



# **A Call to Action**

North Carolina Comprehensive Cancer Control Plan

**2014-2020**

## Preface

The *North Carolina Comprehensive Cancer Control Plan 2014-2020: A Call to Action* was developed by a large and diverse group dedicated to saving lives and improving the quality of life for North Carolinians affected by cancer. The effort to reduce the cancer burden in North Carolina will require a coordinated and collective effort of communities, public and private organizations and individuals. Representatives of the North Carolina Advisory Committee on Cancer Coordination and Control; North Carolina Cancer Partnership; North Carolina Department of Health and Human Services; Division of Public Health; Cancer Prevention and Control Branch and many others interested in reducing the cancer burden in North Carolina are listed in Appendix H.



Dear Fellow North Carolinians:

We are pleased to share the *North Carolina Comprehensive Cancer Control Plan 2014-2020: A Call to Action*. Cancer has been the leading cause of death in North Carolina since 2009. We are all affected by cancer, and it has an enormous economic, physical and emotional impact on North Carolinians. The purpose of this Cancer Plan is to reduce the cancer burden in our state.

This Cancer Plan is organized using the cancer continuum: prevention, early detection, care and treatment and focuses on six specific cancers: lung, colorectal, breast, prostate, cervical and melanoma. It does not have detailed cancer information, so comprehensive references are provided in the Appendices. An interdisciplinary collaboration of professionals from across the state designed this plan to provide a framework for cancer prevention and control.

We hope that public health and healthcare agencies, community organizations and individuals across North Carolina will benefit from using this Cancer Plan as they work together to address cancer prevention and control. One part of the Plan entitled: "Everyone Has A Part to Play in the Fight Against Cancer" describes specific strategies for individuals, community organizations, schools, businesses, healthcare professionals and policy makers.

We hope you find the Cancer Plan useful in your efforts to make a difference in the fight against cancer in North Carolina.

Regards,



Dr. Tom Shea, Chair



Morgan Daven, Co-Chair

North Carolina Advisory Committee  
on Cancer Coordination and Control  
5505 Six Forks Road Raleigh, NC 27609

**M I S S I O N :** To facilitate the reduction of cancer incidence and mortality for all North Carolinians, enhance statewide access to quality treatment and support services, and maximize quality of life for all North Carolina cancer survivors, patients, and their loved ones through educating and advising government officials, policy makers, public and private organizations, and the public.

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## Executive Summary

*North Carolina Comprehensive Cancer Control Plan 2014-2020: A Call to Action* (Cancer Plan) is a statewide blueprint for cancer prevention and control in North Carolina. The Cancer Plan was developed through a collaboration of an interdisciplinary team of individuals who devoted many hours to designing a plan that is specific to the particular needs of North Carolina. Cancer has been the leading cause of death in North Carolina since 2009. As such, it has a huge psychological, social and economic effect on individuals and the state.

The overarching purpose of the Cancer Plan is to reduce the morbidity and mortality associated with cancer in our state. There are five goals that are designed to help achieve this. They are preventing new cancers, detecting cancer at its earliest stages, treating all cancer patients with the most appropriate/effective therapy, enhancing the quality of life for every person affected by cancer and reducing cancer-related disparities in North Carolina. The six specific cancers that are the focus of this Cancer Plan are lung, colorectal, breast, prostate, melanoma and non-melanoma skin cancers and cervical cancer. In order to meet our goals, the Cancer Plan has specific objectives and strategies to address the cancer continuum and the six specific cancers. It also describes evaluation strategies to measure progress towards meeting our goals.

**Prevention:** The Cancer Plan focuses on behaviors, policies and environmental changes that can reduce North Carolinians' cancer risk. After describing the behaviors that place people at risk for cancer, the Cancer Plan provides guidance on ways to lower these risks by adopting healthy behaviors and promoting environmental changes. Recommendations made are for both individuals and organizations/systems.

**Early Detection:** The focus of early detection is on promoting and delivering cancer screenings based on the guidelines and recommendations of the N.C. Advisory Committee on Cancer Coordination and Control. An emphasis in this area is on reaching people most at risk and those with limited access to screenings.

**Care and Treatment:** The Cancer Plan provides guidance on ways to improve access to care, enhance care coordination and assure quality treatment for all cancer patients and their families. It describes professional and public education strategies that will provide information on patient navigation systems, cancer clinical trials and appropriate services for palliation and survivorship services.

Woven throughout this Cancer Plan are ways to address disparities in cancer among populations experiencing a disproportionate burden of disease, disability and death. It is critically important that we reach underserved populations with cancer prevention, early detection and treatment messages and services.



Everyone has a part in the fight against cancer. The grid on page 28 describes ways that individuals, community organizations, healthcare professionals and policy makers can help prevent, detect and treat cancer. It also suggests ways to advocate for policy changes that reduce the risks for cancer and promote good care for those with the disease.

This Call to Action is designed to address the barriers to cancer prevention and care while outlining a plan of action. The action plan will be implemented by a diverse partnership of North Carolina cancer programs, organizations and individuals in order to assure North Carolinians timely and equitable access to healthcare throughout the cancer care continuum. We hope you find this a useful tool.



# Table of Contents

<b>Introduction</b>	1
<b>North Carolina Cancer Burden</b>	5
Unequal Burden in North Carolina	7
<b>Access to Cancer Care</b>	9
<b>North Carolina Comprehensive Cancer Control Plan</b>	11
<b>Cancer Risk and Protective Factors</b>	12
Poor Nutrition, Physical Inactivity, Overweight and Obesity	13
Tobacco Use and Exposure to Secondhand Smoke	15
Environmental Exposures	17
Ultraviolet Radiation Exposures	18
Viral Exposures	19
Alcohol Use	19
<b>Cancer Prevention and Control Action Plan</b>	20
Cancer Prevention	21
Early Detection	22
Cancer Care Continuum	23
<i>Cancer Care</i>	25
<i>Cancer Survivorship</i>	26
Everyone Has a Part in the Fight Against Cancer	23
N.C. Priority Cancers	32
<i>Lung Cancer</i>	33
<i>Colorectal Cancer</i>	34
<i>Breast Cancer</i>	35
<i>Prostate Cancer</i>	36
<i>Cervical Cancer</i>	37
<i>Melanoma Skin Cancer</i>	38
Cancer Surveillance	39
Cancer Plan Evaluation	40



**Summary**

43

**References**

44

**Appendices**

Appendix A – North Carolina Cancer Prevention and Control Branch	47
Appendix B – Scientific Information Resources	48
Appendix C – Commission on Cancer Accredited Hospital Information and Maps	50
Appendix D – Body Mass Index Chart	58
Appendix E – North Carolina Table of Measurements	59
Appendix F – North Carolina Cancer Maps	61
Appendix G – Glossary	71
Appendix H – North Carolina Cancer Plan Contributors	74



# Introduction

The 2014-2020 North Carolina Comprehensive Cancer Control Plan (Cancer Plan) provides not only current cancer information for North Carolina but also provides a framework for action to reduce the effects of cancer. Cancer is a complicated disease with many different signs and symptoms. Nearly everyone knows someone who has been affected by cancer – a friend, family member, coworker or neighbor. Maybe you have had cancer or have been a caregiver for someone who has cancer.

According to the North Carolina Central Cancer Registry 2011 data, approximately 140 people in North Carolina are newly diagnosed with cancer every day. Another 50 people lose their lives daily to this disease.<sup>1</sup>

The Cancer Plan is not intended to provide in-depth cancer information. This information can be found in the resources listed in the Appendices. Instead, it serves as a working guide to help public health and healthcare groups, community organizations, institutions, agencies and individuals across North Carolina work

together to address cancer prevention and control.

The purpose of the Cancer Plan is to reduce the cancer morbidity and mortality in North Carolina. The overarching goals are to prevent future cancers, detect cancer at its earliest stages, treat all cancer patients with the most appropriate and effective therapy, enhance the quality of life for every person affected by cancer and reduce cancer-related disparities in North Carolina.

## Cancer Plan Organization

The Cancer Plan is organized using the cancer continuum: prevention, early detection and care and treatment. It also emphasizes six specific cancers:

- the four most **deadly** cancers (lung, colorectal, breast and prostate),
- the most **common** cancers (melanoma and non-melanoma skin cancers) and
- the cancer that can be prevented through vaccination and early detection: cervical cancer.

The sections have information specific to North Carolina and the priority cancers

discussed. The Appendices contain detailed cancer information and resources. The Cancer Plan with accompanying information and a community brochure that can be copied and used locally, are available on the N.C. Division of Public Health, Chronic Disease and Injury Section Web site located at <http://publichealth.nc.gov/chronicdiseaseandinjury>.

## History

North Carolina's commitment to cancer prevention and control dates back to 1945 when the leadership from the N.C. Medical Society and the American Cancer Society (ACS) worked with the North Carolina General Assembly to pass the Cancer Control Act of 1945. This legislation created the first Cancer Control Program in the nation and originally included funding to assist indigent cancer patients.

Legislation was passed in 1993 to create the N.C. Advisory Committee on Cancer Coordination and Control (Advisory Committee)



and the N.C. Comprehensive Cancer Program, which is part of the Cancer Prevention and Control Branch in the Chronic Disease and Injury Section, Division of Public Health, N.C. Department of Health and Human Services.

## N.C. Advisory Committee on Cancer Coordination and Control

The mission of the Advisory Committee is to facilitate the reduction of cancer incidence and mortality in North Carolina and to enhance access to quality treatment and support services. It also recommends a coordinated, comprehensive cancer control plan to the Secretary of the N.C. Department of Health and Human Services. There are five subcommittees made up of members of the Advisory Committee, the N.C. Cancer Partnership and the Cancer Prevention and Control Branch. The responsibilities of these subcommittees – Prevention; Early Detection; Care and Treatment; Legislation and Education and

Evaluation, Surveillance and Research – are listed below.

### **Prevention Subcommittee**

This subcommittee promotes healthy behaviors and environments that reduce the risk of developing cancer. Topics include nutrition and physical activity, tobacco prevention and control, ultraviolet radiation exposure, chemoprevention and genetic testing.

### **Early Detection Subcommittee**

This subcommittee works to expand the appropriate use of proven cancer-related early detection methods and appropriate follow-up of abnormalities. Foci include colorectal, breast, cervical, prostate, skin and lung cancers.

### **Care and Treatment Subcommittee**

This subcommittee addresses a continuum of services from cancer diagnosis to treatment, care, survivorship and palliative care. Tasks of the Care Subcommittee include identifying and reducing financial, geographic and other barriers to cancer diagnosis, treatment and healthcare services as well as pain control, patient navigation and survivorship.

### **Evaluation, Surveillance and Research Subcommittee**

This subcommittee conducts an assessment of partners' activities in meeting the goals and objectives related to the Cancer Plan. The subcommittee provides surveillance in the monitoring and review of the data regarding the health of North Carolinians. This subcommittee also assists with research for position statements, provides data for the Cancer Plan and assists with writing white papers.

### **Legislation and Education Subcommittee**

This subcommittee recommends policies on cancer-related issues. The subcommittee is made up of legislators and Advisory Committee members, with the Advisory Committee Co-Chair serving as an ex-officio member.

The subcommittees also may prepare position statements that are presented to the Advisory Committee.

The N.C. Cancer Prevention and Control Branch (Branch) provides staff for the Advisory Committee. (See Appendix A for Branch Information) The Branch



focuses on prevention, screening and early detection, treatment and survivorship, as well as education efforts. They emphasize the importance of evidence-based measures to ensure that effective programs and policies are implemented to make efficient use of limited resources.

### N.C. Cancer Partnership

The N.C. Cancer Partnership, a larger group of interested cancer survivors, organizations, individuals and professionals assists the Advisory Committee with its work. All members of the Advisory Committee, N.C. Cancer Partnership and Branch will work toward implementation of this Cancer Plan.



**2008**

Between 2008 and 2012, there were over

**89,500** cancer deaths.

**2012**



Nearly **18,412** of those deaths occurred in 2012.

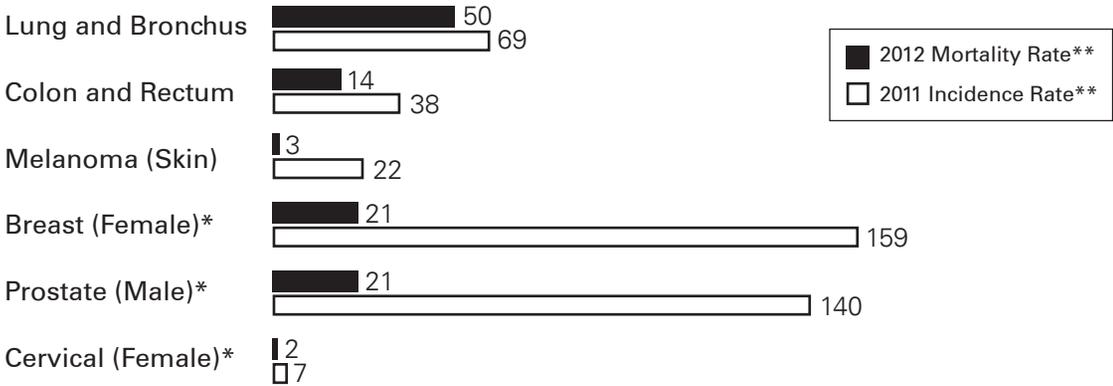


# N.C. Cancer Burden and 2014-2020 Priorities

Cancer has been the leading cause of death in North Carolina since 2009.<sup>1</sup> Between 2008 and 2012, there were over 89,500 cancer deaths. Nearly 18,412 of those deaths occurred in 2012.<sup>1</sup> Nationally and in North Carolina, cancer is the leading cause of death among 45-64 year olds, and the second leading cause of death for people 65 and over.<sup>1,2</sup> In 2010, the North Carolina age-adjusted death rate for cancer, 177.8 per 100,000, was higher than the 2010 national rate, 171.8 per 100,000.<sup>3</sup> 2010 is the most recent national data.

Cancer has a huge economic effect on individuals, the state and the nation. According to the National Institutes of Health (NIH), total cancer care cost the United States an estimated \$125 billion in 2010.<sup>4</sup> During the same period, the average cost per cancer case in North Carolina was \$41,401.<sup>5</sup> This total does not account for indirect costs due to lost productivity from illness and premature death. It is estimated that in 2010 North Carolinians under the age of 75 lost an

## Cancer Mortality and Incidence Rates



\* Sex-specific rates cannot be compared to other cancer site rates because the denominators represent different populations.  
 \*\* Rate per 100,000 population; Age-adjusted to US census NC Central Cancer Registry. *Statistics and Reports.*

average of 8.2 years of life due to cancer.<sup>6</sup> (See Appendix F for a series of maps showing cancer mortality and incidence rates by county)

## Priority Cancers

**Lung cancer** has been the leading cause of cancer deaths in North Carolina for over two decades. Between 2008 and 2012, over 27,000 deaths were due to lung cancer in North Carolina. Of those, nearly 5,454 lung cancer deaths occurred in 2012.<sup>1</sup> According to the 2014 Surgeon General’s Report, 87 percent of lung cancer deaths are preventable. Survival rates (20%) for lung cancers are poor.<sup>7</sup>

ACS reports that lung cancer death rates began declining in 1991 in men and

in 2003 in women. From 2006 to 2010, rates decreased 2.9 percent per year in men and 1.4 percent per year in women. This gender difference in lung cancer deaths reflects historical differences in patterns of smoking uptake and cessation over the past 50 years.<sup>8</sup>

**Colorectal cancer** was the second leading cause of cancer deaths in North Carolina in 2012. There were 1,533 colorectal cancer deaths in 2012 and over 7,550 deaths from 2008-2012 in North Carolina.<sup>1</sup> According to the 2012 Behavioral Risk Factor Surveillance System (BRFSS), 70.6 percent of North Carolina adults over age 50



report “ever having had a sigmoidoscopy or colonoscopy screening for colorectal cancer.”<sup>9</sup> It is estimated that between 2007 and 2011, about 40 out of every 100 deaths from late-stage colorectal cancer could have been prevented if all men and women aged 50 years or older were routinely screened.<sup>10</sup>

**Breast cancer** (female only) was the third leading cause of cancer deaths among North Carolina females in 2012. There were 1,286 female breast cancer deaths in 2012 and over 6,350 deaths from 2008-2012.<sup>1</sup> According to the 2012 BRFSS, 66.6 percent of North Carolina women reported, “ever having had a mammogram.”<sup>9</sup> Between 2007 and 2011, 95 percent of women in North Carolina diagnosed in the earliest stage of breast cancer survived five years compared to 34 percent diagnosed in the advanced stages. Early detection saves lives.<sup>10</sup>

**Pancreatic cancer** was the fourth cause of North Carolina cancer deaths in 2012.<sup>1</sup> In 2012, there were 1,175 pancreatic cancer deaths. It is not included in this Cancer Plan since there currently

are no established guidelines for preventing pancreatic cancer and no screening tests.

**Prostate cancer** (male only) was the fifth leading cause of cancer deaths among males in North Carolina in 2012. There were 844 prostate cancer deaths in 2012 and over 4,350 deaths from 2008-2012 in the state.<sup>1</sup> Prostate cancer death rates have been decreasing since the early 1990s in men of all races and ethnicities, although they remain more than twice as high in African Americans as in any other racial or ethnic group.<sup>8</sup> In 2012, 31.6 percent of men were told by a health professional of the advantages and disadvantages of a Prostate-Specific Antigen (PSA) test, a blood test used to check men for prostate cancer.<sup>9</sup> Almost 60 percent (58.9 %) of men in the same group stated they had “ever had a PSA test.”<sup>9</sup>

The two cancers discussed below are not in the top ten causes of cancer deaths in North Carolina but are important to North Carolinians for different reasons. Cervical cancer is included because it is preventable through the use of Human Papillomaviruses Vaccine (HPV). It can also be easily detected through screening and treated in early stages. Melanoma and other skin cancers are included because they are the most common cancers.

**Cervical cancer** (female only) was responsible for about 0.6 percent of all cancer deaths in North Carolina in 2012. There were 117 cervix uteri (cervical) cancer deaths in 2012 and over 560 deaths from 2008-2012 in N.C.<sup>1</sup> Cervical cancer can be prevented by HPV vaccine and detected through Pap test screening and the HPV test. If detected, early treatment of pre-cancerous conditions can prevent cervical cancer. In 2012, 35.5 percent of girls and 8.6 percent of boys ages 13-17 in North Carolina completed three or more doses of the HPV vaccine.<sup>11</sup>

**Melanoma skin cancer** was responsible for 72.8 percent of all North Carolina skin cancer deaths in 2010. There were 289 melanoma cancer deaths in 2012 and over 1,479 deaths from 2008-2012 in the state. The rate of new melanoma diagnoses is rising rapidly—with an average increase of more than five percent per year from 1995 to 2011.<sup>1</sup>

### **Childhood and Adolescent cancer**

According to the National Cancer Institute (NCI), cancer is the leading cause of death by disease among United States children between infancy and age 14. The causes of most childhood cancers are unknown, and for the most part they cannot be prevented. The major types of childhood cancers are



leukemia, lymphoma, brain and other central nervous system tumors. These account for more than half of new cases of childhood cancer. White and Hispanic children are more likely than children from any other racial or ethnic groups to develop cancer.<sup>12</sup>

Although cancer is not as common in adolescents and young adults (AYA) as in adults, there are certain cancers that affect this group. These include lymphoma thyroid, brain and central nervous system cancers. AYA cancer patients are a special group with unique challenges. Among those are the need for school and career counseling, fertility counseling and fertility protecting services, genetic counseling and AYA-specific psychosocial support.<sup>13</sup>

## Unequal Burden in North Carolina

### Health Disparities

NCI defines health disparities as differences in the incidence, prevalence, mortality and survival of a disease and the related adverse health conditions that exist among specific population groups including:

- racial and ethnic minorities;
- residents of rural areas including Southern Appalachia;
- lesbian, gay, bisexual and transgender people,
- older people,
- people with disabilities;
- people with low incomes and
- people who are uninsured.<sup>4</sup>

Across all chronic health conditions, health disparities exist. Cancer is no different. It is critical to work effectively with communities to eliminate all disparities. This Cancer Plan addresses disparities in cancer among populations experiencing a disproportionate burden of disease,

disability and death through prevention, early detection, care and treatment.

