Diabetes in Northeastern North Carolina

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Diabetes in an 18-County Region of Northeastern North Carolina

Introduction

Diabetes is one of the leading causes of death and disability in Northeastern North Carolina. Each year there are about 155 deaths per year from Diabetes as a primary cause of death and 640 deaths due to diabetes as a primary or a contributing cause of death. The mortality rate for diabetes as a primary cause of death for NENC was 15 percent higher than the rate for the state of North Carolina. In addition, the burden of diabetes is even greater in the African-American population; African-American men and women have mortality rates that are nearly two times the state rate. In a survey conduced in 2003, by the North Carolina State Center for Health Statistics, 12.5% of Northeastern North Carolinians reported that they have been told they have diabetes. The Northeastern North Carolina Partnership has selected diabetes as one of its priorities for the development of regional health programs and interventions.

The following report provides detailed current health data for the region, a description of current public health programs that address diabetes, a description of model programs that have been developed throughout the United States, and a discussion of the strength and gaps in current diabetes public health activities in Northeastern North Carolina. This information will be used by the Northeastern North Carolina Partnership for Public Health as it develops a regional strategic plan to address the problem of diabetes in the region.

The Northeastern North Carolina Partnership for Public Health is a network of 10 local health departments that serve an 18-county region in the northeastern region of the state. This demonstration project is exploring ways that independent local health departments can work together, across jurisdictional boundaries, to carry out the core public health functions and essential services.

Currently the NENCPPH is collaborating to reduce the burden of Diabetes, HIV and AIDS, Heart Disease and Stroke in Northeastern North Carolina. A particular focus is to eliminate the existing racial, gender, and geographic disparities in the disease rates for these conditions.

The NENCPPH, formed in 1999, is guided by a governing board comprised of the directors of the 10 Network health departments, and of representatives from the North Carolina Division of Public Health and the North Carolina Institute for Public Health at the University Of North Carolina School Of Public Health. In 2002, the NENCPPH received a federal grant to help it achieve its goals.

In addition, the NENCPPH is working toward legislative change that will provide funding to local health departments for the delivery of core public health functions. Unlike some other states, local health departments in North Carolina do not receive funding to carry out this important health department role.

Summary

The purpose of this report was to assess the strengths and gaps of current public health efforts to reduce the burden of diabetes in Northeastern North Carolina. This synthesis will help guide the NENCPPH as it develops regional efforts around diabetes prevention. The first aspect of public health diabetes efforts that we evaluated was the availability of data on diabetes. Data on diabetes prevalence, mortality, and quality of care is useful for understanding what the current burden of disease is, what groups need to be targeted with prevention programs, and to monitor disease rates over time as a measure of progress after public health programs are initiated. The Council for State and Territorial Epidemiologists has recommended using 9 defined indicators to monitor diabetes in a population. Secondly, we conducted a survey of the health departments in March of 2004 to assess the strengths and gaps in diabetes programs that currently exist in the region. A majority of these programs are those which are being carried out individually by the 10 health departments in the region. A few are programs that are being carried out jointly between health departments, and a few are programs initiated by other organizations such as hospital.

Data

Northeastern North Carolina Partnership for Public Health has access to regional data for many, but not all of these indicators.

	Data Available in NENC
Diabetes Mortality Rate	Yes
Diabetes Prevalence	Yes
Influenza Vaccination coverage	No
Pneumonia Vaccination Coverage	No
Diabetes Related Hospitalizations	Yes
Diabetes related Lower Extremity Amputations	Yes
Diabetes related end stage renal disease	No
Proportion of adults with Diabetes who had eye exam	No
Proportion of adults with Diabetes who received a foot exam	No

Programs

- 6 health departments have primary prevention programs to increase awareness about diabetes (health communication)
  - *Many of these take place at health fairs, senior centers, schools, civic group meetings, or at the health department.*
  - *None of the health departments described a multimedia approach using radio, newspaper and/or television.*
- 5 health departments have primary prevention programs that are intended to increase physical activity and improve nutrition in the community (community intervention)
- All health departments reported that they provide screening or testing for diabetes
- 8 health departments have tertiary prevention program---diabetes self-management programs to prevent the incidence of diabetic complications.

Existing Prevention Programs in NENC as of March 2004

	Primary Prevention		Screening	Self-Management
	health communication	*community intervention*		
Beaufort			■	
Bertie	■		■	■
Camden	■		■	■
Chowan	■		■	■
Currituck	■		■	■
Dare	■		■	■
Edgecombe			■	■
Gates	■	■	■	■
Halifax	■	■	■	■
Hertford	■	■	■	■
Hyde	■		■	
Martin		■	■	■
Northampton	■	■	■	■
Pasquotank	■		■	■
Perquimans	■		■	■
Tyrrell		■		■
Warren		■	■	■
Washington		■		■

Recommendations

Based on this assessment, we have the following recommendations for future diabetes prevention efforts in NENC:

- Increase multi-media educational programs/ social marketing
- Increase community level primary prevention programs
- Include environmental and policy interventions in a regional program
- Learn more about existing self-management programs
- Explore and test novel interventions
- Increase community knowledge of pre-diabetes
- Look at local data to fill data gaps
- Continue the Behavioral Risk Factor Surveillance Survey (BRFSS) in NENC
- Assess appropriateness of screening programs

Background

Diabetes in the United States

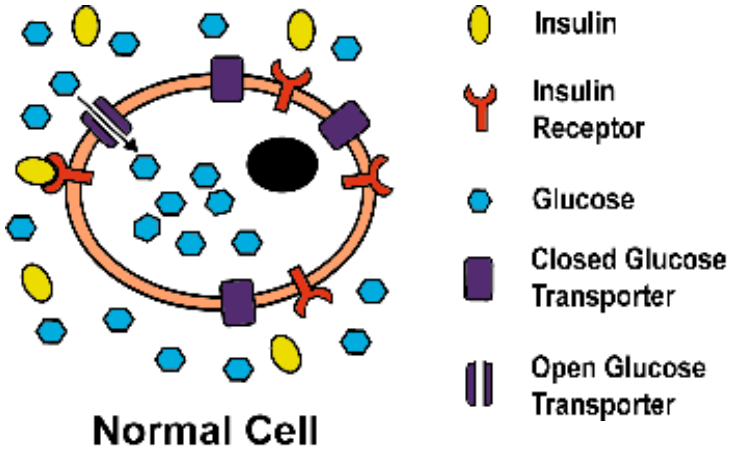
Approximately 18 million adults (8.7%) in the United States have diabetes. Diabetes prevalence increases with age. Of adults aged 60 years and above, 18.3% have diabetes. Compared to Non-Hispanic Whites, African-Americans (1.6 times the rate for whites), Latinos (1.5 times the rate for whites), and American Indian/Alaskan Natives (2.3 times the rate for whites) are more likely to have diabetes . (Centers for Disease Control and Prevention, "Diabetes Fact Sheet, November 2003). Since 1958, prevalence has been increasing over time. From 1991 to 1993, the average prevalence of 3% was greater than 3 times the rate in 1960 and 8 times the rate in 1935. (JS Skyler et al., "Diabetes trends in the USA," Diabetes Metabolism Research and Reviews, 18: S21-S26, 2002.)

In the year 2000, diabetes was the 6th leading cause of death with 69,301 deaths due to diabetes as the primary cause of death. (Centers for Disease Control and Prevention, "Diabetes Fact Sheet, November 2003).

Definition of Diabetes Mellitus

Mellitus---Latin for 'sweetened with honey'

Diabetes is a set of diseases characterized by improper use of fuel by the body—overproduction of glucose by the liver and underutilization by other organs of the body. Because of improper insulin action and/or insulin production, carbohydrates are inefficiently used by the body, resulting in the excretion of glucose in the urine. Diabetes can result in serious complications and premature death. Complications include failure of eyes, kidneys, nerves, coronary heart disease, peripheral vascular disease and stroke. (American Diabetes Association Diabetes Care 27: S47-S54, 2004).



There are three main types of diabetes:

Type I
- Accounts for 5 to 10% of all diabetes cases
- Also called juvenile onset diabetes, or insulin-dependent diabetes
- Results from failure of pancreatic beta cells production of insulin
- Onset is usually during childhood

Type II
- Accounts for 90 to 95% of all diabetes cases
- Also called non-insulin dependent diabetes mellitus (NIDDM)
- Insulin is used ineffectively by the pancreas eventually resulting in lack of insulin production
- Onset is usually in adulthood, though the incidence in children is rising

Gestational Diabetes
- A form of glucose intolerance diagnosed during pregnancy
- 20 to 50% of women with gestational diabetes will develop Type II diabetes within 5 to10 years

Pre-Diabetes
The natural history of diabetes is a continuum ranging from normal glucose metabolism up to full-blown diabetes. Within this range is what is called Pre-diabetes. Persons with impaired glucose tolerance (IGT) and impaired fasting glucose (IFG) have what is called "Pre-Diabetes," and are at increased risk of developing diabetes in the future.

Diagnosis of Diabetes
Diabetes can be diagnosed by one of the three following criteria:

- Symptoms of diabetes, and a casual plasma glucose level of 200 mg/dl. Casual is defined as any time of day without regard to time since last meal. The classic signs of diabetes include polyuria, polydipsia, and unexplained weight loss.
- Fasting plasma glucose level of 126 mg/dl. Fasting is defined as no caloric intake for at least 8 hours.
- 2-hour plasma glucose 200 mg/dl during an oral glucose tolerance test

(American Diabetes Association. "Standards of Medical Care in Diabetes." Diabetes Care 27:S15-S29 2004.)

Diagnosis of Gestational Diabetes
The American Diabetes Association recommends that high risk pregnant women be tested for diabetes as soon as possible. At the initial prenatal visit, a risk assessment should be performed. Women with marked obesity, personal history of GDM, glycosuria, or family history of diabetes are considered to be at high risk. A fasting plasma glucose level greater than or equal to 126 mg/dl, or casual plasma glucose level greater than or equal to 200 mg/dl, is a positive diabetes result. High risk women, who were not initially found to have gestational diabetes, should be tested again between 24 and 28 weeks of gestation, using an oral glucose tolerance test. Low risk pregnant women do not require glucose testing.
(American Diabetes Association. "Standards of Medical Care in Diabetes." Diabetes Care 27:S15-S29 2004.)

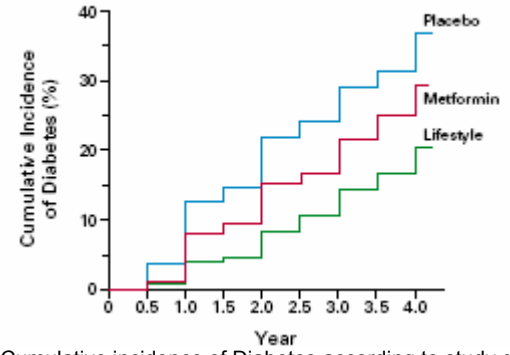
Diagnosis of IFG and IGT
Impaired glucose tolerance and impaired fasting glucose are diagnosed using the same laboratory tests as with diabetes. IGT is defined as a fasting plasma glucose level between 100 and 125 mg/dl, and IGT as a 2-hour plasma glucose level between 140 and 199 mg/dl.
(American Diabetes Association. "Standards of Medical Care in Diabetes." Diabetes Care 27:S15-S29 2004.)

Diabetes Risk Factors
Risk factors for Type II diabetes include older age, obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism (IGT and IFG), physical inactivity, and race/ethnicity. In the United States, African/Americans, Latino Americans, American Indians, some Asian Americans and Alaskan Natives Other Pacific Islanders have a greater risk of developing diabetes (Centers for Disease Control and Prevention, National Diabetes Fact Sheet, Nov 2003.)

Prevention of Diabetic Complications
Control of blood glucose, blood pressure and blood lipids, as well as use of drugs such as ACE inhibitors, statins, aspirin, and/or clopidogel, have been shown to reduce the risk of complications among person with diabetes (Al Vinik, "Prevention of the Complications of Diabetes," The American Journal of Managed Care 9: S63-SS79, 2003).

Prevention or Delay of Type 2 Diabetes
Four recent randomized controlled trials have provided evidence that progression to Type II Diabetes can be delayed or prevented among persons with IGT or IFG. All 4 studies found that lifestyle interventions (diet and exercise) reduced the risk of Type II diabetes. Three of these studies also found that use of pharmacological agents such as metformin, troglitazone, or acarbose, also had a reduction in diabetes (American Diabetes Association, "Prevention or Delay of Type 2 Diabetes", Diabetes Care 27:S47-S54, 2004).

The Diabetes Prevention Study, a clinical trial conducted in the United States, found that a lifestyle intervention was more effective than a drug intervention in reducing the incidence of diabetes. This study recruited participants who were at increased risk of diabetes. Participants were randomly assigned to receive either an intensive lifestyle intervention, 850 mg dose of metformin 2 times per day, or a placebo. The intensive lifestyle intervention included 16 one-on-one and group educational sessions on diet, exercise and healthy lifestyle behaviors related to diabetes. The intervention group was asked to reduce their bodyweight by 7% through a low-calorie, healthy diet, and to get 150 minutes of moderate exercise each week. The study found that the incidence of diabetes was reduced by 58% for the lifestyle group, and by 31% for the metformin group compared to the placebo group.



Cumulative incidence of Diabetes according to study group (Diabetes Prevention Research Group. New England Journal of Medicine 2002; 346(6):393-403.)

