 diabetes** on the basis of sufficient evidence of effectiveness in improving glycemic control among adolescents with Type 1 diabetes.

Recommended Strategy 2: *Case management interventions to improve glycemic control*[55]

Case management involves planning, coordinating, and providing healthcare for all people affected by a disease—in this case, diabetes. It is directed towards people who likely use too much of their income to pay for healthcare services, who are not receiving needed services, or who are receiving services that are not well coordinated.

The Task Force on Community Preventive Services recommends diabetes case management strategies on the basis of strong evidence of effectiveness in improving glycemic control. There also was sufficient evidence of improved provider monitoring of glycated hemoglobin (GHb) when case management was delivered in combination with disease management.

Recommended Strategy 3: *Disease Management*[56]

Disease management is an organized, proactive, and multicomponent approach to healthcare delivery for people with a specific disease, such as diabetes. Care is focused on and integrated across the spectrum of the disease and its complications, the prevention of co morbid conditions, and the relevant aspects of the delivery system. Disease management identifies all clients or patients affected by the disease and determine the most effective ways to treat the disease.

The Task Force on Community Preventive Services recommends diabetes disease management on the basis of strong evidence of effectiveness in improving:

- Glycemic control
- Provider monitoring of glycated hemoglobin (GHb)
- Screening for diabetic retinopathy
- Sufficient evidence is also available of its effectiveness in improving:
- Provider screening of the lower extremities for neuropathy and vascular changes
- Urine screening for protein
- Monitoring of lipid concentrations

Additionally, strategies that promote healthy eating, increased physical activity, and smoking cessation are all recommended for diabetes prevention and control.

Current Initiatives & Activities

- ***Durham Diabetes Coalition***

Duke Medicine and the Durham County Health Department are collaborating to translate the successes seen in individual patient management and outcomes for type 2 diabetes to the broader population in the county. To achieve this objective, Duke Medicine will first build a geo-spatial map of the diabetes problem in the county that will also allow for real-time monitoring of individuals and populations with diabetes and serve as the basis for intervention evaluations. Then, with Duke, Durham County Health Department, and community partners will develop,

pilot and implement a series of community-based interventions and monitor and evaluate the project to determine its impact on health outcomes, health service usage and health care costs. This initiative is funded by the Bristol Meyers Squibb Foundation.

Website: http://www.bms.com/togetherondiabetes/partners/Pages/duke-university.aspx
Phone Number: (919) 560-7600

- ***Diabetes Self Management Education (DSME).***

American Diabetes Association approved programs teach individuals living with diabetes self management skills to control their diabetes. DSME is a recommended standard of care for diabetes treatment and is covered by Medicaid, Medicare, and many third party insurers. Available in Durham County at Duke University Medical Center Health, Duke Children's Hospital, Durham County Health Department, Durham Regional Hospital, Durham VA Hospital, UNC Hospital at Highgate, and at designated Kerr Drugs.

Website: http://www.diabetes.org/
Phone Number: 1 (800) DIABETES (800-342-2383)

- ***Living Healthy program***

Stanford Chronic Disease Self-Management program for worksites and other community groups

Website: http://patienteducation.stanford.edu/programs/cdsmp.html
Phone Number: (650) 723-7935 Durham County local resource: 560-7771

- ***Medical Nutrition Therapy***.

Individualized nutrition assessment and counseling for management of diabetes. Reimbursement by many third party insurances. Available in Durham County and can search through Durham Network of Care and/or the American Dietetic Association.

Website: http://durham.nc.networkofcare.org/family/home/index.cfm or eatright.org
Phone Number: (919) 560-7791 Durham County Health Department

- ***Project REACH Diabetes***

Community awareness on diabetes; collaboration between Durham and Person counties; interventions include webinars, social media, community events and educational sessions

Website: www.projectreachdiabetes.org
http://www.facebook.com/pages/Project-REACH-Diabetes-Initiative/276132562870
Phone Number: (919) 560-7771

- ***Diabetes Improvement Project (DIP).***

An initiative of the African-American Health Improvement Partnership, a coalition sponsored by a grant from NIH to the Division of Community Health, Duke University Medical Center. Provides participants with one-on-one coaching and peer-led social support groups; conducts education sessions about the causes, consequences, and management of diabetes; develops opportunities for physical activity; and supports churches in developing policies and practices that promote good health.

Website: http://communityhealth.mc.duke.edu/healthpromo/?/aahip
Phone Number: (919) 681-3188

- ***North Carolina Diabetes Prevention and Control Branch***.

Helping North Carolina citizens reduce the impact of diabetes through leadership, education, communication and community involvement.

Website: www.ncdiabetes.org
Phone Number: (919) 707 - 5340

Section 6.03 *Heart Disease and Stroke*

Overview

Cardiovascular disease and cerebrovascular disease, or stroke, are two illnesses which greatly impact the overall health of a community. Individually, these two diseases are the second and third most frequent causes of mortality, but together they are the most pervasive and costly health problems in the nation.[57] Reducing the rates of mortality from both cardiovascular and cerebrovascular disease will contribute to the physical and economic well-being of the community by reducing medical costs, increasing adult employability and productivity, and improving both quality and quantity of life for the county's residents.

Cardiovascular disease includes a class of diseases best known as heart disease. They involve the dysfunction of vessels servicing the heart (arteries and veins). Cerebrovascular disease is the result of brain dysfunctions resulting from diseases of the blood vessels supplying the brain. Hypertension is the most noted cause and stroke the most prevalent of the diseases within this group. Although a number of factors contribute to both of the classes of disease, lifestyle behaviors have been shown impactful. The Durham Health Innovations Vascular Intervention Project (VIP) quantified the burden of hypertension, elevated cholesterol levels, and chronic diseases found related to vascular disease in Durham County, North Carolina and found that over 35% of the adult population to have some form of cardiovascular disease.[58] Disparities in morbidity, mortality, utilization of services, and access to care were also observed.[59]

Addressing these diseases will require the community to also address obesity, high rates of high blood pressure and cholesterol, smoking, poor diet, physical inactivity and diabetes. These are all known risk factors for heart disease and stroke.[60]

Healthy NC 2020 Objective

To improve the health of Durham's residents, Durham County and North Carolina will work to reduce the mortality rates associated with chronic diseases such as cardiovascular and cerebrovascular disease.

Chronic Disease

Healthy NC 2020 Objective[61]	Current Durham	Current NC	2020 Target
1. Reduce the cardiovascular disease mortality rate (per 100,000 population) [62]	162.6 (2005-09)	194.7 (2005-09)	161.5

Although the State has not chosen an objective focused on cerebrovascular disease, and Durham's 45.2 deaths (per 100,000)[63] from the disease is lower than the State's rate of 57 per 100,000 population reflected in 2002-2006 data,[64] continuous attention is required for this downward trend to continue. Predictive indicators, such as growing rates of obesity and high

blood pressure, suggest the challenge to continue the downwards trends for both cardiovascular and cerebrovascular disease.[65] The fact that the most recent data reports 35%[66] of the community's adults affected by this broad category of diseases makes this an important focus for the community.

Secondary Data: *Major findings*

Consistent with national and state trends, cardiovascular disease is the second leading cause of death in Durham County.[67] As noted in the Table 6.03(a) below, the age adjusted death rates from heart disease and stroke (per 100,000) in Durham County in 2009 were lower than the state rates.[68]

Table 6.03(a) **Age Adjusted Death Rate Comparisons, 2009**[69]

County	Age adjusted death rate (per 100,000)	
	Heart Disease	Stroke
North Carolina	194.7	51.3
Durham	162.6	45.3
Cumberland	222.8	50.4
Guilford	172.7	46.8
Wayne	217.1	63.6

These diseases are costly to both individuals and the community. The average inpatient hospital utilization in 2009 charged to heart disease as the principle diagnosis in Durham was $43,216 and $37,128 for hospitalizations with stroke as the principle diagnosis.[70]

Primary Data

In 2005, the Durham Behavioral Risk Factor Surveillance Survey (BRFSS) asked about people's experiences with cardiovascular disease and its associated conditions (coronary heart disease, heart attacks, or stroke). Five percent of Durham respondents said they had a history of these conditions, which was the same as the North Carolina rate. By 2009, this rate rose to 7.3%.[71] This rate is trending upward, thus meriting attention.

Community focus groups with minority communities report community health priorities to include reduction of cardiovascular and stroke risk, reduction in the rates of overweight and obesity, improved dietary intake and increased physical activity in African American communities.[72] Table 6.03(b) below reflects 2010 BRFSS Survey results pertaining to the prevalence of any type of cardiovascular disease or stroke found in Durham and its peer counties[73]

Table 6.03(b) **Prevalence of Any Cardiovascular Disease or Stroke**[74]

County	Prevalence of cardiovascular disease or stroke (%)
Durham	5
Cumberland	9.9
Guilford	7.2

Wayne	11.3

The Durham community recognizes cardiovascular disease as an important health issue, as shown by results from the 2010 Durham County Community Health Opinion Survey.[75] When survey respondents were asked to choose what they felt were the top three health issues in Durham County, 34.7% of respondents chose cardiovascular disease as one of their top three. Cardiovascular disease ranked 2nd only to obesity as a top health concern in Durham County; results are shown in Figure 6.03(b) below.[76]

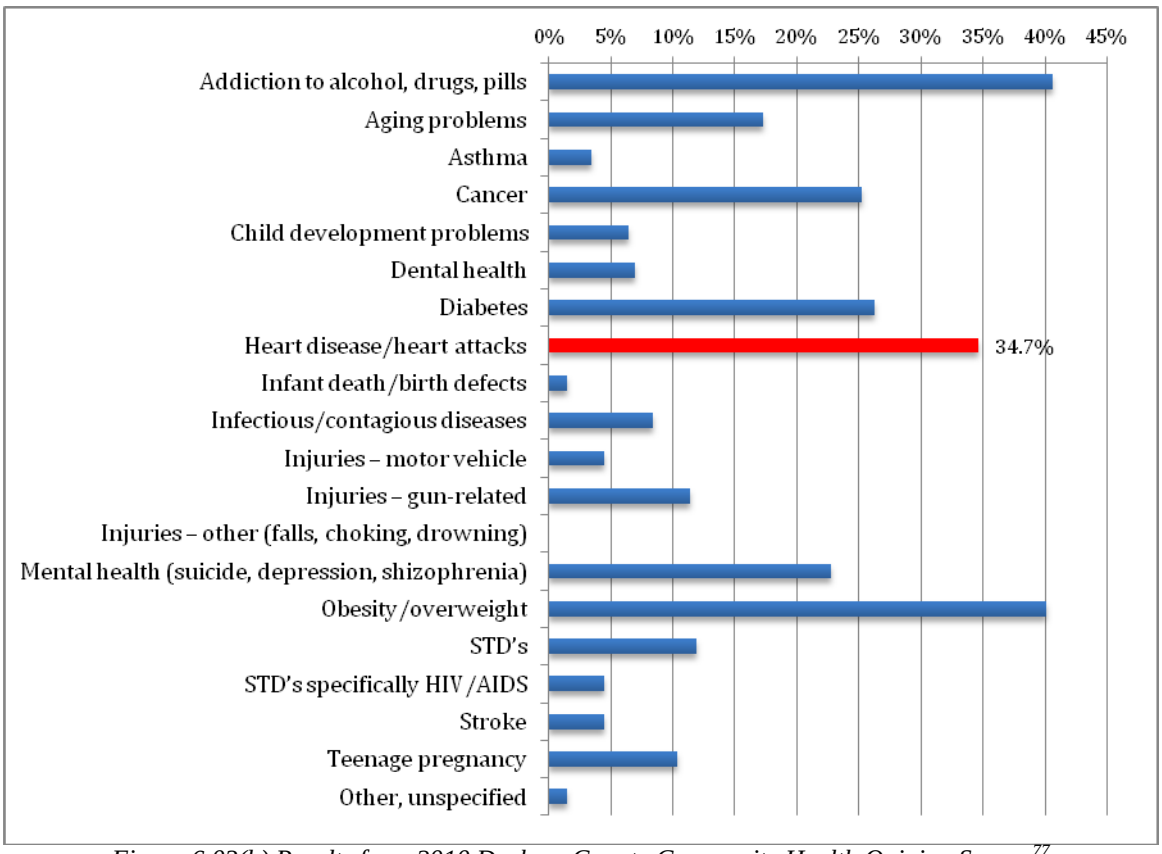


Figure 6.03(b) Results from 2010 Durham County Community Health Opinion Survey[77]

Interpretations: *Disparities, gaps, emerging issues*

Racial/ethnic minorities carry a disproportionately greater burden of cardiovascular (CV) -related conditions.[78] Despite having a lower aggregate CVD death rate than the state overall, non-whites in Durham County have approximately a 63% higher rate of death for this condition than whites (182.1 per 100,000 compared to 112.2 per 100,000 respectively).[79] Between 1999-2000, the death rate due to heart disease was 99.4 per 100,000 in Latino residents of North Carolina; however, the North Carolina Latino population is generally a younger population.[80] Additionally, racial disparities exist among insurance status and utilization of services, as reflected within the Durham Health Innovations Vascular Intervention Project population; 76.1% of the self-pay/uninsured is non-white and racial/ethnic minorities are more likely to receive care only in the emergency department.[81] Therefore, it is essential that local efforts address barriers to care for these vulnerable populations.

Although downward trends in the rates of heart disease exist throughout the Durham community, minority population rates of heart disease trend disproportionately higher than the mean. This is particularly true for minority males; BRFSS data reflects that minorities in the community were more than three times as likely to have been told by a health professional that they had experienced a stroke compared to whites.[82] Furthermore, mortality rates are much higher for minorities than for the general population in Durham County.[83]

Recommended Strategies

The U.S. Department of Health and Human Services recommends evidenced-based clinical, community and individualized strategies for reducing risk and mortality rates of heart disease and stroke. These are described specifically in *Healthy People 2020 Interventions and Resources for Heart Disease and Stroke*.[84] These include the consideration of: aspirin for the prevention of cardiovascular disease; behavioral counseling in the primary care to promote a healthy diet; screening for high blood pressure; screening for lipid disorders in adults; behavioral and social approaches to increase physical activity through individually adapted health behaviors; social support interventions in the community; campaigns and informational approaches to increase physical activity community wide; worksite programs for obesity prevention and control, and assessment of health risks with feedback to change employee's health.[85]

Table 6.03(c) **Evidence-Based and Promising Practices**[86]

Category	Name	Description	Website	Matching 2010 Objective
Workplace, School and Community	In Motion	In Motion uses public awareness, education and motivation strategies, in combination with target audience strategies and constant evaluation to reach all corners of the community. In motion and its champions are successfully creating opportunities for physical activity in six targeted community areas.	http://cbpp-pcpe.phac-aspc.gc.ca/intervention_pdf/en/541.pdf	Chronic Disease Objective 1, 2, & 3
Individual	Cardiovascular Disease Risk Screening & Education	The overall goal of the Cardiovascular Disease Risk Screening and Education Program is to promote overall wellness among clients seen in Region I health units.	http://www.naccho.org/topics/modelpractices/database/practice.cfm?PracticeID=154	Chronic Disease Objective 1
Healthcare	Blood Pressure Measurement for the 21st Century Toolkit	The Blood Pressure Measurement for the 21st Century Tool Kit provides information on accurately and reliably taking a blood pressure measurement, to properly maintain the blood pressure equipment, and suggestions for lifestyle changes that can be taken to reduce high blood pressure.	http://www.williamsandwest.com/sentarainteractive/bloodpressure/downloads/Blood_Pressure_Toolkit.pdf	Chronic Disease Objective 1

The VIP model is built on elements from the chronic care model as defined by Bodenheimer, et al.[87] Key components to community management of chronic illness are anchored by self-management support, clinical information systems, delivery system redesign, decision support, health care organization and community resources. Moreover, within the VIP model are overarching principles that include the entire community, including public and private polices unique to the Durham community, identification and definition of all components of the health care system within Durham County, and integration of all facets of the delivery system including all networks of health care delivery in the county.[88]

Current Initiatives & Activities

- ***Check It Change It (Durham Health Innovations)***

The "Check It, Change It" program focuses on patients seen with high blood pressure at several Durham area clinics. After enrollment, participants receive educational information about how to improve their health through interaction with community health coaches and nurse practitioners. "Check It, Change It" participants have access to computer-based educational tools and can track progress through Heart360 (www.heart360.org), the American Heart Association's free and secure online heart-health wellness center that connects to Microsoft Health Vault. The following outcomes are anticipated from this project: 1) reduce the percentage of the Durham County population that is over target blood pressure levels (140/90 – systolic/diastolic), 2) reduce the percentage of the Durham County population that is over target cholesterol levels (130 – LDL), and 3) reduce the incidence and rate of events of the hypertension and hyperlipidemia sequelae (stroke, MI, heart failure, kidney disease, vascular disease, coronary disease, and revascularization). Health outcomes will be evaluated based on data gathered from the Duke Support Repository (DSR), AHA tools and resources, and any other health information technology tools that are included in the implementation phase.

Website: http://www.checkitchangeit.org/

- ***Community Health Coalition***

The community-based Health Coalition is fortified by its linkage with the Durham Academy of Medicine, Dentistry and Pharmacy (an association for African-American medical professionals) to provide both volunteer leadership and medical grounding. The Health Coalition brings together and focuses existing community resources to provide culturally sensitive and specific health education, promotion and disease prevention activities to and in Durham's African-American community.

Website: http://www.chealthc.org
Phone Number: (919) 470-8680

- ***American Heart Association***

To find out more information on Heart Disease and how to prevent it and find out more about local initiatives you can visit the AHA's website.