### Health Equity

Health equity occurs when every person has the opportunity to attain his or her full health capability and no one is blocked from achieving this capability because of his or her social position or circumstances.<sup>16</sup> The World Health Organization states, “These circumstances are shaped by the distribution of money, power and resources, which are themselves influenced by policy choices.”<sup>17</sup> The goal is to achieve the highest level of health possible for all groups. Research shows health outcomes for minorities –

**North Carolina Cancer Incidence and Mortality Rates  
by Race and Gender per 100,000 Population  
Age-Adjusted to the 2000 US Census\*\***

	<b>White Males</b>	<b>White Females</b>	<b>Minority Males</b>	<b>Minority Females</b>	<b>Total</b>
<b>Cancer Mortality Rate 2012<sup>14</sup></b>	203.1	138.5	245.3	155.4	170.5
<b>Cancer Incidence Rate 2011<sup>15</sup></b>	521.9	444.4	550.6	424.2	476.7

\*\* Note: The N.C. State Center for Health Statistics often publishes data by race for only two groups: white and minority. The State Center recognizes and appreciates the various population groups in North Carolina and the need for more details on race. A number of factors have hampered efforts to obtain accurate data on minority populations.



African Americans, American Indians and Hispanic/Latinos – are worse than for Whites. Social and economic factors such as income, education, racism, housing, employment, food accessibility, transportation and the environment are key components in determining an individual’s health status. Therefore, it is necessary to address these underlying factors in order to improve the health status of individuals and eliminate health disparities.

### **Health Equity Recommendations**

These health equity recommendations to reduce health disparities in general are adapted from the Centers for Disease Control and Prevention (CDC) and the National Association of County and City Health Officials.<sup>18</sup>

- ❑ **Identify/build** strategic partnerships with community organizations in a variety of settings to address social determinants of health such as employment, transportation, housing and public policy initiatives.

- ❑ **Build** community empowerment to address health disparities at the local level.
- ❑ **Encourage** alternative ways of thinking about public health practice, such as dialogues on the impact of structural racism on health.
- ❑ **Advocate, encourage and support** diversity within the workforce at all levels and positions.
- ❑ **Increase** funding for the development of initiatives for addressing health disparities and creating health equity.

### **Specific Cancer Recommendations**

The following recommendations are designed to specifically reduce disparities in cancer.

- ❑ **Improve** early detection through routine screenings.
- ❑ **Implement** evidence-based community interventions designed to improve the health of minority populations.

- ❑ **Use** a variety of culturally competent media to market cancer information to diverse populations in a variety of settings.
- ❑ **Educate** about the benefits of increased access to care for underserved populations to include:
  - healthcare coverage,
  - increased funding for preventive screening programs, such as Breast and Cervical Cancer Control Programs (BCCCP) and colorectal screening programs and
  - increased access to nutrient dense foods through the elimination of food deserts.
- ❑ **Develop** research projects to study the differences in participation in, and results from, cancer prevention and care clinical trials between minority/ ethnic and other population groups.
- ❑ **Increase** funding for preventive cancer screening programs.
- ❑ **Increase** access to nutrient dense foods through the elimination of food deserts.

## Access to Cancer Care

Differences in survival between population groups are influenced by many different factors.

### Lack of Medical Coverage

People with little or no health insurance coverage have a serious problem getting care. The North Carolina Institute of Medicine report, *Healthy North Carolina 2020* states there are an estimated 1.7 million uninsured individuals under the age of 65 living in North Carolina.<sup>19</sup> People with little or no health insurance are more likely to be diagnosed with cancer at later stages and, thus, have less chance of cancer survival.

### Unequal Access to Cancer Prevention, Early Detection and Treatment

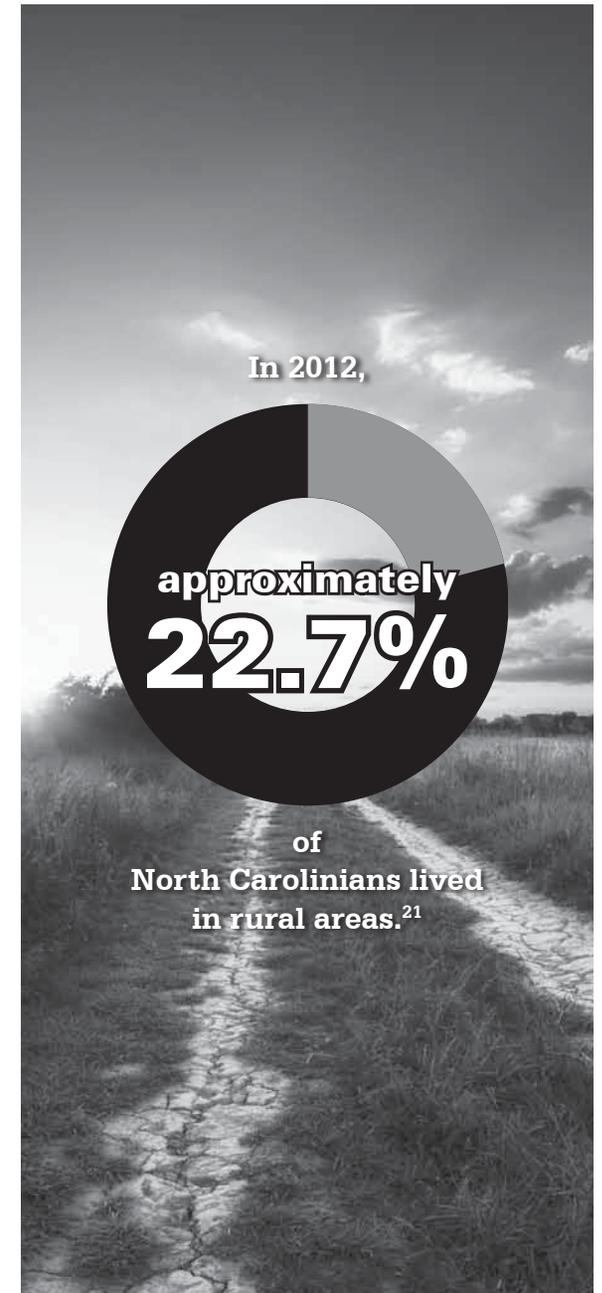
Many North Carolinians face additional financial and physical barriers to receiving preventive health care and health education as well as treatment for existing health problems.

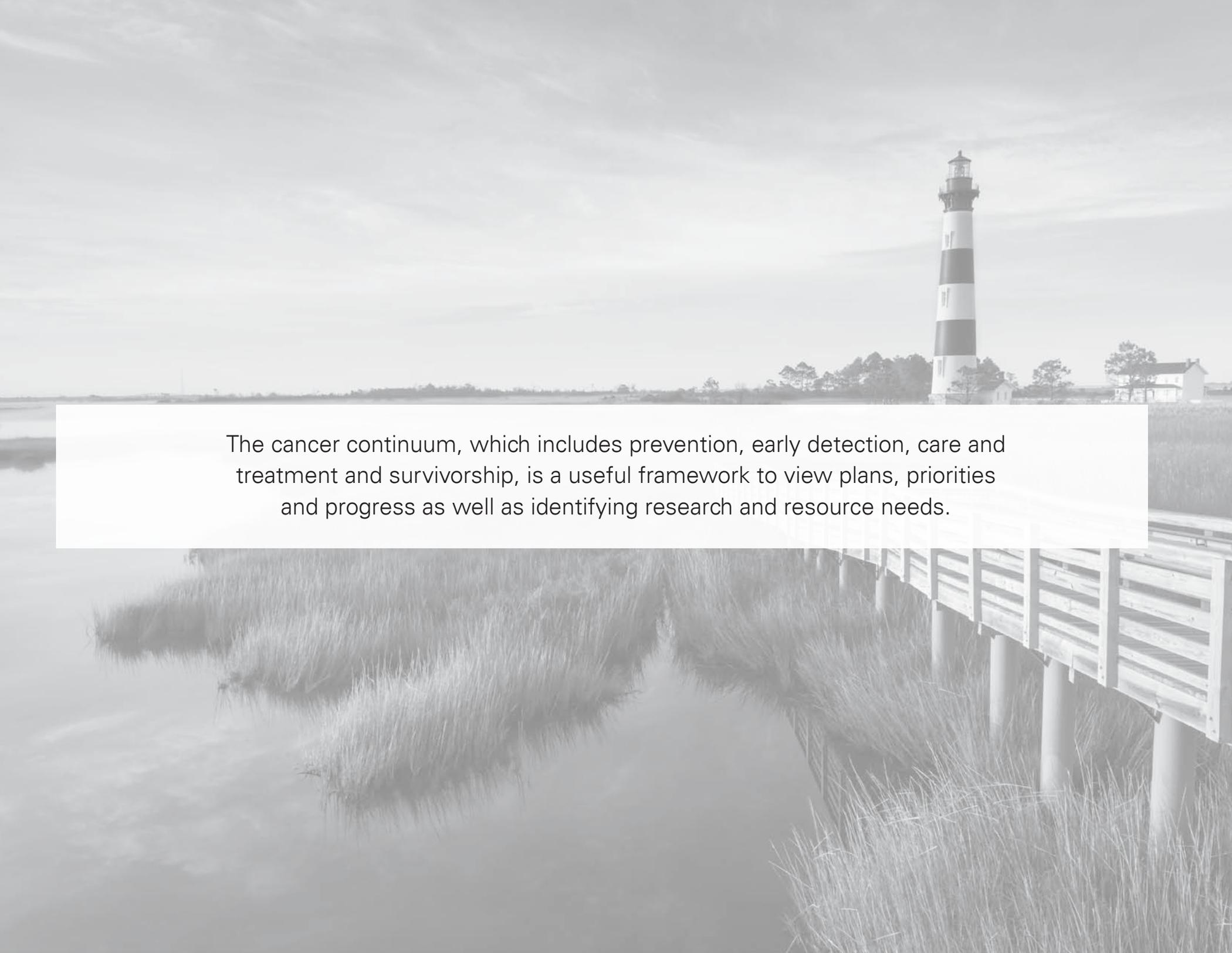
Lack of transportation and insufficient resources are major barriers to health care in North Carolina's rural communities where access to primary care physicians may be very limited.

The United States Census Bureau reports that between 2008 and 2012, 16.8 percent of North Carolinians were living in households whose income was at or below the federal poverty level.<sup>20</sup>

In 2012, approximately 22.7 percent of North Carolinians lived in rural areas.<sup>21</sup> Many cancer centers and doctors across North Carolina provide cancer care and treatment to rural patients close to home. However, the need for specialized care or treatment away from home is needed sometimes for rare kinds of cancer or late-stage cancers. North Carolina has several nationally recognized cancer centers that can give that specialized care. However, care at these centers often requires traveling long distances, a particular challenge for low-income people.

(See Appendix C for information on cancer hospitals)





The cancer continuum, which includes prevention, early detection, care and treatment and survivorship, is a useful framework to view plans, priorities and progress as well as identifying research and resource needs.



# North Carolina Comprehensive Cancer Control Plan

The Cancer Plan is designed to address the barriers to cancer prevention and care while outlining a plan of action for cancer programs, community organizations, policy makers and individual North Carolinians.

The overarching goals of the Cancer Plan are:

- Prevent** new cancers.
- Detect** cancer at its earliest stages.
- Treat** all cancer patients with the most appropriate/effective therapy.
- Enhance** the quality of life for every person affected by cancer.
- Reduce** cancer-related disparities in North Carolina.

In order to meet these goals, the Cancer Plan has specific objectives and strategies to address the cancer continuum, the six specific cancers, cancer surveillance and plan evaluation.

The cancer continuum, which includes prevention, early detection, care and treatment and survivorship, is a useful framework to view plans, priorities and progress, as well as identifying research and resource needs.

The Action Plan will be implemented by a diverse partnership of North Carolina cancer programs, organizations and individuals in order to assure North Carolinians timely and equitable access to healthcare throughout the cancer care continuum.



## Cancer Risk and Protective Factors

### Risk Factors

Risk factors increase a person’s chances of developing cancers. In addition to the risk factors listed in the chart, additional factors are growing older and gender. Risk factors such as growing older, gender and family history of cancer are beyond a person’s control. However, knowledge of family history may help with early detection of cancers with a strong genetic link. Cancers known to run in families include melanoma skin cancer and cancers of the breast, ovary, prostate and colon.

### Protective Factors

For cancers without a known genetic link, a person can significantly lower his or her risk by adopting protective healthy behaviors and improving the environments where he or she lives. Both risk and protective factors are discussed in the following pages.

**Specific Risk Factors’ Relationship to Priority Cancers**

	Lung	Colorectal	Breast	Prostate	Cervical	Skin
<b>Family History</b>						
<b>Tobacco Use</b>						
<b>Unhealthy Lifestyles</b>						
<b>Environmental Toxins</b>						
<b>Alcohol Use</b>						
<b>Ultraviolet Exposure</b>						
<b>Viruses</b>						



people do. Physically active women have a significantly lower risk of breast cancer. In addition, cancer survivors have a better quality of life if they are physically active compared to survivors who are inactive.<sup>23</sup>

The American Institute for Cancer Research recommends meeting physical activity and healthy eating recommendations in addition to maintaining a healthy body weight.<sup>22</sup>

All adults should avoid inactivity. Some physical activity is better than none at all.



# Cancer Risk Associated with Poor Nutrition, Physical Inactivity, Overweight and Obesity

About one third of the most common cancers in the United States can be prevented by a healthy diet, physical activity and weight management according to the American Institute of Cancer Research.<sup>22</sup>

## Overweight and Obesity

The percentage of overweight and obese adults and children has increased markedly over the past few decades. In North Carolina, more than two-thirds of adults are overweight or obese.<sup>24</sup>

Almost one third of North Carolina's children ages 10 to 17 are overweight or obese.<sup>18</sup> High rates of overweight and obesity in the state and nation cause decreases in life expectancy, productivity and quality of life.

A healthy weight depends on a person's height so recommendations for a healthy weight are often expressed in terms of body mass index (BMI). BMI is a number that is calculated using both weight and height.

(See Appendix D for Body Mass Index Chart)

**Poor Nutrition, Physical Inactivity and/or Overweight/Obesity increases the risk for these cancers:<sup>22</sup>**

breast	prostate
liver	colorectal
esophageal	kidney
stomach	lung
pancreas	
endometrial (uterine)	
mouth, pharyngeal and laryngeal	

In general, the higher the number, the more body fat a person has, although there are exceptions. BMI in a range from 18.5 to 24.9 is considered healthy. Persons who have a BMI range from 25.0 to 29.9 are considered overweight. A BMI of 30 or greater indicates that the person is obese.<sup>7</sup>

## Physical Activity and Healthy Eating

Physical activity and healthy eating are risk factors for cancer independent of healthy weight. The *2008 Physical Activity Guidelines for Americans* notes that physically active people have a significantly lower risk of colon cancer than inactive



## Core Behaviors to Reduce Overweight and Obesity<sup>25</sup>

### **Increase Physical Activity**

A pattern of regular physical activity beginning in childhood or adolescence is critical for lifelong weight management. Physical activity burns calories both during and after activity. Physical activity should consist of not only aerobic activities that get the heart pumping, such as walking or bicycling, but also activity that strengthens muscles and bones and increases flexibility.

### **Eat More Fruit and Vegetables**

Fresh fruits and vegetables are low in calories and high in vitamins, minerals, fiber and antioxidants. A diet with lots of fruits and vegetables is higher in volume and fiber while being lower in calories.

### **Eat Less Red and Processed Meats**

High intake of processed meats such as bacon, sausage, lunchmeats and hot dogs are linked to an increase in colorectal cancer incidence and mortality. Prepare

meats by baking, broiling or poaching rather than by frying or charring. Cooking meats at high temperatures can cause the formation of toxins that have been shown to cause cancer in animals.

### **Drink Less Sugar-Sweetened Beverages**

Reduce the number of sugar-sweetened beverages, including soda, sweet tea, energy drinks and sports drinks. These beverages provide calories with little or no nutritional value.

### **Decrease Television Viewing and Screen Time**

Reduce television and screen time so there is more time for physical activity. This also reduces exposure to advertisements for foods that are high in fat and sugar.

### **Eat Less Energy-Dense Foods**

Reduce the number of calorie-rich foods such as packaged snack foods; frosted cakes, cookies and candies; cheeseburgers; fried chicken; French fries and doughnuts. Foods that are energy-dense contain a large number of calories, mostly from fat and sugar. Decreasing the portion sizes of these foods reduces calories.

## **Adult Physical Activity Guidelines**

- Adults should do at least 2½ hours (150 minutes) of moderate-intensity or 1¼ hours (75 minutes) of vigorous-intensity aerobic physical activity per week.
- Adults should also do muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week.

*Note: U.S. Department of Health and Human Services, 2008 Physical Activity Guidelines for Americans*

### **Encourage Breastfeeding**

Promote breastfeeding to increase healthy nutrition for infants, and decrease the risk of childhood obesity. Some studies suggest that breastfeeding may slightly lower breast cancer risk in mothers.

(For additional North Carolina information see *North Carolina's Plan to Address Obesity: Healthy Weight and Healthy Communities 2013-2020* at <http://www.eatsmartmovemorenc.com/ESMMPlan/ESMMPlan.html>)



# Cancer Risk Associated with Tobacco Use and Exposure to Secondhand Smoke

Tobacco use is the number one preventable cause of premature death and disease in North Carolina and the nation. Annual North Carolina medical costs incurred from smoking are \$3.8 billion.<sup>1</sup>

In the United States, tobacco use is responsible for:

- nearly 20 percent of all deaths,
- at least 30 percent of all cancer deaths and
- 87 percent of lung cancer deaths.<sup>8</sup>

## Smoking

In North Carolina, more than 12,200 people die each year due to smoking. Lung cancer is the leading cause of cancer death in North Carolina and the United States for both men and women.<sup>1</sup>

### **Survival rates**

Survival rates for lung cancer are among the lowest of all cancers despite medical developments in its diagnosis and treatment. The national five-year survival rate for lung cancer in 2003-2009 was

**Tobacco use increases cancer risk for:<sup>8</sup>**

lung	stomach
colon/rectum	liver
breast	head/neck
prostate	pancreas
bladder	kidney
skin	ovarian
cervix	uterus
acute myeloid leukemia	

17 percent, a rate that has barely changed for more than 20 years.<sup>8</sup> In North Carolina, the five-year observed survival rate for lung cancer is 20 percent.<sup>1</sup>

### **Other tobacco products**

Smokeless tobacco users have an increased risk of developing cancer of the oral cavity. There is no known safe form of tobacco use including e-cigarettes, snuff, chewing tobacco, cigars and hookahs.

### **Secondhand smoke**

Nonsmokers die from lung cancer and heart disease and hundreds of thousands of children suffer from respiratory infections

because of exposure to secondhand smoke. There is no risk-free level of exposure to secondhand smoke. Thus, for every one person who dies from smoking, 20 more suffer at least one serious tobacco-related illness.<sup>26</sup>

## Protection from Tobacco Exposure

Protect and promote the health of everyone by reducing tobacco use and exposure to secondhand smoke. This will reduce cancer incidence and prevalence, as well as help North Carolinians live longer, be more productive and have happier lives.

## Key Strategies

### **Protect people from tobacco smoke**

Create more smoke-free/tobacco-free spaces where people live, work, play and learn.

- Maintain a statewide smoke-free law for all North Carolina restaurants and bars.



- ❑ Build support for the adoption of a comprehensive smoke-free law that protects all workers from exposure to secondhand smoke.
- ❑ Promote smoke-free and tobacco-free local regulations.
- ❑ Promote tobacco-free colleges and community colleges.
- ❑ Maintain North Carolina's tobacco-free schools and hospitals.
- ❑ Promote smoke-free multi-unit housing in North Carolina.

### ***Offer help to quit tobacco use***

Encourage people who use any type of tobacco products to quit.

- ❑ Increase the number of healthcare systems that adopt clinical practice guidelines for treating tobacco use dependence, and make it a systematic part of clinical assessment, much like a vital sign.



- ❑ Promote QuitlineNC (1-800-QuitNow or 1-800-784-8669) and [www.QuitlineNC.com](http://www.QuitlineNC.com) for all N.C. tobacco users who want to quit.
- ❑ Educate about the need for increased funding for QuitlineNC, so that evidence-based nicotine replacement therapy will be available for all QuitlineNC users who want to quit tobacco.