Part 1: Diabetes Data for the NENCPPH Region

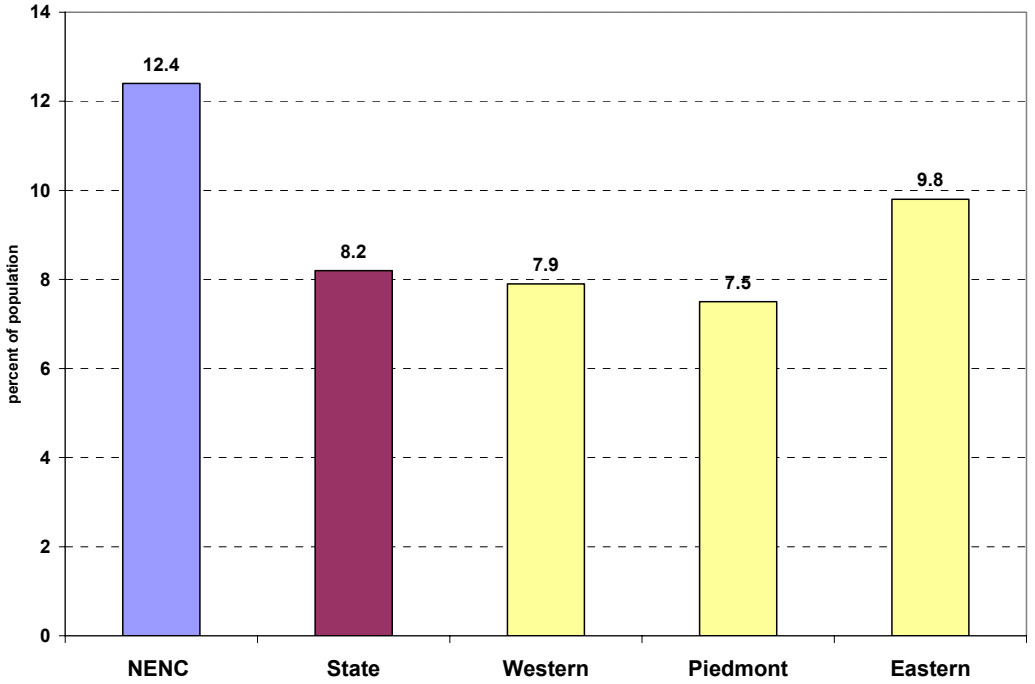
Diabetes Prevalence in 2003

- 12.5% of adults in Northeastern North Carolinians have been diagnosed with diabetes (39,205 adults)
- This percent is 67% higher than the rate for the US. Nationally, an estimated 7.5% of adults have been diagnosed with diabetes.
- The prevalence of self-reported diabetes diagnosis is 51 percent higher in NENC compared to the rate for North Carolina. (12.4 % versus 8.2 %)
- Diabetes is more prevalent in NENC than any other region of the state:

NENC	12.5%	Eastern NC	7.9%
Piedmont	7.5%	Western NC	9.8%

- The prevalence of Diabetes increases with age. In NENC, 20% of people 45 years+ reported having diabetes, compared to 3.1% of 18 to 44 year olds.
- Because about 1/3 of diabetes cases are undiagnosed, the true number of adults with diabetes in NENC is higher.

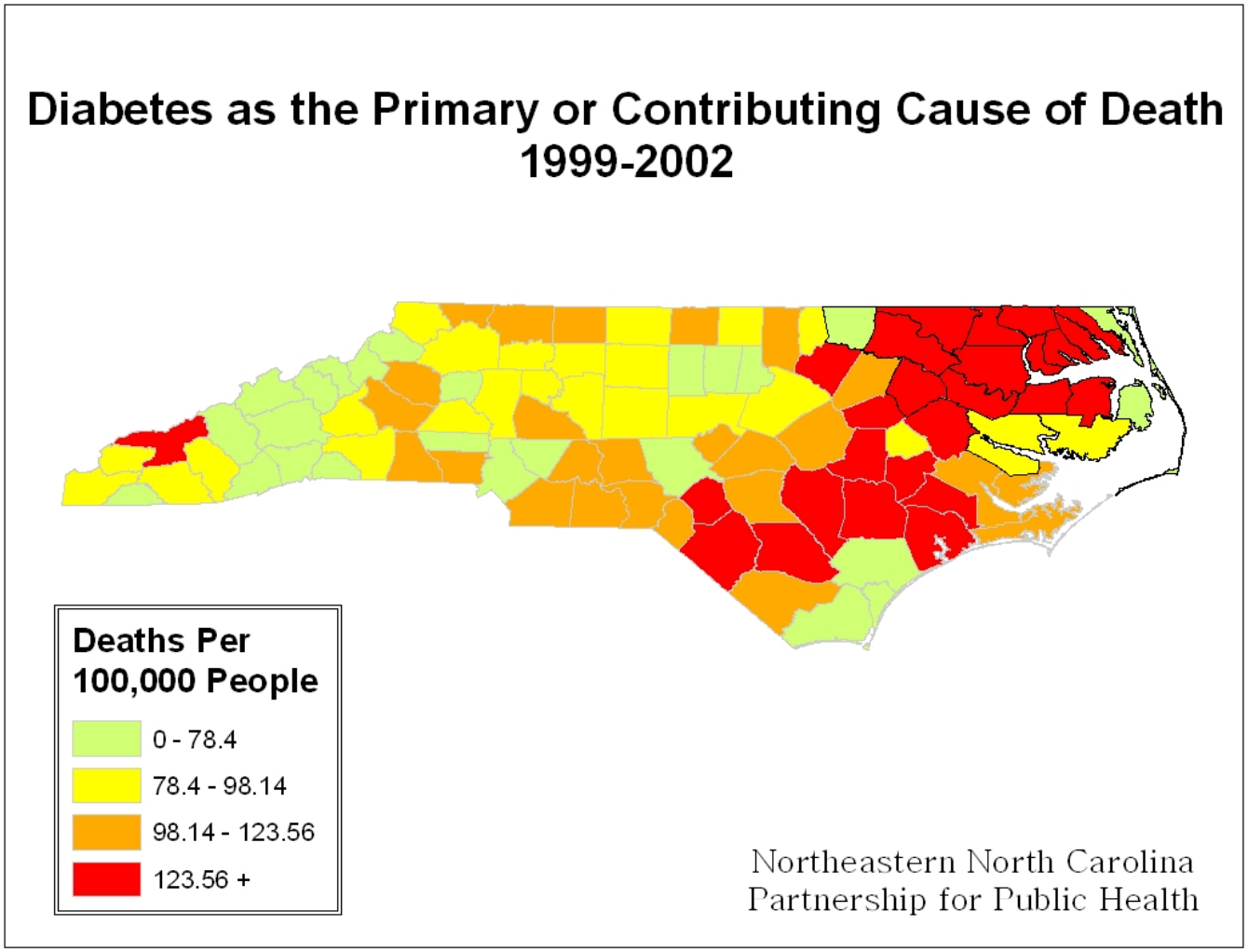
(Data from the 2003 Behavioral Risk Factor Surveillance Survey. The North Carolina State Center for Health Statistics.)



Diabetes Mortality

- During 1999 to 2002 there were 640 deaths each year that were due to diabetes as a primary or contributing cause of death (153.5 deaths per 100,000 people)
- The overall age adjusted mortality rate for NENC is 1.4 times the state rate (132.2 compared to 95.1 deaths per 100,000 people)
- The age-adjusted mortality rate for African-Americans and Native Americans and other non-white races combined, was 1.9 times higher than the rate for whites. (189.7 compared to 98.9 deaths per 100,000)

(North Carolina State Center for Health Statistics, March 2004)



Diabetes Hospitalization

- In NENC in 2001, there were 11,062 hospitalizations for diabetes-related causes. (26.4 hospitalizations per 1,000 people)
- In 2001, NENC diabetes related hospitalizations costs totaled $126,295,426
- Diabetes hospitalizations may be underestimated for border counties where many people seek care outside of North Carolina.

NENC Diabetes Hospitalizations: ANY DIAGNOSIS
1999-2001 NC Hospital Discharge data

	Length of stay in days	Days per 1,000 residents	Average length of stay	Total Charges	Charges per resident	Average charge per stay	Number of discharges	Discharges per 1,000 residents
1999	62,084	149.1	6.1	105,901,819	$254.33	10,464	10,121	24.3
2000	61,143	146.3	5.8	114,911,267	$274.90	10,850	10,591	25.3
2001	62,235	148.6	5.6	126,295,426	$301.63	11,417	11,062	26.4

Diabetes Amputations

- In 2001 in NENC, there were 253 diabetes-related amputations (0.6 hospitalizations per 1,000 people)
- Total costs for diabetes-related amputations were $5,530,115, with the average cost per stay of $21,147

Diabetes Hospitalizations:
AMPUTATION PROCEDURES
WITH ANY DIABETES DIAGNOSIS
NENC Region

	Length of stay in days	Average length of stay	Total Charges	Charges per resident	Average charge per stay	Number of discharges	Discharges per 1,000 residents
1999	2,705	12.9	$4,203,707	$10.37	20,018	210	0.5
2000	2,214	9.9	$4,020,094	$9.62	17,947	224	0.5
2001	2,780	11.0	$5,350,115	$12.78	21,147	253	0.6

Risk Factors for Diabetes

Physical Activity—In a statewide survey of adults done last year, Northeastern North Carolinians reported that **33.3%** of them get moderate physical activity and **13.8%** get vigorous physical activity

Nutrition—19.7% of NENC adults reported having 5 or more servings of fruits and vegetables per day

Body Mass Index—32.1% of NENC adults are obese, and 35.0% are overweight

Child Obesity—An estimated 18.6% of children ages 2 to 19 in NENC are overweight or obese

(North Carolina Behavioral Risk Factor Surveillance System and the North Carolina Physical Activity and Nutrition Surveillance System)

Part 2: Current Diabetes Prevention Activities in the NENCPPH Region

The following table describes current diabetes activities of the 18 counties in the Northeastern North Carolina Partnership Region. Activities are categorized by the level of intervention: (1) Primary Prevention—programs that increase awareness about diabetes and provide resources to promote healthy lifestyles. The goal of these programs is to prevent new cases of diabetes from happening; (2) Screening---programs that provide glucose measurements on asymptomatic people in the community; and (3) Diabetes Self-Management ---programs that educate people with diabetes, and provide them with resources and skills to prevent complications from diabetes from occurring. This information was collected in a survey conducted by the NENCPPH during February and March 2004. Health directors selected one or more staff members involved in diabetes programs in their health department, to complete the surveys. The survey asked them to describe currently implemented programs that target diabetes and its risk factors. If they were aware of other organizations outside the health department that had diabetes programs, they were asked to report on these activities as well. In addition, they were asked their opinion about what might be a solution to alleviate the burden of diabetes in this region of North Carolina. The disparity gap coordinator in each county was responsible for returning the survey to the NENCPPH.

BEAUFORT		
Primary Prevention	**Screening/Testing**	**Self-Management**
	Blood Glucose screening: Health Department will provide fasting blood glucose upon request. Only persons who have never been diagnosed with diabetes are eligible; Sliding scale fee is charged; **Target Population:** all ages; **Location:** Health Department; **Program Began:** before 1999 **Prenatal Screening:** Blood glucose is measured at 28 weeks gestation (1 hour or 2 hour glucose tolerance test); **Target Population:** Pregnant women; **Location:** Health department; **Program Began**: > 1999	

BERTIE		
Primary Prevention	**Screening/Testing**	**Self-Management**
MTW Diabetes Clinic: Provide education for both people with diabetes and patients with impaired glucose tolerance, gestational diabetes, and morbid obesity. **Target Population**: ages 14 and above **Location**: health Department, Senior Center **Program Began**: October 2003 **Diabetes Head to Toe Program:** An informational diabetes awareness program presented to civic groups, seniors upon invitation; Focuses on preventing diabetes by "move more, eat less" concepts and on improving quality of life and preventing diabetes complications for those persons known to have Type 2 diabetes. **Target population:** adults 40 years+ ; **Location:** Senior center, community meeting places, restaurants ; **Program Began:** 2003 **Albemarle Regional Diabetes Care:** Staff provides community outreach programs to educate the public regarding diabetes risk factors and increase public awareness; **Target Population:** ages 14 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994. **Drug Company Diabetes Awareness Day:** Educational conversations , glucose meter questions and answers, finger stick screening by the pharmacy staff or the glucose monitor staff, and literature is provided to the general public; **Target Population:** ages 14+; **Location:** Clinic, Drug Store; **Program Began: ?** **Diabetes Open House:** Provides a day-long opportunity for citizens to float in and out of the Northeast Diabetes Center and to ask questions related to preventing the disease or preventing complications relating to the disease; **Target Population:** adults age 40 years+ ; **Location:** Chronic Disease Management Site; **Program Began**: **?**	**Roanoke Amaranth Community Health Group Office Based Diabetes Screening:** front office and nurses check in patients have a protocol to screen for diabetes. There are 5 clinics that have these protocols. **Target Population:** ages 5years+ ; **Location:** Clinic; **Program Began:** 1999 **Drug Company Diabetes Awareness Day:** Educational conversations , glucose meter questions and answers, finger stick screening by the pharmacy staff or the glucose monitor staff, and literature is provided to the general public; **Target Population:** ages 14+; **Location:** Clinic, Drug Store; **Program Began: ?** **Albemarle Life Quest:** This worksite wellness program screens individuals to detect elevated glucose levels and makes referrals to the Albemarle Regional Diabetes Care Program. Target Population: **Target Population:** ages 19 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994.	**Northeastern Diabetes Self-Management Education Program:** Self-management education in groups following ADA guidelines. Staff includes an RN / certified diabetes educator, and a dietitian **Target Population:** adults with diabetes; **Location:** Chronic Disease Management Center; **Program Began:** May 2000 **Albemarle Regional Diabetes Care**: ADA recognized program that uses a combination of individual and group interventions to improve control and reduce complications of diabetes; **Target Population:** ages 14 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994.

