Swain County Community Health Assessment

December 3

2012

Public Health

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SWAIN COUNTY COMMUNITY HEALTH ASSESSMENT

August 2012

ACKNOWLEDGEMENTS

This document was developed by Swain County Health Department, in partnership with Swain County Hospital as part of a local community health assessment process. We would like to thank several agencies and individuals for their contributions and support in conducting this health assessment.

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EXECUTIVE SUMMARY

Overview of CHA Purpose and Process

Community health assessment (CHA) is the foundation for improving and promoting the health of county residents. **Community health assessment is a key step in the continuous community health improvement process**. The role of CHA is to identify factors that affect the health of a population and determine the availability of resources within the county to adequately address these factors.

In 2009, Swain County completed a comprehensive Community Health Assessment, resulting in the selection of two priorities. Primary and secondary was gathered from surveys, community feedback, the community health data book and other resources. Answers were compiled for each question from the survey and listed in order by the frequency with which each response was chosen. The results were presented to the Community Health Assessment Team and a strategic prioritization exercise was completed. Discussion followed the exercise with consensus being reached on the prioritization for the next four years. The Healthy Carolinians, "Partnership for Health" and Swain County health department hosted the events.

Presentations were made to Partnership for Health, the existing taskforces, and the Board of Health. Reports out presentations were presented to the County Commissioners, the SHAC and other community organization. New action teams were developed. The results were reported to the community through the newspaper, e-mail, and the Health Department web site.
The top health priorities issues to address were reached by using the following criteria based on primary and secondary data presented.

- The problem affects a lot of Swain County residents – including low income and underserved residents.
- More resources are needed for this issue; it is not being sufficiently addressed by existing programs.
- There's a good chance that the problem could be reduced if local groups were dedicated to working on it.
- It will be beneficial to use a collaborative approach involving a variety of community stakeholders in addressing this issue.

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In 2012, Swain County has had the opportunity to partner with Swain County Hospital, a non-profit hospital in new ways through the development of WNC Healthy Impact.

WNC Healthy Impact is a partnership between hospitals and health departments in North Carolina to improve community health. As part of a larger, and continuous, community health improvement process, these partners are collaborating to conduct community health (needs) assessments across western North Carolina. See www.WNCHealthyImpact.com for more details about the purpose and participants of this region-wide effort. The regional work of WNC Healthy Impact is supported by a steering committee, workgroups, local agency representatives, and a public health/data consulting team. In addition, for this data collection phase of our regional efforts, a survey vendor (PRC – Professional Research Consultants, Inc.) was hired to administer a region-wide telephone survey.

In order to enable full participation in WNC Healthy Impact, the decision was made to transition the Swain County CHA timeline to match that of the region and meet the needs of local non-profit hospital partners. While this has great benefits for regional partnerships, it does mean that the 2012 CHA is taking place after three years of community action around the previous priority areas

List of Health Priorities

The 2009 Community Health Assessment resulted in the following priorities:

- Community Obesity
- Risky behavior in the youth population

These health concerns are current, and have not changed dramatically since the 2009 CHA was completed. What has changed is the community's focus on these areas. It takes time to see change, but with combined community efforts we are beginning to see steps in the positive direction. Swain County Schools and Swain County Health Department have partnered to work on Youth Risky Behaviors and Obesity. Swain school's health advisory committee (SHAC) has adopted obesity and mental health issues as a focus. One elementary school has been using the fitness gram program to evaluate K-5 physical fitness and body mass index. Parents are sent a letter home with the results. Health seminars were held for school staff including health checks and classes in stress reduction, yoga, cross-fit intro, and CPR.

Nutritional Education has been given by Swain County Schools' nutritionist and Swain Health Department nutritionist. Activities were introduced, to promote physical activity. Work place health foods policies have been adopted. Many programs have been put into place and environments are becoming more conducive in promoting healthy choices and promoting wellness. There have been steps forward but there is still a lot of work to be done in health and wellness awareness and environmental policy.

The Swain County 2012 Community Health Assessment Priority Areas are:

1. ***Tobacco Use***
2. ***Obesity- Physical Activity and Nutrition***

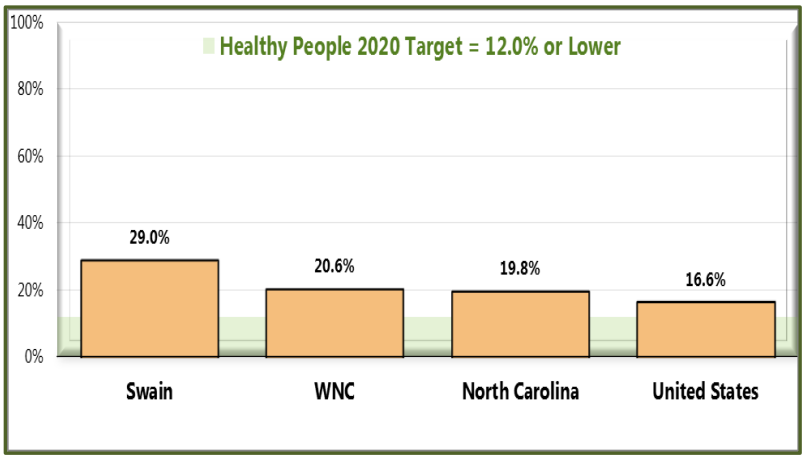
General Review of Data and Trends

The following key data and trends helped support the determination of each of the health priorities. Note that this is only a snapshot of each area and that more detail, source information, and additional analysis can be found in the full report.

1. Tobacco Use

Tobacco use is the single most preventable cause of death and disease in the United States. Each year, approximately 443,000 Americans die from tobacco-related illnesses. For every person who dies from tobacco use, 20 more people suffer with at least one serious tobacco-related illness. In addition, tobacco use costs the US $193 billion annually in direct medical expenses and lost productivity. Preventing tobacco use and helping tobacco users quit can improve the health and quality of life for Americans of all ages. People who stop smoking greatly reduce their risk of disease and premature death. Benefits are greater for people who stop at earlier ages, but quitting tobacco use is beneficial at any age.

Many factors influence tobacco use, disease, and mortality. Risk factors include race/ethnicity, age, education, and socioeconomic status. Significant disparities in tobacco use exist geographically; such disparities typically result from differences among states in smoke-free protections, tobacco prices, and program funding for tobacco prevention (DHHS, 2010).

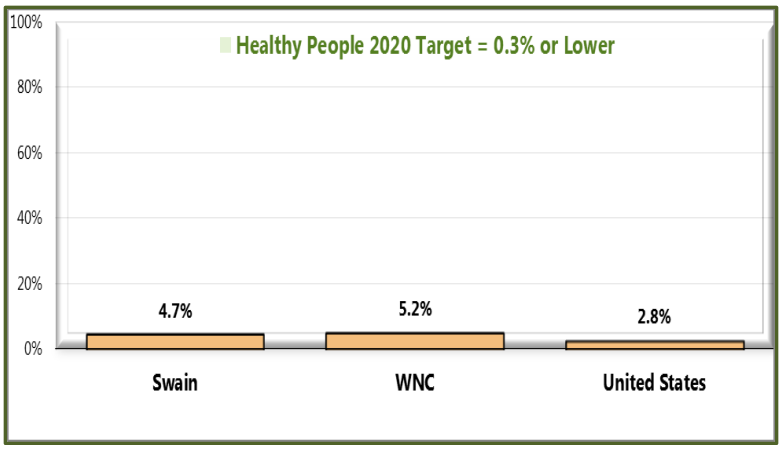


Swain Co. had 29.0 % that answered that they are **currently smoking**.

Which is higher that WNC, NC and the US rate

- Goal 12.0% or lower

(WNC Healthy Impact Survey.) 2012



Swain Co. had 4.7% that answered that they are currently using **smokeless tobacco** products.

- Goal 0.3%

Higher than US, lower that WNC

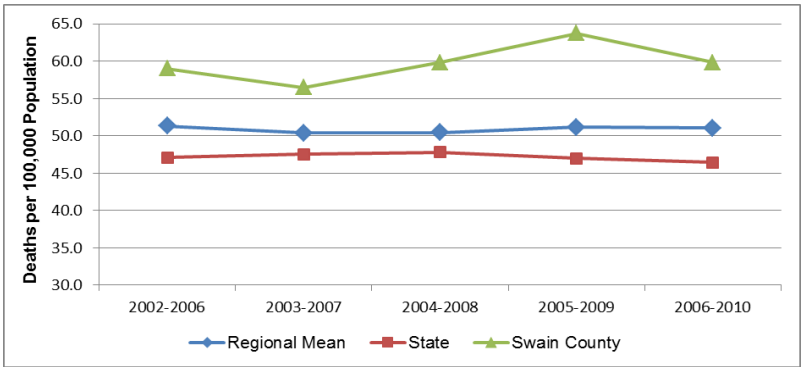
(WNC Healthy Impact Survey)2012

Table 30. Age-Adjusted Mortality Rates for Major Site-Specific Cancers (2006-2010)

Geography	Deaths per 100,000 Population			
	Lung Cancer	Breast Cancer	Prostate Cancer	Colon Cancer
Swain County	70.5	n/a	n/a	n/a
Regional Mean	54.7	24.3	22.9	16.6
State	55.9	23.4	25.5	16.0

The stable county mortality rate for lung cancer (70.5) was above both the mean WNC and NC rates. In WNC, lung cancer is the site-specific cancer with the highest mortality, followed by breast cancer, prostate cancer, and colon cancer.

Figure 21. CLRD Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



In Swain County, the mean CLRD mortality rate among males exceeded the comparable rate among females over most of the past decade, but the difference has become much smaller (Figure 22). In the 2002-2006 aggregate period the CLRD mortality rate for Swain County males (96.8) was almost three times the rate for Swain County females (34.5); in the 2006-2010 aggregate period the rate for males (59.2) was only 1.4% higher than the rate for females (58.4). It should be noted that the first two data points for females in the figure represent technically unstable rates; all the other rates in the figure are stable.

Table 28. Rank of Cause-Specific Mortality Rates for the Fifteen Leading Causes of Death (Five-Year Aggregate, 2006-2010)

Leading Cause of Death	Swain County		WNC Mean		NC	
	Rank	Rate	Rank	Rate	Rank	Rate
Heart Disease	**1**	**259.1**	**1**	**194.4**	**1**	**184.9**
Total Cancer	**2**	**202.9**	**2**	**180.3**	**2**	**183.1**
Chronic Lower Respiratory Disease	**4**	**59.8**	**3**	**51.1**	**4**	**46.4**
Cerebrovascular Disease	5	56.2	4	44.0	3	47.8
All Other Unintentional Injuries	3	69.0	5	42.9	5	28.6
Alzheimer's Disease	7	44.8	6	30.7	6	28.5
Diabetes Mellitus	6	47.3	7	19.6	7	22.5
Pneumonia and Influenza	8	36.3	8	19.1	9	18.6
Unintentional Motor Vehicle Injuries	11	n/a	9	16.7	10	16.7
Suicide	14	n/a	10	16.7	12	12.1
Nephritis, Nephrotic Syndrome & Nephrosis	10	24.2	11	16.2	8	18.9
Septicemia	12	n/a	12	13.4	11	13.7
Chronic Liver Disease & Cirrhosis	9	30.2	13	13.2	13	9.1
Homicide	13	n/a	14	n/a	14	6.6
Acquired Immune Deficiency Syndrome	15	n/a	15	n/a	15	5.4

The top causes of mortality in Swain County are influenced by tobacco use, heart disease, cancer, and chronic lower respiratory disease.

It should be noted that the rank order of leading causes of death varies somewhat among the 16 counties in WNC.

In September, 1935, Fortune Magazine published a discussion of the medical implications of smoking. It concluded that:

"*This much can be said: That the possible benefit to be derived from tobacco is always less than the possible harm"* (Robert, 1949: 256).

In our lifetime transformation has evolved promoting policy and environmental changes in tobacco use. We still have to be proactive and continue the effort of the social norm of being smoke free. The team choose to focus on this priority to promote wellness for Swain County citizens young and old.

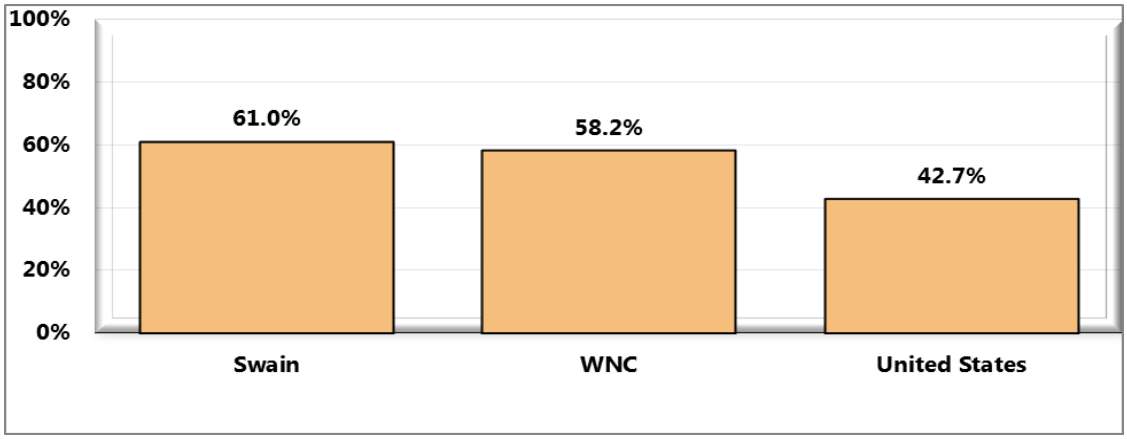
2. Obesity- Physical Activity and Nutrition

Table 35. Estimate of Diagnosed Obesity Among Adults Age 20 and Older (2005-2009)

Geography	2005		2006		2007		2008		2009	
	#	%	#	%	#	%	#	%	#	%
Swain County	**2,880**	**30.1**	**2,855**	**29.0**	**2,867**	**28.2**	**3,191**	**32.0**	**3,175**	**32.5**
Regional Total	128,908	-	136,661	-	139,114	-	143,681	-	148,403	-
Regional Arithmetic Mean	8,057	25.2	8,541	26.4	8,695	26.7	8,980	27.4	9,275	28.0

Table 35 presents trend data from the CDC on the estimated prevalence of diagnosed adult obesity in Swain County and WNC. The prevalence of diagnosed obesity and selected risk factors by county was estimated using data from CDC's Behavioral Risk Factor Surveillance System (BRFSS) and data from the U.S. Census Bureau's Population Estimates Program. Three years of data were used to improve the precision of the year-specific county-level estimates of diagnosed diabetes and selected risk factors.

Figure 55. Meets Physical Activity Recommendations (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 80]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.

Notes:
- Asked of all respondents.
- In this case the term "meets physical activity recommendations" refers to participation in moderate physical activity (exercise that produces only light sweating or a slight to moderate increase in breathing or heart rate) at least 5 times a week for 30 minutes at a time, and/or vigorous physical activity (activities that cause heavy sweating or large increases in breathing or heart rate) at least 3 times a week for 20 minutes at a time.

Obesity Disparity

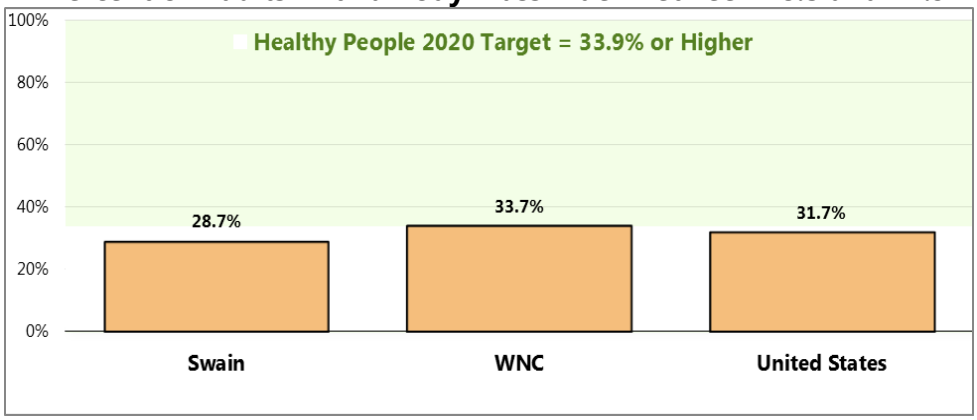
Obesity is a problem throughout the population. However, among adults in the U.S., vast disparities in obesity exist. Within the U.S., the prevalence of obesity is highest for middle-aged people and for non-Hispanic black and Mexican American women. Among children and adolescents, the prevalence of obesity is highest among older and Mexican American children and non-Hispanic black girls. The association of income with obesity varies by age, gender, and race/ethnicity. Social and physical factors affecting diet and physical activity have an impact on weight (DHHS, 2010).

Body Mass Index (BMI), which describes relative weight for height, is significantly correlated with total body fat content. The BMI should be used to assess overweight and obesity and to monitor changes in body weight. In addition, measurements of body weight alone can be used to determine efficacy of weight loss therapy. BMI is calculated as weight (kg)/height squared (m^2). To estimate BMI using pounds and inches, use: [weight (pounds)/height squared ($inches^2$)] x 703.

In this report, underweight is defined as a BMI of <18.5 kg/m^2, normal is defined as a BMI of 18.5 to 24.9 kg/m^2, overweight is defined as a BMI of 25.0 to 29.9 kg/m^2 and obesity as a BMI ≥30 kg/m^2. The rationale behind these definitions is based on epidemiological data that show increases in mortality with BMIs above 25 kg/m^2. The increase in mortality, however, tends to be modest until a BMI of 30 kg/m^2 is reached. For persons with a BMI ≥30 kg/m^2, mortality rates from all causes, and especially from cardiovascular disease, are generally increased by 50 to 100 percent above that of persons with BMIs in the range of 20 to 25 kg/m^2 (NIH, 1998)

Based on self-reported heights and weights, the survey data below shows 2012 county and regional estimates of the prevalence of healthy weight, overweight, and obesity.

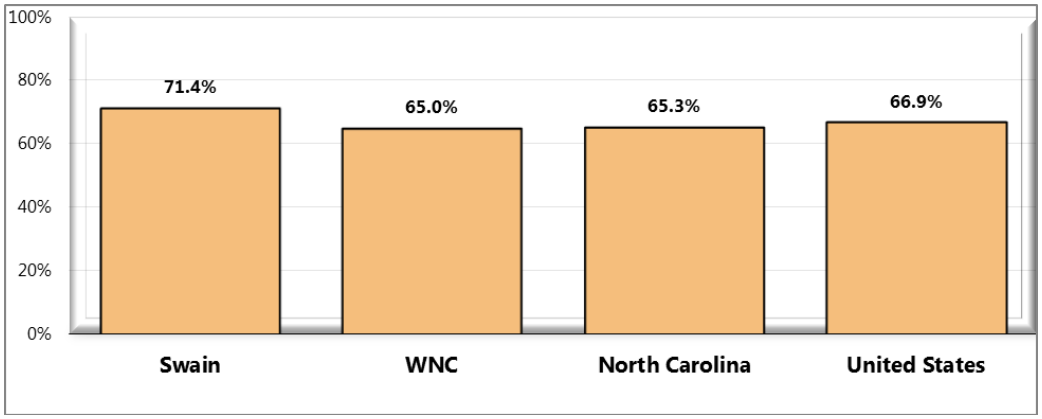
Figure 47. Healthy Weight (WNC Healthy Impact Survey)
Percent of Adults With a Body Mass Index Between 18.5 and 24.9



http://www.healthypeople.gov Objective NWS-8]

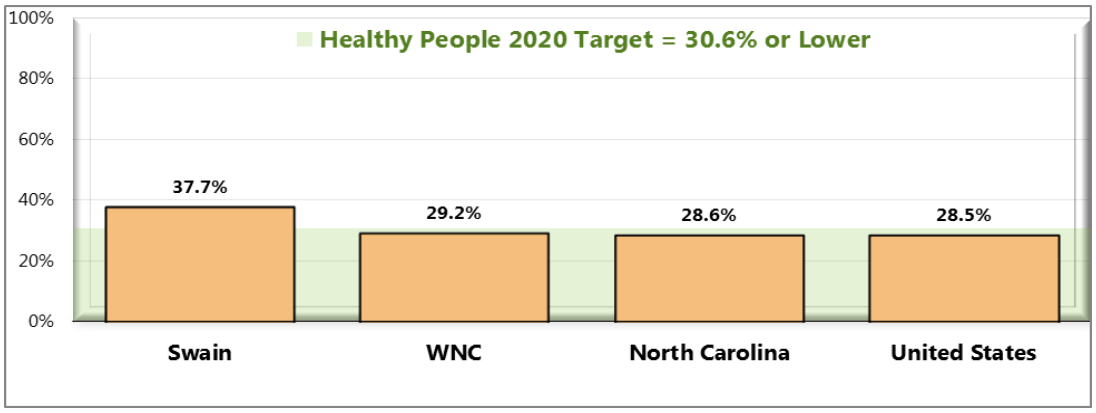
- The definition of healthy weight is having a body mass index (BMI), a ratio of weight to height (kilograms divided by meters squared), between 18.5 and 24.9.

Figure 48. Prevalence of Total Overweight (WNC Healthy Impact Survey)
(Percent of Overweight or/Obese Adults; Body Mass Index of 25.0 or Higher)



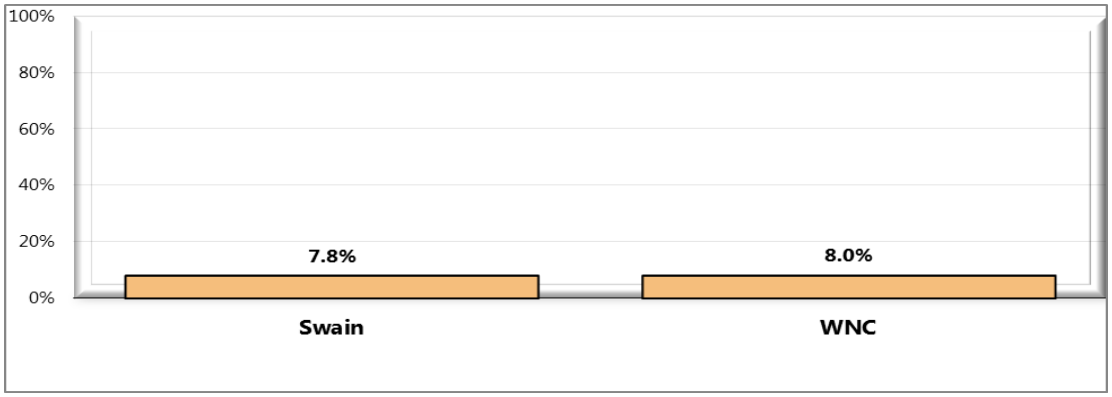
- Based on reported heights and weights, asked of all respondents.
- The definition of overweight is having a body mass index (BMI), a ratio of weight to height (kilograms divided by meters squared), greater than or equal to 25.0, regardless of gender. The definition for obesity is a BMI greater than or equal to 30.0.

Figure 49. Prevalence of Obesity (WNC Healthy Impact Survey)
(Percent of Obese Adults; Body Mass Index of 30.0 or Higher)



To measure fruit and vegetable consumption, survey respondents were asked how many one-cup servings of fruit and one-cup servings of vegetables (not counting lettuce salad or potatoes) they ate over the past week.

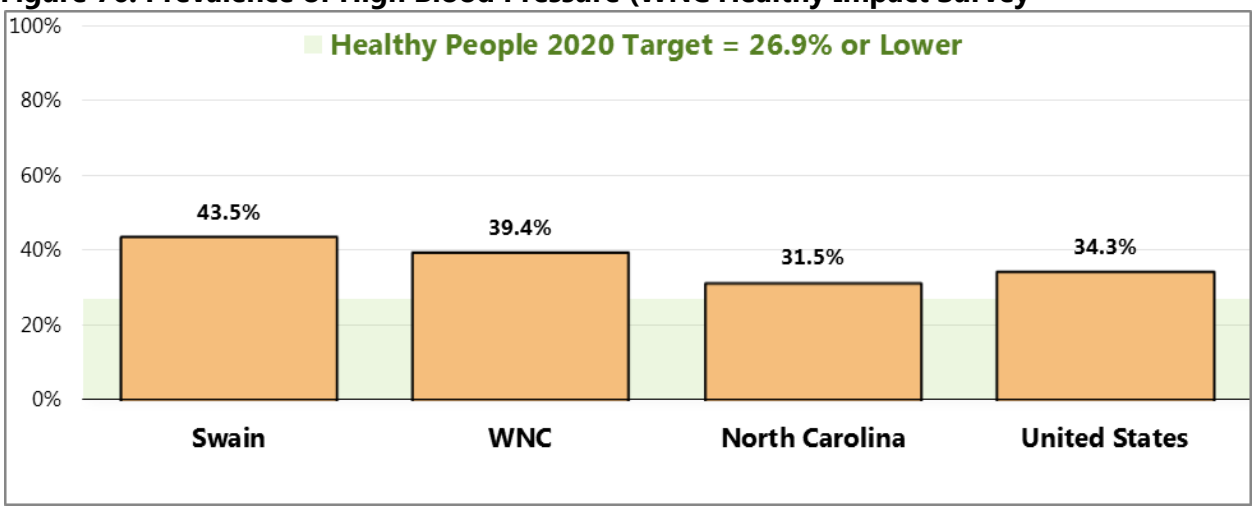
Figure 59. Had an Average of Five or More Servings of Fruits/Vegetables per Day in the Past Week (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 79]

Notes:
- Asked of all respondents.
- For this issue, respondents were asked to recall their food intake during the previous week. Reflects 35 or more 1-cup servings of fruits and/or vegetables in the past week, excluding lettuce salad and potatoes.

Figure 76. Prevalence of High Blood Pressure (WNC Healthy Impact Survey



2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 76]

- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2009 North Carolina data.
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective HDS-5.1]

Notes:
- Asked of all respondents.

***"Our nation stands at a crossroads**. Today's epidemic of overweight and obesity threatens the historic progress we have made in increasing American's quality and years of healthy life.. . .. If we do not reverse these trends, researchers warn that many of our children . . .will be seriously afflicted in early adulthood with medical conditions such as diabetes and heart disease. . ."*
Regina M. Benjamin, MD, MBA. Surgeon General

The teams choose this priority because good nutrition, regular physical activity and weight control are essential to good health now and as you age. The Swain County primary and secondary data, as shown above, constitutes the local need for continued community environmental and policy change around physical activity, nutrition, and a healthy weight.

Next Steps

Data collection and prioritization are just the beginning steps in understanding and addressing priority health needs in a community. National public health organizations such as NACCHO and the CDC are confirming our belief that a Community Health Assessment should be part of a broader community health improvement planning process. A community health improvement planning process uses CHA data to develop and implement strategies for action and establishes accountability to ensure measurable health improvement.

Swain County, along with our partners in WNC Healthy Impact, will move forward with information in this Community Health Assessment to collaborative action planning and determining how we can most effectively impact health in our community. We will collaborate with our hospital and community partners on collaborative action planning which results in a Community Health Improvement Plan (CHIP) that we plan to post on our local and WNC Healthy Impact websites. This planning process will begin in 2013.

A CHIP is used in collaboration with community partners to coordinate action and target resources. The plan looks beyond the performance of an individual organization serving a specific segment of a community to the way in which the activities of many organizations contribute to community health improvement (NACCHO, 2012).

The Swain County CHIP will likely contain the following components, based on guidance from the National Public Health Accreditation Board, and supported by our involvement in WNC Healthy Impact:

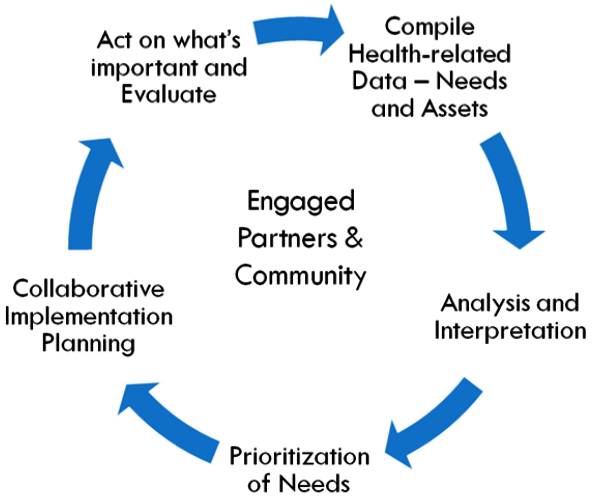
- Goals, objectives, strategies, and related performance measures for determined priorities in the short-term and intermediate term.
- Realistic timelines for achieving goals and objectives.
- Designation of roles in CHIP implementation.
- An emphasis on evidence-based strategies.
- A general plan for sustaining action (NACCHO, 2012)

Once we have worked with partners to develop the Community Health Improvement Plan, it will help guide the state-required Action Plans that will be submitted by the Swain County Health Department to the NC Division of Public Health in 2013, and Swain County Hospital implementation strategies. The CHIP will also be widely disseminated electronically to community organizations and can be used as a roadmap to monitor and evaluate our efforts.

CHAPTER 1 - INTRODUCTION

Purpose of Community Health Assessment (CHA)

Community health assessment (CHA) is the foundation for improving and promoting the health of county residents. **Community-health assessment is a key step in the continuous community health improvement process**. The role of CHA is to identify factors that affect the health of a population and determine the availability of resources within the county to adequately address these factors.



A community health assessment (CHA), which refers both to a process and a document, investigates and describes the current health status of the community, what has changed since a recent past assessment, and what still needs to change to improve the health of the community. The *process* involves the collection and analysis of a large range of secondary data, including demographic, socioeconomic and health statistics, environmental data, as well as primary data such as personal self-reports and public opinion collected by survey, listening sessions, or other methods. The *document* is a summary of all the available evidence and serves as a resource until the next assessment. Together they provide a basis for prioritizing the community's health needs, and for planning to meet those needs.

Because it is good evidence-based public health practice, local health departments (LHDs) across North Carolina (NC) are required to conduct a comprehensive community health assessment at least every four years. It is required of public health departments in the consolidated agreement between the NC Division of Public Health and local public health departments. Furthermore, it is required for local public health department accreditation through the NC Local Health Department Accreditation Board (G.S. § 130A-34.1). As part of the Affordable Care Act, non-profit hospitals are also now required to conduct a community health (needs) assessment at least every three years.

The local health department usually conducts the CHA as part (and usually the leader) of a team composed of representatives from a broad range of health and human service and other organizations within the community. Community partners and residents are part this process as well.

Definition of Community

Community is defined as "county" for the purposes of the North Carolina Community Health Assessment Process. In western North Carolina, hospitals define their community as one or more counties for this process. *Bryson City and Cherokee are the* communities included in this process. Hospitals in Swain County are Swain County Hospital/Medwest and Cherokee Indian Hospital for the purposes of community health improvement and investment, and as such Swain County Hospital was a key partner in this local level assessment process.

WNC Healthy Impact

WNC Healthy Impact is a partnership between hospitals and health departments in North Carolina to improve community health. As part of a larger, and continuous, community health improvement process, these partners are collaborating to conduct community health (needs) assessments across western North Carolina. See www.WNCHealthyImpact.com for more details about the purpose and participants of this region-wide effort. The regional work of WNC Healthy Impact is supported by a steering committee, workgroups, local agency representatives, and a public health/data consulting team. In addition, for this data collection phase of our regional efforts, a survey vendor (PRC – Professional Research Consultants, Inc.) was hired to administer a region-wide telephone survey. Various partners, coalitions, and community members are also engaged at the local level. The template for this CHA report, a core set of secondary and survey (primary) data, and analysis support, were made available through this collaborative regional effort.

Data Collection Process

Core Dataset Collection

As part of WNC Healthy Impact, a regional data workgroup of public health and hospital representatives and regional partners, with support from the consulting team, made recommendations to the steering committee on the data approach and content used to help inform regional data collection. The core regional dataset was informed by stakeholder data needs, guidelines, and requirements. From data collected as part of this core dataset, the consulting team compiled secondary (existing) data and new survey findings for each county in the 16-county region. This assessment includes data integrated from the secondary data efforts as well as the community health survey for our county. See Appendix A for details on the data collection methodology.

Criteria for selecting "highlights"

The body of assessment data supporting this document is wide-ranging and complex. In order to develop a summary of major findings, the consultant team applied three key criteria to nominate data for inclusion in this report. The data described in this report was selected because:

- County statistics deviate in significant ways from WNC regional data or NC statistics;
- County trend data show significant change—positive or negative—over time; or

- County data demonstrate noteworthy age, gender, or racial disparities.

Supplementary to this report is the *WNC Healthy Impact Secondary Data Workbook* (*Data Workbook*) that contains complete county-level data as well as the state and regional averages and totals described here. Data contained in the *Data Workbook* is thoroughly referenced as to source. Readers should consult the *Data Workbook* to review all of the secondary data comprising the regional summaries.

Unless specifically noted otherwise, all tables, graphs and figures presented in this report were derived directly from spreadsheets in the *Data Workbook* or survey data reported by the survey vendor (PRC).

Additional Local Data

Key informant interviews were conducted with two hospital representative and county service providers. The interviews added to the extensive primary data.

Health Resource Data information for our health resource inventory and 2-1-1 caller statistics was provided by 2-1-1 of Western North Carolina and lists health providers in each county, pulled from the 2-1-1 database as of June, 2012, as well as data on most common requests and unmet needs of callers to 2-1-1. See Chapter 7 and/or Appendix D for more details

Definitions & Data Interpretation Guidance

Reports of this type customarily employ a range of technical terms, some of which may be unfamiliar to many readers. This report defines technical terms within the section where each term is first encountered.

Health data, which composes a large proportion of the information included in this report, employs a series of very specific terms which are important to interpreting the significance of the data. While these technical health data terms are defined in the report at the appropriate time, there are some data caveats that should be applied from the onset. See Appendix A for additional details and definitions.

Community Engagement

In the random-sample survey that was administered in our county as part of this community health assessment, 200 community members completed a questionnaire regarding their health status, health behaviors, interactions with clinical care services, support for certain health-related policies, and factors that impact their quality of life. In addition, in our county, community members and partners were involved in data interpretation and priority setting. Community resources were contacted by e-mail and phone to update Swain County's resource inventory. The CHA team and advisory committees met and reviewed the process from 2009 community

assessment process and followed steps as outlined in the state guidance manual for CHA development.

Priority Setting

Details on our county's priority setting process and outcomes are included in Chapter 9 of this document.

CHAPTER 2 – DEMOGRAPHIC AND SOCIOECONOMIC PARAMETERS

Location and Geography

Swain County is one of the westernmost counties in North Carolina, containing a large portion of the Great Smoky Mountains National Park (GSMNP) and half of the Qualla Boundary of the Eastern Band of Cherokee Indians (EBCI). The rugged mountainous terrain has elevations ranging from 1600 to 6643 feet. There are four significant rivers (Tuckaseigee, Little Tennessee, Oconaluftee, Nantahala) and numerous creeks slicing through the land. Swain County is 540 square miles, with 83% of that land under federal or local ownership and out of the tax base: 217,451 acres (65%) is GSMNP, 22,296 acres (6.5%) US Forest Service, 29,477.46 acres (8.5%) Qualla Boundary managed by the EBCI, 7337 acres (2%) Fontana Reservoir managed by TVA, and 3800 acres (1%) local tax-exempt property.

Swain is bordered to the Southwest by Graham County, to the South by Macon County, to the Southeast by Jackson County and to the Northeast by Haywood County. Swain County residents can travel to 4 other state capitals quicker than they can drive to Raleigh. Fontana Lake is located partially in Swain County and also a portion of Fontana Dam. When the land was taken away to build the dam and fill the reservoir, the families that were displaced were promised an access road to the cemeteries so they could return to visit the grave sites of their families. Construction started on the road but was halted because of the negative impact on the environment. This partial road has become known as "The Road to Nowhere" and has been a contentious subject for many in the county. Below: the tunnel at end of the "Road to Nowhere".

In 2010 Swain County Commissioners accepted a long-sought settlement. The National Park Service will pay Swain County $52 million, approximating today's cost of a county road. Environmental and citizen groups that have long argued for settlement say it will close the decades-long fight to stop a proposed road through the most remote, wild area of the Great Smoky Mountains National Park. To date Swain County has received 12.3 million of the settlement.

Swain County is one of the poorest counties in North Carolina. Eighty-six percent of the land is owned by the State or Federal Government, which includes a large portion of the Cherokee Indian Reservation, resulting in a very low tax base. Swain County's per capita income is

$19,506. in comparison with the state average of $25,256 (Dept. of Commerce, income past 12 months (2011 dollars), 2007-2011).

The land area is 2000 square miles with 26.5 persons per square mile compared to North Carolina at 196.1 persons per square mile. Other communities existing in Swain County are: **Alarka, Almond, Conley's Creek, Deep Creek**, **Ela, Kirkland's Creek, Luada, Silvermine, Watia, Wesser, and Whittier**. Few have separate townships or postal codes. The Qualla Boundary straddles Swain and Jackson Counties and has a large town with a well-developed tourism industry, including a casino. It is governed by an elected Tribal Council, and has separate human services (Hospital, Health Department, DSS, Schools, Childcare, Senior Center) with separate Federal funding. All Cherokees who live in the Swain County part of the Reservation have the option of using Swain County services such as Schools and Health Department.

Three state or federal highways run through Swain County. Many county roads have steep grades and curves due to mountainous terrain. Season freezes and thaws leave some of our roads in poor condition. There are still a fair number of unpaved roads throughout the county, some with high traffic volumes such as the "River Road" along the north side of the Tuckaseigee River.

Swain County housing is positioned 37 of 100 by percentage growth in residential real estate. The county is positioned 585 of 3,141 in terms of residential real estate percentage change in

the United States. Housing varies from trailers to grand vacation homes on the lake. Since 1990, there have been at least 3 high-end housing developments on Fontana Lake or at the Smoky Mountain Country Club. There is inadequate low-income housing in the county, however.

History

*T*he area that is now Swain County was home to the Cherokee Indians for many centuries before being settled by Europeans of mostly Scotch, Scotch-Irish, or English ancestry. In 1838, the infamous "Trail of Tears" moved most of the Cherokee to Oklahoma, with tragic results. About 1000 Cherokee stayed in the mountains, and became part of the group that is now recognized as the Eastern Band of Cherokee Indians.

Swain County was established in 1871 from portions of Jackson and Macon Counties. The land on which Bryson City is located was originally part of the Big Bear Reserve, deeded by Congress in 1819 to the Cherokee Chief Yonah. Passing through various hands, it became "Charleston" at the founding of the county, and renamed "Bryson City" in 1889. The Town of Bryson City was established as the county seat and was named in honor of Captain Thaddeus Dillard Bryson. The coming of the railroad in 1884 opened up the mountainous region to the logging industry. Several good sized towns grew up around this industry, including Almond, Bushnell, Dorsey, Japan, Judson, Proctor, Fairfax, Forney Creek, Hazel Creek, and Noland Creek. (These towns were inundated with the creation of Fontana Lake in 1945.) Lumber from Swain County found its way to far-flung markets, gracing some of Europe's grandest buildings.

In 1927, Congress passed enabling legislation for the creation of the Great Smoky Mountain National Park. Population levels, which had been steadily growing from 3400 in 1880 to 13,200 in 1920, dropped to under 10,000 by 1950 due to the creation of the Park in '27 and the Fontana Reservoir in '45. The creation of Fontana Lake is a long-standing sore point for Swain County citizens, as there remains an unfulfilled contract to complete a road along the north shore of the lake through the GSMNP (called the 1943 agreement).

Tourism has been a significant driving force in Swain County even before it's foundation as a county. William Bartram traveled through the area in the 1770s, drawn to explore the natural beauty and spectacular mountains. In the beginning of the 20th century, Horace Kephart, a renowned author and naturalist, lived and worked in Swain County for almost 25 years, exploring and writing about the wilderness. He worked hard to promote the formation of the GSMNP. The Fryemont Inn, built in 1923, was, for a time, the outstanding hotel west of Asheville. Other unique inns followed, including the Hemlock Inn and Nantahala Village, responding to the tourist demand.

In the early 1970's, a whitewater rafting industry grew up around the Nantahala River; over 600 people are seasonally employed on the river each year. Dubbed the "Outdoor Capital of the World", Swain County also has mountain biking, an excursion train, the southern start of the

Blue Ridge Parkway, untold miles of hiking and equestrian trails within the National Park and National Forest, fishing streams with native trout, and a beautiful lake, not to mention all the development and activity in Cherokee.

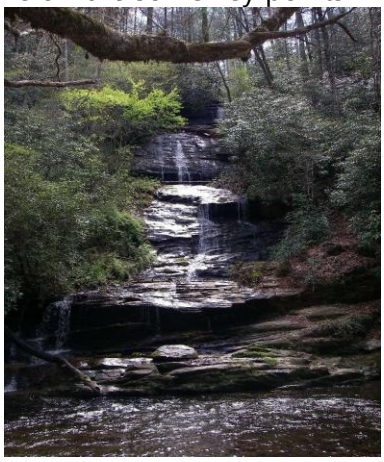
People in Swain County have generally had a strong connection to the land, with many who farm, garden (which means raising vegetables, not flowers), hunt, and fish. The rugged mountains have isolated this community, but have also preserved many old customs, language, and handicrafts, both in the Cherokee people as well as the whites. There is a strong sense of heritage and pride, self-sufficiency and independence, because of or in spite of the high poverty rates.

In summary, Swain county is a small rural county where the people believe it is a good safe place to raise your children and grow old. The communities are church centered, where families are found to worship together, and live in close proximity to one another. Pride is in inherent in the people of Swain County. Most of the recreation in the county is based upon sports. You can find a large percent of the county at the home football games on Friday nights and in the spring at local baseball games.

Much of the culture has been passed down through the years from grandparents to sons and daughters and so on. Food still has a collouquial twist of bacon fat seasoning. Sweet tea cornbread and pinto beans are still considered a good meal.

Economics are a challenge for our small community, especially the year-round native population, where it is dificult to make a living. Unemployment is high, wages low, and poverty prevalent. Many people are eligible for assistance programs. New programs addressing the health issuses are being embraced. Change does take time; you have to look at period of time and not a year to see that efforts are making a difference in people's lives. Reviewing the survey answers you can definitely see where people desire to make changes in their lifestyle. They do realize the detriments of obesity and lack of physical activity.

Below are some key points in Swain County.



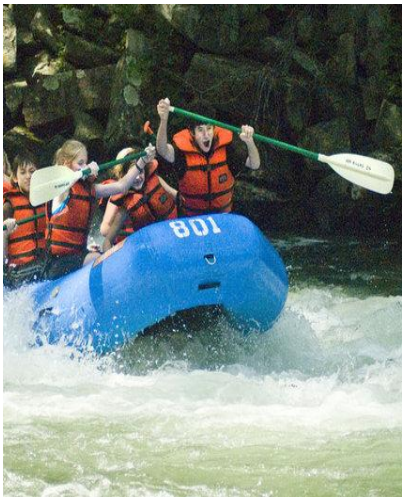
Indian Creek Falls at Deep Creek

Swain County Hospital

Swain County Health Department

Old Court House

Administration Building



Rafting on the Nantahala

Great Smoky Mt. Railway

Swain County Current event - the International Canoe Federation named the Nantahala River Gorge as the site of the **2013 World Freestyle Kayaking Championships**, the outfitters, event organizers and regional tourist planners are working feverishly to prepare.

Population

Understanding the growth patterns and age, gender and racial/ethnic distribution of the population in Swain County will be keys in planning the allocation of health care resources for the county in both the near and long term.

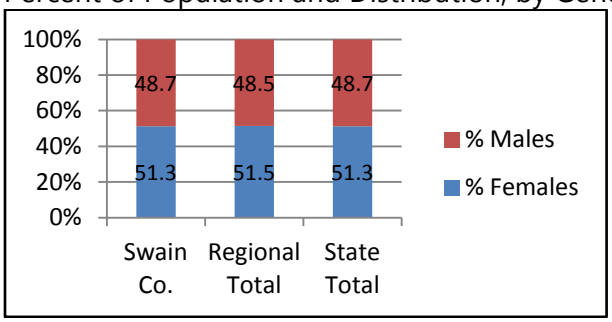
Current Population (Stratified by Gender, Age, and Race/Ethnicity)

According to data from the 2010 US Census, the total population of Swain County is 13,981. In Swain County, as region-wide and statewide, there is a slightly higher proportion of females than males (51.3% vs. 48.7%).

Table 1. Overall Population and Distribution, by Gender (2010)

Geography	Total Population (2010)	# Males	% Males	# Females	% Females
Swain County	13,981	6,812	48.7	7,169	51.3
Regional Total	759,727	368,826	48.5	390,901	51.5
State Total	9,535,483	4,645,492	48.7	4,889,991	51.3

Overall Percent of Population and Distribution, by Gender (2010



In Swain County 16.6% of the population is in the 65-and-older age group, compared to 19.0% region-wide and 12.9% statewide (Table 2). The median age in Swain County is 40.8, while the regional mean median age is 44.7 years and the state median age is 37.4 years.

Table 2. Median Age and Population Distribution, by Age Group (2010)

Geography	Median Age	# Under 5 Years Old	% Under 5 Years Old	# 5-19 Years Old	% 5-19 Years Old	# 20 - 64 Years Old	% 20 - 64 Years Old	# 65 Years and Older	% 65 Years and Older
Swain County	40.8	879	6.3	2,780	19.9	8,001	57.2	2,321	16.6
Regional Total	44.7	40,927	5.4	132,291	17.4	441,901	58.2	144,608	19.0
State Total	37.4	632,040	6.6	1,926,640	20.2	5,742,724	60.2	1,234,079	12.9

In terms of race and ethnicity, the population of Swain County is more diverse than the population of either WNC or NC as a whole, due mostly to a large proportion (27.0%) of American Indians/Alaskan Natives. In Swain County the population is 66.6% white/Caucasian and 33.4% non-white. Region-wide, the population is 89.3% white/Caucasian and 11.7% non-white. Statewide, the comparable figures are 68.5% white and 31.5% non-white (Table 3). The proportion of the population that self-identifies as Hispanic or Latino of any race is 3.9% in Swain County, 5.4% region-wide, and 8.4% statewide (Table 3).

The racial and ethnic diversity within the 16 counties that compose the region is quite varied, and readers should consult the *Data Workbook* to understand those differences.

Table 3. Population Distribution, by Racial/Ethnic Groups, as Percent of Overall Population (2010)

Geography	White	Black or African American	American Indian, Alaskan Native	Asian	Native Hawaiian, Other Pacific Islander	Some Other Race	Two or More Races	Hispanic or Latino (of any race)
Swain County	**66.6**	**0.5**	**27.0**	**0.5**	**0.0**	**1.1**	**4.2**	**3.9**
Regional Total	89.3	4.2	1.5	0.7	0.1	2.5	1.8	5.4
State Total	68.5	21.5	1.3	2.2	0.1	4.3	2.2	8.4

Population Growth Trend

Between the 2000 and 2010 US Censuses the population of Swain County grew by 7.2% and the population of WNC grew by 13.0% (Table 4). The rate of growth in the county is projected to increase significantly over the next 10 years before slowing somewhat in the decade following that. These future county decadal growth rates are somewhat larger than the figures projected for WNC and for NC as a whole over the same period.

Table 4. Decadal Population Growth Rate (2000 to 2030)

Geography	% Total Population Growth			
	2000 to 2010	2010 to 2020	2020 to 2030	2000 to 2030
Swain County	**7.2**	**12.4**	**10.2**	**33.5**
Regional Total	13.0	11.6	9.6	38.2
State Total	15.6	11.3	9.6	44.5

The growth rate of a population is a function of emigration and death rates on the negative side, and immigration and birth rates on the positive side. As illustrated by the data in Table 5, the birth rate in Swain County was sustained at approximately 13.5 births per 1,000 persons over the five aggregate periods between 2002-2006 and 2006-2010 (Table 5). This is the highest birth rate in the 16-county WNC region. Region-wide the birth rate was stable at around 10.8 for several years before falling recently to 10.5. Statewide, the birth rate, stable for several years around 14.2, fell recently to 13.8.

Table 5. Birth Rate, Five 5-Year Aggregate Period (2002-2006 through 2006-2010)

Geography	2002-2006	2003-2007	2004-2008	2005-2009	2006-2010
Swain County	**13.3**	**13.6**	**13.8**	**13.3**	**13.6**
Regional Arithmetic Mean	10.8	10.8	10.8	10.7	10.5
State Total	14.2	14.2	14.2	14.1	13.8

Older Adult Population Growth Trend

As noted previously, the age 65-and-older segment of the population represents a larger proportion of the overall population in Swain County and WNC than in the state as a whole. In terms of future health resource planning, it will be important to understand how this segment of the population, a group that utilizes health care services at a higher rate than other age groups, is going to change in the coming years. Table 6 presents the decadal growth trend for the age 65-and-older population, further stratified into smaller age groups, for the decades from 2010 through 2030. These data illustrate how the population age 65-and-older in the county is going to increase over the coming two decades. Calculated from the figures in Table 6, the percent increase anticipated for each age group in Swain County between 2010 and 2030 is 8.2% for the 65-74 age group, 27.5% for the 75-84 age group, and 5.9% for the 85+ age group. In WNC as a whole, the 65-74 age group is projected to grow by 24.0%, the 75-84 age group by 52.5%, and the 85+ age group by 40.0% over the same period of time.

Table 6. Population Age 65 and Older (2010 through 2030)

Geography	2010 Census Data				2020 (Projected)				2030 (Projected)			
	Total % Age 65 and Older	*% Age 65-74**	*% Age 75-84*	*% Age 85+*	% Age 65 and Older	% Age 65-74	% Age 75-84	% Age 85+	% Age 65 and Older	% Age 65-74	% Age 75-84	% Age 85+ *
Swain County	16.6	9.8	5.1	1.7	18.5	11.1	5.8	1.6	18.9	10.6	6.5	1.8
Regional Total	19.0	10.4	6.1	2.5	23.5	13.2	7.4	2.9	25.7	12.9	9.3	3.5
State Total	12.9	7.3	4.1	1.5	16.6	9.9	4.9	1.8	19.3	10.6	61.8	2.2

Composition of Families with Children

Data **in** Table 7 illustrates that the percentage of households with children headed by a married couple is slightly smaller in Swain County than in WNC (16.9% vs. 17.2%) and smaller than the comparable figure for NC as a whole (16.9% vs. 20.1%).

Table 7. Composition of Family Households, 5-Year Estimate (2006-2010)

Geography	Family Composition						
	# Total Households*	Family Household** Headed by Married Couple (with children under 18 years)		Family Household Headed by Male (with children under 18 years)		Family Household Headed by Female (with children under 18 years)	
		Est. #	%	Est. #	%	Est. #	%
Swain County	5,772	977	16.9	89	1.5	250	4.3
Regional Total	318,280	54,822	17.2	5,322	1.7	17,134	5.4
State Total	3,626,179	729,708	20.1	78,051	2.2	282,131	7.8

* A household includes all the people who occupy a housing unit. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated people who share living arrangements.
** A family consists of a householder and one or more other people living in the same household who are related to the householder by birth, marriage, or adoption. All people in a household who are related to the householder are regarded as members of his or her family. A family household may contain people not related to the householder, but those people are not included as part of the householder's family in tabulations.
*** Family composition percentages are based on total number of households. Numerator is number of family households (headed by male, female or married couple) with children under 18 years; denominator is total number of households.

In Swain County, 69.1% of grandparents living with their minor grandchildren also are the party responsible for their grandchildren's care. In WNC as in NC as a whole, the comparable figure is about 51% (Table 8).

Table 8. Grandparents Responsible for Grandchildren, 5-Year Estimate (2006-2010)

Geography	Family Composition		
	# Grandparents Living with Own Grandchildren (<18 Years)*	Grandparent Responsible for Grandchildren (under 18 years)	
		Est. #	%
Swain County	430	297	69.1
Regional Total	13,470	6,971	51.8
State Total	187,626	95,027	50.6

* Grandparents responsible for grandchildren - data on grandparents as caregivers were derived from American Community Survey questions. Data were collected on whether a grandchild lives with a grandparent in the household, whether the grandparent has responsibility for the basic needs of the grandchild, and the duration of that responsibility. Responsibility of basic needs determines if the grandparent is financially responsible for food, shelter, clothing, day care, etc., for any or all grandchildren living in the household. Percent is derived with the number of grandparents responsible for grandchildren (under 18 years) as the numerator and number of grandparents living with own grandchildren (under 18 years) as the denominator.

Military Veteran Population

Military veterans compose a higher proportion of the total civilian population in WNC than in either NC or the US as a whole. Calculating from figures in Table 9, veterans make up 11.0% of the civilian population in Swain County, compared to 12.4% in the WNC region, 10.8% statewide, and 9.9% nationally. In Swain County, approximately 44% of the veteran population is 65 years of age or older; the comparable proportions are 49% for the WNC mean, 36% for NC statewide, and 40% nationwide.

Table 9. Population of Military Veterans, 5-Year Estimate (2006-2010)

Geography	Civilian Population 18 years and over			% Veterans by Age				
	Total	Veterans	Nonveterans	18 to 34 years	35 to 54 years	55 to 64 years	65 to 74 years	75 years and over
Swain County	**10,644**	**1,175**	**9,469**	**1.0**	**30.6**	**24.0**	**21.1**	**23.3**
Regional Total	593,603	73,783	519,820	n/a	n/a	n/a	n/a	n/a
Regional Arithmetic Mean	n/a	n/a	n/a	3.6	19.3	28.1	24.1	24.9
State Total	6,947,547	747,052	6,200,495	8.7	30.0	25.7	17.9	17.8
National Total	228,808,831	22,652,496	206,156,335	7.8	26.3	25.4	19.0	21.4

Education

It is helpful to understand the level of education of the general population, and with what frequency current students stay in school and eventually graduate.

Why is this Important?

A positive relationship exists between higher levels of education and better health. Higher educational levels often result in more opportunities for higher-paid employment and for jobs that offer health insurance. When economic times get tough, it is the workers with the lowest levels of education who generally have the most difficulty securing and keeping employment. The financial security that often comes with higher education can expand the resources needed to make healthy choices.

Educational Attainment

Table 10 provides data on the proportion of the population age 25 and older with one of three levels of educational attainment: high school or equivalent, some college, and a bachelor's degree or higher. In these terms, in 2006-2010, Swain County had a slightly higher proportion than WNC as a whole of residents age 25 or older possessing a high school diploma or its equivalent (approximately 32.9% vs. 32.2%%), and a 17% higher proportion than NC as a whole (32.9% vs. 28.2%). On the other hand, the overall proportion of the Swain County population with *more* than a high school diploma or equivalency is smaller than for WNC or NC as a whole. The proportion of persons age 25 and older in the county with some college (17.6%) is 14% lower than the comparable percentage in WNC (20.5%) and 16% lower than the comparable percentage statewide (20.9%). At the bachelor's degree and greater level the proportional attainment in the county (18.6%) is 8% smaller than the comparable mean regional figure (20.2%) and 29% smaller than statewide figure (26.1%).

Table 10. Educational Attainment of Population Age 25 and Older, Two 5-Year Estimates (2005-2009 and 2006-2010)

Geography	2005-2009				2006-2010			
	Total Population Age 25 Years and Older	% High School Graduation Rate (Includes equivalency)	% Some College	% Bachelor's Degree or Higher	Total Population Age 25 Years and Older	% High School Graduation Rate (Includes equivalency)	% Some College	% Bachelor's Degree or Higher
Swain County	**9,302**	**32.0**	**18.2**	**19.0**	**9,531**	**32.9**	**17.6**	**18.6**
Regional Total	511,076	n/a	n/a	n/a	532,838	n/a	n/a	n/a
Regional Arithmetic Mean	31,942	32.2	19.6	19.9	33,302	32.2	20.5	20.2
State Total	5,940,248	28.6	20.4	25.8	6,121,611	28.2	20.9	26.1

Drop-Out Rate Trend

There are 17 school districts in the WNC region, one per county plus Asheville City Schools. For each years of the period cited in Table 11, the high school drop-out rate for Swain County public schools was significantly higher than the mean rate for the 17 school districts in WNC as well as the overall rate for all NC public schools.