### ***Warn people about the dangers of tobacco use***

- ❑ Promote evidence-based media campaigns and local interventions that educate about the harms and addictiveness of tobacco use, the dangers of secondhand smoke and the best practices to reduce tobacco use.

- ❑ Educate about the need for recurring state funding for a statewide media campaign to educate North Carolinians, particularly youth, about the harmful effects of tobacco use.

### ***Enforce bans on tobacco advertising, promotion and sponsorship***

- ❑ Maintain compliance with the NC Youth Access to Tobacco law so that North Carolina meets federal requirements to keep youth tobacco sales rates below 10 percent.
- ❑ Maintain activity under contract with the FDA to enforce the North Carolina's requirements of the Family Smoking Prevention and Tobacco Control Act.

### ***Raise the price of tobacco products through increased taxes on cigarettes and other forms of tobacco***

- ❑ Educate and inform the public and decision-makers of the health and economic benefits of tobacco price increases to prevent young people from becoming addicted and to help tobacco users who want to quit.



- Work with partners to educate about the specific benefits of an increase in tobacco excise tax and a comparable increase for other tobacco products.

### ***Sustain tobacco prevention and control infrastructure and policies***

- Educate and inform the public and decision-makers about the return on investment of comprehensive tobacco control programs in coordination with state and national programs.
- Incrementally increase North Carolina's investment in tobacco prevention and control in order to meet the 2014 CDC Best Practices annual investment recommendation by 2020.
- Educate about the benefits of recurring state appropriations for evidence-based youth tobacco prevention and cessation programs to develop and sustain strong tobacco use preventive interventions at the community and state level in North Carolina.

(For more information see North Carolina Tobacco Prevention and Control Branch Web site at <http://www.tobaccopreventionandcontrol.ncdhhs.gov>.)

## **Cancer Risk Associated with Environmental Exposures**

According to NCI, researchers have estimated that as many as 67 percent of cancer cases are linked to some type of environmental factor such as exposures to radiation, infectious agents and substances in the air, water and soil.<sup>4</sup> Some workers may be exposed to cancer-causing chemicals and other substances in their workplaces.

Certain types of exposures are linked to specific cancers; for instance, radon exposure is linked to lung cancer.

**Radon** is a radioactive gas that cannot be seen, smelled or tasted. It is considered the primary cause of lung cancer for non-smokers. When released naturally from soil and rocks, it can accumulate and reach harmful levels when trapped in enclosed spaces such as homes, schools or other buildings. If detected, building modifications can be made to prevent the accumulation of high levels of radon. The N.C. Department of Health and Human Services Radon Program ([ncradon.org](http://ncradon.org)) offers monitoring and mitigation guidance.

**Arsenic** is a naturally-occurring element found in natural rock formations. It is

tasteless and odorless when it leaches into groundwater.

Long-term exposures to high levels of arsenic have been linked with non-melanoma skin cancers, lung cancer and other types of cancer.

**Pesticides** are chemicals used to reduce or eliminate unwanted pests or weeds. Exposure to pesticides may occur through inhalation, skin contact and ingestion. Exposure to pesticides has been linked with prostate, breast, bladder, colon and other types of cancer.

**Low-level medical radiation** is commonly used for x-rays to diagnose broken bones and dental cavities. The risk of cancer from such radiation is considered very small since they are used infrequently and at very low doses.

**High-level medical radiation** is used to diagnose and treat certain types of cancer; it can increase cancer risk later in life.



## Protection from Environmental Exposures

Minimize environmental exposures to radiation, chemicals and other toxic substances at home, schools, offices and the worksite.

### Key Strategies

#### **Check homes, buildings, and schools for high levels of radon**

Test and monitor for elevated levels of radon. A radon reduction system may be installed to remove the radon trapped under the building and vent it to the atmosphere at a safe distance from the building.

#### **Test well water for arsenic levels exceeding state and federal limits**

Test according to North Carolina Well Water and Health schedule. If levels are elevated, seek assistance to treat water or use alternative source of safe drinking water.

#### **Minimize or avoid use of pesticides and other chemicals**

- Research and use alternative methods of pest control.

- Wear protective clothing, gloves and eye protection when working with pesticides or other chemicals. Work outside or in a well-ventilated area.
- Wash hands and clothes thoroughly after working with pesticides or other chemicals. Remove shoes outside the home.
- Wash fruits and vegetables thoroughly before eating. Select organic when possible.

#### **Reduce exposure to diagnostic X-rays**

Speak with your doctor about alternative diagnostic methods.

## Cancer Risk Associated with Ultraviolet Radiation Exposure

UV radiation comes from the sun, sunlamps and tanning beds. It causes early aging of the skin and skin damage that can lead to skin cancer.

### Protection from UV Exposure

Avoid exposure to ultraviolet radiation from the sun and other sources such as tanning beds.

### Key Strategies

#### **Protect the skin with sunscreen**

Use a generous amount of sunscreen with a sun protection factor (SPF) of at least 30.

#### **Avoid long periods of exposure to the sun**

Especially avoid the sun between 10 a.m. and 4 p.m. when it is the strongest.

#### **Wear protective clothing and sunglasses with UV protection**

Protective clothing includes wide brimmed hats and tightly woven long sleeve shirts or clothing with sun protection embedded in it.<sup>8</sup>

#### **Educate about the importance of a state law to protect minors from UV exposure at indoor tanning beds**

Several measures have shown to decrease the use of tanning salons by adolescents:

- imposing an age limit or requiring parental permission,
- mandating salons to post the warning signs of tanning bed use and
- limiting advertisement.



## Cancer Risk Associated with Viral Exposure

Human papillomaviruses (HPVs) infection is the main cause of cervical cancer. Tobacco use, long use of birth control pills and having given birth to three or more children are also risk factors for cervical cancer. HPV infection also may be a risk factor for other types of cancer such as oral cancers.

### Protection from Viral Exposures

Since HPV is a major contributor to cervical cancer, there is a focus on the prevention and treatment of HPV. The HPV vaccine is proven effective in the prevention of many forms of HPV and can prevent cervical cancer as well as anal cancer, mouth and throat cancers, cancer of the penis in men and esophageal cancers in gay men.

Regular Pap tests can prevent cervical cancer by detecting cancer at an early stage, so successful treatment can begin early.

### Key Strategies

#### ***Protect children with HPV vaccines***

HPV vaccines are recommended for boys and girls starting around 11 to 12 years old until age 26, if appropriate.

#### ***Schedule regular Pap test screenings according to recommended guidelines to detect cancer early***

(See Appendix B – Cancer Information Resources for cancer screening information)

## Cancer Risk Associated with Alcohol Use

Drinking too much alcohol can increase the chance of developing cancers of the mouth, throat, esophagus, larynx, liver, breast, colon and rectum. Cancer risk increases with the amount of alcohol a person drinks.

Smoking alone is a known risk factor for some cancers. Smoking and drinking together intensifies the cancer-causing properties of each substance and poses an even greater risk. The risk of throat and

mouth cancers is especially high because alcohol and tobacco both come in direct contact with those areas.

### Protection from Alcohol Abuse

According to the American Institute of Cancer Research, studies show an association between alcohol drinking and several types of cancer. Reduce the risk by reducing or eliminating alcohol use. People who drink alcohol should limit their alcohol intake to two drinks per day for men and one drink per day for women.<sup>20</sup>

**A standard alcoholic drink in the United States contains 14.0 grams (0.6 ounces) of pure alcohol.**

**Generally, this amount of pure alcohol is found in**

- 12 ounces of beer (3 - 7 percent alcohol)
- 8 ounces of malt liquor beer (3 - 7 percent alcohol)
- 5 ounces of wine (9 - 15 percent alcohol)
- 1.5 ounces or a “shot” of 80-proof liquor (usually 35 - 40 percent alcohol), but can be higher.



## Cancer Prevention and Control Action Plan

In order to decrease the cancer risk and increase cancer protective factors, the Cancer Plan has five overarching goals. They are:

- ❑ **Prevent** new cancers.
- ❑ **Detect** cancer at its earliest stages.
- ❑ **Treat** all cancer patients with the most appropriate and effective therapy.
- ❑ **Enhance** the quality of life for every person affected by cancer.
- ❑ **Reduce** cancer-related disparities in North Carolina.

The Cancer Plan focuses on four areas: prevention, early detection, care and treatment and survivorship including palliative care.



## Cancer Prevention Focus

*Change behaviors, policies, environments or other systems to reduce North Carolinians' cancer risk.*

Most cancers can be prevented by taking steps to reduce risk factors such as:

- avoiding tobacco use and secondhand smoke,
- limiting exposure to environmental toxins,
- limiting alcohol use,
- limiting exposure to ultraviolet rays from the sun and tanning beds,
- eating a variety of fruits and vegetables,
- maintaining a healthy weight,
- being physically active and
- having recommended check-ups.

(See Appendix B – Scientific Information Resources)

## Cancer Prevention Strategies

### Education and promotion of healthy behaviors

- Provide education on evidence-based practices, policies, systems and environmental change approaches that focus on: health disparities, tobacco use prevention and control, cancer screening, physical activity and healthy eating.<sup>21,25</sup>
- Develop and use strategic, effective and tailored messaging and media campaigns in combination with other strategies to support healthy behaviors and reduce risk factors.
- Continue the N.C. Department of Public Instruction Standard Course of Study for K-12 students that promotes healthy behaviors.
- Promote radon testing/mitigation in homes, schools, workplaces and other community settings.
- Promote HPV vaccination for girls and boys starting at age 11 or 12 years until age 26, if appropriate.
- Promote cancer-screening tests that may prevent future breast, colorectal, cervical and skin cancers.

### Promotion of public policy

- Support the development and enforcement of state and local policies to prevent and minimize tobacco use, eliminate secondhand smoke and promote quitting.
- Support the development of state and local policies to encourage colorectal cancer screening for preventive purposes in people between the ages of 50 and 75.
- Support education and policy approaches in worksites and communities that can reduce occupational and environmental exposures to carcinogens.
  - Promote education and policy approaches that limit unprotected exposure to ultraviolet light.
  - Promote radon testing, radon resistant construction and mitigation of radon in schools, daycare centers, workplaces and homes.
- Support health education and health promotion policies, processes and interventions that increase the awareness of cancer screenings.





## Early Cancer Detection Focus

*Promote the adoption of recommended cancer screening and early detection methods and referral procedures.*

Screening means checking the body for cancer before a person has symptoms. Appropriate screening and early detection methods can have a significant impact on the incidence and mortality from certain cancers.

Recommended screening varies depending on the type of cancer. Regular screening tests may find breast, cervical, colorectal and skin cancers early when treatment might be most successful.

Research on effective cancer screening is an ongoing process with new methods being tested and released while approved older methods are reevaluated. Check sources for up-to-date information on recommended cancer screening.



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*“Never give up and early detection saves lives.”*

– Patricia, cervical cancer survivor since 1992

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(See Appendix B – Scientific Information Resources for information on cancer screenings)

## Early Cancer Detection Strategies

### Education and promotion of healthy behaviors

- ❑ Encourage healthcare providers to recommend and deliver cancer screenings based on the latest screening recommendations. (See Appendix B – Scientific Information Resources for information on cancer screenings)
- ❑ Partner with public and private healthcare providers and community leaders to:
  - increase cancer awareness,
  - improve opportunities for cancer screening with emphasis on people with high risk of developing cancer and
  - improve opportunities for cancer screening with emphasis on people with limited access to screenings.
- ❑ Promote research for early detection that will lead to improved outcomes, cancer care and quality of life. (See Appendix B – Scientific Information Resources for information on clinical trials and research)



## Cancer Care Continuum

The cancer care continuum begins with cancer screening or diagnosis, goes through treatment, continues throughout survivorship and includes end-of-life care.

**Survivorship** covers the physical, psychosocial and economic issues of disease, beyond the diagnosis and treatment phases. It may include issues related to:

- accessibility of healthcare and follow-up treatment,
- continued effects of treatment,
- reoccurring and/or additional cancers and
- quality of life.

**Palliative care** involves taking care of symptoms and providing relief from pain and stress of an illness.

**Patient navigation** involves helping patients, families and caregivers work through issues that arise during the cancer journey. All cancer patients, especially low-income patients, can have problems getting cancer care. Some of these problems might be:

- transportation which makes it difficult or impossible to get to treatment or other care,
- lack of health insurance,
- fear of the unknown and/or
- distrust of the medical system.

Patient navigators often work with a patient starting with diagnosis and continuing through all phases of the cancer experience. These navigators offer help to patients, families and caregivers by working with the healthcare system to ensure they receive needed care.

## Quality Care

According to the National Institute of Medicine (IOM), patients should receive cancer care that:

- is given by qualified medical providers,
- is decided by both the patient and the medical team (called shared decision making),
- considers age, sex, race, ethnic background, customs, social background and religion,
- is given in a safe and helpful way and



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“...we can live with hope because we are not alone in this journey.”

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– Lidia and Ana Maria,  
breast cancer survivors  
since 2006 and 2010



- is done in a way that saves money and time.

There are other issues involved in providing cancer care. They are the need for:

- a well-trained and reliable work force in which evidence-based practice guidelines are used,
- continuous monitoring of the quality of care across the state to be sure everyone is working together and following guidelines,
- patient navigation to help patients, families and caregivers work with the healthcare system to receive needed care and
- health information technology (HIT) and electronic health records (EHRs) to keep track of referrals made, evidence-based care given and guidelines followed.

The continuum provides patients, their loved ones and/or caregivers with the knowledge, resources and tools to support them through their cancer experience.



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The daffodil –  
the flower  
of cancer  
survivorship

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## Cancer Care Focus

*Improve access to care,  
enhance care coordination  
and assure quality treatment.*

Cancer care includes:

- taking care of symptoms and relief from pain beginning at diagnosis,
- focusing on the whole person,
- watching to see if the cancer returns (recurrence) or if an additional new cancer develops and
- supporting the patient, the patient's family, other loved ones and caregivers throughout survivorship.

Care and treatment should be based on the age of the patient. The very young and very old need care and treatment by healthcare professionals who specialize in cancer care for their population groups. Adolescent and young adult (AYA) cancer patients are another group who require special attention.

## Cancer Care Strategies

### Access to Care and Care Coordination

- Work with professional associations and other groups to:
  - promote a statewide patient navigation model with increased training and networking of patient navigators,
  - increase the number of patient navigators available to help patients overcome both structural and psychosocial barriers to care across the cancer continuum,
  - promote increased access to clinical trials for cancer care that will lead to improved outcomes and quality of life, especially for medically underserved populations and
  - promote adherence to national guidelines for cancer diagnosis and treatment.

### Quality Treatment

- Offer educational opportunities and support to non-Commission on Cancer (CoC) accredited cancer centers, general physicians, other healthcare workers and local agencies so they can:
  - follow national guidelines for cancer diagnosis and treatment,
  - offer evidence-based, value-based and patient-centered care and communications,
  - engage the patient in the care and treatment plan, including informed decision making,
  - use electronic health records,
  - provide age-sensitive and age-appropriate cancer treatment for pediatric, adolescent, young adult (AYA) and geriatric cancer patients,
  - utilize a team approach to patient care that uses appropriate specialist and non-specialist professionals,
  - achieve and adhere to CoC quality guidelines for accreditation and
  - provide educational opportunities for healthcare professionals that enhance or increase their knowledge and skills in:
    - comprehensive, team-based cancer care,
    - palliative care and
    - end-of-life services.





## Cancer Survivorship Focus

*Promote cancer supportive care and survivorship services and the use of cancer palliative care as well as end-of-life comfort care.*

A person becomes a cancer survivor at the time of cancer diagnosis and remains one throughout his or her life. More people today are cancer survivors for longer periods because of better ways to find cancer early and improved treatment.

Cancer survivors can have many problems that begin during and after treatment. Problems include physical, emotional, psychosocial, spiritual and/or financial concerns. Survivorship care supports the patient, the patient's family members, other loved ones, friends and other caregivers.

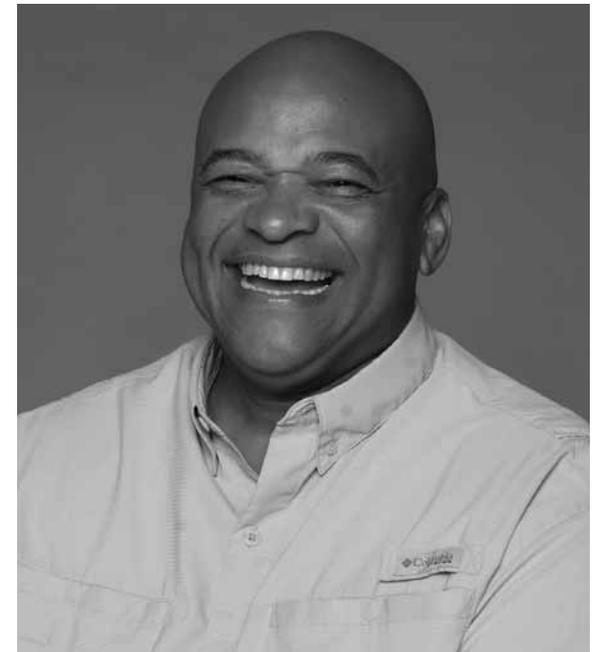
A healthcare professional can work with patients to write individualized survivorship care plans. The care plan can include problems one might anticipate after treatment and where to get help for those problems. The plan can help with emotional wellness, physical health and other support services.

### Palliative Care

Palliative care offers patients relief from the symptoms, pain and stress of an illness. It should offer the best possible feeling of well-being for patients and their families from the time of diagnosis throughout survivorship. Pain makes life difficult, causing problems with normal daily activities. All patients and their families should be educated about the importance of communicating the patient's pain and the need to control it.

Every treatment plan should include palliative care and focus on the patient's needs both during and after treatment. The plan should include the patient and family and/or caregiver in deciding needs and ways to address them. Palliative care uses medicines, non-drug treatments, emotional support and spiritual care.

Persons with cancer who no longer have choices for treatment that may cure or slow the progress of the cancer may be referred to hospice care. Hospice care includes palliative and comfort care to allow for death with dignity.



*"A positive mental attitude is good medicine."*

– John, a prostate cancer survivor since 2007



## Professional Outreach and Education

- Increase outreach and education to general physicians, other healthcare workers and local agencies to:
  - promote surveillance for incidence of recurrence, second primary cancers and long-term/late effects of treatment;
  - monitor maintenance therapy;
  - encourage management of psychosocial complications of diagnosis and treatment;
  - assist patients with transition/ return to a healthy lifestyle;
  - promote prevention strategies to minimize recurrence and second primary cancers;
  - encourage access to certified genetic counseling;
  - encourage the use of oncology rehabilitation services;
  - use a standardized comprehensive care guide/checklist that includes:
    - a tool for assessing their care and
    - information on supportive services, including survivorship, legal and financial counseling;
  - encourage the adoption of policies to increase access to pain management, improve symptom management, use proven complementary and integrative services and enhance end-of-life services;
  - promote strong policies about adequate pain management and
  - offer continuing medical education on pain management.

## Public Education

- Participate in cancer health and wellness campaigns designed to increase public knowledge about:
  - cancer recurrence,
  - second primary cancer prevention,
  - continuum of cancer care,
  - treatment choices,
  - palliative care and
  - end-of-life services.



## Everyone Has a Part in the Fight Against Cancer

Regardless of a person's role in the fight against cancer – as a cancer survivor, family member or friend, community leader, policy maker, business leader or employer, school staff or student, public health or healthcare professional – his or her skills and knowledge are vital in the fight against cancer. Everyone can play a role by working with decision makers and community members to: 1) support lifestyle behavior change to reduce cancer risks; 2) expand opportunities for screening, diagnostic tests, cancer treatment and patient support services and 3) support policy and environment changes to encourage and support healthy lifestyle choices.