CHOWAN, CAMDEN, CURRITUCK, PASQUOTANK, PERQUIMANS		
Primary Prevention	**Screening/Testing**	**Self-Management**
Albemarle Regional Diabetes Care: Staff provides community outreach programs to educate the public regarding diabetes risk factors and increase public awareness; **Target Population:** ages 14 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994.	**Albemarle Life Quest:** This worksite wellness program screens individuals to detect elevated glucose levels and makes referrals to the Albemarle Regional Diabetes Care Program. Target Population: **Target Population:** ages 19 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994.	**Albemarle Regional Diabetes Care**: ADA recognized program that uses a combination of individual and group interventions to improve control and reduce complications of diabetes; **Target Population:** ages 14 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994.
DARE		
Diabetes Education Program: A program to increase awareness of diabetes and diabetes risk factors; The goal is to provide education to a representative sample of the population through press releases and participation in health fairs; **Target Population:** adults 19years+; **Location:** Health Department, Schools, Churches, Senior Centers, Spanish-speaking churches, health fairs; **Program began**: Oct 2001 **Albemarle Regional Diabetes Care:** Staff provides community outreach programs to educate the public regarding diabetes risk factors and increase public awareness; **Target Population:** ages 14 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994.	**Dare County Prenatal Clinic:** Any pregnant woman with increased risk factors is screened for gestational diabetes early in her pregnancy. All pregnant women are screened between 24 -28 weeks of pregnancy using a one-hour glucose challenge test. If this test is positive, the patient is referred for a 3-hour diagnostic glucose tolerance test. **Target Population:** Pregnant women 14 years+; **Location:** Health Department; **Program Began:** 1980s **Albemarle Life Quest:** This worksite wellness program screens individuals to detect elevated glucose levels and makes referrals to the Albemarle Regional Diabetes Care Program. Target Population: ; **Target Population:** ages 19 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994.	**Stepping Stones Support Program**: a support program for people with diabetes and their families. It is sponsored by the Regional Medical Center in Partnership with Dare County Health Department. Guest speakers from various allied health specialties present programs monthly. **Target Population:** Adults with diabetes and their families; **Location:** Regional Medical Center education room; Churches, Medical Office Buildings and Restaurants. **Program Began:** October 2002. **Diabetes Education Program:** Provide patients with tools to effectively self-manage their disease through meal planning, exercise, monitoring and knowledge of acute and chronic complications of diabetes; **Target Population:** Adults with Diabetes; **Location:** Health Department; **Program began:** Oct 2001
EDGECOMBE		
Primary Prevention	**Screening/Testing**	**Self-Management**
	Edgecombe Diabetes Control Program: High Risk Screening for diabetes; **Target Population:** High risk populations; African Americans; all ages; people with no health insurance; **Location:** Churches, Senior Center; **Program Started**: 1999	**Edgecombe Diabetes Control Program:** People with diabetes are referred to program and receive a nurse assessment and 12 nutrition modules by a registered dietitian. Referrals to providers are made for foot and eye exams; Program includes pharmacy consults and a support group; **Target Population:** People with diabetes age 12 years+; **Location:** Health Department; **Program Started**: 1999

GATES

Primary Prevention	Screening/Testing	Self-Management
Healthy Way: Youth obesity prevention/ reduction provided to all SOS after-school students; Target Population: middle school students; Location: School; Program Began: August 2002 **Diabetes Head to Toe Program:** diabetes awareness program presented to civic groups upon invitation; uses "move more, eat less" concepts; focus on improving quality of life and preventing diabetes complications for persons known to have Type 2 diabetes. **Target population:** adults 40 years+ ; **Location:** Senior center, community meeting places, restaurants ; **Program Began:** 2003 **Diabetes Open House:** Provides a day-long opportunity for citizens to float in and out of the Northeast Diabetes Center and to ask questions related to preventing the disease or preventing complications relating to the disease; **Target Population:** adults age 40 years+ ; **Location:** Chronic Disease Management Site; **Program Began**: **?** **Woman's Day:** weekend exhibit at County Community Center; organized by Roanoke-Chowan Hospital; Hertford-Gates Health Agency Diabetes Education program provided awareness information and talked with participants. ViQuest offered cholesterol and blood sugar testing; **Target Population:** all ages; **Location:** Community Center; **Program Began: ?** **Drug Company Diabetes Awareness Day:** Educational conversations, glucose meter questions and answers, finger stick screening by the pharmacy staff or the glucose monitor staff, and literature is provided to the general public; **Target Population:** ages 14+; **Location:** Clinic, Drug Store; **Program Began: ?** **Albemarle Regional Diabetes Care:** Staff provides community outreach programs to educate the public regarding diabetes risk factors and increase public awareness; **Target Population:** ages 14 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994.	**Roanoke Amaranth Community Health Group Office Based Diabetes Screening:** front office and nurses check in patients have a protocol to identify persons at high risk for diabetes. **Target Population:** ages 5years+ ; **Location:** Clinic; **Program Began:** 1999 **Drug Company Diabetes Awareness Day:** Educational conversations , glucose meter questions and answers, finger stick screening by the pharmacy staff or the glucose monitor staff, and literature is provided to the general public; **Target Population:** ages 14+; **Location:** Clinic, Drug Store; **Program Began: ?** **Albemarle Life Quest:** This worksite wellness program screens individuals for elevated glucose levels and makes referrals to the Albemarle Regional Diabetes Care Program. Target Population: ; **Target Population:** ages 19 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994.	**Northeastern Diabetes Self-Management Education Program:** Self-management education in groups following ADA guidelines. Staff includes RN/certified diabetes educator, and dietitian **Target Population:** adults with diabetes; **Location:** Chronic Disease Management Center; **Program Began:** 2000 **Albemarle Regional Diabetes Care**: ADA recognized program that uses a combination of individual and group interventions to improve control and reduce complications of diabetes; **Target Population:** ages 14 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994. **Diabetes Head to Toe Program:** An informational diabetes awareness program presented to civic groups upon invitation; uses "move more, eat less" concepts focus on improving quality of life and preventing diabetes complications for persons known to have Type 2 diabetes. **Target population:** adults 40 years+ ; **Location:** Senior center, community meeting places, restaurants ; **Program Began:** 2003

HALIFAX

Primary Prevention	Screening/Testing	Self-Management
Healthy Carolinian Diabetes Subcommittee: held Diabetes Awareness Day (Nov 2003) and participated in a health fair (May 2003); distributed diabetes educational materials and provided risk assessments; **Target Population:** adults; **Location:** Mall, Wal-Mart; **Program Began:** 2003 **Senior Center Health and Fitness Day:** An annual event; Health department distributes education materials about diabetes; **Target Population:** older adults **; Location:** Senior Center; **Program Began:** before 2000 **Diabetes Peer Education program:** An annual training program to identify diabetes advocates. After completing the training, participants agree to encourage others to strive for goals that reduce the risks of complications **Target Population:** Adults 19-59 years; People who care about the promotion of diabetes education and in improving the quality of life for persons with diabetes; **Location:** Health Resource Center; **Program Began:** 2002 **Stayin' Alive….Longer:** A new program with 3 components: Nutrition education, physical activity, and diabetes screening. It is based in African-American churches, and will identify and train program leaders in each church. They will receive guidance on increased physical activity and improving overall healthy eating; **Target Population:** African-Americans; all ages; **Location:** Churches; **Program Began:** Fall 2003	**Kate B Reynolds / Healthy Carolinian Program:** Diabetes screening in African-American Churches; **Target Population:** African Americans ; all ages; **Location:** Churches; **Program Began:** July 2003. **Roanoke Valley Senior Expo:** each year, the health department provides blood glucose screenings at a senior expo booth; Nurses from Northampton county health department and Halifax county health department provide education and screening; Sponsored by the Northampton County Council on ageing; **Target Population:** Adults age 60+; **Location:** Halifax county civic center; **Program Began:** 1999 **Industrial Health Screenings:** As part of Halifax County's Adult Health Program, Industrial Screenings are offered to area businesses. Services provided include: blood pressure, blood sugar, and cholesterol checks, nutritional education, and glaucoma screenings. These services are provided on a contract basis, usually on a monthly, quarterly, or yearly basis depending on individual business contracts. **Target Population:** Employed Adults; **Location:** Worksites; **Program Began:** ~1993 **Stayin' Alive….Longer:** A new program with 3 components: Nutrition education, physical activity, and diabetes screening. It is based in African-American churches, and will identify and train program leaders in each church. They will receive guidance on increased physical activity and improving overall healthy eating; **Target Population:** African-Americans; all ages; **Location:** Churches; **Program Began:** Fall 2003	**Diabetes Self-Management Training and Medical Nutrition Therapy Services:** Health department has a certified Diabetes Educator and a registered Dietitian to provide one-on-one diabetes self management training and MNT services in the clinical setting. Health Department is looking at the benefits of an ADA approved program; Area physicians refer participants to this program; **Target Population:** all ages with diabetes; **Location:** Clinic; **Program Began:** before 1990 **Diabetes Peer Education program:** An annual training program to identify diabetes advocates. After completing the training, participants agree to encourage others to strive for goals that reduce the risks of complications; CEUs offered to nurses who complete training; courses last 2 days; **Target Population:** Adults 19-59 years; People who care about the promotion of diabetes education and in improving the quality of life for persons with diabetes; **Location:** Health Resource Center; **Program Began:** 2002 **Monthly Diabetes Support Group:** health department leads a monthly support group in 3 locations around the county. Examples of topics covered: glucometers, foot & skin care, weight loss, heart disease & dental care, cooking demonstrations, recipe exchanges, medications, exercise. **Target Population:** adults with diabetes, or anyone interested in diabetes; **Location:** Health Resource Center, Clinic; **Program Began: ?** **Diabetes Educational Videos:** To aid the general public in understanding their diagnosis of diabetes, the health department purchased a set of diabetes educational videos to donate to the local library. General public can check videos out at no charge with a library card. Videos were advertised in the local newspaper. These videos were obtained in conjunction with Halifax/Northampton Healthy Carolinians. **Target Population:** Adults; **Location:** Public Library; **Program Began**: July 2003

HALIFAX (continued)		
Primary Prevention	**Screening/Testing**	**Self-Management**
Drug Company Diabetes Awareness Day: Educational conversations, glucose meter questions and answers, finger stick screening by the pharmacy staff or the glucose monitor staff, and literature is provided to the general public; Halifax county health department provides nurse to perform blood pressure measurements, and a diabetes educator for this annual event; **Target Population:** ages 14+ **Location:** Clinic, Drug Store; **Program Began:** before 1999	**Roanoke Amaranth Community Health Group Office Based Diabetes Screening:** front office and nurses check in patients and have a protocol to screen for diabetes. There are 5 clinics that have these protocols. **Target Population:** ages 5years+; **Location:** Clinic; **Program Began:** 1999 **Drug Company Diabetes Awareness Day:** Educational conversations, glucose meter questions and answers, finger stick screening by the pharmacy staff or the glucose monitor staff, and literature is provided to the general public; **Target Population:** ages 14+ **Location:** Clinic, Drug Store; **Program Began:** before 1999 **Screening for Gestational Diabetes**: women seen in maternity clinic are screened for diabetes 26-28 weeks gestation; **Target Population**: pregnant women; **Location**: health department; **Program Began:** long-standing program	

HERTFORD

Primary Prevention	Screening/Testing	Self-Management
Healthy Way: Youth obesity prevention/ reduction provided to all SOS after-school students; Target Population: middle school students; Location: School; Program Began: August 2002 **Health Hearts and Souls:** Physical activity & nutrition classes held in African American Churches; Walking trails being established around churches; Participants do pre/periodic health risk assessments; Cooperative extension assists with Nutrition education; Lay health advisors trained in aerobics, etc.; Exercise equipment being purchased to leave with the churches. Funded by Kate B Reynolds for 5 years. Target Population: **Afr**ican-Americans 40 to 59 years of age; **Location:** Faith Community Locations; **Program Began:** 2001 **Diabetes Head to Toe Program:** An informational diabetes awareness program presented to civic groups, seniors upon invitation; Focuses on preventing diabetes by "move more, eat less" concepts and on improving quality of life and preventing diabetes complications for those persons known to have Type 2 diabetes. **Target population:** adults 40 years+ ; **Location:** Senior center, community meeting places, restaurants ; **Program Began:** 2003 **Diabetes Open House:** Provides a day-long opportunity for citizens to float in and out of the Northeast Diabetes Center and to ask questions related to preventing the disease or preventing complications relating to the disease; **Target Population:** adults age 40 years+ ; **Location:** Chronic Disease Management Site; **Program Began**: **?** **Drug Company Diabetes Awareness Day:** Educational conversations , glucose meter questions and answers, finger stick screening by the pharmacy staff or the glucose monitor staff, and literature is provided to the general public; **Target Population:** ages 14+; **Location:** Clinic, Drug Store; **Program Began: ?** **Albemarle Regional Diabetes Care:** Community outreach to increase awareness and to educate public of diabetes risk factors; **Target Population:** ages 14 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994.	**Adult Health Clinic:** Glucose screening performed upon request of patient; Patient pays cost of test; Clinic patients complaining of symptoms that suggest diabetes are generally referred to their private provider for evaluation; **Target Population:** general population; **Location:** Health Department Clinic; **Program Began: ?** **Healthy Hearts and Souls:** screening for diabetes is done in this church-based physical activity and nutrition program; **Target Population:** African Americans; **Location**: Churches; **Program Began:** 2001 **Albemarle Life Quest:** This worksite wellness program screens individuals to detect elevated glucose levels and makes referrals to the Albemarle Regional Diabetes Care Program. Target Population: ; **Target Population:** ages 19 + years; **Location:** Health Department; Churches, Schools, Nutrition Centers, Hospital, Senior Center; **Program Began:** 1994. **Roanoke Amaranth Community Health Group Office Based Diabetes Screening:** front office and nurses check in patients have a protocol to screen for diabetes. There are 5 clinics that have these protocols. **Target Population:** ages 5years+ ; **Location:** Clinic; **Program Began:** 1999 **Drug Company Diabetes Awareness Day:** Educational conversations , glucose meter questions and answers, finger stick screening by the pharmacy staff or the glucose monitor staff, and literature is provided to the general public; **Target Population:** ages 14+; **Location:** Clinic, Drug Store; **Program Began: ?**	**Northeastern Diabetes Self-Management Education Program:** Self-management education in groups following ADA guidelines. Staff includes an RN/ certified diabetes educator, and a dietitian **Target Population:** adults with diabetes; **Location:** Chronic Disease Management Center; **Program Began:** May 2000

HYDE		
Primary Prevention	**Screening/Testing**	**Self-Management**
Diabetes Education: Provide diabetes information presentations upon request; **Location:** community locations **Target Population: ?** Program Began: **?**	**Blood Glucose Screening**: Health department provides blood glucose screenings to the public every Thursday for $6.00. Anyone found with an elevated blood glucose is referred to a physician; **Target Population:** all ages; **Location:** Health Department; **Program Began:** ~1995	

MARTIN		
Primary Prevention	**Screening/Testing**	**Self-Management**
Project SELF Improvement: This program is funded through Kate B Reynolds Foundation. The focus is to improve nutrition, increase physical activity, and prevent or cease smoking. Target Population: all ages; **Location: H**ealth Department, schools, churches, nutrition center, senior centers, clinic; Program Began: June 2002 **MTW Diabetes Clinic:** Provide education for both people with diabetes and patients with impaired glucose tolerance, gestational diabetes, and morbid obesity. **Target Population**: ages 14 and above **Location**: health Department, Senior Center **Program Began**: October 2003	**Roanoke Amaranth Community Health Group Office Based Diabetes Screening:** front office staff and nurses check in patients have a protocol to screen for diabetes. There are 5 clinics that have these protocols. **Target Population:** ages 5years+ ; **Location:** Clinic; **Program Began:** 1999	**MTW Diabetes Clinic:** Provide education for both people with diabetes and patients with impaired glucose tolerance, gestational diabetes, and morbid obesity. **Target Population:** ages 14+; **Location: H**ealth Department, Senior Center; **Program Began:** October 2003