Table 11. High School Drop-Out Numbers and Rates (SY2006-2007 through SY2010-2011)

Geography	SY2006-2007		SY2007-2008		SY2008-2009		SY2009-2010		SY2010-2011	
	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Swain County	**56**	**8.25**	**49**	**7.45**	**42**	**6.33**	**41**	**6.11**	**46**	**6.81**
Regional Total	1,756	n/a	1,651	n/a	1,385	n/a	1,129	n/a	1,019	n/a
Regional Arithmetic Mean	n/a	5.66	n/a	5.58	n/a	4.51	n/a	3.61	n/a	3.36
State Total	23,550	5.27	22,434	4.97	19,184	4.27	16,804	3.75	15,342	3.43

Current High School Graduation Rate

The four-year cohort graduation rates for subpopulations of 9th graders entering high school in SY2007-2008 and graduating in SY2010-2011 are presented in Table 12. In Swain County the graduation rates for all subpopulations except the economically disadvantaged were below the mean graduation rate for the 17 school districts in WNC, as well as the comparable rates for NC as a whole. The graduation rate for the population of economically disadvantaged students in Swain County was the same as the county's overall graduation rate, and higher than either the comparable mean WNC or NC rates. At the region- and state-level the graduation rate for economically disadvantaged students is approximately 6.7 percentage points lower than the comparable overall graduation rates.

Table 12. 4-Year Cohort High School Graduation Rate
SY2007-2008 Entering 9th Graders Graduating in SY2010-2011 or Earlier

Geography	Total Number of Students	% Students Graduating				
		All Students	Males	Females	Economically Disadvantaged	Limited English Proficiency
Swain County	**150**	**73.3**	**68.1**	**78.2**	**73.3**	**n/a**
Regional Total	7,545	78.8	75.2	82.5	72.0	57.2
State Total	110,377	77.9	73.8	82.2	71.2	48.1

Why is this Important?

Income

There are several income measures that can be used to compare the economic well-being of communities, among them median household income, and median family income.

Why is this Important?

Those communities with lower inequalities in income distribution tend to have healthier residents. In communities where income inequality is rising, the gap between the wealth of the rich and the poor is getting bigger. Income and financial resources have long been understood as important to health, so that individuals can obtain health insurance, pay for medical care, and afford healthy food, safe housing, and access to other basic goods (County Health Rankings and Roadmaps)

Median Household and Family Income

As calculated from the most recent estimate (2006-2010), the median *household* income in Swain County was $35,071, compared to a mean WNC median household income of $37,815, a difference of $2,744 *less* in Swain County. The median household income in Swain County was over $10,000 lower than the comparable state average for both the periods cited in Table 13, but the gap narrowed by $1,298 from 2005-2009 to 2006-2010.

As calculated from the most recent estimate (2006-2010), the median *family* income in Swain County was $48,101 compared to a mean WNC median family income of $47,608, a difference of $493 *more* in Swain County. The median family income in Swain County was more than $6,500 *lower* than the comparable state average for both periods cited in Table 13, and the gap widened by $1,273 between 2005-2009 and 2006-2010.

Table 13. Median Household and Median Family Income
5-Year Estimates (2005-2009 and 200-2010)

Geography	2005-2009				2006-2010			
	Median Household Income*		Median Family Income**		Median Household Income		Median Family Income	
	$	$ Difference from State	$	$ Difference from State	$	$ Difference from State	$	$ Difference from State
Swain County	**33,272**	**-11,797**	**48,750**	**-6,779**	**35,071**	**-10,499**	**48,101**	**-8,052**
Regional Arithmetic Mean	37,107	-7,962	46,578	-8,951	37,815	-7,756	47,608	-8,545
State Total	45,069	n/a	55,529	n/a	45,570	n/a	56,153	n/a

* Median household income is the incomes of all the people 15 years of age or older living in the same household (i.e., occupying the same housing unit) regardless of relationship. For example, two roommates sharing an apartment would be a household, but not a family.
** Median family income is the income of all the people 15 years of age or older living in the same household who are related through either marriage or bloodline. For example, in the case of a married couple who rent out a room in their house to a non-relative, the household would include all three people, but the family would be just the couple.

Population in Poverty

The *poverty rate* is the percent of the population (both individuals and families) whose money income (which includes job earnings, unemployment compensation, social security income, public assistance, pension/retirement, royalties, child support, etc.) is below a federally established threshold. (This is the "100%-level" figure.)

Table 14 shows the estimated annual poverty rate for two five year periods: 2005-2009 and 2006-2010. The table also presents an estimate for the number of persons living below 200% of the Federal poverty rate, since this figure is often used as a threshold for determining eligibility for government services. The data in this table describe an overall rate, representing the entire population in each geographic entity. As subsequent data will show, poverty may have a strong age component that is not detectable in these numbers.

Why is this Important?

The poverty level is a reflection of a community's ability to meet the basic needs necessary to maintain health. If poverty were considered a cause of death in the U.S. it could be ranked among the top 10 causes of death. While negative health effects resulting from poverty are present at all ages, children in poverty face greater risks. Children face greater morbidity and mortality due to greater risk of accidental injury, lack of health care access, and poor educational achievement. Early (or prenatal) poverty may result in development damage. Children's age-five IQ correlates more with family income than with maternal education, ethnicity, and single female-headed household.
(County Health Rankings and Roadmaps).

The 100%-level poverty rate in Swain County was 22.7% in the 2005-2009 period, but fell to 22.4% in the 2006-2010 period, a decrease of 1.3% in the percent of persons living in poverty. In both periods cited, the poverty rate in Swain County was significantly higher than the comparable rates in both WNC and NC. As calculated from figures in Table 14, the 200%-level poverty rate in Swain County was 42.4% in the 2005-2009 period and rose to 43.5% in the 2006-2010 period, an increase of 2.6%. In WNC the 200% poverty rate was 36.6% in the 2005-2009 period and rose to 37.3% in the 2006-2010 period, an increase of 1.9%. Statewide, the 100%-level poverty rate rose from 15.1% to 15.5% (an increase of 2.6%) and the 200%-level poverty rate rose from 35.0% to 35.6% (an increase of 1.7%) over the same time frame.

Table 14. Population in Poverty, All Ages

5-Year Estimates (2005-2009 and 2006-2010)

Geography	2005-2009				2006-2010			
	Population Estimate	# Below Poverty Level	% Below Poverty Level	# Below 200% Federal Poverty Level	Population Estimate	# Below Poverty Level	% Below Poverty Level	# Below 200% Federal Poverty Level
Swain County	**13,025**	**2,963**	**22.7**	**5,520**	**13,606**	**3,042**	**22.4**	**5,924**
Regional Total	697,685	103,966	14.9	255,556	726,827	113,990	15.7	271,215
State Total	8,768,580	1,320,816	15.1	3,066,957	9,013,443	1,399,945	15.5	3,208,471

Table 15 presents similar data focusing this time exclusively on children under the age of 18. From these data it is apparent that children suffer disproportionately from poverty. In Swain County the 2005-2009 poverty rate for young persons (31.3%) was 37.9% higher than the overall rate (22.7%), and the 2006-2010 poverty rate for young people (30.4%) was 35.7% higher than the overall rate (22.4%). Childhood poverty increased in both WNC and NC between the 2005-2009 and 2006-2010 periods, rising by 5.2% in WNC and 3.8% statewide. During this same interval, childhood poverty in Swain County *decreased* 2.9%, from 31.3% to 30.4%.

Table 15. Population in Poverty, Under Age 18
5-Year Estimates (2005-2009 and 2006-2010)

Geography	2005-2009			2006-2010		
	Population Estimate	# Below Poverty Level	% Below Poverty Level	Population Estimate	# Below Poverty Level	% Below Poverty Level
Swain County	**3,046**	**952**	**31.3**	**3,128**	**950**	**30.4**
Regional Total	146,592	31,196	21.3	149,649	33,486	22.4
State Total	2,173,508	452,280	20.8	2,205,704	476,790	21.6

Housing Costs

Because the cost of housing is a major component of the overall cost of living for individuals and families it merits close examination. Table 16 presents housing costs as a percent of total household income, specifically the percent of housing units—both rented and mortgaged—for which the cost exceeds 30% of household income.

In Swain County, the percentage of *rental* housing units costing more than 30% of household income was 38.1% in the 2005-2009 period and 39.1% in the 2006-2010 period, an increase of 3%. In WNC, the comparable percentage was 38.9% in the 2005-2009 period and 40.5% in the 2006-2010 period, an increase of 4%. These percentages correspond to state figures of 43.0% and 44.0%, respectively, with a state-level increase of only 2%. The percent of *mortgaged* housing units in Swain County costing more than 30% of household income was 29.4% in 2005-2009 and 30.1% in 2006-2010, an increase of 2%. Comparable figures for mortgaged housing units in WNC stood at 33.0% in 2005-2009 and 32.6% in 2006-2010, a decrease of 1%. These percentages compare to state figures of 31.4% and 31.7% in the same periods, and a state-level increase of not quite 1%. From these data it appears that in Swain County, WNC, and NC as a whole a higher proportion of renters than mortgage holders spend 30% or more of household income on housing costs.

Table 16. Estimated Housing Units Spending >30% Household Income on Housing 5-Year Estimates (2005-2009 and 2006-2010)

Geography	Renter Occupied Units				Mortgaged Housing Units			
	2005-2009		2006-2010		2005-2009		2006-2010	
	Total Units	% Units Spending >30%	Total Units	% Units Spending >30%	Total Units	% Units Spending >30%	Total Units	% Units Spending >30%
Swain County	**1,316**	**38.1**	**1,298**	**39.1**	**2,000**	**29.4**	**1,966**	**30.1**
Regional Total	82,441	38.9	86,022	40.5	122,383	33.0	132,668	32.6
State Total	1,131,480	43.0	1,157,690	44.0	1,634,410	31.4	1,688,790	31.7

Note: The percent of renter-occupied units spending greater than 30% of household income on rental housing was derived by dividing the number of renter-occupied units spending >30% on gross rent by the total renter-occupied units. Gross rent is defined as the amount of the contract rent plus the estimated average monthly cost of utilities (electricity, gas, and water and sewer) and fuels (oil, coal, kerosene, wood, etc.) if these are paid for by the renter (or paid for the renter by someone else). Gross rent is intended to eliminate differentials which result from varying practices with respect to the inclusion of utilities and fuels as part of the rental payment.

Employment and Unemployment

The following definitions will be useful in understanding the data in this section.

- *Labor force* – includes all persons over the age of 16 who, during the week, are employed, unemployed or in the armed services.
- *Civilian labor force* – excludes the Armed Forces from the labor force equation.
- *Unemployed* – civilians not currently employed but are available for work and have actively looked for a job within the four weeks prior to the date of analysis; also, laid-off civilians waiting to be called back to their jobs, as well as those who will be starting new jobs in the next 30 days.
- *Unemployment rate* – calculated by dividing the number of unemployed persons by the number of people in the civilian labor force.

Why is this Important?

Employment measures aim to show the percentage of the population that is unemployed and seeking work. Unemployment figures shed light on a community's overall economic situation and provide information about the percentage of the population that may be at risk for various health concerns associated with unemployment (County Health Rankings and Roadmaps)

Employment

Table 17 summarizes employment by sector. In Swain County the five sectors employing the greatest proportions of the workforce are, in descending order: (1) Public Administration (36.14%), (2) Accommodation and Food Service (18.21%), (3) Health Care and Social Assistance (14.78%), (4) Retail Trade (12.71%), and (5) Educational Services (6.97%). In WNC, the five leading employment sectors are: (1) Health Care and Social Assistance (18.52%), (2) Retail Trade (13.86%), (3) Accommodation and Food Services (11.43%), (4) Manufacturing (11.28%) and (5) Educational Services (9.19%). Statewide the comparably ordered list is composed of: (1) Health Care and Social Assistance (14.45%), (2) Retail Trade (11.66%), (3) Manufacturing (11.33%), (4) Educational Services (9.58%) and (5) Accommodation and Food Services (8.95%). The WNC and NC lists are quite similar, with variations in WNC stemming from its relative lack of manufacturing jobs and the regionally greater significance of the tourism industry, represented by the Accommodations and Food Service sector.

Table 17. Insured Employment by Sector, Annual Summary (2011)

Sector	Swain County		WNC	NC
	Avg. No. Employed	% Total Employment in Sector**	% Total Employment in Sector**	% Total Employment in Sector**
Agriculture, Forestry, Fishing & Hunting	*	n/a	0.58	0.74
Mining	n/a	n/a	0.24	0.08
Utilities	*	n/a	0.36	0.35
Construction	284	5.35	4.75	4.53
Manufacturing	*	n/a	11.28	11.33
Wholesale Trade	47	0.89	2.35	4.38
Retail Trade	675	12.71	13.86	11.66
Transportation & Warehousing	*	n/a	2.53	3.27
Information	28	0.53	1.35	1.82
Finance & Insurance	73	1.37	2.25	3.88
Real Estate & Rental & Leasing	24	0.45	0.93	1.23
Professional, Scientific & Technical Services	67	1.26	3.32	4.96
Management of Companies & Enterprises	n/a	n/a	0.49	2.01
Administrative & Waste Services	71	1.34	4.90	6.53
Educational Services	370	6.97	9.19	9.58
Health Care & Social Assistance	785	14.78	18.52	14.45
Arts, Entertainment & Recreation	*	n/a	1.73	1.58
Accommodation & Food Services	967	18.21	11.43	8.95
Public Administration	1,919	36.14	7.18	6.18
Other Services	*	n/a	2.76	2.49
Unclassified	*	n/a	0.00	n/a
TOTAL ALL SECTORS	5,310	100.00	100.00	100.00

Table 18 summarizes the annual average wage paid to employees in the various sectors. Data in Table 18 reveal that overall the annual wage per employee in Swain County ($30,253) is $1,891 lower than the comparable figure for employees region-wide ($32,144) and $16,519 lower than the average annual wage statewide ($46,772).

Table 18. Insured Wages by Sector, Annual Summary (2011)

Sector	Average Annual Wage per Employee		
	Swain County	WNC	NC
Agriculture, Forestry, Fishing & Hunting	n/a	$23,145	$28,752
Mining	n/a	41,662	45,828
Utilities	n/a	72,196	76,552
Construction	$30,812	31,190	41,316
Manufacturing	n/a	38,443	52,613
Wholesale Trade	41,412	36,182	61,194
Retail Trade	20,554	22,109	24,650
Transportation & Warehousing	n/a	39,117	43,400
Information	29,367	38,682	63,833
Finance & Insurance	31,484	42,881	75,088
Real Estate & Rental & Leasing	18,009	24,051	38,476
Professional, Scientific & Technical Services	27,265	36,584	66,951
Management of Companies & Enterprises	n/a	43,518	88,763
Administrative & Waste Services	36,770	25,753	30,258
Educational Services	33,586	32,604	39,787
Health Care & Social Assistance	36,892	32,843	42,811
Arts, Entertainment & Recreation	n/a	20,936	28,474
Accommodation & Food Services	19,283	14,424	14,877
Public Administration	37,603	33,818	43,641
Other Services	n/a	24,660	28,182
Unclassified	n/a	12,056	n/a
TOTAL ALL SECTORS	$30,253	$32,144	$46,772

Unemployment

Table 19 summarizes the annual unemployment rate for 2007 through 2011. From these data it appears that the unemployment rate in Swain County was higher than comparable figures for both WNC and NC as a whole throughout the period from 2007-2011.

Table 19. Unemployment Rate as Percent of Workforce, (2007 through 2012)

Geography	Annual Average				
	2007	2008	2009	2010	2011
Swain County	6.3	7.8	12.1	14.0	14.8
Regional Arithmetic Mean	4.9	6.8	11.8	11.8	11.5
State Total	4.8	6.3	10.5	10.9	10.5

Crime

Why is this Important?

The health impacts of community safety are far-reaching, from the obvious impact of violence on the victim to the symptoms of post-traumatic stress disorder (PTSD) and psychological distress felt by those who are routinely exposed to unsafe communities. Community safety impacts various other health factors and outcomes as well, including birth weight, diet and exercise, and family and social support. (County Health Rankings and

Tables 20-22 present annual crime rates for Swain County, WNC and the state of NC for the 10 years from 2001 through 2010. Table 20 summarizes the "index crime rate", which is the sum of the violent crime rate (murder, forcible rape, robbery, and aggravated assault) *plus* the property crime rate (burglary, larceny, arson, and motor vehicle theft). Table 21 summarizes violent crime, and Table 22 summarizes property crime.

Data in Table 20 indicate that the index crime rate in Swain County was higher than the mean WNC index crime rate every year from 2001 through 2010 except 2002; the county index crime rate was approximately twice the comparable regional rate in 2006. 2009 and 2010 and exceeded the state rate as well in 2006 and 2009. The mean index crime rate in WNC was far lower than the comparable state rate for every year during the decade covered in the table. There is not enough information available from the data source to interpret annual variations in these rates.

Table 20. Index Crime Rate (2001-2010)

Geography	Index Crimes per 100,000 Population									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Swain County	**2,210.7**	**2,203.4**	**3,175.5**	**3,521.1**	**4,172.5**	**5,347.7**	**3,820.7**	**4,331.4**	**5,101.9**	**4,817.4**
Regional Arithmetic Mean	2,163.4	2,294.3	2,413.8	2,656.0	2,648.1	2,536.4	2,688.3	2,703.4	2,502.2	2,426.4
State Total	5,005.2	4,792.6	4,711.8	4,641.7	4,622.9	4,654.4	4,658.6	4,581.0	4,191.2	3,955.7

Table 21 separates the violent crime rate from the overall index crime rate for the same period cited above. The violent crime rate in Swain County was higher than the comparable mean WNC rate every year shown in the table except the first, 2001. The county rate also was higher than the NC rate in 2005, 2006, 2009 and 2010. The mean violent crime rate in WNC was significantly lower than the rate for NC as a whole throughout the period cited in the table. According to data from the NC SCHS, there were a total of 148 homicides in the 16 WNC counties during the five-year period from 2006 through 2010, nine of them in Swain County (*Data Workbook*).

Table 21. Violent Crime Rate (2001-2010)

Geography	Violent Crimes per 100,000 Population									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Swain County	**169.2**	**352.5**	**447.4**	**368.4**	**727.5**	**517.9**	**397.4**	**460.8**	**872.3**	**388.3**
Regional Arithmetic Mean	181.5	194.4	200.4	198.5	232.9	221.9	274.4	190.7	224.4	258.6
State Total	503.8	475.3	454.7	460.9	478.6	483.5	480.5	477.0	417.1	374.4

Table 22 separates the property crime rate from the overall index crime rate for the same period cited above. Comparing these figures to the index crime rate, it is clear that the majority of all index crime committed is property crime. In keeping with the pattern noted for index crime, the property crime rate for Swain County was higher than the comparable WNC rate throughout the period from 2001-2010 except for 2002. The mean property crime rate for WNC was significantly lower than the comparable rate for NC as a whole from 2001 to 2010.

Table 22. Property Crime Rate (2001-2010)

Geography	Property Crimes per 100,000 Population									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Swain County	**2,041.5**	**1,850.8**	**2,728.1**	**3,152.8**	**3,445.0**	**4,829.8**	**3,423.3**	**3,870.6**	**4,229.6**	**4,429.1**
Regional Arithmetic Mean	1,981.9	2,093.9	2,215.2	2,423.1	2,410.3	2,298.7	2,468.3	2,494.0	2,262.1	2,228.4
State Total	4,501.4	4,317.3	4,257.1	4,180.7	4,144.3	4,170.9	4,178.1	4,103.9	3,774.1	3,581.4

CHAPTER 3 – HEALTH STATUS AND HEALTH OUTCOME PARAMETERS

Health Rankings

America's Health Rankings

Each year for 20 years, America's Health Rankings™, a project of United Health Foundation, has tracked the health of the nation and provided a comprehensive perspective on how the nation—and each state—measures up. America's Health Rankings is the longest running state-by-state analysis of health in the US (United Health Foundation, 2011).

America's Health Rankings are based on several kinds of measures, including *determinates* (socioeconomic and behavioral factors and standards of care that underlay health and well-being) and *outcomes* (measures of morbidity, mortality, and other health conditions). Together, the determinates and outcomes help calculate an overall rank. Table 23 shows where NC stood in the 2011 rankings relative to the "best" and "worst" states (where 1="best"). *When comparing county or regional health data with data for the state as a whole it is necessary to keep in mind that NC ranks 32nd overall, just outside the bottom third of the 50 US states.*

Table 23. State Rank of North Carolina in America's Health Rankings (2011)

Geography	National Rank (Out of 50)		
	Overall	Determinates	Outcomes
Vermont	1	1	5
North Carolina	32	31	38
Mississippi	50	48	50

Source: United Health Foundation, 2011. *America's Health Rankings*. Available at: http://www.americashealthrankings.org/mediacenter/mediacenter2.aspx

County Health Rankings

Building on the work of America's Health Rankings, the Robert Wood Johnson Foundation, collaborating with the University of Wisconsin Population Health Institute, supports a project to develop health rankings for the counties in all 50 states.

Each state's counties are ranked according to health outcomes and the multiple health factors that determine a county's health. Each county receives a summary rank for its health outcomes and health factors, and also for four different specific types of health factors: health behaviors, clinical care, social and economic factors, and the physical environment.

Below is a list of the parameters considered in each of the health outcome and health factor categories:

Health Outcomes – Mortality	**Social and Economic Factors**
Premature death	High school graduation
Morbidity	Some college
Poor or fair health	Unemployment
Poor physical health days	Children in poverty
Poor mental health days	Inadequate social support
Low birthweight	Children in single-parent households
Health Factors	Violent crime rate
Health Behaviors	**Physical Environment**
Adult smoking	Air pollution – particulate matter days
Adult obesity	Air pollution – ozone days
Physical inactivity	Access to recreational facilities
Excessive drinking	Limited access to healthy foods
Motor vehicle death rate	Fast food restaurants
Sexually transmitted infections	
Teen birth rate	
Clinical Care	
Uninsured	
Primary care physicians	
Preventable hospital stays	
Diabetic screening	
Mammography screening	

Table 24 presents the health outcome and health factor rankings for Swain County.

Table 24. County Health Rankings via MATCH (2012)

Geography	County Rank (Out of 100)[1]						
	Health Outcomes		Health Factors				Overall Rank
	Mortality	Morbidity	Health Behaviors	Clinical Care	Social & Economic Factors	Physical Environment	
Swain County	100	62	97	98	81	11	95

Source: *County Health Rankings and Roadmaps, 2012*. Available at http://www.countyhealthrankings.org/app/north-carolina/2012/rankings/outcomes/overall

Pregnancy and Birth Data

Why is this Important?

Unintended pregnancy among teens and adults is at the root of a number of important public health and social challenges. Unplanned pregnancies are frequently resolved by abortion. Women experiencing an unplanned pregnancy are less likely to obtain prenatal care. Their babies are at increased risk of both low birth rate and of being born prematurely (County Health Rankings and Roadmaps).

Pregnancy Rate

The following definitions and statistical conventions will be helpful in understanding the data on pregnancy:

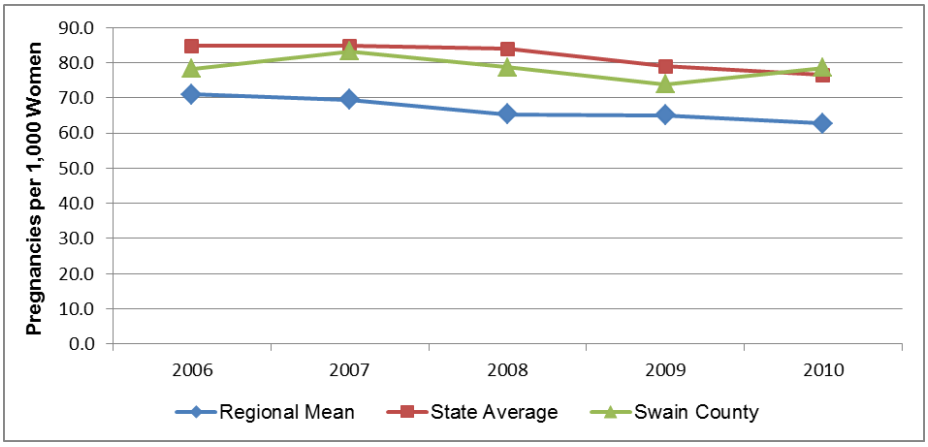
- Reproductive age = 15-44
- Total pregnancies = live births + induced abortions + fetal death at >20 weeks gestation
- Pregnancy rate = number of pregnancies per 1,000 women of reproductive age
- Fertility rate = number of live births per 1,000 women of reproductive age
- Abortion rate = number of induced abortions per 1,000 women of reproductive age

The NC SCHS stratifies much of the pregnancy-related data it maintains into two age groups: ages 15-44 (all women of reproductive age) and ages 15-19 ("teens"). The figures below present pregnancy rate data for ages 15-44 and 15-19. Note that regional rates are presented as *arithmetic means* (sums of individual county rates divided by the number of county rates). These means are approximations of true regional rates, which NC SCHS does not compute.

Data in Figure 1 illustrate that the pregnancy rate for women ages 15-44 in Swain County was lower than the comparable state rate but higher than the mean WNC rate over most of the period cited. The pregnancy rates in WNC and NC decreased between 2006 and 2010, by 11.6% in WNC, and by 9.9% in NC. The pregnancy rate in Swain County fluctuated over the period cited, but was little different in 2006-2010 (78.5) than in 2002-2006 (78.3). The 2010 pregnancy rate was 78.5 in Swain County, 62.7 in WNC, and 76.4 in NC.

When stratified by race, the pregnancy rate in 2010 for white, non-Hispanic women was 75.6; the pregnancy rate for "Other" non-Hispanic women (which would include primarily Native American women in Swain County) was 83.1. There were no other stable minority pregnancy rates in the county during 2010 (*Data Workbook*).

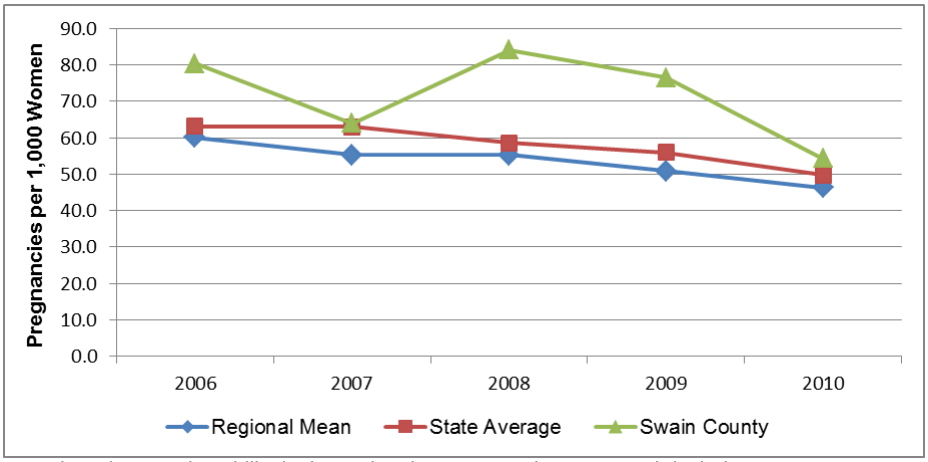
Figure 1 – Pregnancy Rate Ages 15-44, Pregnancies per 1,000 Women (Single Years, 2006-2010)



Data in Figure 2 illustrate that the pregnancy rate for teens (ages 15-19) in Swain County was above the comparable WNC and NC rates over the period cited. Note that the teen pregnancy rate in WNC and NC decreased between 2006 and 2010, by 22.9% in WNC, and by 21.2% in NC. The teen pregnancy rate in Swain County was more variable, due to relatively small and changing numbers of events, but was 32.4% lower in 2010 (54.3) than in 2006 (80.3). The 2010 teen pregnancy rate was 54.3 in Swain County, 46.3 in WNC, and 49.7 in NC.

When stratified by race, the teen pregnancy rate in 2010 for white, non-Hispanic girls was 44.5; the pregnancy rate for "Other" non-Hispanic teens (which would include primarily Native American girls in Swain County) was 56.8. There were no other stable minority pregnancy rates in the county during 2010 (*Data Workbook*).

Figure 2 – Pregnancy Rate Ages 15-19, Pregnancies per 1,000 Women (Single Years, 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

Pregnancy Risk Factors

Smoking During Pregnancy

Smoking during pregnancy is an unhealthy behavior that may have negative effects on both the mother and the fetus. Smoking can lead to fetal and newborn death, and contribute to low birth weight and pre-term delivery. In pregnant women, smoking can increase the rate of placental problems, and contribute to premature rupture of membranes and heavy bleeding during delivery (March of Dimes, 2010).

Table 25 presents data on the number and percent of births resulting from pregnancies in which the mother smoked during the prenatal period. The percentage frequency of smoking during pregnancy in Swain County was higher than the comparable mean percentages for WNC, and the WNC means were significantly higher than the comparable percentages statewide in *all* of the time periods cited in the table. The frequency of smoking during pregnancy in Swain County, WNC, and NC all improved over the period cited, by 5.2% in Swain County, by 8.0% in WNC, and by 14.7% in NC.

Table 25. Births to Mothers Who Smoked During the Prenatal Period (Five-Year Aggregates, 2001-2005 through 2005-2009)

Geography	2001-2005		2002-2006		2003-2007		2004-2008		2005-2009	
	#	%	#	%	#	%	#	%	#	%
Swain County	**224**	**25.1**	**224**	**24.9**	**232**	**25.0**	**235**	**24.8**	**219**	**23.8**
Regional Total	7,496	22.4	7,442	22.1	7,361	21.7	7,106	21.2	6,919	20.6
State Total	76,712	12.9	74,901	12.4	73,887	11.9	72,513	11.5	70,529	11.0

Late or No Prenatal Care

Good pre-conception health and early prenatal care can help assure women the healthiest pregnancies and best birth outcomes possible. Access to prenatal care is particularly important during the first three months of pregnancy (March of Dimes, 2012.

Table 26 shows data summarizing utilization of prenatal care during the first three months of pregnancy. The percent of births in Swain County that included early prenatal care was higher than the comparable NC percentage but lower than the mean WNC percentage in the first three aggregate periods cited; in the last two aggregate periods, the county percentage exceeded the figure for both of the other jurisdictions. Overall, the Swain County percentage of prenatal care utilization rose from 88.1% in 2001-2005 to 88.9% in 2005-2009, an increase of 0.9%. The frequency of early prenatal care utilization was higher in WNC than in the state as a whole for every period noted in the figure, but the percentages for both the region and the state decreased over the period cited, by 2.7% in WNC and by 1.7% in NC.

When stratified by race, the frequency utilization of early prenatal care in 2010 by white, non-Hispanic women was 88.9%; the comparable percentage for "Other" non-Hispanic women (which would include primarily Native American women in Swain County) was 84.8%. There were no other stable minority prenatal care utilization data for the county during 2010 (*Data Workbook*).

Table 26. Births to Mothers Receiving Prenatal Care During the First Trimester (Five-Year Aggregates, 2001-2005 through 2005-2009)

Geography	2001-2005		2002-2006		2003-2007		2004-2008		2005-2009	
	#	%	#	%	#	%	#	%	#	%
Swain County	**785**	**88.1**	**788**	**87.6**	**814**	**87.8**	**843**	**88.8**	**817**	**88.9**
Regional Total	35,375	89.3	35,799	89.0	36,433	88.9	36,806	88.0	37,049	86.9
State Total	497,895	83.5	503,331	83.0	510,954	82.5	519,098	82.1	524,902	82.1

Birth Outcomes

Low Birth Weight

Low birth weight can result in serious health problems in newborns (e.g., respiratory distress, bleeding in the brain, and heart, intestinal and eye problems), and cause lasting disabilities (mental retardation, cerebral palsy, and vision and hearing loss) or even death (March of Dimes, 2012).

Table 27 summarizes data on the number and percent of low birth weight (≤ 2500 grams or 5.5 pounds) births. (Note that NC SCHS also maintains data on *very* low birth weight [≤1500 grams or 3.3 pounds] births. There are so few very low birth weight births in WNC that county rates

are too unstable to calculate a stable regional mean.) In WNC, the percentage of low-birth weight births was lower than the comparable percentage for NC as a whole in each of the aggregate periods cited in the table. Further, the percentages were relatively static in both jurisdictions during the entire period.

In Swain County over the time span from 2002-2006 through 2006-2010, low birth weight percentages were consistently lower than comparable figures for both the region and the state. However, the percentages of low birth weight births in the county did increase 20.7% over the period cited, from 5.8% in 2002-2006 to 7.0% in 2006-2010.

When stratified by race, the frequency of low birth weight births in 2010 among white, non-Hispanic women was 8.2%; the comparable percentage for "Other" non-Hispanic women (which would include primarily Native American women in Swain County) was 5.9%. There were no other stable minority low birth weight data for the county during 2010 (*Data Workbook*).

Table 27. Low-Weight Births (Five-Year Aggregates, 2002-2006 through 2006-2010)

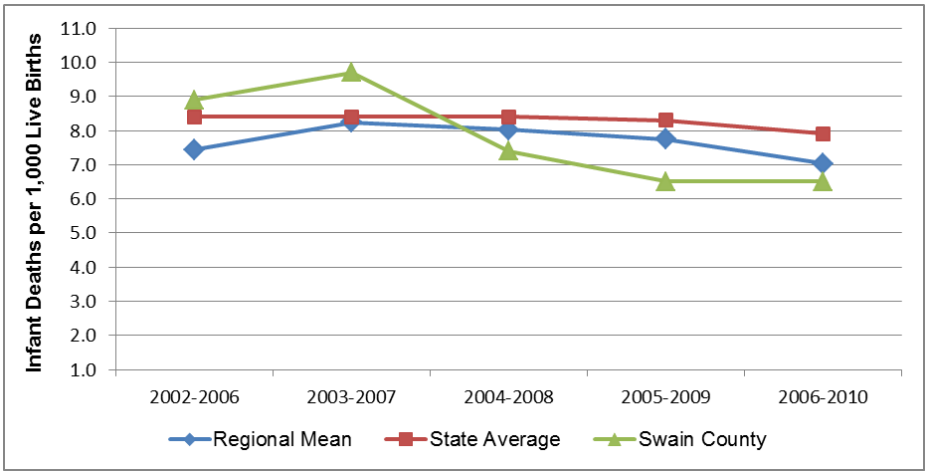
Geography	2002-2006		2003-2007		2004-2008		2005-2009		2006-2010	
	#	%	#	%	#	%	#	%	#	%
Swain County	**52**	**5.8**	**63**	**6.8**	**65**	**6.8**	**64**	**7.0**	**65**	**7.0**
Regional Total	3,447	8.2	3,473	8.4	3,467	8.3	3,434	8.2	3,373	8.2
State Total	54,991	9.1	56,541	9.1	57,823	9.1	58,461	9.1	58,260	9.1

Infant Mortality

Infant mortality is the number of deaths of infants under one year of age per 1,000 live births. Figure 3 presents infant mortality data for WNC and the state. When interpreting this data it is important to remember that the infant mortality rate for NC as a whole is among the highest (i.e., worst) in the US, ranking 46th out of 50 according to the 2011 *America's Health Rankings*, cited previously.

The state's infant mortality rate recently has begun to decrease; after hovering near 8.5 for several years, it was 7.9 in the most recent aggregate period (2006-2010). The mean infant mortality rate for WNC has been lower than the state rate, and appears to be trending in the right direction. While the infant mortality rate for Swain County plotted in Figure 3 was higher than both the WNC and NC rates for the first two aggregate periods, it fell to lower than both in the last three aggregate periods. It should be noted, however, that all five of the rates plotted for the county are unstable due to small numbers of infant deaths (n=6-9 per aggregate period). The large changes from one period to another may be attributable to those unstable rates.

Figure 3. Infant Mortality Rate, Infant Deaths per 1,000 Live Births (Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rates.

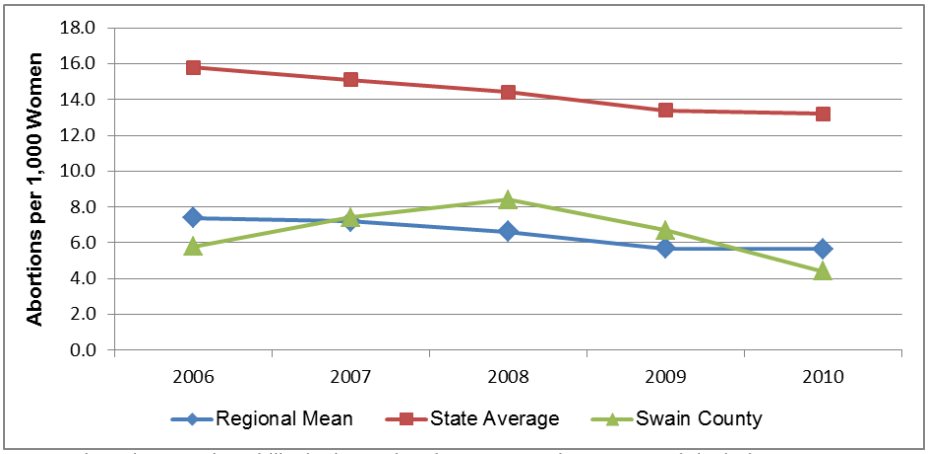
Due to small non-white populations and similarly small numbers of infant deaths among them in both Swain County and WNC it is not possible to calculate stable minority infant mortality rates for those jurisdictions. Statewide in 2006-2010, the infant mortality rate among non-Hispanic African Americans was *more than twice* the comparable rate among whites, and in the group that includes Native Americans, the infant mortality rate was 7% higher than the comparable rate among whites (*Data Workbook*).

Abortion

Figures 4 and 5 depict abortion rates for the region and state. Data in Figure 4 show that the mean abortion rate in WNC for women ages 15-44 was less than half the abortion rate for the state as a whole, and that the rate in both jurisdictions fell over the time period cited in the figure, by 24.3% in WNC and by 16.5% in NC. In 2010 the abortion rate was 5.6 in WNC and 13.2 in NC.

The abortion rate in Swain County was below the NC rate and fluctuated around the comparable mean WNC rate throughout the period cited. Fluctuations in the county data plotted in Figure 4 may be due partly to the relatively small numbers of events used in calculating the rates (n=11-23 abortions per year), although all the county rates shown technically are stable. In 2010 the abortion rate was 4.4 in Swain County, 5.6 in WNC, and 13.2 statewide.

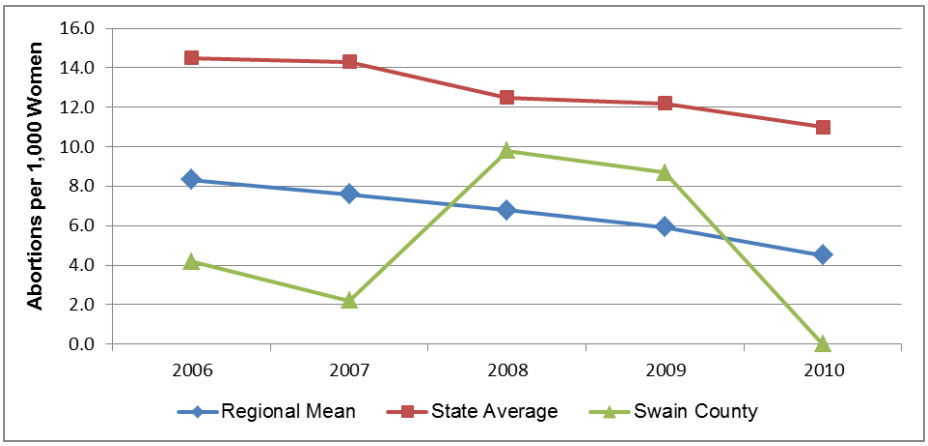
Figure 4. Pregnancies Ending in Abortion, Ages 15-44, per 1,000 Population (Single Years, 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rates.

Data in Figure 5 show that the mean abortion rate in WNC for teens ages 15-19 was slightly more than half the teen abortion rate for the state as a whole for the first three years cited in the figure and less than half the state rate in the most recent two years. The rate in both jurisdictions fell over the time period cited in the figure, by 45.8% in WNC and by 24.1% in NC. The teen abortion rate in Swain County was highly variable due to small numbers of teen abortions (n=0-5 per year). In 2010 the teen abortion rate in Swain County was 0.0; the rate for WNC was 4.5, and the rate for NC was 11.0.

Figure 5. Pregnancies Ending in Abortion, Age 15-19, per 1,000 Population (Single Years, 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

Mortality Data

This section describes mortality for the 15 leading causes of death, as well as mortality due to four major site-specific cancers. The

list of topics and the accompanying data is derived from the NC SCHS *County Health Databook*. Unless otherwise noted, the numerical data are age-adjusted and represent overlapping five-year aggregate periods.

Why is this Important?

Premature death is a key measure of people dying too early. By knowing and comparing premature deaths, it helps our county focus of the deaths that can be prevented. We can target resources to high-risk areas and further investigate causes of death. (County Health Rankings and Roadmaps)

Leading Causes of Death

Table 28 compares the mean rank order of the 15 leading causes of death in Swain County, WNC and NC for the five-year aggregate period 2006-2010. (The causes of death are listed in descending rank order for WNC.) From this data it appears that chronic lower respiratory disease, pneumonia and influenza, motor vehicle injury and suicide rank higher as causes of death in WNC than in the state as a whole. Conversely, cerebrovascular disease, kidney disease, and septicemia rank lower as causes of death regionally than statewide.

The leading causes of death in Swain County differ in rank order from the comparable lists for WNC or NC, most notably in a higher county placement for "all other injuries" and chronic liver disease and cirrhosis. In Swain County the mortality rate for heart disease (259.1) exceeds the mean WNC rate (194.4) by 33.3%, and the mortality rate for total cancer (202.9) exceeds the mean WNC rate (180.3) by 12.5%. Other differences in mortality statistics will be covered as each cause of death is discussed separately below. It should be noted from the onset, however, that for some causes of death (e.g., conditions ranked 11 through 15 below) there may not be stable county mortality rates, due to small numbers of deaths. Some unstable data will be presented in this document, but always accompanied by cautions regarding its use.

Table 28. Rank of Cause-Specific Mortality Rates for the Fifteen Leading Causes of Death (Five-Year Aggregate, 2006-2010)

Leading Cause of Death	Swain County		WNC Mean		NC	
	Rank	Rate	Rank	Rate	Rank	Rate
Heart Disease	1	259.1	1	194.4	1	184.9
Total Cancer	2	202.9	2	180.3	2	183.1
Chronic Lower Respiratory Disease	4	59.8	3	51.1	4	46.4
Cerebrovascular Disease	5	56.2	4	44.0	3	47.8
All Other Unintentional Injuries	3	69.0	5	42.9	5	28.6
Alzheimer's Disease	7	44.8	6	30.7	6	28.5
Diabetes Mellitus	6	47.3	7	19.6	7	22.5
Pneumonia and Influenza	8	36.3	8	19.1	9	18.6
Unintentional Motor Vehicle Injuries	11	n/a	9	16.7	10	16.7
Suicide	14	n/a	10	16.7	12	12.1
Nephritis, Nephrotic Syndrome & Nephrosis	10	24.2	11	16.2	8	18.9
Septicemia	12	n/a	12	13.4	11	13.7
Chronic Liver Disease & Cirrhosis	9	30.2	13	13.2	13	9.1
Homicide	13	n/a	14	n/a	14	6.6
Acquired Immune Deficiency Syndrome	15	n/a	15	n/a	15	5.4

It should be noted that the rank order of leading causes of death varies somewhat among the 16 counties in WNC. Further, in 2005-2009 and 2006-2010 the NC SCHS did not release mortality rates for some causes of death in several counties (including Swain) because the number of deaths fell below the Center's threshold of 20 per five-year aggregate period. The mean WNC ranking displayed in Table 28 includes only stable rates presented in the *Data Workbook*.

Each age group tends to have its own leading causes of death. Table 29 lists the three leading causes of death by age group for the five-year aggregate period from 2006-2010. (Note that for this purpose it is important to use *non*-age adjusted death rates.) The WNC rankings were developed by a qualitative examination of the individual ranking lists for each of the counties in the region.

In Swain County, causes of death in the three older age groups are similar to those noted for WNC and NC as a whole. In the younger two age groups, however, there are striking differences between the county and the other jurisdictions. In Swain County, homicide is one of the three leading causes of death in both the 00-19 and 20-39 year-old age group; homicide is not among the top three leading causes of death in either WNC or NC.

Noteworthy findings among the age-grouped rankings of mortality in WNC compared to NC as a whole include the relatively greater regional prominence of non-motor vehicle injury in the two youngest age groups (00-19 and 20-39) and the third-place ranking of Alzheimer's disease among the leading causes of death in the oldest age group (85+).

Table 29. Leading Causes of Death by Age Group
Unadjusted Death Rates per 100,000 Population
(Five-Year Aggregate, 2006-2010)

Age Group	Rank	Leading Cause of Death		
		Swain County	**WNC**	**NC**
00-19	**1**	Other unintentional injuries	Perinatal conditions	Perinatal conditions
	2	Perinatal conditions	Motor vehicle injuries	Congenital abnormalities
	3	Homicide	Congenital abnormalities	Motor vehicle injuries
			Other unintentional injuries	
20-39	**1**	Other unintentional injuries	Other unintentional injuries	Motor vehicle injuries
	2	Motor vehicle injuries	Motor vehicle injuries	Other unintentional injuries
	3	Homicide	Suicide	Suicide
40-64	**1**	Cancer – all sites	Cancer – all sites	Cancer – all sites
	2	Heart disease	Heart disease	Heart disease
	3	Other unintentional injuries	Other unintentional injuries	Other unintentional injuries
65-84	**1**	Cancer – all sites	Cancer – all sites	Cancer – all sites
	2	Heart disease	Heart disease	Heart disease
	3	Chronic lower respiratory disease	Chronic lower respiratory disease	Chronic lower respiratory disease
85+	**1**	Diseases of the heart	Heart disease	Heart disease
	2	Cancer – all sites	Cancer – all sites	Cancer – all sites
	3	Alzheimer's disease	Alzheimer's disease	Cerebrovascular disease

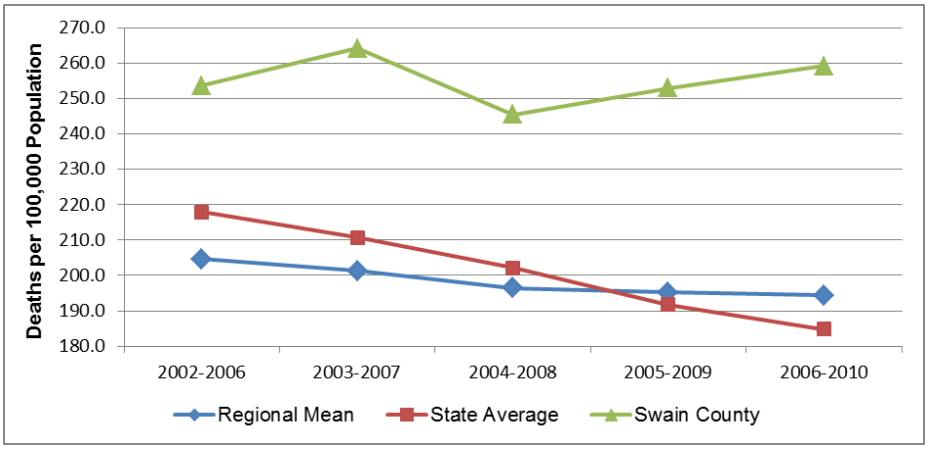
The following section examines in greater detail each of the causes of death listed in Table 28, in the order of highest mean WNC rank to lowest, beginning with heart disease.

Heart Disease Mortality

Heart disease is an abnormal organic condition of the heart or of the heart and circulation. Heart disease is the number one killer in the US. It is also a major cause of disability. The most common cause of heart disease, coronary artery disease, is a narrowing or blockage of the coronary arteries, the blood vessels that supply blood to the heart itself. This is the major reason people have heart attacks. Other kinds of heart problems may happen to the valves in the heart, or the heart may not pump well and cause heart failure (US National Library of Medicine).

Heart disease was the leading cause of death in Swain County, WNC and NC in the 2006-2010 aggregate period (Table 28, cited previously). Figure 6 presents heart disease mortality trend data. This graph illustrates that the heart disease mortality rate in Swain County far exceeded the comparable rates for WNC and NC throughout the period cited. The graph also illustrates that some variability, the heart disease mortality rate in Swain County rose from 253.7 in the 2002-2006 aggregate period to 259.1 in the 2006-2010 aggregate period, an increase of 2.1%. Over the same interval heart diseases mortality rates decreased in the other two jurisdictions. The NC heart disease mortality rate fell from 217.9 for the 2002-2006 aggregate period to 184.9 for the 2006-2010 aggregate period, a decrease of 15.1%. The mean WNC rate, which for the first three periods cited was below the state rate, surpassed the state rate and leveled during the two most recent periods. For the 2002-2006 period the mean WNC heart disease mortality rate was 204.6; by the 2006-2010 period it had fallen to 194.4, a decrease of 4.9%.

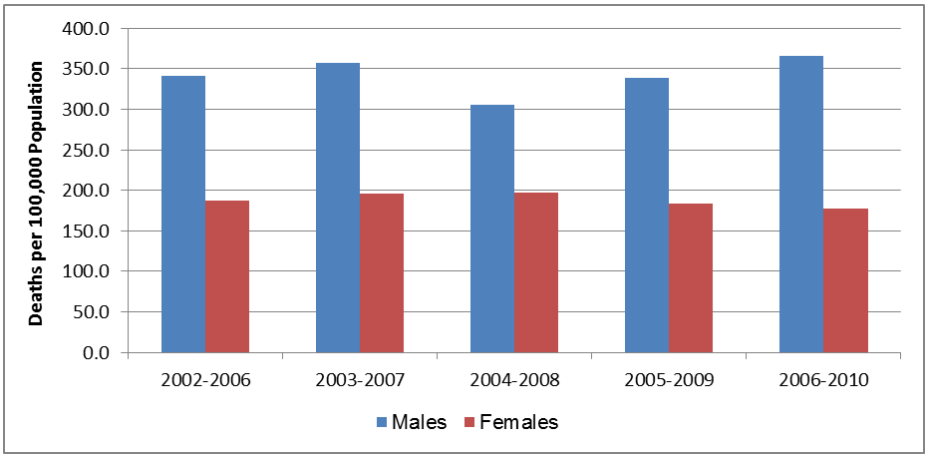
Figure 6. Heart Disease Mortality Rate, Deaths per 100,000 Population Five-Year Aggregates (2002-2006 through 2006-2010)



Further subdivision of heart disease mortality data reveals a striking gender disparity. Figure 7 plots heart disease mortality rates for Swain County, stratified by gender. From these data it is clear that Swain County males have had a higher heart disease mortality rate than females for

the past decade, with the difference ranging from 55% to 106%. There is no clear pattern of change in heart disease mortality in either the female or male population of the county. In the 2006-2010 aggregate period the heart disease mortality rate difference between males (365.1) and females (176.9) in the county was 106%.

Figure 7. Gender Disparities in Heart Disease Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2006-2010)



When stratified by race, other differences in heart disease mortality become clear. In Swain County in the 2006-2010 aggregate period, the heart disease mortality rate among white, non-Hispanic males was 359.6; the comparable rate among white, non-Hispanic females was 166.7. The comparable mortality rate for "Other" non-Hispanic men (which would include primarily Native American men in Swain County) was 375.0, 4% higher than the rate among white, non-Hispanic males. The number of heart disease deaths among "Other" non-Hispanic women in the county was below the NC SCHS threshold for releasing a mortality rate. There were no other stable minority heart disease mortality data for the county in the 2006-2010 period (*Data Workbook*).

Total Cancer Mortality

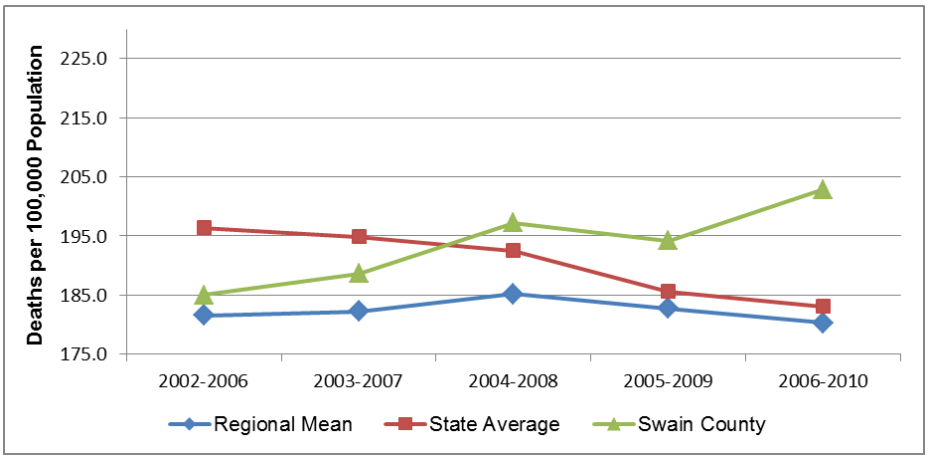
Cancer is a term for diseases in which abnormal cells divide without control and can invade nearby tissues. Cancer cells also can spread to other parts of the body through the blood and lymph systems. If the disease remains unchecked, it can result in death (National Cancer Institute).

Taken together, cancers of all types compose the second leading cause of death in Swain County, WNC and NC in 2006-2010 (Table 28, cited previously).

Figure 8 presents mortality trend data for total cancer. This graph illustrates how over the period cited the total cancer death rate in Swain County rose, from 185.0 in the 2002-2006 aggregate period to 202.9 in the 2006-2010, an increase of 9.7%. Between the mean WNC and NC rates during the first two aggregate periods, the total cancer mortality rate in the county was

above both the mean WNC and NC rates in the last three aggregate periods. In 2006-2010, the total cancer mortality rate in Swain County was 202.9; in WNC it was 180.3, and in NC it was 183.1

Figure 8. Total Cancer Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



Like heart disease mortality, total cancer mortality demonstrates a gender disparity. Figure 9 plots mean total cancer mortality rates for Swain County, stratified by gender. From these data it is clear that males had and continue to have a higher total cancer mortality rate than females for the past decade. Noteworthy, however, is that the total cancer mortality rate among Swain County males appears to have risen 12.8%, from 230.0 to 259.4, as the comparable rate for females remained roughly static. In the most recent aggregate period (2006-2010) the total cancer mortality rate for Swain County males (259.4) was 61% higher than the comparable rate for females (161.1).

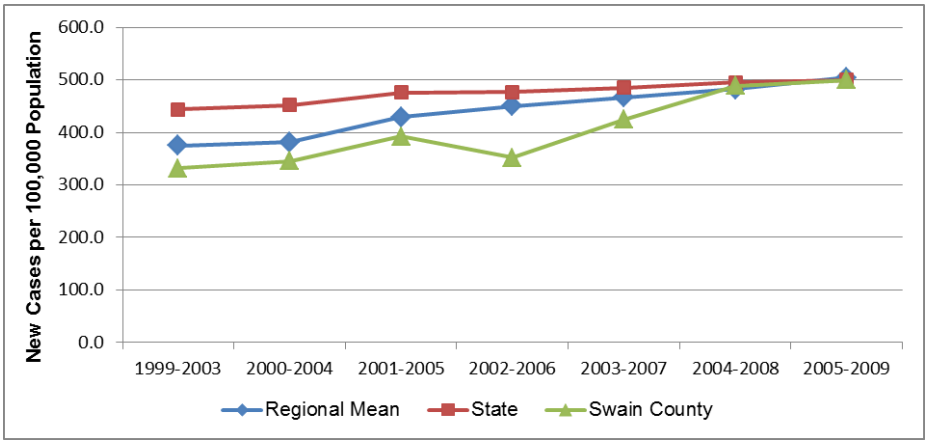
Figure 9. Gender Disparities in Total Cancer Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2006-2010)

When stratified by race, other differences in total cancer mortality become clear. In Swain County in the 2006-2010 aggregate period, the heart disease mortality rate among white, non-Hispanic males was 239.4; the comparable rate among white, non-Hispanic females was 172.4. The comparable total cancer mortality rate for "Other" non-Hispanic men (which would include primarily Native American men in Swain County) was 355.0, or 48% higher than the rate for white, non-Hispanic males. The number of total cancer deaths among "Other" non-Hispanic women in the county was below the NC SCHS threshold for releasing a mortality rate. There were no other stable minority total cancer mortality data for the county in the 2006-2010 period (*Data Workbook*).