	Prevention	Early Detection	Survivorship/Care	Policy/Systems Change
<b>Individuals</b>	<ul style="list-style-type: none"><li><input type="checkbox"/> Stop smoking or never start.</li><li><input type="checkbox"/> Avoid secondhand smoke.</li><li><input type="checkbox"/> Eat more vegetables and fruits.</li><li><input type="checkbox"/> Maintain a healthy weight.</li><li><input type="checkbox"/> Be physically active.</li><li><input type="checkbox"/> Protect the skin and eyes from the sun/UV radiation<ul style="list-style-type: none"><li>• wear protective clothing, hats and sunglasses,</li><li>• use sunscreen and</li><li>• avoid tanning beds.</li></ul></li><li><input type="checkbox"/> Get necessary vaccines and ensure youth get the HPV vaccination.</li><li><input type="checkbox"/> Reduce stress.</li><li><input type="checkbox"/> Educate family, friends and coworkers about things they can do to lower their chances of getting cancer.</li><li><input type="checkbox"/> Test the home for radon and take action to eliminate high levels.</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> Get needed regular screenings.</li><li><input type="checkbox"/> Discuss your family cancer history with other family members.</li><li><input type="checkbox"/> Encourage family, friends and coworkers to get regular screenings.</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> Support individual cancer survivors and caregivers in your community.</li><li><input type="checkbox"/> Volunteer with agencies and organizations that help cancer survivors.</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> Educate legislators/policy makers on the need for monetary and other support for cancer services for North Carolinians.</li><li><input type="checkbox"/> Educate local government and agencies about the need for healthy lifestyle programs and expanded clean air initiatives in communities, schools and places of employment and worship.</li><li><input type="checkbox"/> Make the healthy choice the easy choice by eliminating cancer risk factors in social and physical environments.</li></ul>



# Everyone Has a Part in the Fight Against Cancer

	Prevention	Early Detection	Survivorship/Care	Policy/Systems Change
<b>Individuals (continued)</b>	<input type="checkbox"/> Educate family/friends/coworkers about ways to improve youth health by: <ul style="list-style-type: none"> <li>• supporting youth tobacco use prevention and cessation programs,</li> <li>• advocating for improved nutritional standards in foods/drinks served or sold in schools,</li> <li>• telling those under 18 to avoid tanning beds and</li> <li>• supporting the use of sun protection at schools, sports events and playgrounds.</li> </ul>			
<b>Community Organizations</b>	<input type="checkbox"/> Have a no-tobacco policy inside and outside of buildings. <input type="checkbox"/> Start tobacco cessation programs. <input type="checkbox"/> Encourage physical activity through walking clubs or other activities. <input type="checkbox"/> Provide healthful food at events, meals or in vending machines. <input type="checkbox"/> Encourage sun-safe behaviors and sun-protected physical environments. <input type="checkbox"/> Educate others about the need for radon testing.	<input type="checkbox"/> Encourage community members to get appropriate screenings. <input type="checkbox"/> Provide screening events.	<input type="checkbox"/> Provide educational workshops. <input type="checkbox"/> Promote patient navigation and community health worker programs. <input type="checkbox"/> Encourage participation in clinical trials. <input type="checkbox"/> Volunteer to help cancer survivors, e.g., providing transportation to treatment, offering childcare during treatments, etc.	<input type="checkbox"/> Educate legislators/policy makers about the need for funding for cancer prevention, screening, treatment and research. <input type="checkbox"/> Encourage local government agencies to develop healthy living programs and clean air policies. <input type="checkbox"/> Provide health insurance coverage and increased access to care.



## Everyone Has a Part in the Fight Against Cancer

	Prevention	Early Detection	Survivorship/Care	Policy/Systems Change
<b>Schools</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Include cancer prevention messages in health and other classes.</li> <li><input type="checkbox"/> Provide healthful foods and drinks in vending machines and cafeterias.</li> <li><input type="checkbox"/> Make the campus tobacco-free, including new tobacco products like e-cigarettes.</li> <li><input type="checkbox"/> Encourage sun-safe behaviors and sun-protected physical environments.</li> <li><input type="checkbox"/> Increase physical education requirements and physical activity opportunities.</li> <li><input type="checkbox"/> Educate students about the HPV vaccine as a way to prevent cervical cancer and other HPV caused cancers.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Educate students about the importance of age appropriate cancer screenings.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Educate administrators, staff and faculty about patients' rights in the Americans with Disabilities Act.</li> <li><input type="checkbox"/> Educate teachers about the issues related to cancer treatment and survivorship.</li> <li><input type="checkbox"/> Educate school personnel on ways to ease a student's return to school after cancer treatment.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Educate policy makers about the need for healthy lifestyle programs on campus.</li> <li><input type="checkbox"/> Educate legislators/policy makers about the need for monetary and other support for cancer prevention, detection and treatment services.</li> </ul>
<b>Businesses</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Encourage employees to adopt a healthy lifestyle including healthy meals and regular physical activity.</li> <li><input type="checkbox"/> Maintain a tobacco-free workplace inside and outside of buildings.</li> <li><input type="checkbox"/> Provide sun-protective clothing and encourage use of sunscreen for outside workers.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Provide full financial coverage for recommended cancer screenings.</li> <li><input type="checkbox"/> Allow time off to get cancer screenings.</li> <li><input type="checkbox"/> Encourage promotion of QuitlineNC to tobacco users.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Educate employees on ways to ease a coworker's return to work after cancer treatment.</li> <li><input type="checkbox"/> Educate managers that there may be a need to change the worker's schedule during treatment.</li> <li><input type="checkbox"/> Educate staff and managers about patients' rights in the Americans with Disabilities Act.</li> <li><input type="checkbox"/> Carry short-and long-term disability insurance.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Support healthy behaviors.</li> <li><input type="checkbox"/> Provide health insurance coverage to all workers.</li> <li><input type="checkbox"/> Educate legislators/policy makers to ensure strong public policy for cancer prevention, screening, treatment and research funding.</li> <li><input type="checkbox"/> Ensure all evidence-based treatment is provided by insurance with no cost to patient.</li> </ul>



## Everyone Has a Part in the Fight Against Cancer

	Prevention	Early Detection	Survivorship/Care	Policy/Systems Change
<b>Businesses (continued)</b>			<ul style="list-style-type: none"> <li><input type="checkbox"/> Participate in community events that support cancer survivors.</li> <li><input type="checkbox"/> Provide information to cancer survivors and coworkers.</li> </ul>	
<b>Health Care Professionals</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Encourage patients and staff to adopt a healthy lifestyle by:               <ul style="list-style-type: none"> <li>• avoiding tobacco use and secondhand smoke,</li> <li>• using sun protection,</li> <li>• avoiding tanning beds and</li> <li>• being physically active.</li> </ul> </li> <li><input type="checkbox"/> Maintain a smoke-free environment inside and outside facilities.</li> <li><input type="checkbox"/> Offer cancer screening.</li> <li><input type="checkbox"/> Administer appropriate vaccines.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Recommend and/or provide appropriate cancer screenings.</li> <li><input type="checkbox"/> Allow time off work to get cancer screenings elsewhere.</li> <li><input type="checkbox"/> Provide insurance coverage for cancer screenings.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Provide appropriate medical care, information and referral for survivors.</li> <li><input type="checkbox"/> Offer survivorship educational forums for patients and caregivers.</li> <li><input type="checkbox"/> Use patient navigators and community health worker programs when appropriate.</li> <li><input type="checkbox"/> Encourage consideration of clinical trials as a treatment option.</li> <li><input type="checkbox"/> Provide tobacco treatment or referrals to cancer survivors who smoke.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Educate legislators/policy makers to ensure the availability and support for cancer prevention, screening and treatment.</li> <li><input type="checkbox"/> Work for changes within the organization to support healthy behaviors.</li> <li><input type="checkbox"/> Offer health insurance that covers cancer screenings.</li> <li><input type="checkbox"/> Ensure that Tobacco Treatment Clinical Practice Guidelines are integrated into clinical protocols.</li> </ul>
<b>Policy Makers</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Sponsor or support legislation that promotes cancer prevention/control.</li> <li><input type="checkbox"/> Support evidence-based intervention policies and programs that lead to environmental and behavioral changes and support healthy lifestyles.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Support proven cancer prevention and control programs.</li> <li><input type="checkbox"/> Promote system and funding changes that will increase access to cancer screenings, medications and care.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Support legislation that funds cancer treatment and research including palliative care.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Consider adopting the recommendations of the N.C. Advisory Committee on Cancer Coordination and Control.</li> <li><input type="checkbox"/> Ensure that tobacco settlement and tobacco tax funds are used for tobacco and cancer control purposes.</li> </ul>



## Cancers Addressed in the North Carolina Comprehensive Cancer Control Plan

The cancer continuum (prevention, early detection, care, survivorship including palliative care) discussed in the previous section is the framework for addressing the cancer burden in North Carolina.

The six priority cancers (lung, colorectal, breast, prostate, cervical and skin) are discussed in the next section. Maps showing North Carolina cancer mortality and incidence rates are located in Appendix F.



LUNG



COLORECTAL



BREAST



PROSTATE



CERVICAL



SKIN

## Lung Cancer Objectives

1. Reduce the mortality rate due to lung cancer.
2. Reduce the incidence rate due to lung cancer.
3. Increase the number of homes mitigated for radon.

Lung cancer refers to any cancer that forms in the tissues of the bronchus or lung. Lung cancers are usually grouped into two main types, small cell and non-small cell. These differ in growth rate as well as how they are treated.

Lung cancer was the leading cause of cancer deaths in North Carolina in 2012 (29.6%).<sup>1</sup> It is estimated that 8,624 people will be diagnosed with lung cancer and 6,180 people will die from lung cancer in 2014.<sup>10</sup>

### Risk Factors

Risk factors for lung cancer include smoking and exposure to secondhand smoke, radon and environmental hazards such as asbestos, coal dust and other substances. Nearly all lung cancer is caused by smoking.<sup>19</sup> Among people who have never smoked, radon is the leading cause of lung cancer. People who smoke and are exposed to radon have an increased risk of lung cancer. A person's risk

of lung cancer may be higher if his or her parents, siblings or children have had lung cancer. This could be true because they also smoke or they live or work in the same place where they are exposed to radon and other substances that can cause lung cancer.

### Prevention

Lung cancer is preventable by not smoking and by reducing exposure to secondhand smoke, radon and other environmental hazards.

### Treatment

Treatment is usually most successful when the cancer is detected early. Lung cancer treatment options include surgery, chemotherapy, radiation and targeted drug therapy.

(See Appendix F for a map showing lung cancer mortality and incidence rates by county)

## Lung Cancer Strategies



- Support state and local policies that reduce occupational and environmental exposures to lung carcinogens with an emphasis on tobacco use, secondhand smoke and radon (including homes, schools and workplaces).
- Support messaging campaigns about lung cancer risk factors which include radon exposure, tobacco use and exposure to secondhand smoke.
- Educate policy makers about the need for increased funding for programs, coalitions and action groups that address or reduce the risk factors of lung cancer.
- Encourage the building of radon-resistant new construction and testing and mitigation of radon in schools, daycare centers, workplaces and homes.
- Promote awareness of the USPSTF recommendation for low-dose computed tomography (CT Scans) to healthcare providers for adults who meet specific age and smoking history criteria.
- Support lung cancer research.

Measures	Base Line	2020 Target <sup>28</sup>
Lung cancer mortality rate <sup>14</sup>	49.9/100,000	38.5/100,000
Lung cancer incidence rate <sup>15</sup>	68.5/100,000	60.7/100,000
Estimated number of homes mitigated for radon from 10/2010 to 03/2013 <sup>27</sup>	6,886	Increase by 25%



## Colorectal Cancer Objectives

1. Reduce the mortality rate due to colorectal cancer.
2. Reduce the incidence rate due to colorectal cancer.
3. Increase the percentage of North Carolina adults ages 50-75 who have had a colorectal cancer screening test within the past five years.

Colorectal cancer develops in the colon and/or the rectum. Colorectal cancer was the second leading cause of cancer deaths in North Carolina in 2012 (8.3%).<sup>1</sup> It is estimated that 4,746 people will be diagnosed with colorectal cancer and 1,665 people will die from colorectal cancer in 2014.<sup>10</sup>

### Risk Factors

Risk factors for colorectal cancer include increasing age, colorectal polyps, overweight and obesity, smoking, a family history of colorectal cancer, chronic inflammatory conditions of the colon and certain genetic conditions. Diabetes also increases the risk of developing colon cancer.

### Prevention

Colorectal cancer is mostly preventable. A colonoscopy, one type

of colorectal cancer screening, can find polyps which can be removed before they become cancer. Other screening tests include the two fecal blood tests – Fecal Occult Blood Test (FOBT) and Fecal Immunochemical Test (FIT) – and sigmoidoscopy. Results from the 2012 BRFSS Survey show that 70.6 percent of North Carolina adults over age 50 report, “ever having had a sigmoidoscopy or colonoscopy screening for colorectal cancer.”<sup>9</sup>

While colorectal cancer risk increases with age, lifestyle choices can significantly reduce the overall risk of colorectal cancer.

According to the American Institute for Cancer Research, 50 percent of the estimated

cases of colorectal cancer in the United States are preventable by diet, activity and weight management.<sup>22</sup>

### Treatment

Treatment is usually most successful when the cancer is detected early. Colorectal cancer treatment options include surgery, chemotherapy and radiation therapy.

(See Appendix F for a map showing colorectal cancer mortality and incidence rates by county)

## Colorectal Cancer Strategies

- Conduct targeted outreach using evidence-based strategies to decrease disparities in colorectal cancer mortality. These efforts should focus on population groups who experience high mortality rates from colorectal cancer.
- Promote the use of the guidelines and recommendations of the N.C. Advisory Committee on Cancer Coordination and Control.

(See Appendix B - Scientific Information Resources)

Measures	Base Line	2020 Target <sup>28</sup>
Colorectal cancer mortality rate <sup>14</sup>	14.3/100,000	10.1/100,000
Colorectal cancer incidence rate <sup>15</sup>	37.8/100,000	26.4/100,000
% adults who had sigmoidoscopy or colonoscopy colorectal screening <sup>9</sup>	70.6%	81.4%

## Breast Cancer Objectives

1. Reduce the mortality rate in women due to breast cancer.
2. Reduce the rate of stage III and IV breast cancer in women.
3. Increase the percentage of North Carolina women over the age of 50 who have had a mammogram according to recommended guidelines within the past two years.

Breast cancer is a malignant tumor that starts in the cells of the breast. While the disease occurs mostly in women, men also can get it. Breast cancer was the third leading cause of cancer deaths in North Carolina women in 2012 (7.0%).<sup>1</sup> It is estimated that 9,712 females in North Carolina will be diagnosed with breast cancer and 1,412 females will die from breast cancer in 2014.<sup>23</sup> Between 2007 and 2011, 95 percent of women diagnosed in the earliest stage survive at least five years compared to 34 percent diagnosed in the advanced stage.<sup>9</sup>

### Risk Factors

The strongest risk factor for breast cancer is being female. Other risk factors include increasing age, a family history of breast cancer, early puberty, late menopause, obesity, smoking and alcohol use.

Additionally, according to the American Institute for Cancer Research, 38 percent of the estimated cases of breast cancer in the

United States are preventable by diet, physical activity and weight management.<sup>15</sup>

### Prevention

Mammograms are the most effective method to detect breast cancer early before it causes symptoms or can be detected by touch. According to the 2012 BRFSS Survey, 66.6 percent of North Carolina women of all ages reported, “ever having had a mammogram.”<sup>9</sup>

### Treatment

Treatment is usually most successful when the cancer is detected early. Breast cancer treatment may involve surgery, radiation therapy, chemotherapy and other therapies.

## Breast Cancer Strategies



- Conduct targeted outreach using evidence-based strategies to decrease disparities in breast cancer mortality among women who experience high death rates from breast cancer.
- Partner with NCBCCCP and WISEWOMAN providers and other agencies to improve data sharing and patient tracking to assure that eligible patients get appropriate screening and treatment services for breast cancer. (See Appendix A)
- Promote the use of the guidelines and recommendations of the N.C. Advisory Committee on Cancer Coordination and Control.

(See Appendix B - Scientific Information Resources)

(See Appendix F for a map showing breast cancer mortality and incidence rates by county)

Measures	Base Line	2020 Target <sup>28</sup>
Breast cancer mortality rate <sup>14</sup>	21.4/100,000	16.8/100,000
Stage III and IV breast cancer rate <sup>15</sup>	46.3/100,000	40.9/100,000
% women over age 50 who had mammograms within the past two years <sup>9</sup>	79.4%	TBD*
* Note: Recommendations have changed recently and awaiting BRFSS data changes.		



## Prostate Cancer Objectives

1. Reduce the mortality rate in men due to prostate cancer.
2. Increase the percentage of North Carolina men who have ever talked with their healthcare providers about the advantages and disadvantages of a PSA test.

Prostate cancer is the presence of abnormal cells and/or a tumor in the prostate gland, a part of the male reproductive system. Prostate cancer was the fifth leading cause of cancer deaths in North Carolina in 2012 (4.6%) and is the most frequently diagnosed cancer in men.<sup>1</sup> It is estimated that 8,399 males in North Carolina will be diagnosed with prostate cancer and 1,009 males will die from prostate cancer in 2014.<sup>10</sup> Prostate cancer tends to grow slowly when compared to other cancers. Most men with prostate cancer will die of other causes rather than prostate cancer.

### Risk Factors

Risk factors for prostate cancer include being male, increasing age, African American and American Indian ancestry with a family history of prostate cancer. The older a man is, the greater his risk for getting prostate cancer. About 80 percent of cases are in men over 65 years of age.

Prostate cancer is more common in African American men than in men of other racial backgrounds. Moreover, African American men are more often diagnosed with prostate cancer when it is in advanced stages. They are over two times more likely to die from prostate cancer than white men. In addition, any man with a father, brother or son who has had prostate cancer is two to three times more likely to develop the disease.

### Prevention

Because there is no known cause of prostate cancer, it is difficult to determine how best to prevent it. Dietary practices such as eating red meats, dairy products and fatty foods and cooking meats at high temperatures appear to increase the risk of prostate cancer. Obesity appears to increase the risk of aggressive prostate cancer. There is some evidence that occupational exposures

to certain toxic chemicals increases the risk. Exercising and eating cruciferous vegetables such as broccoli, cabbage and cauliflower and foods with Lycopene. Taking certain drugs such as aspirin, cholesterol lowering and anti-inflammatory medications may decrease the risk.<sup>25</sup>

### Treatment

Some forms of prostate cancer are so slow growing that they may not require treatment. For those who do need treatment, it may include surgery, active surveillance (also known as watchful waiting), chemotherapy, radiation therapy and hormone therapy.

(See Appendix F for a map showing prostate cancer mortality and incidence rates by county)

## Prostate Cancer Strategies

- Conduct targeted outreach using evidence-based strategies to decrease disparities in prostate cancer mortality among male population groups who experience high death rates from prostate cancer.
- Conduct messaging campaigns to increase awareness of the importance of informed decision making regarding prostate cancer.

Measures	Base Line	2020 Target <sup>28</sup>
Prostate cancer mortality rate <sup>14</sup>	21.0/100,000	13.0/100,000
% men who have talked to health care provider about advantages and disadvantages of PSA test. <sup>9</sup>	31.6%	Increase by 10%



## Cervical Cancer Strategies

- Conduct targeted outreach using evidence-based strategies to increase cervical cancer screening among groups of women who experience high mortality rates from cervical cancer.
- Coordinate with stakeholders to develop a messaging campaign to increase the awareness of the public of the importance of recommended HPV vaccines.
- Partner with NCBCCCP and WISEWOMAN providers and other agencies to improve data sharing and patient tracking to assure that eligible patients get appropriate screening and treatment services for cervical cancer.
- Promote the use of the guidelines and recommendations of the N.C. Advisory Committee on Cancer Coordination and Control.

## Cervical Cancer Objectives

1. Reduce the mortality rate in women due to cervical cancer.
2. Reduce the incidence rate in women due to cervical cancer.
3. Increase HPV complete series vaccination rate for males and females ages 9 to 26.\*
4. Increase the percentage of North Carolina women ages 21-65 who have had a Pap test within the past three years.

Cervical cancer is cancer in women that forms in tissues of the cervix, the mouth of the uterus. It is usually caused by human papillomavirus (HPV) infection. Cervical cancer was the 21st leading cause of cancer death in North Carolina in 2012 (0.6 %).<sup>1</sup> It is estimated that 380 women will be diagnosed with cervical cancer and 123 women will die from cervical cancer in 2014.<sup>10</sup>

### Risk Factors

The primary risk factors for cervical cancer are being a woman and having had an HPV infection. Other risk factors are smoking, using oral contraception for five or more years, having given birth to three or more children and having sex with a partner who is infected with HPV.