Website: http://www.americanheart.org/
Phone Number: 1 (800) AHA-USA-1

- ***American Stroke Association***

To find out more information on Cerebrovascular Disease (Stroke) and how to prevent it and find out more about local initiatives you can visit the ASA's website.

Website: http://www.strokeassociation.org/STROKEORG/
Phone Number: 1 (888) 4-STROKE

Section 6.04 *Obesity*

Overview

Overweight (BMI of 25-29.9) and obesity (BMI of 30 or more) are associated with multiple health risks, economic costs, and diminished quality of life for those affected. Conditions that go along with overweight and obesity include heart disease, type 2 diabetes, stroke, and some types of cancer, as well as hypertension, dyslipidemia, osteoarthritis, liver and gall bladder disease, sleep apnea and respiratory problems, and gynecological problems.[89] Some of these shorten lifespan while others make life more difficult; all result in societal costs.

Four of the 10 leading causes of death in North Carolina are related to obesity: heart disease, type 2 diabetes, stroke, and some kinds of cancer.[90] Poor diet and physical inactivity, both of which are very closely associated with obesity, combined were the second leading cause of preventable death in North Carolina in 2007.[91] Obesity also exacerbates problems related to such conditions as arthritis and hypertension.

Body weight is a product of energy balance: the relationship between the energy one obtains from food and the energy spent in basic metabolism, growth, and physical activity. To maintain a healthy weight, a person needs to consume as many calories (the unit by which energy is measured) as s/he spends in metabolism, growth, and physical activity. Any imbalance results in a change in body weight. If the energy from food exceeds energy expenditure, a person gains weight, storing the excess energy or calories as body fat. If food energy is less than energy expenditure, a person loses weight.

Because so many Durham County residents are overweight or obese, Durham needs to offer opportunities for residents to consume healthy, lower calorie foods while engaging in enjoyable physical activities to use at least as much energy as is taken in. This is not only in the health interest of the community but also in its financial interest.

The CDC has identified obesity, physical activity, and nutrition as "winnable battles,"[92] and offered multiple strategies and tools for waging the battle. In North Carolina, Eat Smart, Move More NC[93] offers similar assistance. In Durham, the Obesity and Chronic Illness Committee of the Partnership for a Healthy Durham, considers ways to reduce Durham's obesity rate and offers resources for doing so. These and other resources are listed at the end of this section.

These resources are particularly important considering the high prevalence of overweight and obesity in Durham and in light of a surprising finding. One in four overweight or obese adults don't believe they have a problem.[94] This points to the need for education and easy access to resources to help with weight loss and/or maintenance of healthy weight.

Healthy NC 2020 Objectives

Physical Activity and Nutrition (1); Crosscutting (4)

Healthy NC 2020 Objective[95]	Current Durham	Current NC	2020 Target
1. Increase the percentage of high school students who are neither overweight nor obese.	71.6% (2009)[96]	72% (2009)[97]	79.2%
4. Increase the percentage of adults who are neither overweight nor obese.[98]	40.7% (2010)	34.7% (2010)	38.1%

Secondary Data: *Major findings*

Obesity among adults in the United States rose alarmingly from 1980 to 2008, more than doubling from 13.4 to 34.3%.[99] In North Carolina, as throughout the US, the cost of obesity is significant. North Carolina was the 10th most expensive state in the country for obesity-attributable medical expenses.[100] Those who are obese have 37.4% higher medical costs ($732 more per obese person per year) than those who are at a healthy weight.[101] According to a Duke University study of employees, obese workers accounted for 13 times more lost work days than healthy weight employees.[102]

Primary Data

Adults

In Durham, recent obesity rates were around 29%[103]; 65% of adults were overweight or obese in 2009, up from 59.1% in 2005.[104] In North Carolina, overweight and obesity rates went from 62.6% in 2005 to 65.4% in 2009.[105] Although the rate of increase has slowed, a gradual climb continues. Even if overweight and obesity stabilized at current levels, this would still mean that almost 2/3 of Durham's residents are living at unhealthy weights.

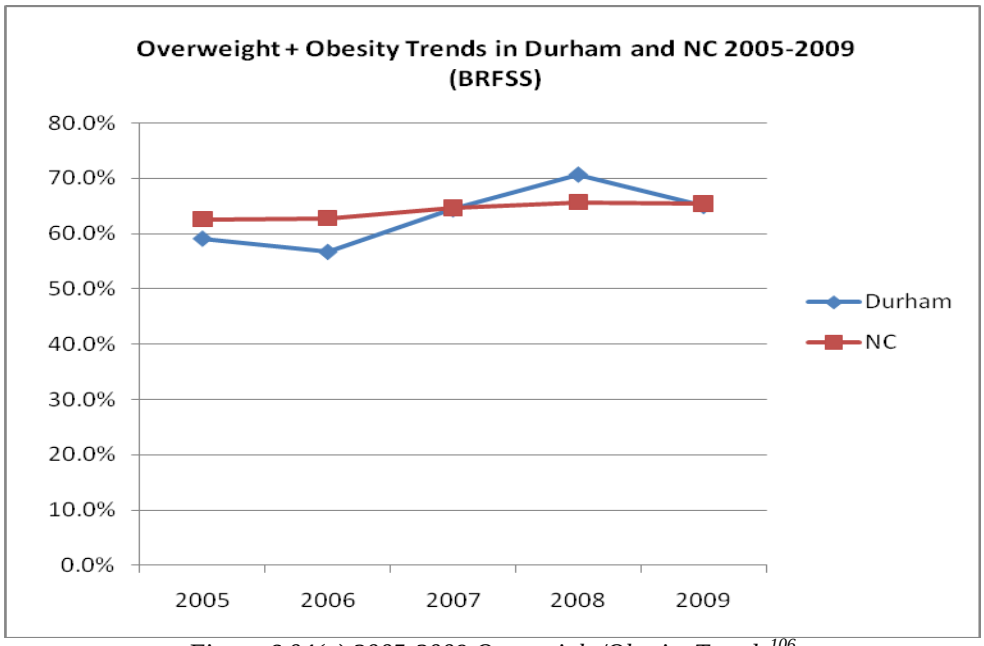


Figure 6.04(a) 2005-2009 Overweight/Obesity Trends[106]

Durham County's overweight and obesity rates do not differ widely from its peer counties. Durham is lower than Cumberland and Wayne Counties and higher than Guilford County.[107]

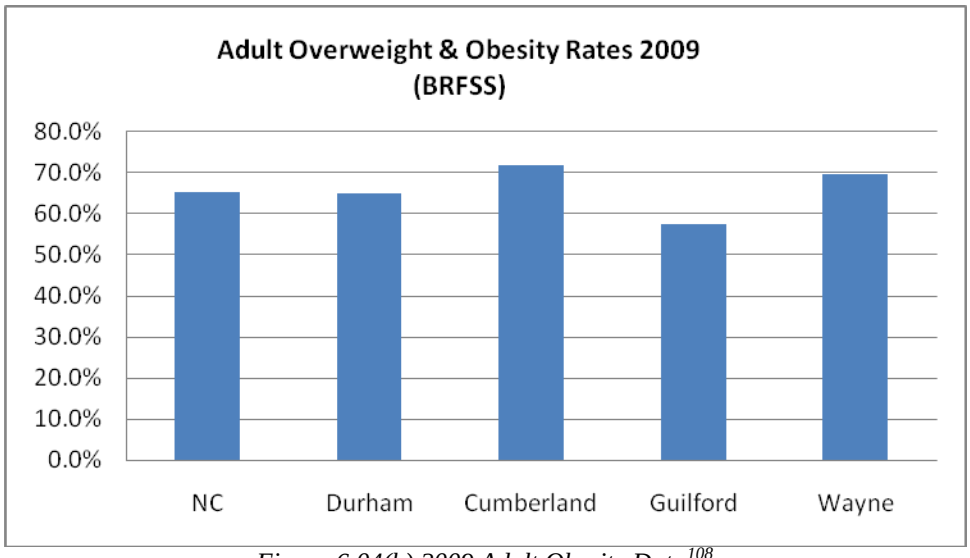


Figure 6.04(b) 2009 Adult Obesity Data[108]

Within Durham, striking differences emerge in certain demographic groups. Males have considerably higher rates of overweight and obesity, as do non-whites, those with high school or less education, and those who earn less than $50,000 per year.[109] This certainly has implications for programming and outreach.

Even in the healthiest weight range groups, combined rates of obesity and overweight do not drop below 55%,[110] meaning that the majority of Durham's residents are at risk of poorer health due to their excess weight.

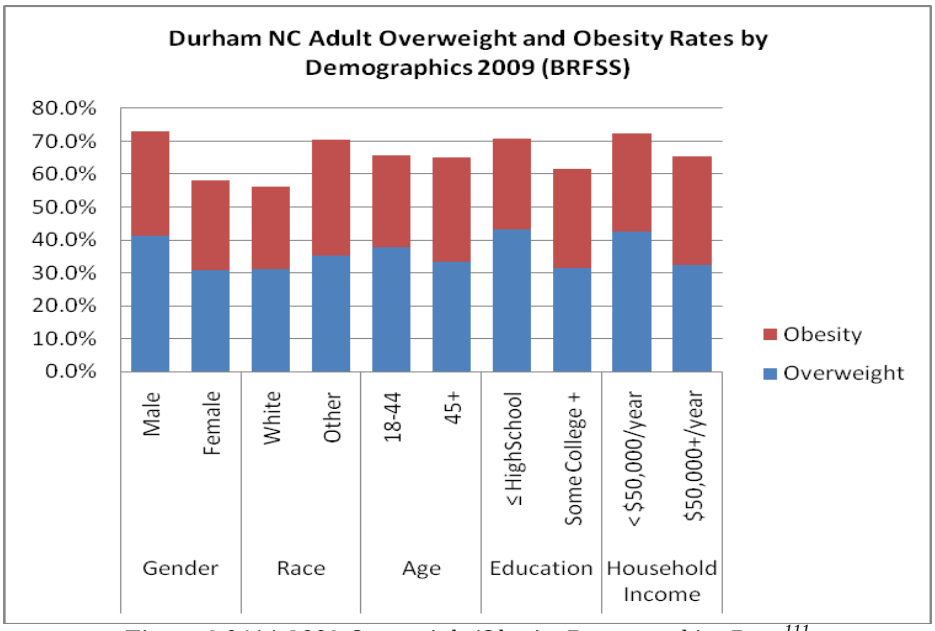


Figure 6.04(c) 2009 Overweight/Obesity Demographics Data[111]

Overweight and obesity rates in Durham increase from childhood to adulthood.[112] Teen obesity is of great concern because an obese teenager has over a 70% greater risk of becoming an obese adult than a healthy-weight teen does.[113]

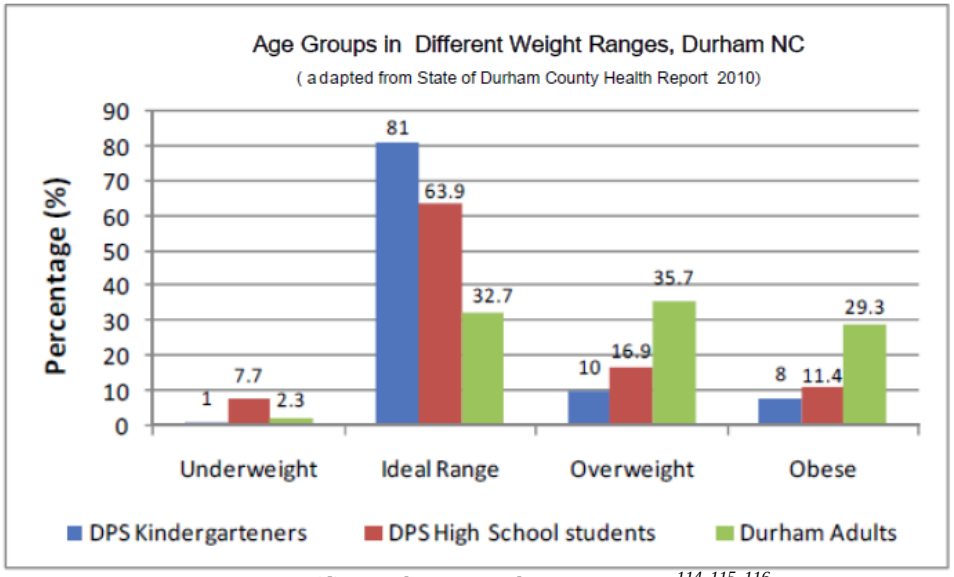


Figure 6.04(d) Weight Ranges by Age Groups[114],[115],[116]

Children

While overweight and obesity rates are lower in childhood than in adulthood, even these rates have increased over time. Obesity prevalence among children and adolescents in the United States more than tripled (from 5% to 17%) from 1980 to 2008.[117] Rates have leveled off recently.

In the last five years, the rate of overweight and obesity in US high school students actually dropped from 28.8% in 2005 to 27.8% in 2009. In North Carolina, similarly, the rate dropped from 29.2% in 2005 to 28.0% in 2009[118], small decreases, but notable for the change in direction. The current Durham Public Schools' high school combined overweight and obesity rate of 28.3% is comparable to the North Carolina rate.[119]

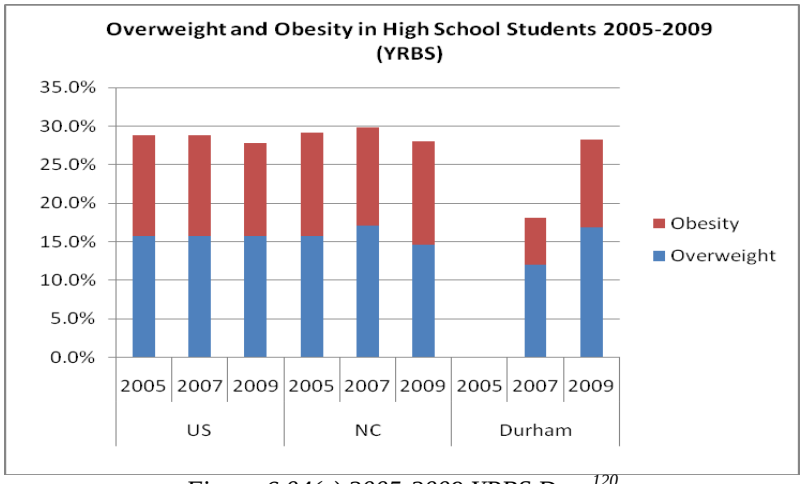


Figure 6.04(e) 2005-2009 YRBS Data[120]

In spite of this, data on low income children and youth in North Carolina show that obesity rates rise as children get older and that rates within each age group have also risen from 2002 to 2008.[121] Data compiled by Durham's Partnership for Children show that 18% of children entering kindergarten in fall 2009 were overweight or obese (10% overweight; 8% obese).[122] This indicates a need to reach children early with both education and opportunities for healthy eating and physical activity.

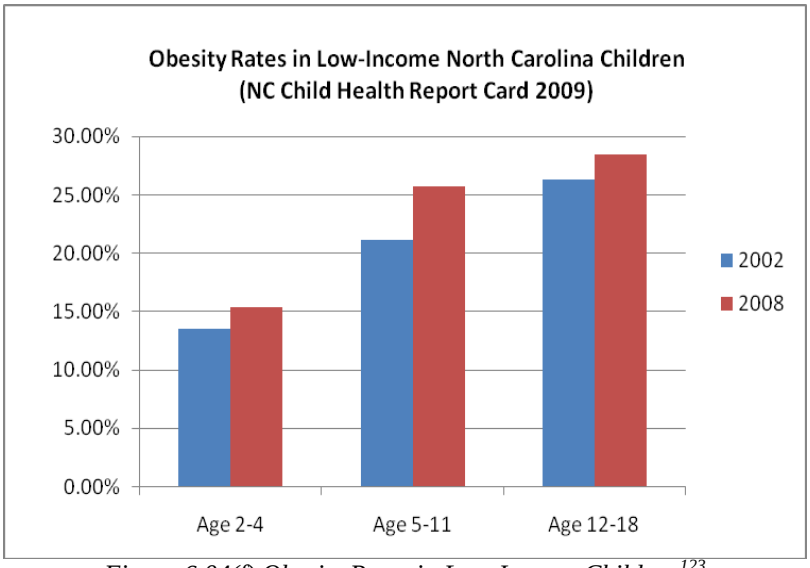


Figure 6.04(f) Obesity Rates in Low-Income Children[123]

Residents of Durham identified overweight/obesity as Durham's number two health problem according to results from the 2010 Community Health Opinion Survey.