Since total cancer is a very significant cause of death, it is useful to examine patterns in the development of new cases of cancer in the county. The statistic important to understanding the growth of a health problem is *incidence*. Incidence is the population-based rate at which new cases of a disease occur and are diagnosed. It is calculated by dividing the number of newly diagnosed cases of a disease or condition during a given period by the population size during that period. Typically, the resulting value is multiplied by 100,000 and is expressed as cases per 100,000; sometimes the multiplier is a smaller number, such as 10,000 or 1,000. Cancer incidence rates were obtained from the NC Cancer Registry, which collects data on newly diagnosed cases from NC clinics and hospitals as well as on NC residents whose cancers were diagnosed at medical facilities in bordering states.

Figure 10 graphs the incidence rates for total cancer for seven five-year aggregate periods. From this data it appears that the incidence rate for total cancer increased in Swain County, WNC and NC between 1999-2003 and 2005-2009. In Swain County, the total cancer incidence rate, which for most of the period cited was below both the mean WNC and NC rates, was approximately the same as the mean WNC and NC rates in the 2006-2010 period. The total cancer incidence rate in the county rose from 331.4 at the beginning of the period cited to 499.4 at the end, an increase of 50.7%. Over the same period, the NC rate rose from 444.0 in 1999-2003 to 500.1 in 2005-2009, a 12.6% increase. The mean total cancer incidence rate in WNC rose from 374.5 in 1999-2003 to 503.8 in 2005-2009, an increase of 35%. Further, the regional incidence rate for total cancer, which for years had been below the comparable NC rate, surpassed the state rate for the first time in the 2005-2009 period.

Figure 10. Total Cancer Incidence Rate, New Cases per 100,000 Population (Five-Year Aggregates, 1999-2003 through 2005-2009)



To this point the discussion of cancer mortality and incidence has focused on figures for total cancer. In Swain County, as throughout both WNC and the state of NC, there are four site-specific cancers that cause most cancer deaths: breast cancer, colon cancer, lung cancer, and prostate cancer. Table 30 summarizes the age-adjusted mortality rates for the four site-specific cancers for the 2006-2010 aggregate period. In Swain County the numbers of deaths attributable to breast cancer, prostate cancer, and colon cancer were below the threshold for calculating stable rates. The stable county mortality rate for lung cancer (70.5) was above both the mean WNC and NC rates. In WNC, lung cancer is the site-specific cancer with the highest mortality, followed by breast cancer, prostate cancer, and colon cancer.

Table 30. Age-Adjusted Mortality Rates for Major Site-Specific Cancers (2006-2010)

Geography	Deaths per 100,000 Population			
	Lung Cancer	Breast Cancer	Prostate Cancer	Colon Cancer
Swain County	70.5	n/a	n/a	n/a
Regional Mean	54.7	24.3	22.9	16.6
State	55.9	23.4	25.5	16.0

Multi-year mortality rate trends for these four site-specific cancers will be presented subsequently, as each cancer type is discussed separately.

Table 31 summarizes the age-adjusted incidence rates for these four site-specific cancers for the 2005-2009 aggregate period. From this data it appears that in Swain County, as in WNC, breast cancer was the site-specific cancer with the highest incidence rate. The cancer with the second highest incidence in the county was lung cancer, followed by prostate cancer and colon cancer. In WNC the cancer with the second highest incidence was prostate cancer, followed by lung cancer and colon cancer. Swain County incidence rates for breast, prostate and lung cancer are above the comparable incidence rates for WNC and NC. Multi-year incidence rate trends for these four site-specific cancers will be presented subsequently, as each cancer type is discussed separately.

Table 31. Age-Adjusted Incidence Rates for Major Site-Specific Cancers (2005-2009)

Geography	New Cases per 100,000 Population			
	Breast Cancer	Prostate Cancer	Lung Cancer	Colon Cancer
Swain County	172.5	83.7	95.5	39.2
Regional Mean	154.0	139.2	75.4	46.0
State	154.5	158.3	75.9	45.5

Lung Cancer Mortality

Lung cancer was the leading cause of cancer mortality in Swain County in 2006-2010 (Table 30, cited above). Figure 11 plots lung cancer mortality rates for several aggregate periods. This data reveals that the lung cancer mortality rate in Swain rose dramatically between 2004-2008 and 2006-2010. The lung cancer mortality rate in Swain County was 51.1 in 2002-2006 but 70.5 in 2006-2010, a 38.0% increase. The county rate, which was below the mean WNC rate and the NC rate during the first two aggregate periods, was well above both the regional and state rates in the final two aggregate periods. Statewide the lung cancer mortality rate fell from 59.8 for 2002-2006 to 55.9 for 2006-2010, a 6.5% decrease over the period. The comparable mean WNC rate fluctuated somewhat but was essentially the same at the end of the period (54.7) as at the beginning (54.2).

Figure 11. Lung Cancer Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)

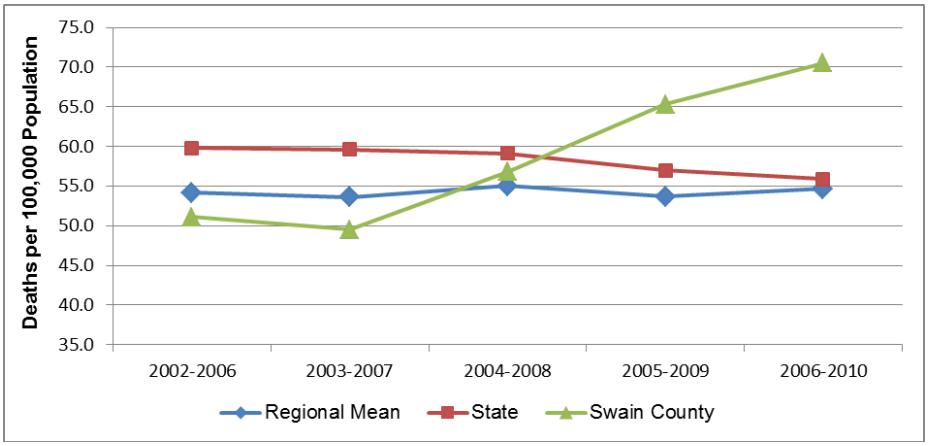
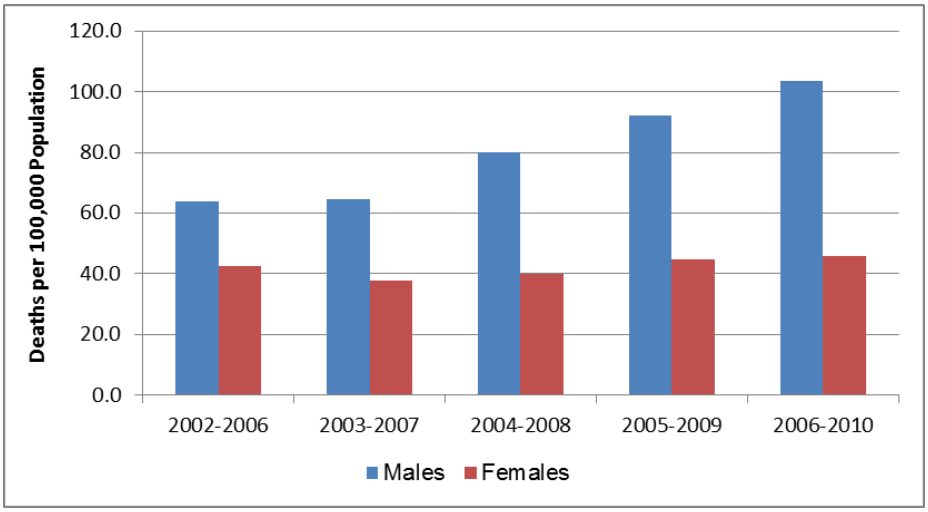


Figure 12 presents gender-stratified Swain County lung cancer mortality rates for several aggregate periods. From this data it is clear that males experience disproportionately higher lung cancer mortality than females, and that the disparity has grown as the lung cancer mortality rate among men increased dramatically. It should be noted that only the last two rates for Swain County females are considered technically stable. In 2006-2010 the lung cancer mortality rate for county females was 45.8, and the comparable rate for county males was 103.4, 2.3 times the rate for females.

Figure 12. Gender Disparities in Lung Cancer Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2006-2010)

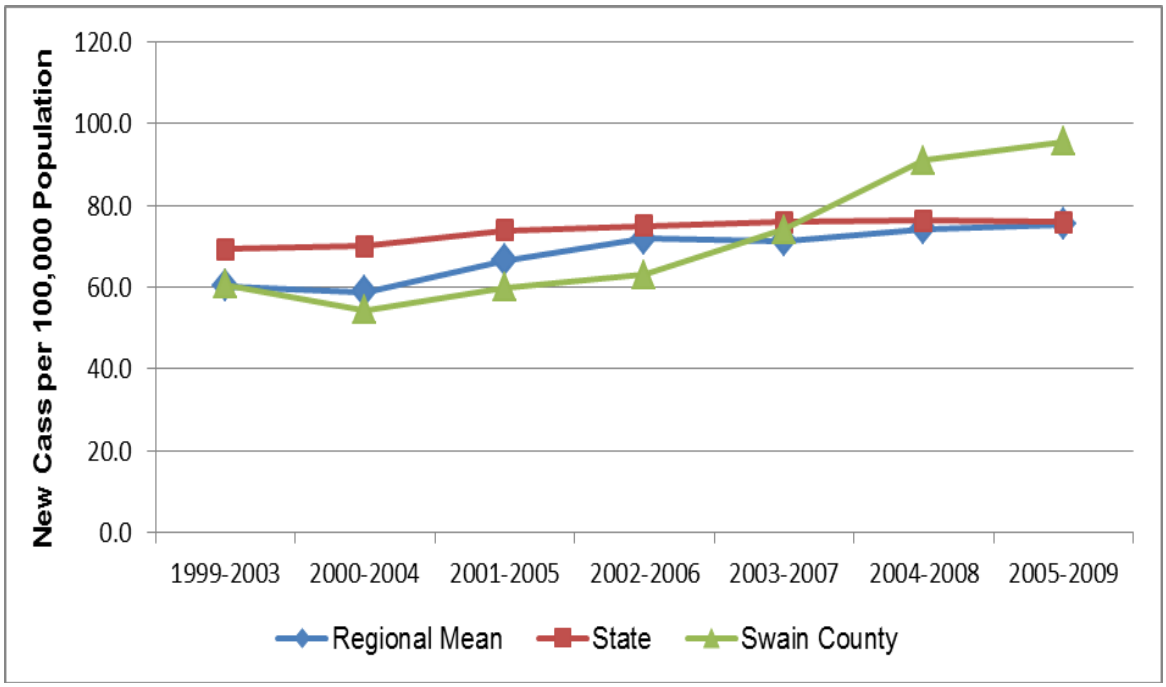


The numbers of gender-stratified minority lung cancer deaths in Swain County were below the threshold for the NC SCHS to calculate and release rates. Regionally, only one of the 16 counties in WNC (Buncombe) had large enough minority populations to yield stable minority lung cancer mortality rates, so it is not possible to calculate stable mean region-wide rates for minorities. Statewide, lung cancer mortality rates demonstrate racial disparity. For example, statewide in 2006-2010 the lung cancer mortality rate among African American non-Hispanic males (90.9) was 19% higher than the comparable rate among white non-Hispanic males (76.1); however, the rate among African American non-Hispanic females (32.7) was 25% *lower* than the rate among white non-Hispanic females (43.7). The comparable rates among "Other" non-Hispanics were 47.2 for males and 24.6 for females. Hispanic males and females had the lowest lung cancer mortality rates, 12.7 and 8.6, respectively (*Data Workbook*).

Since lung cancer is a significant cause of mortality in Swain County, it is instructive to examine the trend of development of new lung cancer cases over time. Figure 13 depicts the seven-year trend of lung cancer incidence.

From this data it appears that lung cancer incidence in Swain County increased 57.3% (from 60.7 to 95.5) between 1999-2003 and 2005-2009. Below both the regional and state rates for the first four aggregate periods, the Swain County lung cancer incidence rate was well above both the mean WNC and NC rates in the last two aggregate periods. Region-wide, the mean lung cancer incidence rate has been creeping upward over the past several years, from a point well below the comparable state rate to a point barely below it. The lung cancer incidence rate in WNC increased 25.0% from the 1999-2003 aggregate period (60.3) to the 2005-2009 aggregate period (75.4), while the statewide lung cancer incidence rate increased by 9.5% (from 69.3 to 75.9) over the same time frame. Since lung cancer mortality is already on the rise in the region, the increase in the incidence rate may portend additional lung cancer mortality in the future.

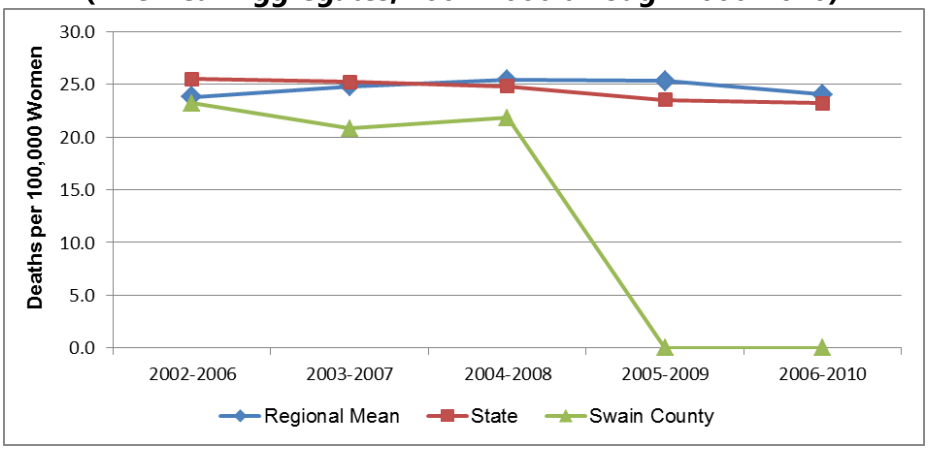
Figure 13. Lung Cancer Incidence, New Cases per 100,000 Population (Five-Year Aggregates, 1999-2003 through 2005-2009)



Breast Cancer Mortality

In 2006-2010 the numbers of breast cancer deaths in Swain County (n=9-11 per five-year aggregate period) were below the NC SCHS threshold for releasing a rate. However, breast cancer was the second leading cause of cancer death in WNC in the same period (Table 30, cited previously). County data in Figure 14 demonstrate fluctuating behavior typical of unstable rates, as all the rates for Swain County are either unstable or "zero" (indicating that NC SCHS did not release a rate in that period due to a small number of events). At the state level, the breast cancer mortality rate fell throughout the period cited, from a high of 25.5 deaths per 100,000 women in 2002-2006 to a low of 23.2 in 2006-2010, a decrease of 9.0%. In WNC, the mean breast cancer mortality rate has been more volatile, actually increasing 6.7% from 23.8 in 2002-2006 to 25.4 in 2004-2008. Since then, the regional rate has reversed to a current breast cancer death rate of 24.0. The WNC mean breast cancer mortality rate has exceeded the comparable state rate for the past three aggregate periods.

Figure 14. Breast Cancer Mortality Rate, Deaths per 100,000 Women (Five-Year Aggregates, 2002-2006 through 2006-2010)

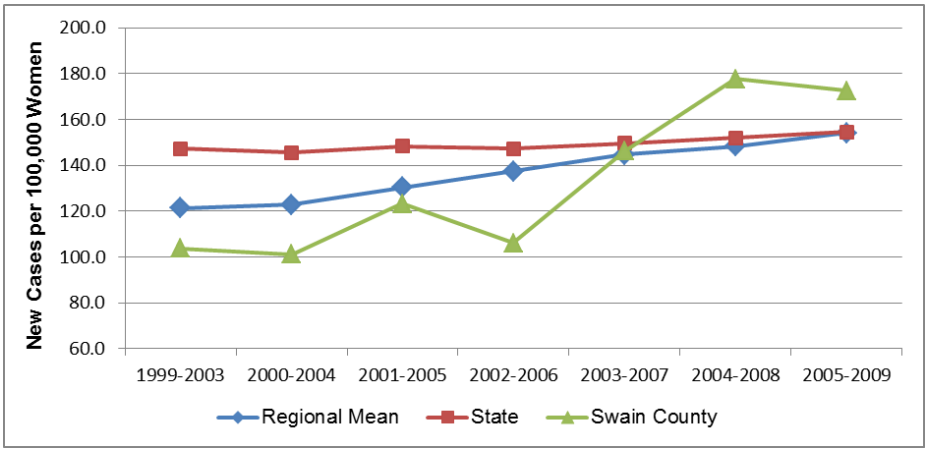


Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

In WNC, none of the 16 counties, including Swain, had large enough minority populations to yield stable breast cancer mortality rates for any minority group. At the state level, minority breast cancer mortality rates are higher than the non-minority rates. For example, statewide in 2006-2010 the breast cancer mortality rate among non-Hispanic African American women (30.7) was 40% higher than the comparable rate among non-Hispanic white women (21.9), and the rate among "Other" non-Hispanic women (11.7) was less than half the rate among non-Hispanic white women. The rate among Hispanic women (6.7) was far lower than the rate in any other population (*Data Workbook*).

Figure 15 demonstrates that the breast cancer incidence rate increased in all three jurisdictions over the past several years, but at the fastest pace in Swain County. In Swain County, the breast cancer incidence rate rose from 103.8 new cases per 100,000 women in the 1999-2003 aggregate period to 172.5 in the 2005-2009 aggregate period, an increase of 66.2%. Over this period, the county breast cancer incidence rate rose from well below both the WNC and NC rates to well above both of them. In WNC, the mean breast cancer incidence rate rose from 121.3 in the 1999-2003 aggregate period to 154.0 in the 2005-2009 aggregate period, an increase of 27.0%. At the state level, breast cancer incidence rate rose from 147.3 to 154.5 over the same period, an increase of approximately 5%.

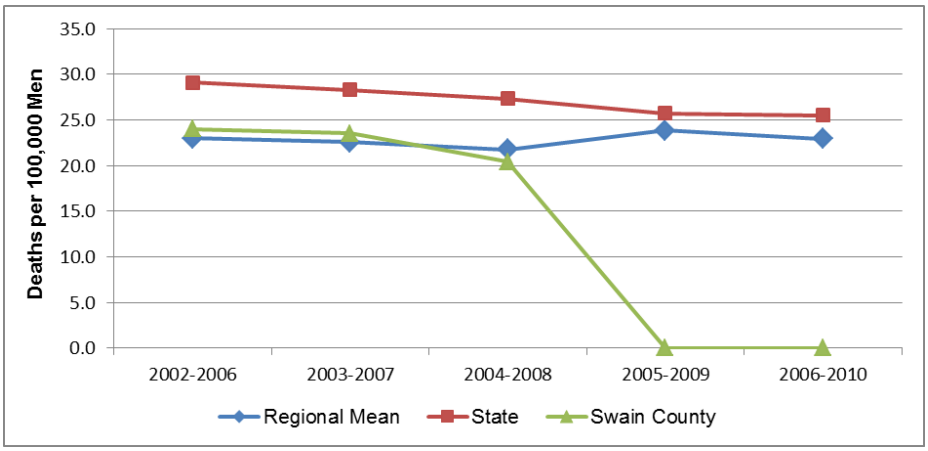
Figure 15. Breast Cancer Incidence, New Cases per 100,000 Women (Five-Year Aggregates, 1999-2003 through 2005-2009)



Prostate Cancer Mortality

Deaths attributable to prostate cancer in Swain County (n=4-8 per five-year aggregate period) were too few to calculate and graph stable mortality rates. Region-wide, prostate cancer is the third largest cause of cancer deaths (Table 30, cited previously). Figure 16 plots the prostate cancer mortality trend for several aggregate periods. Statewide, prostate cancer mortality demonstrates a slight downward trend, with the 2006-2010 rate (25.5) approximately 12% lower than the comparable rate in 2002-2006 (29.1). In WNC, there has been fluctuation but little net decrease in the mean prostate cancer mortality rate over the period cited in the graph (23.0 the first aggregate period; 22.9 the last aggregate period). The variability noted for the Swain County data is attributable to unstable or un-released rates due to small numbers of events.

Figure 16. Prostate Cancer Mortality Rate, Deaths per 100,000 Men (Five-Year Aggregates, 2002-2006 through 2006-2010)

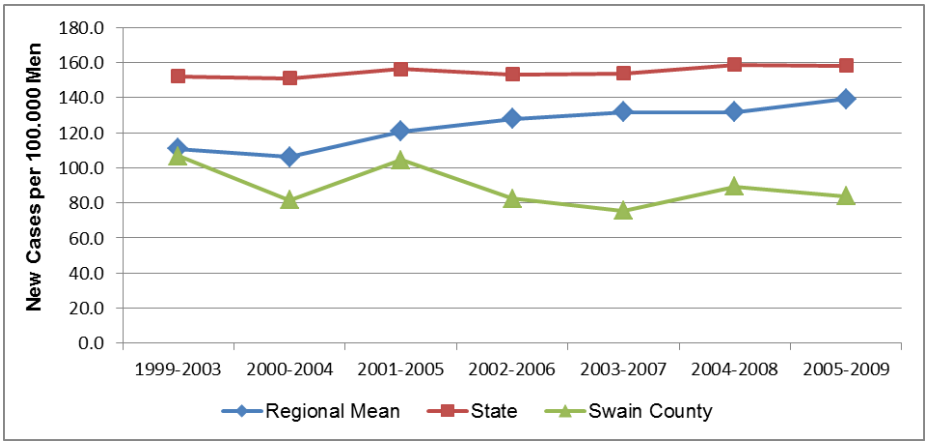


Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

In WNC, none of the 16 counties, including Swain, had large enough minority populations to yield stable prostate cancer mortality rates for any minority group. Statewide, there is a significant racial disparity in prostate cancer mortality. For 2006-2010 in NC as a whole the prostate cancer mortality rate among non-Hispanic African American males (59.4) was *three times* the rate for either non-Hispanic white males (20.4) or "Other" non-Hispanic males (18.2). The prostate cancer mortality rate for Hispanic males (9.5) was the lowest of any minority group in NC (*Data Workbook*).

Prostate cancer incidence statewide has remained relatively static in recent years, increasing by 4.1%, from 152.0 to 158.3, in the period from 1999-2003 through 2005-2009 (Figure 17). Over the same span of time, the mean prostate cancer incidence rate in WNC rose from 110.7 to 139.2, a total increase of 25.7%, or over six times the percentage increase statewide. In Swain County, where the prostate cancer incidence rate has remained below both WNC and NC rates, the rate fell from 106.6 to 83.7 over the same period, an overall decrease of 21.5%.

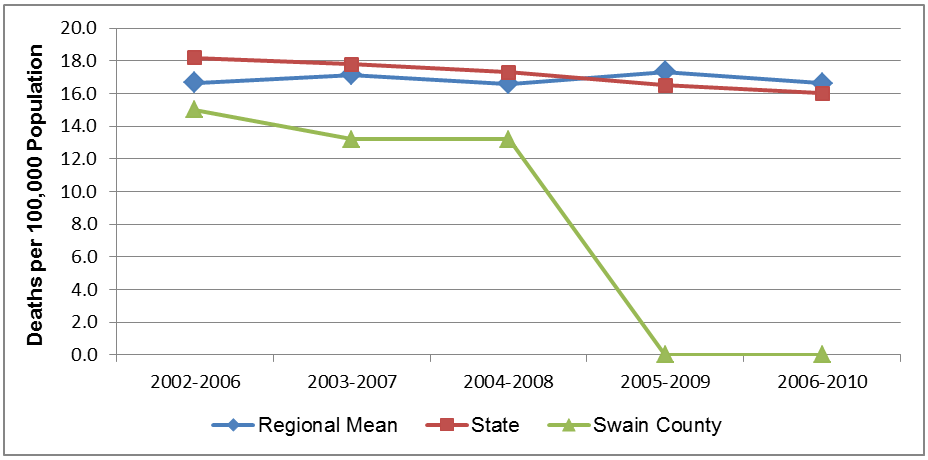
Figure 17. Prostate Cancer Incidence, New Cases per 100,000 Men (Five-Year Aggregates, 1999-2003 through 2005-2009)



Colorectal Cancer Mortality

Deaths attributable to cancer of the colon, rectum and anus (collectively "colorectal" cancer) in Swain County (n=11-13 per five-year aggregate period) were too few to calculate and graph stable mortality rates. However, colorectal cancer caused the fourth largest mortality rate among the major site-specific cancers in WNC in 2006-2010 (Table 30, cited previously). Figure 18 plots the colorectal cancer mortality rate trend for several aggregate periods. The state colorectal cancer mortality rate fell steadily in recent years, from a high of 18.2 for 2002-2006 to a low of 16.0 for 2006-2010, a decrease of 12.1%. In WNC, the mean colorectal cancer mortality rate fluctuated, possibly due to inclusion of a high proportion of unstable county rates, but was the same at the end of the period cited as at the beginning (16.6). The variability noted for the Swain County data is attributable to unstable or un-released rates due to small numbers of events.

Figure 18. Colorectal Cancer Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

In Swain County there are too few colorectal cancer deaths stratified by gender to yield a full series of stable gender-based mortality rates for the target period; only three aggregate periods of gender-stratified county rates were available, and all the rates were unstable. As shown in Figure 19, the colorectal cancer mortality rate differed between males and females in the county, and within this limited data the direction of the difference appeared to shift. It also appeared from this data that the colorectal cancer mortality rate among females in Swain County was increasing while the comparable rate among county males was decreasing.

Figure 19. Gender Disparities in Colorectal Cancer Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2004-2008)

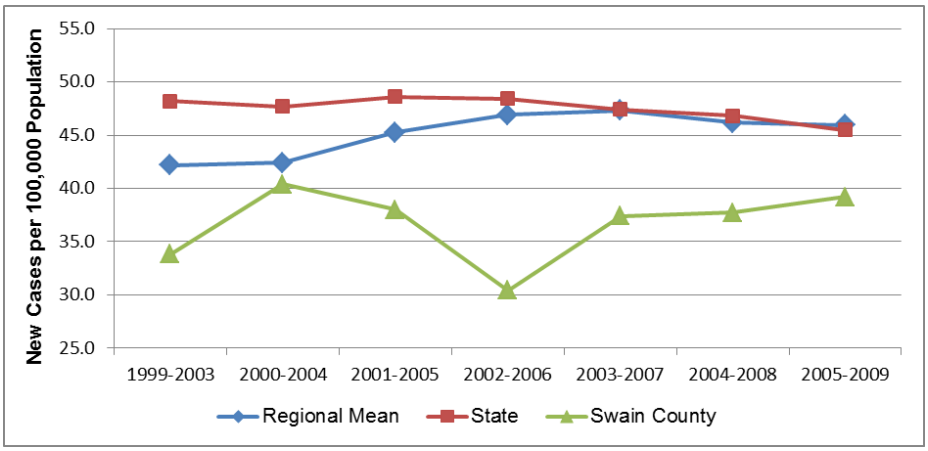
Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

In WNC, only one of the 16 counties (Buncombe) had large enough minority populations to yield stable colorectal cancer mortality rates for any minority group, so it is not possible to calculate stable mean region-wide colorectal cancer mortality rates for minorities. Statewide,

colorectal cancer mortality rates demonstrate some racial disparities. In the 2006-2010 aggregate period, the colorectal cancer mortality rate among African American non-Hispanic males (29.0) was 58% higher than the comparable rate among white non-Hispanic males (18.4) and over three times the rate among Other non-Hispanic males (9.0). Statewide in the same period the colorectal cancer mortality rate was 18.5 for African American non-Hispanic females, 12.4 for white non-Hispanic females, and 9.9 for Other non-Hispanic females. Statewide, the colorectal cancer mortality rates were lowest for Hispanic males (7.4) and Hispanic females (5.4) (*Data Workbook*).

From data in Figure 20 it is apparent that the incidence rate for colorectal cancer in Swain County was below the comparable rates for WNC and NC throughout the period cited. Despite considerable variability, the county colorectal cancer incidence rate rose overall, from 33.8 in 1999-2003 to 39.2 in 2005-2009, an increase of 16.0%. The mean WNC colorectal cancer incidence rate has been, until recently, following a different trend than the comparable state rate. In the 1999-2003 aggregate period, the mean colorectal cancer incidence rate in WNC (42.2) was 12% lower than the comparable state rate (48.2). By the 2005-2009 aggregate period, the state colorectal cancer rate had fallen to 45.5 (a decrease of over 5%), but the mean WNC rate had risen to 46.0 (an increase of 9%).

Figure 20. Colorectal Cancer Incidence, New Cases per 100,000 Population (Five-Year Aggregates, 1999-2003 through 2005-2009)



Chronic Lower Respiratory Disease (CLRD) Mortality

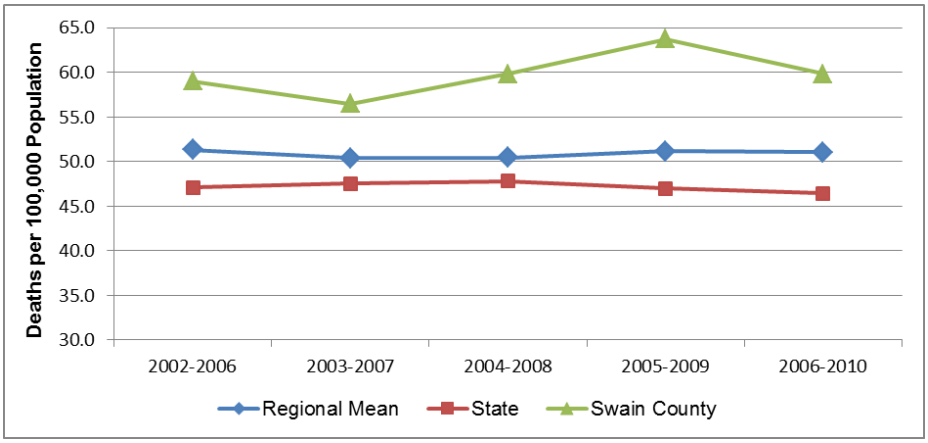
Chronic lower respiratory disease (CLRD) is composed of three major diseases, chronic bronchitis, emphysema, and asthma, all of which are characterized by shortness of breath caused by airway obstruction and sometimes lung tissue destruction. The obstruction is irreversible in chronic bronchitis and emphysema, reversible in asthma. Before 1999, CLRD was called chronic obstructive pulmonary disease (COPD). Some in the field still use the designation COPD, but limit it to mean chronic bronchitis and emphysema only. In the United States, tobacco use is a key factor in the development and progression of CLRD/COPD, but exposure to

air pollutants in the home and workplace, genetic factors, and respiratory infections also play a role (West Virginia Health Statistics Center, 2006).

CLRD/COPD was the third leading cause of death in WNC and the fourth leading cause of death in Swain County for the 2006-2010 aggregate period (Table 28, cited previously).

Figure 21 plots CLRD mortality rates for five aggregate periods. The CLRD mortality rate in Swain County was higher than the comparable WNC and NC rates for the period from 2002-2006 through 2006-2010. The county CLRD mortality rate increased to a high of 63.7 in the 2005-2009 aggregate period before falling to 59.8, a rate still 1.3% higher than the rate in 2002-2006. The mean WNC CLRD mortality rate ranged from 5% to 10% higher than NC rate throughout the period cited in Figure 21. Neither the NC nor the mean WNC CLRD mortality rates improved significantly over the period. In 2006-2010, CLRD mortality rates were 59.8 in Swain County, 46.4 in NC, and 51.1 in WNC.

Figure 21. CLRD Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



In Swain County, the mean CLRD mortality rate among males exceeded the comparable rate among females over most of the past decade, but the difference has become much smaller (Figure 22). In the 2002-2006 aggregate period the CLRD mortality rate for Swain County males (96.8) was almost three times the rate for Swain County females (34.5); in the 2006-2010 aggregate period the rate for males (59.2) was only 1.4% higher than the rate for females (58.4). It should be noted that the first two data points for females in the figure represent technically unstable rates; all the other rates in the figure are stable.

Figure 22. Gender Disparities in CLRD Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2006-2010)

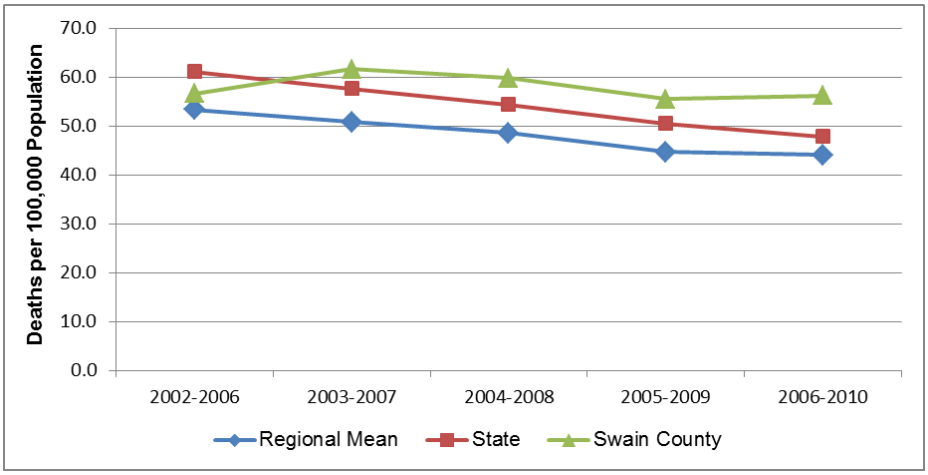
In WNC, only one of the 16 counties (Buncombe) had large enough minority populations to yield stable CLRD mortality rates for any minority group, so it is not possible to calculate a stable mean region-wide CLRD mortality rates for minorities. At the state level for the 2006-2010 aggregate period, the CLRD mortality rate was highest among non-Hispanic white males (58.7), followed by non-Hispanic white females (46.4), non-Hispanic African American males (45.1), Other non-Hispanic males (27.4), non-Hispanic females (21.1), and Other non-Hispanic females (15.6). CLRD mortality rates among Hispanic males and females are much lower (6.8 and 7.5, respectively) (Data Workbook).

Cerebrovascular Disease (Stroke) Mortality

Cerebrovascular disease describes the physiological conditions that lead to stroke. Strokes happen when blood flow to the brain stops and brain cells begin to die. There are two types of stroke. Ischemic stroke (the more common type) is caused by a blood clot that blocks or plugs a blood vessel in the brain. The other kind, called hemorrhagic stroke, is caused by a blood vessel that breaks and bleeds into the brain (US National Library of Medicine).

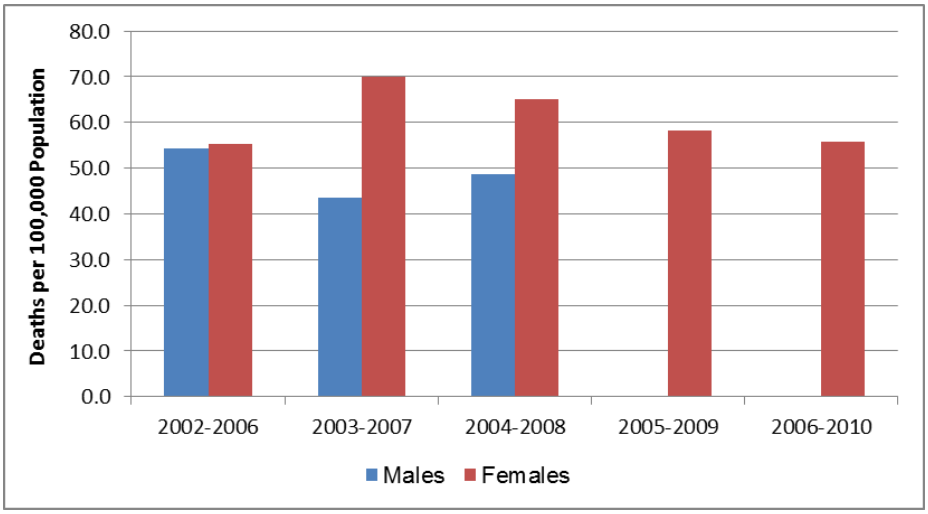
In the 2006-2010 aggregate period, cerebrovascular disease (stroke) was the fourth leading cause of death in WNC, but the fifth leading cause of death in Swain County (Table 28, cited previously). Figure 23 plots stroke mortality rates for several aggregate periods. The stroke mortality rates for WNC and NC decreased over the period cited in the graph. The rate fell 17.4% in WNC (from 53.3 to 44.9) and 21.8% in NC (from 61.1 to 47.8). The stroke mortality rate for Swain County was higher than the rates for the other two jurisdictions in all but the first aggregate period, and the county rate was essentially unchanged over the entire period cited in the figure. In the 2006-2010 period, the stroke mortality rate was 56.2 in Swain County, 44.0 in WNC, and 47.8 in NC.

Figure 23. Cerebrovascular Disease Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



Stroke is one cause of death for which there is little gender disparity in the WNC region (*Data Workbook)*. The data in Figure 24, however, demonstrates that the cerebrovascular disease mortality rate in Swain County was from 2% to 61% higher for females than for males over the period for which NC SCHS reported rates for males. It should be noted that all three rates for males are unstable; the missing data for males indicates that NC SCHS did not release a rate for males in that period due to small numbers of events. After an initial increase between 2002-2006 and 2003-2007, the stroke mortality rate for Swain County women appeared to have decreased 14.2% between 2003-2007 and 2006-2010.

Figure 24. Gender Disparities in Cerebrovascular Disease Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2006-2010)



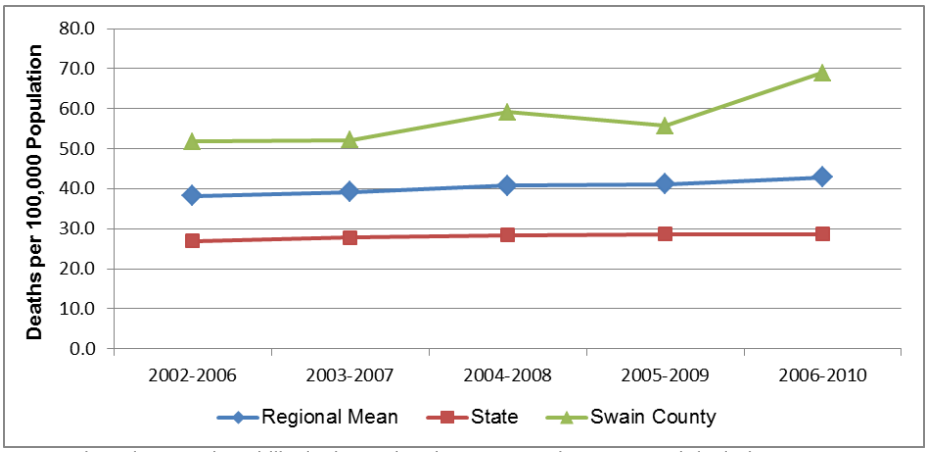
No county in WNC had large enough minority populations to yield stable cerebrovascular disease mortality rates for any minority group, so it is not possible to calculate stable mean region-wide cerebrovascular disease mortality rates for minorities. At the state level stroke mortality demonstrates a significant racial disparity. Statewide in the 2006-2010 aggregate period African American non-Hispanic males and females had the highest stroke mortality rates, 71.4 and 60.1, respectively. The comparable rate for non-Hispanic white males was 44.9, and the rate for non-Hispanic white females was 43.6, and the rate for Other non-Hispanic males was 39.6 and the rate for Other non-Hispanic females was 30.0. The Hispanic population had the lowest stroke mortality rates statewide over the same period, 13.1 among males and 15.2 among females (*Data Workbook*).

Non-Motor Vehicle Injury Mortality ("All Other Injuries Mortality")

Mortality due to injuries *not* involving motor vehicles was the fifth leading cause of death in WNC, but the third leading cause of death in Swain County, in the 2006-2010 aggregate period (Table 28, cited previously). This "all other injuries" category includes death without purposeful intent due to poisoning, falls, burns, choking, animal bites, drowning, and occupational or recreational injuries. (Death due to injury involving motor vehicles is a separate cause of death and will be covered subsequently.)

Figure 25 plots the trend in mortality due to all other injuries for five aggregate periods. Throughout the period cited, the non-motor vehicle injury mortality rate in Swain County exceeded the comparable mean WNC rate, and the rate for WNC exceeded the comparable state rate by from 41% to 50%. While the state rate increased 5.9% (from 27.0 to 28.6) over the entire span cited, the mean WNC rate rose 12.3% from the first period (38.2) to the last (42.9). Over the same span, the comparable rate in Swain County rose 33.2%, from 51.8 to 69.0.

Figure 25. All Other Unintentional Injury Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

As in other leading causes of death, non-motor vehicle injury mortality in Swain County demonstrated a strong gender disparity (Figure 26). In each of the periods cited, the mortality rate for all other unintentional injuries among males was from two to two-and one-half times the comparable rate among females. While the non-motor vehicle injury mortality rates among women in Swain County all were either unstable or unreleased due to small numbers of events, the rate among men increased 35.7% overall between the 2002-2006 and 2006-2010 aggregate periods.

Figure 26. Gender Disparities in All Other Unintentional Injury Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2006-2010)

In WNC, none of the 16 counties had large enough minority populations to yield stable all other injury mortality rates for any minority group, so it is not possible to calculate stable mean region-wide rates for minorities. At the state level for 2006-2010, mortality rates attributable to non-motor vehicle injury are higher among males of each race/ethnicity than females. All other injury mortality rates are highest among non-Hispanic white males (42.2), non-Hispanic African American males (31.7), Other non-Hispanic males (25.6) and Hispanic males (15.0). Comparable rates for females are 23.0 for non-Hispanic white females, 13.1 for non-Hispanic African American females, 12.5 for Other non-Hispanic females, and 6.2 for Hispanic females (*Data Workbook*).

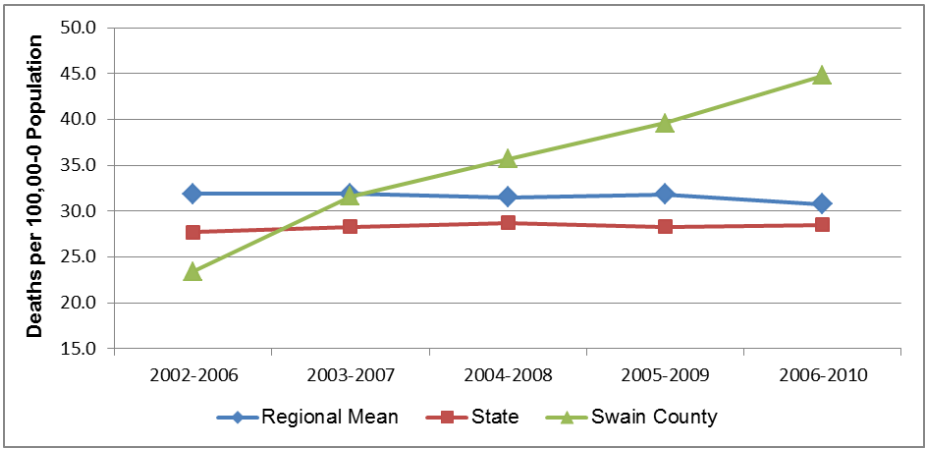
Alzheimer's Disease Mortality

Alzheimer's disease is a progressive neurodegenerative disease affecting mental abilities including memory, cognition and language. Alzheimer's disease is characterized by memory loss and dementia. The risk of developing Alzheimer's disease increases with age (e.g., almost half of those 85 years and older suffer from Alzheimer's disease). Early-onset Alzheimer's has been shown to be genetic in origin, but a relationship between genetics and the late-onset form of the disease has not been demonstrated. No other definitive causes have been identified (National Institute on Aging, 2012).

Alzheimer's disease was the sixth leading cause of death in WNC and the seventh leading cause of death in Swain County for the aggregate period 2006-2010 (Table 28, cited previously).

Figure 27 plots Alzheimer's disease mortality rates over several aggregate periods. The Alzheimer's disease mortality rate in Swain County, on a steep climb over the period cited in the figure, rose from below both the mean WNC and NC rates to a point well above both. The county Alzheimer's disease mortality rate rose from 23.4 in 2002-2006 to 44.8 in 2006-2010, an increase of 91.5%. In the 2006-2010 aggregate period the county rate was 45.9% higher than the mean WNC rate (30.7), and 57.2% higher than the NC rate (28.5). The mean Alzheimer's disease mortality rate in WNC was higher than the comparable state rate throughout the span of time cited in Figure 27, despite the fact that the data used are all age-adjusted. Note, however, that NC SCHS made the age-adjustment calculations on the basis of the 2000 US Census, and as we have seen, the "elderly" population in WNC has grown considerably since 2000. It should be noted that the difference between the WNC and NC rates may look different once the 2010 Census becomes the basis of the age adjustment.

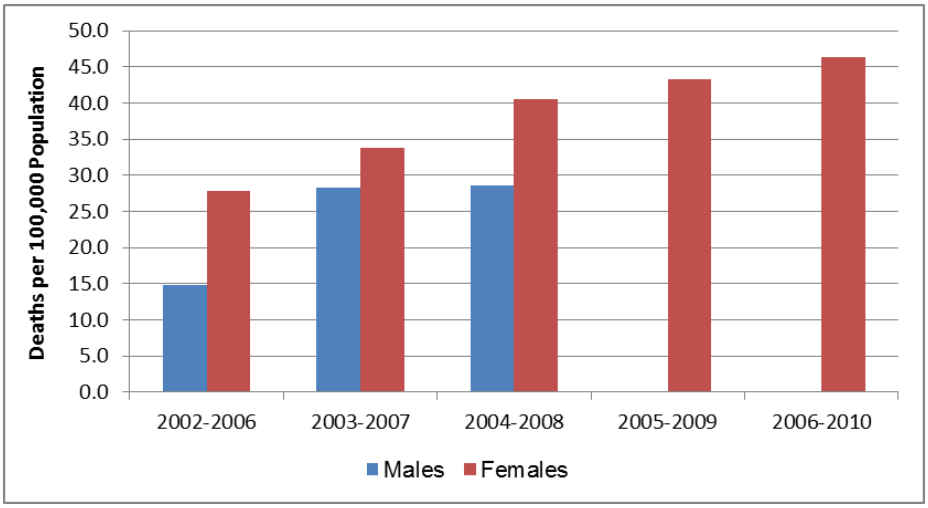
Figure 27. Alzheimer's Disease Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

Alzheimer's disease mortality has a strong gender component, with mortality rates traditionally much higher among women than among men. In WNC, for example, the mean Alzheimer's disease mortality rate among women was from 51% to 62% higher than the rate among men over the past decade (*Data Workbook*). Figure 28 plots the limited available gender-stratified mortality rates for Alzheimer's disease in Swain County. It should be noted that all the rates presented for males in Swain County were unstable, and that no rate was calculated for males the last two aggregate periods. The Alzheimer's disease mortality rate for Swain County females demonstrated a large increase over the period covered in the figure. Although the first two rates for county females were unstable, the following three technically were stable. The Alzheimer's diseases mortality rate for Swain County females rose from 27.8 in 2002-2006 to 46.4 in 2006-2010, a 66.9% increase.

Figure 28. Gender Disparities in Alzheimer's Disease Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2006-2010)



In WNC, none of the 16 counties had large enough minority populations to yield stable Alzheimer's disease mortality rates for any minority group, so it is not possible to calculate stable mean region-wide rates for minorities. Statewide, the disparity in Alzheimer's disease mortality may be more gender-based than race-based. In NC as a whole in the 2006-2010 aggregate period, the Alzheimer's disease mortality rate for white non-Hispanic females was 32.5, compared to 23.3 for white, non-Hispanic males; the rate for African American non-Hispanic females was 27.6 compared to 20.9 for African American non-Hispanic males; and the rate for Other non-Hispanic females was 21.1 compared to 17.3 for Other non-Hispanic males. The Alzheimer's disease mortality rate for Hispanic females was 9.7; due to a small number of events, the NC SCHS did not release a comparable rate for Hispanic males (*Data Workbook*).

Diabetes Mellitus Mortality

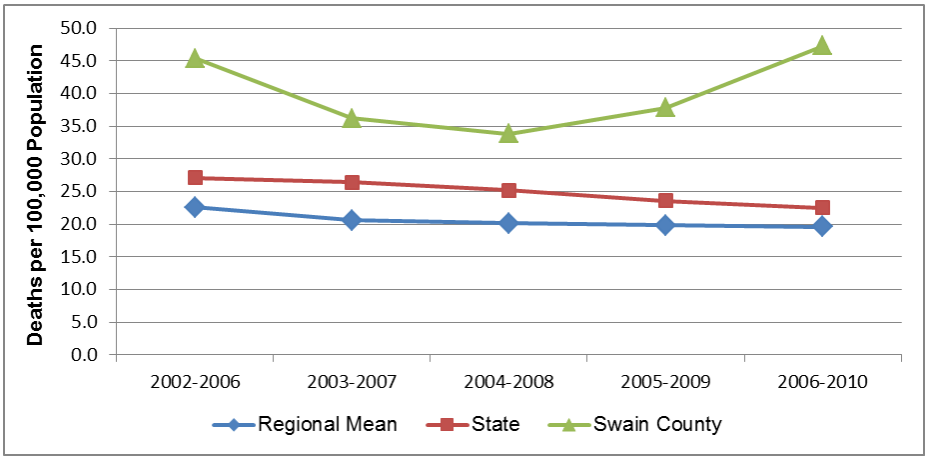
Diabetes is a disease in which the body's blood glucose levels are too high due to problems with insulin production and/or utilization. Insulin is a hormone that helps the glucose get to cells where it is used to produce energy. With type 1 diabetes, the body does not make insulin. With type 2 diabetes, the more common type, the body does not make or use insulin well. Without enough insulin, glucose stays in the blood. Over time, having too much glucose in the blood can damage the eyes, kidneys, and nerves. Diabetes can also lead to heart disease, stroke and even the need to remove a limb (US National Library of Medicine).

Diabetes was the seventh leading cause of death in WNC and the sixth leading cause of death in Swain County in the 2006-2010 aggregate period (Table 28, cited previously).

Figure 29 plots trend data for diabetes mortality for several aggregate periods. According to data in this figure, the diabetes mortality rate in Swain County was above both the comparable mean WNC rate and the NC rate for the duration of the period cited. Although approximately

the same in the last aggregate period (47.3) as in the first aggregate period (45.4) the diabetes mortality rate in Swain County was approximately 35.0 for three periods, a 22% improvement over either endpoint. The mean diabetes mortality rate in WNC is and has been lower than the state rate. Statewide, the diabetes mortality rate fell from 27.1 to 22.5 (17.0%) over the period cited in the figure. Region-wide, the mean diabetes mortality rate fell from 22.6 to 19.6 (13.3%) over the same period. Although the Swain County diabetes mortality rate demonstrates some variability likely due to small numbers of events, the overall decline from the beginning of the period cited (19.7) to the end (15.6) was 20.8%.

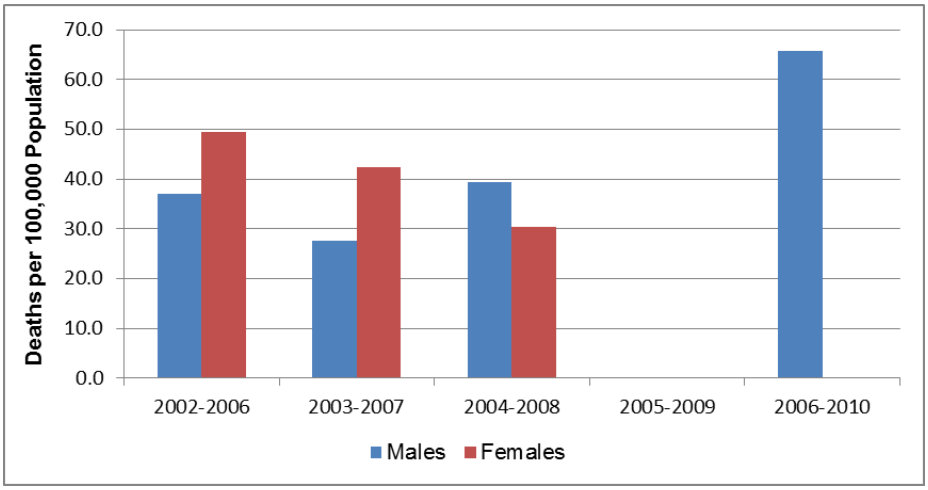
Figure 29. Diabetes Mellitus Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

Most diabetes mortality rates stratified by gender in Swain County are unstable due to small numbers of events. Figure 30 plots the limited data available for the county. The diabetes mortality rate for county females appeared to decrease 38.5%, from 49.4 in 2002-2006 to 30.4 in 2004-2008. Note that the 2004-2008 data point for females was technically unstable, and the NC SCHS did not release other rates for county females due to small numbers of events. On the other hand, the diabetes mortality rate for Swain County males appeared to increase 77.8% from 37.0 in 2002-2006 to 65.8 in 2006-2010. Note that all the data points for males except the last one were technically unstable or not released.

Figure 30. Gender Disparities in Diabetes Mellitus Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2004-2008; 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

In WNC, none of the 16 counties had large enough minority populations to yield stable diabetes mortality rates for any minority group, so it is not possible to calculate stable mean region-wide rates for minorities. Statewide, diabetes mortality demonstrates significant racial disparities. At the state level in the 2006-2010 aggregate period, the highest diabetes mortality rates were observed among African American non-Hispanic males and females, with rates of 51.3 and 42.5, respectively. The next highest rates occurred among Other non-Hispanic persons, both male and female, with rates of 25.0 and 25.5, respectively. The diabetes mortality rate during this period for white non-Hispanics was 22.2 for males and 14.4 for females. The lowest diabetes mortality was observed in the Hispanic population, with a rate of 11.2 for men and 7.1 for women (*Data Workbook*).

Pneumonia and Influenza Mortality

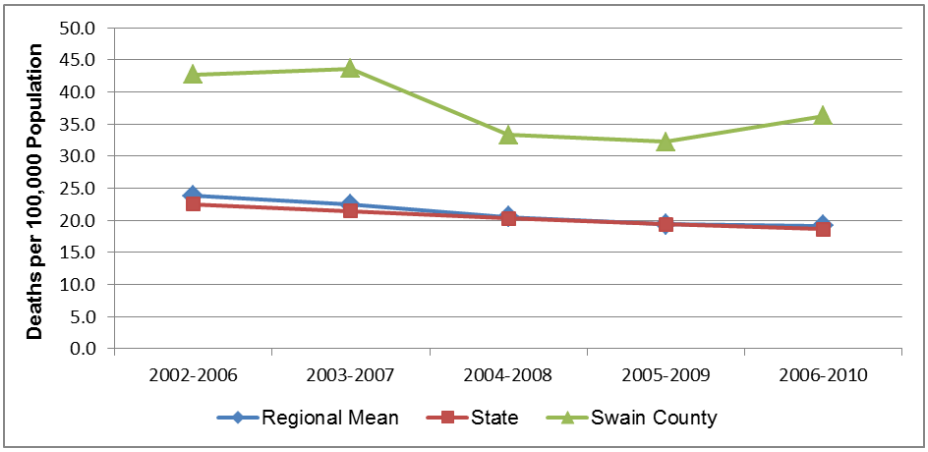
Pneumonia and influenza are diseases of the lungs. Pneumonia is an inflammation of the lungs caused by either bacteria or viruses. Bacterial pneumonia is the most common and serious form of pneumonia, and among individuals with suppressed immune systems, it may follow influenza or the common cold. Influenza (the "flu") is a contagious infection of the throat, mouth and lungs caused by an airborne virus (US National Library of Medicine).