NORTHAMPTON

Primary Prevention	Screening/Testing	Self-Management
Healthy Carolinian Diabetes Subcommittee- held Diabetes Awareness Day (Nov 2003); participated in a health fair distributing diabetes educational materials ; provided risk assessments; **Target Population:** adults; **Locations:** Mall, Wal-Mart; **Program Began:** 2003 **Senior Center Health and Fitness Day:** Annual event; Health department distributes education materials on Diabetes **Diabetes Peer Education program:** Annual training program to identify diabetes advocates. After completing the training, participants agree to encourage others to strive for goals that reduce the risks of complications **Target Population:** Adults 19-59 years; People interested in promotion of diabetes education; **Location:** Health Resource Center; **Program Began:** 2002 **Diabetes Head to Toe Program:** Informational diabetes awareness program presented to civic groups, seniors upon invitation. Uses "move more, eat less" concepts, focus on improving quality of life and preventing diabetes complications for persons known to have Type 2 diabetes. **Target population:** adults 40 years+; **Location:** Senior center, community meeting places, restaurants; **Program Began:**2003 **Diabetes Open House:** Day-long opportunity for citizens to float in and out of the Northeast Diabetes Center and to ask questions related to diabetes prevention or preventing diabetes complications; **Target Population:** adults age 40 years+; **Location:** Chronic Disease Management Site in Ahoskie **Drug Company Diabetes Awareness Day:** glucose meter questions and answers, finger stick screening by the pharmacy staff or the glucose monitor staff, and literature is provided to the general public; **Target Population:** ages 14+; **Location:** Clinic, Drug Store; **Program Began: ?** **Stayin' Alive….Longer:** A new program with Nutrition education, physical activity, and diabetes screening. It is based in African-American churches, and will identify and train program leaders in each church. They will receive guidance on increased physical activity and improving overall healthy eating; **Target Population:** African-Americans; all ages; **Location:** Churches; **Program Began:** Fall 2003	**Roanoke Valley Senior Expo**: each year, the health department provides blood glucose screenings at a senior expo booth; **Target Population**: Adults 60 years+; **Location: ? Program Began:** ? **Kate B Reynolds /Healthy Carolinian Program:** Diabetes screening in African-American Churches; **Target Population**: African-Americans ; all ages; **Location:** Churches; **Program Began:** July 2003 **Roanoke Amaranth Community Health Group Office Based Diabetes Screening:** front office and nurses check in patients and have a protocol to screen for diabetes. There are 5 clinics that have these protocols. **Target Population:** ages 5years+; **Location:** Clinic; **Program Began:** 1999 **Drug Company Diabetes Awareness Day:** Educational conversations, glucose meter questions and answers, finger stick screening by the pharmacy staff or the glucose monitor staff, and literature is provided to the general public; **Target Population:** ages 14+ **Location:** Clinic, Drug Store; **Program Began: ?** **Stayin' Alive….Longer:** A new program with 3 components: Nutrition education, physical activity, and diabetes screening. It is based in African-American churches, and will identify and train program leaders in each church. They will receive guidance on increased physical activity and improving overall healthy eating; **Target Population:** African-Americans; all ages; **Location:** Churches; **Program Began:** Fall 2003	**Chronic Disease Clinic:** health department monitors people with diabetes through a nursing assessment, foot exam, blood sugar, hemoglobin A1C and urine albumins; provides health education about the disease process, prevention of complications and nutritional guidance; **Target Population:** Adults diagnosed with diabetes or hypertension; **Location:** Health Department; **Program Began:** before 1980 **Diabetes Peer Education program:** An annual training program to identify diabetes advocates. After completing the training, participants agree to encourage others to strive for goals that reduce the risks of complications **Target Population:** Adults 19-59 years; People who care about the promotion of diabetes education and in improving the quality of life for persons with diabetes; **Location:** Health Resource Center; **Program Began:** 2002 **Northeastern Diabetes Self-Management Education Program:** Self-management education in groups following ADA guidelines; Staff includes a nurse / certified diabetes educator, and a dietitian; **Target Population:** adults with diabetes; **Location:** Chronic Disease Management Center; **Program Began:** May 2000

TYRRELL & WASHINGTON		
Primary Prevention	**Screening/Testing**	**Self-Management**
Project SELF Improvement: This program is funded through Kate B Reynolds Foundation. The focus is to improve nutrition, increase physical activity, and prevent or cease smoking. Target Population: all ages; **Location:** Health Department, schools, churches, nutrition center, senior centers, clinic; Program Began: June 2002 **MTW Diabetes Clinic:** Provide education for both people with diabetes and patients with impaired glucose tolerance, gestational diabetes, and morbid obesity. **Target Population**: ages 14 and above **Location**: health Department, Senior Center **Program Began**: October 2003		**MTW Diabetes Clinic:** Provide education for both people with diabetes and patients with impaired glucose tolerance, gestational diabetes, and morbid obesity. **Target Population:** ages 14+; **Location:** Health Department, Senior Center; **Program Began:** October 2003

WARREN		
Primary Prevention	**Screening/Testing**	**Self-Management**
Medical Nutrition Therapy: This program addresses obesity; assesses nutritional needs and teaches clients how to make healthy choices for eating **Target Population**: Ages 12 and above; **Location:** Health Department **Program Began:** 2002 **Exerstyle and Exerstyle Plus:** Exercise programs for regular clients and high risk clients (diabetes, high blood pressure, and high cholesterol); The high risk program has a nurse monitoring the pulse during exercise; Glucose and blood pressure are measured before and after exercise. **Target Population:** ages 12+; **Location:** Health Department; **Program Began:** 1988 **Warrenton Walkers** a walking groups that meets at 3 trails in the county. Two billboards have been posted to advertise the trails that are in Noralina, Warren, and Macon. Informational /instructional signs are posted along the walking trails. **Target Population:** all; **Location:** community sites; **Program Began:** summer 2003.	**Health Promotion Screening Program:** health department provides screenings that include blood glucose, cholesterol, blood pressure, weight testing; counseling based on assessment; referrals are made to doctors and/or exercise programs; **Target population**: Ages 12 and above; **Location:** Churches, Senior Center , Industries; **Program Began: ?** **Roanoke Amaranth Community Health Group Office Based Diabetes Screening:** front office and nurses check in patients and have a protocol to screen for diabetes. There are 5 clinics that have these protocols. **Target Population:** ages 5years+; **Location:** Clinic; **Program Began:** 1999 **Health Risk Assessment** an In-house screening for diabetes and cardiovascular disease; referral to exercise programs (exerstyle and exerstyle plus) **Target Population:** ages 12 and above; **Location:** Health Department; **Program Began:** 1993	**Diabetes Support Group** People with diabetes are invited to informational sessions about exercise, nutrition, and diabetes management. Physicians such as eye doctors, and foot doctors, and drug representatives have come as presenters. Program is advertised on billboards; **Target Population:** People with diabetes; **Location:** ?; **Program Began:** 1994.

What should be done to reduce the burden of diabetes in Northeastern North Carolina? The health departments responded with the following thoughts:

- *Diabetes self-management training is the key to reducing the burden of diabetes in NENC. People with diabetes need to understand the decisions they make on a day-to-day basis will affect the development of both short-term and long-term complications.*
- *Adequate money should be allocated for qualified educators and case managers. This should be provided in such a manner that patients and agencies don't have to worry about the hassles of billing and who is going to pay. The government paying up front for prevention and disease control would save 10-1 dollars for the end of life Medicaid costs of the complications from this disease and its related co-morbidities. The education needs to be grass roots project involving peer educators, civic and church groups, industry wellness programs, physical activity enhancements, grocery store specials on the more healthy food choices. Free eye exams should be offered at least every other year for those unable to arrange.*
- *Obtain billing codes for Diabetes management (for example—case management, nutritional counseling, nurse assessments, etc) for ADA certified practitioners*
- *Increased funding should be provided to health departments to increase awareness, screen for early detection as well as provide education to people with diabetes on disease management*
- *There should be more education and physical activity programs available to the citizens*
- *We need more funding and manpower to provide on-going education and management services to residents*
- *There is a lot that could be done to reduce the burden of diabetes in our part of the state, however there is not enough money available. I believe the assorted treatment resources that are less painful (needle less blood glucose monitors, insulin air injectors, insulin pump, etc) were available without a high price tag, people would take better care of their diabetes, thereby reducing the complications.*
- *A focus on reducing overall obesity rates across all age groups will be crucial for a reduction in diabetes diagnosis. The focus should center around having people incorporate physical activity into their daily routines. Providing safe and fun opportunities for physical activity with our youth. Overall reduction in the super-size craze. It will take policy change on a federal level to change the mind set of individuals on a local level. Federal changes such as, stricter guidelines for a la carte and vending in the schools, more time for physical activity, safe neighborhoods, etc. All of these factors are indirectly contributors to the burden of diabetes in our nation.*
- *More social marketing and health education regarding the cause of diabetes type 2. Attack on the sins of carbohydrates-everybody needs to be aware that cheap starchy food and sedentary life styles will lead to obesity and diabetes. Inexpensive low carbohydrate foods like cabbage, greens, etc need to be taught. Parents need to be taught that <u>they</u> MUST role-model an active lifestyle to their children from the very beginning. Communities need to be led toward changing to a healthy lifestyle.*
- *Better nutrition in schools (2) more community outreach and info on nutrition and obesity (3) more financial assistance for meds and test supplies (4) more opportunities for screenings*
- *Increase access and availability of services by increasing reimbursement sources.*
- *We need to target high risk groups. Bridging the gap is what needs to be done.*
- *We need to redistribute glucometers, and have them recalibrated*

Part 3. Community Focus Groups

The NENCPPH conducted focus groups with community members in an effort to gather information on opinions, perceptions and ideas specific to diabetes prevention within the Northeastern region of North Carolina. Specifically the researchers hoped to 1) gain a perspective of what the community members believed were the positive and negative influences on health within their community as it relates to diabetes as well as 2) determine what components would comprise a successful media campaign aimed to prevent and/or educate about diabetes. Pre-established community-based organizations such as Healthy Carolinians groups and sub-committee task forces within the Healthy Carolinians groups were the source for the focus group participants. Five to ten professionals were recruited to participate in the focus group from each participating county.

In total, 5 focus group sessions were completed. The 25 people who participated either lived or worked in Beaufort, Hyde, Gates, Northampton, Halifax, Edgecombe or Washington County. Eighty-eight percent were female, 36 % were African American, 64% were white. All participants were adults, with approximately 20% being between 20 and 29 years of age, and 16% were 30-39 years of age, 32% were 40-49 years, 16% were 50 to 59 years, and 8% were 60 to 69 years of age. Most participants were members of a Healthy Carolinian Task Force (community-based coalitions in North Carolina) and were therefore professionals such as health educators, nutritionists, other types of healthcare professionals. Two participants were retired.

In regards to community attributes or positive influences on ones health as it relates to diabetes, the two overriding themes identified were having access to healthy foods and community walking trails. Negative attributes or negative influences on ones health which were identified were poverty, lack of transportation, minimal activities for children, poor selection of grocery stores, cooking methods (use of lard and fat), limitation to exercise facilities (cost and location) and the idea of a fatalistic attitude among community members.

Participants Quotations

"Well as far as accessibility, if a person wants to be physically active I would think one of the positives … is that there are areas where you can walk and opportunities to get outside for physical activity …People garden and work out in the yard and have lawns to keep …. And people having gardens like vegetables here in the country a lot of the vegetables are home grown versus buying the processed ones from the store."

"The counties you are looking at are more in the poverty areas so they don't have the resources like the gyms; the boys and girls clubs aren't as big."

"We only have one gym in our two counties"

"Another poverty related issue I've noticed…but I've noticed food banks tend to give high calorie items."

"Another issue that was brought up during our last meeting is sort of an acceptance. You know, being heavy is the way it's going to be. You know, 'my momma was heavy, my grandma was heavy so I'm going to be heavy there ain't nothing I can do about it."

"Even though we do have some resources public transportation is another issue, and getting to those resources. I know that … this year we just started doing a diabetic support group and we meet once a month and we have about 10-12 people that show up and its open to the public not just our patients, its been advertised in the newspaper and we probably get 10-12 a month that come to get that education."

"Along with all the fresh vegetables we grow we eat them with the fat back. And they'll drink the juice from it. That's where all the oil and grease is."

"Fresh fruits and vegetables are expensive. People won't spend their money on that"

With respect to the components of a successful media campaign about diabetes and pre-diabetes within the community there were several overriding themes in relation to what population should be targeted, how this population could be reached and from whom should this message come. The majority of the focus groups stated media campaigns should target African Americans/Blacks, school-aged children and blue collar workers. Participants stated that African Americans/Blacks should be educated within the church by an informed church member, school-aged children should be taught within the school through peer education and blue collar workers should be able to seek information at the worksite via an informed professional.

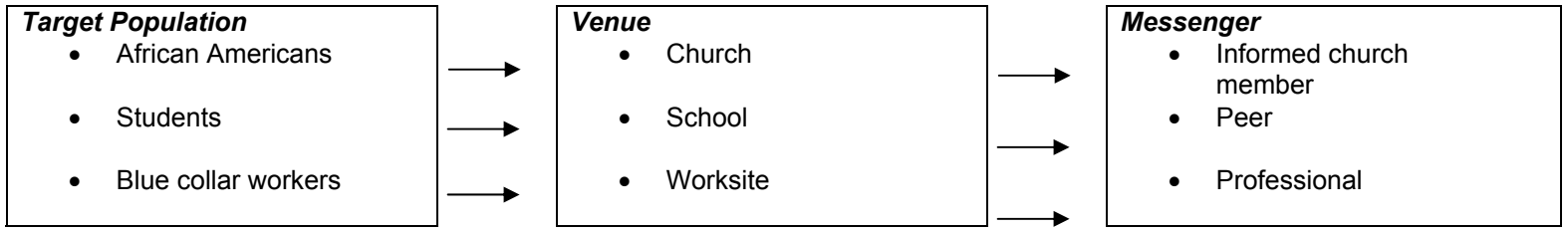
Identified Themes:

Community Attributes

Positive attributes
- Access to healthy foods
- Walking trail

Negative attributes
- Poverty
- Lack of transportation
- No activities for children
- Poor selection of grocery stores
- Cooking methods (fat and lard)
- Fatalistic attitude
- Exercise facilities have limitations

Media Strategies



Part 4. Discussion

The purpose of this report was to assess the strengths and gaps of current public health efforts to reduce the burden of diabetes in Northeastern North Carolina. This synthesis will help guide the NENCPPH as it develops regional efforts around diabetes prevention. The first aspect of public health diabetes efforts that we evaluated was the availability of data on diabetes. Data on diabetes prevalence, mortality, and quality of care is useful for understanding what the current burden of disease is, what groups need to be targeted with prevention programs, and to monitor disease rates over time as a measure of progress after public health programs are initiated. Secondly, we assessed the strengths and gaps in diabetes programs that currently exist in the region. A majority of these programs are those which are being carried out individually by the 10 health departments in the region. A few are programs that are being carried out jointly between health departments, and a few are programs initiated by other organizations such as hospital.