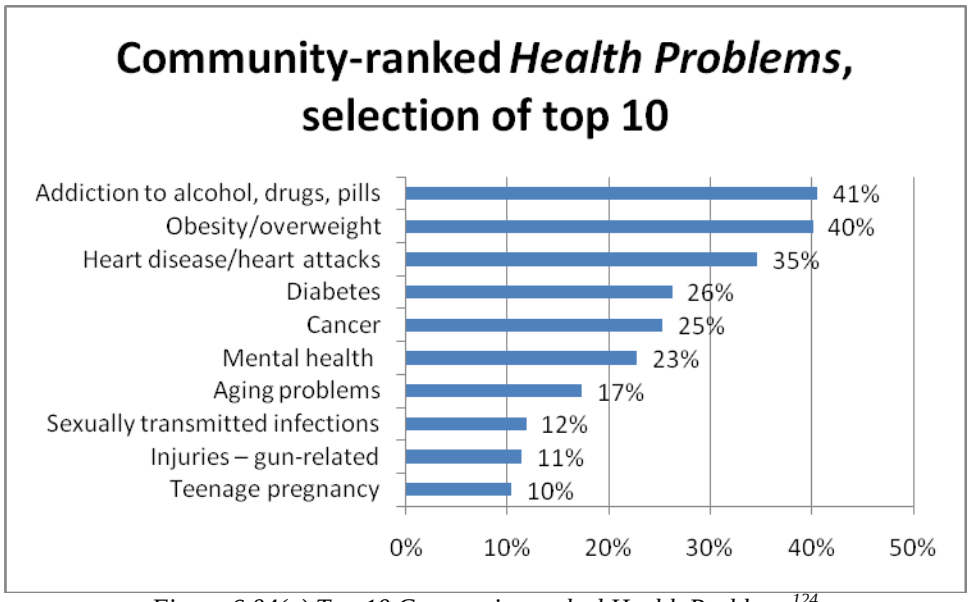


Figure 6.04(g) Top 10 Community-ranked Health Problems[124]

Respondents were also asked, "What one thing would make Durham County or your neighborhood a healthier place to live?" The most frequently cited response to this open-ended question were topics related to, "healthy eating, nutrition, and exercise."[125]

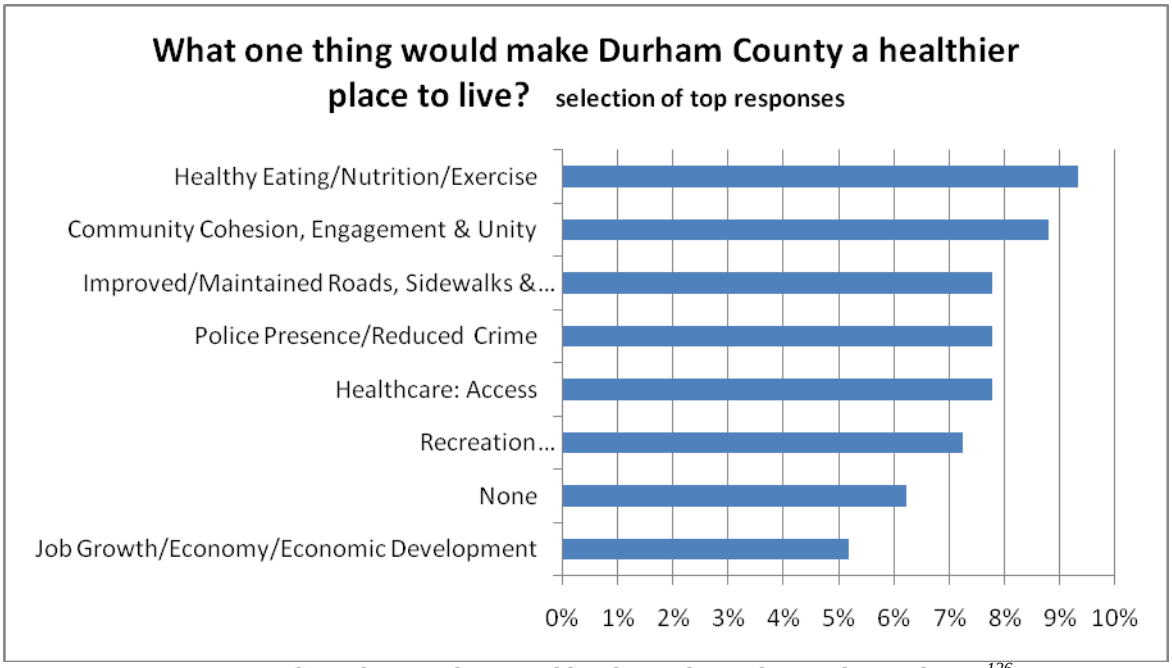


Figure 6.04(h) "What one thing would make Durham a better place to live?"[126]

AHL-DHI Data[127]

The Achieving Health for a Lifetime (AHL) team of Durham Health Innovations (DHI) conducted town meetings, focus groups, and interviews related to healthy weight with Durham residents. Their summaries stated, "Parents of overweight children thought their child's weight problem was due to lack of exercise (both Spanish and English); lack of education, parent's lack of time and modeling poor behavior (Spanish); eating habits, lifestyle and genetics (English)." When asked about what was needed to improve weight, "Spanish-speaking parents… cited improved nutrition and exercise practices as well as seeking professional help (One parent stated, "I need to change my eating habits first, participate in programs that teach you how to cook healthy meals, so I can teach my kids…"). English-speaking parents… cited the need for support (e.g., encouragement, empowerment and active friends), discipline (e.g., parent setting limits and controlling portions) and improved finances."

Overweight adolescents (all black females) expressed the following: The types of support they looked for from friends and family were, "exercising together, eating together (to stay away from bad food choices) and general support/encouragement." They wanted a "place to talk and get positive energy," and identified the best locations for such a place as school, YMCA, or other gym.

"Formerly obese adults (all female who belonged to TOPS) attributed their success to… [a number of factors, including] moderate exercise and encouragement from friends, the support group, and their doctor. They cited temptation by family members and social events, financial stress, and the inconvenience (especially time) of accessing healthy food. The most important things in a weight loss program were affordability, support and convenience. Durham is a hard place to achieve/maintain a healthy weight due to too much fast food, lack of safety and a culture based in food events."

In Northeast Central Durham (NECD), a low socioeconomic, high minority area, children at one elementary school were weighed and measured. Over 40% of the children were overweight or obese. Individual measurements were sent home to parents. Most residents attributed the weight issues to "the expense and inconvenience of obtaining healthy food (only fast food and no quality grocery stores in area except new TROSA store) as well as the poor quality of cafeteria food. They also said most kids do not have a SAFE place to play outside…" One parent summarized, "Kids need things to do, too, so they don't sit at home eating junk and watching TV."

Interpretations: *Disparities, gaps, emerging issues*

Obesity affects every segment of Durham's population, but occurs at disproportionately high rates among males, non-whites, those with lower education levels, and those with lower incomes. Lower income neighborhoods often lack easy access to grocery stores that carry healthy foods like fresh produce while they have abundant fast food restaurants; these neighborhoods frequently also lack safe outdoor recreation facilities that would allow residents easy exercise opportunities. Residents of these neighborhoods, who tend to be among the most

overweight/obese in Durham, lack healthy eating and exercise options that are more readily available in higher-income areas.[128]

Although overweight and obesity are at their lowest in early childhood, this is also the time that children are learning habits that will last a lifetime, so this is an important time to intervene, both with families and with day care providers.

Because of the wide awareness of the "obesity epidemic" and the focus of First Lady Michelle Obama on addressing childhood obesity, the present is an excellent time to take advantage of the momentum toward dealing with weight issues. Public interest is high, and resources are available. Durham needs to coordinate its efforts to promote healthy weight to allow for maximum effectiveness.

Recommended Strategies

Considering the overwhelming prevalence of obesity in Durham, and throughout the country, no less than a culture change is needed to move the population toward the healthier eating and activity habits that will promote healthier weight. Resources are in place to begin to make this happen. They will work most effectively when coordinated to prevent overlap and gaps.

Early childhood nutrition education and access to healthy food and physical activity options are essential. So, too, are continuing nutrition education, access to healthy food and focus on adequate physical activity throughout the school years in addition to the adult years.

Durham Public Schools has developed a strong wellness policy that can make a difference in the weight-influencing habits of both students and staff if it is uniformly enforced. This will require the support of the entire community to encourage that enforcement and to insure that adequate resources are directed toward school wellness.

Many evidence-based and promising strategies that have been developed and tested in other areas could work to lower obesity in Durham County. Several of these are described in Table 6.04(a) below.

Table 6.04(a) **Evidence-Based Resources and Promising Practices**[129]

Setting	Name	Description / Website	Matching 2020 Objective
School	NC Walks To School	This model brings key documents and tools into one convenient package to address components of planning local Walk to School Events. Some documents are comprehensive and provide lots of instruction and examples for Walk to School programs, as well as guidance around technical issues involved in community change to support physical activity. http://eatsmartmovemorenc.com/NCWalksToSchool/NCWalksToSchool.html	Physical Activity & Nutrition Objective 1

Community	"Lighten up Iowa!"	Encourages residents to get involved in a program that promoted physical activity and improved nutrition. http://activelivingbydesign.org/sites/default/files/Iowa.pd	Physical Activity & Nutrition Objective 1, 2 & 3
School	Energizer Program	Energizers are classroom-based physical activities that help teachers integrate physical activity with academic concepts. These are short (about 10 minute) activities that classroom teachers can use to provide physical activity to children in accordance with the request from the North Carolina State Board of Education's Healthy Active Children Policy. http://eatsmartmovemorenc.com/Energizers/Middle.html	Physical Activity & Nutrition Objective 1

Durham County already has initiatives that include Bull City Open Streets; County and City Employee Wellness efforts; Eat Smart, Move More, Weigh Less programs; and Living Healthy workshops. Pulling these together with elements of the Lighten Up Iowa program like weekly meetings/support groups could result in a focused healthy weight program that produces ongoing results.

The NC Institute of Medicine its Prevention Action Plan issued multiple recommendations for obesity prevention. These included addressing nutrition and physical activity in clinical care. Two that could be feasible to implement in Durham are:[130]

Recommendation 4.11: Increase the Availability of Obesity Screenings and Counseling
Primary care providers should screen adult patients for obesity using Body Mass Index (BMI) and provide high intensity counseling either directly, or through referrals, on nutrition, physical activity, and other strategies to achieve and maintain a healthy weight. Insurers, payers, and employers should cover screenings and counseling on nutrition and/or physical activity for adults who are identified as obese.

Recommendation 4.12: Expand the CCNC Childhood Obesity Prevention Initiative
If the Community Care of North Carolina Childhood Obesity Prevention Initiative pilots are shown to be successful, the initiative should be expanded throughout the state. The North Carolina General Assembly should appropriate $174,000 in non-recurring funds to the North Carolina Office of Rural Health and Community Care to support this effort.

Current Initiatives & Activities

- ***Partnership for a Healthy Durham, Obesity and Chronic Illness Committee***

This group, composed of members from Durham County Health Department, Duke University, Durham Public Schools (DPS), Durham Parks and Recreation, Lincoln Community Health Center, Durham Child Care Association, the community, and others, meets monthly to discuss and act on ways to move the people of Durham toward a healthier weight. Committee members

collaborate on actions ranging from writing letters of support for issues like the continued existence of a DPS Wellness Coordinator to creating walking trails in Durham neighborhoods to advocating for healthier food options in DPS to promoting breastfeeding-friendly workplaces.

Website: http://www.healthydurham.org
Phone Number: (919) 560-7833

- ***Durham County Health Department (DCHD)***

DCHD offers multiple services addressing healthy weight. Some of these include:

- Nutrition Division
  - DINE for LIFE offers nutrition education to schools and parts of the community which have high proportions of Supplemental Nutrition Education Program (SNAP, formerly Food Stamps) participants
  - Child Care Nutrition offers consultation about healthy eating and nutrition education to day care centers
  - Clinical Nutrition Services offers one-on-one counseling about a variety of issues including weight management. In addition, at times, nutritionists have offered programs for local physicians about approaching weight issues.
- Health Education Division
- Eat Smart, Move More Weigh Less 560-7771
- Living Healthy 560-7771
- County Wellness Team (worksite) 560-7765
- Wellness For Life (worksite health promotion) offered to small businesses in Durham 560-7771

Website: http://www.durhamcountync.gov/departments/phth/Nutrition.html
Phone Number: (919) 560-7791

- ***Duke Medicine***

Multiple options exist within the Duke system. Some of these include:

- Healthy Lifestyles Program (http://www.dukechildrens.org/services/nutritional_disorders_and_obesity; 919-620-5394)
  One in three children in North Carolina is overweight and suffers health problems, poor quality of life, and social isolation. The Healthy Lifestyles Program seeks to answer this challenge by offering caring providers, family-centered treatment programs, highly trained educators and researchers, and strong community partnerships.
- Live for Life (http://www.hr.duke.edu/about/departments/liveforlife/index.php; 919-684-3136)
  Duke's employee wellness program, offers a variety of programs and services, such as health assessments and education, smoking cessation programs, fitness activities and nutrition activities, to help eligible faculty, staff and family members reach their health and fitness goals.
- Duke Center for Living (http://www.dukehealth.org/locations/center_for_living/; 919-660-6610)

The Center for Living Campus at Duke University is the home of a host of health and wellness programs that provide innovative, personalized care for long-lasting lifestyle change.

- Duke Diet and Fitness Center (http://www.dukehealth.org/services/diet_and_fitness/about/; 919- (919) 688-3079) Duke Diet and Fitness Center treats individuals who are overweight or obese. Their therapeutic residential weight management program helps people affected by excess weight and impaired physical fitness achieve better health through weight loss, physical conditioning, and improved self-care habits.

Website: http://www.duke.edu (See specific websites and phone numbers above with descriptions from the websites)
Phone Number: (919) 684-8111

- ***Durham Public Schools (DPS) Wellness Coordinator***

Durham Public Schools has a Wellness Coordinator whose focus is to promote wellness, particularly healthy eating and adequate physical activity, to the DPS community—students, faculty, staff, administration, families.

Website: http://www.dpsnc.net DPS website
http://www.dpsnc.net/about-dps/district-policies/523/3021-school-wellness-policy DPS wellness policy
Phone Number: Wellness Coordinator (919) 560-2898

- ***YMCA***

The YMCA of the Triangle has three branches in Durham, each offering multiple opportunities for fitness and sometimes for nutrition information, both promoting healthy weight.

Website: http://www.ymcatriangle.org/Durham_YMCAs.aspx
Phone Number: (919) 667-9622

- ***Durham Parks and Recreation Department (DPR)***

DPR offers many fitness options and sometimes classes that relate to healthy eating. These are all ways to promote healthy weight.

Website: http://www.ci.durham.nc.us/departments/parks
Phone Number: (919) 560-4355

- ***Blue Cross Blue Shield North Carolina (BCBSNC)***

BCBSNC offers a number of incentives and resources to its members. Information is available on the member portion of its website.

Website: http://www.bcbsnc.com
Phone Number: (919) 688-5528

Section 6.05 *Mental Health and Substance Abuse*

Overview

Mental health and substance abuse disorders are major contributors to death and disability in North Carolina and Durham County. Addiction to drugs or alcohol is a chronic health problem, and people who suffer from abuse or dependence are at risk for premature deaths, co-morbid health conditions, injuries and disability. Individuals with poor mental health may have difficulties with interpersonal relationships, productivity in school or the workplace, and their overall sense of well-being. Depression is linked to lower productivity in the workplace, is a leading cause of suicide, and has been associated with increased use of health care services.[131] Moreover, addicted individuals are more likely to be involved with the criminal justice system[132] and individuals with severe mental illness have poor physical health and die prematurely when compared to individuals not suffering from chronic diseases.[133]

Addiction and mental illness are often seen as habits or moral failings. Recent research has dispelled this perspective as a myth. A combination of biological, environmental, nurturing, and spiritual factors contribute to an increased risk of contracting the diseases.[134] Thus, prevention and early intervention are critically important in reducing risks.

Healthy NC 2020 Objectives

Substance Abuse

Healthy NC 2020 Objective[135]	Current Durham	Current NC[136]	2020 Target
1. Reduce the percentage of high school students who had alcohol on one or more of the past 30 days	42.5% (2009)[137]	35% (2009)	26.4%
2. Reduce the percentage of traffic crashes that are alcohol-related	4.3% (2008)[138]	5.7% (2008)	4.7%
3. Reduce the percentage of individuals aged 12 years and older reporting any illicit drug use in the past 30 days	*8.5%[139] (North Central NC, 2006-2008)	7.8% (2007-08)	6.6%

*The National Survey on Drug Use and Health measures self-reports of illicit drug use. An estimated 8.5% in the North Central region of North Carolina reported illicit drug use. Figures were not available for Durham County.

While the rate for Durham is below the statewide average and the 2020 target, the percent of fatal crashes related to alcohol have increased from 22% in 2004 to 30% of all crashes in 2008.[140]

Mental Health

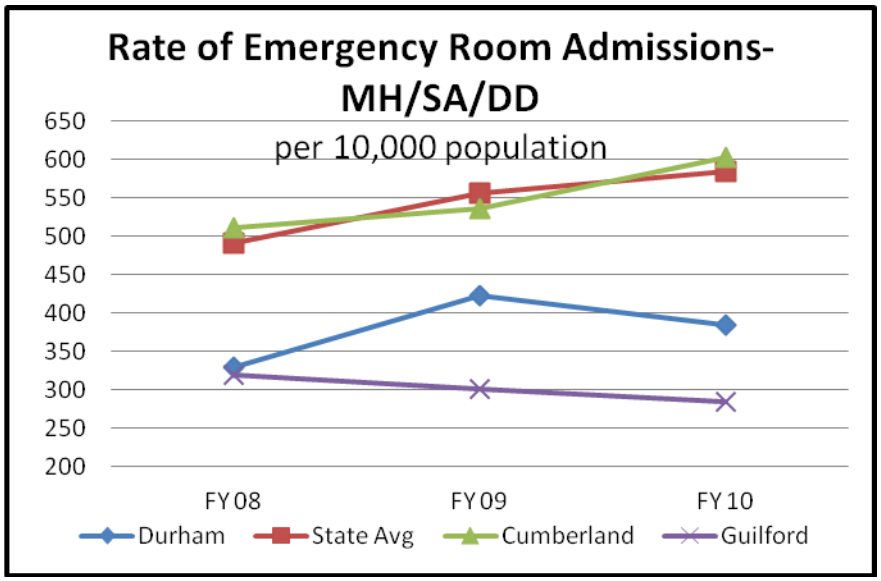
Healthy NC 2020 Objective[141]	Current Durham	Current NC[142]	2020 Target
1. Reduce the suicide rate (per 100,000 population)	7.8 (2004-08)[143]	12.4 (2008)	8.3
2. Decrease the average number of poor mental health days among adults in the past 30 days	3.6 (2009)*	3.7 (2009)	2.8
3. Reduce the rate of mental health-related visits to emergency departments (per 100,000 population)	57.8 (2010)[144]	92 (2008)	82.8

*State Center for Health Statistics, North Carolina Department of Health and Human Services. Written (email) communication. July 7, 2011.