The joint mortality category pneumonia and influenza was the eighth leading cause of death in WNC and in Swain County for the period 2006-2010 (Table 28, cited previously).

Figure 31 plots the mortality trend for pneumonia and influenza for several aggregate periods. From this data it is apparent that the mean pneumonia/influenza mortality rate in WNC closely paralleled the comparable NC rate throughout the period cited in the figure. Both the regional and state mortality rates for this cause of death decreased in the net over the period. The mean WNC rate decreased from 23.8 to 19.1 (19.7%) and the comparable NC rate decreased from 22.5

to 18.6 (17.3%). The pneumonia/influenza mortality rate in Swain County was well above both the mean WNC and NC rates throughout the period cited. Despite period-to-period variability likely attributable to relatively small and changing numbers of deaths, the county pneumonia/influenza mortality rate fell from 42.7 in 2002-2006 to 36.3 in 2006-2010, a decrease of 15.0%.

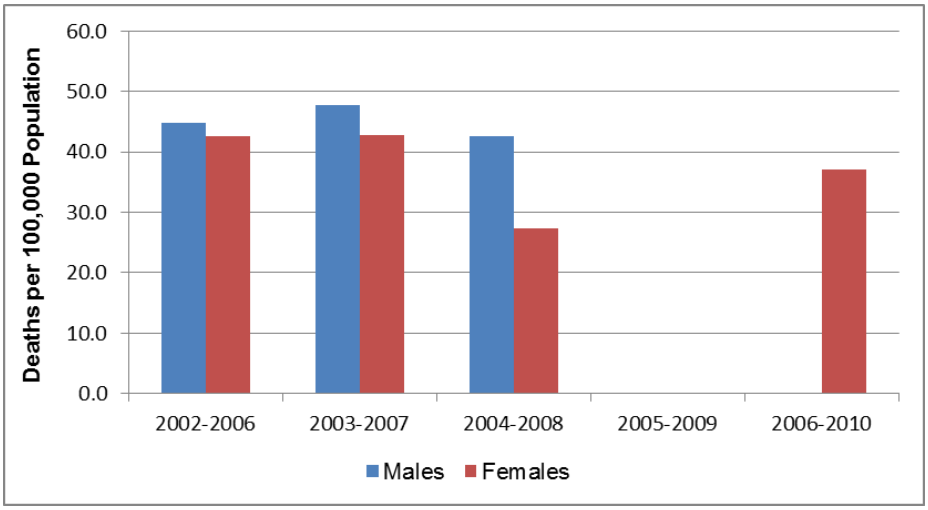
Figure 31. Pneumonia and Influenza Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

Figure 32 plots gender-stratified pneumonia/influenza mortality rates for Swain County for several aggregate periods. Note that due to small numbers of pneumonia/influenza deaths among men mortality rates for county males are unstable or not calculated. Mortality rates for county females were stable only in the first, second, and fifth aggregate periods. According to the limited data displayed in the figure, the pneumonia/influenza mortality rate among Swain County females fell 12.7%, from 42.5 in the first aggregate period to 37.1 in the fifth aggregate period. The even more limited data for males does not present any clear pattern.

Figure 32. Gender Disparities in Pneumonia/Influenza Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2004-2008; 200602010)



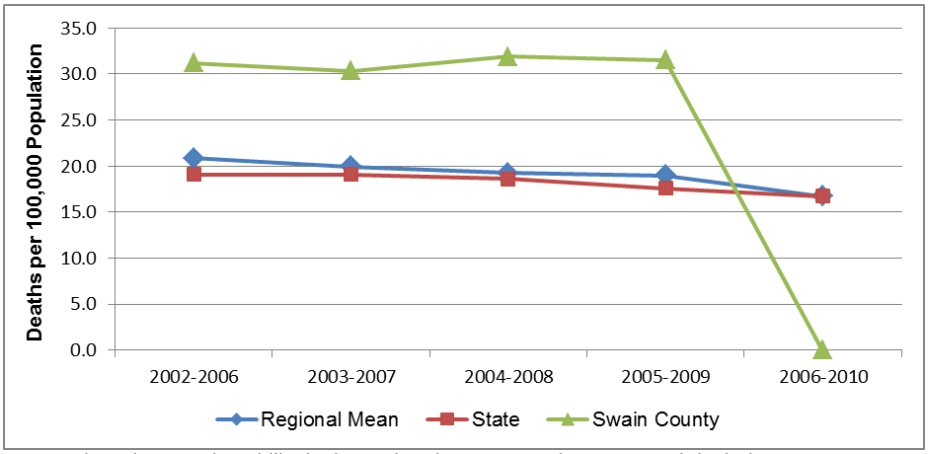
In WNC, none of the 16 counties had large enough minority populations to yield stable pneumonia/influenza mortality rates for any minority group, so it is not possible to calculate stable mean region-wide rates for minorities. At the state level pneumonia and influenza mortality rates demonstrate moderate racial disparities. Statewide in the 2006-2010 aggregate period the highest pneumonia/influenza mortality rate (24.1) occurred among African American non-Hispanic males, followed in order by white non-Hispanic males (21.5), white non-Hispanic females (17.3), African American non-Hispanic females (15.8), other non-Hispanic males (11.1), and other non-Hispanic females (9.0). The Hispanic population, both male and female, experienced the lowest pneumonia and influenza mortality rates, 5.8 and 7.1, respectively (*Data Workbook*).

Unintentional Motor Vehicle Injury (UMVI) Mortality

Death due to injuries incurred in unintentional motor vehicle crashes was the ninth leading cause of death in WNC and the eleventh leading cause of death in Swain County in the 2006-2010 aggregate period (Table 28, cited previously).

Figure 33 plots UMVI mortality rates over several aggregate periods. From this data it appears that the mortality rate attributable to UMVI in Swain County was significantly higher than the comparable rate for WNC until the last aggregate period, and that the mean WNC rate was slightly higher than the comparable state rate for most of the time span cited in the table. UMVI mortality rates in the region and the state fell over the period cited in the figure. In WNC, the UMVI mortality rate fell from 20.9 to 16.7 (20.1%) and in NC the rate fell from 19.1 to 16.7 (12.5%). In Swain County there was little change in the UMVI mortality rate until the 2006-2010 aggregate period, when due to a below-threshold number of vehicular deaths (n=18) the NC SCHS did not release a rate for the county (indicated by a "zero" rate in the figure).

Figure 33. Unintentional Motor Vehicle Injury Mortality Rate
Deaths per 100,000 Population
(Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

In Swain County there were too few deaths among males and females attributable to UMVI to calculate any stable gender-stratified mortality rates, so all the date presented in Figure 34 are unstable; gender-stratified mortality rates for the last two aggregate periods were not released by NC SCHS. From this limited data it did appear that UMVI mortality rate among Swain County males was higher than the comparable rate among females, ranging from 1.9 to 2.8 times higher over the period cited. It also appears that the UMVI mortality rate among women in Swain County decreased while the comparable rate for men in the county increased.

Figure 34. Gender Disparities in Unintentional Motor Vehicle Injury Mortality
Swain County
(Five-Year Aggregates, 2002-2006 through 2004-2008)

Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

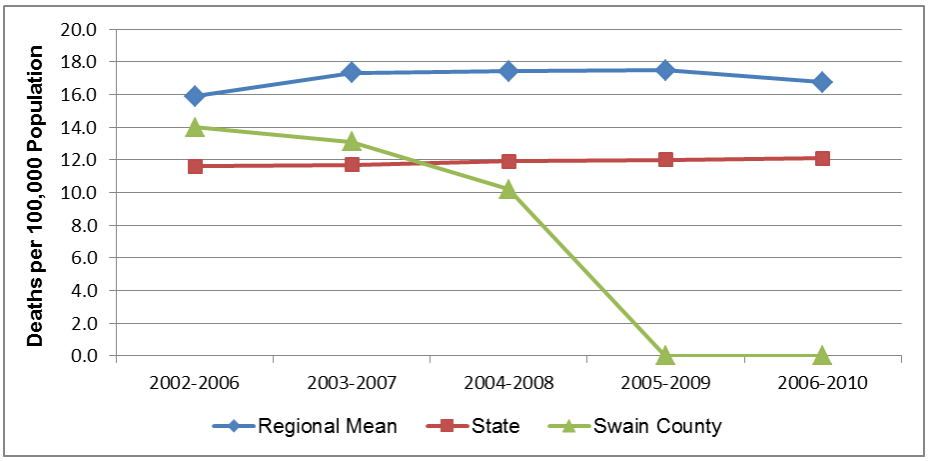
In WNC, none of the 16 counties had large enough minority populations to yield stable UMVI mortality rates for any minority group, so it is not possible to calculate stable mean region-wide rates for minorities. Statewide, disparities in UMVI mortality appear more gender-based than racially-based. At the state level in 2006-2010, the highest UMVI mortality rates all occurred among males with the following rates, in decreasing order: 27.1 for African American non-Hispanic males, 24.2 for non-Hispanic males of other races, and 23.6 for both white non-Hispanic males and Hispanic males. Among women statewide the highest rates were noted among non-Hispanic females of other races (10.4), followed by white non-Hispanic females (9.9), African American non-Hispanic females (7.9) and Hispanic females (7.3) (*Data Workbook*).

Suicide Mortality

Suicide was the tenth leading cause of death in WNC and the fourteenth leading cause of death in Swain County for the 2006-2010 aggregate period (Table 28, cited previously).

Figure 35 plots suicide mortality rates for several aggregate periods. From these data it is clear that mortality due to suicide is significantly higher in WNC than in NC as a whole. The mean suicide mortality rate in WNC ranged from 37% to 48% higher than the state rate over the period cited in Figure 35. The suicide mortality rates in WNC and NC changed little over the period cited. In Swain County all the suicide rates during the target period were unstable or not released by NC SCHS. The three data points plotted for Swain County in the first three aggregate periods did seem to indicate a falling suicide mortality rate.

Figure 35. Suicide Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

Gender-stratified suicide mortality rates for Swain County demonstrated a very pronounced disparity. From data in Figure 36 it is apparent that the suicide mortality rate for Swain County men was more than twice the rate for women over the period for which there are rates. Although all three data points for males and females were technically unstable (and NC SCHS did not release rates for the remainder of the periods cited in the figure) the gender difference

remained very large over time. In 2004-2008 the suicide mortality rate for Swain County males was 15.8; almost four times the comparable rate for females (4.2).

Figure 36. Gender Disparities in Suicide Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2004-2008)

In WNC, none of the 16 counties had large enough minority populations to yield stable suicide mortality rates for any minority group, so it is not possible to calculate stable mean region-wide rates for minorities. At the state level, suicide mortality demonstrates a racial disparity as well as a gender disparity. Statewide in the 2006-2010 aggregate period the highest suicide mortality rates occurred among white non-Hispanic males (23.9) followed by other non-Hispanic males (10.8), African American non-Hispanic males (8.6) and Hispanic males (7.4). Among females, the highest suicide mortality rates occurred among white non-Hispanic females (6.7) followed by other non-Hispanic females (4.7), Hispanic females (1.7) and African American non-Hispanic females (1.5) (*Data Workbook*).

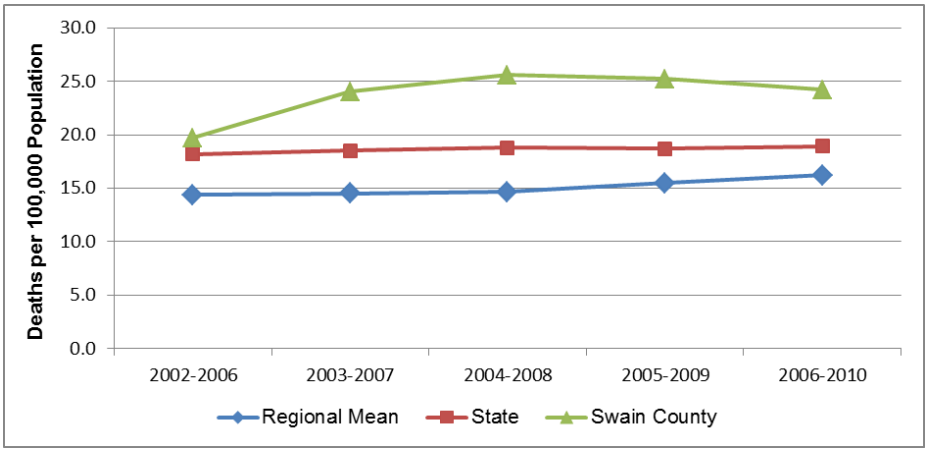
Nephritis, Nephrotic Syndrome and Nephrosis (Kidney Disease) Mortality

Nephritis refers to inflammation of the kidney, which causes impaired kidney function. Nephritis can be due to a variety of causes, including kidney disease, autoimmune disease, and infection. *Nephrotic syndrome* refers to a group of symptoms that include protein in the urine, low blood protein levels, high cholesterol levels, high triglyceride levels, and swelling. *Nephrosis* refers to any degenerative disease of the kidney tubules, the tiny canals that make up much of the substance of the kidney. Nephrosis can be caused by kidney disease, or it may be a complication of another disorder, particularly diabetes (MedineNet.com, March 2012; PubMed Health, 2011).

This set of kidney disorders was the eleventh leading cause of death in WNC and the tenth leading cause of death in Swain County for the 2006-2010 aggregate period (Table 28, cited previously).

Figure 37 plots kidney disease mortality over several aggregate periods. This data reveals that the kidney disease mortality rate in Swain County was above the comparable rates for NC and WNC throughout the period cited. Between the 2002-2006 aggregate period and the 2006-2010 aggregate period the mean regional rate climbed from 14.4 to 16.2 (12.5%), and NC rate increased slightly, from 18.2 to 18.9 (3.8%). Over the same time span the Swain County kidney disease mortality rate rose from 19.7 to 24.2 (22.8%).

Figure 37. Kidney Disease Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

Gender-stratified kidney disease mortality rates for Swain County in the target period were either unstable or not released; nevertheless the unstable rates are plotted in Figure 38. From this limited data it would appear that while the kidney disease mortality rate among county females remained relatively static around 27.5, the comparable rate for males more than tripled in increasing from 7.3 to 23.7.

Figure 38. Gender Disparities in Kidney Disease Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2004-2008)

Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

In WNC, none of the 16 counties has large enough minority populations to yield stable kidney disease mortality rates for any minority group, so it is not possible to calculate stable mean region-wide rates for minorities. Statewide for 2006-2010 kidney disease mortality rates demonstrate both racial and gender disparities. Men of all racial groups suffer kidney disease mortality at rates higher than their female counterparts in the same racial group, and non-Hispanic African Americans of either gender have the highest kidney disease mortality rates among their gender group. For instance, kidney disease mortality among non-Hispanic African American males in this period was 42.4, compared to 19.7 among non-Hispanic white males, 18.0 among other non-Hispanic males, and 7.1 among Hispanic males. Similarly, the kidney disease mortality rate among non-Hispanic African American females was 34.6, followed by 15.3 among other non-Hispanic females, 12.5 among non-Hispanic white females, and 5.4 among Hispanic females (*Data Workbook*).

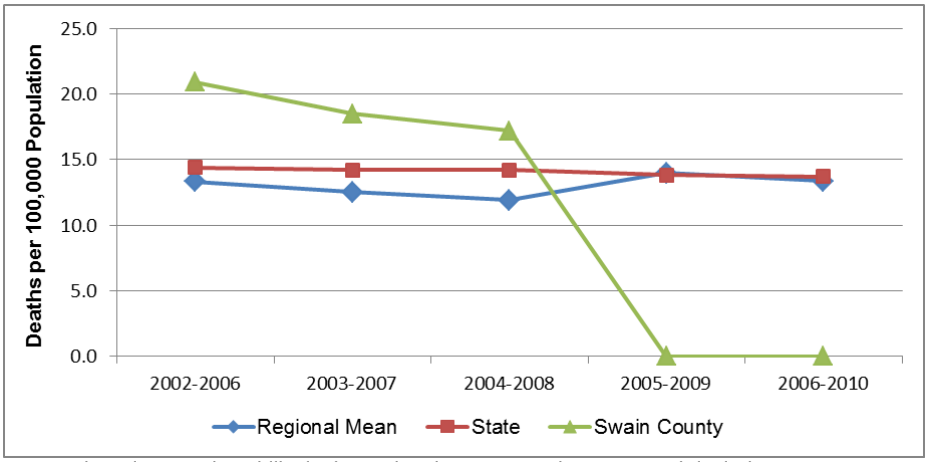
Septicemia Mortality

Septicemia is a rapidly progressing infection resulting from the presence of bacteria in the blood. The disease often arises from other infections throughout the body, such as meningitis, burns, and wound infections. Septicemia can lead to septic shock in which case low blood pressure and low blood flow cause organ failure (US National Library of Medicine). While septicemia can be community-acquired, some cases are acquired by patients hospitalized initially for other conditions; these are referred to as nosocomial infections. Sepsis is now a preferred term for septicemia, but NC SCHS continues to use the older term.

Septicemia was the twelfth leading cause of death in WNC and Swain County for the aggregate period 2006-2010 (Table 28, cited previously).

Figure 39 plots septicemia morality data for several aggregate periods. This data shows that the mean WNC septicemia mortality rate fluctuated over the period cited in approaching the state rate, while the state rate decreased 4.9%, from 14.1 to 13.7. Fluctuation at the WNC-level may be attributed partly to the inclusion of several unstable county rates in the regional mean. In Swain County, the septicemia mortality rates were all unstable, based on small numbers of deaths (n=14-17 per five-year aggregate period). For the three periods when the NC SCHS released a county septicemia mortality rate, it was higher than the comparable mean WNC and NC rates.

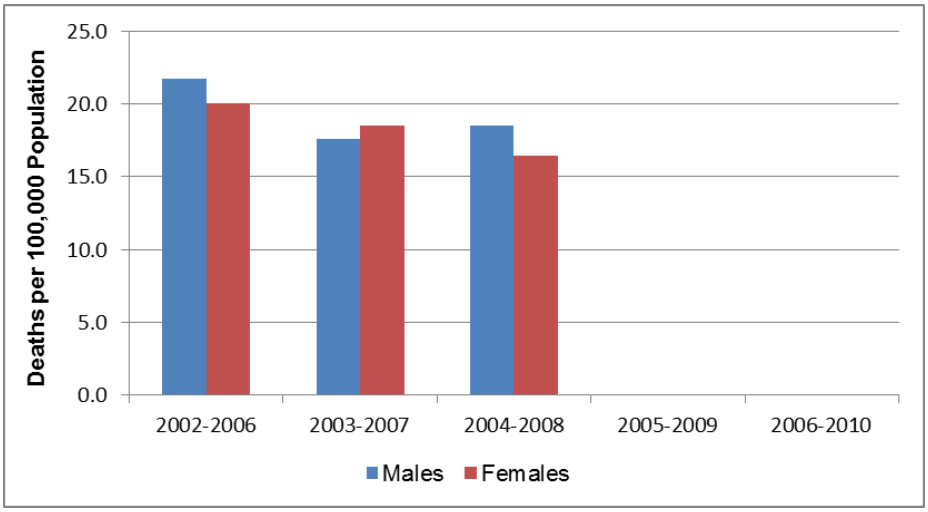
Figure 39. Septicemia Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

Gender-stratified septicemia mortality rates for Swain County are all unstable due to small numbers of deaths (n=5-10 per gender group per five-year aggregate period). From the limited county data presented in Figure 40, there does not appear to be a clear pattern of gender-based difference in mean septicemia mortality rates in Swain County.

Figure 40. Gender Disparities in Septicemia Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2004-2008)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

In WNC, none of the 16 counties had large enough minority populations to yield stable septicemia mortality rates for any minority group, so it is not possible to calculate stable mean region-wide rates for minorities. At the state level, where the calculation of stable septicemia mortality rates is possible, mortality is highest among African American non-Hispanics, both male and female. Statewide the septicemia mortality rate for African American non-Hispanic males in the 2002-2010 aggregate period was 23.7; for females of the same population group the rate was 18.8. For white non-Hispanic males the comparable rate was 13.7; for white non-Hispanic females the rate was 11.5. Among other non-Hispanic males the septicemia mortality rate was 10.6; among other non-Hispanic females the rate was 7.6. The lowest septicemia mortality rates occurred among Hispanics; for males the rate was 5.3, and for females, 4.9 (*Data Workbook*).

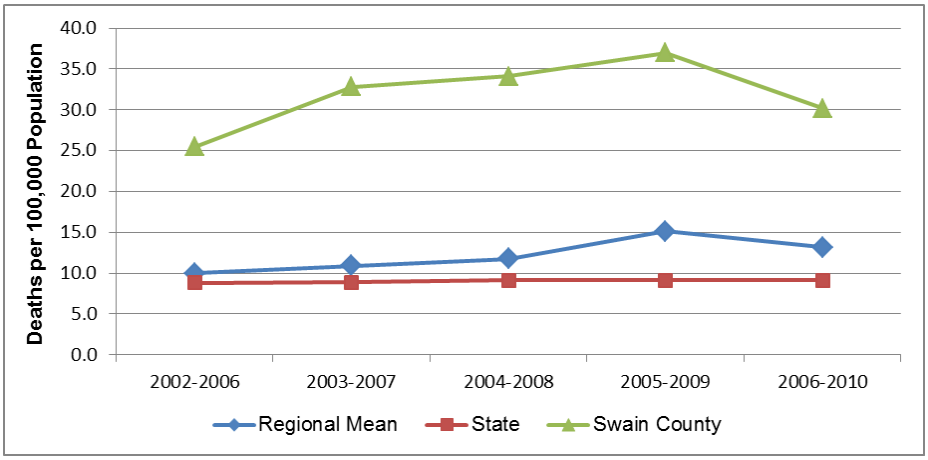
Chronic Liver Disease and Cirrhosis Mortality

Chronic liver disease describes an ongoing disturbance of liver function that causes illness. Liver disease, also referred to as hepatic disease, is a broad term that covers all the potential problems that cause the liver to fail to perform its designated functions. Usually, more than 75% or three quarters of liver tissue needs to be affected before decrease in function occurs. Cirrhosis is a term that describes permanent scarring of the liver. In cirrhosis, the normal liver cells are replaced by scar tissue that cannot perform any liver function (MedicineNet.com, June 2012).

Chronic liver disease and cirrhosis was the thirteenth leading cause of death in WNC but the ninth leading cause of death in Swain County in the 2006-2010 aggregate period (Table 28, cited previously).

Figure 41 plots mortality data for liver disease over several aggregate periods. This data shows that the liver disease mortality rate in Swain County was 2.3 to 3.0 *times* the comparable mean WNC rate, over the period cited in the figure. Note further that the WNC rate exceeded the state rate throughout the period cited. It also appears that the regional and Swain County rates have risen over the period cited. In WNC, the mean chronic liver disease mortality rate rose from 10.0 for 2002-2006 to 13.2 for 2006-2010, an increase of 32%. In Swain County, the comparable rise was from 25.5 to 30.2, an endpoint-to-endpoint increase of 18.4%, although in intermediate aggregate periods the county liver disease mortality rate was even higher than in the last aggregate period. Throughout this period the state rate has been stable at or near 9.1.

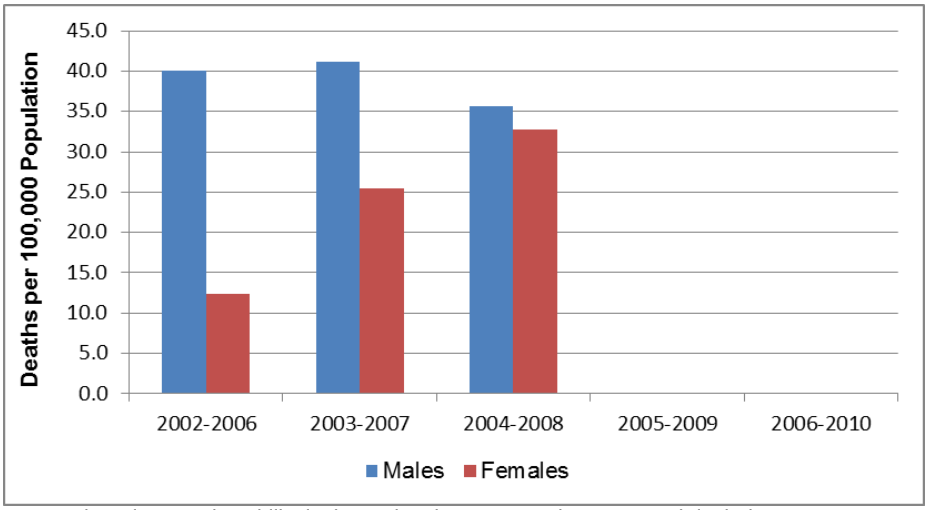
Figure 41. Chronic Liver Disease and Cirrhosis Mortality Rate
Deaths per 100,000 Population
(Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

Gender-stratified chronic liver disease and cirrhosis mortality rates for Swain County for the target period were all unstable or not released by NC SCHS. The limited county data presented in Figure 42 may illustrate a strong but changing gender-based disparity in liver disease mortality rates in Swain County. From this data it appeared that the liver disease mortality rate among men in the county was higher than the comparable rates among county women, but that the gap was narrowing as the rate for men decreased and the rate for women increased. Due to its consistency, this gender disparity may have been real despite the technically unstable data.

Figure 42. Gender Disparities in Chronic Liver Disease and Cirrhosis Mortality, Swain County (Five-Year Aggregates, 2002-2006 through 2004-2008)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

In WNC, none of the 16 counties had large enough minority populations to yield stable chronic liver disease/cirrhosis mortality rates for any minority group, so it is not possible to calculate stable mean region-wide rates for minorities. At the state level, liver disease mortality rates demonstrate some differences among racial groups but a consistent trend of higher mortality rates among men than women. For example, the liver disease mortality rate is highest among white non-Hispanic men (13.8), followed by African American non-Hispanic men (11.2). The liver disease mortality rates among other non-Hispanic men was 7.5, and the rate among Hispanic men was 6.8. Liver disease mortality rates among females were highest for white non-Hispanic women (6.0), followed by other non-Hispanic women (5.2), and African American women non-Hispanic women (5.1). There were too few liver disease deaths among Hispanic women statewide to calculate a stable rate (*Data Workbook*).

Homicide Mortality

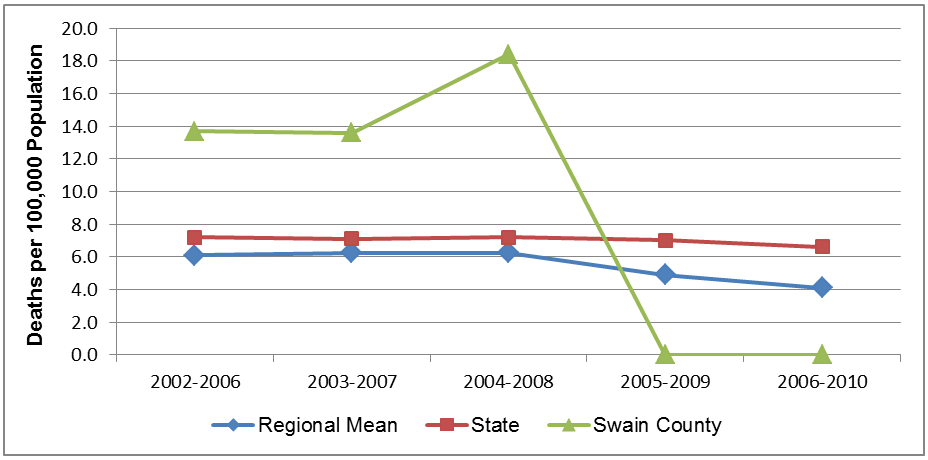
Death by homicide was the fourteenth leading cause of death in WNC and the thirteenth leading cause of death in Swain County for the 2006-2010 aggregate period (Table 28, cited previously).

Figure 43 plots homicide mortality rate trends over several aggregate periods. From this data it is apparent that mean homicide mortality rates in WNC are lower than comparable rates for NC as a whole. The mean homicide mortality rate in WNC for the 2006-2010 aggregate period was 4.1; the comparable rate for NC was 6.6.

In Swain County, all the posted homicide mortality rates are unstable due to small numbers of events (n=9-12 homicides per five-year aggregate period). The three unstable rates plotted for

the county all were above the comparable mean WNC and NC rates. The "zero" rates plotted signify that the NC SCHS did not release a county homicide mortality rate in that aggregate period due to a below-threshold number of homicide deaths.

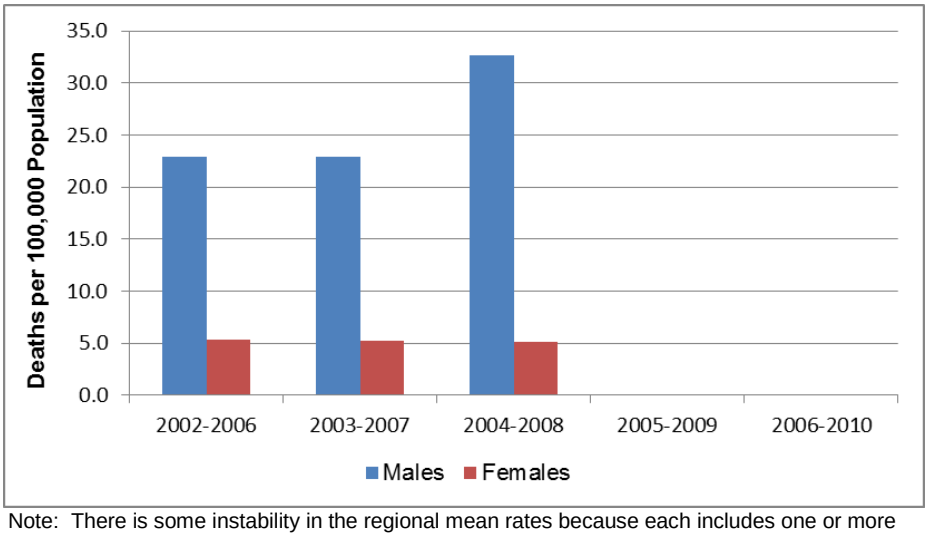
Figure 43. Homicide Mortality Rate, Deaths per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

According to the limited unstable data presented in Figure 44, the homicide mortality rate among Swain County males appeared to be two to four times the rate among county females.

Figure 44. Gender Disparities in Mean Homicide Mortality, WNC (Five-Year Aggregates, 2002-2006 through 2004-2008)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

In WNC, none of the 16 counties had large enough minority populations to yield stable homicide mortality rates for any minority group, so it is not possible to calculate stable mean region-wide rates for minorities. At the state level homicide mortality demonstrates strong

racial and gender disparities. In NC for the 2006-2010 aggregate period the highest homicide mortality rates were among African American non-Hispanic males (25.6), and Hispanic males and other non-Hispanic males (13.0). The next highest homicide mortality rate occurred among African American non-Hispanic females (5.2), followed by white, non-Hispanic males (4.6), other non-Hispanic females (3.4), Hispanic females (2.6), and white non-Hispanic females (2.2) (*Data Workbook*).

Acquired Immune Deficiency Syndrome (AIDS) Mortality

The human immunodeficiency virus (HIV) is the virus that causes AIDS. HIV attacks the immune system by destroying CD4 positive (CD4+) T cells, a type of white blood cell that is vital to fighting off infection. The destruction of these cells leaves people infected with HIV vulnerable to other infections, diseases and other complications. The acquired immunodeficiency syndrome (AIDS) is the final stage of HIV infection. A person infected with HIV is diagnosed with AIDS when he or she has one or more opportunistic infections, such as pneumonia or tuberculosis, and has a dangerously low number of CD4+ T cells (less than 200 cells per cubic millimeter of blood) (National Institutes of Health, 2012).

AIDS was the fifteenth leading cause of death in WNC and Swain County for the aggregate period 2006-2010 (Table 28, cited previously). In Swain County there were too few deaths attributable to AIDS to calculate even a stable overall rate. Note that neither are there county-level gender-stratified or racially-stratified rates for this cause of death.

Because of small numbers of AIDS deaths across WNC, AIDS mortality rates are unstable or non-existent in 15 of the 16 counties in the region. A stable rate is available only for Buncombe County; hence it is not possible to plot meaningful regional AIDS mortality data.

Even at the state level it is not possible to calculate a stable AIDS mortality rate for several minority population groups. Using the stable NC rates available, it is apparent that non-Hispanic African Americans suffered mortality attributable to AIDS at rates much higher than did other groups. For example, in the 2006-2010 aggregate period, the AIDS mortality rate for African American non-Hispanic men (20.2) was almost 12 times the rate among white non-Hispanic men (1.7), and the rate among African American non-Hispanic women (9.8) was almost 25 times the rate among white non-Hispanic women (0.4). The AIDS mortality rate among Hispanic men statewide during this period was 4.1; rates were not released for any other minority group because of below-threshold numbers of AIDS deaths (*Data Workbook*).

Life Expectancy

Life expectancy is the average number of additional years that someone at a given age would be expected to live if current mortality conditions remained constant throughout their lifetime. As the above data has demonstrated, there are many factors, from the prenatal period through the senior years, which can affect life expectancy. Table 32 presents a fairly recent summary of life expectancy for Swain County, WNC, and NC as a whole. From this data it appears that females

born in Swain County in the period cited could expect to live 7.2 years longer than males born at the same time. Similarly, females born in WNC in the period cited in the table could expect to live 5.5 years longer on average than males born under the same parameters. There is no comparable data for minorities in Swain County, but African Americans born in WNC at the same time could expect to live a 3.3 year shorter lifespan than their white counterparts. Life expectancy overall in Swain County (72.6) is 4.4 years shorter than life expectancy in WNC (77.0 years), and 4.7 years shorter than for the state as a whole (77.3 years).

Table 32. Life Expectancy at Birth (2006-2008)

Geography	Overall	Gender		Race	
		Male	Female	White	African American
Swain County	**72.6**	**69.1**	**76.3**	**75.0**	**n/a**
Regional Arithmetic Mean	77.0	74.3	79.8	77.3	74.0
State Total	77.3	74.5	80.0	78.1	73.8

Morbidity Data

Morbidity as used in this report refers generally to the current presence of injury, sickness or disease (and sometimes the symptoms and/or disability resulting from those conditions) in the living population. In this report disability, diabetes, obesity, injury, communicable disease (including sexually-transmitted infections) and mental health conditions are the topics covered under morbidity.

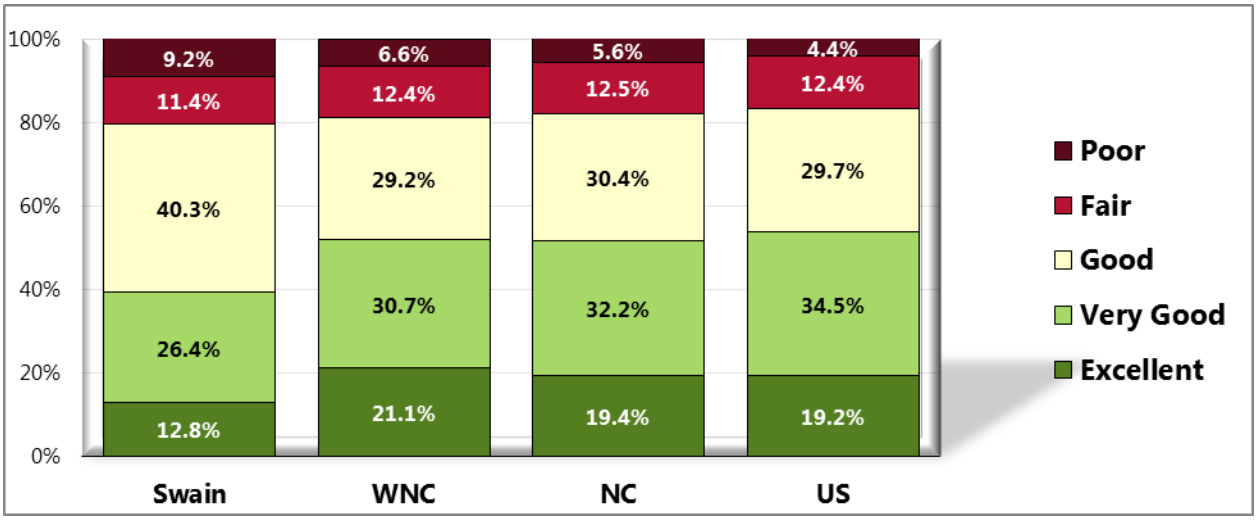
Why is this Important?
Health-related quality of life (HRQoL) is a multi-dimensional concept that includes domains related to physical, mental, emotional and social functioning. It goes beyond direct measures of population health, life expectancy and causes of death, and focuses on the impact health status has on quality of life. Understanding the HRQoL of the population helps communities identify unmet health needs, assess disparities among demographic and socioeconomic subpopulations, characterized the burden of disabilities and chronic disease, and track population patterns and trends. (County Health Rankings and Roadmaps)

The parameter most frequently used to describe the current extent of any condition of morbidity in a population is *prevalence*. Prevalence is the number of existing cases of a disease or health condition in a population at a defined point in time or during a period. Prevalence usually is expressed as a proportion, not a rate, and often represents an estimate rather than a direct count.

Self-Reported Health Status

Survey respondents were asked, "Would you say that in general your health is excellent, very good, good, fair, or poor?"

Figure 45. Self-Reported Health Status (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 12]
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.

Notes:
- Asked of all respondents.

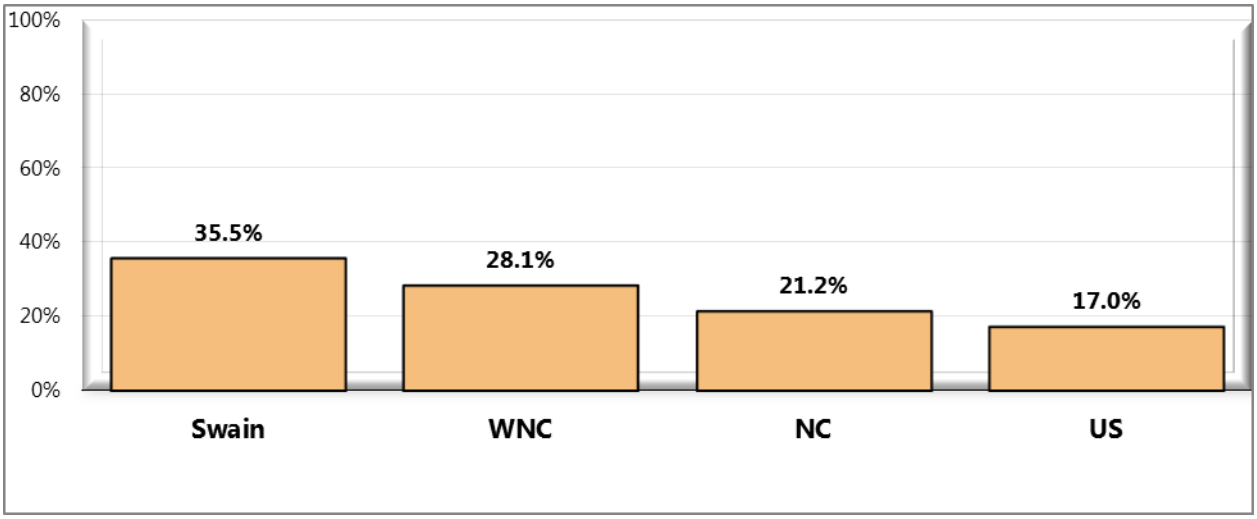
Disability and Limitations in Physical Activity

An individual can get a disabling impairment or chronic condition at any point in life. Compared with people without disabilities, people with disabilities are more likely to (DHHS, 2010):

- Experience difficulties or delays in getting the health care they need.
- Not have had an annual dental visit.
- Not have had a mammogram in past 2 years.
- Not have had a Pap test within the past 3 years.
- Not engage in fitness activities.
- Use tobacco.
- Be overweight or obese.
- Have high blood pressure.
- Experience symptoms of psychological distress.
- Receive less social-emotional support.
- Have lower employment rates.

Survey respondents were asked, "Are you limited in any way in any activities because of physical, mental or emotional problems?" Those who responded, "yes," were then asked to name the major impairment or health problem that limits them. Due to small county-level sample sizes, only regional data is shown for the latter question.

Figure 46. Limited in Activities in Some Way Due to Physical, Mental or Emotional Problem (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 67]
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.

Notes:
- Asked of all respondents

Table 33. Type of Problem That Limits Activities (WNC Healthy Impact Survey)
(Among Those Reporting Activity Limitations)
(Western North Carolina, 2012)

	Arthritis/ Rheumatism	Back/Neck Problem	Difficulty Walking	Fracture/Bone/ Joint Injury	Heart Problem	Lung/Breathing Problem	Mental/ Depression	Other (<3%)
Swain	10.0%	12.1%	15.2%	7.9%	7.1%	3.7%	1.1%	42.9%

Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 68]

Notes:
- Asked of those respondents reporting activity limitations.

Diabetes

Table 34 presents trend data from the US Centers for Disease Control and Prevention (CDC) on the estimated prevalence of diagnosed diabetes in Swain County and WNC. The prevalence of diagnosed diabetes and selected risk factors by county was estimated using data from CDC's Behavioral Risk Factor Surveillance System (BRFSS) and data from the U.S. Census Bureau's Population Estimates Program. Three years of data were used to improve the precision of the year-specific county-level estimates of diagnosed diabetes and selected risk factors.

From these data it appears that the estimated prevalence of diagnosed diabetes among adults in Swain County rose every year, from 9.7% in 2005 to 12.1% in 2009, an increase of 24.7%. In WNC the estimated mean percent prevalence of diagnosed diabetes among adults rose from

8.5% in 2005 to 9.0% in 2009, an increase of 5.9%. Diabetes prevalence in Swain County exceeded the comparable WNC mean prevalence in every year cited in the table.

Table 34. Estimate of Diagnosed Diabetes Among Adults Age 20 and Older (2005-2009)

Geography	2005		2006		2007		2008		2009	
	#	%	#	%	#	%	#	%	#	%
Swain County	1,059	9.7	1,122	9.8	1,179	10.0	1,281	10.8	1,424	12.1
Regional Total	49,896	-	52,045	-	55,160	-	55,442	-	58,378	-
Regional Arithmetic Mean	3,119	8.5	3,253	8.7	3,448	8.9	3,465	8.8	3,649	9.0

In 2010, inpatient hospitalizations for diabetes among Swain County residents totaled 75 cases, or 3.1% of all inpatient hospitalizations listed for the county. In the same year, there were 1,240 inpatient hospital cases associated with treatment of diabetes in WNC. This number of cases represented 1.6% of all hospitalizations in the region. Statewide, diabetes hospitalizations composed 1.9% of all hospitalizations in NC (*Data Workbook*).

Obesity

Obesity is a problem throughout the population. However, among adults in the U.S., vast disparities in obesity exist. Within the U.S., the prevalence of obesity is highest for middle-aged people and for non-Hispanic black and Mexican American women. Among children and adolescents, the prevalence of obesity is highest among older and Mexican American children and non-Hispanic black girls. The association of income with obesity varies by age, gender, and race/ethnicity. Social and physical factors affecting diet and physical activity have an impact on weight (DHHS, 2010).

Body Mass Index (BMI), which describes relative weight for height, is significantly correlated with total body fat content. The BMI should be used to assess overweight and obesity and to monitor changes in body weight. In addition, measurements of body weight alone can be used to determine efficacy of weight loss therapy. BMI is calculated as weight (kg)/height squared (m^2). To estimate BMI using pounds and inches, use: [weight (pounds)/height squared ($inches^2$)] x 703.

In this report, underweight is defined as a BMI of <18.5 kg/m^2, normal is defined as a BMI of 18.5 to 24.9 kg/m^2, overweight is defined as a BMI of 25.0 to 29.9 kg/m^2 and obesity as a BMI ≥30 kg/m^2. The rationale behind these definitions is based on epidemiological data that show increases in mortality with BMIs above 25 kg/m^2. The increase in mortality, however, tends to be modest until a BMI of 30 kg/m^2 is reached. For persons with a BMI ≥30 kg/m^2, mortality rates from all causes, and especially from cardiovascular disease, are generally increased by 50 to 100 percent above that of persons with BMIs in the range of 20 to 25 kg/m^2 (NIH, 1998)

Adult Obesity

Table 35 presents trend data from the CDC on the estimated prevalence of diagnosed adult obesity in Swain County and WNC. The prevalence of diagnosed obesity and selected risk factors by county was estimated using data from CDC's Behavioral Risk Factor Surveillance System (BRFSS) and data from the U.S. Census Bureau's Population Estimates Program. Three years of data were used to improve the precision of the year-specific county-level estimates of diagnosed diabetes and selected risk factors.

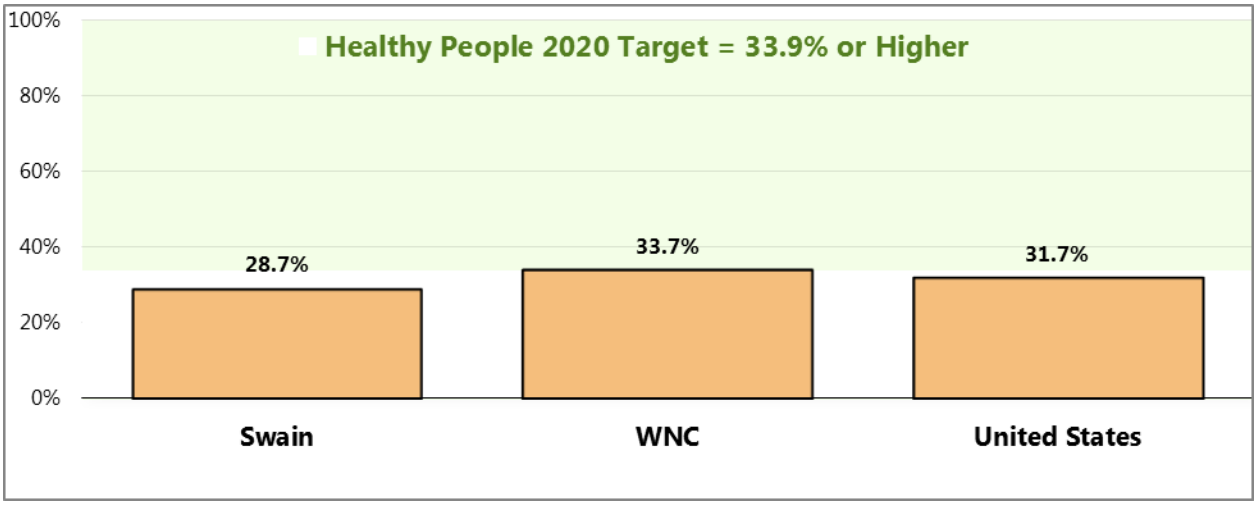
From these data it appears that the estimated prevalence of diagnosed obesity among adults in Swain County fluctuated from year to year but rose 8.0% overall between 2005 and 2009. The estimated mean prevalence of adult obesity in WNC increased annually throughout the period cited. Between 2005 and 2009 the estimated mean percentage of the WNC population diagnosed as obese rose from 25.2% to 28.0%, a total increase of 11.1%. Obesity prevalence in Swain County exceeded the comparable mean obesity prevalence for WNC in every year cited.

Table 35. Estimate of Diagnosed Obesity Among Adults Age 20 and Older (2005-2009)

Geography	2005		2006		2007		2008		2009	
	#	%	#	%	#	%	#	%	#	%
Swain County	**2,880**	**30.1**	**2,855**	**29.0**	**2,867**	**28.2**	**3,191**	**32.0**	**3,175**	**32.5**
Regional Total	128,908	-	136,661	-	139,114	-	143,681	-	148,403	-
Regional Arithmetic Mean	8,057	25.2	8,541	26.4	8,695	26.7	8,980	27.4	9,275	28.0

Based on self-reported heights and weights, the survey data below shows 2012 county and regional estimates of the prevalence of healthy weight, overweight, and obesity.

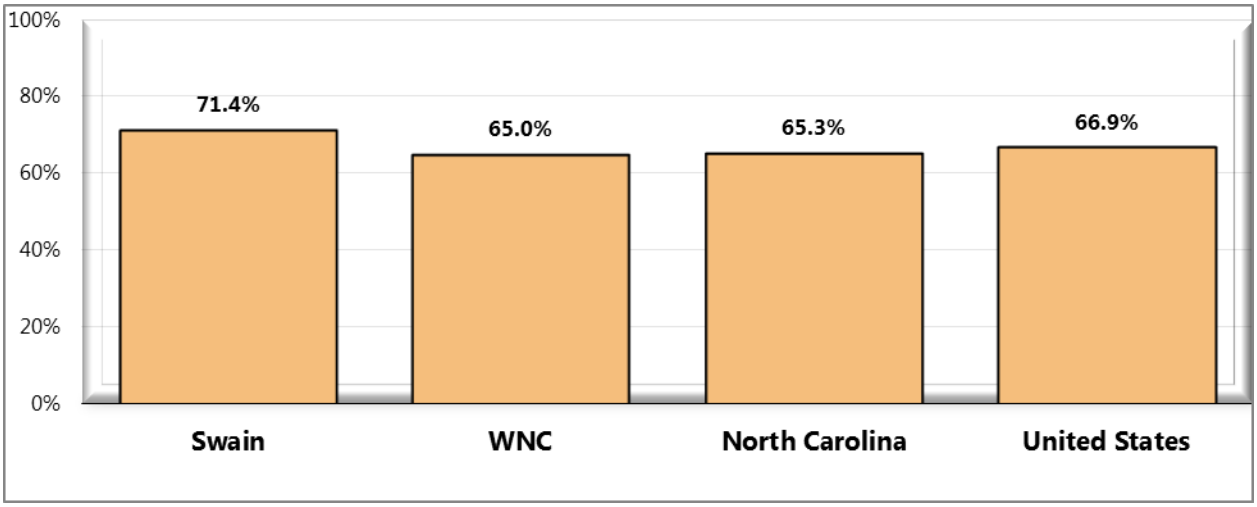
Figure 47. Healthy Weight (WNC Healthy Impact Survey)
(Percent of Adults With a Body Mass Index Between 18.5 and 24.9)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 85]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.

Notes:
- Based on reported heights and weights, asked of all respondents.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov Objective NWS-8]
- The definition of healthy weight is having a body mass index (BMI), a ratio of weight to height (kilograms divided by meters squared), between 18.5 and 24.9.

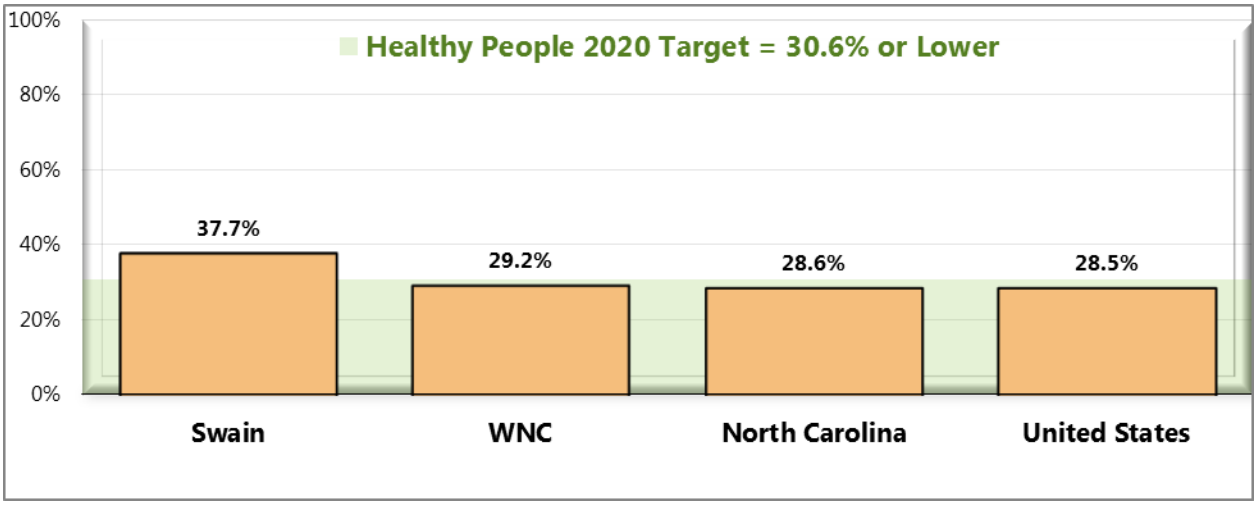
Figure 48. Prevalence of Total Overweight (WNC Healthy Impact Survey)
(Percent of Overweight or/Obese Adults; Body Mass Index of 25.0 or Higher)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 85]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.

Notes:
- Based on reported heights and weights, asked of all respondents.
- The definition of overweight is having a body mass index (BMI), a ratio of weight to height (kilograms divided by meters squared), greater than or equal to 25.0, regardless of gender. The definition for obesity is a BMI greater than or equal to 30.0.

Figure 49. Prevalence of Obesity (WNC Healthy Impact Survey)
(Percent of Obese Adults; Body Mass Index of 30.0 or Higher)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 85]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective NWS-9]
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.

Notes:
- Based on reported heights and weights, asked of all respondents.
- The definition of obesity is having a body mass index (BMI), a ratio of weight to height (kilograms divided by meters squared), greater than or equal to 30.0, regardless of gender.

Childhood Obesity

The NC Healthy Weight Initiative, using the NC Nutrition and Physical Activity Surveillance System (NC NPASS), collects height and weight measurements from children seen in NC DPH-sponsored WIC and Child Health Clinics, as well as some school-based Health Centers (NC DHHS – Nutrition Services Branch, 2012). (Note that this data is not necessarily representative of the county-wide or region-wide population of children.) This data is used to calculate Body Mass Indices (BMIs) in order to gain some insight into the prevalence of childhood obesity.

BMI is a calculation relating weight to height by the following formula:

BMI = (weight in kilograms) / (height in meters)

For children, a BMI in the 95th percentile or above is considered "obese" (formerly defined as "overweight"), while BMIs that are between the 85th and 94th percentiles are considered "overweight" (formerly defined as "at risk for overweight").

Tables 36, 37 and 38 present NC NPASS data for 2010 on children in three age groups: ages 2-4, ages 5-11, and ages 12-18.

From data presented in Table 36 it appears that the prevalence of healthy weight among 2-4 year-olds in Swain County (65.7%) was higher than the comparable figures for either WNC (64.5%) or NC (63.5%). The prevalence of *overweight* among children ages 2-4 was higher in Swain County (18.2%) than the mean for WNC (17.2%) or the figure for NC as a whole (16.1%). The prevalence of *obesity* in Swain County 2-4 year-olds (11.1%) was lower than the mean prevalence in WNC (13.6%) or in NC as a whole (15.6%). It must be noted that the regional means denoted in *italics* contain one or more county percentages that are unstable due to small numbers of children participating in the program.

Table 36. Prevalence of Obesity, Overweight, Healthy Weight and Underweight
Children 2 through 4 years

(2010)

Geography	Total	Underweight		Healthy Weight		Overweight		Obese	
		<5th Percentile		≥5th to <85th Percentile		≥85th to <95th Percentile		≥95th Percentile	
	#	#	%	#	%	#	%	#	%
Swain County	**198**	**10**	**5.1**	**130**	**65.7**	**36**	**18.2**	**22**	**11.1**
Regional Total	6,814	316	-	4,410	-	1,139	-	949	-
Regional Arithmetic Mean	426	20	*4.8*	276	64.5	71	*17.2*	59	*13.6*
State Total	105,410	4,935	4.7	66,975	63.5	17,022	16.1	16,478	15.6

The Swain County Health Department does not routinely collect NC NPASS data for the 5-11 year-old age group. From data presented in Table 37 it appears that the mean prevalence of children ages 5-11 with healthy weight in WNC (63.4%) is higher than the comparable figure for NC (54.3%). In WNC, the mean prevalence of overweight in the 5-11 age group (14.3%) is lower than in NC as a whole (17.1%), and the mean prevalence of obesity in this age group in WNC (19.4%) also is lower than the comparable figure for NC as a whole (25.8%). It must be noted that the regional means denoted in *italics* contain one or more county percentages that are unstable due to small numbers of children participating in the program.

