

## Cancer Survivors and Chronic Disease — North Carolina 2009



### Background

Approximately 12 million adults in the U.S. are cancer survivors,<sup>1</sup> and this estimate could double by 2050.<sup>2</sup> Due to medical advances in early detection and treatment, people with cancer are living longer than ever before. Two-thirds of adults with cancer are now expected to live at least five years after being diagnosed.<sup>1</sup> Even among women with breast cancer, the five-year survival rates have improved dramatically. In 1975, 75.0 percent of women were still alive five years after a diagnosis of breast cancer; in 2002, the five-year survival rate for breast cancer was 90.6 percent.<sup>3</sup> However, a potential downside to increased longevity among cancer survivors are potential side effects of cancer treatment, resulting from chemotherapy, radiation or surgery. These “late effects” can become apparent a few months or years after treatment has ended.<sup>4</sup> Late effects can include heart or kidney problems; lung problems, which can cause difficulty breathing; memory problems; infertility; vision or hearing loss; and an increased risk of future cancers.<sup>4</sup> Consequently, cancer survivors have an increased risk of developing adverse health conditions and/or chronic disease. This report examines the occurrence of chronic disease among cancer survivors, using the results from the 2009 North Carolina Behavioral Risk Factor Surveillance System (BRFSS).

### Methods

Cancer status was classified by response to the 2009 BRFSS Core question from the Cancer Survivors Module: “Have you ever been told by a doctor, nurse, or other health professional that you had cancer?” Cancer survivors and adults who reported no history of a cancer diagnosis (without cancer) were compared on demographic characteristics and prevalence of chronic diseases and health conditions. Cochran-Mantel-Haenszel age-adjusted relative risks were calculated to assess the excess risk of chronic disease among cancer survivors. In this case, the relative risk is the ratio of the prevalence of chronic disease occurring among cancer survivors versus those without cancer. Results are based on 12,615 adults who answered the question about ever being diagnosed with cancer.

### Results

Ten percent of respondents (N=1906) reported having been diagnosed with cancer. Comparisons on demographic characteristics by cancer status (Table 1) revealed that levels of education and income did not vary substantially by cancer status. Among cancer survivors, female respondents were more likely to report being

**Table 1**  
**Demographic Characteristics By Cancer Status:**  
**2009 NC BRFSS Survey (N=12,615)**

Demographics	Cancer Status			
	Cancer Survivors		Without Cancer	
	N	%	N	%
<b>Sex</b>				
Males	663	39.4	4,042	49.6
Females	1,243	60.6	6,667	50.4
Total	1,906	100.0	10,709	100.0
<b>Age</b>				
18–44	133	13.1	3,267	52.7
45–54	237	17.0	2,205	19.2
55–64	405	23.6	2,267	14.5
65–74	565	22.9	1,697	8.1
75+	551	23.3	1,187	5.5
Total	1,891	100.0	10,623	100.0
<b>Race</b>				
White	1,684	84.8	8,346	70.2
African American	147	11.0	1,582	19.4
Other	68	4.2	705	10.4
Total	1,899	100.0	10,633	100.0
<b>Education</b>				
Less than H.S	260	11.4	1,351	13.9
High School	548	29.7	3,174	28.7
Post High School	480	24.1	2,737	26.3
College or More	616	34.7	3,431	31.1
Total	1,904	100.0	10,693	100.0
<b>Income</b>				
<\$15,000	239	11.7	1,130	11.3
\$15,000–24,999	316	17.1	1,679	17.4
\$25,000–34,999	213	13.3	1,087	11.0
\$35,000–49,999	252	15.5	1,383	13.4
\$50,000+	575	42.4	3,868	46.9
Total	1,595	100.0	9,147	100.0
<b>Employment</b>				
Employed	545	34.3	5,499	58.3
Out of Work	77	6.3	809	10.0
Other/retired	1,081	48.9	3,560	25.3
Unable to Work	201	10.5	825	6.4
Total	1,904	100.0	10,709	100.0