Secondary Data: *Major findings*

Many residents of Durham County are impacted by substance abuse and mental health disorders, either personally or by witnessing the struggles of a friend, significant other, or family member. A mental health disorder requiring treatment may vary from a minor or periodic episode, such as post-partum depression; to life-long illnesses resulting in severe functional impairment (examples include schizophrenia or bi-polar disorders). Approximately 20% of the US population suffers from any mental illness, while 4.8% have been diagnosed with serious mental illness.[145] About 9% of the public struggle with substance use disorders such as alcohol or drug addiction.[146] A recent study by Duke found that alcohol was the primary substance abused by Durham County residents seeking crisis detox services and by adolescents in Durham's middle and high schools.[147] An estimated 17,000 residents of Durham County need mental health treatment and 19,000 need substance use treatment.[148]

Substantial improvements have been made in reducing psychiatric admissions to the state hospitals and local emergency departments and using more appropriate crisis services in the Durham community. In the 2011 report, *Community Hospital Emergency Department Admissions for Individuals with Behavioral Health Disorders in Durham County*, The Durham Center indicated that behavioral health and developmental disability admissions to emergency departments have decreased by 31% since July 2009 and state hospital admissions have decreased by 76% since July 2007.[149] Durham's rate is lower than the state average. When compared to similar counties of the same size, the rate of admission in Durham is lower than Cumberland, but higher than Guilford. This is shown in Figure 6.05(a) below.



*Note: MH/SA/DD = mental health / substance abuse / developmental disabilities
Figure 6.05(a)[150]

There has been a steady increase in individuals utilizing the broad array of services available at Durham Center Access, Durham Center's 24/7 crisis facility established in 2006 and operated by Freedom House Recovery Services. In 2008, the facility increased capacity from 5 to 11 evaluation and observation chairs, from 12 to 16 longer-term beds, and added evaluations of individuals for involuntary commitment when it moved to a newly-renovated facility that resulted from a close collaboration between The Durham Center, the Durham Board of County Commissioners and Duke Medicine. In addition to providing on-site crisis services, the facility houses the Mobile Crisis Team (MCT), Psychiatric Walk-In Clinic (PWIC), The Durham Center Assessment Team – which provides independent assessments to uninsured individuals seeking behavioral health services in Durham County, and an outpatient substance abuse treatment program. Additionally, a primary healthcare clinic is slated to open at Durham Center Access in late fiscal year 2011-2012 operated by Lincoln Community Health Care, which will provide on-site medical services and linkage to specialty care for those served by Durham Center Access.

The facility has an average of 180 admissions per month into the crisis evaluation chairs (typically fewer than 23 hours length of stay) and 120 admissions per month into the short-term stabilization beds with an average length of stay of three days. During fiscal year 2010, the facility accommodated 2,155 admissions to crisis evaluation and observation services. This translates to 45,650 hours of assessment, stabilization and referral to appropriate services and 1,463 admissions to facility-based crisis services. It also resulted in 4,732 days of medical and social detoxification, psychiatric medication, stabilization and outpatient referral. Between July and December of 2010, Durham Center Access diverted 71 individuals from state psychiatric hospitalization.

The Mobile Crisis Team, established in 2006, can respond 24/7 to a Durham resident at any location in Durham County to provide assessment, triage and stabilization in the least-restrictive, community-based setting. Of the 204 individuals served in fiscal year 2010, nearly all were diverted from hospitalization into a state facility.

The Durham Center Access Psychiatric Walk-in Clinic provides face-to-face assessments and intervention services Monday-Friday from 10:00am-6:00pm, including crisis stabilization, brief treatment (including medication) and linkage with community services. Of the 532 individuals served in fiscal year 2010, 100% were linked to community providers and diverted from state psychiatric hospitalization.

Treatment

The delivery of behavioral health services differ depending on the financial resources of the individual. According to a national survey, "34.5% of individuals who received *outpatient* mental health services in the past year indicated that most of the cost for those services was paid by private health insurance; 43.7% of those who received *inpatient* mental health services indicated that most of the costs were paid for by public insurance (Medicaid and Medicare)". Yet, over 60% of the individuals who received mental health services had private insurance, suggesting that private insurance was not utilized for most of the services received.[151]

Private Mental Health

Unlike the public mental health system, there is no central repository of data for treatment paid by private insurance. Blue Cross/Blue Shield is the largest insurer of health services in the state with 3.7 million customers. In 2008, the insurance company processed 46 million claims.[152] Private insurance is most often purchased by employers. Duke University and Duke University Medical Center manage their own plan.

Durham City/County governments purchase Blue Cross/Blue Shield for their employees. Data from Durham County indicated that behavioral health claims increased from FY 09 to FY 11:

- Psychiatric claims – 1,930 claims from 225 employees, an increase of 20%.
- Behavioral health outpatient claims – 65 visits from 20 employees, an increase of 300% (3 times as many claims submitted in FY 11 as there were in FY 09). Most of the increase occurred in FY 10, when the co-pay for the visits was eliminated.

Public Mental Health

Individuals with Medicaid or no insurance, and no ability to pay, are served by the public mental health system, managed by The Durham Center Local Management Entity (The Durham Center), a Durham County government agency. The Durham Center managed care for over 8,000 individuals—4,548 adults and 3,510 children and youth[153] in State Fiscal Year 2010 (July 1, 2009-June 30, 2010), along with an additional 148 youth and families who received prevention and early intervention services from July – December 2010.[154] Approximately 54-66% of the individuals in need of mental health treatment and 12-13% of the individuals needing substance abuse treatment are served by the public mental health system.[155]

The Durham Center conducted an assessment of consumer and family needs in early 2011 (previous assessments may be found on the Durham Center's website). Several major services were identified as strengths:

- Crisis services for adults
- Outpatient therapy
- Intensive substance abuse treatment
- Community living for individuals with developmental disabilities
- Care Coordination for those with multiple needs: The Durham Center's Care Coordination Team has successfully reduced readmissions to state psychiatric hospitals for individuals with multiple and complicated needs (e.g., multiple hospitalizations, involvement with law enforcement, chronic medical conditions). In a study of the impact of intensive care coordination and wrap-around services for 50 of the highest risk individuals, preliminary results suggest that the number of hospitalizations decreased by 64%, a savings of over $1.4 million in hospitalization costs.
- Access to and initiating treatment services - Individuals needing services in Durham County are consistently accessing and initiating services at rates above the state averages and standards. Direct service providers in The Durham Center network serve an average of 7% more consumers needing substance abuse and developmental disability services and 22% more consumers needing mental health services than state projections. The award-winning Durham Assessment Team is the first stop for consumers who are referred for services and who do not have an established provider. Since its inception, the Team has consistently received over 500 unduplicated referrals per quarter. The percent of individuals showing for the assessments is higher than the average across the state at approximately 65%.
- Use of best practices - Greater numbers of individuals are utilizing the best practice services available to residents of Durham County. For example, fewer youth are being placed out of home in non-family settings, such as group homes and institutions.[156] This is depicted in Figure 6.05(b) below.

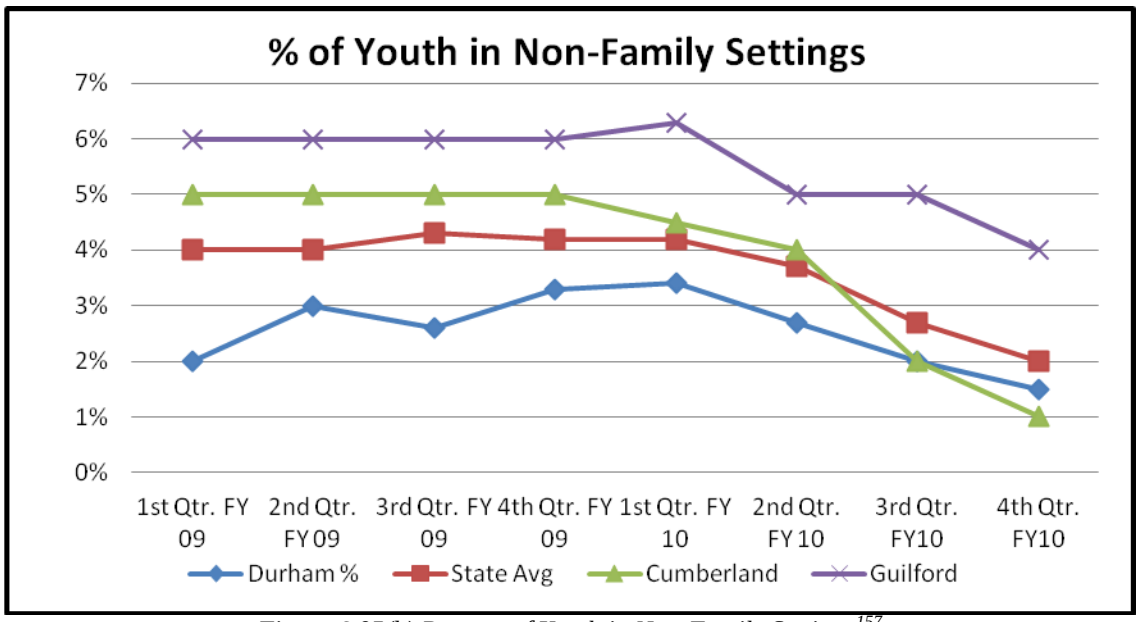


Figure 6.05(b) Percent of Youth in Non-Family Settings[157]

- Housing and services for the homeless - Individuals who are homeless or at-risk of being homeless are eligible for funding resources through their clinical home providers.

Assertive homeless outreach and rental assistance has helped over 550 people in the past fiscal year. In addition, more than 150 individuals sought assistance with housing services and 35 were connected with behavioral health services at the 2010 Project Homeless Connect.

Primary Data

Durham Health Innovations (DHI)[158]

Durham Health Innovations funded two planning grants related to mental health and substance abuse in 2009—Adolescent Health Initiative and Rethinking Pain. In Rethinking Pain, a community-based group discussed the co-existing conditions of chronic pain and behavioral health disorders. The group recommended greater integration of primary and behavioral healthcare, more training for Emergency Room staff on risks of opioid medication and alternative treatment, and creation of a system in the Emergency Room to track generalized pain complaints not associated with obvious injury.

The Adolescent Health Initiative reviewed the data on risky behaviors of Durham's adolescents. Mental health data from the YRBS suggests serious mental health concerns among Durham youth; 24% of high school respondents agreed that they feel alone in their lives, 27% reported feeling sad or hopeless, and 18% reported attempting suicide in the past year. The group recommended training peer educators on reducing risks and using texting/social media to promote messages, encouraging the development of protective factors within the schools, and creating a website listing resources for adolescents.

2010 Durham County Community Health Opinion Survey[159]

The 2010 Durham County Community Health Opinion Survey randomly selected Durham County households and asked several questions related to mental health and substance abuse. One section of the survey asked respondents to look at several lists and rank their top three neighborhood concerns. For example, one question had a list of 16 risky behaviors. Respondents were told, *"Please look at this list of risky behaviors. Keeping in mind yourself and the people in your neighborhood, pick the top unhealthy behaviors that have the greatest effect on quality of life in Durham County. Please choose up to 3."* As illustrated in the chart below, the four most popular responses are related to mental health and substance abuse: drug or prescription medication abuse (39%), alcohol abuse (35%), violent behavior (33%), and reckless/drunk driving (29%).

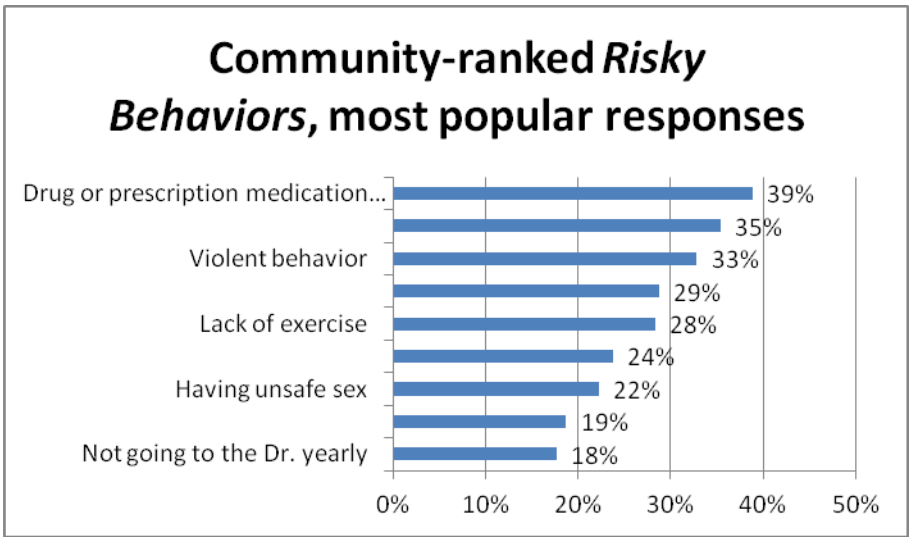


Figure 6.05(c) Community-ranked Risky Behaviors

When respondents were asked to identify the top three health problems in their community, addiction to alcohol, drugs or prescription pills ranked the highest (selected by 41% of respondents) and was followed by obesity/overweight (40%) and heart disease/heart attacks (35%). The percentage differed slightly based on the area of Durham, but both Northern and Southern Durham ranked this as the number one issue.

When asked "If you or a family member needed counseling for a mental health or a drug/alcohol problem, who would you tell them to call?" respondents overwhelming choose doctors (38.3%) followed by a private counselor or therapist (19.4%) and Durham Center Access (13.1%).

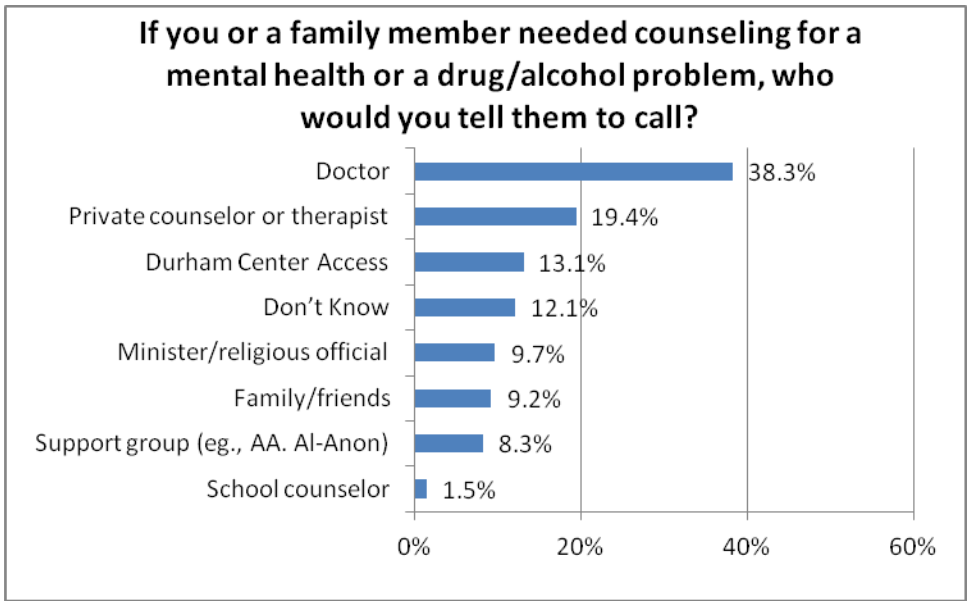


Figure 6.05(d)" If you or a family member needed counseling who would you call?"

2009 Youth Risk Behavior Survey (YRBS) [160]

The YRBS was given to randomly selected classrooms of middle and high school students in Durham Public Schools. The YRBS is a CDC survey designed to monitor priority risk behaviors related to tobacco use, unhealthy diet, inadequate physical activity, alcohol and other drug use, unintended pregnancy and sexually transmitted diseases, and unintentional injuries and violence. In 2009, Durham County met three North Carolina benchmarks for both middle and high school students, which included smoking before the age of 11, overall smoking, and sniffing glue or spray containers.

Below is a selection of questions that middle school (MS) and high school (HS) students answered related to mental health and substance use. Compared to minority students, white middle school students (80.6%) were significantly more likely to report feeling good about themselves. Hispanic students were significantly more likely to report *not* feeling good about themselves, report drinking more heavily and attempting suicide more often when compared to students of other ethnicities.