Strengths and Weaknesses of the Data

The Council for State and Territorial Epidemiologists has recommended using 9 defined indicators to monitor diabetes in a population. These indicators are (1) Diabetes-related mortality rates; (2) diabetes prevalence among adults; (3) influenza vaccination among persons with diabetes; (4) prevalence of pneumonia vaccination among persons with diabetes; (5) diabetes-related hospitalizations; (6) diabetes-related lower extremity amputation rates; (7) diabetes end-stage renal disease rates; (8) proportion of adults with diabetes who received a dilated eye exam; (9) proportion of adults with diabetes receiving a foot exam.

The Northeastern North Carolina Partnership for Public Health has access to regional data for many, but not all of these indicators. The North Carolina State Center for Health Statistics (NCSCHS) can provide current diabetes mortality and hospitalization rates. While crude rates for diabetes hospitalizations can be obtained from the NCSCHS, it may also be useful to have age-adjusted hospitalization rates for NENC. Age-adjusted rates would allow NENC rates to be fairly compared to other county, state, and national rates. The NENCPPH could work with the Diabetes Prevention and Care Branch and the NCSCHS to calculate these rates.

One of the strengths of the NENCPPH is that the region is over-sampled in the Behavioral Risk Factor Surveillance Survey, conducted by the NCSCHS. Regional diabetes prevalence data is available beginning with the year 2003.

Data is not currently available to monitor the prevalence of pneumonia or influenza vaccinations, or the proportion of adults with diabetes who received a foot or dilated eye exam, or rates of end stage renal failure among persons with diabetes. The BRFSS does include questions about pneumonia and influenza vaccination, as well as eye and foot exams among persons with diabetes, however because the number of people in NENC surveyed each year is small, estimates of the proportion of persons with diabetes who have had these vaccinations or exams, is very statistically unreliable. However, as NENCPPH region is surveyed through the BRFSS in subsequent years, it may be possible to combine data from multiple years to get a reliable answer. In addition, it may be possible to obtain estimates of this through local data from, for example, some of the diabetes support groups and health department diabetes management programs in the region. There is no readily available data on the incidence and prevalence of end-stage renal disease attributable to diabetes.

Nationally there is some evidence that the incidence of Type II Diabetes among children in the United States is rising. There is no readily available data on the prevalence of Type II diabetes among children in NENC.

Strengths and Gaps of Current Diabetes Programs in the NENC region

Based on a survey conducted by NENCPPH in March 2004, most counties report having primary care activities that are intended to increase awareness of diabetes and its risk factors (health communication interventions). Many of these take place at health fairs, senior centers, schools, civic group meetings, or at the health department. None of the health departments described a multimedia approach using radio, newspaper and/or television.

While 5 of the health departments reported having primary prevention programs that are intended to increase physical activity and improve nutrition in the community, many of health departments do not have community-based primary prevention interventions that aggressively promote and enable healthy lifestyle changes to reduce the risk of diabetes.

Some health departments reported population-based screening programs. There is controversy as to the efficiency and cost-effectiveness of this type of activity. The American Diabetes Association currently advises against community-based opportunistic screening such as at health fairs and community programs.

Eight health departments reported that they have a tertiary prevention program---diabetes self-management programs to prevent the incidence of diabetic complications. It would be useful to gather more information about these programs. For example, what strategies are these programs using---one-on-one education, group education sessions and/or support groups. Further, it might be useful to assess the level of interaction that these programs have with private medical providers and other organizations in the community.

Recommendations

Increase multi-media educational programs/ social marketing

While nearly all health departments reported conducting community education sessions on diabetes, none of them described utilizing a multi-media approach. The existing awareness programs tend to be presentations done by health department staff at health fairs, civic group meetings, churches, senior centers, etc. None of the health departments described uses avenues such as newspapers, radio, or television or using a systematic approach that incorporates social marketing methods.

Focus group participants recommended that educational campaigns should reach children, African Americans and blue collar workers, and that messages might be more influential if knowledgeable and respected individuals in the communities help to deliver the diabetes prevention messages.

Increase community level primary prevention programs

Primary prevention of diabetes is a gap that was identified through the survey of local health departments. A majority of the health departments did not report having community-based primary prevention programs to reduce the number of new cases of diabetes in the region. Community level primary prevention activities might include community-based exercise and nutrition programs targeting people at high risk for diabetes (DHHS Promising Practices in Chronic Disease Prevention and Control 2003).

Include environmental and policy interventions in a regional program

It is recommended that program planning in NENC incorporate a multi-level or socio-ecological approach to behavior change. Most of our diabetes programs focus on encouraging changes in the behavior of an individual—exercise more and eat healthier Another strategy that could

be employed is to create changes in the environment of NENC that help to make NENC a place where it is easier to live healthfully---it is easier to eat right, and it is easier to get enough exercise.

> *Program planners should consider creating change within physical and social environments of the communities organizations, policies and procedures of the social workplace and work settings and individual's access to information*
>
> --Eat Smart, Move More NC

Examples of Multi-level Intervention to Increase Physical Activity

Society	*Improving physical education classes in North Carolina Schools* *Partnering with organizations to build walking trails/biking lanes* *Developing statewide media campaigns to promote environmental change*
Community	*Collaborating with community members to influence policy change (advocating for access to high school track)* *Community groups demanding zoning for bike lanes*
Organizational	*Worksite health promotion program* *No smoking policy* *Health education information included in church bulletin/newsletter*
Interpersonal	*Providing educational information to family members and peers* *Developing walking clubs*
Individual	*Exercise classes* *Health fairs* *Counseling*

Examples of Multilevel Intervention to encourage Healthy Eating

Society	*Partnering with Department of Agriculture to increase facilities such as farmers markets* *Improving quality of food and beverage in schools* *Developing a campaign to promote the need for environments with healthy foods*
Community	*Form community coalition to assess availability of nutritious foods in neighborhoods or restaurants* *Community leaders collaborating to influence social norms and policies about nutrition*
Organizational	*Establishing organizational policy stating that healthy foods be included on all menus* *Sponsoring school, faith based organizations and worksite nutrition events* *Including healthy eating messages in newsletters and websites*
Interpersonal	*Providing parents with written educational information* *Training lay health advisors* *Developing weight management clubs*
Individual	*Providing cooking classes* *Media campaigns* *Counseling*

Adapted from Eat Smart, Move More North Carolina

Learn more about existing self-management programs

Most of the health departments reported that they have a tertiary prevention program---diabetes self-management programs to prevent the incidence of diabetic complications. It would be useful to gather more information about these programs. For example, what strategies are these programs using---one-on-one education, group education sessions and/or support groups. Further, it might be useful to assess the level of interaction that these programs have with private medical providers and other organizations in the community. It is likely that there is variation in

how these self-management programs are carried out. Sharing more specific information about this between health departments throughout the region may be useful so that programs could learn from each other and successful practices could be disseminated. The survey of local health departments did not ask for specific outcome measures of these programs. It may be useful to collect similar outcome measures of these programs.

Explore and test novel interventions

Funding opportunities are available through the federal government that would allow to the NENCPPH to develop and test the effect of a novel diabetes prevention program. Because of the population size and diversity in NENC, it is suitable to apply for these research dollars, a source of funding that is not normally utilized by local health departments. In addition, it would allow the NENCPPH to be creative in designing a program that fits the needs of the region.

Increase knowledge of pre-diabetes

Data from clinical trials provides evidence that diabetes is preventable in high risk persons. Increasing physical activity and weight loss, can prevent the onset of diabetes. The survey of local health departments did not specifically ask whether this message was being delivered in the various existing primary prevention programs. However, the focus group sessions revealed that many people in the region may not be aware of this. During focus groups, participants commonly reported that they believe many people in NENC have a fatalistic attitude about diabetes—that there is nothing they can do once they get diabetes, or that they are destined to get diabetes. Primary prevention programs in the region should definitely emphasize the message that it can be prevented.

Look at local data to fill data gaps

There is no data on the prevalence of eye or foot exams among diabetics, nor of the prevalence of influenza or pneumonia vaccination among persons with diabetes in NENC. These are measures of quality of care for diabetics. While continued participation in the Behavioral Risk Factor Surveillance Survey may solve this data gap, local diabetes self-management programs, or diabetes support groups may be an alternate source for this type of information. A collaborative survey among these programs in the region could be done to measure these indicators.

Continue the Behavioral Risk Factor Surveillance Survey (BRFSS) in NENC

The Behavioral Risk Factor Surveillance Survey data for NENC is one of the strengths of the NENCPPH. Since 2002, the partnership pays to have the region over-sampled in this survey so that it can have region-specific data. Each year, about 900 households in NENC are included in this telephone survey about health that is conducted by the NCSCHS. There are several questions related to diabetes that are asked in this survey, including have you ever been told by a doctor that you have diabetes. Respondents who report that they are have been diagnosed with diabetes are also asked whether they have received annual eye and foot exams, or if they have received influenza and pneumonia vaccinations. Additional questions ask about lifestyle behaviors such as fruit and vegetable consumption and physical activity. These data can be summarized for the NENCPPH region as a whole or for subgroups of the region (Sub-Region I : Warren / Halifax/ Northampton/ Bertie/ Hertford; Sub-region II: Edgecombe/ MTW/ Beaufort/ Dare/ ARHS). It is recommended that the region continue to be over-sampled in this survey so that these data can be assessed over time to monitor progress after instituting a regional diabetes program.

Assess appropriateness of screening programs

Some health departments reported population-based screening programs. There is controversy as to the efficiency and cost-effectiveness of this type of activity. The American Diabetes Association currently advises against community-based opportunistic screening such as at health fairs and community programs.

Appendices

2003 Northeastern Partnership Region BRFSS Survey Results

Diabetes

Have You ever been told by a doctor that you have diabetes?

		Yes			Yes, during pregnancy			No		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	9,441	959	8.2	(7.5- 9.0)	78	0.9	(0.6- 1.2)	8,404	90.9	(90.1-91.7)
Northeastern Partnership	972	137	12.4	(10.3-15.0)	8	0.7	(0.3- 1.4)	827	86.9	(84.3-89.1)
GENDER										
Male	329	51	12.8	(9.4-17.3)	0	0	(-)	278	87.2	(82.7-90.6)
Female	643	86	12.1	(9.6-15.3)	8	1.2	(0.6- 2.7)	549	86.6	(83.4-89.3)
RACE										
White	558	67	11.1	(8.4-14.4)	5	0.8	(0.3- 2.1)	486	88.1	(84.7-90.9)
Other	411	70	14.7	(11.2-19.2)	3	0.4	(0.1- 1.6)	338	84.8	(80.4-88.4)
AGE										
18-44	352	14	3.1	(1.7- 5.5)	2	0.3	(0.1- 1.3)	336	96.6	(94.1-98.1)
45+	615	122	20	(16.5-24.1)	6	0.9	(0.4- 2.4)	487	79.1	(74.9-82.7)
EDUCATION										
H.S. or Less	532	93	14.5	(11.4-18.3)	3	0.3	(0.1- 1.1)	436	85.2	(81.4-88.3)
Some College +	437	44	9.9	(7.2-13.6)	5	1.1	(0.4- 2.8)	388	89	(85.2-91.9)
HOUSEHOLD INCOME										
Less than $50,000	584	89	12.9	(10.1-16.3)	4	0.5	(0.2- 1.5)	491	86.6	(83.1-89.4)
$50,000+	165	11	8.3	(4.5-14.7)	3	1.6	(0.4- 5.6)	151	90.2	(83.5-94.3)

2003 Northeastern North Carolina Sub-Region I (Warren /Halifax/Northampton/Bertie/Hertford) BRFSS results

Diabetes

Have you ever been told by a doctor that you have diabetes?

		Yes			Yes, during pregnancy			No		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	9,441	959	8.2	(7.5- 9.0)	78	0.9	(0.6- 1.2)	8,404	90.9	(90.1-91.7)
Northeast NC I	461	72	13.9	(10.7-17.7)	5	0.8	(0.3- 2.1)	384	85.3	(81.4-88.6)
GENDER										
Male	144	25	13	(8.3-19.9)	0	0	(-)	119	87	(80.1-91.7)
Female	317	47	14.5	(10.7-19.4)	5	1.4	(0.5- 3.6)	265	84.2	(79.2-88.2)
RACE										
White	211	28	12.8	(8.5-18.7)	2	0.6	(0.1- 2.8)	181	86.6	(80.6-90.9)
Other	249	44	14.9	(10.6-20.4)	3	0.9	(0.3- 3.3)	202	84.2	(78.5-88.6)
AGE										
18-44	176	9	4.5	(2.2- 8.9)	2	0.9	(0.2- 3.6)	165	94.6	(90.1-97.2)
45+	285	63	21.5	(16.6-27.4)	3	0.7	(0.2- 2.7)	219	77.8	(71.9-82.8)
EDUCATION										
H.S. or Less	269	51	15.1	(11.1-20.3)	3	0.8	(0.2- 3.0)	215	84	(78.7-88.2)
Some College +	191	21	12	(7.5-18.6)	2	0.7	(0.2- 3.2)	168	87.3	(80.6-91.9)
HOUSEHOLD INCOME										
Less than $50,000	307	54	15.9	(12.0-20.9)	3	0.8	(0.2- 2.9)	250	83.2	(78.2-87.3)
$50,000+	68	3	5.8	(1.6-18.7)	1	0.6	(0.1- 3.9)	64	93.6	(81.3-98.0)

2003 Northeastern North Carolina Sub-Region II (Edgecombe/MTW/Beaufort/Dare/ARHS) BRFSS results

Diabetes

Have you ever been told by a doctor that you have diabetes?