Table 37. Prevalence of Obesity, Overweight, Healthy Weight and Underweight
Children 5 through 11 years
(2010)

Geography	Total	Underweight		Healthy Weight		Overweight		Obese	
		<5th Percentile		≥5th to <85th Percentile		≥85th to <95th Percentile		≥95th Percentile	
	#	#	%	#	%	#	%	#	%
Regional Total	1,243	26	-	721	-	208	-	288	-
Regional Arithmetic Mean	78	2	*2.9*	45	*63.4*	13	*14.3*	18	*19.4*
State Total	12,633	353	2.8	6,859	54.3	2,157	17.1	3,264	25.8

The Swain County Health Department does not routinely collect NC NPASS data for the 12-18 year-old age group. From data presented in Table 38 it appears that the mean prevalence of children ages 12-18 with healthy weight in WNC (56.3%) is higher than the comparable figure for NC (51.9%). In WNC, the mean prevalence of overweight in the 12-18 age group (19.0%) is higher than in NC as a whole (18.1%), but the mean prevalence of obesity in this age group in WNC (23.8%) is lower than the comparable figure for NC as a whole (28.0%). It must be noted that the regional means denoted in *italics* contain one or more county percentages that are unstable due to small numbers of children participating in the program.

Table 38. Prevalence of Obesity, Overweight, Healthy Weight and Underweight Children 12 through 18 years (2010)

Geography	Total	Underweight		Healthy Weight		Overweight		Obese	
		<5th Percentile		≥5th to <85th Percentile		≥85th to <95th Percentile		≥95th Percentile	
	#	#	%	#	%	#	%	#	%
Regional Total	1,348	13	-	729	-	245	-	361	-
Regional Arithmetic Mean	84	1	*1.0*	46	*56.3*	15	*19.0*	23	*23.8*
State Total	6,854	133	1.9	3,560	51.9	1,241	18.1	1,920	28.0

For further details regarding this NC NPASS data, consult the *Data Workbook*.

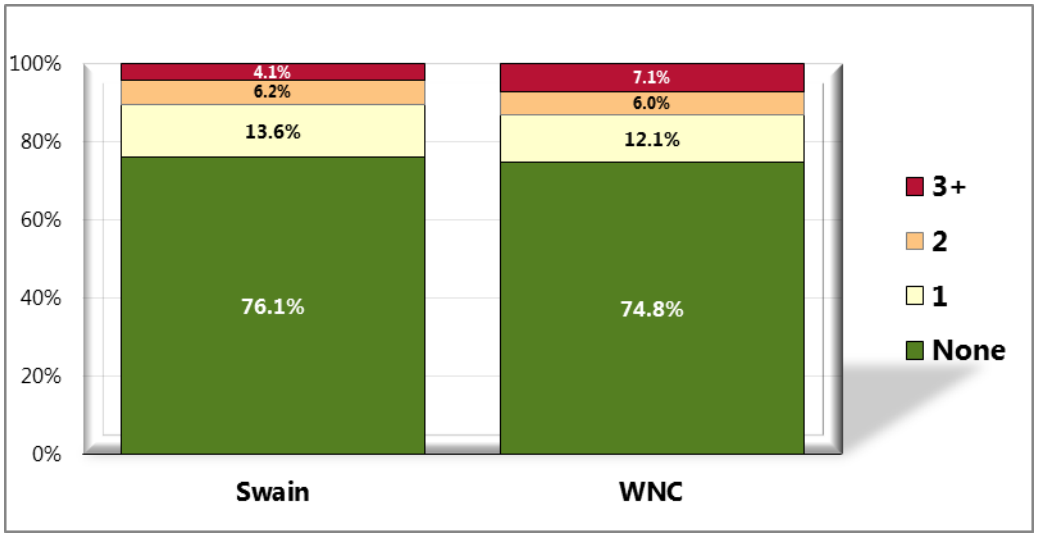
Injuries

Falls

There were eight deaths due to falls in Swain County in the aggregate period 2006-2010. No age-stratified data were available for the county in the target period (*Data Workbook*).

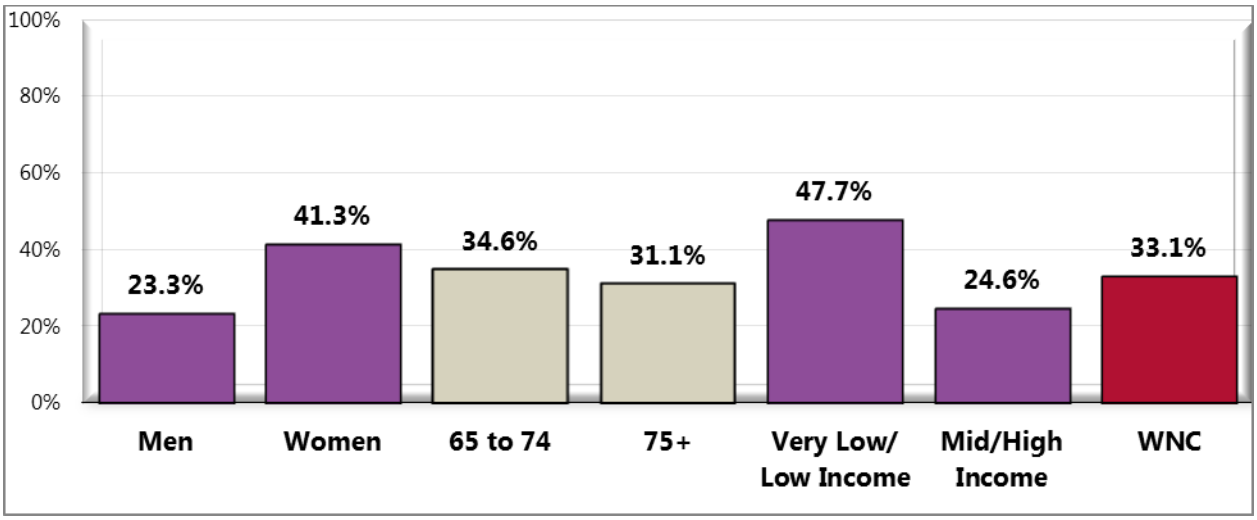
Survey respondents were also asked how many times they have fallen in the past 12 months, and how many of these falls caused an injury. Data is shown below for adults age 65 and older. Due to small county-level sample sizes, fall-related injury data is provided at the regional level.

Figure 50. Number of Falls in the Past Year (WNC Healthy Impact Survey)
(Among Adults Age 65 and Older)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 40]
Notes: ● Asked of respondents age 65 and older.
* These counties have sample sizes deemed unreliable (n<50).

Figure 51. Sustained a Fall-Related Injury in the Past Year (WNC Healthy Impact Survey)
(Among Adults 65+ Who Have Fallen in the Past Year)
(Western North Carolina, 2012)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 41]
Notes: ● Asked of respondents age 65 and older who have fallen in the past year.
● Includes falls that caused respondent to limit his/her regular activities for at least a day or caused him/her to go see a doctor.
● Hispanics can be of any race. Other race categories are non-Hispanic categorizations (e.g., "White" reflects non-Hispanic White respondents).
● Income categories reflect respondent's household income as a ratio to the federal poverty level (FPL) for their household size. "Low Income" includes households with incomes up to 200% of the federal poverty level; "Mid/High Income" includes households with incomes at 200% or more of the federal poverty level.

Vehicle Crashes

The Highway Safety Research Center at the University of North Carolina at Chapel Hill tracks information about vehicle crashes across the state on an annual basis, including detail on the proportion of crashes that are alcohol-related. Table 39 presents trend data on vehicle crashes for the period from 2006 through 2010. The data presented for Swain County demonstrated high variability, but the county percentage of crashes that were alcohol-related was higher than the comparable mean percentage for WNC as well as the percentage for the state as a whole in every year cited except 2006. The data in the table also showed that the percentage of alcohol-related vehicle crashes in WNC was higher than the comparable percentage for the state as a whole throughout the period cited, with the difference varying from 16% to 27% depending on the year.

Table 39. Alcohol-Related Traffic Crashes (2006-2010)

Geography	2006		2007		2008		2009		2010	
	# Crashes	% Alcohol-Related	# Crashes	% Alcohol-Related	# Crashes	% Alcohol-Related	# Crashes	% Alcohol-Related	# Crashes	% Alcohol-Related
Swain County	**203**	**4.9**	**197**	**9.6**	**244**	**11.5**	**293**	**7.5**	**273**	**8.1**
Regional Total	15,004	6.2	15,216	6.5	13,997	7.1	14,075	6.6	14,763	5.8
State Total	220,307	5.1	224,307	5.3	214,358	5.6	209,695	5.4	213,573	5.0

Table 40 presents additional detail on the nature of vehicular crashes for a single year, 2010. In Swain County 8.1% of *all* crashes were alcohol-related; although the following number may be unstable since it is based on only four events, 66.7% of the *fatal* crashes (4 of 6) in the county were alcohol-related. In both WNC and NC as a whole, the proportion of *all* crashes that were alcohol-related was less than 6%, but the proportion of *fatal* crashes that were alcohol-related was over 30%. It is noteworthy that the percentages of crashes that were alcohol-related were higher in WNC than in NC for every outcome category displayed in Table 40.

Table 40. Outcomes of Traffic Crashes (2010)

Geography	Total Crashes		Property Damage Only Crashes		Non-Fatal Crashes		Fatal Crashes	
	# Reportable Crashes	% Alcohol-Related Crashes	# Reportable Crashes	% Alcohol-Related Crashes	# Reportable Crashes	% Alcohol-Related Crashes	# Reportable Crashes	% Alcohol-Related Crashes
Swain County	**273**	**8.1**	**169**	**5.3**	**98**	**9.2**	**6**	***66.7***
Regional Total	14,763	5.8	9,469	4.0	5,192	8.3	102	36.3
State Total	213,573	5.0	143,211	3.4	69,138	7.8	1,224	32.4

Distracted Drivers
There is no comparable data for Swain County, WNC or NC, but in the US as a whole in 2010, 3,092 people died and 416,000 were injured as a result of distracted driving (*Data Workbook*).

Workplace Injury
There is no comparable data for Swain County, WNC or the US, but in NC as a whole, the mortality rate associated with work-related injury was 3.9 deaths per 100,000 full-time equivalent workers in 2008, and 3.3 in 2009 (*Data Workbook*).

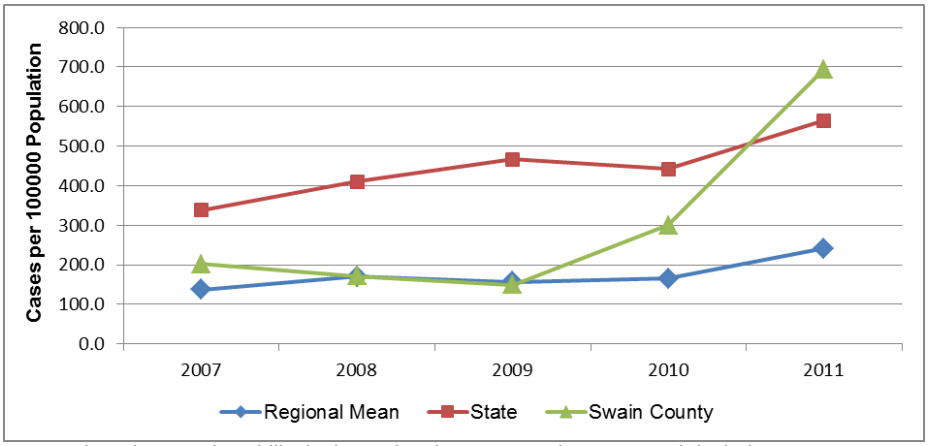
Poisonings
For the five-year aggregate period 2006-2010 there were 19 unintentional poisoning deaths in Swain County, with a corresponding age-adjusted mortality rate of 44.2 per 100,000 population. The comparable mean unintentional poisoning mortality rate for WNC was 23.1 over the same period.

Communicable Disease
A communicable disease is a disease transmitted through direct contact with an infected individual or indirectly through a vector (Merriam-Webster.com). The topic of communicable diseases includes sexually transmitted infections (STIs). The STIs of greatest regional interest are chlamydia and gonorrhea. HIV/AIDS is sometimes grouped with STIs, since sexual contact is one mode of HIV transmission. While AIDS, as the final stage of HIV infection, was discussed previously among the leading causes of death, HIV is discussed here as a communicable disease.

Chlamydia is the most frequently reported bacterial STI in the US. It is estimated that there are approximately 2.8 million new cases of chlamydia in the US each year. Chlamydia cases frequently go undiagnosed and can cause serious problems in men and women, such as penile discharge and infertility respectively, as well as infections in newborn babies of infected mothers (CDC, 2012).

Figure 52 plots Chlamydia rates for several years. From this data it appears that Chlamydia infection, which in 2007 and 2008 was less prevalent in Swain County than in NC and about as prevalent as in WNC, skyrocketed in 2010 and 2011 to an incidence rate above both the region and the state. In WNC the mean Chlamydia infection rate was 57% to 66% lower than the comparable rate for NC as a whole for the time span cited. Chlamydia rates in both NC and WNC increased overall between 2007 and 2011, as the NC rate rose 67.2% (from 337.7 to 564.8) and the mean WNC rate rose 76.4% (from 136.9 to 241.5). In Swain County over the same period the Chlamydia infection rate underwent a more than three-fold increase, from 202.3 to 693.8.

Figure 52. Chlamydia Rate, All Ages, Cases per 100,000 Population (Five Single Years, 2007-2011)

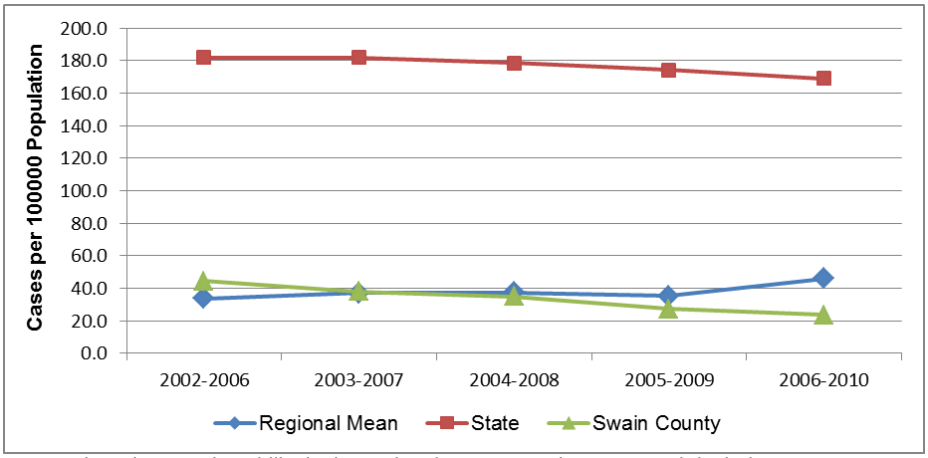


Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

Gonorrhea is the second most commonly reported bacterial STI in the US. The highest rates of gonorrhea have been found in African Americans, people 20 to 24 years of age, and women, respectively. In women, gonorrhea can spread into the uterus and fallopian tubes, resulting in pelvic inflammatory disease (PID). PID affects more than 1 million women in the US every year and can cause tubal pregnancy and infertility in as many as 10 percent of infected women. In addition, some health researchers think gonorrhea adds to the risk of getting HIV infection (CDC, 2012).

Figure 53 plots gonorrhea rates for several aggregate periods. From this data is appears that gonorrhea is far less prevalent in Swain County and WNC than in NC. The mean gonorrhea rate in WNC was 72% to 82% lower than the state rate for the span of aggregate periods cited in the figure. It is noteworthy that as the state gonorrhea rate decreased 7.2% (from 182.0 to 168.9) over the period cited, the mean WNC gonorrhea rate increased 36.2% (from 33.7 to 45.9) in the same time span. The gonorrhea infection rate in Swain County fluctuated near the comparable mean WNC rate for most of the period cited. Note that the figures for Swain County for 2005-2009 and 2006-2010 are unstable due to small numbers of events (n=16-20 cases per aggregate period).

Figure 53. Gonorrhea Rate, Cases per 100,000 Population (Five-Year Aggregates, 2002-2006 through 2006-2010)



Note: There is some instability in the regional mean rates because each includes one or more unstable county rate.

HIV infection, an important communicable disease in some regions of NC, is a rare occurrence throughout most of WNC. Only one county in the region (Buncombe) has reported enough cases in some years to calculate a stable incidence rate. The total number of HIV cases in WNC in 2008 was 58; in 2009 the total was 46, and in 2010 the total was 40 (*Data Workbook)*.

CHAPTER 4 – HEALTH BEHAVIORS

Physical Activity

Why is this Important?

Regular physical activity can improve the health and quality of life of Americans of all ages, regardless of the presence of a chronic disease or disability. Among adults and older adults, physical activity can lower the risk of: early death; coronary heart disease; stroke; high blood pressure; type 2 diabetes; breast and colon cancer; falls; and depression. Among children and adolescents, physical activity can: improve bone health; improve cardio respiratory and muscular fitness; decrease levels of body fat; and reduce symptoms of depression. For people who are inactive, even small increases in physical activity are associated with health benefits. (County Health Rankings and Roadmaps)

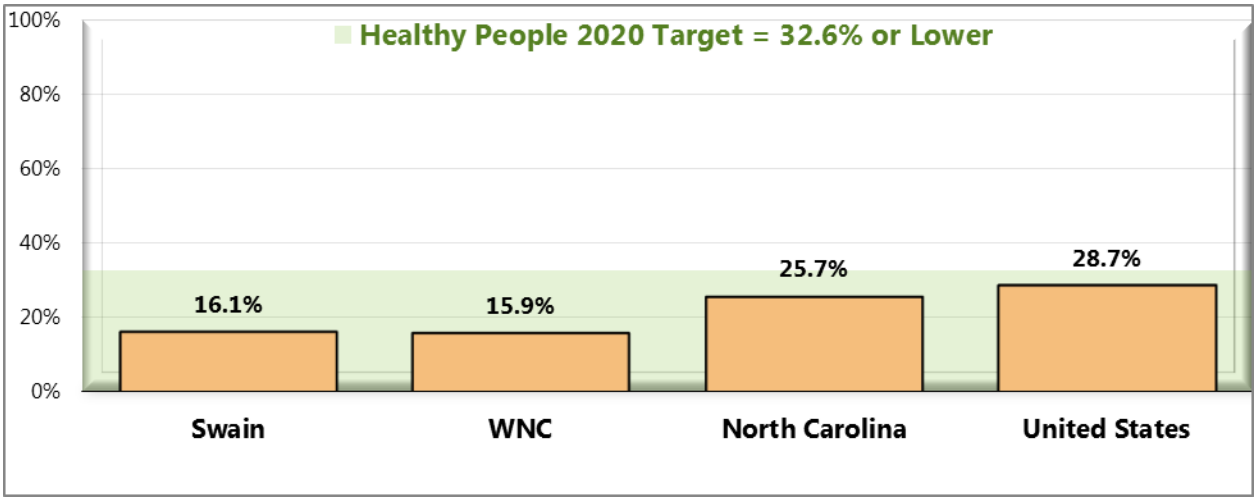
Personal, social, economic, and environmental factors all play a role in physical activity levels among youth, adults, and older adults. Factors **positively** associated with adult physical activity include: postsecondary education; higher income; enjoyment of exercise; expectation of benefits; belief in ability to exercise (self-efficacy); history of activity in adulthood; social support from peers, family, or spouse; access to and satisfaction with facilities; enjoyable scenery; and safe neighborhoods. Factors **negatively** associated with adult physical activity include: advancing age; low income; lack of time; low motivation; rural residency; perception of great effort needed for exercise; overweight or obesity; perception of poor health; and being disabled. Older adults may have additional factors that keep them from being physically active, including lack of social support, lack of transportation to facilities, fear of injury, and cost of programs (DHHS, 2010).

Adults (age 18–64) should do 2 hours and 30 minutes a week of moderate-intensity, or 1 hour and 15 minutes (75 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic physical activity. Aerobic activity should be performed in episodes of at least 10 minutes, preferably spread throughout the week. Additional health benefits are provided by increasing to 5 hours (300 minutes) a week of moderate-intensity aerobic physical activity, or 2 hours and 30 minutes a week of vigorous-intensity physical activity, or an equivalent combination of both.

Older adults (age 65 and older) should follow the adult guidelines. If this is not possible due to limiting chronic conditions, older adults should be as physically active as their abilities allow. They should avoid inactivity. Older adults should do exercises that maintain or improve balance if they are at risk of falling.

For all individuals, some activity is better than none. Physical activity is safe for almost everyone, and the health benefits of physical activity far outweigh the risks (DHHS, 2008).

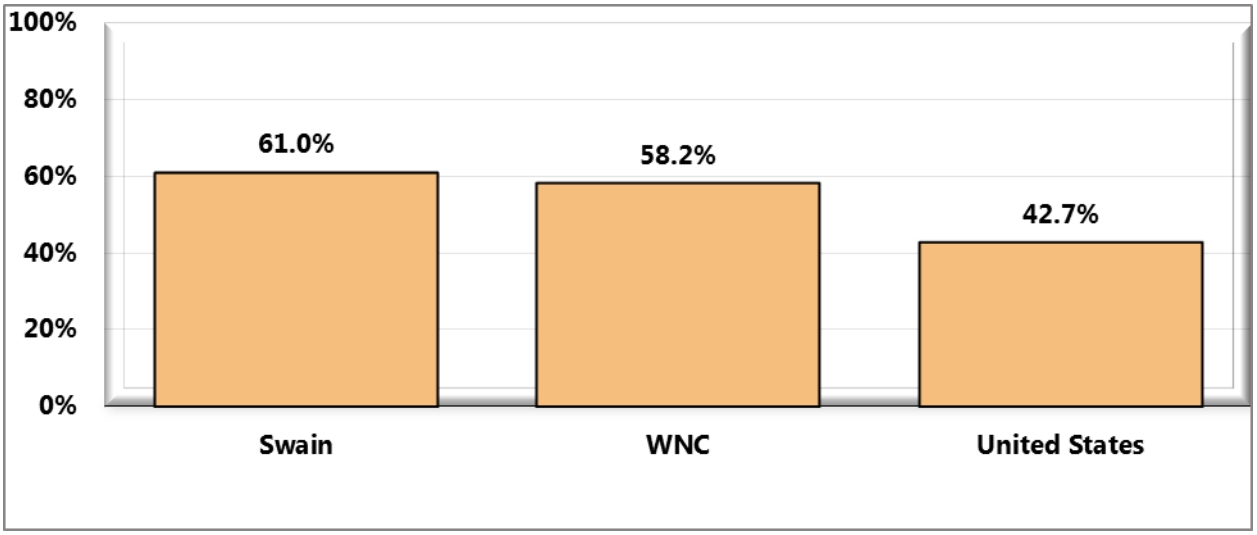
Figure 54. No Leisure-Time Physical Activity in the Past Month (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 56]
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective PA-1]

Notes:
- Asked of all respondents.

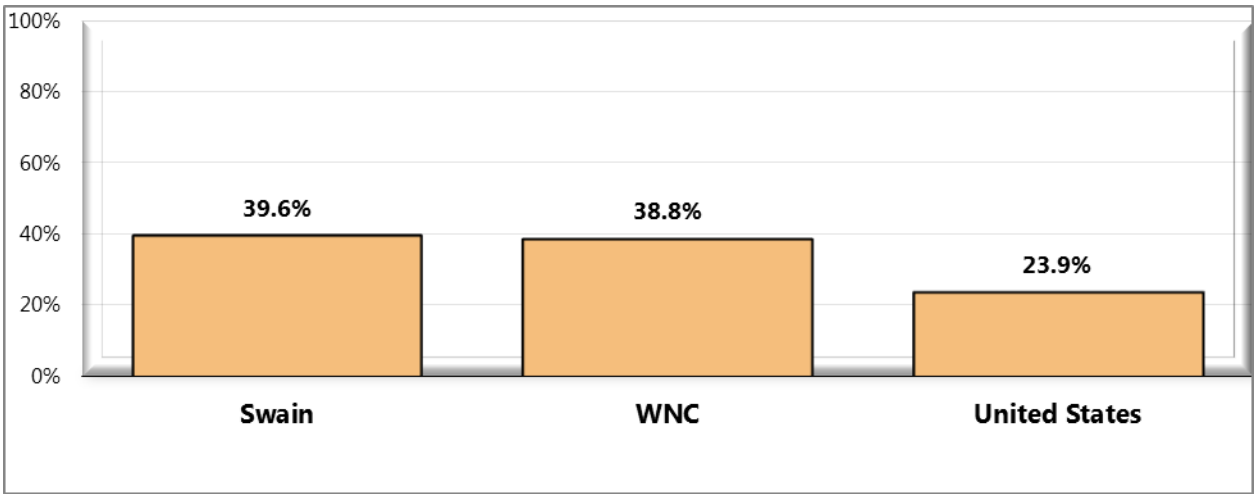
Figure 55. Meets Physical Activity Recommendations (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 80]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.

Notes:
- Asked of all respondents.
- In this case the term "meets physical activity recommendations" refers to participation in moderate physical activity (exercise that produces only light sweating or a slight to moderate increase in breathing or heart rate) at least 5 times a week for 30 minutes at a time, and/or vigorous physical activity (activities that cause heavy sweating or large increases in breathing or heart rate) at least 3 times a week for 20 minutes at a time.

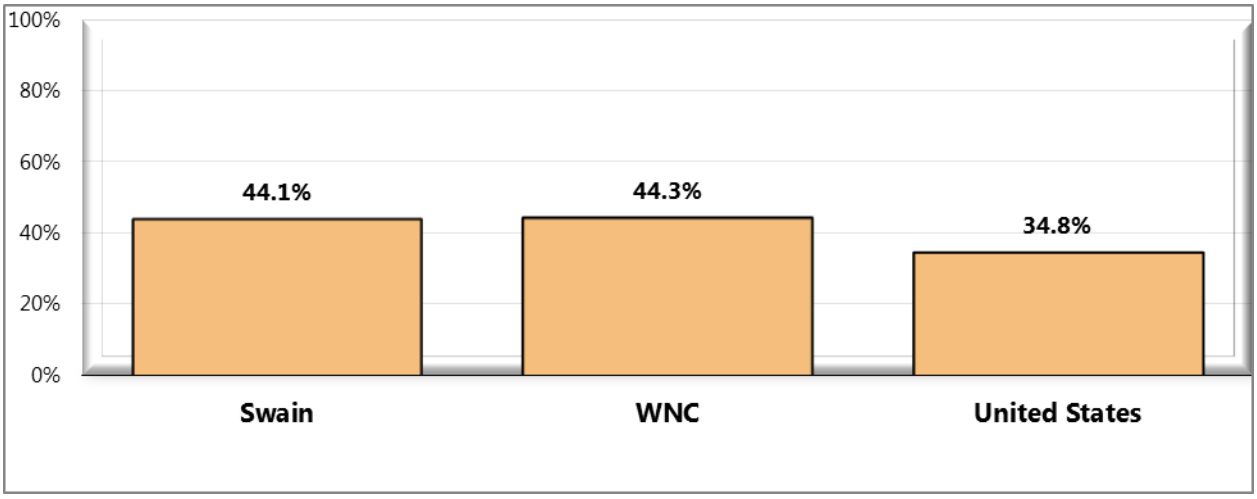
Figure 56. Moderate Physical Activity (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 81]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.

Notes:
- Asked of all respondents.
- Moderate Physical Activity: Takes part in exercise that produces only light sweating or a slight to moderate increase in breathing or heart rate at least 5 times per week for at least 30 minutes per time.

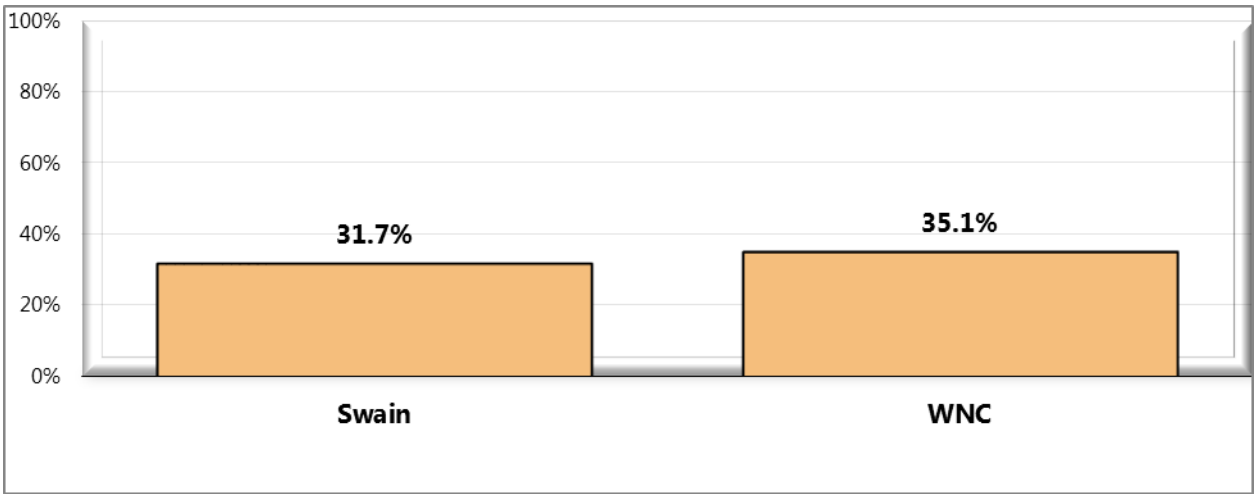
Figure 57. Vigorous Physical Activity (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 82]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.

Notes:
- Asked of all respondents.
- Vigorous Physical Activity: Takes part in activities that cause heavy sweating or large increases in breathing or heart rate at least 3 times per week for at least 20 minutes per time.

Figure 58. Strengthening Physical Activity (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 83]

Notes:
- Asked of all respondents.
- Strengthening Physical Activity: Takes part in physical activities or exercises that strengthen muscles at least 2 times per week.

Diet and Nutrition

Social Determinants of Diet. Social factors thought to influence diet include:

- Knowledge and attitudes
- Skills
- Social support
- Societal and cultural norms
- Food and agricultural policies
- Food assistance programs
- Economic price systems

Physical Determinants of Diet.
The places where people eat appear to influence their diet. For example, foods eaten away from home often have more calories and are of lower nutritional quality than foods prepared at home. Marketing also influences people's—particularly children's—food choices (DHHS, 2010).

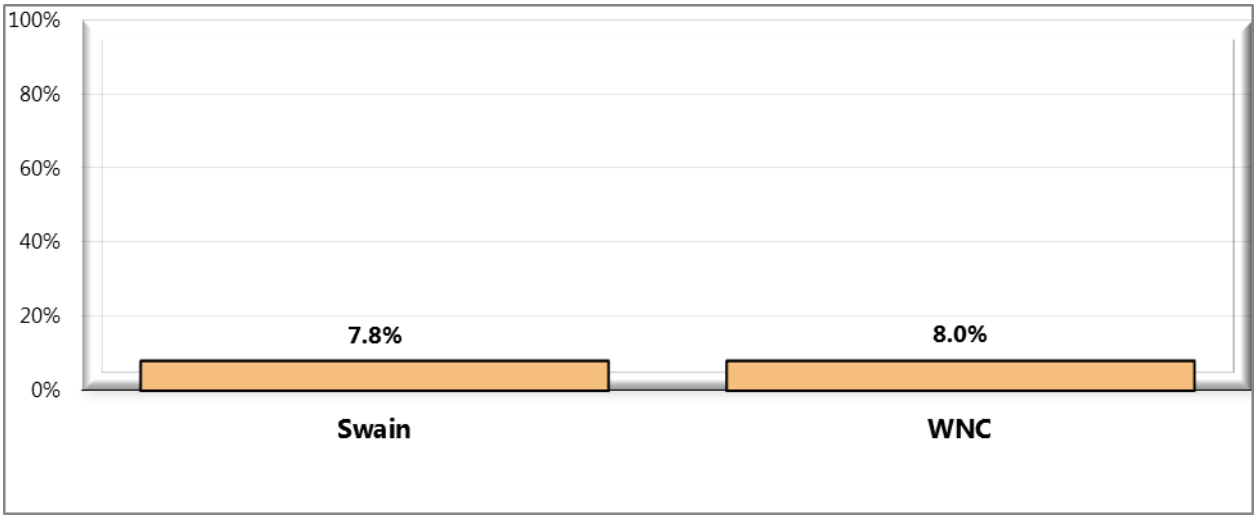
More information is available elsewhere in this report about some of these determinants.

Why is this Important?

Strong science exists supporting the health benefits of eating a healthful diet and maintaining a healthy body weight. Diet and body weight are related to health status. Good nutrition is important to the growth and development of children. A healthful diet also helps Americans reduce their risks for many health conditions, including: overweight and obesity; malnutrition; iron-deficiency anemia; heart disease; high blood pressure; dyslipidemia (poor lipid profiles); type 2 diabetes; osteoporosis; oral disease; constipation; diverticular disease; and some cancers. Efforts to change diet and weight should address individual behaviors, as well as the policies and environments that support these behaviors in settings such as schools, worksites, healthcare organizations, and communities.
(County Health Rankings and Roadmaps)

To measure fruit and vegetable consumption, survey respondents were asked how many one-cup servings of fruit and one-cup servings of vegetables (not counting lettuce salad or potatoes) they ate over the past week.

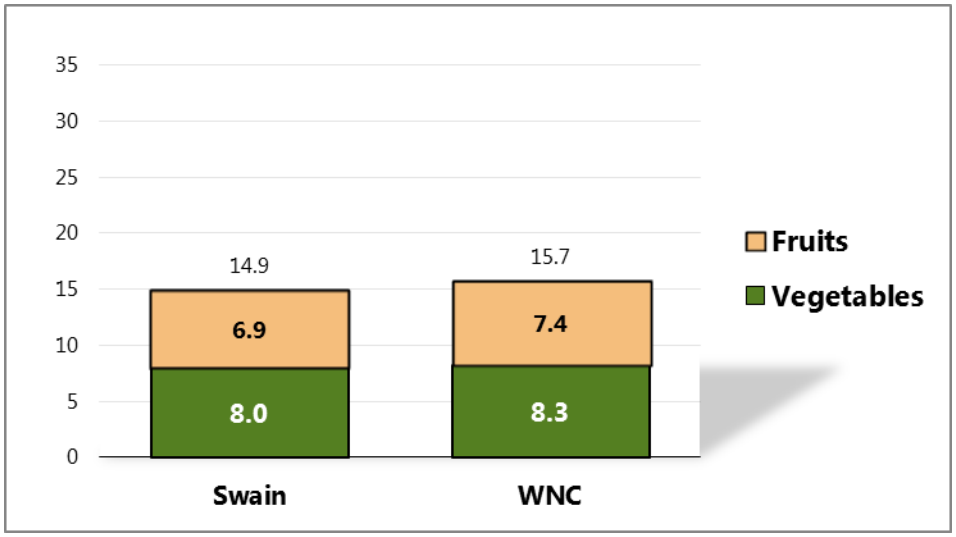
Figure 59. Had an Average of Five or More Servings of Fruits/Vegetables per Day in the Past Week (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 79]

Notes:
- Asked of all respondents.
- For this issue, respondents were asked to recall their food intake during the previous week. Reflects 35 or more 1-cup servings of fruits and/or vegetables in the past week, excluding lettuce salad and potatoes.

Figure 60. Average Servings of Fruits/Vegetables in the Past Week (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Items 53-54]

Notes:
- Asked of all respondents.
- For this issue, respondents were asked to recall their food intake during the previous week.

Reflects 35 or more 1-cup servings of fruits and/or vegetables in the past week, excluding lettuce salad and potatoes.

Substance Use/Abuse

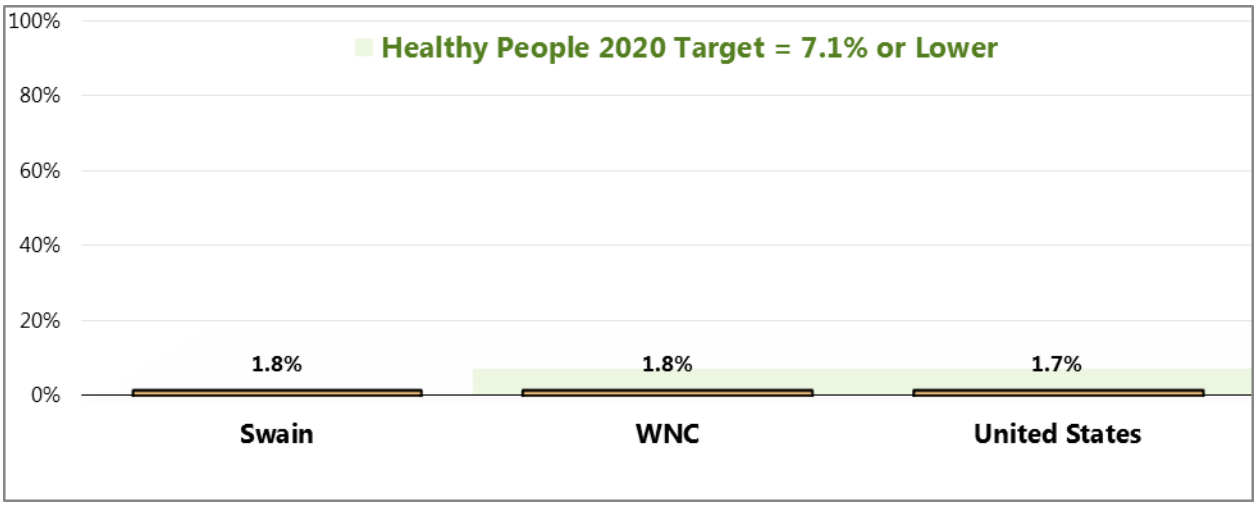
Why is this Important?
Consumption of too much alcohol is a risk factor for a number of adverse health outcomes. These include, but are not limited to, alcohol poisoning, hypertension, acute myocardial infarction, sexually transmitted infections, fetal alcohol syndrome, and interpersonal violence.
Among youth, the use of alcohol and other drugs has been linked to unintentional injuries, physical fights, academic and occupational problems, and illegal behavior. Drug use contributes directly and indirectly to the HIV epidemic and alcohol and drug use contribute markedly to infant morbidity and mortality. (County Health Rankings and Roadmaps)

Substance abuse refers to a set of related conditions associated with the consumption of mind- and behavior-altering substances that have negative behavioral and health outcomes. Social attitudes and political and legal responses to the consumption of alcohol and illicit drugs make substance abuse one of the most complex public health issues. In 2005, an estimated 22 million Americans struggled with a drug or alcohol problem. Almost 95% of people with substance use problems are considered unaware of their problem. Of those who recognize their problem, 273,000 have made an unsuccessful effort to obtain treatment. These estimates highlight the importance of increasing prevention efforts and improving access to treatment for substance abuse and co-occurring disorders. Substance abuse has a major impact on individuals, families, and communities. The effects of substance abuse are cumulative, significantly contributing to costly social, physical, mental, and public health problems (DHHS, 2010).

Illicit Drugs

For the purposes of the survey, "illicit drug use" includes use of illegal substances or of prescription drugs taken without a physician's order. It is important to note that as a self-reported measure – and because this indicator reflects potentially illegal behavior – it is reasonable to expect that it might be underreported, and that actual illicit drug use in the community is likely higher.

Figure 61. Illicit Drug Use in the Past Month (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 52]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective SA-13.3]

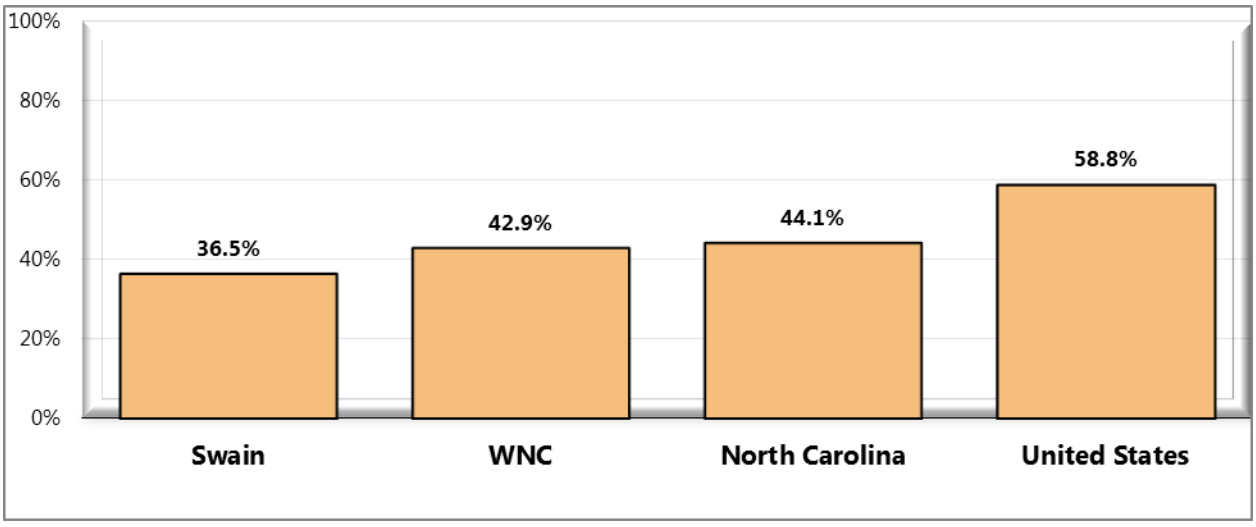
Notes:
- Asked of all respondents.
- Includes reported use of an illegal drug or of a prescription drug not prescribed to the respondent.

Alcohol

"**Current drinkers**" include survey respondents who had at least one drink of alcohol in the month preceding the interview. For the purposes of this study, a "drink" is considered one can or bottle of beer, one glass of wine, one can or bottle of wine cooler, one cocktail, or one shot of liquor. "**Chronic drinkers**" include survey respondents reporting 60 or more drinks of alcohol in the month preceding the interview.

In this assessment, "**binge drinkers**" include adults who report drinking 5 or more alcoholic drinks on any single occasion during the past month. Note that state and national data reflect different thresholds for men (5+ drinks) and women (4+ drinks), so county and regional data is not directly comparable to state and national figures.

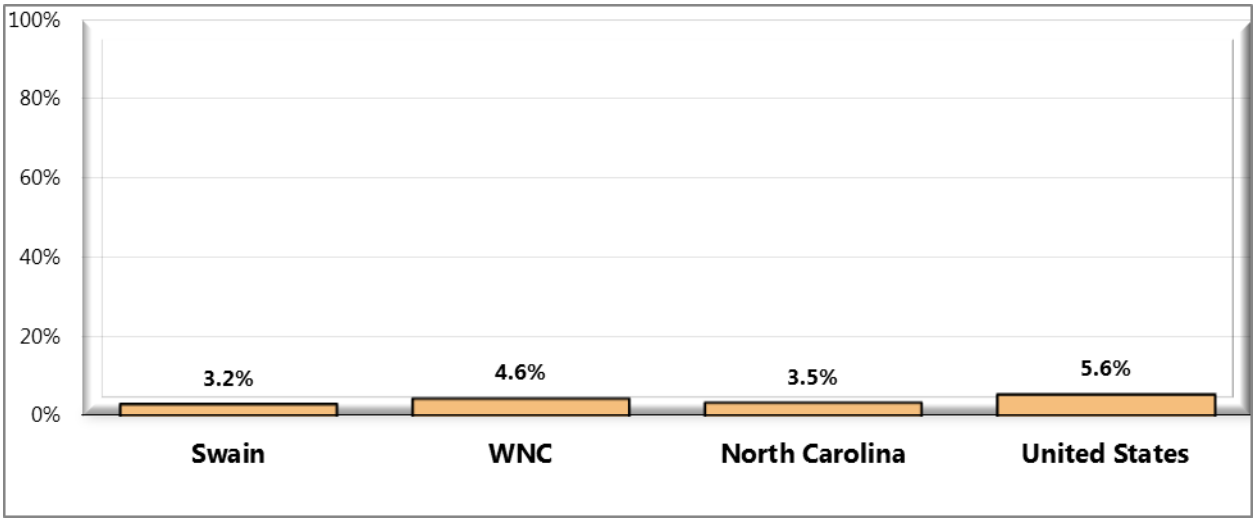
Figure 62. Current Drinkers (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 88]
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.

Notes:
- Asked of all respondents.
- Current drinkers had at least one alcoholic drink in the past month.

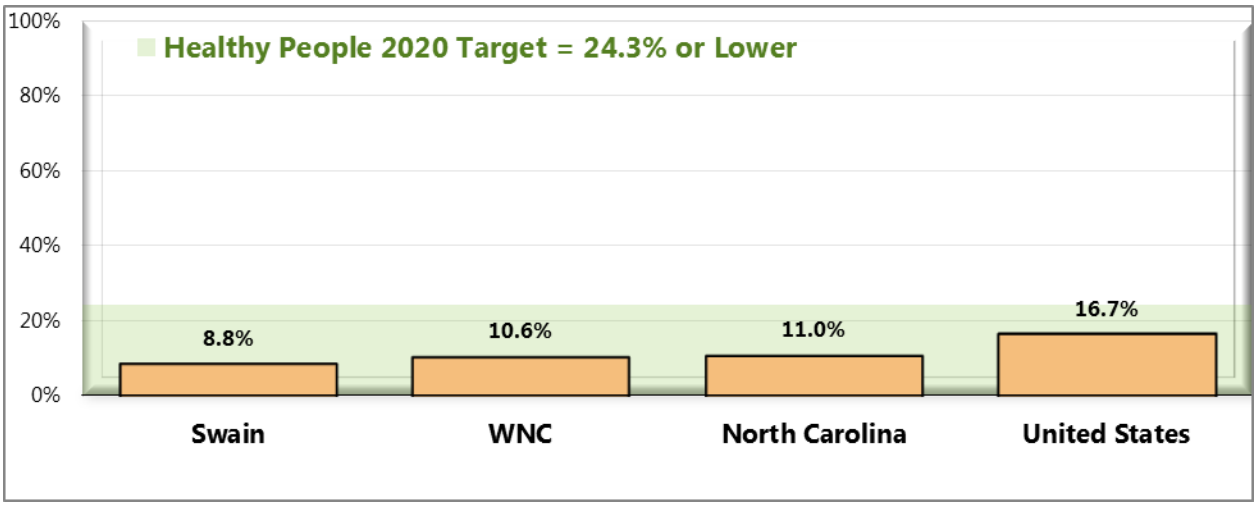
Figure 63. Chronic Drinkers (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 89]
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.

Notes:
- Asked of all respondents.
- Chronic drinkers are defined as having 60+ alcoholic drinks in the past month.
- *The state definition for chronic drinkers is males consuming 2+ drinks per day and females consuming 1+ drink per day in the past 30 days.

Figure 64. Binge Drinkers (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 90]
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective SA-14.3]

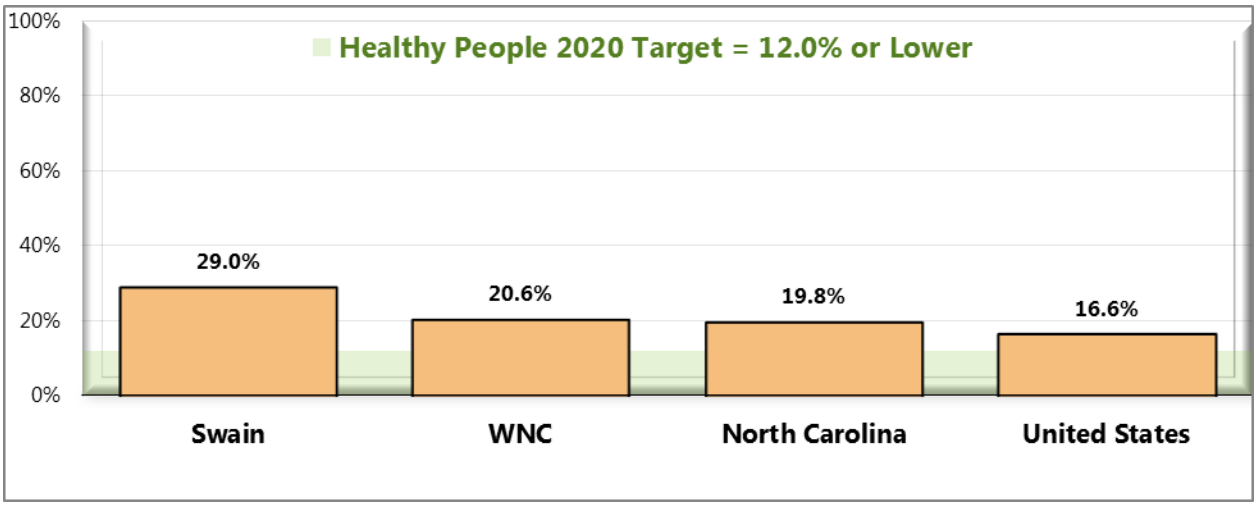
Notes:
- Asked of all respondents.
- Binge drinkers are defined as those consuming 5+ alcoholic drinks on any one occasion in the past 30 days; * note that state and national data reflect different thresholds for men (5+ drinks) and women (4+ drinks).

Tobacco

Tobacco use is the single most preventable cause of death and disease in the United States. Each year, approximately 443,000 Americans die from tobacco-related illnesses. For every person who dies from tobacco use, 20 more people suffer with at least one serious tobacco-related illness. In addition, tobacco use costs the US $193 billion annually in direct medical expenses and lost productivity. Preventing tobacco use and helping tobacco users quit can improve the health and quality of life for Americans of all ages. People who stop smoking greatly reduce their risk of disease and premature death. Benefits are greater for people who stop at earlier ages, but quitting tobacco use is beneficial at any age.

Many factors influence tobacco use, disease, and mortality. Risk factors include race/ethnicity, age, education, and socioeconomic status. Significant disparities in tobacco use exist geographically; such disparities typically result from differences among states in smoke-free protections, tobacco prices, and program funding for tobacco prevention (DHHS, 2010).

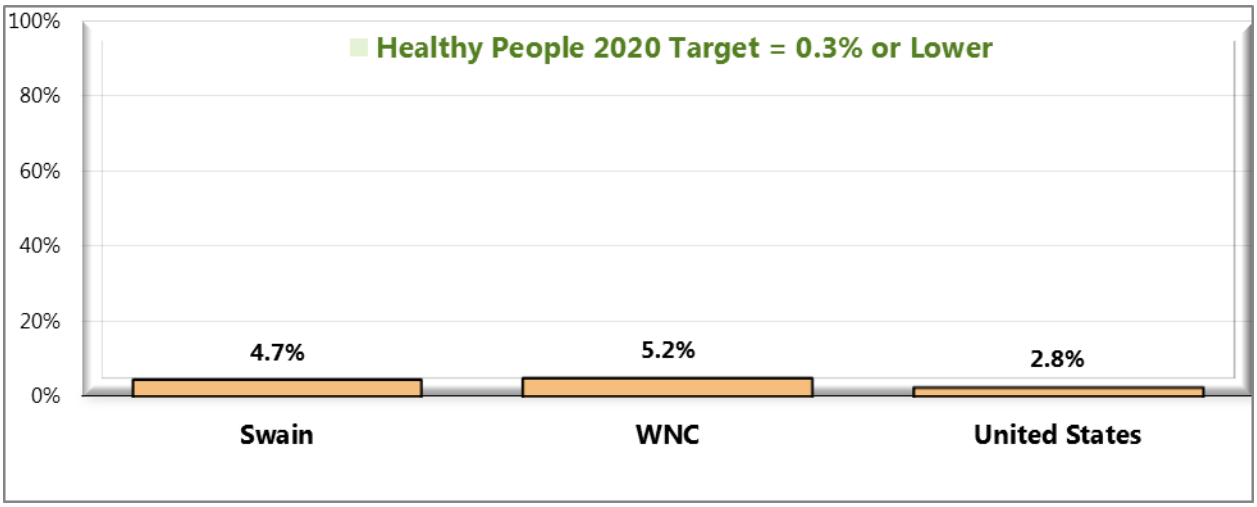
Figure 65. Current Smokers (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 86]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective TU-1.1]

Notes:
- Asked of all respondents.
- Includes regular and occasional smokers (every day and some days).

Figure 66. Currently Use Smokeless Tobacco Products (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 43]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective TU-1.2]

Notes:
- Asked of all respondents.
- Includes regular and occasional users (every day and some days).

Table 41. Top Three Resources Respondents Would Go to for Help Quitting Tobacco (WNC Healthy Impact Survey)

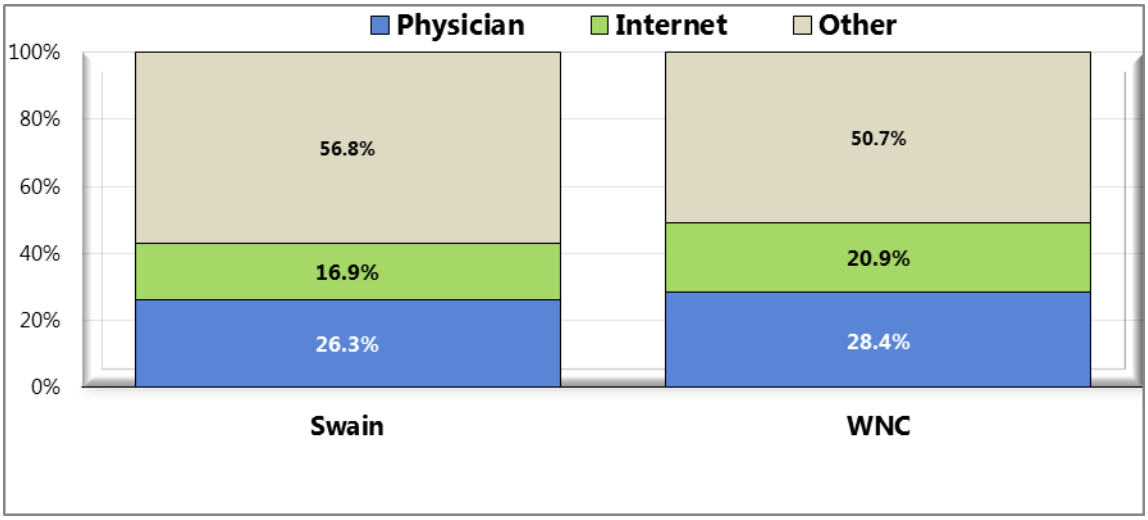
	Doctor	On My Own/Cold Turkey	Don't Know
Swain	✓	✓	✓
WNC	✓	✓	✓

Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 48]
Notes: ● Asked of all respondents.

Health Information

Survey respondents were asked about where they get their healthcare information. Swain County residents were also asked about their internet access: 71.9% of Swain County residents have access to the internet for personal use at home, work, or school.

Figure 67. Primary Source of Healthcare Information (WNC Healthy Impact Survey)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 11]
Notes: ● Asked of all respondents.

CHAPTER 5 – CLINICAL CARE PARAMETERS

Medical Care Access

Access to comprehensive, quality health care services is important for the achievement of health equity and for increasing the quality of a healthy life for everyone. It impacts: overall physical, social, and mental health status; prevention of disease and disability; detection and treatment of health conditions; quality of life; preventable death; and life expectancy.

Access to health services means the timely use of personal health services to achieve the best health outcomes. It requires three distinct steps: 1) gaining entry into the health care system; 2) accessing a health care location where needed services are provided; and 3) finding a health care provider with whom the patient can communicate and trust (DHHS, 2010).

Why is this Important?
Access to comprehensive, quality health care services is important for the achievement of health equity and for increasing the quality of a healthy life for everyone. It impacts: overall physical, social, and mental health status; prevention of disease and disability; detection and treatment of health conditions; quality of life; preventable death; and life expectancy.

Health insurance by itself does not ensure access. It is also necessary to have comprehensive coverage, providers that accept the individual's health insurance, relatively close proximity of providers to patients, and primary care providers in the community.