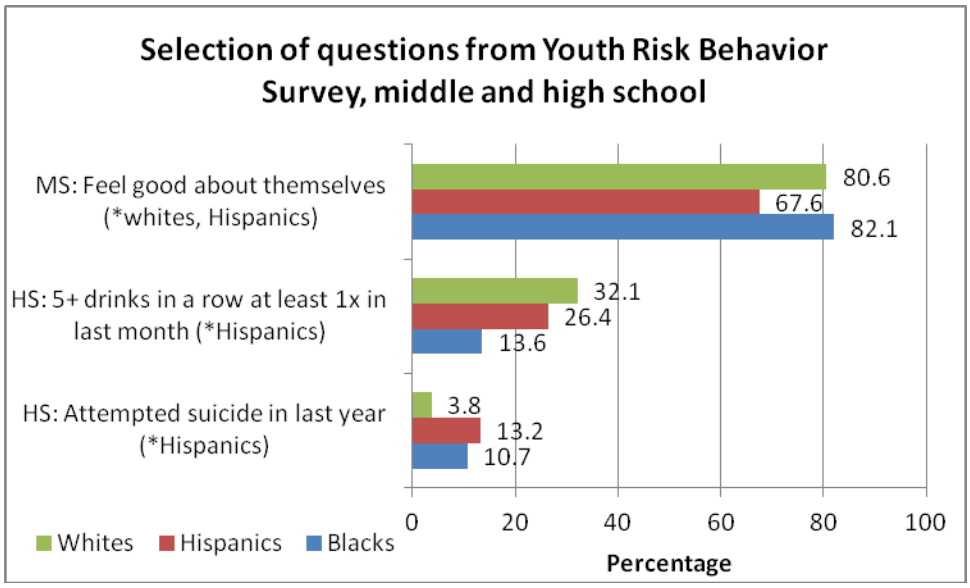


Figure 6.05(e) YRBS Data

The rate of suicides in Durham is lower than the statewide average and the 2020 Healthy North Carolina objective. On the other hand, young people in Durham report thoughts of and suicide attempts at slightly higher rates than the state average. According to the YRBS survey:

- 20.1% of middle school students have seriously considered killing themselves
- 13.9% of high school students seriously considered attempting suicide during the past 12 months
- 15.5% of middle school students and 10.4% of high school students have ever made a plan about how they would kill themselves

In addition to the results above, findings from Durham's Youth Risk Behavior Survey indicated that alcohol is used frequently by high school students:

- 2/3 reported ever drinking alcohol

- 21% have consumed 5 or more drinks in a row

Equally concerning is the use of illicit substances and misuse of prescription medications among young people. Forty-four (44%) reported ever using marijuana, 29% of which used in the last 30 days and 17% misuse prescription medications.[161]

Interpretations: *Disparities, gaps, emerging issues*

The priorities for service needs as identified from The Durham Center's assessment include:

- ***Treatment for co-occurring disorders*** – integrated mental health and substance abuse services for individuals leaving jail/prison and services for individuals with developmental disabilities who also suffer from mental health disorders.
- ***Identification of individuals with developmental disabilities who need services*** – estimates reported by the state indicated that individuals with developmental disabilities access services in Durham at rates lower than expected. However, there are 288 people waiting for CAP (Medicaid waivers for developmental disability services) services.
- ***Additional crisis services for youth*** – located close to or inside Durham County. In 2009, 124 Durham County youth required involuntary commitment due to a psychiatric crisis. Currently, there are limited options for Durham County youth in crisis. Durham Center Access (DCA) has the ability to accommodate up to two youth in its 23-hour Crisis Evaluation and Observation (CEO) chairs. If the youth has a treatment provider, DCA staff coordinate treatment planning with provider staff and family involved and ideally stabilize the individual to where he or she can be released from petition and returned to community-based services. If the youth does not have a current provider, every effort is made to connect that individual to a provider with the appropriate level of services and clinical care. For youth that are identified as needing a higher level of care, DCA attempts to locate community hospital beds prior to accessing State hospital beds for psychiatric stabilization.

  In addition to DCA, Duke University Medical Center (DUMC) regularly has youth in crisis. DUMC is often able to stabilize youth in the emergency room; however, unlike some hospitals in the triangle area (e.g., UNC), DUMC does not have the capability to admit anyone under 18 for psychiatric reasons. While both DCA and DUMC are able to treat youth that present in various capacities, resources are needed for youth that require stabilization beyond 23 hours. Additionally, crisis prevention and response services should be created to address the needs of the Hispanic population. Thirteen percent (13%) of Hispanic youth responding to the YRBS survey indicated that they had attempted suicide in the last year, three times greater than the percentage of white students.
- ***Services for individuals involved with the criminal justice system*** – in addition to the co-occurring services mentioned above, data indicated additional services are needed to divert non-violent offenders with mental health and substance abuse disorders from the jail, treatment services for sex offenders, and specialized services for violent offenders. The data indicate a correlation between substance misuse and law enforcement involvement: approximately 20% - 60% of individuals incarcerated or involved with the juvenile justice system need substance abuse treatment and nearly 1/3 of domestic violence calls to law enforcement are related to substance use.

- ***Expansion of substance abuse prevention and residential services*** - on average, 21 families are waiting for prevention services and 4 adults are waiting for residential services. Prevention services are critical to reduce the need for more expensive treatment services. The need for prevention and early intervention services to curb substance abuse is essential in Durham County due to the greater percentage of adolescent youth using alcohol and marijuana, as compared to the rest of the state. According to the YRBS, 43% of youth in high school consumed alcohol in the past 30 days and 44% have ever tried marijuana.
- ***Services for consumers with eating disorders***.

Several ancillary supports, adjunct to therapy services, were identified as a need for The Durham Center's consumers:

- *Housing* – independent and supported housing
- *Employment* - full-time positions, particularly for individuals with criminal histories, and supported employment. Of those consumers who responded to the employment related questions, 63% reported being employed where they want to be.
- *Social/Recreational* – social activities, day programs, and "social gathering places" for individuals with mental illness.

In addition to the service needs mentioned above, the data suggested that several groups of Durham County residents need specialized services:

Spanish speakers

According to the 2010 Census, the Hispanic population in Durham has grown substantially in the last decade to 36,077 people, an increase of 112% from the 17,039 individuals counted in the 2000 Census.[162] Since Hispanics have the highest uninsured rate of any ethnic group and tend to have lower incomes, Hispanic individuals would be expected to present in the public mental health system at a rate greater than other minority populations. In 2007, approximately 7% of Durham Center consumers (475 individuals) were identified as Hispanic.[163] Beginning in 2009, a greater number of Spanish speaking individuals began presenting in the public mental health system for services. Many Spanish-speaking individuals do not receive treatment because they cannot pay or are sent to providers who do not have bi-lingual staff to communicate effectively with them. Providers rely on well-trained interpreter services. However, services are more effective when delivered by professionals who are bi-cultural and bi-lingual. Starting in 2010, Durham Center developed greater capacity to serve these individuals. In the first half of FY 11, 154 Spanish speaking individuals in the first quarter and 157 in the second quarter presented for bi-lingual, bi-cultural treatment. The Durham Centers expects the number of Spanish-speaking individuals presenting in the public mental health system to continue to increase, and, thus, need additional capacity to serve them.

Senior Citizens

Data suggest that mental illness and substance use disorders are prevalent among older adults aged 50 and over. National studies estimate that 4 – 5% of older adults abuse substances, particularly marijuana and prescription medications,[164] and 6% - 10% suffer from frequent

mental distress.[165] Approximately 3% - 4% of the consumers served by The Durham Center are aged 60 and over and another 10% are aged 50 – 59.[166] Programs need to be designed specifically for older adults, using best practice guides such as Linking Older Adults with Medication, Alcohol, and Mental Health Resources.[167]

Military /Veteran Population

North Carolina is home to the fourth largest military population in the nation. There are currently 120,000 active-duty personnel based at 7 military installations in North Carolina. It also home to almost 800,000 veterans, which places the state fifth in military retiree population and ninth in veteran population. Health care services and supports for the military population are not always available or easily accessible. Accessing comprehensive behavioral health care is complicated by several barriers, including stigma, insurance networks, and lack of behavioral health professionals.[168]

The Durham Veterans Administration (VA) Medical Center provides health care to the military/veteran population and also serves as a major referral center for North Carolina, southern Virginia, northern South Carolina, and eastern Tennessee.[169] According to 2010 Census data, 15,211 veterans live in Durham County.[170] As the military population continues to grow in North Carolina, it is important that agencies work collaboratively at all levels to address the challenges and needs of this special population.

Transition-Aged Youth

Serving older youth transitioning into adulthood is one of the most difficult issues facing our society, especially our human service agencies. Older youth who have been frequent users of intensive child mental health services, including out-of-home placements, are at considerable risk of disengagement from services as they age out of the child and into the adult mental health system. Such disengagement is a consequence of the substantial service chasm between the disparate child and adult mental health systems and yet, the service needs of individuals stuck in this chasm are extensive. Youth with a severe emotional disturbance (SED) show patterns of school disengagement, high rates of academic failure, high dropout rates, higher criminal justice involvement, and significantly lower employment rates. In addition to being disengaged from the service system, high risk transition-aged youth may also experience a parallel separation from family and other social supports. Access to services and continuity of care that can facilitate their transition to adulthood are unavailable for this vulnerable population of young people in current service systems.

The consequences of inappropriate or inadequate care can be enormous; failure to achieve developmental milestones such as education, employment, stable and independent housing and meaningful relations increases the risk for negative outcomes in the transition to adulthood. Furthermore, research has shown that achievement of developmental milestones prompts access to psychotropic medications, and effective psychosocial services can serve as protective factors for the course of a severe mental illness.

In 2010 the Durham Center was awarded a federal grant from the US Substance Abuse & Mental Health Services Administration (SAMHSA) to create a bridge between the child and adult service systems, addressing clinical, developmental, and social needs including educational attainment and workforce connections. The initiative is called BECOMING (Building Every Chance of Making It Now and Grown-up) and will serve youth ages 16-21 who have behavioral health challenges and are characterized as "disconnected". More information is available in the Current initiatives and activities section below.

Lastly, we recommend efforts to increase awareness of services and how to support individuals with mental health and substance use disorders. From the several surveys cited above, respondents indicated the need for more information about behavioral health disorders and services. The community opinion survey indicated that nearly half of respondents recognized addiction as a problem in their community. Participants in Durham Center's focus groups and surveys recommended greater awareness of services and supports. More education and awareness programming may assist community members in intervening to address the problem.

Recommended Strategies

Setting	Name	Description / Website
Community	Durham System of Care	Durham's System of Care is a framework for organizing and coordinating services and resources into a comprehensive and interconnected network. Its goal is to help individuals and families who need services or supports from multiple human service agencies to be safe and successful at home, in school, at work and in the community. Our System of Care builds on individual and community strengths, and makes the most of existing resources to help these individuals and families achieve better outcomes. http://www.durhamsystemofcare.org
Individual	Strengthening Families Program	An evidence-based family skills training program found to significantly reduce problem behaviors, delinquency, and alcohol and drug abuse in children and to improve social competencies and school performance. http://www.strengtheningfamiliesprogram.org/
Individual	Evidence-Based Treatment Models	Models with curriculum manuals and specific training shown to effectively treat mental health and substance use disorders. Models currently in use in Durham can be found online at: http://www.durhamcenter.org/uploads/docs/publications/Evidence-Based_Practices_Brochure.pdf
School	Reconnecting Youth/Early Risers	School-based education and skill-development programs shown to prevent or reduce substance use among elementary and middle school youth. http://www.reconnectingyouth.com/ http://wch.uhs.wisc.edu/13-Eval/Tools/Resources/Model%20Programs/Early%20Risers.pdf
School	Adolescent School Health Program	Depression screening and healthy behavior group classes in public, private, charter and alternative schools. The division promotes early intervention, advocate for treatment and referral and follow-up services. Treatment for depression is not provided. http://www.naccho.org/topics/modelpractices/database/practice.cfm?PracticeID=281

Current Initiatives & Activities

- ***The Durham Center LME***

Manager of public behavioral health and developmental disability services.

Website: http://www.durhamcenter.org/providerdb/index.php
Phone Number: (919) 560-7200 (information), (919) 560-7100 (request treatment services)

- ***Network of Care***

Online directory of behavioral health services and information place for the individuals, families, and agencies.

Website: http://durham.nc.networkofcare.org

- ***Partnership for a Healthy Durham***

Mental Health and Substance Abuse Committee - develops strategies to address mental health and substance abuse concerns in Durham County.

Website: http://www.healthydurham.org/
Phone Number: (919) 560-7833

- ***Durham System of Care***

Durham's System of Care is a framework for organizing and coordinating services and resources into a comprehensive and interconnected network. Its goal is to help individuals and families who need services or supports from multiple human service agencies to be safe and successful at home, in school, at work and in the community. Our System of Care builds on individual and community strengths, and makes the most of existing resources to help these individuals and families achieve better outcomes.

Website: http://www.durhamsystemofcare.org

- ***Durham VA Medical Center***

Provides comprehensive medical and behavioral health services to veterans in central and eastern North Carolina.

Website: http://www.durhamva.gov

- ***BECOMING (Building Every Chance of Making It Now and Grown-up)***

  Serve youth ages 16-21 who have behavioral health challenges and are characterized as "disconnected" in one or more of the following ways: no diploma and not in school, pregnant or parenting, involvement with criminal justice, exiting foster care, or long term unemployed or underemployed.

  Contact: Tonya Van Deinse; tvandeinse@durhamcountync.gov
  Phone Number: (919) 560-7589

- ***Report: Substance Use and Abuse in Durham County (October 2010)***

This report compiles information from a variety of agencies and sources on how substance use and abuse is affecting Durham County. By examining information from a variety of sources such as law enforcement agencies, treatment providers, information on self-reported prevalence of use, drug seizures, and motor vehicle accidents, a better understanding of the substance use problem in the community becomes apparent.

Website: http://www.healthydurham.org/docs/file/resources/SA%20Abuse%202010.pdf
Phone Number: (919) 560-7833

Section 6.06 *Asthma*

Overview

Asthma is an inflammatory disease of the airways that usually manifests as tightness in the chest, shortness of breath, coughing, and wheezing. When someone suffers an "asthma attack" muscles around the airways tighten, which causes the air passage lining to swell.[171] Less air can move through the airways and it becomes harder to breathe. Some people with asthma have other family members with asthma or allergies, but others do not have a family history of asthma. Asthma attacks can be triggered by common allergens, such as animals, mold, pollen, or dust, or by pollution, tobacco smoke, or changes in the weather. The affects of asthma can be severe and include the possibility of death, inability to exercise or partake in physical activities, diminished sleep, permanent damage to the airways, chronic cough, and even severe interventions that require use of a ventilator.[172]

Healthy NC 2020 Objective

There is no Healthy NC 2020 Objective for Asthma.

Secondary Data

Innovative Approaches to Better Detect and Treat Asthma and Chronic Obstructive Pulmonary Disease (COPD) in Durham is a collaboration of healthcare providers and community members who serve the public in Durham County. This team is one of ten teams under the Durham Health Innovations (DHI) partnership between Duke Medicine and the Durham community – a partnership that seeks to improve the health status of Durham County residents. Ten DHI teams were awarded planning grants to design health systems that deliver proven interventions which use information technology to facilitate coordination around care. Team projects focus on reducing the rates of death and disability across all of Durham County. The DHI Asthma/COPD team focuses on improving healthcare outcomes of Durham County residents with Asthma or COPD, and there is reason for concern when we consider statistical reports on Durham County.

Among adult residents (> 18 years), asthma was diagnosed in 56% during childhood, and 44% during adulthood.[173] These statistics contrast from the national average, where 10-20% of asthma is diagnosed in adulthood. Of note, a diagnosis of asthma in Durham adults was also present in 35% of patients with COPD, suggesting an overlap between these two diseases in the adult population in North Carolina.[174] Of the adults with asthma, 20% experienced at least one exacerbation requiring an urgent care/Emergency Department visit, and 15% lost between 1 and 7 days of work.[175]

While COPD is the fourth leading cause of death nationally, it was the second leading cause of death in Durham from 2001-2005 and fourth leading cause from 2005-2009, suggesting considerable morbidity and mortality associated with this disease.[176, 177]

Given the significant burden of asthma and COPD in Durham County, particularly among those who are uninsured or insured by federal programs, the question arises of how to provide quality

care that can minimize relevant outcomes: ED visits, hospital admissions, urgent physician visits, and loss of time from work and/or school. Approximately 50-60% of healthcare dollars spent on asthma and COPD are to care for patients during an exacerbation.[178] Despite the presence of federally funded clinics and several community programs in which patients with respiratory disease with Medicaid and Medicare are eligible to participate such as the Durham Community Health Network/Carolina Access, Local Access to Coordinated Health Care (LATCH), Just for Us, Project Access and School nurse programs, morbidity remains high.[179]

Primary Data

The burden of asthma and chronic obstructive pulmonary disease (COPD) is increasingly common worldwide with significant associated morbidity and mortality. The impact of asthma and COPD in Durham County is concerning, as demonstrated by data made available through the 2009 Youth Risk Behavior Surveillance (YRBS). In Durham County, both middle school and high school students have a higher prevalence of asthma when compared to the remaining central region and the state of North Carolina.[180] This is depicted Figure 6.06(a) below.