		Yes			Yes, during pregnancy			No		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	9,441	959	8.2	(7.5- 9.0)	78	0.9	(0.6- 1.2)	8,404	90.9	(90.1-91.7)
Northeast NC II	511	65	11.7	(8.9-15.2)	3	0.6	(0.2- 1.9)	443	87.7	(84.2-90.6)
GENDER										
Male	185	26	12.7	(8.4-18.7)	0	0	(-)	159	87.3	(81.3-91.6)
Female	326	39	10.7	(7.5-15.0)	3	1.2	(0.4- 3.6)	284	88.1	(83.7-91.5)
RACE										
White	347	39	10.5	(7.4-14.6)	3	0.9	(0.3- 2.7)	305	88.7	(84.4-91.9)
Other	162	26	14.6	(9.4-22.0)	0	0	(-)	136	85.4	(78.0-90.6)
AGE										
18-44	176	5	2.3	(0.9- 6.0)	0	0	(-)	171	97.7	(94.0-99.1)
45+	330	59	19.2	(14.6-24.8)	3	1.1	(0.3- 3.4)	268	79.7	(74.1-84.4)
EDUCATION										
H.S. or Less	263	42	14.1	(10.0-19.6)	0	0	(-)	221	85.9	(80.4-90.0)
Some College +	246	23	9	(5.8-13.8)	3	1.2	(0.4- 3.9)	220	89.7	(84.8-93.2)
HOUSEHOLD INCOME										
Less than $50,000	277	35	11.1	(7.6-15.9)	1	0.3	(0.0- 2.2)	241	88.6	(83.7-92.2)
$50,000+	97	8	9.3	(4.6-17.8)	2	2	(0.5- 8.0)	87	88.7	(79.9-93.9)

Diabetes as Primary or Contributing Cause of Death 1999-2002

COUNTY	TOTAL DEATHS	RATE	AGE-ADJUSTED RATE	COUNTY	TOTAL DEATHS	RATE	AGE-ADJUSTED RATE
North Carolina	29,941	92.8	95.09	Durham	527	59.14	73.47
NENCPPH Region	2,559	153.51	132.2	Edgecombe	352	160.26	159.41
Alamance	425	80.88	71.25	Forsyth	1,158	94.53	93.51
Alexander	99	73.6	75.63	Franklin	228	118.7	127.34
Alleghany	69	163.09	110.22	Gaston	908	120.2	120.41
Anson	118	118.18	101.24	Gates	78	185.98	168.1
Ashe	135	137.85	95.57	Graham	40	126.55	92.75
Avery	53	76.86	61.16	Granville	212	108.27	115.08
Beaufort	212	117.61	95.99	Greene	69	90.93	89.71
Bertie	198	249.94	211.16	Guilford	1,317	78.82	81.34
Bladen	217	168.92	146.16	Halifax	382	168.69	148.72
Brunswick	255	85.31	71.39	Harnett	314	85.58	98.3
Buncombe	695	84.7	67.55	Haywood	237	109.68	73.62
Burke	411	116.52	107.31	Henderson	424	118.96	73.27
Cabarrus	399	74.77	77.58	Hertford	187	205.66	171.76
Caldwell	381	123.03	115.78	Hoke	131	96.32	135.79
Camden	36	128.37	126.46	Hyde	29	125.62	94.01
Carteret	304	127.54	102.44	Iredell	468	93.69	92.16
Caswell	113	120.99	104.87	Jackson	136	103.91	90.63
Catawba	520	91.48	92.67	Johnston	459	92.59	106.41
Chatham	201	100.27	83.38	Jones	73	181.38	155.25
Cherokee	115	118.26	79.04	Lee	207	104.57	99.4
Chowan	114	199.83	140.14	Lenoir	372	157.26	138.37
Clay	38	107.28	63.28	Lincoln	178	69.44	72.9
Cleveland	451	117.66	106.75	Macon	169	140.87	81.78
Columbus	294	135.46	123.56	Madison	53	67.7	52.53
Craven	370	101.2	102.87	Martin	168	165.28	140.51
Cumberland	909	75.48	119.43	McDowell	187	110.79	95.36
Currituck	57	76.78	78.4	Mecklenburg	1,353	48.42	65.03
Dare	69	56.37	58.79	Mitchell	69	110.9	77.22
Davidson	570	96.54	94.79	Montgomery	135	127.04	119.91
Davie	157	111.39	98.14	Moore	280	93.04	59.89
Duplin	276	141.98	134.52	Nash	425	119.97	121.41

Diabetes as Primary or Contributing Cause of Death 1999-2002 (cont'd)

COUNTY	TOTAL DEATHS	RATE	AGE-ADJUSTED RATE
New Hanover	464	72.51	69.97
Northampton	173	199.13	148.54
Onslow	388	64.74	131.79
Orange	215	46.03	62.51
Pamlico	74	143.94	101.36
Pasquotank	202	143.81	131.22
Pender	118	71.3	64.44
Perquimans	102	224.62	156.49
Person	153	107.53	96.65
Pitt	552	103.08	131.26
Polk	98	134.29	75.83
Randolph	420	80.17	81.43
Richmond	222	119.89	110.92
Robeson	615	125.83	148.87
Rockingham	419	114.36	97.96
Rowan	643	123.32	109.23
Rutherford	275	109.85	89.72
Sampson	324	136.41	128.66
Scotland	159	111.6	119.1
Stanly	281	121.02	108.15
Stokes	178	99.37	101.6
Surry	367	129.26	106.07
Swain	112	216.38	178.79
Transylvania	121	103.83	65.63
Tyrrell	32	193.9	149.76
Union	405	79.27	106.54
Vance	148	85.26	86.52
Wake	1,363	53.14	83.3
Washington	93	172.97	141.45
Watauga	107	63.21	71.48
Wayne	571	125.82	142.12
Wilkes	251	95.61	84.58
Wilson	404	137.57	134.37
Yadkin	155	106.01	91.22
Yancey	76	107.53	75.62

Hospitalization Rates: Diabetes as Any Diagnosis
1999-2001 NC Hospital Discharge data

		Length of stay in days	Days per 1,000 residents	Average length of stay	Total Charges	Charges per resident	Average charge per stay	Number of discharges	Discharges per 1,000 residents
1999	NENC	62,084	149.1	6.1	105,901,819	$254.33	10,464	10,121	24.3
	North Carolina	833,838	105.0	5.9	$1,616,021,426.52	$203.58	$11,471.64	140,871	17.7
2000	NENC	61,143	146.3	5.8	114,911,267	$274.90	10,850	10,591	25.3
	North Carolina	853,018	106.0	5.7	$1,771,797,347.67	$220.12	$11,739.35	150,928	18.8
2001	NENC	62,235	148.6	5.6	126,295,426	$301.63	11,417	11,062	26.4
	North Carolina	874,166	106.8	5.5	$2,025,599,732.84	$247.39	$12,729.45	159,127	19.4

Hospitalization Rates: Diabetes as any Diagnosis
2001 NC Hospital Discharge data

	2001 Population	Length of stay in days	Days per 1,000 residents	Average length of stay	Total Charges	Charges per resident	Average charge per stay	Number of discharges	Discharges per 1,000 residents
North Carolina	8,188,010	874,166	106.8	5.5	$2,025,599,732.84	$247.39	$12,729.45	159,127	19.4
NENC Region	418,713	62,235	148.634029	5.626017	$126,295,425.79	$301.63	$11,417.05	11,062	26.42
Beaufort	45,332	6,073	134.0	5.1	$12,133,688.70	$267.66	$10,248.05	1,184	26.1
Bertie	19,855	3,214	161.9	5.3	$6,594,441.38	$332.13	$10,810.56	610	30.7
Camden	7,024	773	110.1	7.5	$1,803,611.19	$256.78	$17,510.79	103	14.7
Chowan	14,538	1,486	102.2	4.5	$3,268,893.68	$224.85	$9,875.81	331	22.8
Currituck	18,839	1,124	59.7	6.7	$2,232,775.26	$118.52	$13,211.69	169	9.0
Dare	31,209	1,041	33.4	5.1	$2,395,437.78	$76.75	$11,685.06	205	6.6
Edgecombe	54,698	10,011	183.0	5.4	$20,091,401.59	$367.32	$10,883.75	1,846	33.7
Gates	10,560	805	76.2	5.8	$1,736,429.26	$164.43	$12,582.82	138	13.1
Halifax	57,134	12,526	219.2	6.2	$24,304,538.48	$425.40	$12,031.95	2,020	35.4
Hertford	22,156	3,231	145.8	5.1	$6,054,712.74	$273.28	$9,610.66	630	28.4
Hyde	5,742	736	128.2	4.0	$1,549,220.09	$269.80	$8,374.16	185	32.2
Martin	25,339	4,580	180.7	5.2	$9,963,788.98	$393.22	$11,258.52	885	34.9
Northampton	22,008	4,772	216.8	6.4	$9,218,989.06	$418.89	$12,357.89	746	33.9
Pasquotank	35,028	5,680	162.2	6.6	$11,365,596.84	$324.47	$13,124.25	866	24.7
Perquimans	11,522	1,866	162.0	6.5	$3,588,270.45	$311.43	$12,590.42	285	24.7
Tyrrell	4,149	610	147.0	5.6	$1,222,623.60	$294.68	$11,320.59	108	26.0
Warren	19,982	2,099	105.0	5.4	$5,014,935.94	$250.97	$12,925.09	388	19.4
Washington	13,598	1,608	118.3	4.4	$3,756,070.77	$276.22	$10,347.30	363	26.7

Hospitalization Rates: Diabetes as any Diagnosis

2000 NC Hospital Discharge data

	2000 Population	Length of stay in days	Days per 1,000 residents	Average length of stay	Total Charges	Charges per resident	Average charge per stay	Number of discharges	Discharges per 1,000 residents
North Carolina	8,049,313	853,018	106.0	5.7	$1,771,797,347.67	$220.12	$11,739.35	150,928	18.8
NENC Region	418,006	61,143	146.27302	5.8	$114,911,267.49	$274.90	$10,849.90	10,591	25.3
Beaufort	44,958	6,802	151.3	5.4	$11,907,918.10	$264.87	$9,398.51	1,267	28.2
Bertie	19,773	3,225	163.1	5.4	$5,466,269.83	$276.45	$9,125.66	599	30.3
Camden	6,885	432	62.7	4.8	$879,644.01	$127.76	$9,773.82	90	13.1
Chowan	14,526	1,766	121.6	4.8	$3,499,981.13	$240.95	$9,433.91	371	25.5
Currituck	18,190	1,067	58.7	6.8	$2,171,144.57	$119.36	$13,741.42	158	8.7
Dare	29,967	1,168	39.0	6.5	$2,464,891.96	$82.25	$13,770.35	179	6.0
Edgecombe	55,606	9,845	177.0	5.4	$18,678,674.48	$335.91	$10,156.97	1,839	33.1
Gates	10,516	671	63.8	6.0	$1,584,964.59	$150.72	$14,278.96	111	10.6
Halifax	57,370	12,103	211.0	6.5	$22,676,998.48	$395.28	$12,165.77	1,864	32.5
Hertford	22,601	3,529	156.1	5.3	$5,831,538.84	$258.02	$8,808.97	662	29.3
Hyde	5,826	775	133.0	4.0	$1,576,895.79	$270.67	$8,086.65	195	33.5
Martin	25,593	4,044	158.0	5.7	$8,023,337.83	$313.50	$11,332.40	708	27.7
Northampton	22,086	4,305	194.9	6.0	$7,424,818.48	$336.18	$10,326.59	719	32.6
Pasquotank	34,897	5,609	160.7	7.0	$10,509,525.05	$301.16	$13,039.11	806	23.1
Perquimans	11,368	2,181	191.9	7.7	$4,131,128.78	$363.40	$14,495.19	285	25.1
Tyrrell	4,149	426	102.7	4.7	$943,747.53	$227.46	$10,486.08	90	21.7
Warren	19,972	1,597	80.0	5.0	$3,758,193.20	$188.17	$11,671.41	322	16.1
Washington	13,723	1,598	116.4	4.9	$3,381,594.84	$246.42	$10,372.99	326	23.8

Hospitalization Rates: Diabetes as any diagnosis
1999 NC Hospital Discharge data

	1999 Estimated Population	Length of stay in days	Days per 1,000 residents	Average length of stay	Total Charges	Charges per resident	Average charge per stay	Number of discharges	Discharges per 1,000 residents
North Carolina	7,938,062	833,838	105.0	5.9	$1,616,021,426.52	$203.58	$11,471.64	140,871	17.7
NENC Region	416,401	62,084	149.096664	6.1	$105,901,818.90	$254.33	$10,463.57	10,121	24.3
Beaufort	44,755	6,578	147.0	5.7	$11,113,826.56	$248.33	$9,564.39	1,162	26.0
Bertie	19,819	3,227	162.8	5.5	$5,408,153.90	$272.88	$9,135.40	592	29.9
Camden	6,811	521	76.5	5.7	$1,033,069.97	$151.68	$11,352.42	91	13.4
Chowan	14,448	1,837	127.1	5.0	$3,441,001.82	$238.16	$9,325.21	369	25.5
Currituck	17,864	950	53.2	6.7	$1,598,948.95	$89.51	$11,260.20	142	7.9
Dare	29,416	1,213	41.2	6.5	$2,411,228.84	$81.97	$12,894.27	187	6.4
Edgecombe	55,771	9,518	170.7	5.4	$16,940,103.76	$303.74	$9,581.51	1,768	31.7
Gates	10,418	849	81.5	6.2	$1,619,238.33	$155.43	$11,819.26	137	13.2
Halifax	57,255	9,410	164.4	6.5	$17,504,843.46	$305.73	$12,164.59	1,439	25.1
Hertford	22,554	3,127	138.6	5.1	$5,116,354.53	$226.85	$8,401.24	609	27.0
Hyde	5,835	1,295	221.9	5.5	$2,325,642.01	$398.57	$9,854.42	236	40.4
Martin	25,549	7,919	310.0	8.3	$8,389,526.76	$328.37	$8,803.28	953	37.3
Northampton	22,000	3,750	170.5	6.4	$6,865,669.90	$312.08	$11,696.20	587	26.7
Pasquotank	34,908	6,056	173.5	7.7	$10,543,358.48	$302.03	$13,482.56	782	22.4
Perquimans	11,297	1,644	145.5	6.0	$3,091,892.83	$273.69	$11,325.61	273	24.2
Tyrrell	4,155	498	119.9	5.4	$872,834.81	$210.07	$9,487.33	92	22.1
Warren	19,807	1,865	94.2	5.7	$4,267,701.38	$215.46	$13,051.07	327	16.5
Washington	13,739	1,827	133.0	4.9	$3,358,422.61	$244.44	$8,955.79	375	27.3