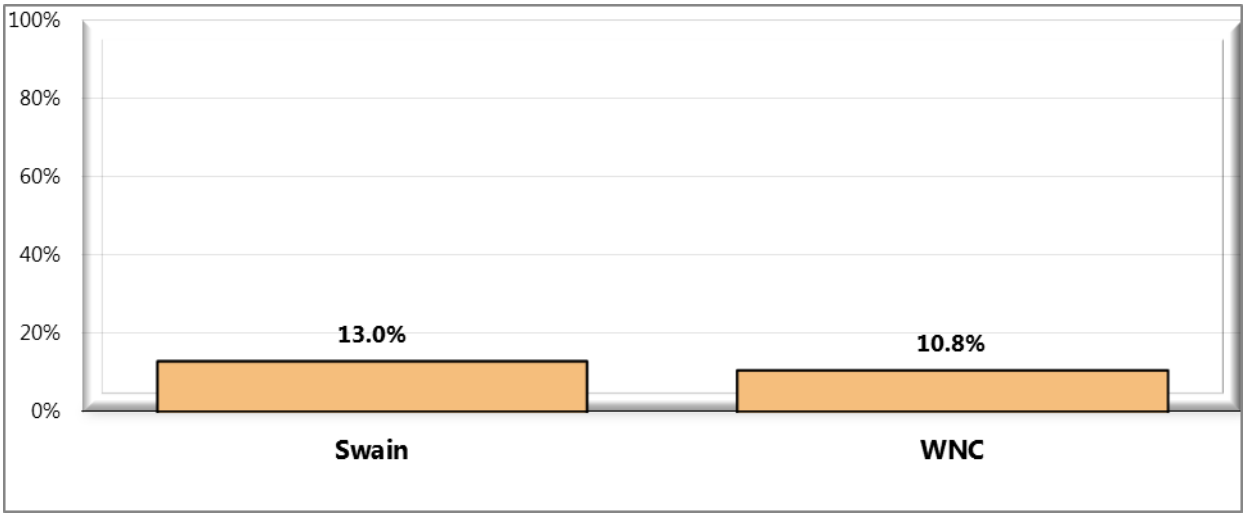
Evidence shows that a higher density of primary care providers is associated with lower probability of hospitalization for ambulatory- care sensitive conditions. (County Health Rankings and Roadmaps)

Self-Reported Access

Survey respondents were asked if there was a time in the past 12 months when they needed medical care, but could not get it. If they responded, "yes," they were asked to name the main reason they could not get needed medical care. Due to small county-level sample sizes, the responses to the latter question are displayed at the regional-level, below.

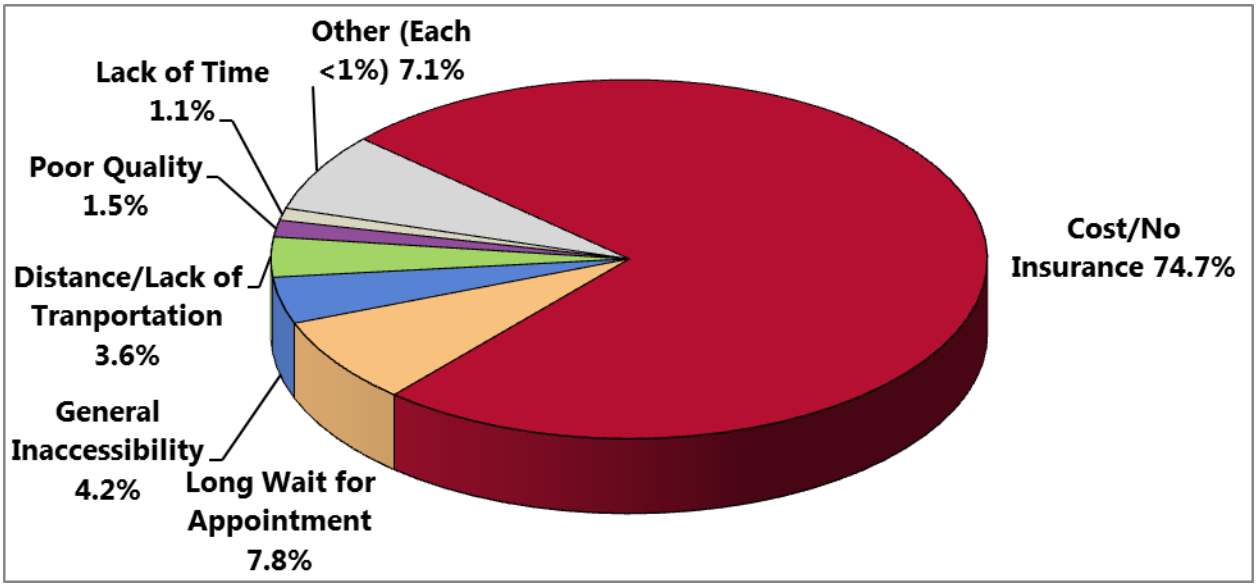
Survey respondents were also asked to indicate their agreement with the following statement: "*Considering cost, quality, number of options and availability, there is good healthcare in my county*."

Figure 68. Was Unable to Get Needed Medical Care at Some Point in the Past Year (WNC Healthy Impact Survey)



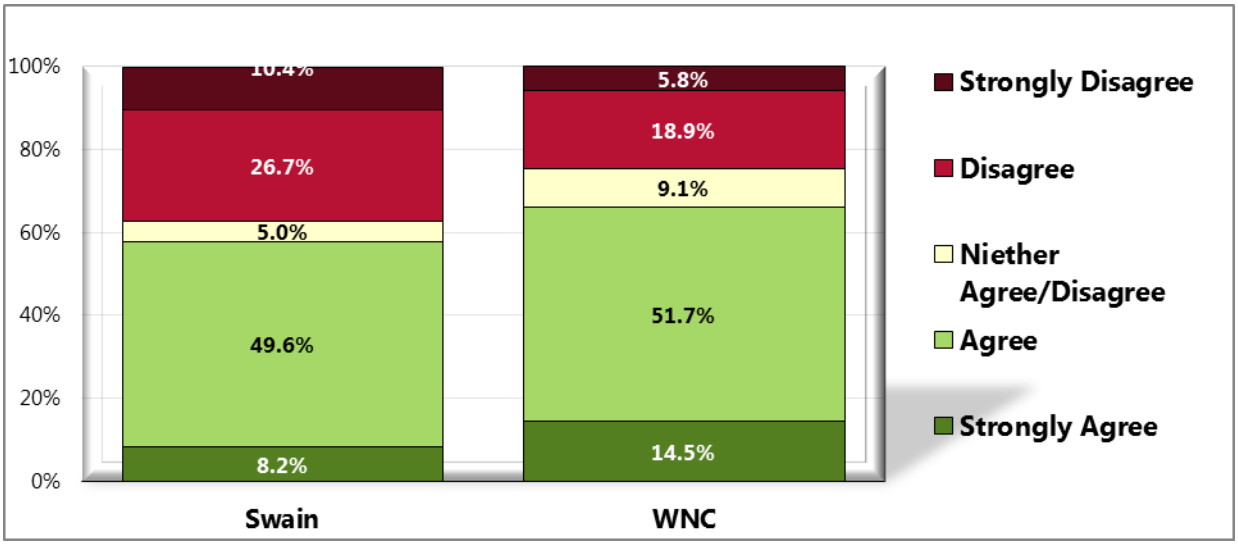
Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 13]
Notes: • Asked of all respondents.

Figure 69. Primary Reason for Inability to Get Needed Medical Care (WNC Healthy Impact)
(Adults Unable to Get Needed Medical Care at Some Point in the Past Year)
(Western North Carolina, 2012)



Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 14]
Notes: • Asked of all respondents.

Figure 70. "Considering cost, quality, number of options and availability, there is good health care in my county" (WNC Healthy Impact Survey)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 7]
Notes: ● Asked of all respondents.

Health Care Providers

Provider/Population Ratios

One way to judge the supply of health care providers in a jurisdiction is to calculate the ratio of the number of health professionals to the number of persons in the population of that jurisdiction. In NC, there is data on the ratio of active health professionals per 10,000 population calculated at the county level. Table 42 presents those data (which for simplicity's sake will be referred to simply as the "ratio") for Swain County, WNC, state as a whole, and the US for five key categories of health care professionals: physicians, primary care physicians, dentists, registered nurses, and pharmacists. The years covered are 2008 and 2010.

According to this data, the ratio of professionals to population was higher in both years in Swain County than in WNC for all categories except pharmacists. The ratio for primary care physicians in the county was higher than the comparable rate in the other three jurisdictions. It should be noted that the average ratios for WNC are lower than the comparable state averages in every professional category listed in the table, and lower than the comparable national average in every professional category except primary care.

Table 42. Active Health Professionals per 10,000 Population (2008 and 2010)

Geography	2008					2010				
	Phys	Primary Care Phys	Dents	RNs	Pharms	Phys	Primary Care Phys	Dents	RNs	Pharms
Swain County	15.7	12.9	3.6	90.1	5.7	18.5	16.4	3.6	88.5	5.0
Regional Average	15.0	8.9	3.4	75.3	7.0	14.8	8.9	3.4	74.9	6.9
State Average	21.2	9.0	4.3	95.1	9.3	21.7	9.4	4.4	97.4	9.2
National Average	23.2*	8.5*	4.9	91.4	8.0	22.7**	8.2**	5.7	92.0	8.3

* Data are for 2006
** Data are for 2008

Providers by Specialty

Table 43 lists the number of active health care professionals in Swain County and WNC, by specialty, for 2010. From these data it is apparent that there are two categories of professionals absent from Swain County: obstetricians/gynecologists and certified nurse midwives.

Table 43. Active Health Professionals in Swain County and WNC, by Specialty (2010)

Category of Professionals	Swain County	WNC Total
Physicians		
Primary Care Physicians	23	813
Family Practice	14	368
General Practice	1	10
Internal Medicine	3	240
Obstetrics/Gynecology	0	85
Pediatrics	5	110
Other Specialties	3	853
Dentists and Dental Hygienists		
Dentists	5	342
Dental Hygienists	4	479
Nurses		
Registered Nurses	124	7,981
Nurse Practitioners	5	316
Certified Nurse Midwives	0	28
Licensed Practical Nurses	34	1,854
Other Health Professionals		
Chiropractors	1	192
Occupational Therapists	3	242
Occupational Therapy Assistants	3	99
Optometrists	1	84
Pharmacists	7	669
Physical Therapists	5	511
Physical Therapy Assistants	6	309
Physician Assistants	10	290
Podiatrists	1	24
Practicing Psychologists	2	201
Psychological Assistants	2	87
Respiratory Therapists	6	370

Uninsured Population

Table 44 presents data on the proportion of the non-elderly population (ages 19-64) without health insurance of any kind. While there was a 21% increase in the percent of uninsured at the state level from 2006-2007 to 2009-2010, the percent of uninsured adults in WNC decreased from one period to the next throughout the span of years shown in the table. In Swain County the percent of uninsured decreased from 2006-2007 to 2009-2010, but increased the following period.

Table 44. Estimated Percent Uninsured Adults, Ages 19-64 Biennial Periods (2006-2007, 2008-2009, and 2009-2010)

Geography	Percent Uninsured		
	2006-2007	2008-2009	2009-2010
Swain County	23.8	20.8	24.0
Regional Arithmetic Mean	23.4	22.3	22.0
State Total	19.5	23.2	23.6

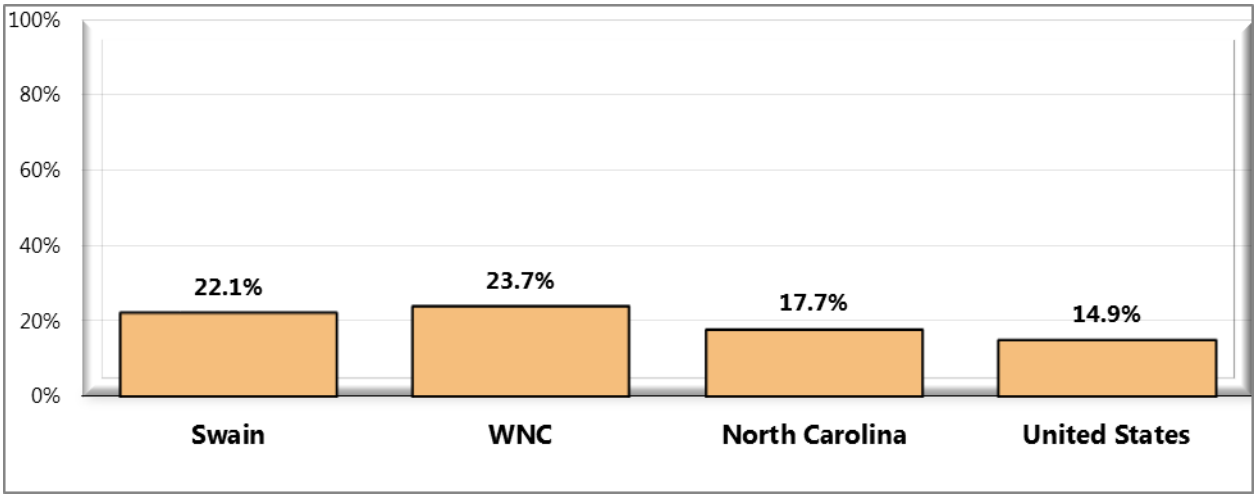
Table 45 shows the percent uninsured for one biennium (2009-2010) stratified by age. This data makes it clear that in Swain County as well as in WNC and NC as a whole, insurance coverage is better for children, among whom the percentage uninsured is less than half the percentage uninsured among the 19-64 age group.

Table 45. Estimated Percent Uninsured, All Ages (2009-2010)

Geography	2009-2010		
	Children (0-18)	Adults (19-64)	Total (0-64)
Swain County	10.0	24.0	19.8
Regional Arithmetic Mean	9.6	22.0	18.6
State Total	10.3	23.6	19.6

Survey data also provides county and regional estimates of health insurance coverage. Lack of health insurance coverage reflects respondents age 18 to 64 (thus, excluding the Medicare population) who have no type of insurance coverage for healthcare services – neither private insurance nor government-sponsored plans (e.g., Medicaid).

Figure 71. Lack of Healthcare Insurance Coverage (WNC Healthy Impact Survey)
(Among Adults 18-64)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 125]
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective AHS-1]

Notes:
- Reflects adults under the age of 65.
- Includes any type of insurance, such as traditional health insurance, prepaid plans such as HMOs, or government-sponsored coverage (e.g., Medicare, Medicaid, Indian Health Services, etc.).

Medicaid Eligibility

Table 46 presents trend data on the number and percent of persons eligible for Medicaid for several state fiscal years. This data demonstrates that in Swain County the number and percent of Medicaid-eligible persons fluctuated without a clear pattern over the period cited. Nevertheless, the percent of Medicaid-eligible Swain County residents was higher than the comparable figures for WNC and NC for each year shown in the figure. With the exception of SFY2007, the mean percent of the WNC population eligible for Medicaid rose from one year to the next throughout the period cited in the table. Note that between SFY2006 and SFY2007 the number in WNC that were Medicaid-eligible rose even if the percentage did not. Further, the mean percent Medicaid-eligible in WNC exceeded the comparable percent eligible statewide for every period cited.

Table 46. Number and Percent of Population Medicaid-Eligible (SFY2004 through SFY2008)

Geography	SFY 2004		SFY 2005		SFY 2006		SFY 2007		SFY 2008	
	#	%	#	%	#	%	#	%	#	%
Swain County	3,461	25.92	3,559	26.42	3,647	26.85	3,574	25.64	3,722	26.80
Regional Total	128,727	-	132,895	-	138,616	-	139,891	-	142,606	-
Regional Arithmetic Mean	16,091	19.90	16,612	20.21	17,327	20.75	17,486	20.52	17,826	20.82
State Total	1,512,360	17.97	1,563,751	18.31	1,602,645	18.46	1,682,028	18.98	1,726,412	19.04

Screening and Prevention

Diabetes

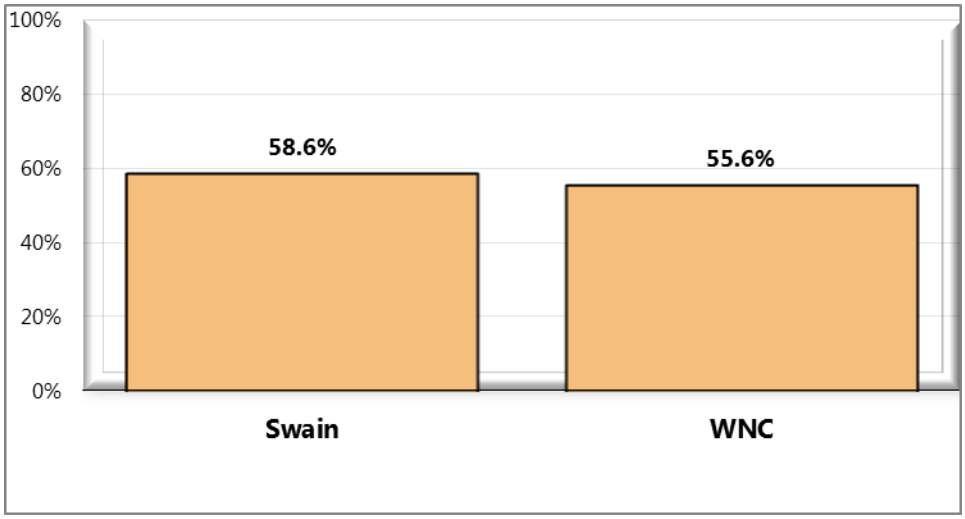
Diabetes mellitus occurs when the body cannot produce or respond appropriately to insulin. Insulin is a hormone that the body needs to absorb and use glucose (sugar) as fuel for the body's cells. Without a properly functioning insulin signaling system, blood glucose levels become elevated and other metabolic abnormalities occur, leading to the development of serious, disabling complications. Many forms of diabetes exist; the three common types are Type 1, Type 2, and gestational diabetes.

Diabetes mellitus affects an estimated 23.6 million people in the United States and is the 7th leading cause of death. Diabetes mellitus:

- Lowers life expectancy by up to 15 years.
- Increases the risk of heart disease by 2 to 4 times.
- Is the leading cause of kidney failure, lower limb amputations, and adult-onset blindness.

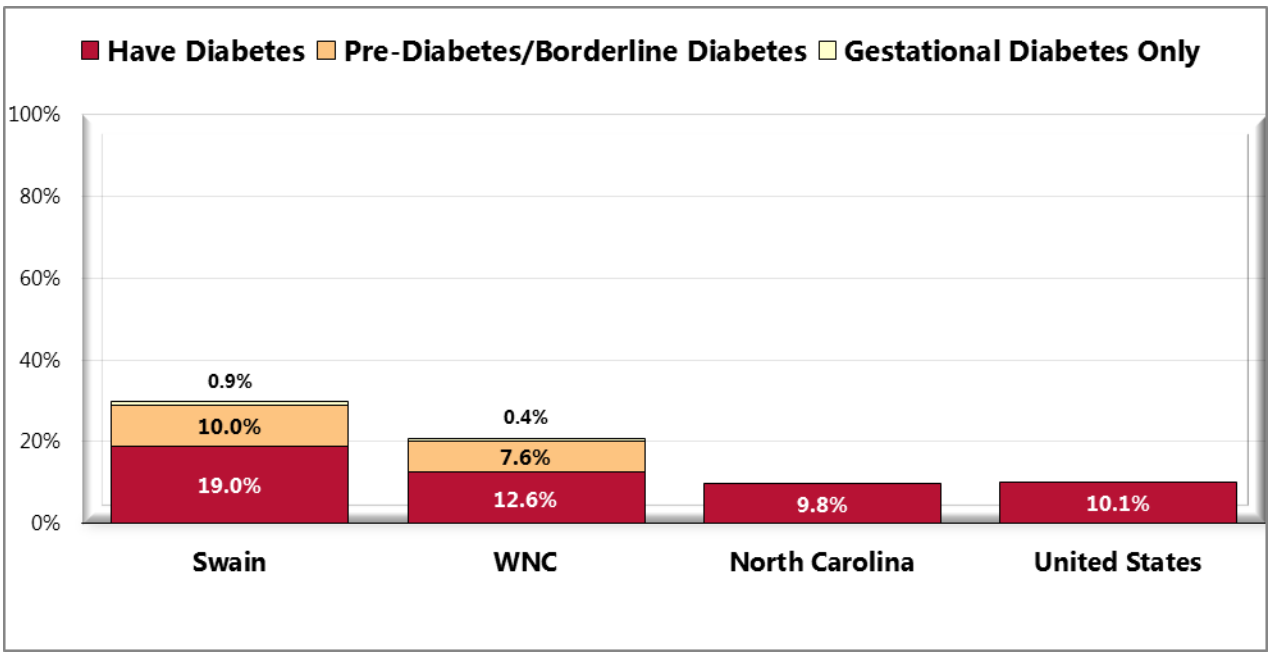
People from minority populations are more frequently affected by type 2 diabetes. Minority groups constitute 25% of all adult patients with diabetes in the US and represent the majority of children and adolescents with type 2 diabetes. Lifestyle change has been proven effective in preventing or delaying the onset of type 2 diabetes in high-risk individuals (DHHS, 2010).

Figure 72. Tested for Diabetes in the Past Three Years (WNC Healthy Impact Survey)
(Among Adults Who Have Not Been Diagnosed With Diabetes)



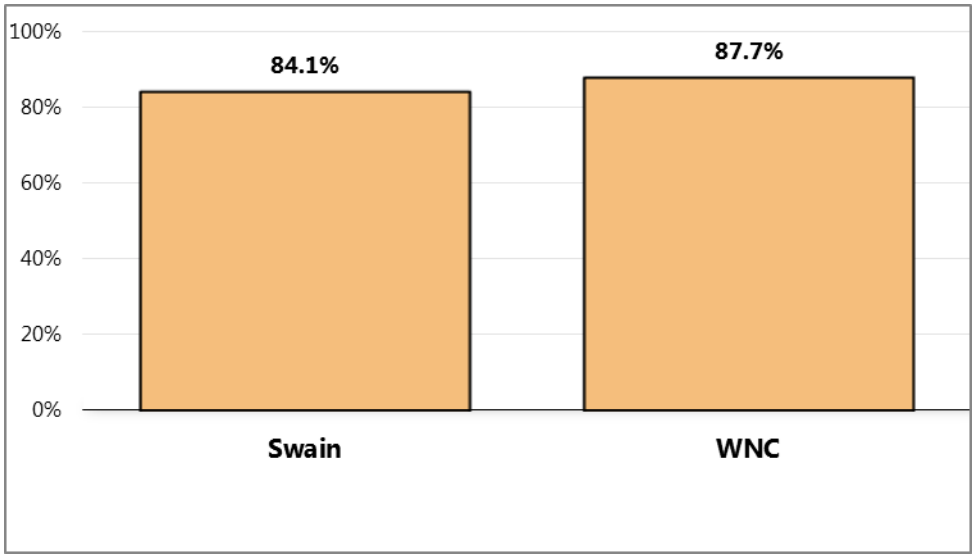
Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 19]
Notes: • Asked of respondents who have never been diagnosed with diabetes; also includes women who have only been diagnosed when pregnant.

Figure 73. Prevalence of Diabetes (Ever Diagnosed)
(WNC Healthy Impact Survey)



Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 78]
• 2011 PRC National Health Survey, Professional Research Consultants, Inc.
• Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.
Notes: • Asked of all respondents.
• Local and national data exclude gestation diabetes (occurring only during pregnancy).

Figure 74. Taking Action to Control Diabetes or Prediabetes (WNC Healthy Impact Survey)
(Among Adults Diagnosed with Diabetes or Prediabetes/Borderline Diabetes)



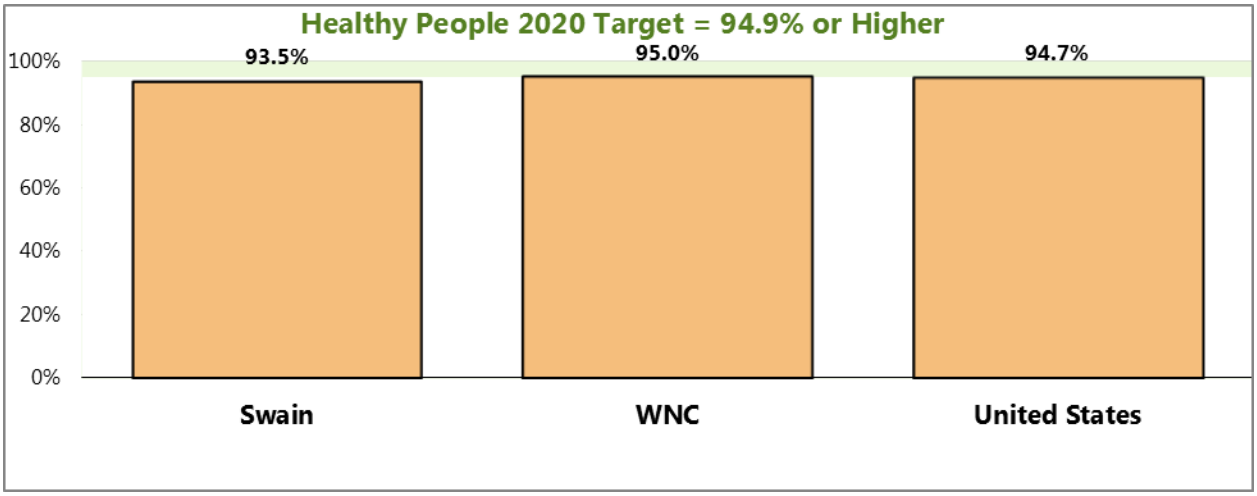
Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 21]

Notes:
- Asked of respondents who have been diagnosed with diabetes or prediabetes/borderline diabetes.
- In this case, the term "action" refers to taking natural or conventional medicines or supplements, diet modification, or exercising.

Hypertension

Controlling risk factors for heart disease and stroke remains a challenge. High blood pressure is still a major contributor to the national epidemic of cardiovascular disease. High blood pressure affects approximately 1 in 3 adults in the United States, and more than half of Americans with high blood pressure do not have it under control (DHHS, 2010).

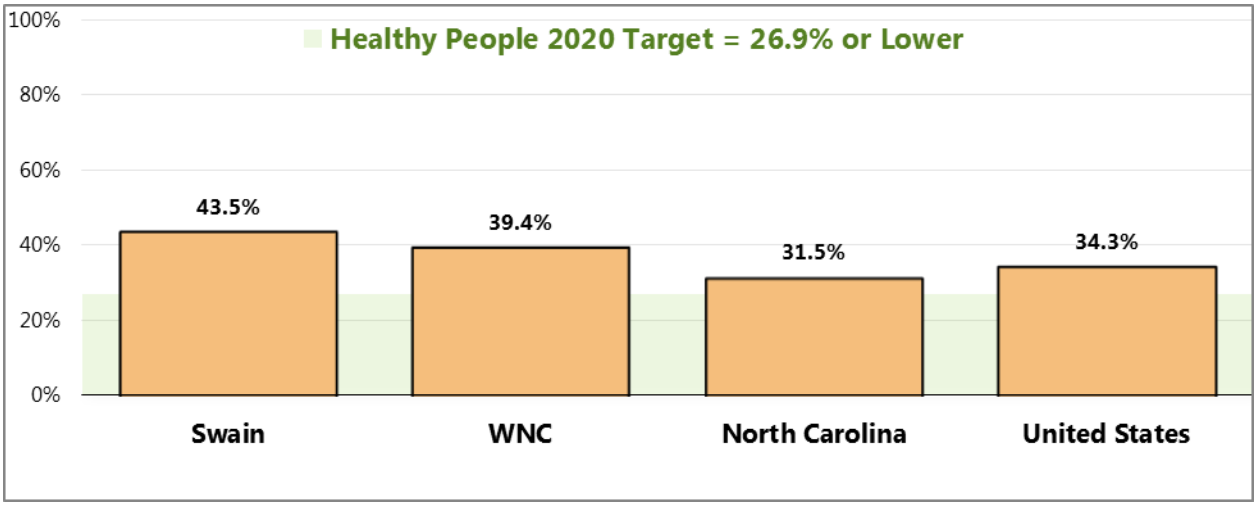
Figure 75. Have Had Blood Pressure Checked in the Past Two Years (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 24]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective HDS-4]

Notes:
- Asked of all respondents.

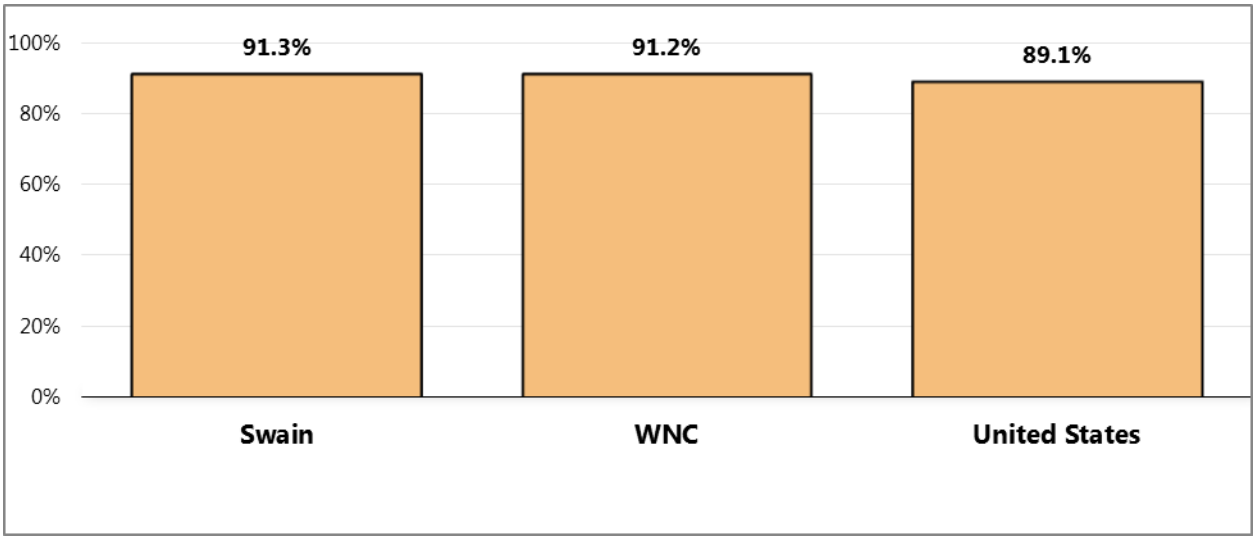
Figure 76. Prevalence of High Blood Pressure (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 76]
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2009 North Carolina data.
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective HDS-5.1]

Notes:
- Asked of all respondents.

Figure 77. Taking Action to Control Hypertension (WNC Healthy Impact Survey)
(Among Adults with High Blood Pressure)



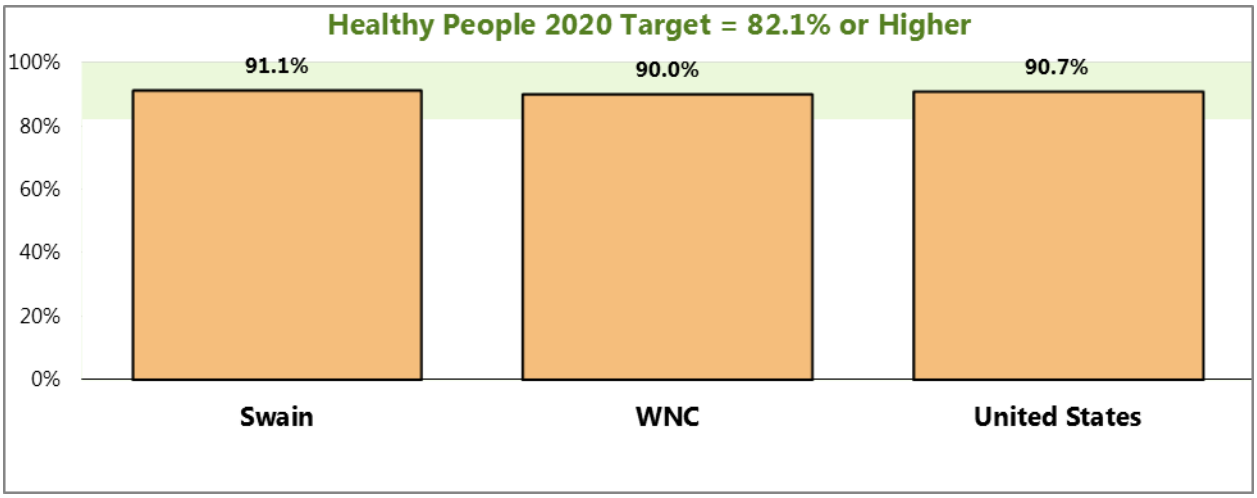
Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 23]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.

Notes:
- Asked of respondents who have been diagnosed with high blood pressure.
- In this case, the term "action" refers to medication, change in diet, and/or exercise.

Cholesterol

Cholesterol is also a major contributor to the national epidemic of cardiovascular disease. Survey respondents were asked a series of questions about their blood cholesterol levels.

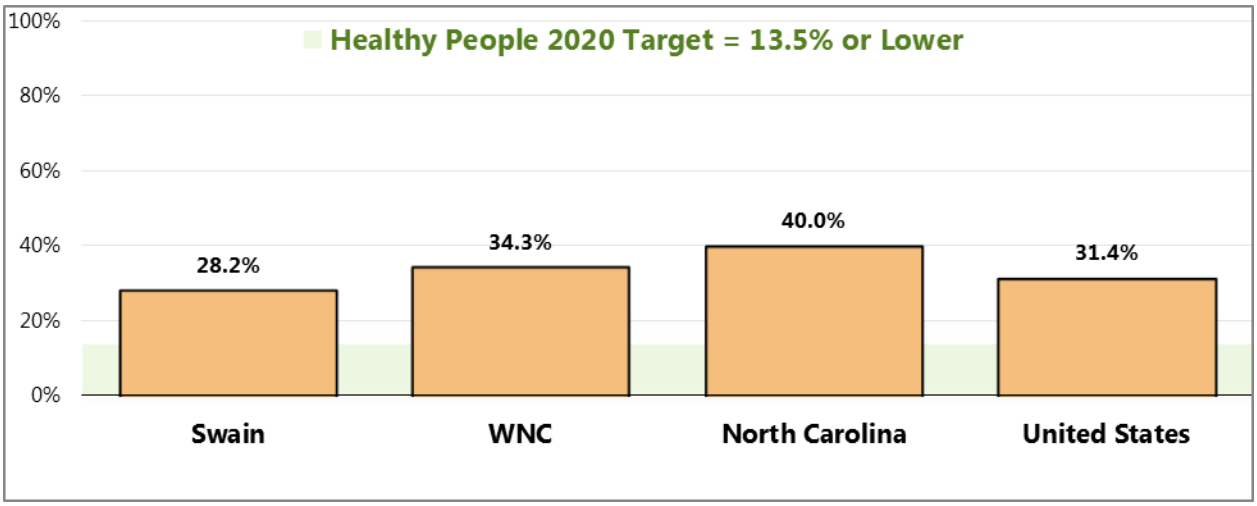
Figure 78. Have Had Blood Cholesterol Levels Checked in the Past Five Years (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 27]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective HDS-6]

Notes:
- Asked of all respondents.

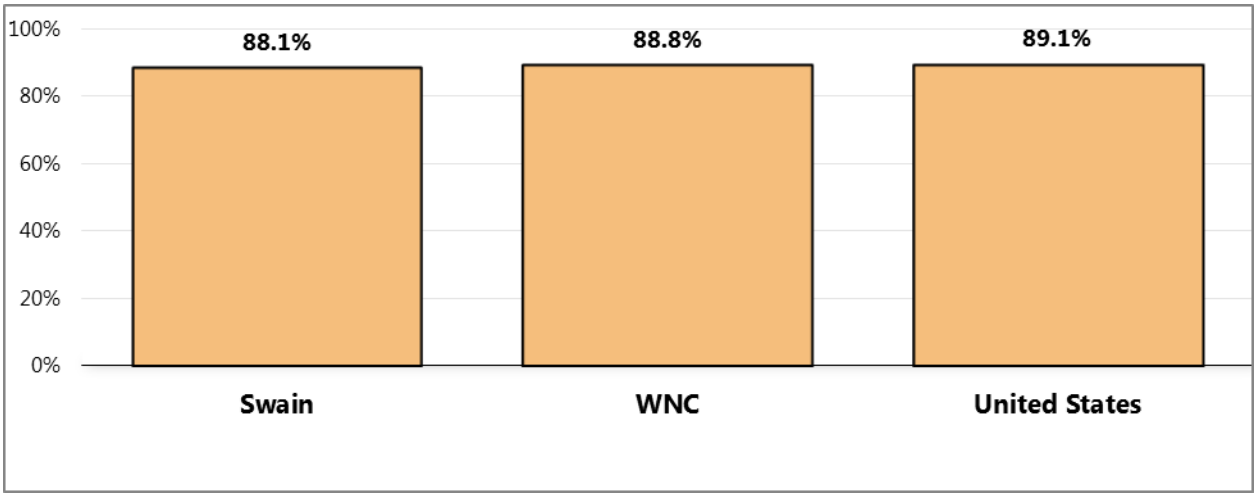
Figure 79. Prevalence of High Blood Cholesterol (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 77]
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2009 North Carolina data.
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective HDS-7]

Notes:
- Asked of all respondents.

Figure 80. Taking Action to Control High Blood Cholesterol (WNC Healthy Impact Survey)
(Among Adults With High Blood Pressure)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 26]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.

Notes:
- Asked of respondents who have been diagnosed with high blood cholesterol.
- In this case, the term "action" refers to medication, change in diet, and/or exercise.

Healthcare Utilization

Why is this Important?

Improving health care services includes increasing access to and use of evidence-based preventive services. Clinical preventive services are services that: **prevent** illness by detecting early warning signs or symptoms before they develop into a disease (primary prevention); or **detect** a disease at an earlier, and often more treatable, stage (secondary prevention) (DHHS, 2010).

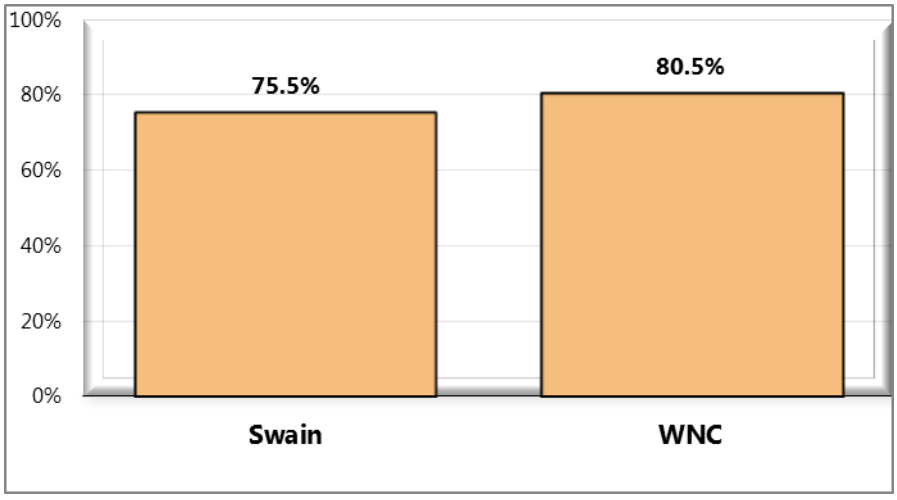
Routine Medical Care

Improving health care services depends in part on ensuring that people have a usual and ongoing source of care. People with a usual source of care have better health outcomes and fewer disparities and costs. Having a primary care provider (PCP) as the usual source of care is especially important. PCPs can develop meaningful and sustained relationships with patients and provide integrated services while practicing in the context of family and community. Having a usual PCP is associated with:

- Greater patient trust in the provider
- Good patient-provider communication
- Increased likelihood that patients will receive appropriate care

Improving health care services includes increasing access to and use of evidence-based preventive services. Clinical preventive services are services that: **prevent** illness by detecting early warning signs or symptoms before they develop into a disease (primary prevention); or **detect** a disease at an earlier, and often more treatable, stage (secondary prevention) (DHHS, 2010).

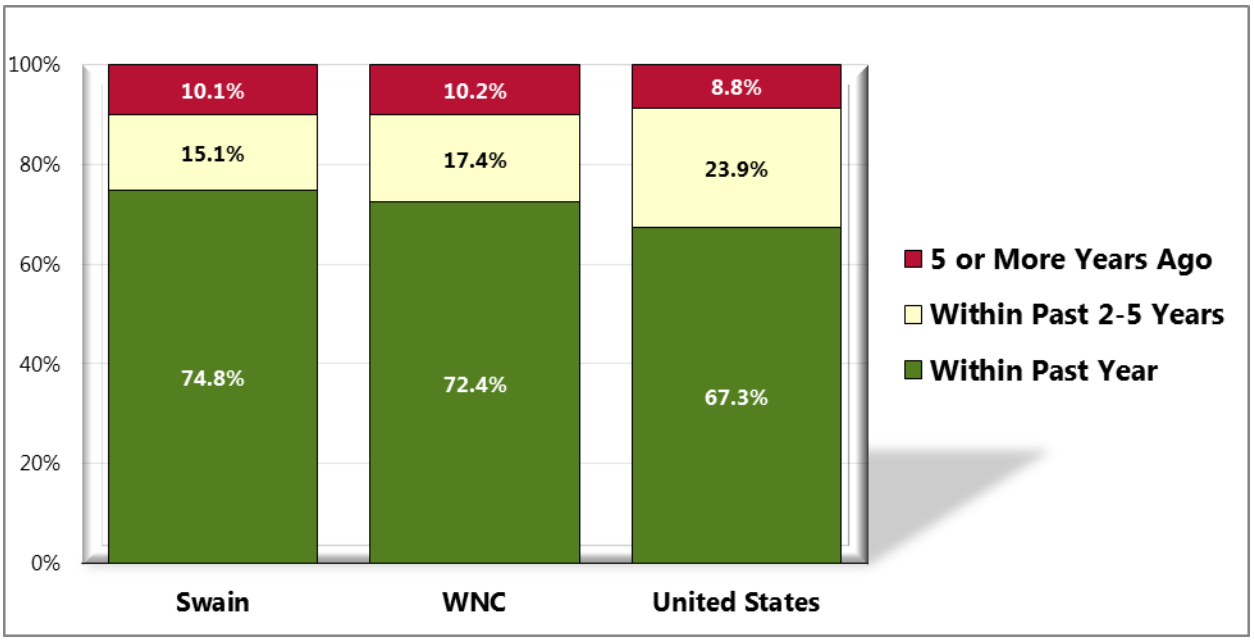
Figure 81. Have One Person Thought of as Respondent's Personal Doctor or Health Care Provider (WNC Healthy Impact Survey)



Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 16]
Notes: • Asked of all respondents.

Figure 82. Length of Time Since Last Routine Check-Up

(WNC Healthy Impact Survey)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 15]
● 2011 PRC National Health Survey, Professional Research Consultants, Inc.
Notes: ● Asked of all respondents.

Emergency Department Utilization

According to data in Table 47, the diagnoses associated with the highest frequency of emergency department visits in Swain County in 2010 were diabetes (9.08% of all ED visits), followed by chest pain/ischemic heart disease (8.47%) and lower respiratory disorders (7.94%). On the regional level, the diagnoses associated with the highest frequency of ED visits were chest pain/ischemic heart disease (11.83% of all ED visits), followed by psychiatric disorders (10.98%) and lower respiratory disorders (9.48%)

Table 47. North Carolina Emergency Department Visits, NC DETECT Data (2010)

Diagnosis	Swain County		WNC Mean
	#	%	%
Chest pain/ischemic heart disease	809	8.47	11.83
Heart failure	111	1.16	2.58
Cardiac arrest	17	0.18	0.14
Lower respiratory disorders	758	7.94	9.48
Diabetes	867	9.08	8.80
Neoplasms	104	1.09	1.57
Dental problems	321	3.36	1.85
Stroke/TIA	53	0.56	0.62
Traumatic brain injury	36	0.38	0.30
Psychiatric disorders	502	5.26	10.98
Substance abuse	243	2.55	2.99
Total ED Visits	9,546	n/a	n/a

Note: for the full description of the disease group diagnosis codes included in each diagnosis line, see the *Data Workbook*.

Table 48 presents a summary of the major emergency department diagnoses for the region according to DRG code. According to this data, the most common first-listed diagnosis codes in emergency departments across the region are abdominal pain (2.37% of all ED visits) and back pain, sprains of the lumbar spice, and sciatica (also 2.37%).

Table 48. Most Common First-Listed Diagnosis Codes in Emergency Departments, WNC
NC DETECT Data
2010

Diagnosis	Diagnosis Codes	# ED Visits	% of Total ED Visits
Abdominal pain	789.0, 789.00, 789.03, 789.09	7,597	2.37
Back pain, sprains of lumbar spine, sciatica	724.2, 724.3, 724.5, 847.2	7,590	2.37
Essential hypertension	401.9	7,490	2.34
Nausea with vomiting or vomiting alone	787.01, 787.03	5,873	1.83
Headache, Migraine, unspecified	784.0, 346.9	5,584	1.74
Acute URI/Pharyngitis, Streptococcal sore throat	034.0, 465.9, 462	5,458	1.70
Cough, Bronchitis	786.2, 466.0, 490	4,703	1.47
Dental caries, periapical abscess, tooth structure, disorders	521.00, 522.5, 525.9	4,210	1.31
UTI	599	4,027	1.26
Fever, Unknown origin	780.6, 780.60	3,285	1.03
Asthma, unspecified	493.90, 439.92	2,823	0.88
Neck sprains/stains	723.1, 847.0	2,728	0.85
Pain in joint	719.41, 719.45, 719.46	2,609	0.81
Pain in limb	729.5	2,486	0.78
Chest pain	786.5, 786.50, 786.59	2,186	0.68
Otitis media	382.9	2,083	0.65
Pneumonia	486	1,934	0.60
Open wound of hand or finger without complication	882.0, 883.0	1,644	0.51
Contusion of face, scalp, and neck except eyes	920	1,622	0.51
Syncope and collapse	780.2	1,552	0.48
TOTAL ED VISITS		320,429	

Inpatient Hospitalizations

Table 49 lists the diagnostic categories accounting for the most cases of inpatient hospitalization for 2010. The source data is based on a patient's county of residence, so the regional totals presented in the table represent the sum of hospitalizations from each of the 16 WNC counties.

According to data in Table 49, the diagnosis resulting in the highest number of cases of hospitalization in 2010 among Swain County residents was respiratory diseases, including pneumonia/influenza and chronic obstructive pulmonary disease, which accounted for 332 hospitalizations. The next highest number of hospitalizations was for cardiovascular and circulatory diseases, including heart disease and cerebrovascular disease (308 cases), followed by digestive diseases, including chronic liver disease and cirrhosis (283 cases).

Table 49. Inpatient Hospital Utilization by Swain County Residents, by Principal Diagnoses Excluding Newborns and Discharges from Out-of-State Hospitals (2011)

Diagnostic Category	Total # Cases		
	Swain County	Region	North Carolina
INFECTIOUS & PARASITIC DISEASES	77	2,741	41,705
-- Septicemia	39	1,604	27,412
-- AIDS	3	41	1,456
MALIGNANT NEOPLASMS	59	2,599	31,225
-- Colon, Rectum, Anus	10	324	3,770
-- Trachea, Bronchus, Lung	13	346	4,541
-- Female Breast	1	157	1,498
-- Prostate	2	192	2,505
BENIGN, UNCERTAIN & OTHER NEOPLASMS	15	650	8,948
ENDOCRINE, METABOLIC & NUTRITIONAL DISEASES	151	2,905	40,208
-- Diabetes	75	1,240	18,101
BLOOD & HEMOPOETIC TISSUE DISEASES	22	770	14,011
NERVOUS SYSTEM & SENSE ORGAN DISEASES	43	1,597	19,315
CARDIOVASCULAR & CIRCULATORY DISEASES	308	12,961	162,327
-- Heart Disease	205	9,006	108,060
-- Cerebrovascular Disease	51	2,259	29,429
RESPIRATORY DISEASES	332	8,683	93,891
-- Pneumonia/Influenza	137	3,089	29,852
-- Chronic Obstructive Pulmonary Disease	69	2,557	30,832
DIGESTIVE SYSTEM DISEASES	283	8,527	95,068
-- Chronic Liver Disease/Cirrhosis	8	178	2,361
GENITOURINARY DISEASES	133	4,123	45,978
-- Nephritis, Nephrosis, Nephrotic Synd.	33	1,036	14,368
PREGNANCY & CHILDBIRTH	281	7,921	125,271
SKIN & SUBCUTANEOUS TISSUE DISEASES	62	1,287	17,734
MUSCULOSKELETAL SYSTEM DISEASES	117	5,950	58,753
-- Arthropathies and Related Disorders	59	3,155	30,683
CONGENITAL MALFORMATIONS	8	294	3,318
PERINATAL COMPLICATIONS	14	198	4,035
SYMPTOMS, SIGNS & ILL-DEFINED CONDITIONS	167	3,916	48,299
INJURIES & POISONING	198	7,474	78,637
OTHER DIAGNOSES (INCL. MENTAL DISORDERS)	143	7,329	84,657
ALL CONDITIONS	2,413	79,925	973,380

Source: *Inpatient Hospital Utilization and Charges by Principal Diagnosis, and County of Residence, North Carolina, 2010 (Excluding Newborns & Discharges from Out of State Hospitals)* Retrieved June 20, 2012, from North Carolina State Center for Health Statistics (NC SCHS), 2012 County Health Data Book website: http://www.schs.state.nc.us/schs/data/databook/

Dental Services

The significant improvement in the oral health of Americans over the past 50 years is a public health success story. Most of the gains are a result of effective prevention and treatment efforts. One major success is community water fluoridation, which now benefits about 7 out of 10 Americans who get water through public water systems. However, some Americans do not have access to preventive programs. People who have the least access to preventive services and dental treatment have greater rates of oral diseases. A person's ability to access oral healthcare is associated with factors such as education level, income, race, and ethnicity.

Why is this Important?

Oral health is essential to overall health. Good oral health improves a person's ability to speak, smile, smell, taste, touch, chew, swallow, and make facial expressions to show feelings and emotions. However, oral diseases, from cavities to oral cancer, cause pain and disability for many Americans. Good self-care, such as brushing with fluoride toothpaste, daily flossing, and professional treatment, is key to good oral health. Health behaviors that can lead to poor oral health include:

- Tobacco use
- Excessive alcohol use
- Poor dietary choices

(County Health Rankings and Roadmaps)

There are also social determinants that affect oral health. In general, people with lower levels of education and income, and people from specific racial/ethnic groups, have higher rates of disease. People with disabilities and other health conditions, like diabetes, are more likely to have poor oral health. (DHHS, 2010.)

Utilization of Dental Services by the Medicaid Population

Table 50 presents data on the percent of the Medicaid population eligible for dental care that utilizes it. This data represents the Medicaid population of all ages, but split into under-age-21 and age-21-and over-categories. In all three jurisdictions the Medicaid population under age 21 appears to be more likely to utilize dental services than the population age 21 and older. The figures for Swain County are lower than in the other two jurisdictions.

Table 50. Medicaid Recipients Receiving Dental Services, All Ages (2010)

Geography	Medicaid Recipients Utilizing Dental Services (by Ages Group)					
	<21 Years Old			21+ Years Old		
	# Eligible for Services	# Receiving Services	% Eligibles Receiving Services	# Eligible for Services	# Receiving Services	% Eligibles Receiving Services
Swain County	2,340	755	32.3	1,751	381	21.8
Regional Total	85,652	42,135	49.2	62,817	18,536	29.5
State Total	1,113,692	541,210	48.6	679,139	214,786	31.6

Table 51, focusing only on children ages 1-5, helps in understanding why utilization in the under 21 age group is so high. In this youngest age group, half or more of the eligible population in WNC and NC received dental services; in Swain County the comparable percentage was just 34.9%, but it was still higher than the overall percentage for the under 21 age group.

Table 51. Medicaid-Recipients Receiving Dental Services, Ages 1-5 (2010)

Geography	Children (aged 1-5) Enrolled in Medicaid Who Received Any Dental Service In the Previous 12 Months)		
	# Eligible for Services*	# Receiving Services**	% Eligibles Receiving Services
Swain County	743	259	34.9
Regional Total	26,820	14,407	53.7
State Total	n/a	n/a	51.7

Dental Screening Results among Children

Table 52 presents 2009 dental screening results for kindergarteners. While the screening process captures other data, this data covers only the average number of decayed, missing or filled teeth. The average number of decayed, missing or filled teeth discovered among kindergarteners screened in Swain County (1.99 per child) was 9% lower than the mean percentage for WNC (2.18) but 33% higher than the state average (1.50).

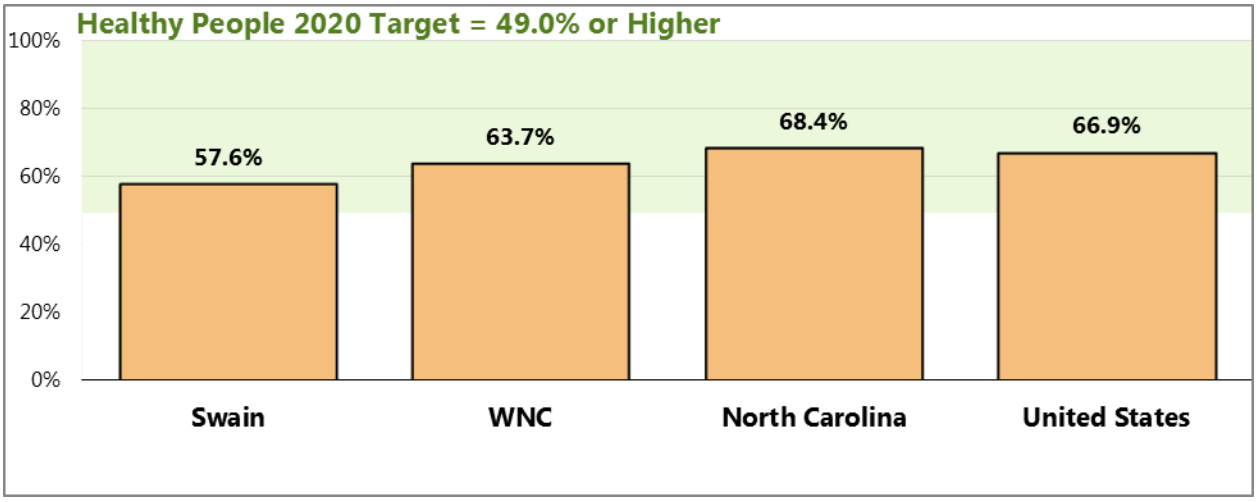
Table 52. Dental Screening Results, Kindergarteners (2009)

Geography	Average # Decayed, Missing or Filled Teeth
Swain County	1.99
Regional Arithmetic Mean	2.18
State Total	1.50

Utilization of Preventive Dental Care

Survey respondents were asked, "About how long has it been since you last visited a dentist or a dental clinic for any reason? This includes visits to dental specialists, such as orthodontists."

Figure 83. Have Visited a Dentist or Dental Clinic Within the Past Year (WNC Healthy Impact Survey)



Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 17]
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective OH-7]
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2010 North Carolina data.

Notes:
- Asked of all respondents.

Mental Health

Mental health is a state of successful performance of mental function, resulting in productive activities, fulfilling relationships with other people, and the ability to adapt to change and to cope with challenges. Mental health is essential to personal well-being, family and interpersonal relationships, and the ability to contribute to community or society. Mental disorders are health conditions that are characterized by alterations in thinking, mood, and/or behavior that are associated with distress and/or impaired functioning. Mental disorders contribute to a host of problems that may include disability, pain, or death. Mental illness is the term that refers collectively to all diagnosable mental disorders.

Mental disorders are among the most common causes of disability. The resulting disease burden of mental illness is among the highest of all diseases. According to the national Institute of Mental Health (NIMH), in any given year, an estimated 13 million American adults (approximately 1 in 17) have a seriously debilitating mental illness. Mental health disorders are the leading cause of disability in the United States and Canada, accounting for 25% of all years of life lost to disability and premature mortality. Moreover, suicide is the 11th leading cause of death in the United States, accounting for the deaths of approximately 30,000 Americans each year.