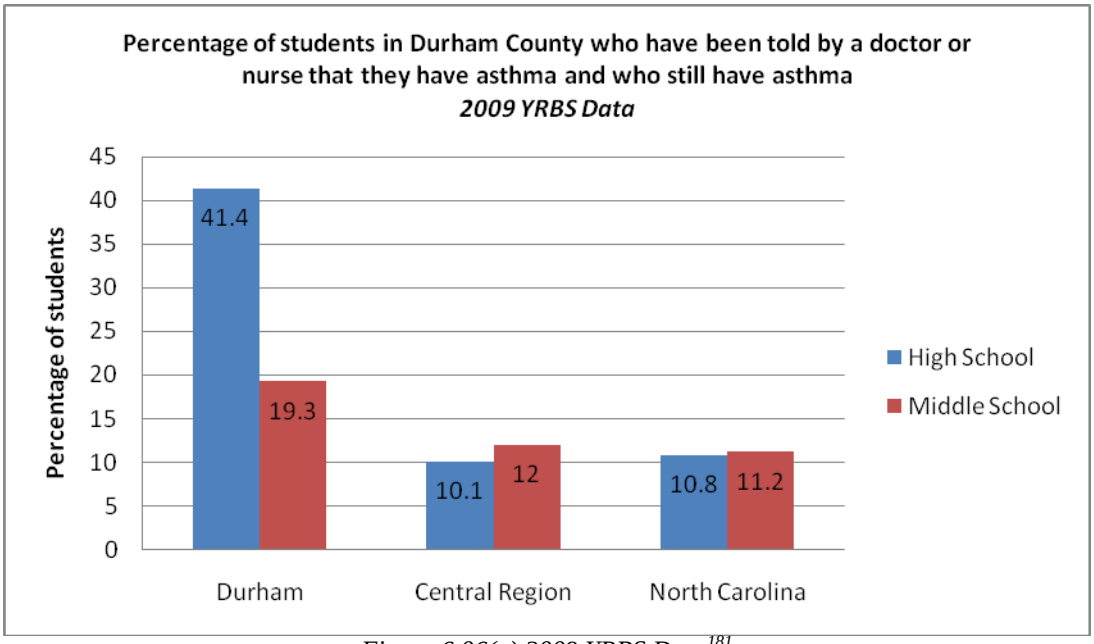


Figure 6.06(a) 2009 YRBS Data[181]

High pediatric asthma admission rates also underscore the issue of asthma in Durham County. In 2007, the Durham County pediatric asthma admission rate was 109.5 per 100,000, the third highest county in North Carolina.[182]

Interpretations: *Disparities, gaps, emerging issues*

In 2009, the Durham Health Innovations (DHI) Asthma-COPD team studied disparities, gaps, and emerging issues with asthma and COPD treatment in the Durham County area. Geospatial mapping provided insight into the characteristics of this at-risk population. Those areas with the

highest density of both outpatient and emergency department utilization for either asthma or COPD care were consistently localized to a small number of zip codes within Durham County. These areas were notable also for having a higher percentage of minority population, higher percentage of poverty, and an overall lower median household income.[183]

Recommended Strategies[184]

The DHI Asthma-COPD team 2009 report recommended a chronic care model that involves education and self-management, clinical decision support, delivery system design/proactive care, clinical information systems, and several health care organizations and community resources.[185] A key component of the initial model is a strong on-going quality improvement component, which would improve monitoring of patients with asthma or COPD and consequently prevent future exacerbations and subsequent visits to emergency departments. Furthermore, the model would support the use of case management by means of community health care navigators to monitor, support, facilitate and document/track activities of patients in local clinics. These navigators could interface with all designated care providers to provide a consolidated approach to patients, provide education and instruct in the self-management of Asthma and COPD using well-established methodologies to determine control of airway disease and assess whether intervention is necessary. The team report also recommends creation of an asthma/COPD chronic disease registry to utilize health information, to identify patients who are non-adherent, and identify situations in which providers may not be following the recommended guidelines. The team also proposes utilizing the Community Oriented Approach to Coordinated Healthcare, or "COACH" system currently in place for NC Medicaid patients and applying those same concepts and tools to the entire Asthma and COPD population in local clinics.

Current Initiatives & Activities

- ***Asthma Alliance of North Carolina***

The Alliance serves as an "umbrella" group to ensure coordination and collaboration among the many asthma-related organizations in this state. Our partner, the NC Division of Public Health, has established a program infrastructure that is helping to move the Alliance forward and strengthen the relationships between this statewide effort and local initiatives. Most recently, the Alliance played a key advisory role in the development and now in the implementation of the North Carolina Asthma Plan 2007-2012.

Website: http://www.asthma.ncdhhs.gov/ncapAANC.htm
Phone Number: (919) 707-5212

- ***Duke Asthma, Allergy and Airways Center***

The Duke Asthma, Allergy and Airways Center are a project of the Departments of Medicine and Pediatrics to develop a state-of-the-art clinic for patients with asthma and other lung and allergic problems. The Center brings together specialists in lung disease, and allergy to offer care for adults and children in a caring environment at a site conveniently located in Durham, but still a part of Duke University Medical Center. In addition to comprehensive medical care, it is our goal to educate patients so that they are empowered to control their disease.

Website: http://aaac.duhs.duke.edu
Phone Number: (919) 620-7300

- ***American Lung Association***
  The American Lung Association is the leading organization working to save lives, improve lung health and prevent lung disease. The American Lung Association is "Fighting for Air" through research, education and advocacy.

  Website: http://www.lungusa.org/

Section 6.07 *Sickle Cell Disease and Sickle Cell Trait*

Overview

Sickle cell disease is a genetic condition scientifically known as a hemoglobinopathy or blood disorder. It is a characterized by a dysfunction of the red blood cells which carry oxygen from the lungs throughout the body causing chronic, lifelong debilitating health problems. Some of these health problems include stroke, acute chest syndrome, leg ulcers and pain crisis. The originator to this inherited disease is the presence of the sickle cell gene. Persons born with sickle cell trait are carriers of the sickle cell gene. According to Centers for Disease Control and Prevention, people who inherit one sickle gene and one normal gene are born as carriers of the sickle cell gene and considered as carriers of the sickle cell gene.[186] These persons are referred to as having sickle cell trait and typically do not have any of the symptoms of the disease, but they can pass it on to their children. However, it is possible for persons with sickle cell trait to experience complications of sickle cell disease, such as splenic sequestration, pain crisis, and rarely, sudden death. This can happen under extreme conditions of:

- High altitudes (flying, mountain climbing or cities with high altitudes)
- Increased pressure (scuba diving)
- Low oxygen (mountain climbing, exercising extremely hard, such as in military boot camp or when training for an athletic competition)
- Dehydration

People at high risk for sickle cell disease and sickle cell trait are those whose ancestors come from Africa, Central America, Caribbean, Mediterranean countries, India and Saudi Arabia. However, persons of any race or ethnicity can have sickle cell disease and sickle cell trait.[187]

Since 1994, all infants born in North Carolina have been tested for sickle cell disease and sickle cell trait through the state's newborn screening program. However, many people still do not know if they have sickle cell trait. Citizens must be educated about this condition and the potential risk for passing sickle cell trait or sickle cell disease to their unborn children. From a public health standpoint, education, access to counseling, testing and longitudinal clinical care is critical to reduce sickle cell disease and sickle cell trait.

Healthy NC 2020 Objective

There is not a Healthy NC 2020 Objective for sickle cell disease or sickle cell trait. However, according to the U.S. Department of Health and Human Services (DHHS), there is a national goal and several objectives for hemoglobinopathies (blood disorders), which include sickle cell disease, sickle cell trait and blood safety. The goal and objectives defined by Healthy People 2020 are as follows:[188]

Goal: To prevent illness and disability related to blood disorders and the use of blood products.

Blood Disorders and Blood Safety (BDBS) Objectives:
BDBS–1 Vaccinations of persons with hemoglobinopathies
BDBS–2 Patient and family referral for hemoglobinopathies
BDBS–3 Hemoglobinopathies care in a medical home
BDBS–4 Screening for complications of hemoglobinopathies
BDBS–5 Disease-modifying therapies for hemoglobinopathies
BDBS–6 Penicillin prophylaxis for sickle cell disease
BDBS–7 Hospitalizations for sickle cell disease
BDBS–8 High school completion among persons with hemoglobinopathies
BDBS–9 Community-based organizations campaigns for hemoglobinopathies
BDBS–10 Awareness of hemoglobinopathy carrier status

While all of these are worthy objectives, the focus of this section is objective ***BDBS-10: Awareness of hemoglobinopathy carrier status***.

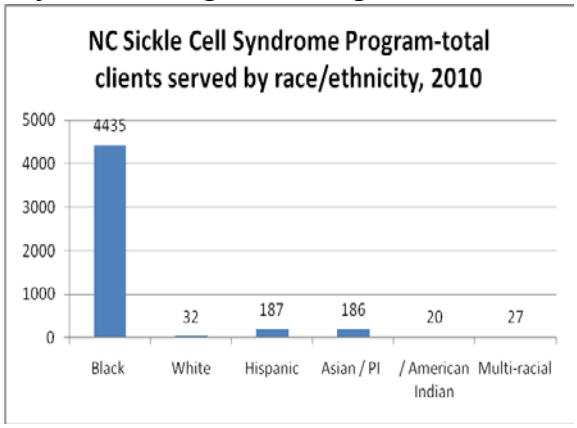
Secondary Data: *Major findings*

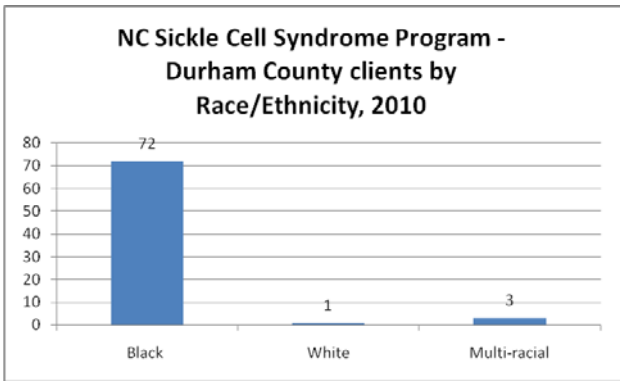
The North Carolina Sickle Cell Syndrome Program (NCSCSP), located within the North Carolina Department of Health and Human Services, offers comprehensive services for individuals and their families affected by the disease, as well as education and genetic counseling for the general public.

United States, North Carolina and Durham County Statistics[189]

- It is estimated that up to 100,000 persons have sickle cell disease in the US.
- It is estimated that more than 2 million people have sickle cell trait which occurs in about 1 in 12 African Americans.
- As of December 2010, the NCSCSP served approximately 4,887 people in North Carolina with abnormal blood disorders including sickle cell disease.
- As of December 2010, the NCSCSP currently provides care coordination to 76 persons in Durham County with sickle cell disease. These services are provided by a state employed Regional Educator Counselor.
- In 2009, Durham County had 4,423 live births and of those live births, two infants were born with sickle cell disease and 164 babies were diagnosed with sickle cell trait.

The two charts below illustrate the total clients served by the North Carolina Sickle Cell Syndrome Program, throughout the state and in Durham County.[190]





Cost of Sickle Cell

According to the Centers for Disease Control and Prevention (CDC), in 2005, medical costs for children with sickle cell disease averaged $11,702 for children with Medicaid coverage and $14,772 for children with employer-sponsored insurance. During this time, 40% of both groups had at least one hospital stay.[191] Historically, sickle cell disease has been a major public health concern; from 1989 through 1993, there was an average of 75,000 hospitalizations due to sickle cell disease in the U.S., with costs totaling close to $475 million.[192]

Primary Data

There is no primary data available on this topic.

Interpretations: *Disparities, gaps, emerging issues*

Sickle cell disease is a congenital, chronic and debilitating disease. People at high risk for having sickle cell disease and sickle cell trait are those whose ancestors come from Africa, Central America, Caribbean, Mediterranean countries, India and Saudi Arabia. However, persons of any race or ethnicity can have sickle cell disease and sickle cell trait.[193]

Durham County is unique when compared to other parts of the state in that it is home to Duke University Medical Center and UNC–Chapel Hill is located within 30 miles of its borders. Both of these institutions have comprehensive medical centers that offer specialized clinical services to persons with sickle cell disease and sickle cell trait. Statistics maintained by the NCSCSP indicate that the overwhelming majority of clients served in Durham County are African-American. Reaching out to this group and addressing the emerging population of Hispanics suggest that special efforts should be made to educate and inform them about sickle cell disease and sickle cell trait.

The Bridges Pointe Foundation, a local sickle cell community-based organization has identified two major problems for sickle cell disease clients. These include limited employment

opportunities and inadequate psychosocial support services. Bridges Pointe Foundation provides education about sickle cell disease to local employers in an effort to improve the work environment for sickle cell disease clients.

Although Durham County does have resources within the sickle cell provider community, there are still gaps in the coordination of client care, public awareness about sickle cell disease and reaching at-risk populations. While babies are identified at birth for sickle cell disease and sickle cell trait through newborn screening, many adults may not know if they carry the sickle cell trait. Sickle cell trait testing and counseling is important and should be promoted for all Durham County residents.

Recommended Strategies

The recommended strategies for strengthening services for sickle cell clients and providing general sickle cell education to Durham County residents include:

- Increase the distribution of education materials to clients that attend Durham County Health Department (eg. place posters & brochures in visible client areas).
- Continue to provide sickle cell trait testing at no charge to Durham County residents at the Durham County Health Department
- Coordinate activities with the state employed regional sickle cell educator counselor for counseling, referral and education services.
- Collaborate with Bridges Point Foundation for adult sickle cell client housing, social support as well as the provision of sickle cell education and resource information to various community groups.
- Provide opportunities for sickle cell education at meetings, conferences, health fairs and other health related activities.
- Work with other health agencies to enhance sickle cell trait counseling services.
- Refer sickle cell clients to Duke University Medical Center Comprehensive Sickle Cell Program and to UNC-Chapel Hill Comprehensive Sickle Cell Program.

Current Initiatives & Activities

North Carolina Sickle Cell Syndrome Program (NCSCSP)

NCSCSP is a state legislated program created under House Bill 32 that began in 1973. The program is housed in the Division of Public Health within the Department of Health and Human Services. It is supported by the governor appointed North Carolina Council on Sickle Cell Syndrome and Related Genetic Disorders. This 15-member advisory council has representatives from around the state committed to enhancing the lives of those affected by sickle cell disease and sickle cell trait.

NCSCSP currently serves 4,887 clients and operates a staff of 12 employees. Three are central office staff and nine are sickle cell educator counselors who provide sickle cell care coordination, counseling and education services to persons living in 81 counties. Three state-contracted community-based organizations with four locations provide these same services in 19 counties, thereby covering all 100 counties.

In addition, the program provides services and resources which include sickle cell education, training and genetic counseling. NCSCSP has educator counselors who work with local health departments to ensure residents receive free sickle cell testing and counseling. An added benefit of the program is the state funded Purchase of Medical Care (POMC) component which offers financial assistance to cover medical costs for eligible clients.

Over the past year and a half, the program has been conducting the Registry and Surveillance of Hemoglobinopathies (RuSH) project funded by Centers for Disease Control and Prevention (CDC). The aim of this project is to identify those individuals with sickle cell and thalassemia that are not captured in any formalized or comprehensive data system. This project includes partnerships with UNC Greensboro, the State Laboratory of Public Health, Vital records, Medicaid/Medicare, Newborn Screening, the three community based organizations and the six comprehensive sickle cell medical centers. From this effort, a client find pilot project is being implemented with the three community based organizations that will provide additional quantitative and qualitative data for surveillance.

- ***North Carolina Sickle Cell Syndrome Program*** **(NCSCSP)**

Website: http://www.ncsicklecellprogram.org
Phone Number: Regional Educator Counselor: (919)707-5700 or (252) 438-5733
Attention: (Ester Kearney)

NCSCSP provides sickle cell care coordination, counseling and education services to persons living in 81 counties. They also partner with institutions and organizations throughout the state to promote sickle cell education and awareness by participating in local and statewide activities and sponsoring conferences. NCSCSP distributes free educational materials and promotional items when requested by individuals, groups or organizations.

Medical Centers

There are also six state-contracted comprehensive medical centers which provide specialized clinical care to persons with sickle cell disease. These medical centers are: Duke University, UNC-Chapel Hill, East Carolina University, Missions Hospital, Wake Forest Baptist Medical Center and Carolina's Medical Center. They have been at the forefront of sickle cell research and conduct clinical trials and important work advancing patient care and seeking a cure for individuals living with sickle cell disease.

- ***Duke University Comprehensive Medical Center***

Provides specialized clinical care to persons with sickle cell disease.

Website: http://www.chg.duke.edu/diseases/sicklecell.html
Phone Number: (919) 684-6464

- ***UNC-Chapel Hill***

Provides specialized clinical care to persons with sickle cell disease.

Website: http://www.med.unc.edu/
Phone Number: (919) 966-0178

Community-based organizations and resources

The three community based organizations are: Community Health Interventions and Sickle Cell Agency, Piedmont Health Services and Sickle Cell Agency and Sickle Cell Disease Association of America, Inc., Eastern North Carolina Chapter. These three community-based organizations support summer camps for youth and have been funded by the federal government to promote telemedicine and sickle cell trait studies.

- ***Durham County Health Department***

Provides sickle cell trait testing at no charge to residents who request it.

Website: http://www.co.durham.nc.us/departments/phth/
Phone Number: (919) 560-7600

- ***Bridges Point Foundation***

Provides client social support and housing for adults living with sickle cell disease. It is a local resource for sickle cell education, including local events and educating employers to improve the work environment for sickle cell disease clients.

Website: http://www.bridgespointefoundation.org
Phone Number: (919) 684-6464 (Attention: Elaine Whitworth)

- ***The North Carolina Sickle Cell Consortium***

This voluntary-led organization addresses meets quarterly in Durham and has representatives from the sickle cell community-based organizations, the comprehensive medical centers, sickle cell educator counselors, persons living with sickle cell disease, their family members and other interested persons.