Hospitalization Rates: Amputations among persons with Diabetes Diagnosis
1999 NC Hospital Discharge data

	1999 Estimated Population	Length of stay in days	Days per 1,000 residents	Average length of stay	Total Charges	Charges per resident	Average charge per stay	Number of discharges	Discharges per 1,000 residents
North Carolina	7,938,062	38,790	4.9	12.2	$65,344,450.93	$8.23	$20,593.90	3,173	0.4
NENC Region	405,435	2705	6.7	12.9	$4,203,707.16	$10.37	$20,017.65	210	0.5
Beaufort	44,755	324	7.2	11.2	$473,168.32	$10.57	$16,316.15	29	0.6
Bertie	19,819	90	4.5	10.0	$138,176.65	$6.97	$15,352.96	9	*
Chowan	14,448	153	10.6	15.3	$238,018.94	$16.47	$23,801.89	10	*
Currituck	17,864	38	2.1	19.0	$42,507.40	$2.38	$21,253.70	2	*
Dare	29,416	160	5.4	17.8	$248,424.32	$8.45	$27,602.70	9	*
Edgecombe	55,771	331	5.9	12.7	$636,789.52	$11.42	$24,491.90	26	0.5
Gates	10,418	74	7.1	18.5	$147,681.92	$14.18	$36,920.48	4	*
Halifax	57,255	297	5.2	13.5	$402,199.07	$7.02	$18,281.78	22	0.4
Hertford	22,554	55	2.4	7.9	$65,417.65	$2.90	$9,345.38	7	*
Hyde	5,835	145	24.9	16.1	$192,253.85	$32.95	$21,361.54	9	*
Martin	25,549	403	15.8	16.8	$530,989.41	$20.78	$22,124.56	24	0.9
Northampton	22,000	157	7.1	22.4	$188,807.61	$8.58	$26,972.52	7	*
Pasquotank	34,908	190	5.4	9.0	$380,621.02	$10.90	$18,124.81	21	0.6
Perquimans	11,297	90	8.0	9.0	$173,683.04	$15.37	$17,368.30	10	*
Warren	19,807	87	4.4	7.9	$141,904.97	$7.16	$12,900.45	11	*
Washington	13,739	111	8.1	11.1	$203,063.47	$14.78	$20,306.35	10	*

***excludes Camden and Tyrrell counties
Note: Rates were not calculated due to the small number in the numerator.
*

Hospitalization Rates: Amputations among people with a Diabetes Diagnosis
2000 NC Hospital Discharge data

	2000 Population	Length stay	Days per 1000 Residents	Average Length of Stay	Total Charges	Charges per Resident	Average charge	Discharges	Discharges per 1000 Residents
North Carolina	**8,049,313**	**35,786**	**4.4**	**11.5**	**$66,668,094.24**	**$8.28**	**$21,340.62**	**3,124**	**0.4**
NENC Region	**393,767**	**2214**	**5.6**	**9.9**	**$4,020,093.86**	**$10.21**	**$17,946.85**	**224**	**0.6**
Beaufort	**44,958**	**277**	**6.2**	**9.6**	**$418,960.78**	**$9.32**	**$14,446.92**	**29**	**0.6**
Bertie	**19,773**	**229**	**11.6**	**9.5**	**$396,939.71**	**$20.07**	**$16,539.15**	**24**	**1.2**
Camden	**6,885**	**55**	**8.0**	**11.0**	**$97,877.05**	**$14.22**	**$19,575.41**	**5**	*
Chowan	**14,526**	**78**	**5.4**	**8.7**	**$138,459.46**	**$9.53**	**$15,384.38**	**9**	*
Currituck	**18,190**	**15**	**0.8**	**15.0**	**$16,829.85**	**$0.93**	**$16,829.85**	**1**	*
Dare	**29,967**	**58**	**1.9**	**11.6**	**$116,880.53**	**$3.90**	**$23,376.11**	**5**	*
Edgecombe	**55,606**	**294**	**5.3**	**7.9**	**$624,627.78**	**$11.23**	**$16,881.83**	**37**	**0.7**
Halifax	**57,370**	**262**	**4.6**	**10.9**	**$500,263.23**	**$8.72**	**$20,844.30**	**24**	**0.4**
Hertford	**22,601**	**99**	**4.4**	**7.1**	**$193,030.78**	**$8.54**	**$13,787.91**	**14**	*
Hyde	**5,826**	**14**	**2.4**	**7.0**	**$22,848.65**	**$3.92**	**$11,424.33**	**2**	*
Martin	**25,593**	**311**	**12.2**	**14.8**	**$518,143.01**	**$20.25**	**$24,673.48**	**21**	**0.8**
Northampton	**22,086**	**127**	**5.8**	**10.6**	**$220,495.48**	**$9.98**	**$18,374.62**	**12**	*
Pasquotank	**34,897**	**139**	**4.0**	**7.7**	**$218,335.65**	**$6.26**	**$12,129.76**	**18**	*
Perquimans	**11,368**	**105**	**9.2**	**11.7**	**$239,996.57**	**$21.11**	**$26,666.29**	**9**	*
Tyrrell	**4,149**	**11**	**2.7**	**11.0**	**$14,248.44**	**$3.43**	**$14,248.44**	**1**	*
Warren	**19,972**	**140**	**7.0**	**10.8**	**$282,156.89**	**$14.13**	**$21,704.38**	**13**	*

* Note: Rates were not calculated due to the small number in the numerator.

Diabetes Hospitalizations: Amputations among persons with Diabetes Diagnosis
2001 NC Hospital Discharge data

	2001 Population	Length of stay in days	Days per 1,000 residents	Average length of stay	Total Charges	Charges per resident	Average charge per stay	Number of discharges	Discharges per 1,000 residents*
North Carolina	8,188,010	33,658	4.1	11.2	$70,227,513.15	$8.58	$23,362.45	3,006	0.4
NENC Region	418,713	2780	6.6	11.0	$5,350,115.33	$12.78	$21,146.70	253	0.6
Beaufort	45,332	266	5.9	9.2	$454,075.61	$10.02	$15,657.78	29	0.6
Bertie	19,855	253	12.7	14.9	$549,139.75	$27.66	$32,302.34	17	0.9
Camden	7,024	32	4.6	10.7	$49,995.88	$7.12	$16,665.29	3	0.4
Chowan	14,538	51	3.5	8.5	$115,963.30	$7.98	$19,327.22	6	0.4
Currituck	18,839	42	2.2	21.0	$57,412.95	$3.05	$28,706.48	2	0.1
Dare	31,209	42	1.3	10.5	$59,371.11	$1.90	$14,842.78	4	0.1
Edgecombe	54,698	332	6.1	9.0	$693,948.64	$12.69	$18,755.37	37	0.7
Gates	10,560	31	2.9	10.3	$61,399.16	$5.81	$20,466.39	3	0.3
Halifax	57,134	355	6.2	9.1	$599,758.38	$10.50	$15,378.42	39	0.7
Hertford	22,156	222	10.0	10.1	$360,587.63	$16.27	$16,390.35	22	1.0
Hyde	5,742	51	8.9	8.5	$84,385.93	$14.70	$14,064.32	6	1.0
Martin	25,339	210	8.3	16.2	$403,840.03	$15.94	$31,064.62	13	0.5
Northampton	22,008	233	10.6	11.1	$392,340.34	$17.83	$18,682.87	21	1.0
Pasquotank	35,028	366	10.4	13.6	$805,523.88	$23.00	$29,834.22	27	0.8
Perquimans	11,522	94	8.2	23.5	$136,114.53	$11.81	$34,028.63	4	0.3
Tyrrell	4,149	17	4.1	8.5	$27,819.68	$6.71	$13,909.84	2	0.5
Warren	19,982	130	6.5	10.0	$411,729.59	$20.61	$31,671.51	13	0.7
Washington	13,598	53	3.9	10.6	$86,708.94	$6.38	$17,341.79	5	0.4

*** Rates with fewer than 20 events in the numerator may be subject to serious random error. Please interpret with caution.**

2003 Northeastern North Carolina Partnership for Public Health Region BRFSS results

Moderate Physical Activity

		Yes			No		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	9,169	3,242	37.6	(36.0-39.2)	5,927	62.4	(60.8-64.0)
Northeastern Partnership	942	312	33.3	(29.6-37.2)	630	66.7	(62.8-70.4)
GENDER							
Male	318	113	32.6	(26.5-39.3)	205	67.4	(60.7-73.5)
Female	624	199	33.8	(29.5-38.4)	425	66.2	(61.6-70.5)
RACE							
White	542	206	39.3	(34.3-44.5)	336	60.7	(55.5-65.7)
Other	397	104	23.4	(18.8-28.7)	293	76.6	(71.3-81.2)
AGE							
18-44	344	123	35.2	(28.9-42.0)	221	64.8	(58.0-71.1)
45+	594	187	31.6	(27.4-36.1)	407	68.4	(63.9-72.6)
EDUCATION							
H.S. or Less	513	147	27.5	(22.8-32.9)	366	72.5	(67.1-77.2)
Some College +	426	165	40.3	(34.8-46.1)	261	59.7	(53.9-65.2)
HOUSEHOLD INCOME							
Less than $50,000	567	184	33.4	(28.6-38.5)	383	66.6	(61.5-71.4)
$50,000+	162	76	44.9	(36.4-53.7)	86	55.1	(46.3-63.6)

**Data in this table were derived from the physical activity questions in BRFSS*
Yes=respondents who report doing moderate physical activity for 30 or more minutes per day, five or more days per week, or respondents who report doing physical activity for 20 or more minutes per day, three or more days per week.

No=respondents who report doing no moderate physical activity , or less than 30 minutes per day, or less than 5 days per week

2003 Northeastern North Carolina Partnership for Public Health Region BRFSS results

Vigorous Physical Activity

		Yes			No		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	9,311	1,465	19.3	(17.9-20.7)	7,846	80.7	(79.3-82.1)
Northeastern Partnership	958	114	13.8	(11.1-17.0)	844	86.2	(83.0-88.9)
GENDER							
Male	322	52	16.2	(11.6-22.0)	270	83.8	(78.0-88.4)
Female	636	62	11.7	(8.8-15.5)	574	88.3	(84.5-91.2)
RACE							
White	550	84	17.8	(13.9-22.6)	466	82.2	(77.4-86.1)
Other	405	28	6.9	(4.4-10.5)	377	93.1	(89.5-95.6)
AGE							
18-44	347	60	19.3	(14.2-25.6)	287	80.7	(74.4-85.8)
45+	607	53	9.2	(6.9-12.3)	554	90.8	(87.7-93.1)
EDUCATION							
H.S. or Less	526	41	9.9	(6.5-14.8)	485	90.1	(85.2-93.5)
Some College +	429	73	18.7	(14.7-23.5)	356	81.3	(76.5-85.3)
HOUSEHOLD INCOME							
Less than $50,000	577	63	13.4	(9.7-18.2)	514	86.6	(81.8-90.3)
$50,000+	162	37	23.3	(16.8-31.4)	125	76.7	(68.6-83.2)

Data in this table were derived from the physical activity questions.

Yes = Respondents who report doing vigorous physical activity for 20 or more minutes per day, three or more days per week.

No = Respondents who report no vigorous physical activity or less than 20 minutes per day, or less than three days per week.

2003 Northeastern North Carolina Sub-Region I (Warren/ Halifax/ Northampton/ Bertie/ Hertford)

Moderate Physical Activity

		Yes			No		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	9,169	3,242	37.6	(36.0-39.2)	5,927	62.4	(60.8-64.0)
Northeast NC I	446	135	28.7	(24.0-33.9)	311	71.3	(66.1-76.0)
GENDER							
Male	137	45	28.3	(20.3-38.0)	92	71.7	(62.0-79.7)
Female	309	90	29	(23.7-35.0)	219	71	(65.0-76.3)
RACE							
White	203	73	35.8	(28.7-43.5)	130	64.2	(56.5-71.3)
Other	242	62	23.1	(17.4-30.0)	180	76.9	(70.0-82.6)
AGE							
18-44	174	57	29.6	(22.0-38.6)	117	70.4	(61.4-78.0)
45+	272	78	28	(22.5-34.2)	194	72	(65.8-77.5)
EDUCATION							
H.S. or Less	261	69	23.7	(18.2-30.2)	192	76.3	(69.8-81.8)
Some College +	184	66	36.3	(28.8-44.6)	118	63.7	(55.4-71.2)
HOUSEHOLD INCOME							
Less than $50,000	298	88	29.1	(23.7-35.3)	210	70.9	(64.7-76.3)
$50,000+	66	28	41.6	(29.1-55.4)	38	58.4	(44.6-70.9)

2003 Northeastern North Carolina Sub-Region I (Warren/ Halifax/ Northampton/ Berties/ Hertford)

Vigorous Physical Activity

		Yes			No		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	9,311	1,465	19.3	(17.9-20.7)	7,846	80.7	(79.3-82.1)
Northeast NC I	452	42	9.5	(6.8-13.0)	410	90.5	(87.0-93.2)
GENDER							
Male	140	16	10.7	(6.2-17.9)	124	89.3	(82.1-93.8)
Female	312	26	8.6	(5.7-12.6)	286	91.4	(87.4-94.3)
RACE							
White	204	24	12	(7.8-18.0)	180	88	(82.0-92.2)
Other	247	18	7.4	(4.5-12.0)	229	92.6	(88.0-95.5)
AGE							
18-44	173	21	11.9	(7.4-18.6)	152	88.1	(81.4-92.6)
45+	279	21	7.5	(4.8-11.5)	258	92.5	(88.5-95.2)
EDUCATION							
H.S. or Less	265	18	6.3	(3.8-10.4)	247	93.7	(89.6-96.2)
Some College +	186	24	14.3	(9.4-21.1)	162	85.7	(78.9-90.6)
HOUSEHOLD INCOME							
Less than $50,000	303	28	9.3	(6.3-13.7)	275	90.7	(86.3-93.7)
$50,000+	65	10	16.5	(8.5-29.6)	55	83.5	(70.4-91.5)

2003 Northeastern North Carolina Partnership for Public Health Region II (Edgecombe/ MTW/ Beaufort/ Dare/ ARHS) BRFSS Results