### Prevention

Cervical cancer is easily detected and can mostly be prevented through the use of the HPV vaccine. An important way women can

prevent cervical cancer is to have regular screening tests starting at age 21. Two tests can help prevent cervical cancer. The Pap test (or Pap smear) looks for precancers, which are cell changes on the cervix that may become cervical cancer if they are not treated appropriately. The other test is the human papillomavirus (HPV) test. This test looks for the virus that can cause the cell changes.

### Treatment

Treatment is usually most successful when the cancer is detected early. Treatment options for cervical cancer include surgery, chemotherapy and/or radiation therapy.

Measures	Base Line		2020 Target <sup>28</sup>	
Cervical cancer mortality rate <sup>14</sup>	2.0/100,000		1.3/100,000	
Cervical cancer incidence rate <sup>15</sup>	7.3/100,000		6.1/100,000	
*data only available for % of population ages 13-17 vaccinated with HPV <sup>11</sup>	Females	Males	Females	Males
	35.5%	8.6%	57.7%	17.7%
% Women who had pap tests age 21-65 <sup>9</sup>	86.5%		TBD*	
* Recommendations have changed recently and awaiting BRFSS data changes				



## Melanoma Skin Cancer Objectives

1. Reduce the mortality rate due to melanoma.
2. Reduce the incidence rate due to melanoma

Skin cancer forms in the tissues of the skin. There are several types of skin cancer: melanoma forms in the skin cells that make pigment; basal cell cancer forms in the outer layer of the skin and squamous cell cancer forms in the flat cells that form the surface of the skin. Melanoma is the most serious form of skin cancer and causes 72.8 percent of all skin cancer deaths. Left untreated, it can spread to other organs and is difficult to control.

The rate of new melanoma diagnoses in North Carolina is rising rapidly—with an average increase of more than five percent per year from 1995 to 2011.<sup>1</sup>

Basal cell and squamous cell cancers are less serious types and make up 95 percent of all skin cancers.<sup>1</sup>

### Risk Factors

Risk factors vary for different types of skin cancer. For melanoma, the major risk factors include a personal or family history of melanoma and the

presence of large, irregularly shaped or numerous moles, i.e., more than 50.

The primary risk factor for other forms of skin cancers is exposure to ultraviolet radiation from the sun and other sources such as tanning beds and sun lamps. Other risk factors for all types of skin cancers include sun sensitivity such as sun burning easily, a history of excessive unprotected sun exposure, the use of tanning booths, diseases or treatments that suppress the immune system and a history of skin cancer.<sup>7</sup>

Skin cancer is more common among people with a light (fair) skin tone. However, skin cancer is not limited to people with fair skin.

### Prevention

Research shows that there is a correlation between sunburns acquired during childhood

and increased risk of some skin cancers later in adulthood. Protection from UV radiation is important all year round, not just during the summer or at the beach. It is important that prevention and education strategies be emphasized for all ages.

### Treatment

Melanoma treatment options include surgery, chemotherapy, immunotherapy and/or radiation therapy. Basal cell and squamous cell cancers are highly curable when treated early. Several methods of treatment include surgical incision, cryosurgery, chemotherapy, tissue destruction by electric current and/or radiation therapy.

## Melanoma Cancer Strategies

- Promote education and policies in schools and recreational and tourism settings that can improve sun safety behaviors such as, limiting unprotected exposure to ultraviolet light.
- Support policy changes that require parental approval for adolescents to use artificial sun tanning facilities and other sources of ultraviolet light.

Measures	Base Line	2020 Target <sup>28</sup>
Melanoma cancer mortality rate <sup>14</sup>	2.7/100,000	2.2/100,000
*Melanoma cancer incidence rate <sup>15</sup>	21.5/100,000	27.9/100,000

\* Note: While the target is an **increase** over the base line, it actually reflects an over ten percent **decrease** in the incidence growth rate.

## Cancer Surveillance Focus

*Promote the use of cancer surveillance data to support a broad range of analyses at the state, regional and local levels.*

Plans for reducing the cancer burden in North Carolina depend greatly on having timely, high quality and complete cancer data. Data can help identify possible causes for cancer, determine where greater prevention efforts are needed and identify which strategies are most effective in reducing cancer mortality.

The core functions of cancer surveillance are the measurement of cancer incidence, morbidity, survival and mortality for persons with cancer. It also includes the assessment of genetic predisposition, environmental and behavioral risk factors, screening practices and the quality of care from prevention through palliation. The availability of statewide cancer data enables health researchers and policy makers to analyze demographic and geographic factors that influence cancer risk, early detection and effective treatment of cancer patients. Combined with

behavioral, attitudinal, environmental and structural data, cancer surveillance informs the development, implementation and evaluation of early detection, educational and other cancer-related programs.



## Cancer Surveillance Strategies

- ❑ Collaborate with regional coalitions to determine county and region specific data needed.
- ❑ Work with the N.C. State Center for Health Statistics and others to plan and implement training opportunities for potential users of cancer data.
- ❑ Develop data sources for those objectives and strategies for which baseline data are not currently available.
- ❑ Partner with the N.C. State Center for Health Statistics and others to support and utilize monitoring and surveillance systems and data sources for tracking cancer outcomes, risk factors and health behaviors.
- ❑ Promote the development of North Carolina cancer specific screening registries.
- ❑ Identify and/or create opportunities for data sharing/data linkage with partners and other stakeholders in accordance with Health Insurance Portability and Accountability Act (HIPAA) standard.
- ❑ Seek opportunities to share data from systems such as the N.C. Central Cancer Registry and the Behavioral Risk Factor Surveillance (BRFSS) system with partners and other interested parties.



## Cancer Plan Evaluation Focus

*Create, conduct and disseminate evaluation studies and survey data to monitor and assess change in knowledge, attitude and behavior of North Carolinians.*

### Cancer Plan Evaluation

Evaluation is a critical and central component of the implementation of the North Carolina Comprehensive Cancer Control Plan. The evaluation process:

- monitors activities,
- measures progress and
- establishes a foundation for future cancer control work.

Measuring the outcomes of specific initiatives and tracking progress in meeting targets in the Cancer Plan are essential to achieving the goals of the Advisory Committee. Without evaluation, time and resources may be misspent and

more strategies that are successful may be overlooked. Evaluation also includes assessing success in engaging partner organizations and determining their satisfaction with the activities and implementation of the Cancer Plan.

In order to monitor progress toward implementing the plan, a regular review of strategies will be conducted. This review will be reported to the Advisory Committee and its subcommittees and work groups to ensure implementation of the plan is on track. A systematic review provides an opportunity to update and revise plans as necessary.

### Evaluation Plan

Process and outcome evaluation plans and surveillance systems are needed to show progress toward achievement of the goals and objectives of the Cancer Plan and to assess and monitor the cancer burden in North Carolina.

- **Process evaluation** monitors implementation of programs and activities. The focus of process evaluation is on progress toward implementing planned strategies and interventions directly linked to goals and objectives. Process evaluation will determine if the plan is implemented as intended as well as identify areas that can be modified or improved. Process evaluation will also assess the partner’s level of engagement and satisfaction with the Cancer Plan development and implementation process.
- **Outcome evaluation** monitors the long-term progress of Cancer Plan goals and objectives. Changes in outcome measures such as cancer incidence and mortality occur slowly. These measures will be monitored and reported annually, using the data sources and targets listed in the Cancer Plan.

### Cancer Plan Evaluation Strategies

- Assess the degree to which the Cancer Plan strategies are implemented.
- Disseminate evaluation reports and documents including survey summaries, and implementation assessments to the Advisory Committee, subcommittees and N.C. Cancer Partnership members and other stakeholders.
- Develop and/or expand partnerships that provide evaluation and program feedback.
- Maintain and modify as needed reporting mechanisms that document progress.



## Evaluation Areas

The evaluation will focus on the following areas and include education and policy development data measures.

### ***Policy development***

Policy development and promotion includes state and local laws, regulations and ordinances, as well as institutional policies and practices.

Policy development evaluation involves tracking types and implementation of health-related policies (treatment/management protocols, public policies, evidence-based standards, organizational wellness and risk factor awareness/prevention), to include:

- level of impact (state, local, organizational);
- population sector(s) affected and
- partners involved.

### ***Education***

Education and awareness programs, initiatives and campaigns for both public and professional audiences are important components of the implementation of the Cancer Plan.

Education evaluation will involve two components.

- The documentation of the development and distribution of:
  - treatment/management protocols,
  - toolkits,
  - media campaigns,
  - Web site pages and
  - fact sheets.
- An assessment of the cultural and linguistic appropriateness of the materials or workshops for the intended audiences.

### ***Systems changes***

Systems changes to improve healthcare delivery and accessibility include electronic records and monitoring systems to validate adherence to recommended treatment guidelines, protocols to facilitate coordination of care across specialty areas and transitions between settings.

Evaluation will monitor:

- documentation of current screening and treatment protocols in healthcare settings,

- record reviews to validate implementation and
- documentation of established collaborations that enhance multidisciplinary approaches and communications among providers in a variety of settings.



**CALL TO ACTION**  
**Everyone has a part in the fight against cancer**  
palliative care prostate prevention tobacco use  
care and treatment obesity collaboration data  
mortality lung incidence  
ultraviolet radiation exposures priority cancers burden exposure to secondhand smoke physical activity  
environmental exposures physical inactivity colorectal alcohol use melanoma poor nutrition viral exposures  
risk factors sun protection radon testing partnerships patient navigation  
survivorship tanning bed overweight  
early detection evaluation  
cervical surveillance  
good nutrition  
cancer  
breast



## Summary

Cancer is a complex disease that makes cancer prevention and control multifaceted. This 2014-2020 North Carolina Comprehensive Cancer Control Plan provides not only a description of the current state of cancer in North Carolina but guidance for statewide coordination of cancer prevention and care efforts for a broad group of institutions, agencies, community groups and individuals across the state.

The overarching goals of the plan are to:

- prevent new cancers,
- detect cancer at its earliest stages,
- treat all cancer patients with the most appropriate and effective therapy,
- enhance the quality of life for every person affected by cancer and
- reduce cancer-related disparities in North Carolina.

The Cancer Plan is organized using the cancer continuum: prevention, early detection, care and treatment. It focuses on specific cancers including lung, prostate, breast, colorectal, cervical and

melanoma and non-melanoma skin cancers. The Cancer Plan with additional references and resources is available on <http://publichealth.nc.gov/chronicdiseaseandinjury>.

A companion community brochure is available on the upcoming Web site. This brochure can be copied and used for community outreach.



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27. North Carolina Department of Health and Human Services. Radon Program. [http://www.ncradon.org/How\\_to\\_test\\_%26\\_mitigate.html](http://www.ncradon.org/How_to_test_%26_mitigate.html)
28. Target data were established using the *Healthy North Carolina 2020* methodology. This target-setting method determined what the 2020 target would be if the average annual percentage change was maintained. This target was found by first calculating the percentage change between each year from 2001 to the current year available which is 2011 for incidence data and 2012 for mortality data to get an average annual percentage change. This average annual percentage change was used to calculate a 2020 value. Then the target was set by making a 10 percent improvement in the 2020 value.

A grayscale photograph of a flower, likely a poppy, with several petals and a central cluster of stamens. The image is softly blurred, creating a bokeh effect in the background. A white rectangular text box is centered over the flower, containing the word "Appendices" in a bold, black, sans-serif font.

# Appendices



## Appendix A

# N.C. Cancer Prevention and Control Branch

## North Carolina Cancer Prevention and Control Branch

The North Carolina Cancer Prevention and Control Branch strives to reduce the overall cancer burden in North Carolina by:

- planning, directing and supporting cancer control efforts through collaborations with partners in state and federal health agencies, academic institutions, and national, voluntary and private organizations;
- providing screening services and follow-up services for low-income uninsured and under-insured women;
- identifying problems, needs and opportunities related to modifiable behavioral and other risk factors and
- recommending priorities for health promotion, health education and cancer risk reduction activities for professionals and the public.

The Branch consists of several programs that work to ensure a comprehensive and collaborative approach in addressing the state's cancer burden. For information on these programs, call: 919-707-5300 or <http://publichealth.nc.gov/chronicdiseaseandinjury>

## North Carolina Comprehensive Cancer Program

The North Carolina Comprehensive Cancer Program (NCCCP) staffs the North Carolina Advisory Committee on Cancer Coordination and Control, assesses the burden of cancer, determines priorities and develops and facilitates the implementation of the state cancer plan adopted by the North Carolina Advisory Committee on Cancer Coordination and Control. NCCCP facilitates opportunities in communities to promote healthy lifestyles and recommended cancer screenings, educates people about cancer symptoms, increases access to quality cancer care and enhances cancer survivors' quality of life.

## North Carolina Breast and Cervical Cancer Control Program

The North Carolina Breast and Cervical Cancer Control Program (NCBCCCP) provides free or low-cost breast and cervical cancer screenings and follow-up to eligible women in North Carolina. NCBCCCP services are offered at most local health departments as well as some local health centers and hospitals across the state.

## Well-Integrated Screening and Evaluation for Women Across the Nation

The Well-Integrated Screening and Evaluation for Women Across the Nation Project (WISEWOMAN) provides cardiovascular disease screening, intervention, counseling and referral services to NCBCCCP-enrolled women. WISEWOMAN services are offered in conjunction with NCBCCCP services at approximately 40 local health departments and local health centers across the state.

## North Carolina Central Cancer Registry

The North Carolina Central Cancer Registry (NCCCR) is part of the N.C. State Center for Health Statistics. It collects, processes and analyzes data on all cancer cases diagnosed among North Carolina residents to inform the planning and evaluation of cancer control efforts.

For cancer data requests, call 919-733-4728 or <http://www.schs.state.nc.us>



## Appendix B

# Scientific Information Resources

### General Cancer Information

**American Cancer Society**

<http://www.cancer.org>

**Centers for Disease Control and Prevention (CDC)**

<http://www.cdc.gov>

**Healthy North Carolina 2020**

<http://publichealth.nc.gov/hnc2020/objectives.htm>

**Healthy People 2020**

<http://www.healthypeople.gov/2020>

**National Cancer Institute**

<http://www.cancer.gov>

**World Health Organization. Social Determinants of Health**

<http://www.who.int>

### Evidence-Based Strategies

**Cancer Control P.L.A.N.E.T.**

<http://cancerplanet.cancer.gov>

**Guide to Community Preventive Services**

<http://www.thecommunityguide.org>

**N.C. Institute of Medicine (NCIOM)**

<http://www.nciom.org>

**Research-Tested Interventions Programs (RTIPS)**

[http://www.cancer.gov/rtips/index/nutrition\\_guidelines](http://www.cancer.gov/rtips/index/nutrition_guidelines)

### Healthy Lifestyle

**Eat Smart Move More NC**

<http://www.EatSmartMoveMoreNC.com>

**NC Tobacco Prevention and Control Branch**

<http://www.tobaccopreventionandcontrol.ncdhhs.gov>

**NC Tobacco Free Schools Initiative**

<http://www.NCTobaccoFreeSchools.org>

**QuitLineNC.com**

<http://www.quitlineNC.com>

**U.S. Department of Health and Human Services. Healthy Weight, Healthy People, and Healthy Communities 2013- 2020.**

<http://www.hrsa.gov/healthyweight>

**U.S. Department of Health and Human Services. Surgeon General's Report, The Health Consequence of Smoking – 50 years of Progress**

<http://www.surgeongeneral.gov/library/reports/50-years-of-progress/index.html>

**U.S. Department of Health and Human Services. 2008 Physical Activity Guidelines for Americans**

<http://www.health.gov/paguidelines/guidelines/default.aspx>

**US Preventive Services Task Force (USPSTF)**

<http://www.uspreventiveservicestaskforce.org>

### Screening Guidelines

**Advisory Committee on Cancer Coordination and Control**

**American Cancer Society**

<http://www.cancer.org>

**Centers for Disease Control and Prevention (CDC)**

<http://www.cdc.gov>

**US Preventive Services Task Force (USPSTF)**

<http://www.uspreventiveservicestaskforce.org>



## Cancer and Surveillance

### **State Center for Health Statistics, Cancer**

<http://www.schs.state.nc.us/data/cancer.cfm>

### **CDC Wonder, United States Cancer Statistics Data**

<http://wonder.cdc.gov/cancer.html>

### **Cancer Prevalence and Cost of Care Projections, NIH**

<http://costprojections.cancer.gov>

### **Dartmouth Atlas of Health Care**

<http://www.dartmouthatlas.org/tools/downloads.aspx?tab=40>

### **North American Association of Central Cancer Registries**

<http://www.naacr.org>

### **SEER (Surveillance, Epidemiology, and End Results Program)**

<http://seer.cancer.gov>

### **National Program of Cancer Registries (NPCR)**

<http://apps.nccd.cdc.gov/uscs>

### **North Carolina Community Health Information Portal (NC-HIP)**

<https://nchip.n3cn.org>

### **HealthStats for North Carolina**

<http://healthstats.publichealth.nc.gov>

### **County Health Rankings and Roadmaps**

<http://www.countyhealthrankings.org>

## Clinical Trials in North Carolina

### **ClinicalTrials.Gov Research Information**

[www.clinicaltrials.gov](http://www.clinicaltrials.gov)

### **CenterWatch – Clinical Trials Listing Service**

<http://www.centerwatch.com>

### **Coalition of Cancer Cooperative Groups**

[www.cancertrialshelp.org](http://www.cancertrialshelp.org)

### **Project CONNECT: The Bridge to Healthy Communities Through Research**

[www.connect.unc.edu](http://www.connect.unc.edu)

### **metaRegister of Controlled Trials (free registration required)**

<http://www.controlled-trials.com/mrct>

### **Duke Health.org**

<http://www.dukehealth.org/clinicaltrials>

### **The Carolina Center for Clinical Trials**

<http://www.med.unc.edu/ccct>

### **Wake Forest Comprehensive Cancer Center Clinical Trials**

<http://www1.wfubmc.edu/cancer/Clinical+Trials>



## Appendix C

# Commission on Cancer Accredited Programs Information and Maps

As of September 30, 2013, North Carolina had 39 Commission on Cancer-accredited cancer programs. The Commission on Cancer (CoC) was established by the American College of Surgeons in 1922. The CoC-Accreditation Program encourages hospitals, treatment centers and other facilities to improve their quality of patient care through various cancer-related programs. These programs focus on prevention, early diagnosis, pretreatment evaluation, staging, optimal treatment, rehabilitation, surveillance for recurrent disease, support services and end-of-life care.

CoC-accreditation by a cancer program ensures its patients will have access to the full scope of services. For the patient and community, the quality standards established by the CoC for cancer programs ensure:

- quality care close to home;
- comprehensive care that includes a complete range of state-of-the-art services and equipment,
- a multidisciplinary team approach to coordinate the best available treatment options,
- access to cancer-related information and education,
- information about ongoing cancer clinical trials and new treatment options,
- a cancer registry that offers lifelong patient follow-up, and
- ongoing monitoring and improvements in cancer care.

Each CoC-accredited facility is assigned to a cancer program category based on the type of facility or organization, services provided and case load. Accredited programs may have different requirements for specific standards based on their cancer program category.

