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## Cervical Cancer Disparities Between African-American Women and White Women in North Carolina, 1995-1998

by

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### ABSTRACT

**Objectives:** The purpose of this study is to portray current differences in North Carolina between African-American and white women in cervical cancer incidence, stage at diagnosis, treatment, and mortality.

**Methods:** Data from the North Carolina Central Cancer Registry on cervical cancer cases for 1995-1998 were used to examine racial differences in incidence, stage at diagnosis, and treatment. Data from North Carolina death certificates for 1995-1998 were used to calculate cervical cancer mortality rates for African-American and white women. The data are presented for the age groups 15-44, 45-64, and 65 and over. Also, age-adjusted cervical cancer incidence and mortality rates were calculated.

**Results:** The age-adjusted cervical cancer incidence rate for African-American women is 1.5 times the age-adjusted incidence rate for white women. The disparity is most pronounced among women ages 65 and older, where the incidence rate for African-American women is three times that for white women. Cervical cancer mortality rates are also much higher among African-American women. This difference in mortality is consistent with the findings that a much higher percentage of the African-American women with cervical cancer were diagnosed at a later stage, and the African-American women received less treatment for their cervical cancer than the white women.

**Conclusions:** Unmeasured socioeconomic factors associated with race may partly account for the cervical cancer differences observed here. These results suggest the need for increased preventive cervical cancer screening for African-American women, so that more cases of cancer can be detected at an earlier stage.

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## INTRODUCTION

Disparities in cervical cancer incidence, stage at diagnosis, and mortality between African-American women and white women are well documented. Nationally, the age-adjusted cervical cancer incidence rate for African-American women is approximately 70 percent higher than for white women, 13.6 (per 100,000 female population) compared to 8.1 for the 1995-1999 period.<sup>1</sup> This disparity is particularly evident among women ages 65 and older, with African-American women experiencing 3 times the incidence of white women, 34.2 versus 11.4.<sup>1</sup> Similarly, the age-adjusted mortality rate for African-American women (6.2) is more than two times that for white women (2.8), a disparity that is partly attributable to the excess incidence of cervical cancer among African-American women ages 65 and older.<sup>1</sup> Also contributing to this picture, African-American women are diagnosed at later stages of the disease and have lower survival rates than white women.<sup>1,2,3</sup>

Simoes et al.<sup>4</sup> found that African-American women were somewhat more likely to be in compliance with annual cervical cancer screening than white women. Compared to white women, African-American women were more likely to have had a diagnostic Pap smear rather than a routine (preventive) Pap smear. The researchers suggested the need for future research to confirm whether the greater overall compliance with cervical cancer screening guidelines among African-American women is partially attributable to a higher occurrence of diagnostic (vs. preventive) screening.

Differences in the receipt of treatment for cervical cancer also have been reported. Brooks et al.<sup>5</sup> suggested that the more frequent receipt of radiation among African-American women than white women may be explained by the higher percentage of African-American women than white women presenting with more advanced disease. However, Howell et al.<sup>6</sup> found that African-American women received surgery less often and radiation more often than white women, even after controlling for stage of disease.

This paper reports the results of a descriptive analysis of the incidence and mortality rates, stage at diagnosis, and treatment for cervical cancer among African-American women and white women in North Carolina from 1995 through 1998. Race is considered as a marker for health problems, not as a risk factor or cause. Among the underlying causes of the higher cervical cancer rates and later stage at diagnosis among African-American women are lower income and education levels. Describing racial differences in cervical cancer allows targeting of resources and health improvement programs toward populations most in need.

## METHODS

### *Data sources*

Data on North Carolina cervical cancer cases for 1995 through 1998 were obtained from the North Carolina Central Cancer Registry at the State Center for Health Statistics (SCHS). This analysis was restricted to the 1,688 invasive cervical cancer cases among white women and African-American women for this time period. The analysis was restricted to this 4-year period rather than a more typical 5-year period (i.e., 1994-1998) because there was no treatment data available for 1994. Data on 1995 through 1998 cervical cancer deaths, and the North Carolina population data for 1995 through 1998 (used in the denominators), were also obtained from SCHS.

### *Incidence and mortality rates*

Age-specific incidence and mortality rates were calculated for African-American women and white women. The three age groups used for the age-specific calculations were 15-44, 45-64, and 65 and older. Since the North Carolina population projections for 1995-1998 are recorded as white and non-white, the population data for non-white females were adjusted by the estimated percentages of African-American women represented in the non-white categories (>90%) to produce the denominators for the rates. In addition, since the North Carolina African-American population is younger

than the white population, the overall incidence and mortality rates (for all ages combined) were age-adjusted to the United States projected population for 2000 to standardize the age distribution. Age adjustment is important when comparing chronic disease rates between African Americans and whites, since the younger average age of the African-American population in North Carolina will by itself tend to lower the unadjusted rates. All rates are expressed per 100,000 population per year.

### *Stage at diagnosis*

Age-specific distributions of the stage of the disease at diagnosis were tabulated for African-American women and white women. Four stage categories were used: localized, regional, distant, and unstaged.

### *Treatment*

Receipt of surgery and/or radiation among African-American women and white women was tabulated by stage at diagnosis. In addition, women's receipt of any treatment was tabulated, using four categories: no radiation/no surgery, no radiation/yes surgery, yes radiation/no surgery, and yes radiation/yes surgery.

## **RESULTS**

As shown in Table 1, there were 478 cervical cancer cases and 213 deaths among African-American women and 1,210 cases and 326 deaths among white women in North Carolina from 1995 through 1998. Data in some of the other tables may differ from these numbers due to missing data for some of the cross-tabulation variables.