Website: http://ncscc.org/
Phone Number: (919) 684-6464 (Attention: Elaine Whitworth)

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6.07	Sickle cell disease	Vickie White, RN	Durham County Health Department, Program Manager

Data Sources

[1] North Carolina Institute of Medicine Task Force on Prevention. *Prevention for the Health of North Carolina: Prevention Action Plan.* Morrisville, NC: North Carolina Institute of Medicine; 2009. http://www.nciom.org/wp-content/uploads/NCIOM/projects/prevention/finalreport/PreventionReport-July2010.pdf. Accessed August 5, 2011.
[2] North Carolina Institute of Medicine Task Force on Prevention. *Prevention for the Health of North Carolina: Prevention Action Plan.* Morrisville, NC: North Carolina Institute of Medicine; 2009. http://www.nciom.org/wp-content/uploads/NCIOM/projects/prevention/finalreport/PreventionReport-July2010.pdf. Accessed August 5, 2011.
[3] American Cancer Society. *Cancer Facts and Figures 2011.* Atlanta, GA: American Cancer Society; 2011. http://www.cancer.org/acs/groups/content/@epidemiologysurveilance/documents/document/acspc-029771.pdf. Accessed October 25, 2011.
[4] Ibid.
[5] Ibid.
[6] North Carolina State Center for Health Statistics. *2004-2008 NC Cancer Incidence Rate by Race and Ethnicity per 100,000 Population.* Raleigh, NC: North Carolina State Center for Health Statistics; 2008. http://www.schs.state.nc.us/SCHS/CCR/incidence/2008/5yearRatesbyRaceEth.pdf. Accessed October 25, 2011.
[7] North Carolina State Center for Health Statistics, University of Cancer Research Fund. *Cancer in North Carolina: Cancer and Income with a Special Report on Cancer, Income and Racial Differences.* Raleigh, NC: North Carolina State Center for Health Statistics; 2008. http://ucrf.unc.edu/publications/cancer_report_2008.pdf. Accessed October 25, 2011.
[8] North Carolina Institute of Medicine Task Force on Prevention. *Prevention for the Health of North Carolina: Prevention Action Plan.* Morrisville, NC: North Carolina Institute of Medicine; 2009. http://www.nciom.org/wp-content/uploads/NCIOM/projects/prevention/finalreport/PreventionReport-July2010.pdf. Accessed August 5, 2011.
[9] North Carolina State Center for Health Statistics. 2011 County Health Data Book. 2005-2009 Race-sex-specific age-adjusted death rates by county. North Carolina Department of Health and Human Services website. http://www.schs.state.nc.us/SCHS/data/databook/. Accessed September 16, 2011. Published November 2010.
[10] Ibid.
[11] American Cancer Society. The Importance of Behavior in Cancer Prevention and Early Detection. American Cancer Society. http://www.cancer.org/Research/ResearchProgramsFunding/BehavioralResearchCenter/TheImportanceofBehaviorinCancerPreventionandEarlyDetection/index. Accessed October 27, 2010.
[12] Kochanek KD, Xu JQ, Murphy SL, et al. Deaths: Preliminary data for 2009. National vital statistics reports; vol 59 no 4. Hyattsville, MD: National Center for Health Statistics. 2011. http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_04.pdf. Accessed October 28, 2011.
[13] Centers for Disease Control and Prevention. Cancer: Addressing the Cancer Burden at a Glance. Centers for Disease Control and Prevention website. http://www.cdc.gov/chronicdisease/resources/publications/AAG/dcpc.htm. Accessed November 23, 2011.
[14] Centers for Disease Control and Prevention. Cancer: Addressing the Cancer Burden at a Glance. Centers for Disease Control and Prevention website. http://www.cdc.gov/chronicdisease/resources/publications/AAG/dcpc.htm. Accessed November 23, 2011.
[15] Ibid.
[16] Partnership for a Healthy Durham. *Durham County 2010: State of the County Health Report*. Durham, NC: Durham County Health Department; 2010. http://www.healthydurham.org/docs/Durham%20County%202010%20SOTCH%20-web.pdf. Accessed April 25, 2011.
[17] North Carolina State Center for Health Statistics. 2011 County Health Data Book. 2005-2009 Race-sex-specific age-adjusted death rates by county. North Carolina Department of Health and Human Services website. http://www.schs.state.nc.us/SCHS/data/databook/. Accessed September 16, 2011. Published November 2010.
[18] Ibid.
[19] North Carolina State Center for Health Statistics. Behavioral Risk Factor Surveillance System. 2010 BRFSS topics for Durham County. Colorectal cancer screening. North Carolina Department of Health and Human Services website. http://www.schs.state.nc.us/SCHS/brfss/2010/durh/topics.html#pcs. Accessed August 30, 2011. Updated July 14, 2011.

[20] Ibid.
[21] 2010 Durham County Community Health Opinion Survey. Partnership for a Healthy Durham website. http://www.healthydurham.org/index.php?page=health_recent. Accessed September 15, 2011.
[22] North Carolina State Center for Health Statistics. 2011 County Health Data Book. 2005-2009 Race-sex-specific age-adjusted death rates by county. North Carolina Department of Health and Human Services website. http://www.schs.state.nc.us/SCHS/data/databook/. Accessed September 16, 2011. Published November 2010.
[23] Ibid.
[24] American Cancer Society. The Importance of Behavior in Cancer Prevention and Early Detection. American Cancer Society. http://www.cancer.org/Research/ResearchProgramsFunding/BehavioralResearchCenter/TheImportanceofBehaviorinCancerPreventionandEarlyDetection/index. Accessed October 27, 2010.
[25] Ibid.
[26] Ibid.
[27] The Office of Healthy Carolinians and Health Education. Evidence-based and promising practice resources that follow the Healthy NC 2020 Objectives. The Office of Healthy Carolinians and Health Education. Updated April, 2011.
[28] American Diabetes Association. *Standards of Medical Care in Diabetes-2011*. Alexandria, VA: Diabetes Care; 2011. Vol (34), pg S12. http://care.diabetesjournals.org/content/34/Supplement_1/S11.full.pdf. Accessed June 7, 2011.
[29] Diabetes Prevention and Control Branch. *The Burden of Diabetes in North Carolina*. Raleigh, NC: North Carolina Department of Health and Human Services: Division of Public Health; 2010. http://www.ncdiabetes.org/library/_pdf/Burden%20of%20Diabetes%20in%20NC%202010ppt.pdf. Accessed June 7, 2011.
[30] American Diabetes Association. *Standards of Medical Care in Diabetes-2011*. Alexandria, VA: Diabetes Care; 2011. Vol (34), pg S12. http://care.diabetesjournals.org/content/34/Supplement_1/S11.full.pdf. Accessed June 7, 2011.
[31] North Carolina Institute of Medicine. Healthy North Carolina 2020: A Better State of Health. Morrisville, NC: North Carolina Institute of Medicine; 2011. http://publichealth.nc.gov/hnc2020/docs/HNC2020-FINAL-March-revised.pdf. Accessed September 15, 2011.
[32] North Carolina State Center for Health Statistics. Behavioral Risk Factor Surveillance System. 2010 BRFSS topics for Durham County. Diabetes. North Carolina Department of Health and Human Services website. http://www.schs.state.nc.us/SCHS/brfss/2010/durh/topics.html#pcs. Accessed August 30, 2011. Updated July 14, 2011.
[33] Ibid.
[34] Diabetes Prevention and Control Branch. *The Burden of Diabetes in North Carolina*. Raleigh, NC: North Carolina Department of Health and Human Services: Division of Public Health; 2008. http://www.ncdiabetes.org/library/_pdf/Diabetes%20Burden%20Bk.pdf. Accessed June 7, 2011.
[35] American Diabetes Association. *Standards of Medical Care in Diabetes-2011*. Alexandria, VA: Diabetes Care; 2011. Vol (34), pg S12. http://care.diabetesjournals.org/content/34/Supplement_1/S11.full.pdf. Accessed June 7, 2011.
[36] Diabetes Prevention and Control Branch. *The Burden of Diabetes in North Carolina*. Raleigh, NC: North Carolina Department of Health and Human Services: Division of Public Health; 2008. http://www.ncdiabetes.org/library/_pdf/Diabetes%20Burden%20Bk.pdf. Accessed June 7, 2011.
[37] Ibid.
[38] Diabetes Prevention and Control Branch. *The Burden of Diabetes in Durham County*. Raleigh, NC: North Carolina Department of Health and Human Services: Division of Public Health; 2010. http://www.ncdiabetes.org/factsFigures/burdenDiabetes.aspx. Accessed June 7, 2011.
[39]Diabetes Prevention and Control Branch. *The Burden of Diabetes in North Carolina*. Raleigh, NC: North Carolina Department of Health and Human Services: Division of Public Health; 2010. http://www.ncdiabetes.org/library/_pdf/Burden%20of%20Diabetes%20in%20NC%202010ppt.pdf. Accessed June 7, 2011.
[40] Diabetes Prevention and Control Branch. *The Burden of Diabetes in Durham County*. Raleigh, NC: North Carolina Department of Health and Human Services: Division of Public Health; 2010. http://www.ncdiabetes.org/factsFigures/burdenDiabetes.aspx. Accessed June 7, 2011

[41] American Diabetes Association. *Standards of Medical Care in Diabetes-2011*. Alexandria, VA: Diabetes Care; 2011. Vol (34), pg S12. http://care.diabetesjournals.org/content/34/Supplement_1/S11.full.pdf. Accessed June 7, 2011.
[42] North Carolina State Center for Health Statistics. Behavioral Risk Factor Surveillance System. 2010 BRFSS topics for Durham County. North Carolina Department of Health and Human Services website. http://www.schs.state.nc.us/SCHS/brfss/2010/durh/topics.html#pcs. Accessed August 30, 2011. Updated July 14, 2011.
[43] Ibid.
[44] The Durham Health Innovations Project. (2010). Partnership IMPACTS Diabetes Outcomes, Final report, page 7.
[45] 2010 Durham County Community Health Opinion Survey. Partnership for a Healthy Durham website. http://www.healthydurham.org/index.php?page=health_recent. Accessed September 15, 2011.
[46] 2010 Durham County Community Health Opinion Survey. Partnership for a Healthy Durham website. http://www.healthydurham.org/index.php?page=health_recent. Accessed September 15, 2011.
[47] North Carolina Institute of Medicine. Healthy North Carolina 2020: A Better State of Health. Morrisville, NC: North Carolina Institute of Medicine; 2011. http://publichealth.nc.gov/hnc2020/docs/HNC2020-FINAL-March-revised.pdf. Accessed September 15, 2011.
[48] Diabetes Prevention and Control Branch. *The Burden of Diabetes in North Carolina*. Raleigh, NC: North Carolina Department of Health and Human Services: Division of Public Health; 2010. http://www.ncdiabetes.org/library/_pdf/Burden%20of%20Diabetes%20in%20NC%202010ppt.pdf. Accessed June 7, 2011.
[49] US Census Bureau. State & County Quick Facts: Durham County, North Carolina. US Census Bureau website. http://quickfacts.census.gov/qfd/states/37/37063.html. Accessed June 3, 2011. Updated October, 2011.
[50] North Carolina State Center for Health Statistics. Behavioral Risk Factor Surveillance System. 2010 BRFSS topics for Durham County. Diabetes. North Carolina Department of Health and Human Services website. http://www.schs.state.nc.us/SCHS/brfss/2010/durh/topics.html#pcs. Accessed August 30, 2011. Updated July 14, 2011.
[51] Ibid.
[52] Ibid.
[53] Office of Healthy Carolinians. Evidence-based Resources and Promising Practices-Office of Healthy Carolinians and Health Education; NC DPH DRAFT; updated 4/2011
[54]The Community Guide. Diabetes Prevention and Control: Self-Management Education. The Community Guide website. http://www.thecommunityguide.org/diabetes/selfmgmteducation.html. Accessed June 19, 2011. Updated January, 2011.
[55]The Community Guide. Diabetes Prevention and Control: Case Management Interventions to Improve Glycemic Control. The Community Guide website. http://www.thecommunityguide.org/diabetes/casemgmt.html. Accessed June 19, 2011. Updated June, 2011.
[56] Ibid.
[57] Elliott-Bynum, S., Thomas, K. (2010) *Cardiovascular Team Report: Vascular Intervention Project*. Durham Health Innovations. Durham, NC: Duke University. Unpublished.
[58] Ibid.
[59] Ibid.
[60] US Department of Health & Human Services. Topics and Objectives: Heart disease and stroke. US Department of Health and Human Services website. http://www.healthypeople.gov/2020/topicsobjectives2020/ebr.aspx?topicId=21. Accessed June 2011. Updated September, 2011.
[61] North Carolina Institute of Medicine. *Healthy North Carolina 2020: A Better State of Health*. Morrisville, NC: North Carolina Institute of Medicine; 2011. http://publichealth.nc.gov/hnc2020/docs/HNC2020-FINAL-March-revised.pdf. Accessed September 15, 2011.
[62] North Carolina State Center for Health Statistics. Age Adjusted Death Rates per 100,000 Population. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/deaths/ . Accessed July 3, 2011. Updated February, 2011.
[63] The Partnership for a Health Durham. *Durham County 2007 Community Health Assessment*. Durham, NC: The Partnership for a Health Durham; 2007.

http://www.healthydurham.org/docs/file/durhams_health/2007DurhamHealthAssessmentWithYRBSdata-final.pdf . Accessed June 12, 2011.
[64] Ibid.
[65] Ibid.
[66] Elliott-Bynum, S., Thomas, K. (2010) *Cardiovascular Team Report: Vascular Intervention Project*. Durham Health Innovations. Durham, NC: Duke University. Unpublished.
[67] The Partnership for a Health Durham. *Durham County 2007 Community Health Assessment.* Durham, NC: The Partnership for a Health Durham; 2007.
http://www.healthydurham.org/docs/file/durhams_health/2007DurhamHealthAssessmentWithYRBSdata-final.pdf . Accessed June 12, 2011.
[68] North Carolina State Center for Health Statistics. 2009 Age Adjusted Death Rates per 100,000 Population. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/deaths/lcd/2009 . Accessed July 3, 2011. Updated February, 2011.
[69] Ibid
[70] North Carolina State Center for Health Statistics. 2011 County Health Data Book. North Carolina Department of Health and Human Services website. http://www.schs.state.nc.us/SCHS/data/databook/. Accessed August 1, 2011. Published November 2010. Updated March 25, 2011.
[71] North Carolina State Center for Health Statistics. Behavioral Risk Factor Surveillance System. 2005, 2007 and 2009 Topics for Durham County. Cardiovascular Disease Prevalence. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/brfss/2009/durh/cvdstrk3.html . Accessed June 23, 2011.
[72] Durham Community Health Coalition. 2011 CHC Community Priority Focus Groups. Durham, NC. November, 2010.
[73]North Carolina State Center for Health Statistics. Behavioral Risk Factor Surveillance System. 2010 Topics for Durham County. results: Cardiovascular Disease Prevalence. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/brfss/2010/durh/cvdstrk3.html. Accessed June 17, 2011.
[74] Ibid
[75] 2010 Durham County Community Health Opinion Survey. Partnership for a Healthy Durham website. http://www.healthydurham.org/index.php?page=health_recent. Accessed September 15, 2011.
[76] Ibid.
[77] Ibid.
[78] Rosamond W., Flegal K, et al. Heart disease and stroke statistics--2007 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Circulation **115**(5): e69-171.
[79] The Partnership for a Health Durham. *Durham County 2007 Community Health Assessment.* Durham, NC: The Partnership for a Health Durham; 2007.
http://www.healthydurham.org/docs/file/durhams_health/2007DurhamHealthAssessmentWithYRBSdata-final.pdf . Accessed June 12, 2011.
[80] North Carolina State Center for Health Statistics. Selected Data on the Health of the Latino Population in North Carolina. North Carolina State Center for Health Statistics website.
http://www.epi.state.nc.us/SCHS/data/minority.cfm. Accessed June 28, 2011.
[81] Elliott-Bynum, S., Thomas, K. (2010) *Cardiovascular Team Report: Vascular Intervention Project*. Durham Health Innovations. Durham, NC: Duke University. Unpublished.
[82] 2009 BRFSS survey results: Durham County Cardiovascular Disease Prevalence. Retrieved June 2011 from NC State Center for Health Statistics: http://www.schs.state.nc.us/SCHS/brfss/2009/durh/cvdstrk3.html
[83] North Carolina State Center of Health Statistics. *North Carolina Vital Health Facts: Population & Health Data by Race and Ethnicity*. Raleigh, NC: North Carolina State Center for Health Statistics; 2010.
http://www.schs.state.nc.us/SCHS/pdf/NCPopHealthDatabyRaceEth10152010.pdf. Accessed July 7, 2011.
[84] US Department of Health & Human Services. Topics and Objectives: Heart disease and stroke. US Department of Health and Human Services website.
http://www.healthypeople.gov/2020/topicsobjectives2020/ebr.aspx?topicId=21. Accessed June 2011. Updated September, 2011.
[85] Ibid.
[86] Office of Healthy Carolinians and Health Education. Evidence-based Resources and Promising Practices (Draft). North Carolina Department of Public Health. Updated April 20, 2011.