North Carolina has

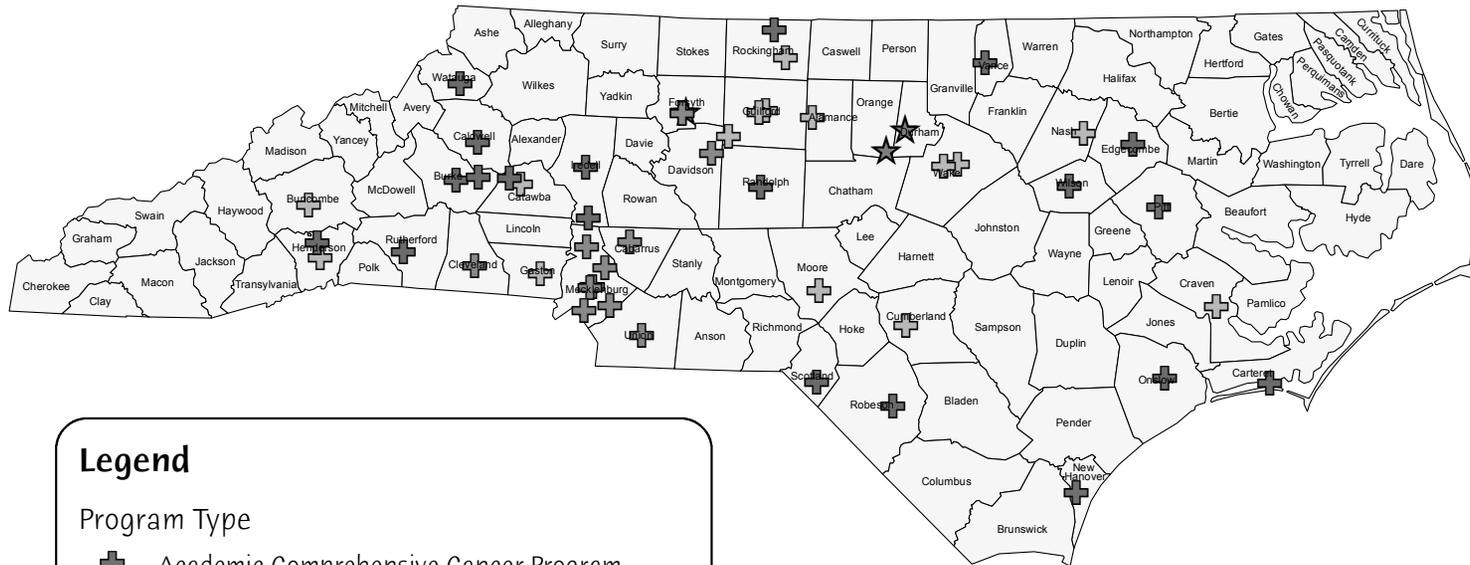
- 3 NCI-designated comprehensive cancer program centers,
- 15 community cancer program centers,
- 13 comprehensive community cancer program centers,
- 6 integrated network cancer program centers, and
- 2 academic comprehensive cancer program centers.

A collaborative of the American Cancer Society (ACS) and the CoC-accredited cancer centers will be sharing the state cancer plan with each local cancer program committee. This will support goals identified in the state plan, leverage limited resources and leverage the synergies between the ACS, CoC and the Comprehensive Cancer Program to work on cancer control activities that support each community.

The following cancer program information can be found at: <https://www.facs.org/search/cancer-programs?state=NC>.



# North Carolina American College of Surgeons Commission on Cancer Accredited Cancer Program Hospitals



## Legend

### Program Type

-  Academic Comprehensive Cancer Program
-  Community Cancer Program
-  Comprehensive Community Cancer Program
-  Integrated Network Cancer Program
-  NCI Designated Comprehensive Cancer Program

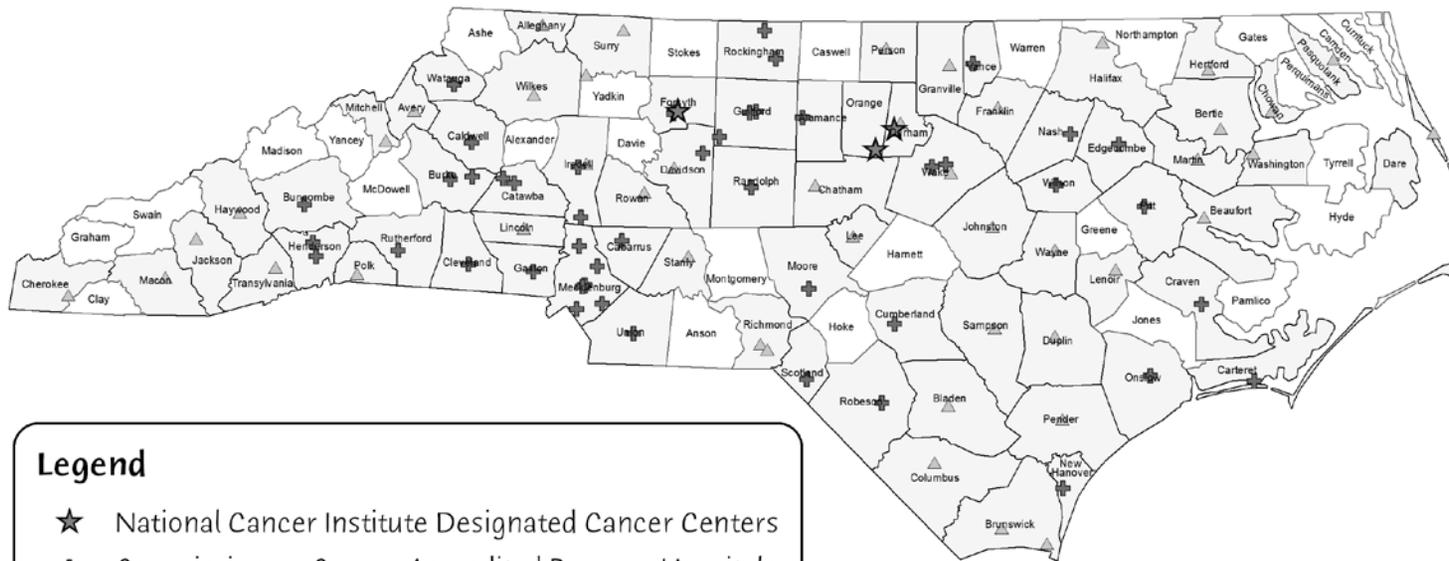
 County

**sehs**  
State Center for  
Health Statistics  
April 2014





# North Carolina Hospitals Treating Cancer



## Legend

- ★ National Cancer Institute Designated Cancer Centers
- ⊕ Commission on Cancer Accredited Program Hospitals
- ▲ All Other Hospitals Treating Cancer\*
- County
- County with No Hospital with Cancer Treatment

\*Hospitals Reporting to the North Carolina Central Cancer Registry

**sehs**  
State Center for  
Health Statistics  
April 2014





## NCI Designated Comprehensive Cancer Program

NCI Designated Comprehensive Cancer Programs are designated by the National Cancer Institute and offer a full range of diagnostic and treatment services provided. Staff physicians are available. The programs participate in basic and clinical research. No minimum caseload is required for this category

### Duke University Hospital

Duke Cancer Institute  
2301 Erwin Road  
Durham, NC 27710-0001  
Phone: 888-275-3853  
<http://www.dukecancerinstitute.org>

### University of North Carolina Hospitals

Lineberger Comprehensive Cancer Center  
101 Manning Drive  
Chapel Hill, NC 27514-4220  
Phone: 919-966-4131  
[www.unchealthcare.org](http://www.unchealthcare.org)

Wake Forest University Baptist Medical Center  
Outpatient Comprehensive Cancer Center  
Medical Center Boulevard  
Winston-Salem, NC 27157-1001  
Phone: 336-716-2011  
[www.wakehealth.edu](http://www.wakehealth.edu)

## Academic Comprehensive Cancer Programs

Academic Comprehensive Cancer Programs provide postgraduate medical education in at least four program areas, including internal medicine and general surgery. Programs serve more than 500 newly diagnosed cancer cases each year and offer a full range of diagnostic and treatment services either on-site or by referral.

### New Hanover Regional Medical Center

Zimmer Cancer Center  
2131 South 17th Street  
Wilmington, NC 28402-9000  
Phone: 910-343-7000  
[www.nhrmc.org](http://www.nhrmc.org)

#### **Additional Campuses:**

- Cape Fear Memorial Hospital, Wilmington
- New Hanover Regional Medical Center, Wilmington

### Vidant Medical Center

Vidant Medical Center Cancer Care  
2100 Stantonsburg Road  
PO Box 6028  
Greenville, NC 27834  
Phone: 252-847-7867  
<http://vidanthealth.com>

## Integrated Network Cancer Program

Integrated Network Cancer Programs are a part of a joint venture with multiple facilities providing integrated cancer care and comprehensive services. At least one facility in the category is a hospital, and all facilities that are part of the Network are CoC-accredited cancer programs. They participate in cancer-related clinical research either by enrolling patients in cancer-related clinical trials or by referring patients. They have no minimum caseload requirements.

### Carolinas Healthcare System

Blumenthal Cancer Center  
1000 Blythe Boulevard  
Charlotte, NC 28203  
Phone: 704-355-2000  
[www.carolinashealthcare.org](http://www.carolinashealthcare.org)



**Additional Campuses:**

Carolinas Medical Center

- Union, Monroe
- Main Campus, Charlotte
- Mercy, Charlotte
- NorthEast, Concord
- Pineville, Charlotte
- University, Charlotte

**Cleveland Regional Medical Center**

Blumenthal Cancer Center  
201 East Grover Street  
Shelby, NC 28150  
Phone: 980-487-3000  
[www.clevelandregional.org](http://www.clevelandregional.org)

**Forsyth Regional Cancer Center**

Derrick L Davis Forsyth Regional Cancer Center  
3333 Silas Creek Parkway  
Winston-Salem, NC 27103  
Phone: 336-718-7000  
[www.forsythmedicalcenter.org](http://www.forsythmedicalcenter.org)

**Additional Campuses:**

- Forsyth Medical Center, Winston-Salem
- Medical Park Hospital, Winston-Salem
- Thomasville Medical Center, Thomasville

**Presbyterian Cancer Center**

Presbyterian Cancer Center  
200 Hawthorne Lane  
Charlotte, NC 28204  
Phone: 704-384-4750  
[www.presbyterian.org](http://www.presbyterian.org)

**Additional Campuses:**

- Presbyterian Hospital, Charlotte
- Presbyterian Hospital, Huntersville
- Presbyterian Hospital, Matthews

**Comprehensive Community Cancer Program**

Comprehensive Community Cancer Programs offer a full range of diagnostic and treatment services provided either on-site or by referral. Programs serve more than 500 newly diagnosed cancer cases each year. They participate in cancer-related clinical research either by enrolling patients in cancer-related clinical trials or by referring patients.

**Alamance Regional Medical Center**

Alamance Regional Cancer Center  
1240 Huffman Mill Road  
Burlington, NC 27215  
Phone: 336-538-7000  
[www.armc.com](http://www.armc.com)

**Cape Fear Valley Health System**

Cape Fear Valley Cancer Center  
1638 Owen Drive  
Fayetteville, NC 28304-3424  
Phone: 910-615-4000  
[www.capefearvalley.com](http://www.capefearvalley.com)

**CarolinaEast Medical Center**

CarolinaEast Cancer Care  
2000 Neuse Boulevard  
New Bern, NC 28560-3499  
Phone: 252-633-8111  
[www.carolinaeasthealth.com](http://www.carolinaeasthealth.com)

**Catawba Valley Medical Center**

Comprehensive Cancer Center  
810 Fairgrove Church Road Southeast  
Hickory, NC 28602-9643  
Phone: 828-326-3000  
[www.catawbavalleymc.org](http://www.catawbavalleymc.org)

**Cone Health**

Cone Health Cancer Center  
1200 N Elm Street  
Greensboro, NC 27401  
Phone: 336-832-7000  
[www.conehealth.com](http://www.conehealth.com)



**Additional Campuses:**

- Annie Penn Memorial Hospital, Reidsville
- Moses Cone Health System, Greensboro
- Wesley Long Community Hospital, Greensboro
- Women’s Hospital of Greensboro

Duke Raleigh Hospital  
 Duke Raleigh Cancer Center  
 3400 Wake Forest Road  
 Raleigh, NC 27609  
 Phone: 919-862-5400  
<http://www.dukeraleighhospital.org>

FirstHealth Moore Regional Hospital  
 155 Memorial Drive  
 PO Box 3000  
 Pinehurst, NC 28374-8710  
 Phone: 910-715-1000  
[www.firsthealth.org](http://www.firsthealth.org)

Gaston Memorial Hospital  
 CaroMont Cancer Center  
 2525 Court Drive  
 Gastonia, NC 28054-2140  
 Phone: 704-834-2000  
[www.caromonthhealth.org](http://www.caromonthhealth.org)

High Point Regional Health  
 The Charles and Pauline Hayworth Cancer Center of High Point Regional  
 601 North Elm Street  
 High Point, NC 27262-4331  
 Phone: 336-878-6000  
[www.highpointregional.com](http://www.highpointregional.com)

Margaret R. Pardee Memorial Hospital  
 Comprehensive Cancer Center at Pardee  
 800 North Justice Street  
 Hendersonville, NC 28791-3410  
 Phone: 828-696-1000  
[www.pardeehospital.org](http://www.pardeehospital.org)

Mission Hospitals  
 Mission Cancer Center  
 21 Hospital Drive  
 Asheville, NC 28801  
 Phone: 828-213-3530  
[www.missionhospitals.org](http://www.missionhospitals.org)

Nash Health Care Systems  
 Nash Cancer Treatment Center  
 2460 Curtis Ellis Drive  
 Rocky Mount, NC 27804-2237  
 Phone: 252-962-8000  
[www.nhcs.org](http://www.nhcs.org)

Rex Healthcare  
 Rex Cancer Center  
 4420 Lake Boone Trail  
 Raleigh, NC 27607-6599  
 Phone: 919-784-3441  
[www.rexhealth.com](http://www.rexhealth.com)

**Community Cancer Programs**

Community Cancer Programs offer a full range of diagnostic and treatment services provided, but referral for a portion of diagnosis or treatment may occur. Programs serve more than 100 but fewer than 500 newly diagnosed cancer cases each year. They participate in cancer-related clinical research either by enrolling patients in cancer-related clinical trials or by referring patients.

Blue Ridge HealthCare System  
 2201 South Sterling Street  
 Morganton, NC 28655  
 Phone: 828-580-5000  
[www.blueridgehealth.org](http://www.blueridgehealth.org)

**Additional Campuses:**

- Grace Hospital, Morganton
- Valdese Hospital, Valdese



**Caldwell Memorial Hospital**  
McCreary Cancer Center  
321 Mulberry Street Southwest  
Lenoir, NC 28645-5720  
Phone: 828-757-5100  
[www.caldwellmemorial.org](http://www.caldwellmemorial.org)

**Carteret General Hospital**  
3500 Arendell Street  
Morehead City, NC 28557-2901  
Phone: 252-808-6000  
[www.ccggh.org](http://www.ccggh.org)

**DLP Maria Parham Medical Center**  
566 Ruin Creek Road  
Henderson, NC 27536-2957  
Phone: 252-438-4143  
[www.mphosp.org](http://www.mphosp.org)

**Frye Regional Medical Center**  
420 North Center Street  
Hickory, NC 28601  
Phone: 828-315-5000  
[www.fryemedctr.com](http://www.fryemedctr.com)

**Iredell Memorial Hospital**  
557 Brookdale Drive  
Statesville, NC 28677-4107  
Phone: 704-873-5661  
[www.iredellmemorial.org](http://www.iredellmemorial.org)

**Lake Norman Regional Medical Center**  
171 Fairview Road  
 Mooresville, NC 28117-9500  
Phone: 704-660-4000  
[www.LNRMC.com](http://www.LNRMC.com)

**Morehead Memorial Hospital**  
Smith McMichael Cancer Center  
117 East Kings Highway  
Eden, NC 27288-5299  
Phone: 336-623-9711  
[www.morehead.org](http://www.morehead.org)

**Onslow Memorial Hospital**  
317 Western Boulevard  
Jacksonville, NC 28540-6379  
Phone: 910-577-2345  
[www.onslow.org](http://www.onslow.org)

**Park Ridge Health**  
100 Hospital Drive  
Hendersonville, NC 28792  
Phone: 828-684-8501  
[www.parkridgehealth.org](http://www.parkridgehealth.org)

**Randolph Hospital**  
Randolph Cancer Center  
364 White Oak Street  
Asheboro, NC 27203-5400  
Phone: 336-625-5151  
[www.randolphhospital.org](http://www.randolphhospital.org)

**Rutherford Regional Medical Center**  
288 South Ridgecrest Avenue  
Rutherfordton, NC 28139-3097  
Phone: 828-286-5000  
[www.rutherfordregional.com](http://www.rutherfordregional.com)

**Scotland Health Care System**  
Scotland Cancer Treatment Center  
500 Lauchwood Drive  
Laurinburg, NC 28352-5599  
Phone: 910-291-7100  
[www.scotlandhealth.org](http://www.scotlandhealth.org)

**Southeastern Regional Medical Center**  
Gibson Cancer Center  
300 West 27th Street  
Lumberton, NC 28358-3017  
Phone: 910-671-5000  
[www.srmc.org](http://www.srmc.org)



## Vidant Edgecombe Hospital

Vidant Oncology-Tarboro  
123 Hospital Drive  
Tarboro, NC 27886-2011  
Phone: 252-641-7714  
[www.vidanthealth.com/edgecombe](http://www.vidanthealth.com/edgecombe)

## Watauga Medical Center

Seby B. Jones Cancer Center  
336 Deerfield Road  
Boone, NC 28607-2600  
Phone: 828-262-4332  
[www.apprhs.org](http://www.apprhs.org)

## Wilson Medical Center

Wilson Regional Cancer Center  
1705 Tarboro Street Southwest  
Wilson, NC 27893  
Phone: 252-399-8040  
[www.wilmed.org](http://www.wilmed.org)



## Appendix D Body Mass Index Chart

Body mass index (BMI) is a measure of body fat, based on height and weight that applies to adult men and women. BMI is an estimate of body fat and a good gauge of your risk for diseases that can occur with more body fat. The higher the BMI, the higher the risk for certain diseases such as heart disease, high blood pressure, type 2 diabetes, gallstones, breathing problems, and certain cancers. Although BMI can be used for most men and women, it does have some limits:

- It may overestimate body fat in athletes and others who have a muscular build.
- It may underestimate body fat in older persons and others who have lost muscle.

### BMI Categories:

- Underweight = <18.5
- Normal weight = 18.5 – 24.9
- Overweight = 25–29.9
- Obesity = BMI of 30 or greater

	Normal																			Overweight					Obese					Extreme Obesity									
BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54			
Height (inches)	Body Weight (pounds)																																						
58	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167	172	177	181	186	191	196	201	205	210	215	220	224	229	234	239	244	248	253	258			
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173	178	183	188	193	198	203	208	212	217	222	227	232	237	242	247	252	257	262	267			
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	184	189	194	199	204	209	215	220	225	230	235	240	245	250	255	261	266	271	276			
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190	195	201	206	211	217	222	227	232	238	243	248	254	259	264	269	275	280	285			
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	196	202	207	213	218	224	229	235	240	246	251	256	262	267	273	278	284	289	295			
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197	203	208	214	220	225	231	237	242	248	254	259	265	270	278	282	287	293	299	304			
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204	209	215	221	227	232	238	244	250	256	262	267	273	279	285	291	296	302	308	314			
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324			
66	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216	223	229	235	241	247	253	260	266	272	278	284	291	297	303	309	315	322	328	334			
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223	230	236	242	249	255	261	268	274	280	287	293	299	306	312	319	325	331	338	344			
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230	236	243	249	256	262	269	276	282	289	295	302	308	315	322	328	335	341	348	354			
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236	243	250	257	263	270	277	284	291	297	304	311	318	324	331	338	345	351	358	365			
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243	250	257	264	271	278	285	292	299	306	313	320	327	334	341	348	355	362	369	376			
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250	257	265	272	279	286	293	301	308	315	322	329	338	343	351	358	365	372	379	386			
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258	265	272	279	287	294	302	309	316	324	331	338	346	353	361	368	375	383	390	397			
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265	272	280	288	295	302	310	318	325	333	340	348	355	363	371	378	386	393	401	408			
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272	280	287	295	303	311	319	326	334	342	350	358	365	373	381	389	396	404	412	420			
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279	287	295	303	311	319	327	335	343	351	359	367	375	383	391	399	407	415	423	431			
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287	295	304	312	320	328	336	344	353	361	369	377	385	394	402	410	418	426	435	443			

Source: Adapted from Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report.