Mental health and physical health are closely connected. Mental health plays a major role in people's ability to maintain good physical health. Mental illnesses, such as depression and anxiety, affect people's ability to participate in health-promoting behaviors. In turn, problems with physical health, such as chronic diseases, can have a serious impact on mental health and decrease a person's ability to participate in treatment and recovery.

In addition to advancements in the prevention of mental disorders, there continues to be steady progress in treating mental disorders as new drugs and stronger evidence-based outcomes become available (DHHS, 2010).

The unit of NC government responsible for overseeing mental health services is the Division of Mental Health, Developmental Disabilities and Substance Abuse Services (DMH/DD/SAS). The NC mental health system is built on a system of Local Management Entities (LMEs)—area authorities or county programs—responsible for managing, coordinating, facilitating and monitoring the provision of MH/DD/SAS services in the catchment area served. There are two LMEs serving the population in WNC: Smoky Mountain Center and Western Highlands Network (NC Division of Mental Health, August 2012).

Mental Health Service Utilization Trends

Table 53 presents figures on the numbers of persons receiving services in Area Mental Health Programs in 2006 through 2010. No clear pattern of service utilization is apparent from this data in any of the three jurisdictions. It should be noted that the mental health system in NC is in some disarray, as reform of the recent past is being reconsidered.

Table 53. Persons Served in Area Mental Health Programs (2006-2010)

Geography	# Persons Served in Area Mental Health Programs				
	2006	2007	2008	2009	2010
Swain County	**852**	**1,029**	**1,128**	**657**	**667**
Regional Total	30,952	31,271	28,380	24,527	28,453
State Total	322,397	315,338	306,907	309,155	332,796

Table 54 presents figures on the numbers of persons receiving services in NC state alcohol and drug treatment centers. Although the pattern of increase is not straight-line, it appears that increasing numbers of persons in WNC have received services from NC state alcohol and drug treatment centers since 2007. Noteworthy at the regional level was a 23% increase in persons being served between 2009 and 2010. There was no clear pattern discernible in the data for Swain County.

Table 54. Persons Served in NC State Alcohol and Drug Treatment Centers (2006-2010)

Geography	# Persons Served in NC Alcohol and Drug Treatment Centers				
	2006	2007	2008	2009	2010
Swain County	**14**	**8**	**6**	**1**	**6**
Regional Total	664	604	774	751	921
State Total	4,003	3,733	4284	4,812	4,483

Table 55 presents figures on the numbers of persons receiving services in NC state psychiatric hospitals. The number of persons in Swain County utilizing these services fell 77% from 2006 to 2010. The number of persons in WNC receiving these services also fell. The number of persons in WNC utilizing state psychiatric hospital services in 2010 (564) was 63% lower than the number utilizing services in 2006 (1,509). The decrease in persons receiving services likely is a reflection of a decreasing availability of state services, rather than a decreasing need for services.

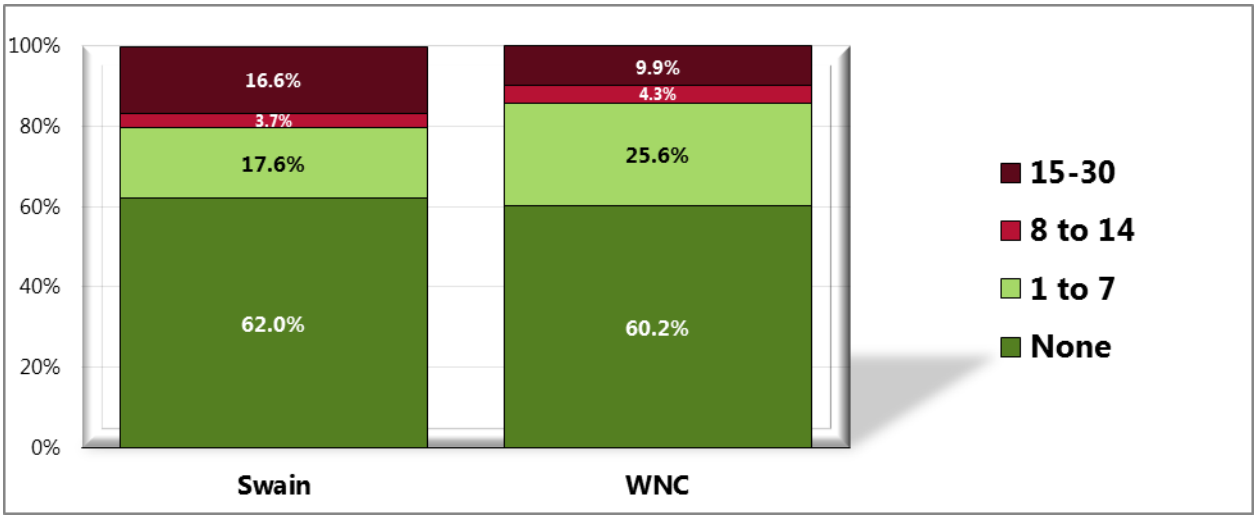
Table 55. Persons Served in NC State Psychiatric Hospitals (2006-2010)

Geography	# Persons Served in NC State Psychiatric Hospitals				
	2006	2007	2008	2009	2010
Swain County	**31**	**17**	**18**	**17**	**7**
Regional Total	1,509	1,529	1190	818	564
State Total	18,292	18,498	14643	9,643	7,188

Poor Mental Health Days

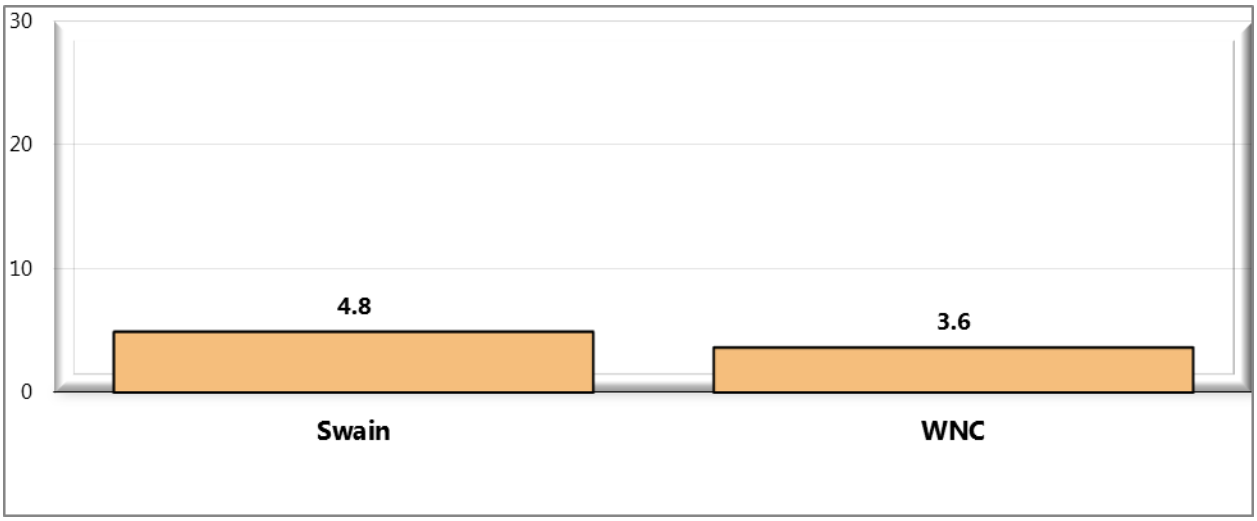
Survey respondents were asked, "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many of the past 30 days was your mental health not good?"

Figure 84. Number of Days in the Past 30 Days on Which Mental Health Was Not Good (WNC Healthy Impact Survey)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 64]
Notes: ● Asked of all respondents.

Figure 85. Average Number of the Past 30 Days on Which Mental Health Was Not Good (WNC Healthy Impact Survey)

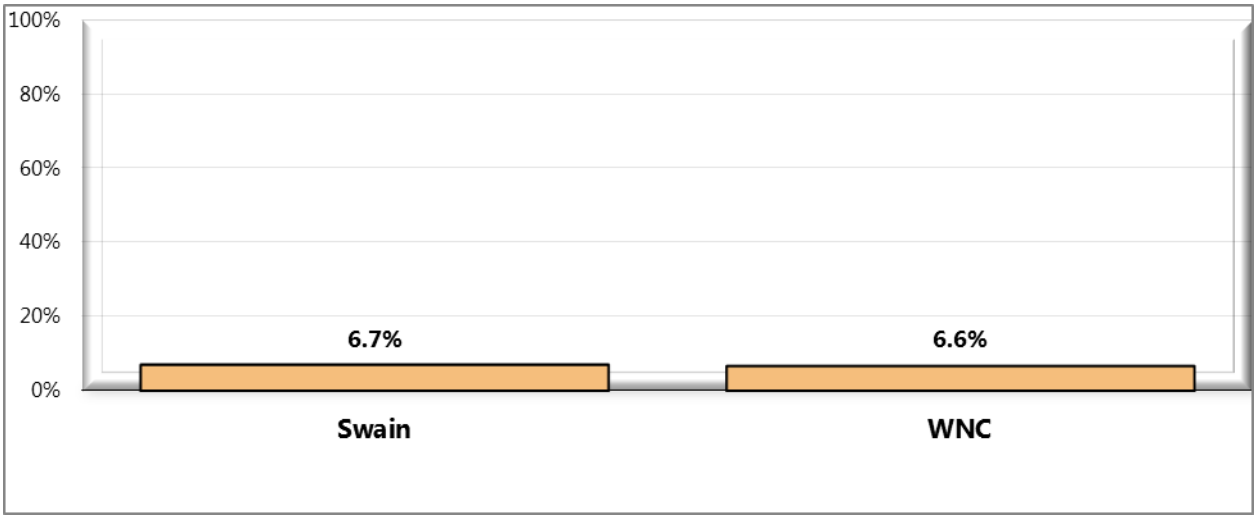


Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 64]
Notes: ● Asked of all respondents.

Access to Mental Health Services

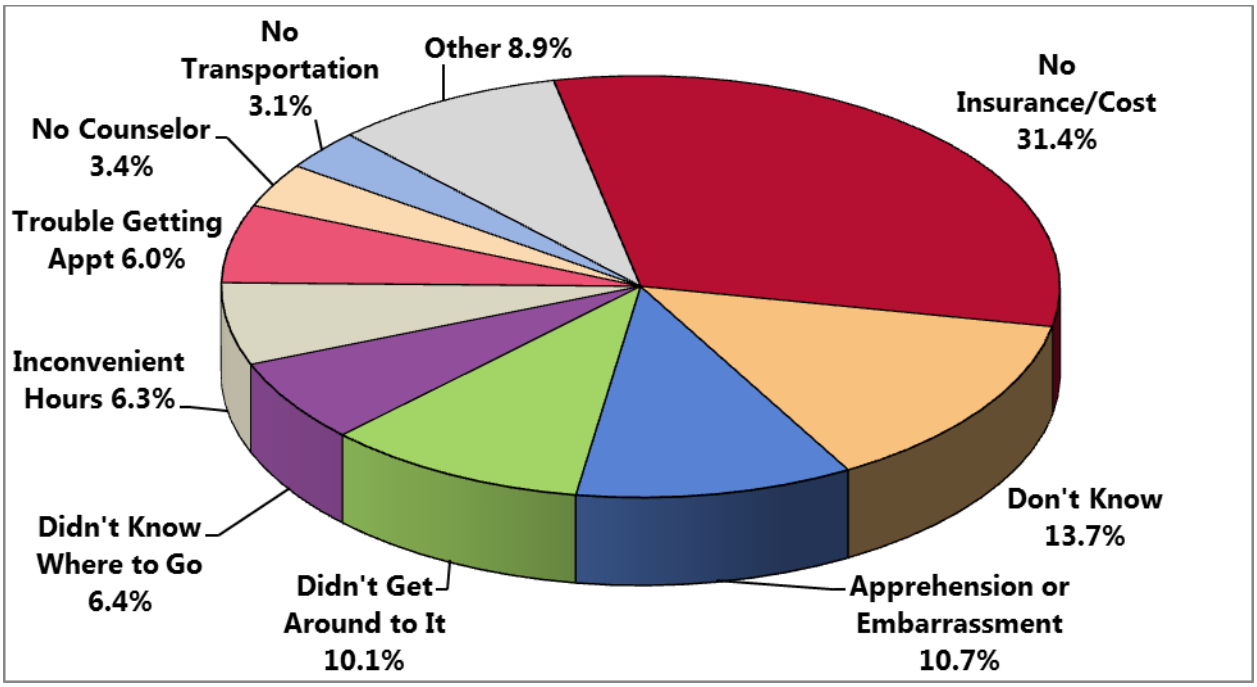
Survey respondents were asked if they had a time in the past year when they needed mental health care or counseling, but did not get it at that time. Those who responded, "yes," were asked to name the main reason they did not get mental health care or counseling. Due to small county-level sample sizes, responses to the latter question are displayed below for the region.

Figure 86. Had a Time in the Past Year When Mental Health Care or Counseling Was Needed, But Was Unable to Get It (WNC Healthy Impact Survey)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 65]
Notes: ● Asked of all respondents.

Figure 87. Primary Reason for Inability to Access Mental Health Services (WNC Healthy Impact Survey)
(Adults Unable to Get Needed Mental Health Care in the Past Year)
(Western North Carolina, 2012)

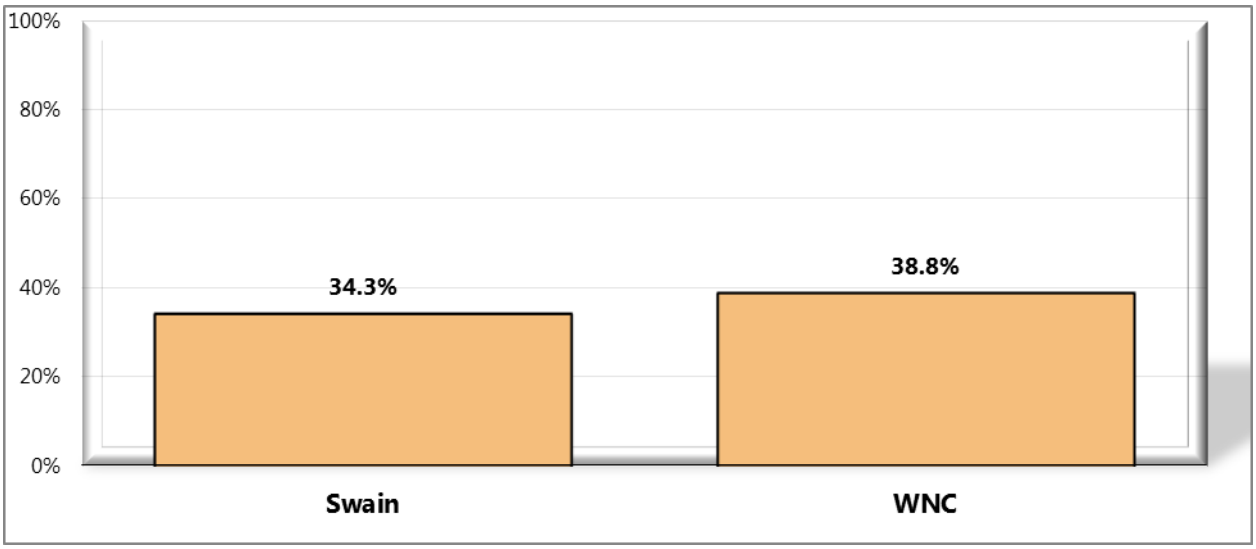


Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 66]
Notes: ● Asked of those respondents who were unable to get needed mental health care in the past year.

Advance Directives

An Advance Directive is a set of directions given about the medical care a person wants if he/she ever loses the ability to make decisions for him/herself. Formal Advance Directives include Living Wills and Healthcare Powers of Attorney. Survey respondents were asked whether they have any completed Advance Directive documents, and if so, if they have communicated these health care decisions to their family or doctor.

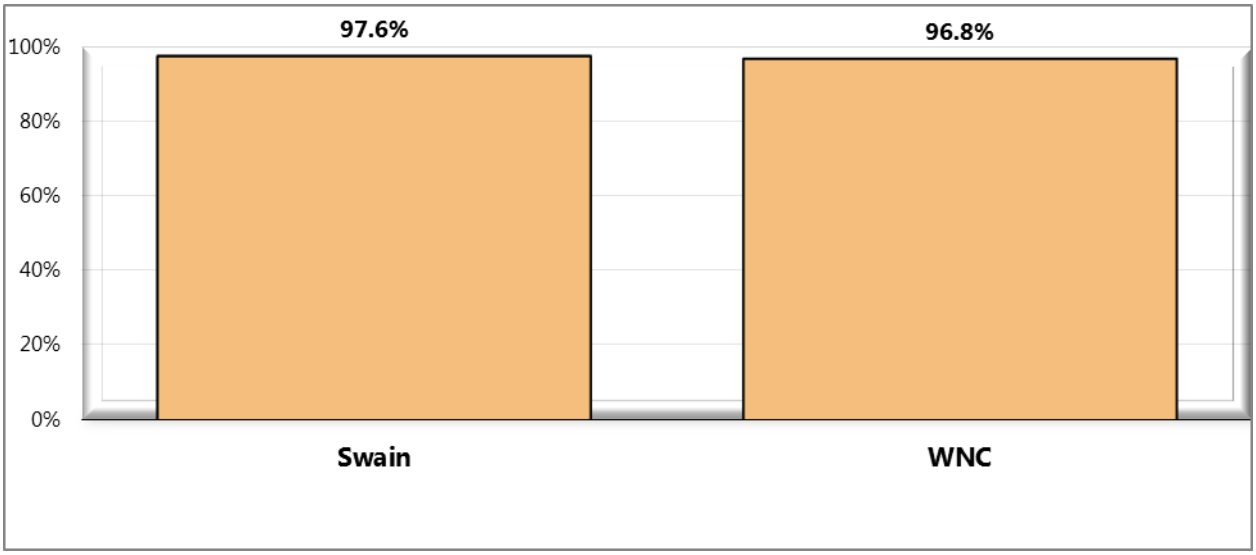
Figure 88. Have Completed Advance Directive Documents (WNC Healthy Impact Survey)



Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 34]
Notes: • Asked of all respondents.

Figure 89. Have Communicated Health Care Decisions to Family or Doctor (WNC Healthy Impact Survey)

(Among Respondents with Advance Directive Documents)

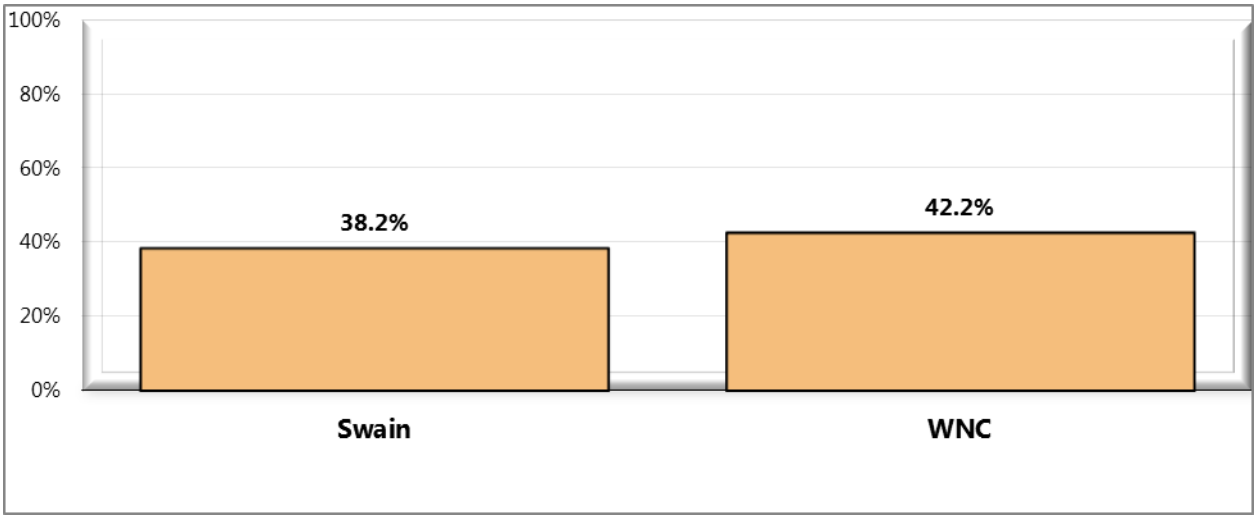


Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 35]
Notes: ● Asked of respondents with completed advance directive documents.

Care-giving

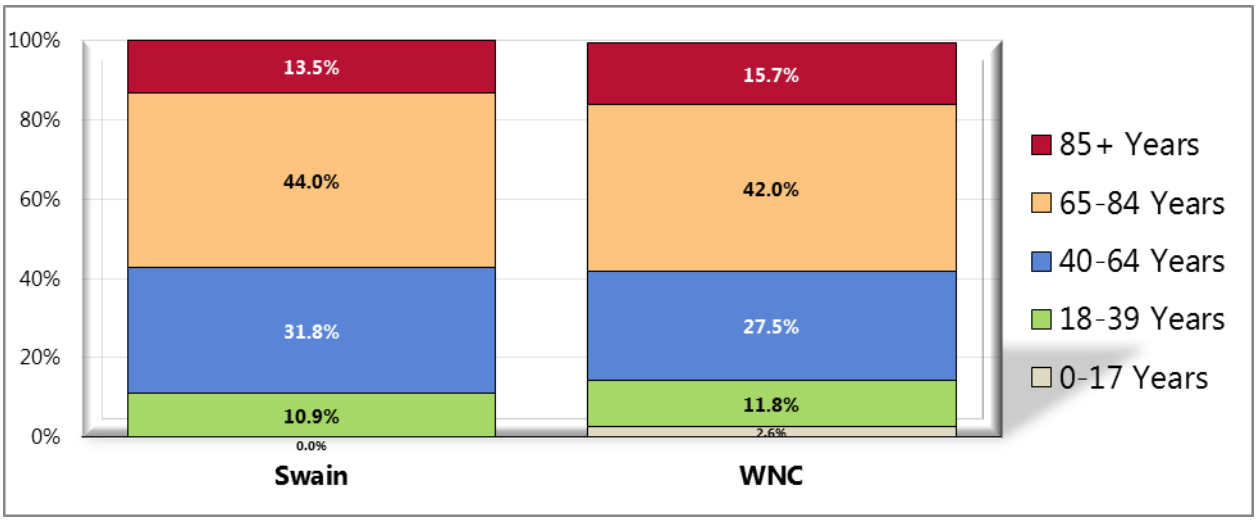
People may provide regular care or assistance to a friend or family member who has a health problem, long-term illness, or disability. Respondents were asked, "During the past month, did you provide any such care or assistance to a friend or family member?" Those who answered, "yes," were asked for the age, primary health issue, and the primary type of assistance needed by the person for whom the respondent provides care.

Figure 90. Provide Regular Care or Assistance to a Friend/Family Member Who Has a Health Problem or Disability (WNC Healthy Impact Survey)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 69]
Notes: ● Asked of all respondents.

Figure 91. Age of Person for Whom Respondent Provides Care (WNC Healthy Impact Survey)
(Among Respondents Acting as a Caregiver for a Friend/Family Member)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 70]
Notes: ● Asked of respondents acting as a caregiver for a friend or family member.

Table 56. Primary Health Issue of Person for Whom Respondent Provides Care (WNC Healthy Impact Survey)

(Among Respondents Acting as a Caregiver for a Friend/Family Member)

Sources: ● 2012 PRC Community Health Survey, Professional Research C

	Aging	Alzheimers /Dementia	Cancer	Diabetes	Emotional/ Mental	Heart Disease	Stroke	Other (Each <4%)	Don't Know/Not Sure
Swain	3.9%	3.5%	5.5%	10.4%	0.0%	4.9%	2.9%	54.4%	14.5%
WNC	7.9%	8.4%	8.6%	4.3%	4.8%	7.4%	4.9%	46.3%	7.4%

onsultants, Inc. [Item 71]

Notes: ● Asked of respondents acting as a caregiver for a friend or family member.

Table 57. Primary Type of Assistance Needed by Person for Whom Respondent Provides Care (WNC Healthy Impact Survey)

(Among Respondents Acting as a Caregiver for a Friend/Family Member)

	Other (Each <2%)	Learning/ Remembering	Communi-cating	Moving Around the Home	Taking Care of Living Space	Taking Care of Self	Help with Anxiety/ Depression	Transportation Outside Home
Swain	0.6%	2.6%	4.6%	7.3%	42.0%	16.1%	7.0%	19.7%
WNC	2.0%	3.8%	3.9%	6.3%	18.5%	20.1%	20.9%	24.5%

Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 72]

Notes: ● Asked of respondents acting as a caregiver for a friend or family member.

CHAPTER 6 – PHYSICAL ENVIRONMENT

Air Quality

Outdoor Air Quality

Nationally, outdoor air quality monitoring is the responsibility of the Environmental Protection Agency (EPA); most of the following information and data originate with that agency. In NC, the agency responsible for monitoring air quality is the Division of Air Quality (DAQ) in the NC Department of Environment and Natural Resources (NC DENR).

The EPA categorizes outdoor air pollutants as "criteria air pollutants" (CAPs) and "hazardous air pollutants" (HAPs). Criteria air pollutants (CAPS), which are covered in this report, are six chemicals that can injure human health, harm the environment, or cause property damage: carbon monoxide, lead, nitrogen oxides, particulate matter, ozone, and sulfur dioxide. The EPA has established National Ambient Air Quality Standards (NAAQS) that define the maximum legally allowable concentration for each CAP, above which human health may suffer adverse effects (US Environmental Protection Agency, 2012).

The impact of CAPs in the environment is described on the basis of emissions, exposure, and health risks. A useful measure that combines these three parameters is the *Air Quality Index* (AQI).

The AQI is an information tool to advise the public. The AQI describes the general health effects associated with different pollution levels, and public AQI alerts (often heard as part of local weather reports) include precautionary steps that may be necessary for certain segments of the population when air pollution levels rise into the unhealthy range. The AQI measures concentrations of five of the six criteria air pollutants and converts the measures to a number on a scale of 0-500, with 100 representing the NAAQS standard. An AQI level in excess of 100 on a given day means that a pollutant is in the unhealthy range that day; an AQI level at or below 100 means a pollutant is in the "satisfactory" range (AIRNow, 2011). Table 58 defines the AQI levels.

Table 58. General Health Effects and Cautionary Statements, Air Quality Index

Index Value	Descriptor	Color Code	Meaning
Up to 50	Good	Green	Air quality is satisfactory, and air pollution poses little or no risk.
51 to 100	Moderate	Yellow	Air quality is acceptable; however, for some pollutants there may be a moderate heath concern for a very small number of people who are unusually sensitive to air pollution.
101 to 150	Unhealthy for sensitive groups	Orange	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
151 to 200	Unhealthy	Red	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
201-300	Very unhealthy	Purple	Health alert: everyone may experience more serious health effects.
301-500	Hazardous	Maroon	Health warnings of emergency conditions. The entire population is more likely to be affected.

Source: AIRNow, Air Quality Index (AQI) – A Guide to Air Quality and Your Health; http://airnow.gov/index.cfm?action=aqibasics.aqi

The EPA reports AQI measures for nine of the 16 counties in the WNC region: Buncombe, Haywood, Graham, Jackson, Macon, McDowell, Mitchell, Swain and Yancey. The WNC figures presented in Tables 59 and 60 below represent the arithmetic means of the values for those nine counties. Data in Table 59 shows that there were no days rated "very unhealthy" or "unhealthy" in 2011, and only one day was rated "unhealthy for sensitive groups". Of the 2011 mean of 275 days in WNC with an assigned AQI, 227 had "good" air quality and 47 had "moderate" air quality. Of the 362 monitored days in Swain County, 295 had "good" air quality and 67 had "moderate" air quality.

Table 59. Air Quality Index Summary, WNC (2011)

Geography	No. Days with AQI	Number of Days When Air Quality Was:				
		Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy
Swain County	362	295	67	0	0	0
Regional Arithmetic Mean	275	227	47	1	0	0

Table 60 lists the pollutants causing the air quality deficiencies. This data shows that in WNC in 2011 the primary air pollutants were ozone (O_3) and small particulate matter ($PM_{2.5}$).

Ozone, the major component of smog, is not usually emitted directly but rather formed through chemical reactions in the atmosphere. Peak O_3 levels typically occur during the warmer and sunnier times of the day and year. The potential health effects of ozone include damage to lung tissues, reduction of lung function and sensitization of lungs to other irritants (Scorecard, 2011).

Particulate matter is usually categorized on the basis of size, and includes dust, dirt, soot, smoke, and liquid droplets emitted directly into the air by factories, power plants, construction activity, fires and vehicles. Particulates in air can affect breathing, aggravate existing respiratory and cardiovascular disease, and damage lung tissue (Scorecard, 2011).

Table 60. CAPs Causing Air Quality Problems, WNC (2011)

Geography	No. Days with AQI	Number of Days When Air Pollutant Was:					
		CO	NO_2	O_3	SO_2	$PM_{2.5}$	PM_{10}
Swain County	362	0	0	96	0	266	0
Regional Arithmetic Mean	275	0	0	156	0	118	0

Toxic Chemical Releases

Over 4 billion pounds of toxic chemicals are released into the nation's environment each year. The US Toxic Releases Inventory (TRI) program, created in 1986 as part of the Emergency Planning and Community Right to Know Act, is the tool the EPA uses to track these releases. Approximately 20,000 industrial facilities are required to report *estimates* of their environmental releases and waste generation annually to the TRI program office. These reports do not cover all toxic chemicals, and they omit pollution from motor vehicles and small businesses (US Environmental Protection Agency, 2012).

According to EPA data, twelve of the 16 WNC counties had measurable TRI releases in 2010. (Only Clay, Madison, Polk and Transylvania Counties did not.) In 2010, Haywood County in WNC was the eighth leading emitter of TRIs in NC in terms of tonnage of TRI chemicals released. Although not among the "top ten", Rutherford County, also in WNC, ranks just off the list, at number eleven. (No other WNC county ranks higher than 21st.) The *Data Workbook* presents detail on toxic chemical releases in all 16 WNC counties.

Table 61 presents the 2010 TRI Summary for Swain County, which is not listed among the state's 86 ranked counties. The TRI chemical released in the greatest quantity in Swain County was diisocyanates, from Consolidated Metco, Inc. in Bryson City.

Table 61. Toxic Release Inventory (TRI) Summary, Swain County, 2010

Total On-and Off-Site Disposal or Other Released, in Pounds	Compounds Released in Greatest Quantity	Quantity Released, in Pounds	Releasing Facility	Facility Location
40	Diisocyanates	40	Consolidated Metco Inc.	Bryson City

Indoor Air Quality

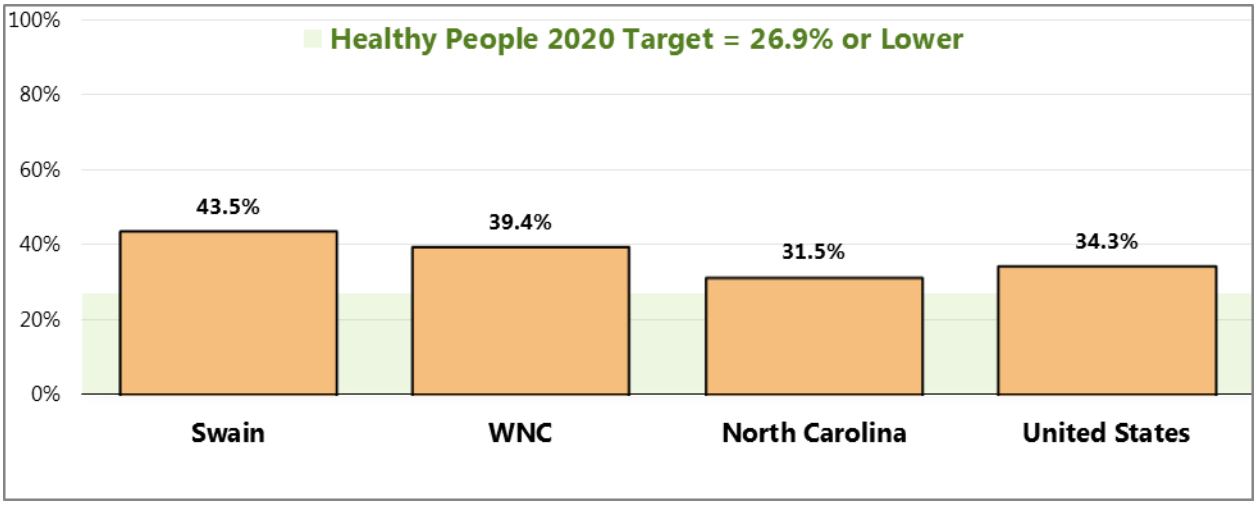
Environmental tobacco smoke

Tobacco smoking has long been recognized as a major cause of death and disease, responsible for hundreds of thousands of deaths each year in the U.S. Smoking is known to cause lung cancer in humans, and is a major risk factor for heart disease. However, it is not only active smokers who suffer the effects of tobacco smoke. In 1993, the EPA published a risk assessment on passive smoking and concluded that the widespread exposure to environmental tobacco smoke (ETS) in the US had a serious and substantial public health impact (US Environmental Protection Agency, 2011).

ETS is a mixture of two forms of smoke that come from burning tobacco: sidestream smoke (smoke that comes from the end of a lighted cigarette, pipe, or cigar) and mainstream smoke (smoke that is exhaled by a smoker). When non-smokers are exposed to secondhand smoke it is called involuntary smoking or passive smoking. Non-smokers who breathe in secondhand smoke take in nicotine and other toxic chemicals just like smokers do. The more secondhand smoke that is inhaled, the higher the level of these harmful chemicals will be in the body (American Cancer Society, 2011).

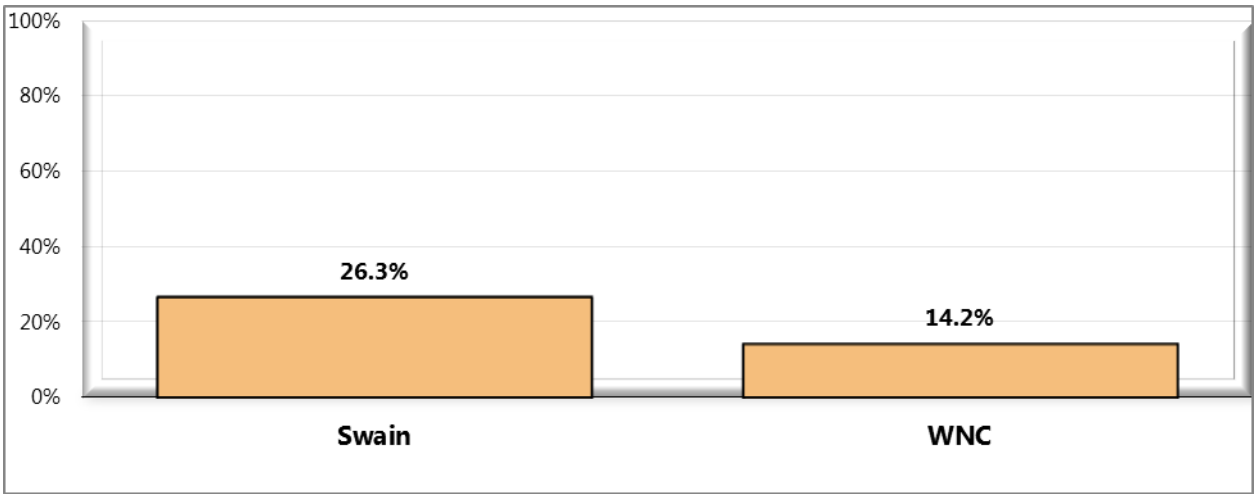
Survey respondents were asked about their second-hand smoke exposure in their workplace. Specifically, they were asked, "During how many of the past 7 days, at your workplace, did you breathe the smoke from someone who was using tobacco?" In order to evaluate community members' perceptions about environmental tobacco smoke, survey respondents were given a series of three statements regarding smoking in public places and asked whether they "strongly agree," "agree," "neither agree nor disagree," "disagree" or "strongly disagree" with each statement. The statements were: "I believe it is important for universities and colleges to be 100% tobacco-free," "I believe it is important for government buildings and grounds to be 100% tobacco-free," and, "I believe it is important for parks and public walking/biking trails to be 100% tobacco free."

Figure 92. Have Breathed Someone Else's Cigarette Smoke at Work in the Past Week (WNC Healthy Impact Survey)
(Among Employed Respondents)
Figure 76. Prevalence of High Blood Pressure (WNC Healthy Impact Survey)



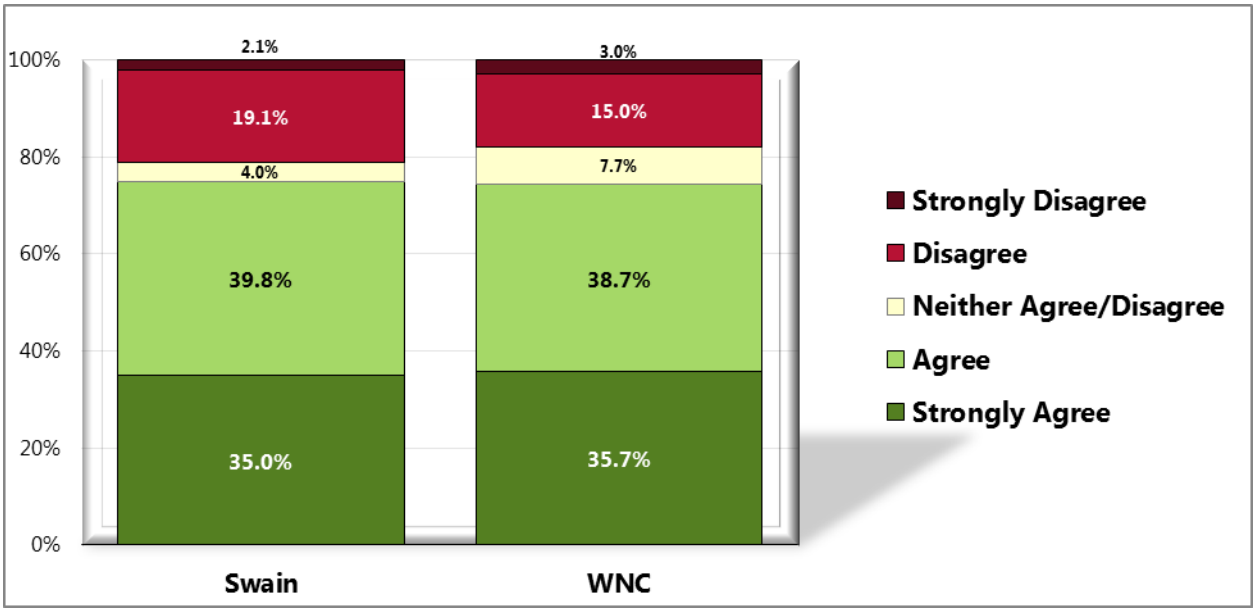
Sources:
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 76]
- Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia. United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): 2009 North Carolina data.
- 2011 PRC National Health Survey, Professional Research Consultants, Inc.
- US Department of Health and Human Services. Healthy People 2020. December 2010. http://www.healthypeople.gov [Objective HDS-5.1]

Notes:
- Asked of all respondents.



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 44]
Notes: ● Asked of employed respondents.

Figure 93. "I believe it is important for universities and colleges to be 100% tobacco-free" (WNC Healthy Impact Survey)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 45]
Notes: ● Asked of all respondents.

Figure 94. "I believe it is important for government buildings and grounds to be 100% tobacco-free (WNC Healthy Impact Survey)

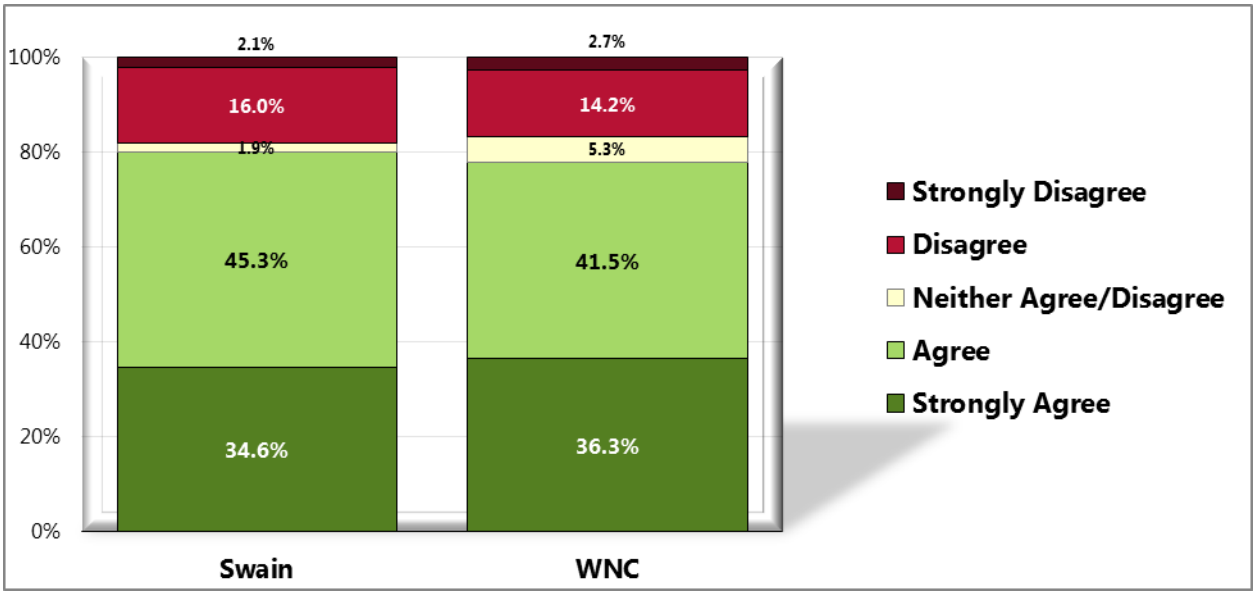
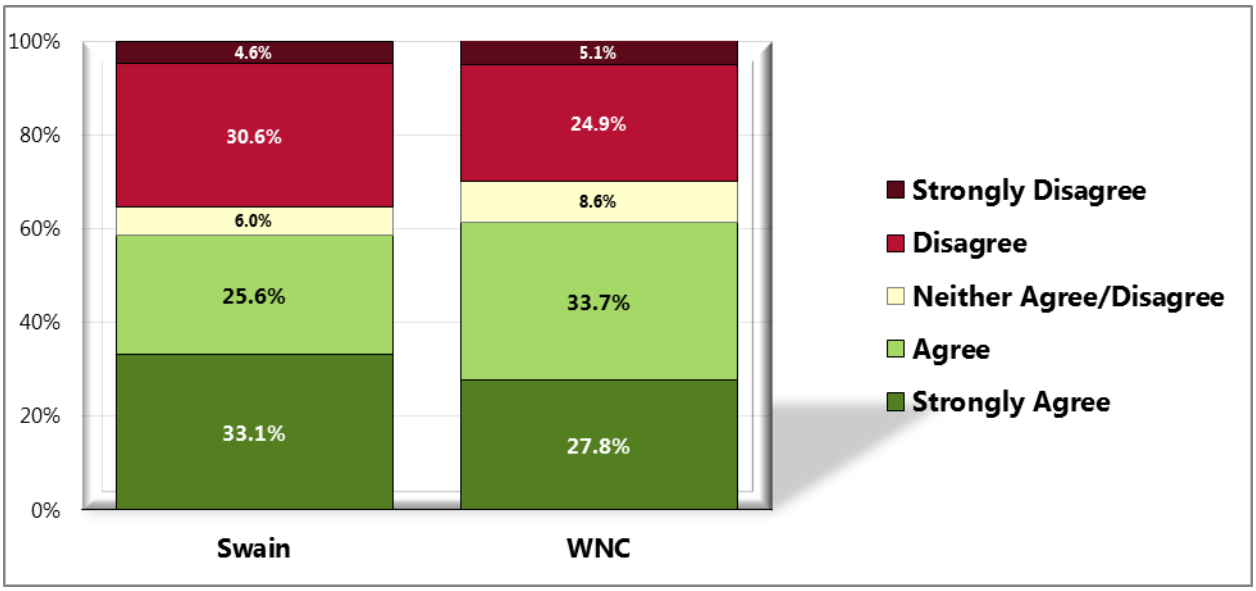


Figure 95. "I believe it is important for parks and public walking/biking trails to be 100% tobacco-free (WNC Healthy Impact Survey)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 47]
Notes: ● Asked of all respondents.

Drinking Water

In February 2012, a regional mean of 55% of the WNC population was being served by community water systems (*Data Workbook*). The 45% remaining presumably were being served by wells or by some other source, such as springs, creeks, rivers, lakes, ponds or cisterns.

Individual counties in WNC, however, have highly varied percentages of their populations served by community water systems; in some counties the figure is as low as 18% and in others it is as high as 65%. In Swain County, 4,717 of 13,981 county residents, or 33.7%, were being served by community water systems in February of 2012. Presumably the remaining 66.3% were served by wells or other sources.

Why is this important?

Adequate environmental quality in terms of good air and water quality are prerequisites for good health. Poor air or water quality can be particularly detrimental to the very young, the old, and those with chronic health conditions.

The source from which the public gets its drinking water is a health issue of considerable importance. Water from all municipal and most community water systems is treated to remove harmful microbes and many polluting chemicals, and is generally considered to be "safe" from the standpoint of public health because it is subject to required water quality standards. Municipal drinking water systems are those operated and maintained by local governmental units, usually at the city/town or county level. Community water systems are systems that serve at least 15 service connections used by year-round residents or regularly serves 25 year-round residents. (County Health Rankings

Radon

Radon is a naturally occurring, invisible, odorless gas that comes from soil, rock and water. It is a radioactive decay product of radium, which is in turn a decay product of uranium; both radium and uranium are common elements in soil. Radon usually is harmlessly dispersed in outdoor air, but when trapped in buildings it can be harmful. Most indoor radon enters a home from the soil or rock beneath it, in the same way air and other soil gases enter: through cracks in the foundation, floors, hollow-block walls, and openings around floor drains, heating and cooling ductwork, pipes, and sump pumps. The average outdoor level of radon in the air is normally so low that it is not a problem (NC Department of Environment and Natural Resources).

Radon may also be dissolved in water as it flows over radium-rich rock formations. Dissolved radon can be a health hazard, although to a lesser extent than radon in indoor air. Homes supplied with drinking water from private wells or from community water systems that use wells as water sources generally have a greater risk of exposure to radon in water than homes receiving drinking water from municipal water treatment systems. This is because well water comes from ground water, which has much higher levels of radon than surface waters. Municipal water tends to come from surface water sources which are naturally lower in radon, and the municipal water treatment process itself tends to reduce radon levels even further (NC Department of Environment and Natural Resources).

There are no immediate symptoms to indicate exposure to radon. The primary risk of exposure to radon gas is an increased risk of lung cancer (after an estimated 5-25 years of exposure). Smokers are at higher risk of developing radon-induced lung cancer than non-smokers. There is no evidence that other respiratory diseases, such as asthma, are caused by radon exposure, nor is there evidence that children are at any greater risk of radon-induced lung cancer than are adults (NC Department of Environment and Natural Resources).

Elevated levels of radon have been found in many counties in NC, but the highest levels have been detected primarily in the upper Piedmont and mountain areas of the state where the soils contain the types of rock (gneiss, schist and granite) that have naturally higher concentrations of uranium and radium (NC Department of Environment and Natural Resources). Eight counties in NC historically have had the highest levels of radon, exceeding, on average, 4 pCi/L (pico curies per liter). These counties are Alleghany, Buncombe, Cherokee, Henderson, Mitchell, Rockingham, Transylvania and Watauga, five of which are in the WNC region. There are an additional 31 counties in the central and western Piedmont area of the state with radon levels in the 2-4 pCi/L range; the remaining 61 NC counties, mostly in the piedmont and eastern regions of the state have predicted indoor radon levels of less than 2 pCi/L (NC Department of Environment and Natural Resources).

According to one recent assessment, the regional mean indoor radon level for the 16 counties of WNC was 4.3 pCi/L, over three times the national indoor radon level of 1.3 pCi/L. According to this same source, the level for Swain County was 5.3 pCi/L, four times the national indoor radon level (*Data Workbook*).

Built Environment

The term "built environment" refers to the human-made surroundings that provide the setting for human activity, ranging in scale from buildings and parks or green space to neighborhoods and cities that can often include their supporting infrastructure, such as water supply, or energy networks. In recent years, public health research has expanded the definition of built environment to include healthy food access, community gardens, "walkability", and "bikability" (Wikipedia, 2012).

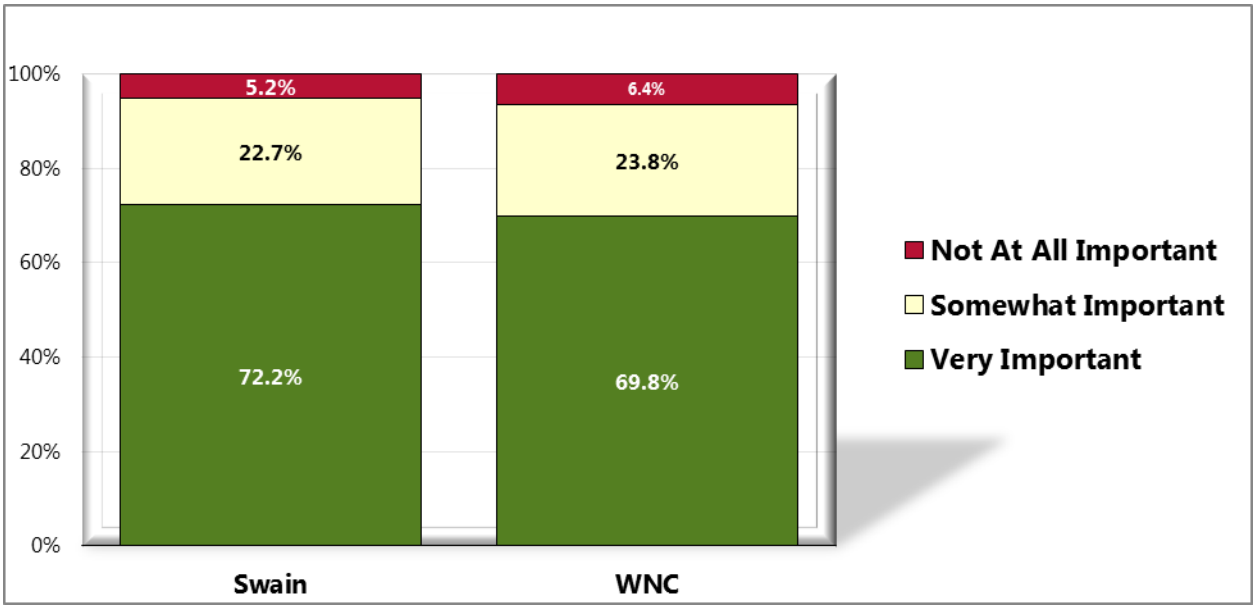
Access to Farmers' Markets and Grocery Stores

According to the US Department of Agriculture (USDA) Economic Research Service's *Your Food Environment Atlas,* there were a total of 49 farmers' markets in the 16 WNC counties in 2009. This number was reported to have grown by 5, to a total of 54, in 2011, an increase of 10%. According to this source, in Swain County there were three farmers' markets in 2009 and four in 2011 (*Data Workbook*).

According to the same source, there were a total of 158 grocery stores in the 16 WNC counties in 2007. This number was reported to have shrunken by 4, to a total of 154, in 2009, a decrease of 2%. In Swain County there were four grocery stores in both 2007 and 2009 (*Data Workbook*).

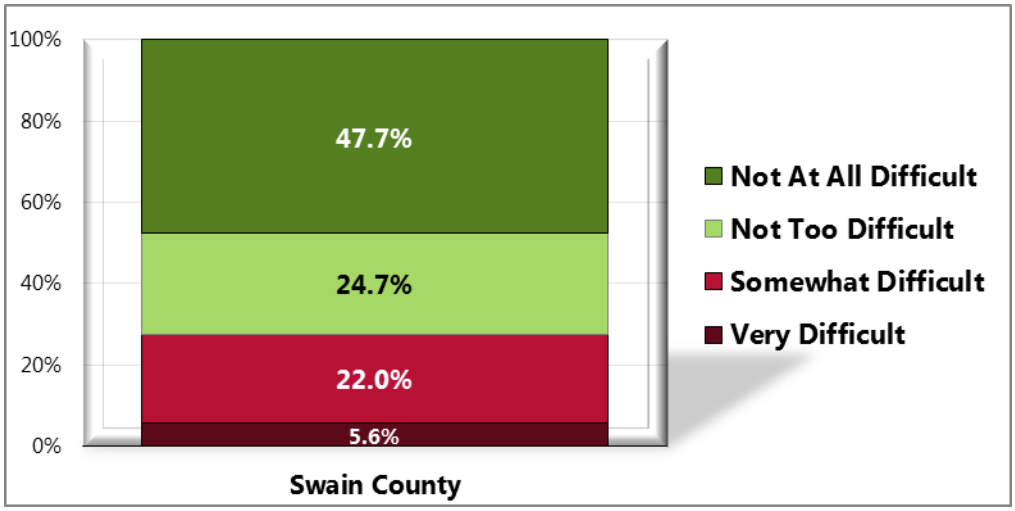
Survey respondents were asked, "How important do you feel it is for your community to make it easier for people to access farmer's markets, including mobile farmer's markets and tailgate markets?" Survey respondents in Swain County were also asked about their access to affordable food, including fresh produce.

Figure 96. Importance of Communities Making It Easier to Access Farmer's Markets, Including Mobile/Tailgate Markets (WNC Healthy Impact Survey)



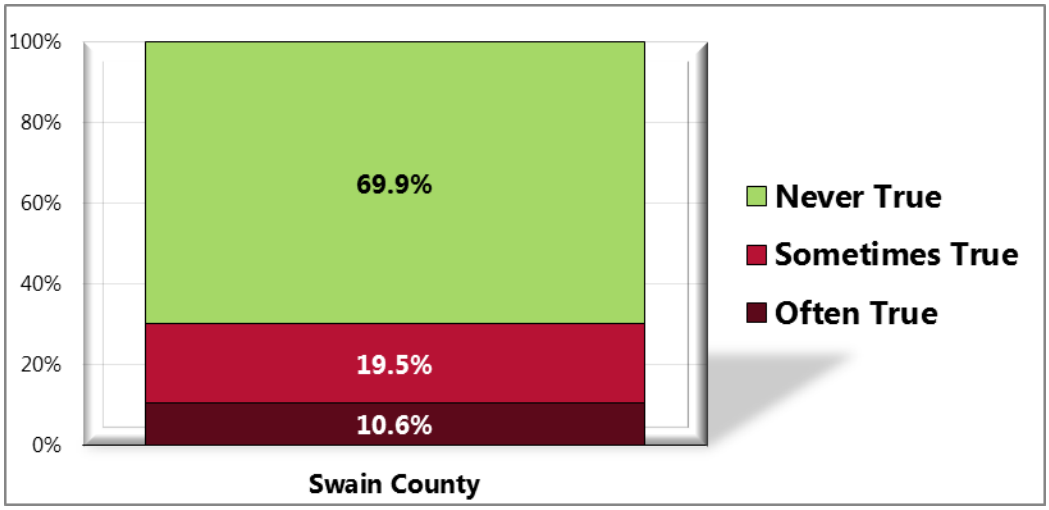
Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 55]
Notes: • Asked of all respondents.

Figure 97. Level of Difficulty Accessing Fresh Produce at an Affordable Price (WNC Healthy Impact Survey)



Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 108]
Notes: • Asked of all respondents.

Figure 98. Have worried in the Past Year About Food Running Out Before Having Money to Buy More (WNC Healthy Impact Survey)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 113]
Notes: ● Asked of all respondents.