[87] Bodenheimer T, Wagner E.H., et al. Improving primary care for patients with chronic illness. *JAMA.* 2002; 288(14): 1775-1779.
[88] Ibid.
[89] Centers for Disease Control and Prevention. Overweight and Obesity Causes and Consequences. Centers for Disease Control and Prevention website. http://www.cdc.gov/obesity/causes/health.html. Accessed May 18, 2011. Updated March, 2011.
[90] Eat Smart Move More North Carolina. *The Burden of Obesity in North Carolina*. Raleigh, NC: North Carolina Department of Health and Human Services: Division of Public Health; 2009. http://www.eatsmartmovemorenc.com/ObesityInNC/Texts/OBESITY_BURDEN_2009_WEB.pdf. Accessed June 13, 2011.
[91] Ibid
[92] Centers for Disease Control and Prevention. Winnable Battles: Nutrition, Physical Activity, and Obesity. Centers for Disease Control and Prevention website. http://www.cdc.gov/WinnableBattles/Obesity/index.html. Accessed June 2, 2011. Updated October, 2011.
[93]Eat Smart Move More North Carolina. The Burden of Obesity. Eat Smart Move More North Carolina website. http://www.eatsmartmovemorenc.com/ObesityInNC/ObesityInNC.html. Accessed June 2, 2011.
[94] Hartsoe, S. 1 In 4 Overweight or Obese Adults Don't Believe They Have a Problem. *Duke Today*. March 2011. http://today.duke.edu/2011/03/obesity.html. Accessed June 19, 2011.
[95] North Carolina Institute of Medicine. *Healthy North Carolina 2020: A Better State of Health*. Morrisville, NC: North Carolina Institute of Medicine; 2011. http://publichealth.nc.gov/hnc2020/docs/HNC2020-FINAL-March-revised.pdf. Accessed September 15, 2011.
[96] Angle M, Sharpe L. *Durham County Schools, Youth Risk Behavior Survey – Spring 2009.* Mars Hill, NC: Richard L. Hoffman Center for Assessment and Research Alliances; 2010. http://www.healthydurham.org/docs/2009_Durham_Report_Final%282%29.pdf.
[97] Ibid.
[98] 2010 BRFSS survey results: Durham County BMI less than 25. Retrieved June 2011 from NC State Center for Health Statistics: http://www.schs.state.nc.us/SCHS/brfss/2010/durh/rf2.html
[99] U.S. Department of Health and Human Services. *The Surgeon General's Vision for a Healthy and Fit Nation.* Rockville, MD: U.S. Department of Health and Human Services, Office of the Surgeon General; 2010. http://www.surgeongeneral.gov/library/obesityvision/obesityvision2010.pdf . Accessed June 19, 2011.
[100] Finkelstein EA., Fiebelkorn IC, Wang G. State-level estimates of annual medical expenditures attributable to obesity. *Obesity Research.* 2004;12: 18-24.
[101] Finkelstein EA**.,** Fiebelkorn IC**,** Wang G. National medical spending attributable to overweight and obesity: how much, and who's paying? *HealthAffairs, Suppl Web Exclusives*. 2003; W3-219-26.
[102] Østbye, T. etal. Obesity and Workers' Compensation: Results From the Duke Health and Safety Surveillance System. *Archives of Internal Medicine*. 2007;167:766-773.
[103]County Health Rankings. 2011: Durham County. County Health Rankings website. http://www.countyhealthrankings.org/north-carolina/durham. Accessed May 19, 2011.
[104] North Carolina State Center for Health Statistics. Behavioral Risk Factor Surveillance Survey System. 2005-2009 Durham County Data. Department of Health and Human Services website. http://www.schs.state.nc.us/SCHS/brfss. Accessed June 7, 2011.
[105] Ibid
[106] Ibid
[107] Ibid
[108] Ibid
[109] Ibid
[110] Ibid
[111] Ibid
[112] Partnership for a Healthy Durham. *Durham County 2010: State of the County Health Report*. Durham, NC: Durham County Health Department; 2010. http://www.healthydurham.org/docs/Durham%20County%202010%20SOTCH%20-web.pdf. Accessed April 25, 2011.
[113]U.S. Department of Health and Human Services. The Surgeon General's Vision for a Healthy and Fit Nation Fact Sheet. US Department of Health and Human Services website.

http://www.surgeongeneral.gov/library/obesityvision/obesityvision_factsheet.html. Accessed May 25, 2011. Updated March, 2010.
[114] Vandersea T, Irish K, Michele Rivest Consulting Inc. *Healthy & Ready: Assessing children's health status upon public school entry.* Durham, NC: Durham's Partnership for Children and Durham Public Schools; 2010. http://www.dpfc.net/Admin/uploads/photos/Documents/reports/KHAreport.pdf.
[115] Angle M, Sharpe L. *Durham County Schools, Youth Risk Behavior Survey – Spring 2009.* Mars Hill, NC: Richard L. Hoffman Center for Assessment and Research Alliances; 2010. http://www.healthydurham.org/docs/2009_Durham_Report_Final%282%29.pdf.
[116] North Carolina State Center for Health Statistics. Behavioral Risk Factor Surveillance System. 2009 BRFSS topics for Durham County Data. Department of Health and Human Services website. http://www.schs.state.nc.us/SCHS/brfss/2009/durh/rf1.html. Accessed June 7, 2011. Updated June 10, 2010.
[117] U.S. Department of Health and Human Services. *The Surgeon General's Vision for a Healthy and Fit Nation.* Rockville, MD: U.S. Department of Health and Human Services, Office of the Surgeon General; 2010. http://www.surgeongeneral.gov/library/obesityvision/obesityvision2010.pdf . Accessed June 19, 2011.
[118] Angle M, Sharpe L. *Durham County Schools, Youth Risk Behavior Survey – Spring 2009.* Mars Hill, NC: Richard L. Hoffman Center for Assessment and Research Alliances; 2010. http://www.healthydurham.org/docs/2009_Durham_Report_Final%282%29.pdf.
[119] Ibid.
[120] Ibid.
[121] Action for Children North Carolina and North Carolina Institute of Medicine. *North Carolina Child Health Report Card*. Raleigh, NC: Action for Children North Carolina; 2009. http://www.ncchild.org/sites/default/files/2009%20Health%20Report%20Card_10-14-09_FINAL.pdf. Accessed April 28, 2011.
[122] Durham's Partnership for Children. *Healthy & Ready: Assessing children's health status upon public school entry*. Durham, NC: Durham's Partnership for Children; 2010. http://www.dpfc.net/Admin/uploads/photos/Documents/reports/KHAreport.pdf . Accessed April 29, 2011.
[123] Ibid
[124] 2010 Durham County Community Health Opinion Survey. Partnership for a Healthy Durham website. http://www.healthydurham.org/index.php?page=health_recent. Accessed September 15, 2011.
[125] Ibid
[126] Ibid
[127] Durham Health Innovations—Achieving a Healthy Body for Life Group. (2011). *DHI Team Reports, Obesity Achieving Health Bodies for a Lifetime, Appendix B, map 2.* Unpublished.
[128] Ibid
[129] Office of Healthy Carolinians. Evidence-Based Resources and Promising Practices. Office of Health Carolinians and Health Education; NC DPH Draft. Updated April, 2011.
[130] North Carolina Institute of Medicine. *Prevention for the Health of North Carolina: Prevention Action Plan.* Morrisville, NC: North Carolina Institute of Medicine; 2010. http://www.nciom.org/wp-content/uploads/NCIOM/projects/prevention/finalreport/PreventionReport-July2010.pdf. Accessed July 5, 2010.
[131] North Carolina Institute of Medicine. *Healthy North Carolina 2020: A Better State of Health.* Morrisville, NC: North Carolina Institute of Medicine; 2011. http://publichealth.nc.gov/hnc2020/docs/HNC2020-FINAL-March-revised.pdf. Accessed September 15, 2011.
[132] National Institute on Drug Abuse. *Principles of Drug Abuse Treatment for Criminal Justice Populations: A Research-Based Guide*. Bethesda, MD: National Institute on Drug Abuse; 2007. http://www.nida.nih.gov/PDF/PODAT_CJ/PODAT_CJ.pdf. Accessed July 7, 2011.
[133] National Association of State Mental Health Program Directors (NASMHPD). *Morbidity and Mortality in Persons with Severe Mental Illness*. Alexandria, VA: National Association of State Mental Health Program Directors; 2006. http://www.nasmhpd.org/general_files/publications/med_directors_pubs/Mortality%20and%20Morbidity%20Final%20Report%208.18.08.pdf . Accessed July 17, 2011.
[134] National Institute on Drug Abuse. *Drugs, Brains, and Behavior: The Science of Addiction*. Bethesda, MD: National Institute on Drug Abuse; 2010. http://www.nida.nih.gov/scienceofaddiction/sciofaddiction.pdf. Accessed June 30, 2011.

[135] North Carolina Institute of Medicine. *Healthy North Carolina 2020: A Better State of Health.* Morrisville, NC: North Carolina Institute of Medicine; 2011. http://publichealth.nc.gov/hnc2020/docs/HNC2020-FINAL-March-revised.pdf. Accessed September 15, 2011.
[136] Ibid.
[137] Angle M, Sharpe L. *Durham County Schools, Youth Risk Behavior Survey – Spring 2009.* Mars Hill, NC: Richard L. Hoffman Center for Assessment and Research Alliances; 2010. http://www.healthydurham.org/docs/2009_Durham_Report_Final%282%29.pdf.
[138] North Carolina Alcohol Facts. Durham County data. About the North Carolina alcohol facts (NCAF) website. http://www.hsrc.unc.edu/ncaf/index.cfm?p=home. Accessed June 18, 2011.
[139] Substance Abuse and Mental Health Services Administration, Office of Applied Studies (2010). Substate estimates from the 2006-2008 National Surveys on Drug Use and Health. Substance Abuse and Mental Health Services Administration, Office of Applied Studies website. http://oas.samhsa.gov/substate2k10/toc.cfm. Accessed June 18, 2011. Updated August, 2010.
[140] North Carolina Alcohol Facts. Durham County data. About the North Carolina alcohol facts (NCAF) website. http://www.hsrc.unc.edu/ncaf/index.cfm?p=home. Accessed June 18, 2011.
[141] North Carolina Institute of Medicine. *Healthy North Carolina 2020: A Better State of Health.* Morrisville, NC: North Carolina Institute of Medicine; 2011. http://publichealth.nc.gov/hnc2020/docs/HNC2020-FINAL-March-revised.pdf. Accessed September 15, 2011.
[142] Ibid.
[143] North Carolina Injury & Violence Prevention Branch. *Violent Death in North Carolina: Durham County Incidents: 2004-2008.* Raleigh, NC: North Carolina Department of Health and Human Services; 2010. http://www.injuryfreenc.ncdhhs.gov/About/2008CountyFactSheetDurhamFINAL.pdf . Accessed June 30, 2011.
[144] The Durham Center (2011a). *Community Hospital Emergency Department Admissions for Individuals with Behavioral Health Disorders in Durham County.* Internal Report.
[145] National Survey of Drug Use and Health Report (2007). Mental Health Tables. National Survey of Drug Use and Health Report website. http://oas.samhsa.gov/NSDUH/2k7nsduh/tabs/LOTSect6pe.htm . Accessed June 23, 2011. Updated December, 2008.
[146] Substance Abuse and Mental Health Services Administration Office of Applied Studies. *Results from the 2009National Survey on Drug Use and Health: Volume I. Summary of National Findings.* Rockville, MD: Substance Abuse and Mental Health Services, Office of Applied Studies; 2010. http://oas.samhsa.gov/NSDUH/2k9NSDUH/2k9ResultsP.pdf . Accessed July 13, 2011.
[147] Duke Center for Child and Family Policy (2010). *Substance Use and Abuse in Durham County: 2010.* Durham, NC: Duke Center for Child and Family Policy; 2010. http://childandfamilypolicy.duke.edu/pdfs/news/2010_Substance_Use_Abuse_Durham_County.pdf. Accessed July 17, 2011.
[148] North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services. Appendices for MH/DD/SAS Community Systems Progress Report Second Quarter SFY 2010-2011, October 1 – December 31, 2010. North Carolina Division of Mental Health, Developmental Disabilities and Substance Abuse Services website. http://www.ncdhhs.gov/mhddsas/statspublications/reports/index.htm#cspir. Accessed August 2, 2011. Updated October, 2011.
[149] The Durham Center (2011a). *Community Hospital Emergency Department Admissions for Individuals with Behavioral Health Disorders in Durham County.* Internal report.
[150] Ibid
[151] Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. The NSDUH Report: Sources of Payment for Mental Health Treatment for Adults. Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality website. http://oas.samhsa.gov/2k11/025/WEB_SR_025.htm . Accessed August 7, 2011. Updated July, 2011.
[152] North Carolina Blue Cross/Blue Shield. *2008 Annual Report: Walk the Talk.* Durham, NC: North Carolina Blue Cross/Blue Shield; 2008. http://www.bcbsnc.com/assets/corporate/public/pdfs/company/u6129_annual_report_08_web.pdf . Accessed July 9, 2011.
[153] The Durham Center. *Fiscal Year 2010 Annual Report.* Durham, NC: The Durham Center; 2010. http://www.durhamcenter.org/uploads/docs/publications/Annual_Report_2010.pdf . Accessed August 1, 2011.
[154] The Durham Center (2011b). *FY 2011 - Second Quarter Data Report to Durham Area Board.* Internal report.

[155] North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services. Appendices for MH/DD/SAS Community Systems Progress Report Second Quarter SFY 2010-2011, October 1 – December 31, 2010. North Carolina Division of Mental Health, Developmental Disabilities,and Substance Abuse Services website. http://www.ncdhhs.gov/mhddsas/statspublications/reports/index.htm#cspir. Accessed July 20, 2011. Updated October, 2011.
[156] The Durham Center (2011b). *FY 2011 - Second Quarter Data Report to Durham Area Board*. Internal report.
[157] Ibid
[158] Durham Health Innovations—Adolescent Health Initiative and Rethinking Pain. (2011). *DHI Team Reports*, Unpublished.
[159] Partnership for a Healthy Durham. *2010 Durham County Community Health Opinion Survey Results.* Durham, NC: Durham County Health Department; 2010. http://www.healthydurham.org/docs/Appendix%20G.pdf. Accessed February 6, 2012.
[160] Angle M, Sharpe L. *Durham County Schools, Youth Risk Behavior Survey – Spring 2009.* Mars Hill, NC: Richard L. Hoffman Center for Assessment and Research Alliances; 2010. http://www.healthydurham.org/docs/2009_Durham_Report_Final%282%29.pdf.
[161] Ibid
[162] US Census Bureau. 2010 Census Data. US Census Bureau website. http://factfinder2.census.gov. Accessed July 9, 2011.
[163] The Durham Center, 2007. *A Description of Operations and Services, FY 07*. Internal report.
[164] Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *The NSDUH Report: Illicit Drug Use among Older Adults*. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies; 2009. http://oas.samhsa.gov/2k9/168/168OlderAdultsHTML.pdf. Accessed August 3, 2011.
[165] Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System (BRFSS): 2005-2009.
[165] Centers for Disease Control and Prevention website. http://apps.nccd.cdc.gov/HRQOL . Accessed August 3, 2011.
[166] The Durham Center. (2009). *A Description of Operations and Services, FY 09*. Internal report.
[167] SAMSHA—Get Connected! Linking Older Americans With Medication, Alcohol, and Mental Health Resources. DHHS Pub. No. (SMA) 03-3824. Rockville, MD: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration, 2003. http://store.samhsa.gov/shin/content//SMA03-3824/SMA03-3824.pdf. Accessed August 4, 2011.
[29] Alexander-Brathcher K, Martin G, Purcell W, Watson M, Silberman P. Honoring Their Service: Behavioral Health Services in North Carolina for Military Service Members, Veterans, and Their Families. *NC Med J*. 2011;73(1):29-31
[169] United States Department of Veteran Affairs, Durham VA Medical Center. VISN6 : VA Mid Atlantic Health Care Network: Durham VA Medical Center: United States Department of Veteran Affairs, Durham VA Medical Center website. http://www.durham.va.gov/. Accessed August 7, 2011.
[170] US Census Bureau. 2010 Census Data. US Census Bureau website. http://factfinder2.census.gov. Accessed July 9, 2011.
[171] National Asthma Education and Prevention Program Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. Rockville, MD. National Heart, Lung, and Blood Institute, US Dept of Health and Human Services; 2007. NIH publication 08-4051
[172] Ibid.
[173] Centers for Disease Prevention and Health. Behavior Risk Factor Surveillance System (BRFSS). Centers for Disease Control and Prevention website. http://www.cdc.gov/BRFSS/. Accessed July 7, 2011.
[174] Ibid.
[175] Ibid.
[176] Durham Health Innovations. (2009). *Duke-Durham Respiratory Partnership Breathe Easy Team*. Durham Health Innovations Project. Unpublished.
[177] North Carolina State Center for Health Statistics. 2011 County Health Data Book. North Carolina Department of Health and Human Services website. http://www.schs.state.nc.us/SCHS/data/databook/. Accessed August 1, 2011. Published November 2010. Updated March 25, 2011.
[178] Ibid.
[179] Duke-Durham Respiratory Partnership Breathe Easy Team, Durham Health Innovations Project, 2009

[180] Angle M, Sharpe L. *Durham County Schools, Youth Risk Behavior Survey – Spring 2009.* Mars Hill, NC: Richard L. Hoffman Center for Assessment and Research Alliances; 2010. http://www.healthydurham.org/docs/2009_Durham_Report_Final%282%29.pdf.
[181] Ibid.
[182] Durham Health Innovations. (2009). *Duke-Durham Respiratory Partnership Breathe Easy Team*. Durham Health Innovations Project. Unpublished.
[183] Ibid.
[184] Ibid.
[185] Ibid.
[186] Centers for Disease Control and Prevention. Sickle Cell Trait. Centers for Disease Control and Prevention website. www.cdc.gov/ncbddd/sickle cell/traits.html Accessed on August 22, 2011.
[187] Ibid.
[188] HealthyPeople.gov. Blood disorders and blood safety. U.S. Department of Health and Human Services website. http://healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=4 Accessed on August 31, 2011.
[189] Division of Public Health/ Women's and Children's Health Section/ Women's Health Branch/North Carolina Sickle Cell Syndrome Program – Women's and Children's Section website (WCS web 2005- version 2.1.0.11). http://www.cdc.gov/NCBDDD/sicklecell/data.html Accessed on August 22, 2011.
190 Ibid.
[191] HealthyPeople.gov. Blood disorders and blood safety. U.S. Department of Health and Human Services website. http://healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=4. Accessed on August 31, 2011.
[192] Division of Public Health/ Women's and Children's Health Section/ Women's Health Branch/North Carolina Sickle Cell Syndrome Program – Women's and Children's Section website (WCS web 2005- version 2.1.0.11). http://www.cdc.gov/NCBDDD/sicklecell/data.html. Accessed on August 22, 2011.
[193] Centers for Disease Control and Prevention. Sickle Cell Trait. Centers for Disease Control and Prevention website. www.cdc.gov/ncbddd/sickle cell/traits.html Accessed on August 22, 2011.