NORTH CAROLINA SCHS STATE CENTER FOR HEALTH STATISTICS

No. 46 June 2017

Statistical Brief

1908 Mail Service Center ♦ Raleigh, NC 27699-1900
919.733.4728 ♦ www.schs.state.nc.us

Cervical Cancer Disparities Between African American Women and White Women in North Carolina, 2010–2014

Gary Y. Leung, Ph.D., Statistician, North Carolina Central Cancer Registry
Chandrika Rao, Ph.D., Director, North Carolina Central Cancer Registry

Introduction

This report is an update to the original study on cervical cancer conducted in August 2002 by the State Center for Health Statistics (SCHS).[1] Since the last report, the age-adjusted incidence rate of cervical cancer in North Carolina has remained stable from 7.8 per 100,000 in 2002 to 7.5 per 100,000 in 2014. A similar pattern was also observed in the mortality rate (2.5 per 100,000 in 2002 to 2.2 per 100,000 in 2014). However, the national incidence of cervical cancer has been decreasing between 2002 (8.7 per 100,000) and 2013 (7.2 per 100,000).[2] The mortality rate of cervical cancer has also decreased nationally since 2002.

Our last report showed substantial racial disparity in incidence, mortality, stage at diagnosis and treatment status between white and African-American women in North Carolina during the diagnosis years 1995–1998. The purpose of this report is to reexamine if such a disparity still exists and to determine how it has changed over time.

Methods

Data Sources

The most current incidence and mortality data from the North Carolina Central Cancer Registry (N.C. CCR) (diagnosis years 2010–2014) were used. Due to low numbers of cases and deaths in other minority groups, only non-Hispanic whites and non-Hispanic African Americans were included in the study.

Incidence and Mortality Rates

2010–2014 invasive cervical cancer incidence and mortality rates by race, age-adjusted to the U.S. Standard 2000 population, were estimated for North Carolina. Age-specific incidence and mortality rates by race were also estimated for the following age groups: 15–44, 45–64, and 65 and over.

For comparison, 2009–2013 national age-adjusted, as well as age-specific, incidence[2] and mortality[3] rates of cervical cancer were obtained from the Centers for Disease Control and Prevention (CDC) Wonder website.

Stage at Diagnosis

The incident cases of cervical cancer between 2010 and 2014 were categorized into four stages at diagnosis: localized, regional, distant and unknown. The percentages of each stage were calculated from the number of overall cases for comparison. Data were further divided by non-Hispanic whites and non-Hispanic African Americans to examine any disparity by stage at diagnosis.

Treatment Status

Similar to "Stage at Diagnosis" analysis, incident cases of cervical cancer for non-Hispanic whites and non-Hispanic African Americans from 2010 to 2014 were categorized by the following treatment status: surgery only, radiation only, chemotherapy only, surgery and radiation, surgery and chemotherapy, radiation and chemotherapy, all three treatments and no treatment.

The data were further divided by stage at diagnosis to examine the disparity in reception of treatment by stage at diagnosis for the two racial groups.

Results

Between 2010 and 2014, the age-adjusted incidence rate of cervical cancer was significantly higher among non-Hispanic African American women (8.2 per 100,000) than non-Hispanic white women (6.8 per 100,000) in North Carolina. Similar findings were observed in 2009–2013 U.S. national incidence (non-Hispanic African Americans: 9.6; non-Hispanic whites: 6.9) (Table 1).

NC Public Health
HEALTH AND HUMAN SERVICES

Table 1. Cervical Cancer Incidence Rates per 100,000 in North Carolina (2010–2014) and the U.S. (2009–2013)

	North Carolina (2010–2014)		U.S. (2009–2013)	
	Cases	Rate	Cases	Rate
Non-Hispanic Whites				
Age Groups				
15 to 44	461	7.7	13,795	7.5
45 to 64	490	10.4	16,139	10.9
65+	239	7.8	7,663	8.2
Age-adjusted	1,190	6.8	37,605	6.9
Non-Hispanic African Americans				
Age Groups				
15 to 44	150	6.2	3,048	6.8
45 to 64	215	14.6	4,309	16.8
65+	104	15.9	2,239	20.6
Age-adjusted	469	8.2	9,600	9.6

Produced by the N.C. Central Cancer Registry, 02/2017
Numbers are subject to change as files are updated.
Cases may not sum to totals due to unknown or other values.
Rates based on counts fewer than 16 are unstable. Use with caution.
Hispanic ethnicity is independent of race. Hispanic ethnicity is determined by self-report and the National Hispanic Identification Algorithm (www.naaccr.org/LinkClick.aspx?fileticket=iTvgbzLrx8I%3d&tabid=118&mid=458).
Vintage 2014 bridged-race postcensal population estimates were obtained from the National Center for Health Statistics (www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2014).