Access to Fast Food Restaurants

According to the same source cited above, there were a total of 526 fast food restaurants in the 16 WNC counties in 2007. This number was reported to have dropped by 21, to a total of 505, in 2009, a decrease of 4%. In Swain County the number of fast food restaurants fell from 19 to 18 over the same period (*Data Workbook*).

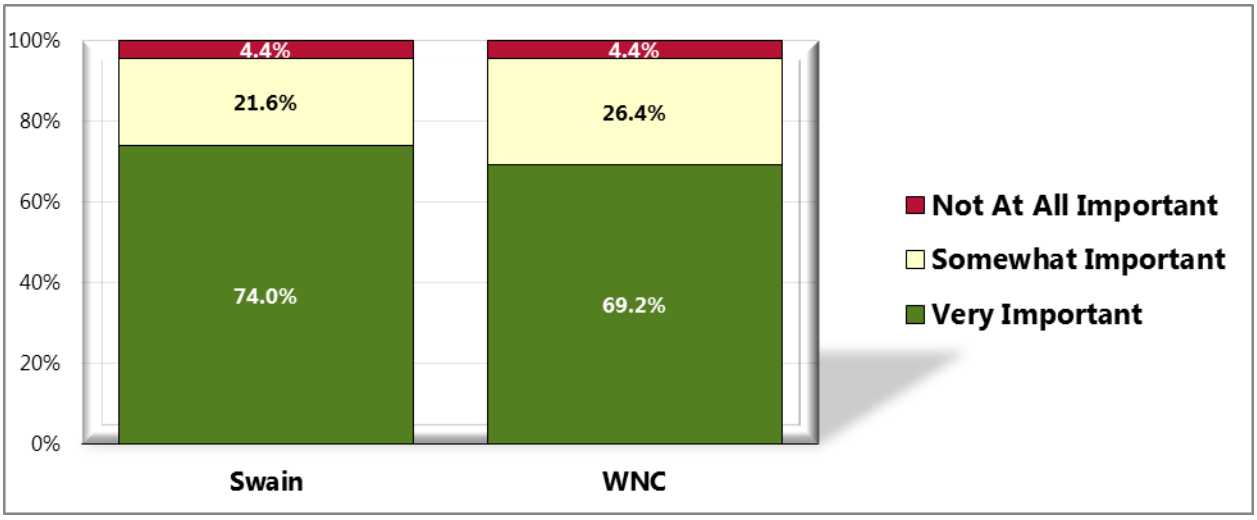
Also according to the USDA, mean per capita fast food expenditures in WNC rose 45% (from $514 to $746) between 2002 and 2007, and mean per capita restaurant expenditures in WNC also rose 45% (from $449 to $665) over the same period (*Data Workbook*).

Access to Recreational Facilities

According to the same source cited above, there were a total of 81 recreation and fitness facilities in the 16 WNC counties in 2007. This number was reported to have dropped by 26, to a total of 55, in 2009, a decrease of 32%. In Swain County the number of recreational and fitness facilities fell from three to two over the same period (*Data Workbook*).

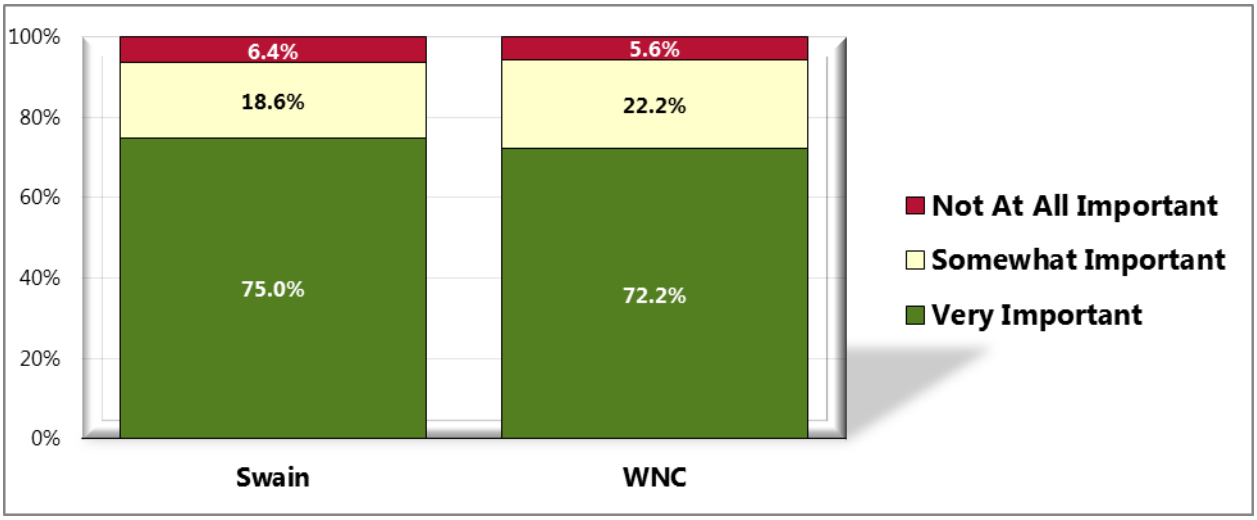
Survey respondents were asked whether they feel it is important for community organizations to explore ways to increase the public's access to physical activity spaces during off-times, as well as whether it is important for communities to improve access to trails, parks, and greenways.

Figure 99. Importance That Community Organizations Make Physical Activity Spaces Available for Public Use After Hours (WNC Healthy Impact Survey)



Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 60]
Notes: • Asked of all respondents.

Figure 100. Importance That Communities Improve Access to Trails, Parks, and Greenways (WNC Healthy Impact Survey)



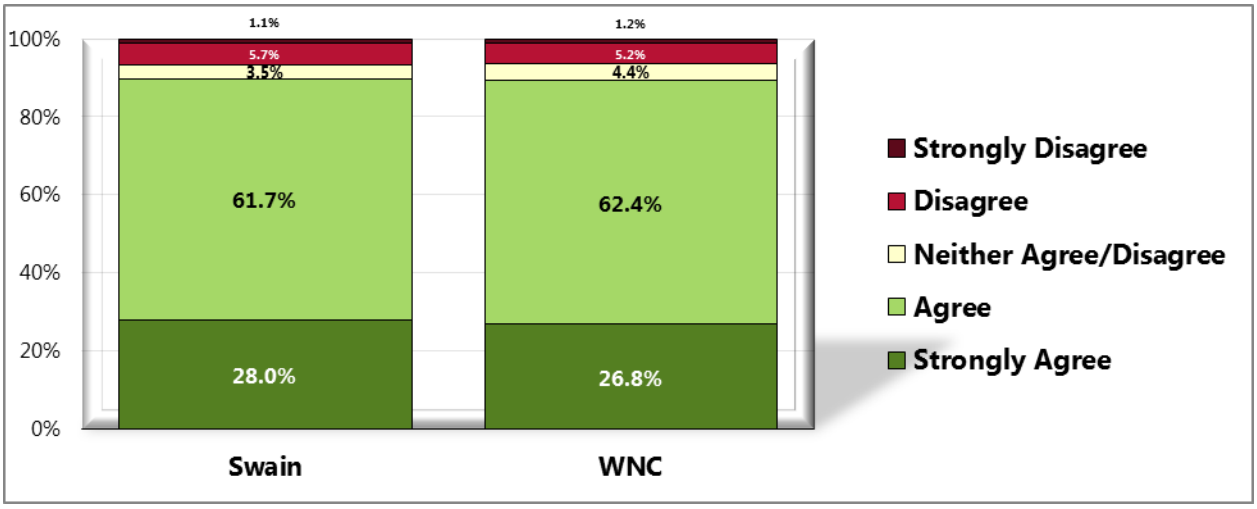
Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 61]
Notes: • Asked of all respondents.

CHAPTER 7 – QUALITY OF LIFE

Perception of County

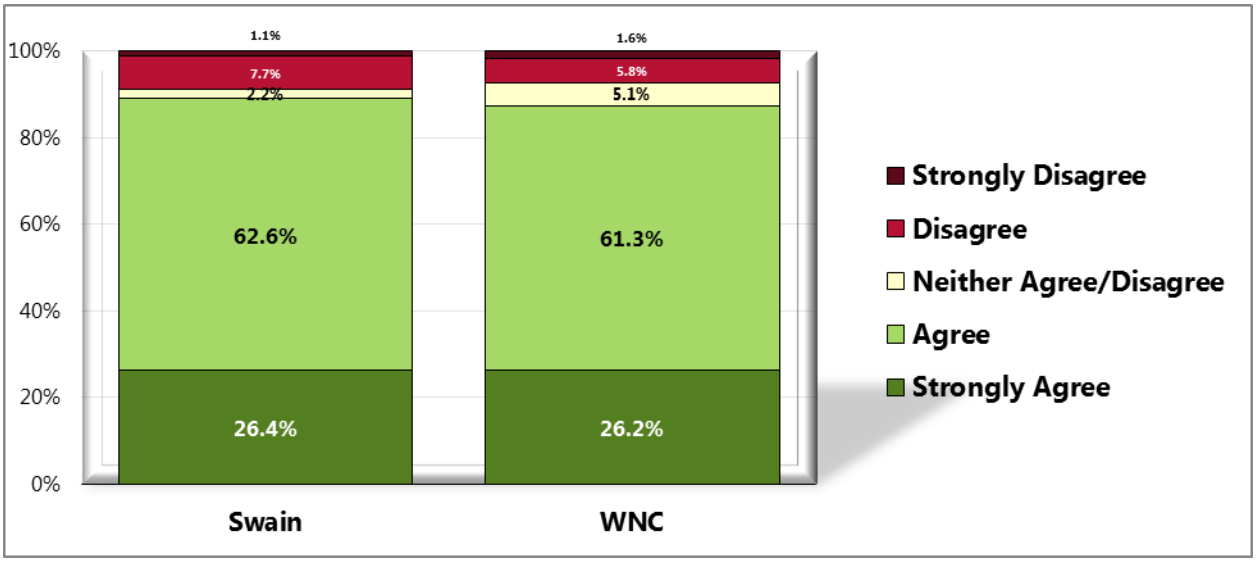
In order to evaluate community members' perceptions about the quality of life in western North Carolina (WNC), survey respondents were given a series of three statements regarding life in their county (my county is a good place to raise children, my county is a good place to grow old, and there is plenty of help for people during times of need in my county) and asked whether they "*strongly agree*," "*agree*," "*neither agree nor disagree*," "*disagree*" or "*strongly disagree*" with each statement. Survey respondents were also asked about their frequency of getting needed social and emotional support, their satisfaction with life, the one thing that needs the most improvement in their neighborhood or community, and the one issue which has the most negative impact on the quality of life in their county.

Figure 101. "My county is a good place to raise children"
(WNC Healthy Impact Survey)



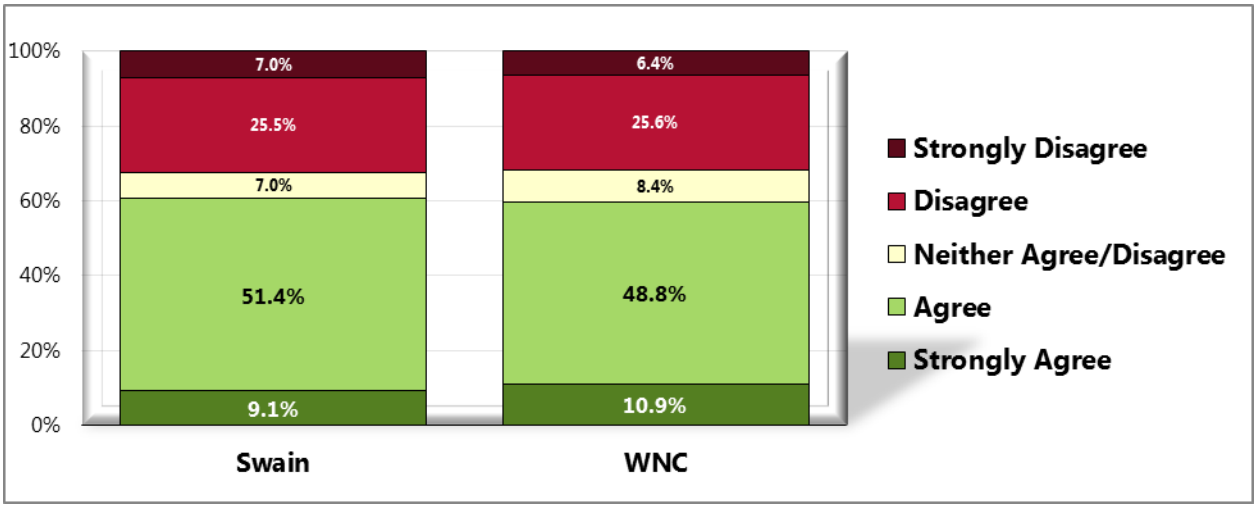
Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 5]
Notes: ● Asked of all respondents.

Figure 102. "My county is a good place to grow old."
(WNC Healthy Impact Survey)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 6]
Notes: ● Asked of all respondents.

Figure 103. "There is plenty of help for people during times of need in my county."
(WNC Healthy Impact Survey)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 8]
Notes: ● Asked of all respondents.

Table 62. Top Three County Issues Perceived as Having the Most Negative Impact on Quality of Life (WNC Healthy Impact Survey)

	Economy/ Unemployment	Nothing	Don't Know	Substance Abuse	Government/ Politics	Health Care
Swain	✓	✓		✓		
WNC	✓	✓	✓			

Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 10]
Notes: • Asked of all respondents.

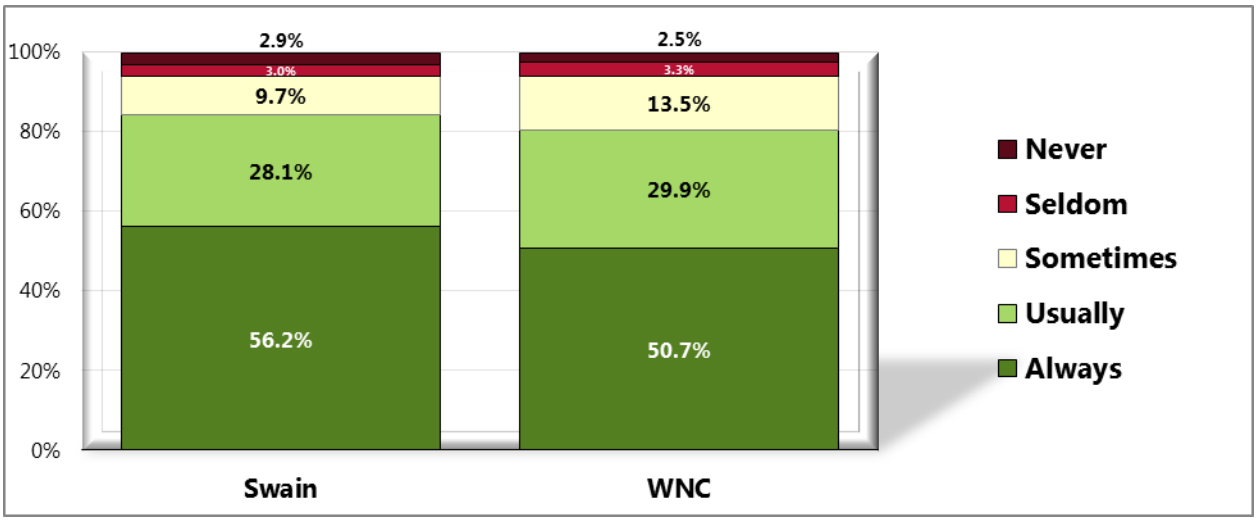
Table 63. Top Three Neighborhood/Community Issues Perceived as in Most Need of Improvement (WNC Healthy Impact Survey)

	Economy/ Unemployment	Healthcare Services	Activity/Recreation Options	Nothing
Swain	✓	✓	✓	
WNC	✓	✓		✓

Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 9]
Notes: • Asked of all respondents.

Social and Emotional Support

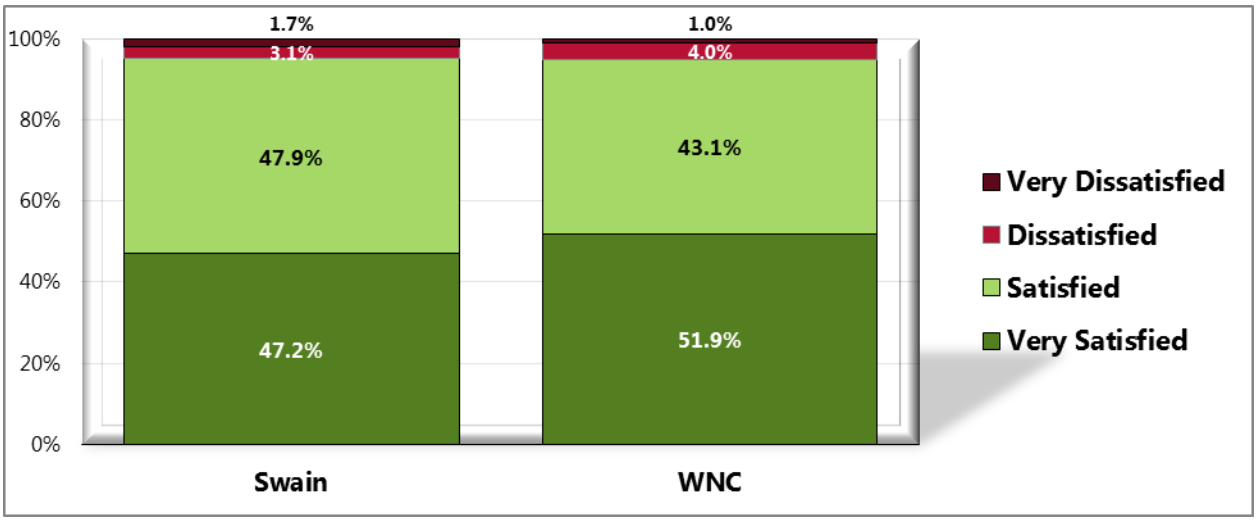
Figure 104. Frequency of Getting Needed Social/Emotional Support (WNC Healthy Impact Survey)



Sources: • 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 63]
Notes: • Asked of all respondents.

Satisfaction with Life

Figure 105. Satisfaction with Life
(WNC Healthy Impact Survey)



Sources: ● 2012 PRC Community Health Survey, Professional Research Consultants, Inc. [Item 62]
Notes: ● Asked of all respondents.

CHAPTER 8 - HEALTHCARE & HEALTH PROMOTION RESOURCES

Health Resources

For additional information and data:

- WNC Healthy Impact: http://www.wnchealthyimpact.com/
- Centers for Disease Control and Prevention: http://www.cdc.gov/nchs/
- 2010 Census Data: http://2010census.gov/2010census/
- North Carolina Youth Risk Behavior Survey (YRBS): http://www.nchealthyschools.org/data/yrbs/
- Behavioral Risk Factor Surveillance System (BRFSS0: http//www.schs.state.nc.us/schs/brfss/index.html
- North Carolina Center for Health Statistics http://www.schs.stat.nc.us

  For more information on accessing the data please contact:
  Sara Peterson, M. Ed.
  Health Educator
  Swain County Health Department
  545 Center Street
  Bryson City, NC 28713
  Office: 828-488-3198

See Appendix A for a description of the data collection methods use to gather this information.

See Appendix C for a summary list of the healthcare and health promotion resources and facilities available in Swain County to respond to the health needs of the community. Also listed is the 2-1-1 health resources for Swain County as report from 2-1-2.

Resource Gaps

Assessment of resource gaps that can impact the health of Swain County residents comes from 2-1-1 of WNC. Resource gaps also were assessed by documentation from Swain County Health Department calls and service provider," request for information", calls.

Mental Health Patients Total in Emergency Department at Swain Hospital in 2012 was 207. There was consensus that mental health and substance abuse resources were limited and classified having gaps in service. Other areas that were identified as having resource gaps were dental services for Medicaid and people with no insurance.

In Swain County the enrolled members of the Cherokee Eastern Band can utilize Cherokee's abundant services and resources. In comparison of non-enrolled members and non-Cherokee there is a gap in health services overall.

Much of Swain County health data, such as: No. of doctors, nurses, specialized care facilities are included in the number count for Swain County data, but only accessible to enrolled members of the Eastern Band of Cherokee Indians.

WNC 2-1-1 Data

Needs Grouped by Category	Needs
No Need Recorded	5
Basic Needs	3
Health Care	2
Income Support and Employment	2
Mental Health Care and Counseling	2
Individual and Family Life	1
Organizational/Community/International Services	1
Sum:	16

Top Unmet Needs (By Call Count)	Not Met	Sum:
Central Intake/Assessment for Psychiatric Services	1	1
Sum:	1	1

CHAPTER 9 - HEALTH PRIORITIES & NEXT STEPS

Prioritization Process & Criteria

In 2009, Swain County completed a comprehensive Community Health Assessment, resulting in the selection of two priorities. Primary and secondary was gathered from surveys, community feedback, the community health data book and other resources. Answers were compiled for each question from the survey and listed in order by the frequency with which each response was chosen. The results were presented to the Community Health Assessment Team and a strategic prioritization exercise was completed. Discussion followed the exercise with consensus being reached on the prioritization for the next four years. The Healthy Carolinians, "Partnership for Health" and Swain County health department hosted the events.

Presentations were made to Partnership for Health, the existing taskforces, and the Board of Health. Reports out presentations were presented to the County Commissioners, the SHAC and other community organization. New action teams were developed. The results were reported to the community through the newspaper, e-mail, and the Health Department web site.
The top health priorities issues to address were reached by using the following criteria based on primary and secondary data presented.

- The problem affects a lot of Swain County residents – including low income and underserved residents.
- More resources are needed for this issue; it is not being sufficiently addressed by existing programs.
- There's a good chance that the problem could be reduced if local groups were dedicated to working on it.
- It will be beneficial to use a collaborative approach involving a variety of community stakeholders in addressing this issue.

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In 2012, Swain County has had the opportunity to partner with Swain County Hospital, a non-profit hospital in new ways through the development of WNC Healthy Impact.

WNC Healthy Impact is a partnership between hospitals and health departments in North Carolina to improve community health. As part of a larger, and continuous, community health improvement process, these partners are collaborating to conduct community health (needs) assessments across western North Carolina. See www.WNCHealthyImpact.com for more details about the purpose and participants of this region-wide effort. The regional work of WNC

Healthy Impact is supported by a steering committee, workgroups, local agency representatives, and a public health/data consulting team. In addition, for this data collection phase of our regional efforts, a survey vendor (PRC – Professional Research Consultants, Inc.) was hired to administer a region-wide telephone survey.

In order to enable full participation in WNC Healthy Impact, the decision was made to transition the Swain County CHA timeline to match that of the region and meet the needs of local non-profit hospital partners. While this has great benefits for regional partnerships, it does mean that the 2012 CHA is taking place after three years of community action around the previous priority areas

Priority Health Issues

The 2009 Community Health Assessment resulted in the following priorities:

- Community Obesity
- Risky behavior in the youth population

These health concerns are current, and have not changed dramatically since the 2009 CHA was completed. What has changed is the community's focus on these areas. It takes time to see change, but with combined community efforts we are beginning to see steps in the positive direction. Swain County Schools and Swain County Health Department have partnered to work on Youth Risky Behaviors and Obesity. Swain school's health advisory committee (SHAC) has adopted obesity and mental health issues as a focus. One elementary school has been using the fitness gram program to evaluate K-5 physical fitness and body mass index. Parents are sent a letter home with the results. Health seminars were held for school staff including health checks and classes in stress reduction, yoga, cross-fit intro, and CPR.

Nutritional Education has been given by Swain County Schools' nutritionist and Swain Health Department nutritionist. Activities were introduced, to promote physical activity. Work place health foods policies have been adopted. Many programs have been put into place and environments are becoming more conducive in promoting healthy choices promoting wellness. There have been steps forward but there is still a lot of work to be done in health and wellness awareness and environmental policy.

The Swain County 2012 Community Health Assessment Priority Areas are:

1. ***Tobacco Use***
2. ***Obesity- Physical Activity and Nutrition***

Next Steps

Data collection and prioritization are just the beginning steps in understanding and addressing priority health needs in a community. National public health organizations such as NACCHO and the CDC are confirming our belief that a Community Health Assessment should be part of a broader community health improvement planning process. A community health improvement planning process uses CHA data to develop and implement strategies for action and establishes accountability to ensure measurable health improvement.

Swain County, along with our partners in WNC Healthy Impact, will move forward with information in this Community Health Assessment to collaborative action planning and determining how we can most effectively impact health in our community. We will collaborate with our hospital and community partners on collaborative action planning which results in a Community Health Improvement Plan (CHIP) that we plan to post on our local and WNC Healthy Impact websites. This planning process will begin in 2013.

A CHIP is used in collaboration with community partners to coordinate action and target resources. The plan looks beyond the performance of an individual organization serving a specific segment of a community to the way in which the activities of many organizations contribute to community health improvement (NACCHO, 2012).

The Swain County CHIP will likely contain the following components, based on guidance from the National Public Health Accreditation Board, and supported by our involvement in WNC Healthy Impact:

- Goals, objectives, strategies, and related performance measures for determined priorities in the short-term and intermediate term.
- Realistic timelines for achieving goals and objectives.
- Designation of roles in CHIP implementation.
- An emphasis on evidence-based strategies.
- A general plan for sustaining action (NACCHO, 2012)

Once we have worked with partners to develop the Community Health Improvement Plan, it will help guide the state-required Action Plans that will be submitted by the Swain County Health Department to the NC Division of Public Health in 2013, and Swain County Hospital implementation strategies. The CHIP will also be widely disseminated electronically to community organizations and can be used as a roadmap to monitor and evaluate our efforts.

Developing strategies have been discussed briefly in priority setting sessions. The objectives will be developed during the action planning stage. Input from community leaders in health and the CHA team will develop the objectives using community information and Healthy NC 2020 guidance.

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APPENDICES

Appendix A – Data Collection Methods & Limitations
Appendix B – WNC Healthy Impact Survey Instrument
Appendix C – Health Resource Inventory
Appendix D – Listening Sessions (if applicable)

APPENDIX A - DATA COLLECTION METHODS & LIMITATIONS

Supplementary to this Community Health Assessment is the WNC Healthy Impact Secondary Data Workbook (Data Workbook) that contains complete county-level data from a wide range of sources, as well as the state and regional averages and totals described here. Readers can consult the Data Workbook if looking for the direct source information and links to this secondary data for all counties in the region.

This data workbook was created by WNC Healthy Impact to manage and report the large amount of secondary data collected from a variety of sources during our regional process. This process and product were part of our regional effort to improve efficiency and standardization of data collection and reporting across a sixteen county region.

Unless specifically noted otherwise, all tables, graphs and figures presented in this report were derived directly from spreadsheets in the Data Workbook or survey data reported by the survey vendor (PRC).

Secondary Data

Secondary Data Methodology

In order to learn about the specific factors affecting the health and quality of life of residents of WNC, the WNC Healthy Impact data workgroup and consulting team identified and tapped numerous secondary data sources accessible in the public domain. For data on the demographic, economic and social characteristics of the region sources included: the US Census Bureau; Log Into North Carolina (LINC); NC Office of State Budget and Management; NC Department of Commerce; Employment Security Commission of NC; NC Department of Public Instruction; NC Department of Justice; NC Division of Medical Assistance; and the Cecil B. Sheps Center for Health Services Research. The WNC Healthy Impact consultant team made every effort to obtain the most current data available *at the time the report was prepared*. It was not possible to continually update the narrative past a certain date; in most cases that end-point was June 30, 2012.

The principal source of secondary health data for this report was the NC State Center for Health Statistics (NC SCHS), including its County Health Data Books, Behavioral Risk Factor Surveillance System, Vital Statistics unit, and Cancer Registry. Other health data sources included: NC Division of Public Health (DPH) Epidemiology Section; NC Division of Mental Health, Developmental Disabilities and Substance Abuse Services; National Center for Health Statistics; NC DPH Nutrition Services Branch; UNC Highway Safety Research Center; NC Department of Transportation; NC DETECT and the NC DPH Oral Health Section.

Because in any CHA it is instructive to relate local data to similar data in other jurisdictions, throughout this report representative county data is compared to like data describing the 16-county region and the state of NC as a whole. WNC Healthy Impact received approval from the NC Division of Public Health to use this regional comparison as "peer" for the purposes of our

assessments (and related requirements). County data may not be available for some of the data parameters included in this report; in those cases state-level data is compared to US-level data or other standardized measures. Where appropriate and available, trend data has been used to show changes in indicators over time.

Environmental data was gathered from sources including: US Environmental Protection Agency; US Department of Agriculture, and NC Radon Program.

It is important to note that this report contains data retrieved **directly** from sources in the public domain. In some cases the data is very current; in other cases, while it may be the most current available, it may be several years old. Note also that the names of organizations, facilities, geographic places, etc. presented in the tables and graphs in this report are quoted exactly as they appear in the source data. In some cases these names may **not** be those in current or local usage; nevertheless they are used so readers may track a particular piece of information directly back to the source.

Data Definitions

Reports of this type customarily employ a range of technical terms, some of which may be unfamiliar to many readers. This report defines technical terms within the section where each term is first encountered.

Health data, which composes a large proportion of the information included in this report, employs a series of very specific terms which are important to interpreting the significance of the data. While these technical health data terms are defined in the report at the appropriate time, there are some data caveats that should be applied from the onset.

Error

First, readers should note that there is some error associated with every health data source. Surveillance systems for communicable diseases and cancer diagnoses, for instance, rely on reports submitted by health care facilities across the state and are likely to miss a small number of cases, and mortality statistics are dependent on the primary cause of death listed on death certificates without consideration of co-occurring conditions.

Age-adjusting

Secondly, since much of the information included in this report relies on *mortality* data, it is important to recognize that many factors can affect the risk of death, including race, gender, occupation, education and income. The most significant factor is age, because an individual's risk of death inevitably increases with age. As a population ages, its collective risk of death increases; therefore, an older population will automatically have a higher overall death rate just because of its age distribution. At any one time some communities have higher proportions of "young" people, and other communities have a higher proportion of "old" people. In order to compare mortality data from one community with the same kind of data from another, it is necessary first to control for differences in the age composition of the communities being compared. This is accomplished by *age-adjusting* the data. Age-adjustment is a statistical

manipulation usually performed by the professionals responsible for collecting and cataloging health data, such as the staff of the NC State Center for Health Statistics (NC SCHS). It is not necessary to understand the nuances of age-adjustment to use this report. Suffice it to know that age-adjusted data are preferred for comparing most health data from one population or community to another and have been used in this report whenever available.

Rates

Thirdly, it is most useful to use *rates* of occurrence to compare data. A rate converts a raw count of events (deaths, births, disease or accident occurrences, etc.) in a target population to a ratio representing the number of same events in a standard population, which removes the variability associated with the size of the sample. Each rate has its own standard denominator that must be specified (e.g., 1,000 women, 100,000 persons, 10,000 people in a particular age group, etc.) for that rate.

While rates help make data comparable, it should be noted that small numbers of events tend to yield rates that are highly unstable, since a small change in the raw count may translate to a large change in rate. To overcome rate instability, another convention typically used in the presentation of health statistics is *data aggregation*, which involves combining like data gathered over a multi-year period, usually three or five years. The practice of presenting data that are aggregated avoids the instability typically associated with using highly variable year-by-year data, especially for measures consisting of relatively few cases or events. The calculation is performed by dividing the sum number of cases or deaths in a population due to a particular cause over a period of years by the sum of the population size for each of the years in the same period. Health data for multiple years or multiple aggregate periods is included in this report wherever possible. Sometimes, however, even aggregating data is not sufficient, so the NC SCHS recommends that any rate based on fewer than 20 events—whether covering an aggregate period or not—be considered *unstable*. In fact, in some of its data sets the NC SCHS no longer calculates rates based on fewer than 20 events. To be sure that unstable data do not become the basis for local decision-making, this report will highlight and discuss primarily rates based on 20 or more events in a five-year aggregate period, or 10 or more events in a single year. Where exceptions occur, the text will highlight the potential instability of the rate being discussed.

Regional arithmetic mean

Fourthly, sometimes in order to develop a representative regional composite figure from 16 separate county measures the consultants calculated a *regional arithmetic mean* by summing the available individual county measures and dividing by the number of counties providing those measures. It must be noted that when regional arithmetic means are calculated from *rates* the mean is not the same as a true average rate but rather an approximation of it. This is because most rates used in this report are age-adjusted, and the regional mean cannot be properly age-adjusted.

Describing difference and change

Fifthly, in describing differences in data of the same type from two populations or locations, or changes over time in the same kind of data from one population or location—both of which appear frequently in this report—it is useful to apply the concept of percent difference or change. While it is always possible to describe difference or change by the simple subtraction of a smaller number from a larger number, the result often is inadequate for describing and understanding the scope or significance of the difference or change. Converting the amount of difference or change to a percent takes into account the relative size of the numbers that are changing in a way that simple subtraction does not, and makes it easier to grasp the meaning of the change. For example, there may be a rate of for a type of event (e.g., death) that is one number one year and another number five years later. Suppose the earlier figure is 12.0 and the latter figure is 18.0. The simple mathematical difference between these rates is 6.0. Suppose also there is another set of rates that are 212.0 in one year and 218.0 five years later. The simple mathematical difference between these rates also is 6.0. But are these same simple numerical differences really of the same significance in both instances? In the first example, converting th 6 point difference to a percent yields a relative change factor of 50%; that is, the smaller number increased by half, a large fraction. In the second example, converting the 6 point difference to a percent yields a relative change factor of 2.8%; that is, the smaller number increased by a relatively small fraction. In these examples the application of percent makes it very clear that the difference in the first example is of far greater degree than the difference in the second example. This document uses percentage almost exclusively to describe and highlight degrees of difference and change, both positive (e.g., increase, larger than, etc.) and negative (e.g., decrease, smaller than, etc.)

Data limitations

Some data that is used in this report may have inherent limitations, due to the sample size, its geographic focus, or its being out-of-date, for example, but it is used nevertheless because there is no better alternative. Whenever this kind of data is used, it will be accompanied by a warning about its limitations.

Gaps in Available Information

WNC Healthy Impact Survey (Primary Data)

Survey Methodology

Survey Instrument

To supplement the secondary core dataset, meet additional stakeholder data needs, and hear from community members about their concerns and priorities, a community survey, *2012 WNC Healthy Impact Survey* (a.k.a. 2012 PRC Community Health Survey), was developed and

implemented in 16 counties across western North Carolina. The survey instrument was developed by WNC Healthy Impact's data workgroup, consulting team, and local partners, with assistance from Professional Research Consultants, Inc. (PRC). Many of the questions are derived from the Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS), as well as other public health surveys; other questions were developed specifically for WNC Healthy Impact to address particular issues of interest to communities in western North Carolina. Each county was given the opportunity to include three additional questions of particular interest to their county, which were asked of their county's residents.

Professional Research Consultants, Inc.

The geographic area for the regional survey effort included 16 counties: Buncombe, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania and Yancey counties.

Sample Approach & Design

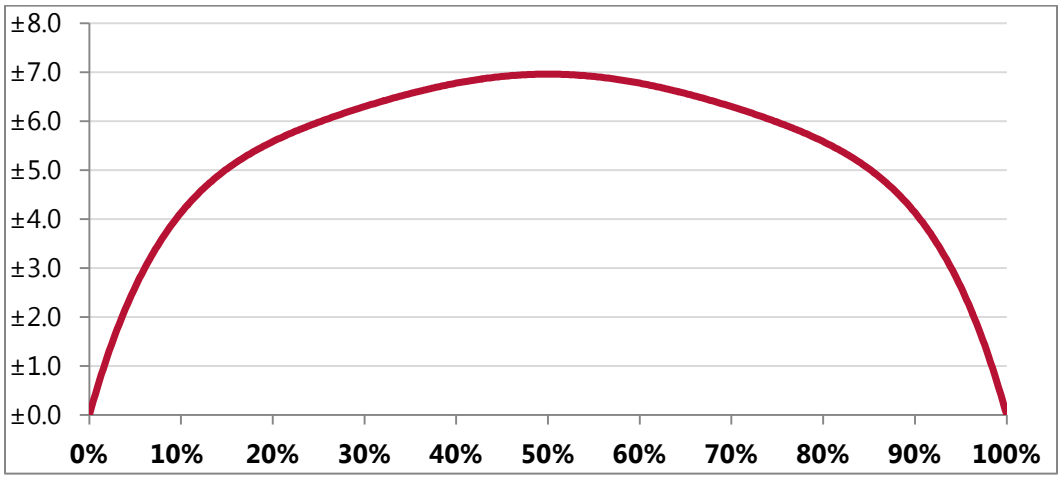
To ensure the best representation of the population surveyed, a telephone interview methodology (one that incorporates both landline and cell phone interviews) was employed. The primary advantages of telephone interviewing are timeliness, efficiency and random-selection capabilities.

The sample design used for this regional effort consisted of a stratified random sample of 3,300 individuals age 18 and older in Western North Carolina. Our county's sample size was 200. All administration of the surveys, data collection and data analysis was conducted by Professional Research Consultants, Inc. (PRC). The interviews were conducted in either English or Spanish, as preferred by respondents.

Sampling Error

For our county-level findings, the maximum error rate is ±6.9%.

Expected Error Ranges for a Sample of 200 Respondents at the 95 Percent Level of Confidence



Note: ● The "response rate" (the percentage of a population giving a particular response) determines the error rate associated with that response. A "95 percent level of confidence" indicates that responses would fall within the expected error range on 95 out of 100 trials.

Examples:

- If 10% of the sample of 200 respondents answered a certain question with a "yes," it can be asserted that between 5.8% and 14.2% (10% ± 4.2%) of the total population would offer this response.
- If 50% of respondents said "yes," one could be certain with a 95 percent level of confidence that between 43.1% and 56.9% (50% ± 6.9%) of the total population would respond "yes" if asked this question.

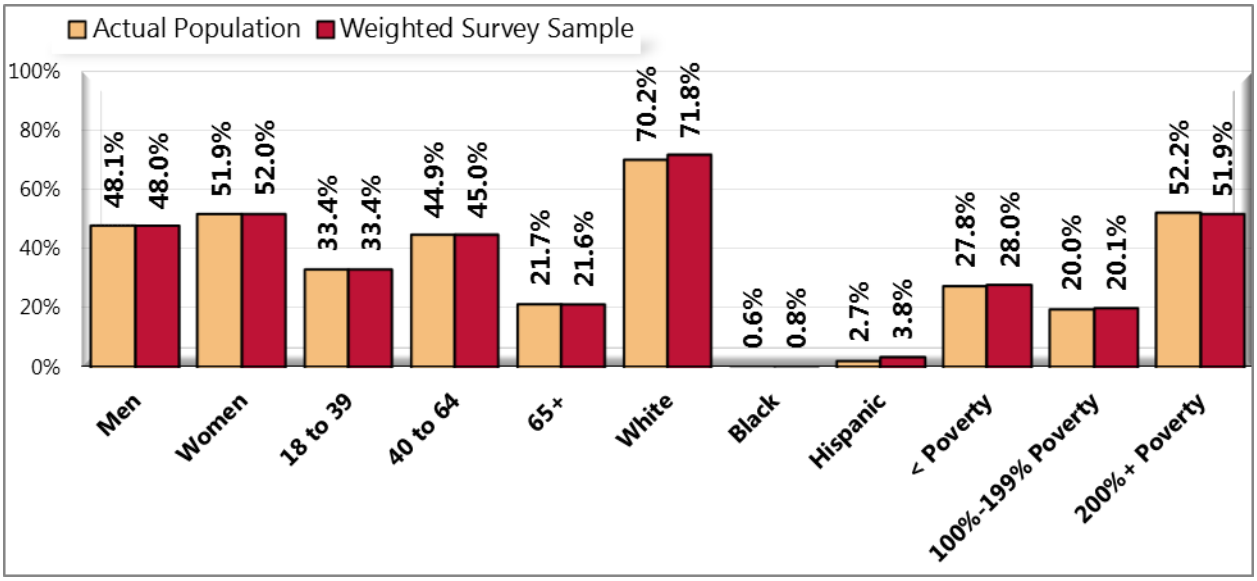
Sample Characteristics

To accurately represent the population studied, PRC worked to minimize bias through application of a proven telephone methodology and random-selection techniques. And, while this random sampling of the population produces a highly representative sample, it is a common and preferred practice to "weight" the raw data to improve this representativeness even further. This is accomplished by adjusting the results of a random sample to match the geographic distribution and demographic characteristics of the population surveyed (poststratification), so as to eliminate any naturally occurring bias. Specifically, once the raw data are gathered, respondents are examined by key demographic characteristics (namely gender, age, race, ethnicity, and poverty status) and a statistical application package applies weighting variables that produce a sample which more closely matches the population for these characteristics. Thus, while the integrity of each individual's responses is maintained, one respondent's responses may contribute to the whole the same weight as, for example, 1.1 respondents. Another respondent, whose demographic characteristics may have been slightly oversampled, may contribute the same weight as 0.9 respondents. In order to determine WNC regional estimates, county responses were weighted in proportion to the actual population distribution so as to appropriately represent Western North Carolina as a whole.

The following chart outlines the characteristics of the survey sample for our county by key demographic variables, compared to actual population characteristics revealed in census data. Note that the sample consisted solely of area residents age 18 and older.

Population and Sample Characteristics

(Swain County, 2012)



Sources:
- Census 2010, Summary File 3 (SF 3). U.S. Census Bureau.
- 2012 PRC Community Health Survey, Professional Research Consultants, Inc.

Notes:
- Hispanics can be of any race. Other race categories are non-Hispanic categorizations (e.g., "White" reflects non-Hispanic White respondents).

Poverty descriptions and segmentation used in this report are based on administrative poverty thresholds determined by the US Department of Health & Human Services. These guidelines define poverty status by household income level and number of persons in the household *(e.g., the 2012 guidelines place the poverty threshold for a family of four at $23,050 annual household income or lower)*. In sample segmentation: "very low income" refers to community members living in a household with defined poverty status; "low income" refers to households with incomes just above the poverty level, earning up to twice the poverty threshold; and "mid/high income" refers to those households living on incomes which are twice or more the federal poverty level.
The sample design and the quality control procedures used in the data collection ensure that the sample is representative. Thus, the findings may be generalized to the total population of community members in the defined area with a high degree of confidence.

Benchmark Data

North Carolina Risk Factor Data
Statewide risk factor data are provided where available as an additional benchmark against which to compare local survey findings; these data are reported in the most recent *BRFSS (Behavioral Risk Factor Surveillance System) Prevalence and Trend Data* published by the Centers for Disease Control and Prevention and the US Department of Health & Human Services.

Nationwide Risk Factor Data
Nationwide risk factor data, which are also provided in comparison charts where available, are taken from the *2011 PRC National Health Survey*; the methodological approach for the national study is identical to that employed in this assessment, and these data may be generalized to the US population with a high degree of confidence.

Healthy People 2020
Healthy People provides science-based, 10-year national objectives for improving the health of all Americans. The Healthy People initiative is grounded in the principle that setting national objectives and monitoring progress can motivate action. For three decades, Healthy People has established benchmarks and monitored progress over time in order to:

- Encourage collaborations across sectors.
- Guide individuals toward making informed health decisions.
- Measure the impact of prevention activities.

Healthy people 2020 is the product of an extensive stakeholder feedback process that is unparalleled in government and health. it integrates input from public health and prevention experts, a wide range of federal, state and local government officials, a consortium of more than

2,000 organizations, and perhaps most importantly, the public. More than 8,000 comments were considered in drafting a comprehensive set of Healthy People 2020 objectives.

Survey Administration

Pilot Testing & Quality Assurance

Before going into the field in the latter half of May, PRC piloted 30 interviews across the region with the finalized survey instrument. After this phase, PRC corrected any process errors that were found, and discussed with the consulting team any substantive issues that needed to be resolved before full implementation.

PRC's methods and survey administration comply with current research methods and industry standards. To maximize the reliability of research results and to minimize bias, PRC follows a number of clearly defined quality control protocols. PRC uses a telephone methodology for its community interviews, in which the respondent completes the questionnaire with a trained interviewer, not through an automated touch-tone process.

With more than 700 full- and part-time interviewers who work exclusively with healthcare and health assessment projects, PRC uses a state-of-the-art, automated CATI interviewing system that assures consistency in the research process. Furthermore, PRC maintains the resources to conduct all aspects of this project in-house from its headquarters in Omaha, Nebraska, assuring the highest level of quality control.

Random-Digit Dialing

PRC employs the latest CATI (computer-aided telephone interviewing) system technology in its interviewing facilities. The system PRC uses is a hybrid variation of a commercial application enhanced with internally developed software applications designed to specifically meet the needs of its health care client base. Since 1998 PRC has maintained, refined and developed proficiency in using this CATI system.

The CATI system automatically generates the daily sample for data collection using a random-digit dialing technique, retaining each telephone number until the Rules of Replacement (see description, below) are met. Up to five call attempts are made on different days and at different times to reach telephone numbers for which there is no answer. Systematic, unobtrusive electronic monitoring is conducted regularly by supervisors throughout the data collection phase of the project.

Rules of Replacement

Replacement means that no further attempts are made to connect to a particular number, and that a replacement number is drawn from the sample. To retain the randomness of the sample,

telephone numbers drawn for the sample are not discarded and replaced except under very specific conditions.

Minimizing Potential Error

In any survey, there exists some degree of potential error. This may be characterized as sampling error (because the survey results are not based on a complete census of all potential respondents within the population) or non-sampling error (e.g., question wording, question sequencing, or through errors in data processing). Throughout the research effort, Professional Research Consultants makes every effort to minimize both sampling and non-sampling errors in order to assure the accuracy and generalizability of the results reported.

Noncoverage Error. One way to minimize any effects of underrepresentation of persons without telephones is through poststratification. In poststratification, the survey findings are weighted to key demographic characteristics, including gender, age, race/ethnicity and income.

Sampling Error. Sampling error occurs because estimates are based on only a sample of the population rather than on the entire population. Generating a random sample that is representative and of adequate size can help minimize sampling error. Sampling error, in this instance, is further minimized through the strict application of administration protocols. Poststratification, as mentioned above, is another means of minimizing sampling error.

Measurement Error. Measurement error occurs when responses to questions are unduly influenced by one or more factors. These may include question wording or order, or the interviewer's tone of voice or objectivity. Using a tested survey instrument minimizes errors associated with the questionnaire. Thorough and specific interviews also reduce possible errors. The automated CATI system is designed to lessen the risk of human error in the coding and data entry of responses.

Information Gaps

While this assessment is quite comprehensive, it cannot measure all possible aspects of health in the community, nor can it adequately represent all possible populations of interest. It must be recognized that these information gaps might in some ways limit the ability to assess all of the community's health needs.

For example, certain population groups (such as the homeless, institutionalized persons, or those who only speak a language other than English or Spanish) are not represented in the survey data. Other population groups (for example, pregnant women, lesbian/gay/bisexual/transgender residents, undocumented residents, and members of certain racial/ethnic or immigrant groups) might not be identifiable or might not be represented in numbers sufficient for independent analyses.

In terms of content, this assessment was designed to provide a comprehensive and broad picture of the health of the overall community. However, there are certainly a great number of medical conditions that are not specifically addressed.

Listening Sessions (if applicable) (Primary Data)

N/A

APPENDIX B - COMMUNITY HEALTH SURVEY INSTRUMENT

Double-click on the survey coversheet below to access the complete survey instrument. If you cannot access this, please contact your local health department for a copy.

Date _____
Interviewed by _____ ID# __ __ __ __

2012-0615-02

WESTERN NORTH CAROLINA
2012 Community Health Needs Assessment MASTER
Asheville, North Carolina

Hello, this is _____ with Professional Research Consultants. We are conducting a survey to study ways to improve the health of your community.

(IF NECESSARY, READ:) Your number has been chosen randomly to be included in the study, and we'd like to ask some questions about things people do which may affect their health. Your answers will be kept completely confidential.

(IF Respondent seems suspicious, READ:) Some people we call want to know more before they answer the survey. If you would like more information regarding this research study, you can call '+chaname+' at '+chanumb+' during regular business hours.

Note that this survey is for processing & reports only. It is <u>not</u> to be used for interviewing in its current form. The notes in this survey do not have supporting logic, and this survey did not receive the review that the individual child surveys received from quality assurance.

APPENDIX C - HEALTH RESOURCE INVENTORY

2-1-1 is an information and referral service that links people to community health and human services. Resources are available through phone (free, confidential, 24/7) and the web. This is a point-in-time summary list, and greater details on these services can be accessed by calling 2-1-1 to speak to a trained staff person or visiting www.NC211.org.

Autumn Winds(21717)	Mountain View Manor(21944)	Tsali Care Center(22652)
Blind Services, Swain County Department of Social Services(22562)	Mountain View Manor(21944)	Valley View Care and Rehabilitation Center(22666)
Blind Services, Swain County Department of Social Services(22562)	Swain County Hospital(22614)	Vocational Opportunities of Cherokee, Inc.(22667)

Community, State and National Health Resources

Health Topics including Local, State and National Statistics.

Contact Sara Peterson/Swain County Health Department/828-488-3198 x 2027
for more detailed information.

Swain County Community Resources:

Swain County History: http://www.swaincountync.gov/history.html
Swain County Genealogy Society: http://swaingenealogy.com
Swain County Quick Facts: http://quickfacts.census.gov/qfd/states/37/37173.html
Swain County Vital Statistics: http://www.schs.state.nc.us/SCHS/data/vitalstats.cfm

Swain County Health Department: http://www.swaincountync.gov/health.html
Swain County Hospital: http://www.westcare.org/locations/swain/medwest-swain.aspx
Sylva Pediatrics Associates: http://www.sylvapediatricassociates.com/
Swain Medical Center: http://www.swainmedicalcenter.info/
Eastern Band of Cherokee: http://nc-cherokee.com/
Cherokee Choices: http://cherokee-hmd.com/cherokee-choices/index.html
Mountain View Manor: http://mountainviewmanor.biz/
Tsali Care Center: http://cherokee-hmd.com/tsali-care/index.html
Cornerstone Living Center: 314 Hughes Branch Road, Bryson City, NC 28713 – 828.488.2870

Swain County Chamber of Commerce: http://www.greatsmokies.com/
Swain Public Transit: http://swaintransit.com/
Swain County Family Resource Center: 100 Brendle Street, Bryson City, NC – 828.488.7505
Swain County Department of Social Services: http://www.swaincountydss.org/
Swain/Qualla SAFE (Domestic Violence Crisis Center) 828-488-6809
Swain County Cooperative Extension: http://swain.ces.ncsu.edu/
Quick Guide for Families in Swain County: http://www.regionakids.org/Guides/Swain.pdf
Fontana Regional Library: http://www.fontanalib.org/
Swain County Sheriff's Department: http://www.swaincountync.gov/sheriff.html
Swain County Senior Center – 125 Brendle Street, Bryson City, NC 28713 - 828.488-3047
Smoky Mountain Center: http://smokymountaincenter.com/
NC 2-1-1 - http://www.unitedwaync.org/nc-2-1-1
Great Smoky Mountains Railroad: http://www.gsmr.com/
Nantahala Outdoor Center: http://www.noc.com/
Great Smoky Mountains National Park: http://www.nps.gov/grsm/planyourvisit/events.htm
Swain County Recreation Department: http://www.swaincountync.gov/recreation.html

Bryson City Health and Fitness Club – http://bchaf.com/index.html
Swain County Hiking – http://www.greatsmokies.com/hiking.asp
Cherokee Life Fitness Center - http://nc-cherokee.com/cherokeelifecenter
Swain County Schools Administration: http://www.swain.k12.nc.us/administration.aspx
West Elementary School: http://www.swain.k12.nc.us/west
East Elementary School: http://www.swain.k12.nc.us/east
Swain County Middle School: http://www.swain.k12.nc.us/middle
Swain County High School: http://www.swain.k12.nc.us/school_home.aspx?schoolid=1

General Health Information and Statistics:

Centers for Disease Control and Prevention (CDC): www.cdc.gov
Medline Plus: http://www.nlm.nih.gov
National Institutes of Health (NIH): www.nih.gov
United States Department of Health and Human Services: http://www.hhs.gov/
North Carolina Department of Health and Human Services: http://www.ncdhhs.gov/
American Academy of Pediatrics: http://www.aap.org
World Health Organization: www.who.int/en/
NC State Center for Health Statistics: www.schs.state.nc.us/SCHS/
Pregnancy Risk Assessment Monitoring Systems (PRAMS):
http://www.schs.state.nc.us/SCHS/prams/
American Cancer Society: www.cancer.org
US Census Bureau: www.census.gov
North Carolina Division of Public Health www.publichealth.nc.gov
Epidemiology in North Carolina: http://www.epi.state.nc.us/epi/
NC Office of Minority Health and Health Disparities: http://www.ncminorityhealth.org/
Public Health Preparedness and Response: http://www.epi.state.nc.us/epi/phpr/
Health Check: http://www.ncdhhs.gov/dma/healthcheck/
Health Choice: http://www.ncdhhs.gov/dma/healthchoice/
CDC Flu Information: http://www.cdc.gov/features/flu/

Research:

Kaiser Family Foundation: http://kff.org/
USDHHS – Agency for Health Care Research and Quality: http://www.ahcpr.gov
MAHEC Health Services Library: http://www.mahec.net/library
NCDHHS – Agency for Health Care and Research: http://www.ahrq.gov/news/factix.htm

Health Departments:

NC Health Departments (by county): http://www.ncalhd.org/county

Government Regulations, Laws, etc.

Government Bill Tracking: http://www.govtrack.us/
NC Legislature: www.ncleg.net
North Carolina General Statutes: http://www.ncga.state.nc.us/gascripts/statutes/Statutes.asp

Nutrition:

Food & Drug Administration: http://www.fda.gov/
Food and Nutrition Information Center: Resource list: http://www.nal.usda.gov
NC East Smart Move More State Health Promotion: www.eatsmartmovemorenc.com
Dole Nutrition: www.dole.com
Every Woman North Carolina: http://everywomannc.com/
American Diabetes Association www.diabetes.org
Choose My Plate (USDA): http://www.choosemyplate.gov/

Lung and Heart Health:

American Heart Association: http://www.americanheart.org
American Lung Association: www.lungusa.org
National Heart, Lung and Blood Institute: http://www.nhlbi.nih.gov/health/dci/index.html
Smoke Free North Carolina: http://tobaccopreventionandcontrol.ncdhhs.gov/smokefreenc/

Drugs and Alcohol:

North Carolina Substance Abuse Professional Practice Board (NCSAPPB): http://www.ncsappb.org/
Alcohol/Drug Council of North Carolina: http://www.alcoholdrughelp.org/
Kids Health (For Parents, Kids and Teens): http://kidshealth.org/teen/index.jsp?tracking=T_Home
Substance Abuse and Mental Health Services Administration: http://store.samhsa.gov/home
Tobacco Reality Unfiltered: www.realityunfiltered.com
NC Quitline: www.quitnownc.org
NC Tobacco Free Schools: www.nctobaccofreeschools.com
You Decide: www.alcoholscreening.org

Safety:

National Highway Traffic Safety Administration: www.nhtsa.dot.gov

Maternity Information:

March of Dimes: www.marchofdimes.com
Childbirth Connection: www.childbirthconnection.com
Lamaze International: www.lamaze.org
North Carolina Healthy Start: http://www.nchealthystart.org/

Sexual Health:

National Campaign to Prevent Teen and Unplanned Pregnancy: www.teenpregnancy.org
Adolescent Pregnancy Prevention Campaign of North Carolina: http://www.appcnc.org/
Planned Parenthood: http://www.plannedparenthood.org
AIDS & HIV information from the AIDS charity: www.avert.org
Association of Reproductive Health Professionals: http://www.arhp.org
Centers for Disease Control and Prevention (CDC): http://www.cdc.gov/sexualhealth/
HIV Testing Sites: www.hivtest.org
I Know HIV/AIDS: http://www.iknowhiv.org/

APPENDIX D - LISTENING SESSION AND/OR KEY INFORMANT INTERVIEW GUIDE (IF APPLICABLE)