Moderate Physical Activity

		Yes			No		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	9,169	3,242	37.6	(36.0-39.2)	5,927	62.4	(60.8-64.0)
Northeast NC II	496	177	35.6	(30.7-40.9)	319	64.4	(59.1-69.3)
GENDER							
Male	181	68	34.5	(26.8-43.2)	113	65.5	(56.8-73.2)
Female	315	109	36.7	(30.8-43.1)	206	63.3	(56.9-69.2)
RACE							
White	339	133	40.5	(34.3-47.0)	206	59.5	(53.0-65.7)
Other	155	42	23.6	(16.8-32.0)	113	76.4	(68.0-83.2)
AGE							
18-44	170	66	38.2	(29.7-47.5)	104	61.8	(52.5-70.3)
45+	322	109	33.4	(27.9-39.5)	213	66.6	(60.5-72.1)
EDUCATION							
H.S. or Less	252	78	29.9	(23.3-37.5)	174	70.1	(62.5-76.7)
Some College +	242	99	42.1	(35.0-49.6)	143	57.9	(50.4-65.0)
HOUSEHOLD INCOME							
Less than $50,000	269	96	35.9	(29.2-43.3)	173	64.1	(56.7-70.8)
$50,000+	96	48	46.3	(35.6-57.3)	48	53.7	(42.7-64.4)

2003 Northeastern North Carolina Partnership for Public Health Region II (Edgecombe/ MTW/ Beaufort/ Dare/ ARHS) BRFSS Results

Vigorous Physical Activity

		Yes			No		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	9,311	1,465	19.3	(17.9-20.7)	7,846	80.7	(79.3-82.1)
Northeast NC II	506	72	16.1	(12.3-20.7)	434	83.9	(79.3-87.7)
GENDER							
Male	182	36	18.6	(12.6-26.6)	146	81.4	(73.4-87.4)
Female	324	36	13.6	(9.5-19.2)	288	86.4	(80.8-90.5)
RACE							
White	346	60	19.8	(14.9-25.9)	286	80.2	(74.1-85.1)
Other	158	10	6.3	(3.1-12.7)	148	93.7	(87.3-96.9)
AGE							
18-44	174	39	23.2	(16.2-32.2)	135	76.8	(67.8-83.8)
45+	328	32	10.2	(7.0-14.5)	296	89.8	(85.5-93.0)
EDUCATION							
H.S. or Less	261	23	12.1	(7.1-19.6)	238	87.9	(80.4-92.9)
Some College +	243	49	20.6	(15.4-27.0)	194	79.4	(73.0-84.6)
HOUSEHOLD INCOME							
Less than $50,000	274	35	15.9	(10.5-23.2)	239	84.1	(76.8-89.5)
$50,000+	97	27	26	(17.8-36.3)	70	74	(63.7-82.2)

2003 Northeastern North Carolina Partnership for Public Health Region BRFSS Results

Body Mass Index Grouping*

		Underweight			Recommended Weight			Overweight			Obese		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	8,893	185	1.8	(1.4- 2.3)	3,278	37.3	(35.7-38.9)	3,122	36.9	(35.3-38.5)	2,308	24	(22.6-25.4)
Northeastern Partnership	925	13	1.4	(0.7- 2.9)	287	31.5	(27.9-35.4)	310	35	(31.2-38.9)	315	32.1	(28.5-35.8)
GENDER													
Male	320	4	1.4	(0.4- 4.6)	94	29.4	(23.6-35.9)	118	38.7	(32.3-45.5)	104	30.5	(24.9-36.8)
Female	605	9	1.5	(0.6- 3.4)	193	33.4	(29.1-38.0)	192	31.6	(27.5-36.2)	211	33.5	(29.2-38.0)
RACE													
White	543	9	1.5	(0.7- 3.4)	197	34.2	(29.5-39.2)	184	35.2	(30.4-40.3)	153	29.1	(24.7-34.0)
Other	380	4	1.3	(0.3- 5.2)	89	26.9	(21.4-33.2)	125	34.5	(28.4-41.1)	162	37.3	(31.6-43.5)
AGE													
18-44	335	6	1.9	(0.6- 5.3)	103	32.8	(26.8-39.4)	107	33.5	(27.5-40.2)	119	31.8	(26.1-38.1)
45+	586	7	1.1	(0.5- 2.7)	183	30.5	(26.3-35.1)	201	35.9	(31.3-40.8)	195	32.4	(28.1-37.1)
EDUCATION													
H.S. or Less	501	9	1.8	(0.7- 4.2)	146	30.3	(25.4-35.7)	166	34.2	(28.9-39.8)	180	33.8	(28.9-39.1)
Some College +	421	4	1.1	(0.3- 3.5)	139	32.9	(27.7-38.6)	143	35.8	(30.5-41.5)	135	30.2	(25.2-35.7)
HOUSEHOLD INCOME													
Less than $50,000	565	9	2	(0.9- 4.6)	151	27.6	(23.1-32.5)	190	34.2	(29.4-39.4)	215	36.2	(31.4-41.1)
$50,000+	159	1	0.5	(0.1- 3.5)	57	33.7	(26.0-42.3)	57	37.4	(29.3-46.4)	44	28.4	(20.6-37.6)

2003 Northeastern North Carolina Partnership Region I (Warren/ Halifax/ Northampton/ Bertie/ Gates/ Hertford) BRFSS Results

Body Mass Index Groupings

		Underweight			Recommended Weight			Overweight			Obese		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	8,893	185	1.8	(1.4- 2.3)	3,278	37.3	(35.7-38.9)	3,122	36.9	(35.3-38.5)	2,308	24	(22.6-25.4)
Northeast NC I	438	6	1	(0.4- 2.3)	132	32.1	(27.1-37.6)	141	32.4	(27.4-37.8)	159	34.5	(29.6-39.8)
GENDER													
Male	139	2	0.8	(0.2- 3.2)	42	29.2	(21.2-38.7)	49	37.6	(28.6-47.6)	46	32.4	(24.3-41.6)
Female	299	4	1.1	(0.4- 3.3)	90	34.1	(28.0-40.8)	92	28.8	(23.5-34.7)	113	36	(30.1-42.4)
RACE													
White	205	3	1.1	(0.3- 3.8)	74	35.7	(28.5-43.7)	70	36	(28.7-44.0)	58	27.1	(20.9-34.5)
Other	232	3	0.9	(0.3- 2.7)	58	28.9	(22.2-36.6)	70	28.6	(22.2-36.0)	101	41.7	(34.5-49.2)
AGE													
18-44	166	3	1	(0.3- 3.3)	47	33.6	(25.4-42.8)	55	33.4	(25.7-42.1)	61	32	(24.7-40.4)
45+	272	3	1	(0.3- 3.3)	85	31	(25.0-37.6)	86	31.7	(25.4-38.7)	98	36.4	(30.1-43.3)
EDUCATION													
H.S. or Less	252	4	1	(0.4- 2.6)	72	31	(24.6-38.2)	84	33.4	(27.0-40.5)	92	34.6	(28.2-41.6)
Some College +	185	2	1	(0.2- 4.4)	59	33.5	(25.9-42.0)	57	31	(23.6-39.7)	67	34.5	(27.2-42.7)
HOUSEHOLD INCOME													
Less than $50,000	294	3	0.7	(0.2- 2.3)	76	26.4	(20.8-32.8)	100	36.2	(29.8-43.1)	115	36.7	(30.6-43.3)
$50,000+	64	1	1.7	(0.2-11.3)	23	39.4	(26.3-54.3)	17	23.1	(14.1-35.4)	23	35.8	(23.9-49.7)

2003 Northeastern North Carolina Partnership Region II (Edgecombe/ MTW/ Beaufort/ Dare/ ARHS) BRFSS Results

Body Mass Index Groupings

		Underweight			Recommended Weight			Overweight			Obese		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	8,893	185	1.8	(1.4- 2.3)	3,278	37.3	(35.7-38.9)	3,122	36.9	(35.3-38.5)	2,308	24	(22.6-25.4)
Northeast NC II	487	7	1.7	(0.7- 4.0)	155	31.2	(26.5-36.4)	169	36.3	(31.2-41.7)	156	30.8	(26.2-35.9)
GENDER													
Male	181	2	1.7	(0.4- 6.6)	52	29.5	(22.1-38.0)	69	39.2	(31.0-47.9)	58	29.7	(22.7-37.9)
Female	306	5	1.7	(0.6- 5.0)	103	33	(27.3-39.2)	100	33.4	(27.6-39.8)	98	31.9	(26.3-38.2)
RACE													
White	338	6	1.7	(0.6- 4.3)	123	33.6	(27.9-39.8)	114	34.9	(29.1-41.2)	95	29.8	(24.3-36.0)
Other	148	1	1.7	(0.2-11.3)	31	25	(17.0-35.2)	55	39.8	(30.2-50.2)	61	33.5	(25.2-43.0)
AGE													
18-44	169	3	2.3	(0.6- 7.8)	56	32.4	(24.7-41.3)	52	33.6	(25.6-42.7)	58	31.7	(24.1-40.3)
45+	314	4	1.2	(0.4- 3.8)	98	30.3	(24.7-36.5)	115	38.2	(32.1-44.7)	97	30.3	(24.7-36.5)
EDUCATION													
H.S. or Less	249	5	2.2	(0.7- 6.3)	74	29.9	(23.4-37.4)	82	34.6	(27.4-42.6)	88	33.3	(26.7-40.7)
Some College +	236	2	1.1	(0.2- 5.2)	80	32.6	(26.0-40.1)	86	38	(31.1-45.4)	68	28.2	(22.0-35.5)
HOUSEHOLD INCOME													
Less than $50,000	271	6	2.8	(1.1- 7.1)	75	28.3	(22.1-35.4)	90	33.1	(26.5-40.4)	100	35.8	(29.3-42.8)
$50,000+	95	0	0	(-)	34	31.3	(22.5-41.8)	40	43.4	(32.7-54.6)	21	25.3	(16.0-37.7)

2003 Northeastern North Carolina Partnership Region BRFSS results

Overweight or Obese

	Total	No N	%	C.I. (95%)	Yes N	%	C.I. (95%)
NORTH CAROLINA	8,893	3,463	39.1	(37.5-40.7)	5,430	60.9	(59.3-62.5)
Northeastern Partnership	925	300	33	(29.3-36.9)	625	67	(63.1-70.7)
GENDER							
Male	320	98	30.8	(24.9-37.4)	222	69.2	(62.6-75.1)
Female	605	202	34.9	(30.5-39.5)	403	65.1	(60.5-69.5)
RACE							
White	543	206	35.7	(31.0-40.7)	337	64.3	(59.3-69.0)
Other	380	93	28.2	(22.5-34.6)	287	71.8	(65.4-77.5)
AGE							
18-44	335	109	34.7	(28.6-41.4)	226	65.3	(58.6-71.4)
45+	586	190	31.7	(27.4-36.3)	396	68.3	(63.7-72.6)
EDUCATION							
H.S. or Less	501	155	32.1	(27.1-37.5)	346	67.9	(62.5-72.9)
Some College +	421	143	34	(28.7-39.7)	278	66	(60.3-71.3)
HOUSEHOLD INCOME							
Less than $50,000	565	160	29.6	(25.0-34.7)	405	70.4	(65.3-75.0)
$50,000+	159	58	34.2	(26.5-42.8)	101	65.8	(57.2-73.5)

2003 Northeastern North Carolina Partnership for Public Health Region I (Warren Halifax/ Northampton/ Bertie/ Hertford) BRFSS Results

Overweight or Obese

		No			Yes		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	8,893	3,463	39.1	(37.5-40.7)	5,430	60.9	(59.3-62.5)
Northeast NC I	438	138	33.1	(28.0-38.5)	300	66.9	(61.5-72.0)
GENDER							
Male	139	44	30	(21.9-39.5)	95	70	(60.5-78.1)
Female	299	94	35.2	(29.1-41.9)	205	64.8	(58.1-70.9)
RACE							
White	205	77	36.9	(29.6-44.8)	128	63.1	(55.2-70.4)
Other	232	61	29.8	(23.0-37.5)	171	70.2	(62.5-77.0)
AGE							
18-44	166	50	34.6	(26.4-43.8)	116	65.4	(56.2-73.6)
45+	272	88	31.9	(25.9-38.6)	184	68.1	(61.4-74.1)
EDUCATION							
H.S. or Less	252	76	31.9	(25.5-39.2)	176	68.1	(60.8-74.5)
Some College +	185	61	34.5	(26.8-43.0)	124	65.5	(57.0-73.2)
HOUSEHOLD INCOME							
Less than $50,000	294	79	27.1	(21.5-33.5)	215	72.9	(66.5-78.5)
$50,000+	64	24	41.2	(27.9-55.8)	40	58.8	(44.2-72.1)

Northeastern North Carolina Partnership for Public Health Region II (Edgecombe/ MTW/ Beaufort/ Hyde/ Dare/ ARHS) BRFSS Results

Overweight or Obese

		No			Yes		
	Total	N	%	C.I. (95%)	N	%	C.I. (95%)
NORTH CAROLINA	8,893	3,463 3	9.1	(37.5-40.7)	5,430 6	0.9	(59.3-62.5)
Northeast NC II	487	162 3	2.9	(28.0-38.2)	325 6	7.1	(61.8-72.0)
GENDER							
Male	181	54 3	1.1	(23.6-39.8)	127 6	8.9	(60.2-76.4)
Female	306	108 3	4.7	(28.8-41.0)	198 6	5.3	(59.0-71.2)
RACE							
White	338	129 3	5.3	(29.5-41.5)	209 6	4.7	(58.5-70.5)
Other	148	32 2	6.8	(18.4-37.1)	116 7	3.2	(62.9-81.6)
AGE							
18-44	169	59 3	4.7	(26.7-43.7)	110 6	5.3	56.3-73.3)
45+	314	102 3	1.5	(25.9-37.7)	212 6	8.5	(62.3-74.1)
EDUCATION							
H.S. or Less	249	79 3	2.1	(25.4-39.7)	170 6	7.9	(60.3-74.6)
Some College +	236	82 3	3.8	(27.0-41.3)	154 6	6.2	(58.7-73.0)
HOUSEHOLD INCOME							
Less than $50,000	271	81 3	1.1	(24.7-38.4)	190 6	8.9	(61.6-75.3)
$50,000+	95	34 3	1.3	(22.5-41.8)	61 6	8.7	(58.2-77.5)