The Behavioral Risk Factor Surveillance System (BRFSS) is a random telephone health survey of non-institutionalized adults aged 18 and older in households sponsored by the Centers for Disease Control and Prevention (CDC). The North Carolina BRFSS operates through the State Center for Health Statistics’ Survey Center, Division of Public Health, conducting interviews monthly in both English and Spanish. Beginning in January 2009, the CDC introduced three questions in the Core Section of the survey on cancer survivors. The questions pertained to ever-diagnosed with cancer, how many different types of cancer, and respondent age at diagnosis. In addition, the CDC also sponsored an optional module on cancer survivorship, containing 10 questions ranging from treatment to health insurance coverage for cancer. For more detailed information, please visit the NC-BRFSS Web site at [www.schs.state.nc.us/SCHS/brfss](http://www.schs.state.nc.us/SCHS/brfss) or contact the BRFSS Coordinator at (919) 855-4485.

diagnosed with cancer (60.6%) than male respondents (39.4%). Whites were more likely to report a diagnosis of cancer (84.8%) than African Americans (11.0%), compared to their distribution in the non-cancer group. Given the fact that cancer survivors were significantly older than those without cancer (as expected), the results also show that almost half of all cancer survivors were either retired or in some non-employed capacity.

The weighted prevalence for chronic diseases and health conditions (Table 2) was found to be higher among cancer survivors compared to adults without cancer. The prevalence of cardiovascular disease and kidney disease was more than two times greater among cancer survivors. After controlling for age, cancer survivors had a significantly greater relative risk of having arthritis, kidney disease, disability, chronic obstructive pulmonary disease (COPD), and asthma. Compared to adults without cancer, cancer survivors had a 13 percent higher probability of having arthritis; a 54 percent higher probability of kidney disease; a 12 percent higher probability of disability; a 30 percent higher probability of COPD; and a 48 percent higher probability of asthma.

In conclusion, the overall burden of chronic disease appears to be higher among cancer survivors. When compared to those with no reported history of cancer, we also found that cancer survivorship was strongly associated with the majority of chronic diseases we examined. Limitations of the survey do not allow us to examine the association that cancer treatment may have had with chronic disease among survivors.

**Suggested citation:** Herrick H. *Cancer Survivors and Chronic Disease*. North Carolina BRFSS Surveillance Update, No. 3. Raleigh, NC: DHHS, Chronic Disease and Injury Section, State Center for Health Statistics, October, 2010.

## References

- Centers for Disease Control and Prevention, Cancer Prevention and Control. Cancer Survivorship. [www.cdc.gov/cancer/survivorship](http://www.cdc.gov/cancer/survivorship). Accessed August 19, 2010.
- Yabroff KR, Lawrence WF, Clauser S, Davis WW, Brown ML. Burden of illness in cancer survivors: findings from a population-based national sample. *Journal of the National Cancer Institute*. 2004;96:1322–30.
- Altekruse SF, Kosary CL, Krapcho M, Neyman N, Aminou R, Waldron W, Ruhl J, Howlader N, Tatalovich Z, Cho H, Mariotto A, Eisner MP, Lewis DR, Cronin K, Chen HS, Feuer EJ, Stinchcomb DG, Edwards BK (eds). SEER Cancer Statistics Review, 1975–2007, National Cancer Institute. Bethesda, MD, [http://seer.cancer.gov/csr/1975\\_2007](http://seer.cancer.gov/csr/1975_2007), based on November 2009 SEER data submission, posted to the SEER Web site, 2010.
- Mayo Clinic. *Cancer survivors: Managing late effects of cancer treatment*. [www.mayoclinic.com/health/cancer-survivor/CA00073](http://www.mayoclinic.com/health/cancer-survivor/CA00073). Accessed August 20, 2010.

**Table 2**  
**Weighted Prevalence and Age-adjusted Relative Risk of Chronic Diseases and Health Conditions Among Cancer Survivors Compared to Adults Without a History of Cancer: 2009 NC BRFSS Survey (N = 12,615).**

Chronic Disease/ Health Condition	Prevalence		Relative Risk	
	Cancer Survivors %	Without Cancer %	aRR	95% C.I.
Diabetes	16.0	9.1	1.00	0.83–1.19
Arthritis	47.5	25.4	1.13*	1.03–1.23
Cardiovascular disease	17.4	7.8	1.05	0.90–1.24
High blood pressure	50.1	30.1	1.02	0.95–1.10
Kidney disease	4.0	1.7	1.54*	1.10–2.15
Disability	43.8	28.9	1.12*	1.02–1.23
COPD	9.6	5.1	1.30*	1.02–1.66
Asthma	10.1	7.7	1.48*	1.15–1.89

Abbreviations: COPD—chronic obstructive pulmonary disease;  
aRR—age-adjusted relative risk.  
\*Statistically significant  $p < 0.05$