## Appendix E

# N.C. Cancer Plan Table of Measures

Measure	Baseline		2020 Target	
<b>Cancer mortality rate<sup>1</sup> (2012)</b>	<b>170.5 / 100,000</b>		<b>134.9 / 100,000</b>	
<b>Cancer incidence rate<sup>2</sup> (2011)</b>	<b>476.7 / 100,000</b>		<b>431.4 / 100,000</b>	
Lung cancer mortality rate <sup>1</sup> (2012)	49.9 / 100,000		38.5 / 100,000	
Lung cancer incidence rate <sup>2</sup> (2011)	68.5 / 100,000		60.7 / 100,000	
Estimated number of homes mitigated for radon from 10/2010 to 03/2013 <sup>3</sup>	6,886		Increase by 25%	
Colorectal cancer mortality rate <sup>1</sup> (2012)	14.3 / 100,000		10.1 / 100,000	
Colorectal cancer incidence rate <sup>2</sup> (2011)	37.8 / 100,000		26.4 / 100,000	
% adults who had sigmoidoscopy or colonoscopy colorectal screening <sup>4</sup> (2012)	70.6%		81.4% BRFSS	
Breast cancer mortality rate <sup>1</sup> (2012)	21.4 / 100,000		16.8 / 100,000	
Stage III and IV breast cancer rate <sup>5</sup> (2011)	46.3 / 100,000		40.9 / 100,000	
% Women over age 50 who had mammograms within the past two years <sup>6</sup> (2012)	79.4%		TBD (75.0% 2020 Projection)	
Prostate cancer mortality rate <sup>1</sup> (2012)	21.0 / 100,000		13.0 / 100,000	
% men who have talked to health care provider about advantages and disadvantages of PSA test. <sup>7</sup> (2012)	31.6%		Increase by 10%	
Cervical cancer mortality rate <sup>1</sup> (2012)	2.0 / 100,000		1.3 / 100,000	
Cervical cancer incidence rate <sup>2</sup> (2011)	7.3 / 100,000		6.1 / 100,000	
% of population ages 13-17 vaccinated with ≥ 3 doses HPV <sup>8</sup> (2012)	Females	Males	Females	Males
	35.5%	8.6%	57.7%	17.7%
% Women who had pap tests age 21-65 <sup>9</sup> (2012)	86.5%		TBD (84.0% 2020 Projection)	
Melanoma cancer mortality rate <sup>1</sup> (2012)	2.7 / 100,000		2.2 / 100,000	
Melanoma cancer incidence rate <sup>2</sup> (2011)	21.5 / 100,000		27.9 / 100,000	



## 2020 Target Methodology:

We used the NC Healthy People 2020 methodology in setting incidence and mortality targets. First, we calculated the average change from 2001 to 2011. Then, we used the average rate of change to project incidence and mortality until 2020. Finally, we took that projection and calculated a 10 percent improvement.

<http://www.nciom.org/wp-content/uploads/2011/01/HNC2020-TechReport-final.pdf>

Other NC Healthy People 2020 methodologies include using the measures of the best states as goals. The Cancer Plan did this with the HPV measure as recommended by the NC Immunization Branch. Rhode Island had the best 2012 HPV rates for both males and females. Most BRFSS targets were set using the calculated rate of linear change using data from 2000 and 2001 through 2010. The 2012 BRFSS measure was not included in this calculation due to BRFSS methodological changes that do not allow for comparisons of data before 2011 (BRFSS cancer measures mainly occur in even years.). We projected the linear rate of change from the current 2012 BRFSS measure until 2020. This projection also provided our 2020 target measure.

The BRFSS sigmoidoscopy and colonoscopy screening targets were set using the calculated rate of quadratic/curvilinear change using data from 2000 and 2001 through 2010. The 2012 BRFSS measure was not included in this calculation due to BRFSS methodological changes that do not allow for comparisons of data before 2011 (BRFSS cancer measures mainly occur in even years.). We projected the quadratic/curvilinear rate of change from the current 2012 BRFSS measure until 2020. This projection also provided our 2020 target measure.

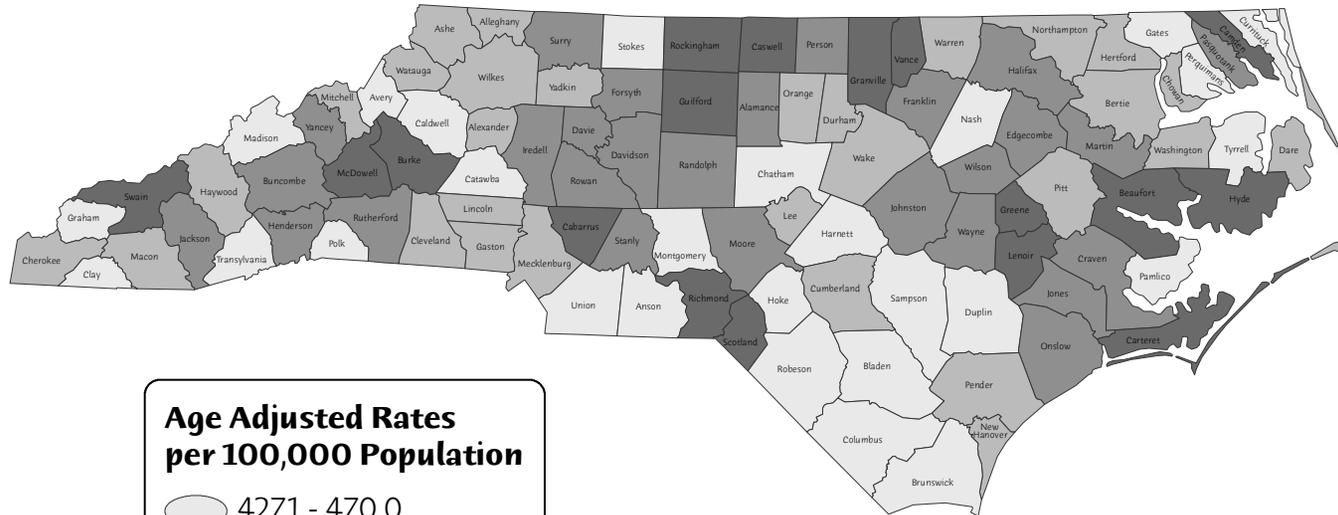
### Sources:

1. *Statistics and Reports: Cancer. North Carolina Central Cancer Registry. 2012 mortality data.* <http://www.schs.state.nc.us/data/cancer.cfm>
2. *Statistics and Reports: Cancer. North Carolina Central Cancer Registry. 2011 incidence data.* <http://www.schs.state.nc.us/data/cancer.cfm>
3. N.C. Radon Program. <http://www.ncradon.org/Home.html>
4. 2012 BRFSS Survey Results: North Carolina Colorectal Cancer Screening (Age 50+). BRFSS 2012. <http://www.schs.state.nc.us/schs/brfss/2012/nc/all/hadsigm3.html>
5. State Center for Health Statistics, North Carolina Department of Health and Human Services. North Carolina Central Cancer Registry. Special Queries based on Incidence Rates. 2011. <http://www.schs.state.nc.us/data/cancer.cfm>
6. North Carolina Division of Public Health, State Center for Health Statistics. 2012 BRFSS North Carolina: Breast and Cervical Cancer Screening. 2020 projection based on special data query data based on 2000, 2002, and 2004 BRFSS NC: Breast and Cervical Cancer Screening. 2020 projection excluded 2002 outlier data in calculation. <http://www.schs.state.nc.us/schs/brfss/2012/nc/all/topics.html#wh>. 2020 target is not determined due to recently changed recommendations.
7. North Carolina Division of Public Health, State Center for Health Statistics. Special data query based on 2012 BRFSS Survey Results: North Carolina Prostate Cancer Screening (Males, Age 40+) <http://www.schs.state.nc.us/SCHS/brfss/2012/nc/all/topics.html#pcs>
8. 2012 National Immunization Survey -Teen Vaccination Coverage Table Data. Centers for Disease Control. <http://www.cdc.gov/vaccines/imz-managers/coverage/nis/teen/data/tables-2012.html>  
Immunization target measures set using best state method, Rhode Island (2012 data), according to a standard used in NC Immunization Branch based on 3/28/14 phone conversation with Amy Grimshaw. They set a 90% goal when a vaccine is required.
9. North Carolina Division of Public Health, State Center for Health Statistics. Special data query based on 2012 BRFSS Survey Results: North Carolina Breast and Cervical Cancer Screening. <http://www.schs.state.nc.us/schs/brfss/2012/nc/all/topics.html#wh>. 2020 target is not determined due to recently changed recommendations.



Appendix F  
**North Carolina Cancer Maps**

**North Carolina  
 All Cancer Incidence Rates  
 2007-2011**



**Age Adjusted Rates  
 per 100,000 Population**

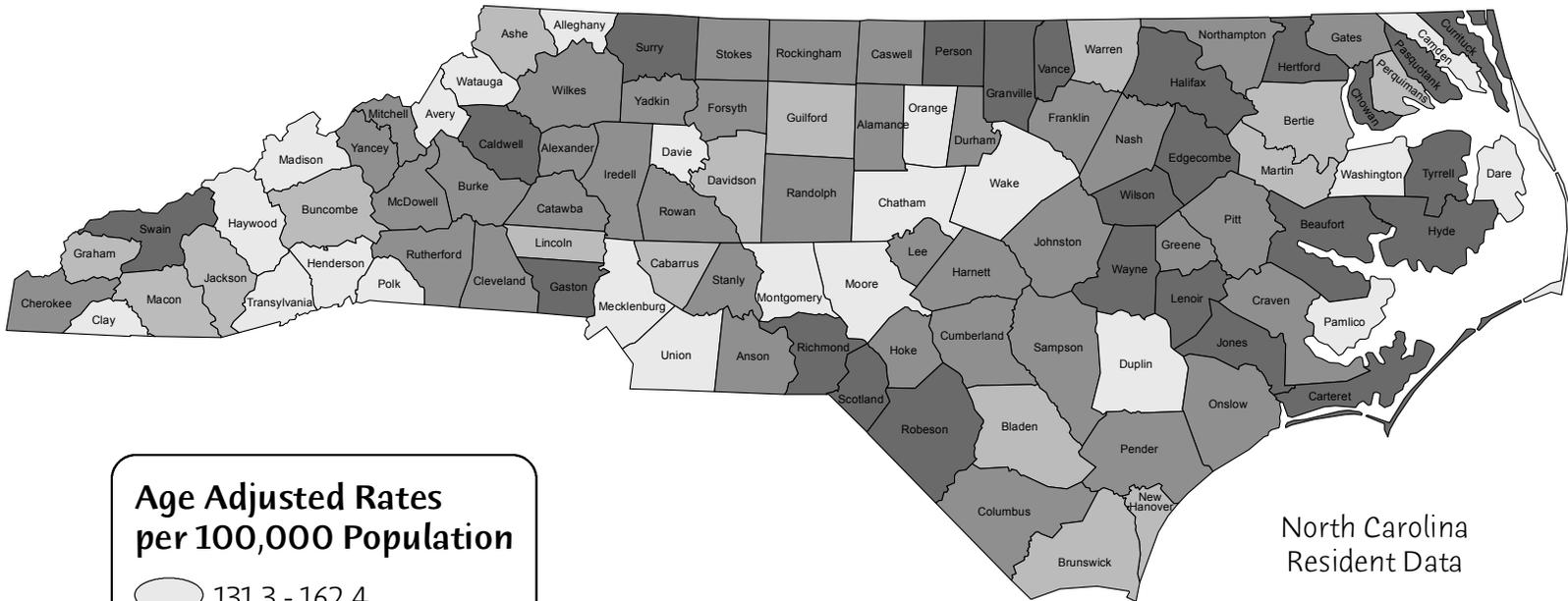
- 427.1 - 470.0
- 470.1 - 496.7
- 496.8 - 525.7
- 525.8 - 584.2

Note: Information is subject to change as files are updated.



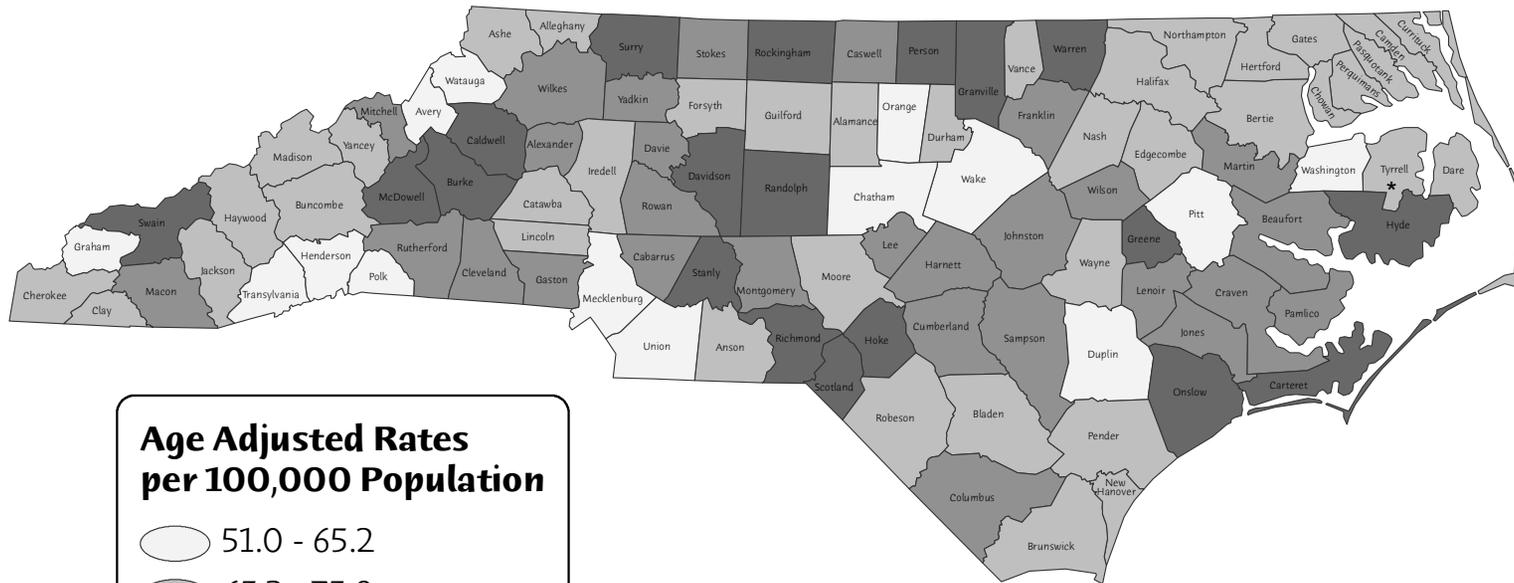


# North Carolina All Cancer Mortality Rates 2008-2012





# North Carolina Lung Cancer Incidence Rates 2007-2011



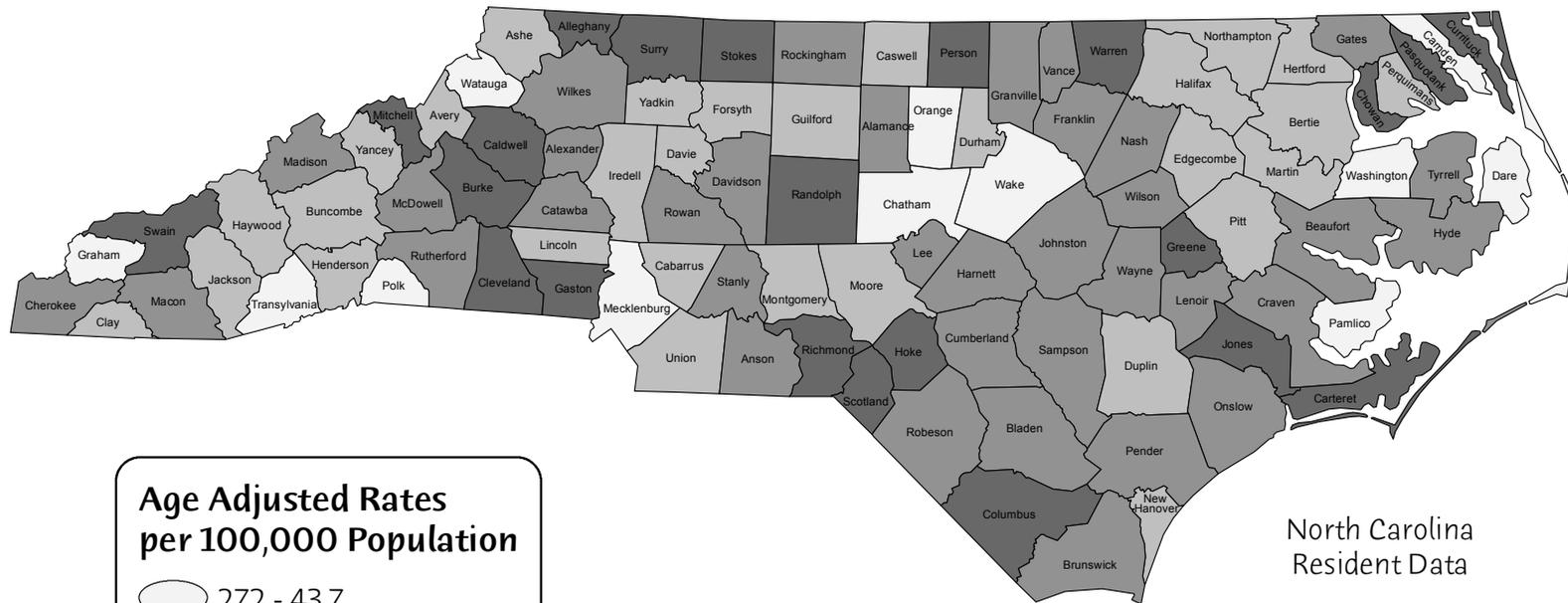
**Age Adjusted Rates  
per 100,000 Population**

- 51.0 - 65.2
- 65.3 - 75.8
- 75.9 - 85.5
- 85.6 - 112.5

Note: Information is subject to change as files are updated.

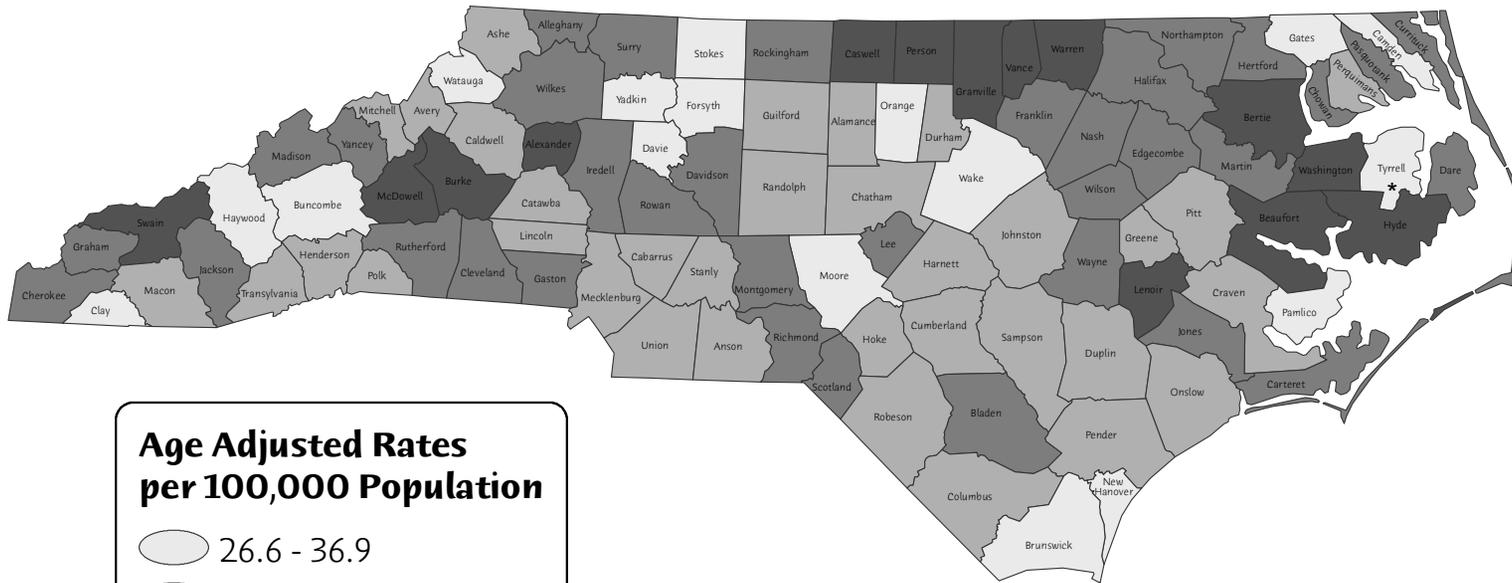


# North Carolina Lung Cancer Mortality Rates 2008-2012





# North Carolina Colon Cancer Incidence Rates 2007-2011



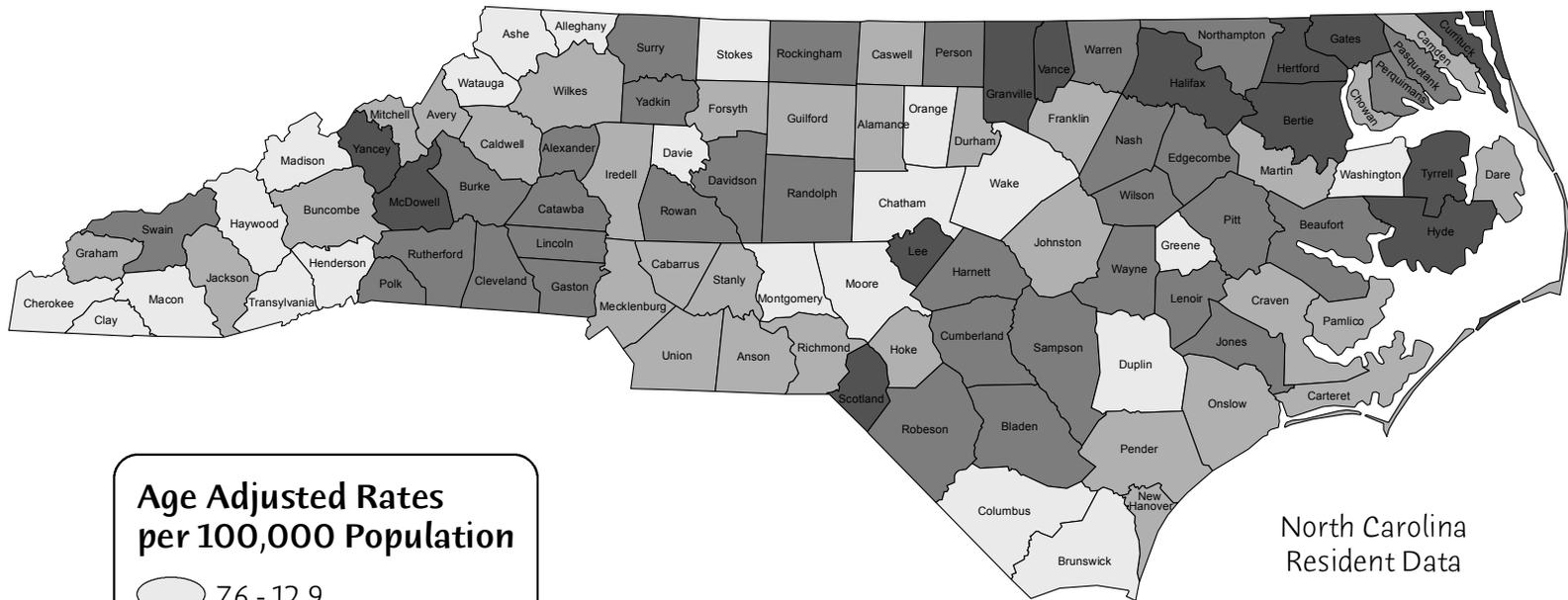
### Age Adjusted Rates per 100,000 Population

-  26.6 - 36.9
-  37.0 - 43.1
-  43.2 - 51.8
-  51.9 - 67.5

\*Rates based on small numbers (fewer than 16 cases) are unstable and should be interpreted with caution.  
Note: Information is subject to change as files are updated.