Table 2. Cervical Cancer Mortality Rates per 100,000 in North Carolina (2010–2014) and the U.S. (2009–2013)

	North Carolina (2010–2014)		U.S. (2009–2013)	
	Deaths	Rate	Deaths	Rate
Non-Hispanic Whites				
Age Groups				
15 to 44	66	1.1	2,178	1.2
45 to 64	159	3.4	6,096	4.1
65+	141	4.6	4,504	4.8
Age-adjusted	366	1.8	12,778	2.0
Non-Hispanic African Americans				
Age Groups				
15 to 44	31	1.3	733	1.6
45 to 64	96	6.5	1,910	7.4
65+	72	11.0	1,342	12.3
Age-adjusted	199	3.4	3,985	4.0

Produced by the N.C. Central Cancer Registry, 02/2017
Numbers are subject to change as files are updated.
Cases may not sum to totals due to unknown or other values.
Rates based on counts fewer than 16 are unstable. Use with caution.
Hispanic ethnicity is independent of race. Hispanic ethnicity is determined by self-report and the National Hispanic Identification Algorithm (www.naaccr.org/LinkClick.aspx?fileticket=iTvgbzLrx8I%3d&tabid=118&mid=458).
Vintage 2014 bridged-race postcensal population estimates were obtained from the National Center for Health Statistics (www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2014).

Comparison by age groups shows that the incidence of cervical cancer was higher in non-Hispanic African Americans among older age groups (45–64: 14.6; 65 and older: 15.9) when compared to non-Hispanic whites (45–64:10.4; 65 and older: 7.8). Similar patterns were observed in 2009–2013 age-specific national rates (Table 1).

Table 2 illustrates the age-adjusted and age-specific mortality rates of cervical cancer for non-Hispanic whites and non-Hispanic African Americans in North Carolina (2010–2014) and the U.S. (2009–2013). Non-Hispanic African American women had higher mortality rates, age-adjusted (3.4 per 100,000) and age-specific, than non-Hispanic whites (age-adjusted: 1.8 per

Table 3. 2010–2014 Stage at Diagnosis of Cervical Cancer by Race and Age Groups

	Localized		Regional		Distant		Unknown		Total
	Cases	Percent	Cases	Percent	Cases	Percent	Cases	Percent	Cases
Non-Hispanic Whites									
Age Groups									
15 to 44	283	61.4%	127	27.5%	32	6.9%	19	4.1%	461
45 to 64	198	40.4%	186	38.0%	88	18.0%	18	3.7%	490
65+	62	25.9%	109	45.6%	47	19.7%	21	8.8%	239
All Ages	543	45.6%	422	35.5%	167	14.0%	58	4.9%	1190
Non-Hispanic African Americans									
Age Groups									
15 to 44	88	58.7%	46	30.7%	11	7.3%	5	3.3%	150
45 to 64	82	38.1%	82	38.1%	41	19.1%	10	4.7%	215
65+	28	26.9%	35	33.7%	31	29.8%	10	9.6%	104
All Ages	198	42.2%	163	34.8%	83	17.7%	25	5.3%	469

Produced by the N.C. Central Cancer Registry, 02/2017
Numbers are subject to change as files are updated.
Cases may not sum to totals due to unknown or other values.

Table 4. 2010–2014 Treatment Status by Race and Stage at Diagnosis for Cervical Cancer

Treatment Status		Localized Percent	Regional Percent	Distant Percent	Unknown Percent	All Stages Percent
Surgery only	Non-Hispanic Whites	93.7%	3.0%	0.8%	2.5%	33.5%
	Non-Hispanic African Americans	95.5%	3.0%	0.8%	0.8%	28.1%
Radiation only	Non-Hispanic Whites	17.5%	49.2%	33.3%	0.0%	5.3%
	Non-Hispanic African Americans	16.2%	43.2%	35.1%	5.4%	7.9%
Chemotherapy only	Non-Hispanic Whites	0.0%	11.5%	80.8%	7.7%	2.2%
	Non-Hispanic African Americans	0.0%	0.0%	100.0%	0.0%	1.7%
Surgery and radiation	Non-Hispanic Whites	72.7%	20.0%	5.5%	1.8%	4.6%
	Non-Hispanic African Americans	81.3%	12.5%	0.0%	6.3%	3.4%
Surgery and chemotherapy	Non-Hispanic Whites	33.3%	19.0%	47.6%	0.0%	1.8%
	Non-Hispanic African Americans	25.0%	25.0%	50.0%	0.0%	0.9%
Radiation and chemotherapy	Non-Hispanic Whites	12.3%	67.6%	19.8%	0.3%	28.0%
	Non-Hispanic African Americans	14.4%	60.1%	25.5%	0.0%	32.6%
All three treatments	Non-Hispanic Whites	29.6%	58.7%	10.7%	1.0%	17.3%
	Non-Hispanic African Americans	33.3%	54.7%	10.7%	1.3%	16.0%
No treatment	Non-Hispanic Whites	10.3%	17.2%	24.1%	48.3%	7.3%
	Non-Hispanic African Americans	11.4%	15.9%	27.3%	45.5%	9.4%