The age-adjusted incidence rate for African-American women, 19.7, is 1.5 times the age-adjusted incidence rate for white women, 12.8 (Table 2). The disparity is most pronounced among women ages 65 and older, where the incidence rate for African-American women, 39.9, is 3 times that for white women, 13.3. The age-adjusted mortality rate for African-American women, 8.9, is 2.7 times the

age-adjusted mortality rate for white women, 3.3. The disparity in mortality is also greatest among women ages 65 and older, where the rate for African-American women is over threefold that for white women (24.6 vs. 7.3).

**Table 1**  
**Cervical Cancer Cases and Deaths Among African-American Women and White Women in North Carolina, 1995-1998**

Race	Number of Cases	Number of Deaths	Death/Case Ratio
African-American	478	213	.45
White	1,210	326	.27

**Table 2**  
**Age-Specific and Age-Adjusted Cervical Cancer Incidence and Mortality Rates for African-American Women and White Women in North Carolina, 1995-1998**

Race/Age	Incidence		Mortality	
	Number of Cases	Rate	Number of Cases	Rate
<b>African-American</b>				
Ages				
15-44	150	9.3	53	3.3
45-64	177	28.8	67	10.9
65+	151	39.9	93	24.6
Total	478	18.4	213	8.2
Age-Adjusted Rate		19.7		8.9
<b>White</b>				
Ages				
15-44	536	11	80	1.6
45-64	427	16.2	112	4.3
65+	245	13.3	134	7.3
Total	1,208	12.9	326	3.5
Age-Adjusted Rate		12.8		3.3

Note: Rates are per 100,000 female population.

The 2000 U.S. projected population was used as the standard for age-adjustment.

A greater percentage of white women, 59.7 percent, than African-American women, 48.1 percent, were diagnosed while their cancer was at the localized stage (Table 3). This difference in stage at diagnosis is most pronounced in the 15-44 age group. African-American women were also less likely to receive surgery and more likely to receive radiation

compared to white women, particularly for the localized cancers (Table 4). In addition, a somewhat greater percentage of African-American women did not receive any treatment compared to white women, while a greater percentage of white women received both radiation and surgery compared to African-American women (Table 5).

**Table 3**  
**Age-Specific Distribution of Stage at Diagnosis of Cervical Cancer Among African-American Women and White Women in North Carolina, 1995-1998**

Race/Age	Localized		Regional		Distant		Unstaged		Total Number of Cases
	Number of Cases	Percent	Number of Cases	Percent	Number of Cases	Percent	Number of Cases	Percent	
<b>African-American</b>									
Ages									
15-44	77	51.3	54	36.0	9	6.0	10	6.7	150
45-64	86	48.6	68	38.4	14	7.9	9	5.1	177
65+	67	44.4	52	34.4	16	10.6	16	10.6	151
Total	230	48.1	174	36.4	39	8.2	35	7.3	478
<b>White</b>									
Ages									
15-44	382	71.3	126	23.5	11	2.1	17	3.2	536
45-64	238	55.9	133	31.2	33	7.7	22	5.2	426
65+	101	41.2	90	36.7	35	14.3	19	7.8	245
Total	721	59.7	349	28.9	79	6.5	58	4.8	1,207

**Table 4**  
**Percentage of Cervical Cancer Cases Receiving Surgery and Radiation By Stage at Diagnosis Among African-American Women and White Women in North Carolina, 1995-1998**

	Localized	Regional	Distant	Total
<b>% Receiving Surgery</b>				
African-American	61.3	27.6	20.5	44.5
White	83.4	42.4	22.5	66.7
<b>% Receiving Radiation</b>				
African-American	52.6	87.4	71.8	67.9
White	34.5	86.2	72.5	52.8

Note: Unstaged cases of cervical cancer are excluded from this table due to substantial numbers with unknown treatment status.

**Table 5**  
**Percentage By Type of Treatment for Cervical Cancer Among African-American Women and White Women in North Carolina, 1995-1998**

	African American	White
No Radiation/ No Surgery	10.4	5.8
No Radiation/ Yes Surgery	24.1	42.3
Yes Radiation/ No Surgery	46.2	29.3
Yes Radiation/ Yes Surgery	19.4	22.6
Total # of Cases	460	1,197

Note: Cases with unknown or missing treatment data were excluded.

## DISCUSSION

This paper presents descriptive results for cervical cancer incidence, stage at diagnosis, treatment, and mortality among African-American and white women. No control variables were measured, and the racial differences in cervical cancer are related to other factors that are associated with race. African-American women are, on average, of lower socioeconomic status than white women; it may be primarily these social and economic factors that account for the racial differences related to cervical cancer. For example, health insurance coverage may be a confounding factor affecting the differential in diagnosis and treatment. Also, visual markers may lead some health care providers to engage in discriminatory behavior that reduces access to health care for minority populations.<sup>7</sup>

These results for North Carolina corroborate previous reports on cervical cancer disparities between African-American women and white women.<sup>1,2</sup> The results show that African-American women have a much higher cervical cancer incidence rate than white women at ages 45 and older. Also, African-American women have their cervical cancer diagnosed at a later stage than white women. In addition, there is evidence that African-American women receive less treatment for their cervical cancer. All of these factors would contribute to the higher cervical cancer death rates among African-American women.

These results suggest the need for increased preventive cervical cancer screening for African-American women, so that more cases of cancer can be detected at an earlier stage. In addition, as Howell et al.<sup>6</sup> suggest, attention should be given to how differences in severity of disease, co-morbidity, socioeconomic status, patient preferences, and physician decisions account for the differences in treatment between African-American women and white women.

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