# North Carolina Colon Cancer Mortality Rates 2008-2012



**Age Adjusted Rates  
per 100,000 Population**

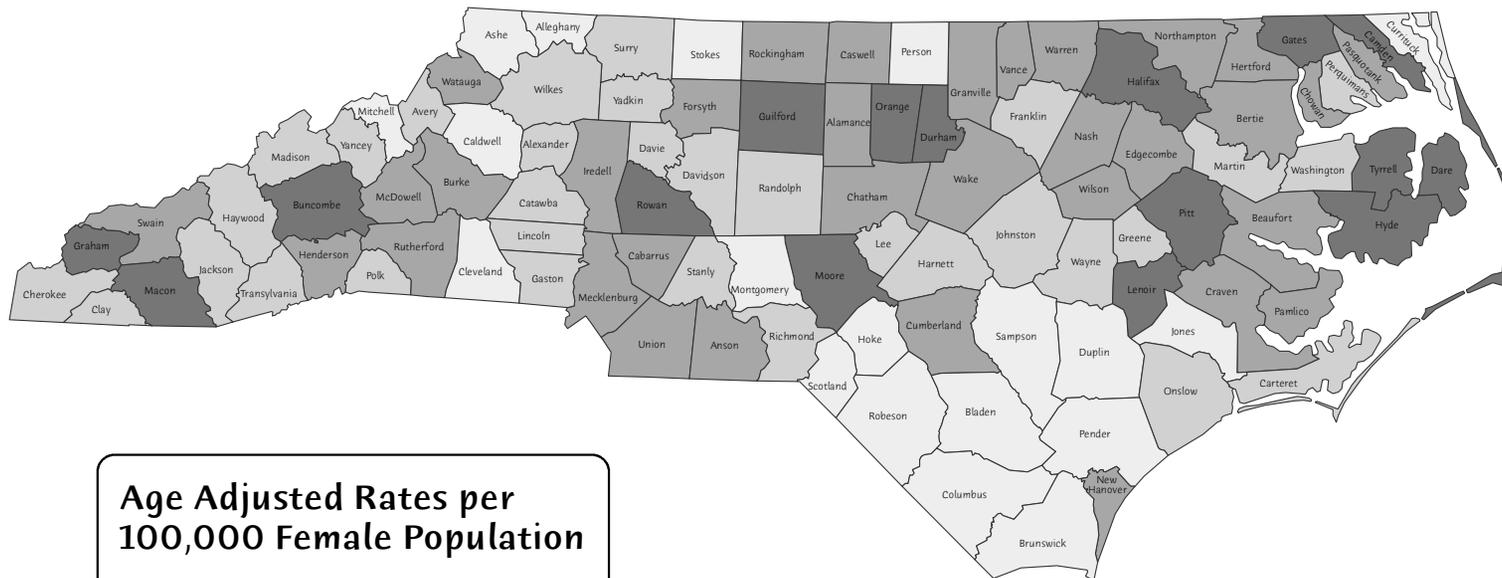
- 7.6 - 12.9
- 13.0 - 16.0
- 16.1 - 19.7
- 19.8 - 28.5

North Carolina  
Resident Data





# North Carolina Female Breast Cancer Incidence Rates 2007-2011



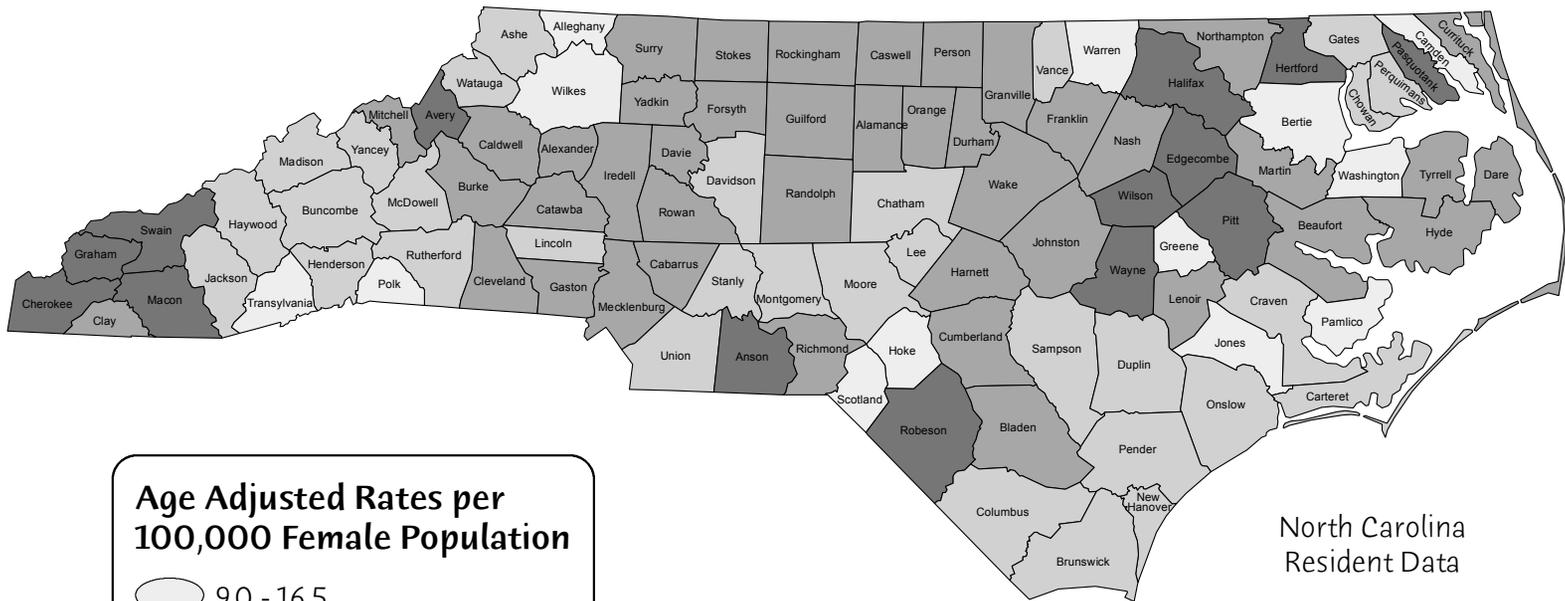
**Age Adjusted Rates per  
100,000 Female Population**

- 113.8 - 135.5
- 135.6 - 152.4
- 152.5 - 169.9
- 170.0 - 216.4

Note: In situ cases are included. Information is subject to change as files are updated.



# North Carolina Breast Cancer Mortality Rates 2008-2012



**Age Adjusted Rates per  
100,000 Female Population**

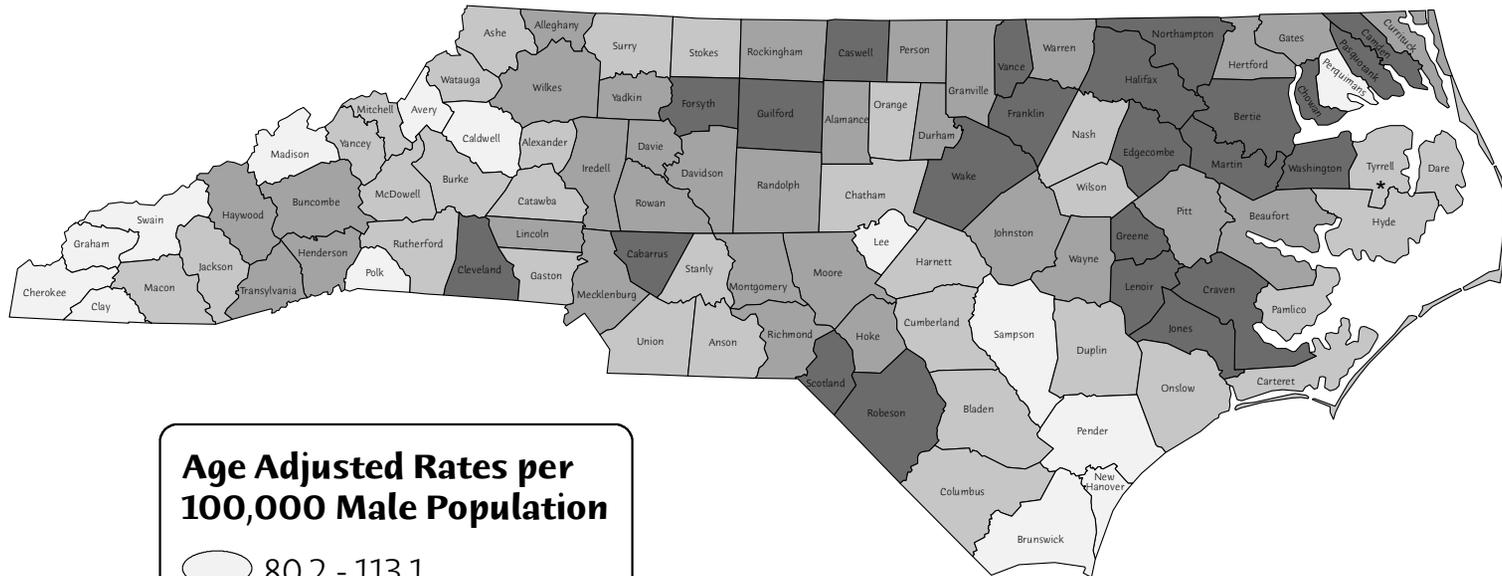
- 9.0 - 16.5
- 16.6 - 21.1
- 21.2 - 26.4
- 26.5 - 36.2

North Carolina  
Resident Data





# North Carolina Prostate Cancer Incidence Rates 2007-2011



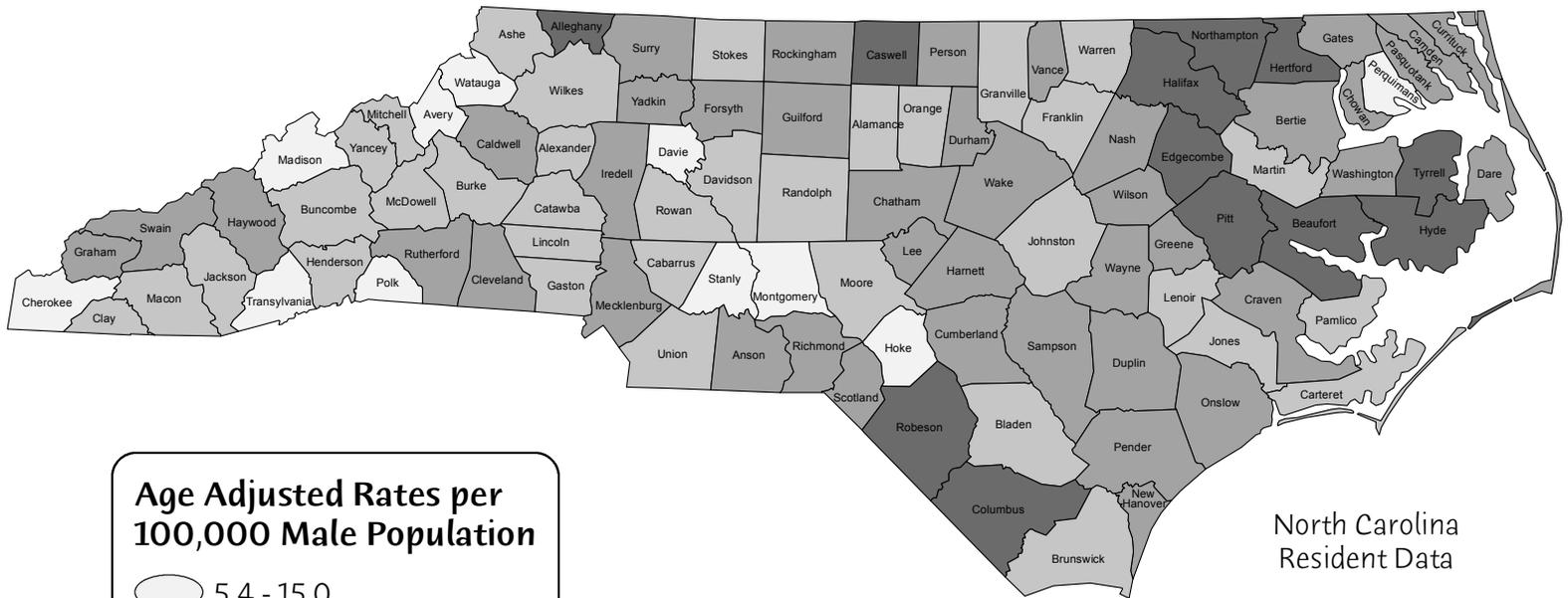
## Age Adjusted Rates per 100,000 Male Population

-  80.2 - 113.1
-  113.2 - 140.4
-  140.5 - 166.8
-  166.9 - 225.2

\*Rates based on small numbers (fewer than 16 cases) are unstable and should be interpreted with caution.  
Note: Information is subject to change as files are updated.



# North Carolina Prostate Cancer Mortality Rates 2008-2012





## Appendix G

# Glossary

**Behavioral Risk Factor Surveillance System (BRFSS)** is a randomized telephone survey of state residents, aged 18 and older in households with telephones, that captures the health behavior and preventive health practices related to the leading causes of death or disability.

**Cancer**, also called malignancy, is a term for diseases in which abnormal cells divide without control and can invade nearby tissues. Cancer cells can also spread to other parts of the body through the blood and lymph systems. There are several main types of cancer. Carcinoma is a cancer that begins in the skin or in tissues that line or cover internal organs. Sarcoma is a cancer that begins in bone, cartilage, fat, muscle, blood vessels, or other connective or supportive tissue. Leukemia is a cancer that starts in blood-forming tissue, such as the bone marrow, and causes large numbers of abnormal blood cells to be produced and enter the blood. Lymphoma and multiple myeloma are cancers that begin in the cells of the immune system. Central nervous system cancers are cancers that begin in the tissues of the brain and spinal cord. (National Cancer Institute)

**Care and treatment** include diagnosis of the disease and prompt treatment. Cancer treatment and care consists of timely completion of the diagnostic evaluation of the tumor and related areas and prompt implementation of evidence-based treatments including management of treatment side effects. Since cancer care may involve a combination of surgery, chemotherapy and radiation, it is best treated by a multi-disciplinary team of medical, surgical and radiation oncologists.

**Cultural competence** refers to an ability to interact effectively with people of different cultures and socio-economic backgrounds, particularly in the context of human resources, non-profit organizations, and government agencies whose employees work with persons from different cultural/ethnic backgrounds. Cultural competence comprises four components: (a) awareness of one's own cultural worldview, (b) attitude towards cultural differences, (c) knowledge of different cultural practices and worldviews and (d) cross-cultural skills. Developing cultural competence results in an ability to understand, communicate with and effectively interact with people across cultures.<sup>16</sup>

**Disparity population** refers to groups of people who are unequal as in age, race, sex, education, social economic status, geography, etc. Cancer rates for diagnosis, treatment and mortality vary among different population groups. Identifying population groups and determining the factors that cause disparities in cancer rates are key to reducing these rates.



**Early detection** includes screening assessments to detect disease at an early stage when treatment can be most effective. Early detection screenings for cancer include: Pap tests for cervical cancer, mammograms for breast cancer, FIT, FOBT, sigmoidoscopy and colonoscopy for colorectal cancer, and prostate-specific antigen (PSA) and/or digital rectal examination (DRE) for prostate cancer. Screening tests can be provided to large groups of people, one at a time.

**Evidence-based** is a process for making decisions about a program, practice or policy that is grounded in the best available research evidence and informed by experiential evidence from the field and relevant contextual evidence.

**Food deserts** are defined as urban neighborhoods and rural towns without ready access to fresh, healthy and affordable food. The lack of access contributes to a poor diet and can lead to higher levels of obesity and other diet-related diseases.

**Health Disparity** is the difference in the incidence, prevalence, mortality and survival of a disease and the related adverse health conditions that exist among specific population groups.

**Health Equity** occurs when every person has the opportunity to attain his or her full health capability and no one is disadvantaged from achieving this capability because of his or her social position or other socially determined circumstance.

**Incidence Rate** is the rate at which new cases of a disease are occurring in a population.

**Morbidity** is a measurement of ill health.

**Mortality Rate** is a measurement of death in a population.

**Palliative care** begins at the time of diagnosis and specializes in the relief of pain, symptoms and stress of serious disease. The goal is to prevent and relieve suffering and to improve the quality of life for patients of all ages and their families and loved ones. Palliative care helps to make patients more comfortable at every stage of the disease – from time of diagnosis, throughout survivorship and at end of life.

**Prevalence rate** is the proportion of a population that has a disease or health characteristic at a given point in time, including both new and previously diagnosed cases. It is a snapshot of all the people who have a disease at that one moment.

**Primary prevention** is aimed at preventing the occurrence of disease and promoting health. Primary prevention of cancer includes healthy eating habits, regular physical activity, smoking cessation, and reducing exposure to secondhand smoke. Evidence shows that the risk of breast, colorectal and prostate cancers may be increased when individuals are overweight or obese.



**Social Determinants of Health** are life-enhancing resources, such as food supply, housing, economic and social relationships, transportation, education and health care, whose distribution across populations effectively determines length and quality of life.

**Survivorship** focuses on improving the quality of health and life of a person with a disease until the end of life. It covers the physical, psychosocial and economic issues of a disease, beyond the diagnosis and treatment phases. In cancer, survivorship may include issues related to the accessibility of healthcare and follow-up treatment, continued effects of treatment, additional cancers and quality of life. Family members, friends, and caregivers play an important role in the survivorship experience.



## Appendix H

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