Produced by the N.C. Central Cancer Registry, 02/2017
Numbers are subject to change as files are updated.

100,000) in North Carolina. The 2009–2013 U.S. national mortality rates showed similar patterns.

Table 3 shows that non-Hispanic African American women with cervical cancer were more likely to be diagnosed at distant stage in North Carolina (17.7% vs. 14% in non-Hispanic whites). Across age groups, non-Hispanic African American women were more likely to be diagnosed at distant stage.

Table 4 presents the treatment status for the two racial groups by stage at diagnosis. Overall, non-Hispanic African American women with cervical cancer were more likely to receive a combination of radiation and chemotherapy (32.6%) than non-Hispanic whites (28%). They were also more likely to receive no treatment (9.4%) than non-Hispanic whites (7.3%).

Discussions

This report shows that racial disparity has persisted in incidence, mortality, stage at diagnosis and treatment status in North Carolina since the last study in 2002. Non-Hispanic African American women suffered higher incidence and mortality from cervical cancer. They were also less likely to be diagnosed early or receive treatment. Such disparities were essentially unchanged since the last report.

Since the results were not adjusted for any confounding factors, the disparity may be due to factors such as access to health care. For example, using SEER database data from 2007 to 2011, Amini and colleagues showed that for major cancers with screening tests, individuals without health insurance had higher odds of their cancers being diagnosed at advanced stages.[4] Our internal analysis showed that non-Hispanic African American women with cervical cancer were more likely to be uninsured (11.1%) than non-Hispanic whites (9.2%). According to North Carolina BRFSS results in 2014, non-Hispanic African Americans were also less likely to have ever had a Pap test (88.7%) than were non-Hispanic whites (92.9%).[5] The disparity in health coverage and screening behavior may contribute to the differences in the outcomes of cervical cancer.

The results from this study showed that there is a continuing need to improve the outcomes of cervical cancer in underserved populations. For example, efforts must be made to increase health coverage and awareness, to increase early detection

through screening and to increase funding for screening tests and treatments among these populations. As mentioned above, the study did not assess unmeasured confounders, such as socioeconomic status and health beliefs. Future studies should be conducted to minimize confounding and to further identify the factors contributing to disparity in cervical cancer outcomes. Interventions can then be developed to help these populations.

References

1. Edwards JM and Buescher PA. Cervical cancer disparities between African-American women and white women in North Carolina, 1995–1998. *SCHS Study No. 134*. August 2002. Accessed on February 9, 2017. Available at: www.schs.state.nc.us/schs/pdf/schs-134.pdf.
2. United States Cancer Statistics: 1999–2013 Incidence, WONDER Online Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2016. Accessed at http://wonder.cdc.gov/cancer-v2013.html on Feb 8, 2017 1:28:45 PM.
3. United States Cancer Statistics: 1999–2013 Mortality, WONDER Online Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention; 2016. Accessed at http://wonder.cdc.gov/CancerMort-v2013.html on Feb 8, 2017 1:30:01 PM.
4. Amini A, et al. Disparities in disease presentation in the four screenable cancers according health insurance status. *Public Health*. 2016;138:50–6.
5. Breast and Cervical Cancer Screening: Have you ever had a Pap test. 2014 BRFSS Survey Results: North Carolina. September 2015. Accessed on February 9, 2017. Available at: www.schs.state.nc.us/data/brfss/2014/nc/all/hadpap.html.

State of North Carolina / Roy Cooper, Governor
Department of Health and Human Services / Dr. Mandy K. Cohen, Secretary / www.ncdhhs.gov
North Carolina Division of Public Health / www.ncpublichealth.com
State Center for Health Statistics / Eleanor Howell, M.S., Director / www.schs.state.nc.us
North Carolina DHHS is an equal opportunity employer and provider.