



SCHS Studies

A Special Report Series by the State Center for Health Statistics
1908 Mail Service Center, Raleigh, N.C. 27699-1908
www.schs.state.nc.us/SCHS/

No. 150

June 2006

Female Breast Cancer Incidence, Stage at Diagnosis, Treatment, and Mortality in North Carolina

by

Sohrab Ali, MPH, MIS

ABSTRACT

Objectives: Female breast cancer is the most commonly diagnosed cancer in North Carolina. It also accounts for the second largest number of cancer-related deaths among women. The objective of this study is to examine recent breast cancer incidence, stage at diagnosis, treatment, and mortality differences between white and African American women in North Carolina. Also, trends in incidence and mortality are examined for the 1990 to 2002 period.

Methods: Data on North Carolina breast cancer cases were obtained from the North Carolina Central Cancer Registry. Data on breast cancer deaths were obtained from the vital statistics unit of the State Center for Health Statistics. Population data from the National Center for Health Statistics were used in the denominators of the rates, which are expressed per 100,000 population. Rates were age-adjusted to the 2000 United States population. In-situ, localized, regional, distant, and unknown categories were used for defining cancer stage. Information about breast cancer treatment was categorized into surgery, chemotherapy, hormone therapy, and radiation therapy.

Results: The age-adjusted breast cancer incidence rate for white women in North Carolina is 1.1 times the rate for African American women. However, the age-adjusted breast cancer death rate for African American women is 1.5 times the rate for white women. Much of this difference is due to African American women being substantially more likely than white women to have breast cancer diagnosed at the regional or distant stage. Mortality is higher when breast cancer is diagnosed at a later stage. African American women were somewhat less likely to receive hormone therapy and more likely to receive chemotherapy than white women, regardless of the stage at diagnosis. Breast cancer death rates declined somewhat for both white and African American women from 1990 to 2002.

Conclusions: The results suggest the need for increased preventive breast cancer screening for African American women, so that more cancer cases can be diagnosed at an earlier stage, as a means of reducing racial disparities in breast cancer mortality. The decline in death rates for both white and African American women suggests earlier diagnosis of breast cancer and more effective treatment for all women in recent years.

Note: Sohrab Ali is a statistician with the North Carolina Central Cancer Registry, State Center for Health Statistics, Division of Public Health, North Carolina Department of Health and Human Services, Raleigh, North Carolina.



INTRODUCTION

Female breast cancer is the most commonly diagnosed cancer in North Carolina. It also accounts for the second largest number of cancer-related deaths among women.¹ In 2002, 6,237 women were diagnosed with breast cancer in North Carolina. Disparities in breast cancer incidence, stage at diagnosis, and mortality between African American women and white women are well documented. Further, racial differences in stage at diagnosis have been found to contribute substantially to the disparity in mortality.²

The objective of this study is to examine recent breast cancer incidence, stage at diagnosis, treatment, and mortality differences between white and African American women in North Carolina in recent years. Trends in incidence and mortality were examined for the 1990 to 2002 period.

METHODS

Data Sources

Data on North Carolina breast cancer cases were obtained from the North Carolina Central Cancer Registry (CCR). The CCR operates under the authority granted in the North Carolina General Statute 130A-208. All health care providers are required by law to report cases to the CCR. The primary data source is the hospitals of the state. The CCR supplements hospital data with reports from physicians who diagnosed cases that are not seen

in a hospital. The CCR also collects data from pathology laboratories and freestanding treatment centers. Data on breast cancer deaths were obtained from the vital statistics unit of the State Center for Health Statistics (SCHS). Population data from the National Center for Health Statistics (NCHS) were used in the denominators of the rates, which are expressed per 100,000 population. Five-year (1998-2002) incidence and mortality rates for white women and African American women were calculated to assess racial disparities in breast cancer. Rates were age-adjusted to the 2000 United States population. In-situ, localized, regional, distant, and unknown categories were used for defining the cancer stage. For the 1990-2002 trend analysis, three-year overlapping rates were used to improve stability over time. The analysis for treatment was performed for the two year period of 2001-2002 because national standards required more complete treatment data starting in 2001. Information about breast cancer treatment is categorized into surgery, chemotherapy, hormone therapy, and radiation therapy. Stage at diagnosis percentages were also calculated for the 2001-2002 period, to be consistent with the treatment data.

RESULTS

Incidence and mortality trends

In 1998-2002 there were 26,259 breast cancer cases reported for white women and 5,470 reported for African American women. Incidence and death

Table 1: Breast Cancer Incidence and Death Rates for African American Women and White Women in North Carolina, 1998-2002

Race	Incidence		Mortality	
	Number of Cases	Rate*	Number of Deaths	Rate*
African American	5,470	132.5	1,438	34.8
White	26,259	151.7	4,259	23.8

*Rates are age-adjusted and expressed per 100,000 population.

rates by race (1998-2002) are presented in Table 1. The five year age-adjusted death rate for African American women is 34.8, which is 1.5 times the age-adjusted death rate for white women (23.8 per 100,000 females). The five-year age adjusted incidence rate for white women (151.7) is 1.1 times the age-adjusted incidence rate for African American women (132.5). There is a slight increase in breast cancer incidence from 1990 to 2001 for both African American and white women. Breast cancer incidence since 2001 shows a slight decline for both the white women and African American women (Figure 1). The difference in breast cancer mortality between African American and white women was consistent over the last 10 years, with African American women having substantially higher death rates across the period. It is encouraging that breast cancer death rates have declined somewhat for both African American women and white women (Figure 2).

Stage at diagnosis

The stage distribution of breast cancer for 2001-2002 is presented in Figure 3. Five stage categories were used: in-situ, localized, regional, distant, and unknown/unstaged. Fifty-nine percent of African American women are diagnosed with early stage cancer (in-situ and localized) compared to 70 percent of white women. A higher percentage of African American women are diagnosed with later stage breast cancer compared to white women. The percentages of late stage cancer (regional and distant) were 37 percent for African American women and 27 percent for white women. Unknown/unstaged cancers were about the same for African American women (4%) and white women (3%).

Figure 1: Breast Cancer Incidence Trends in North Carolina, 1990-2002

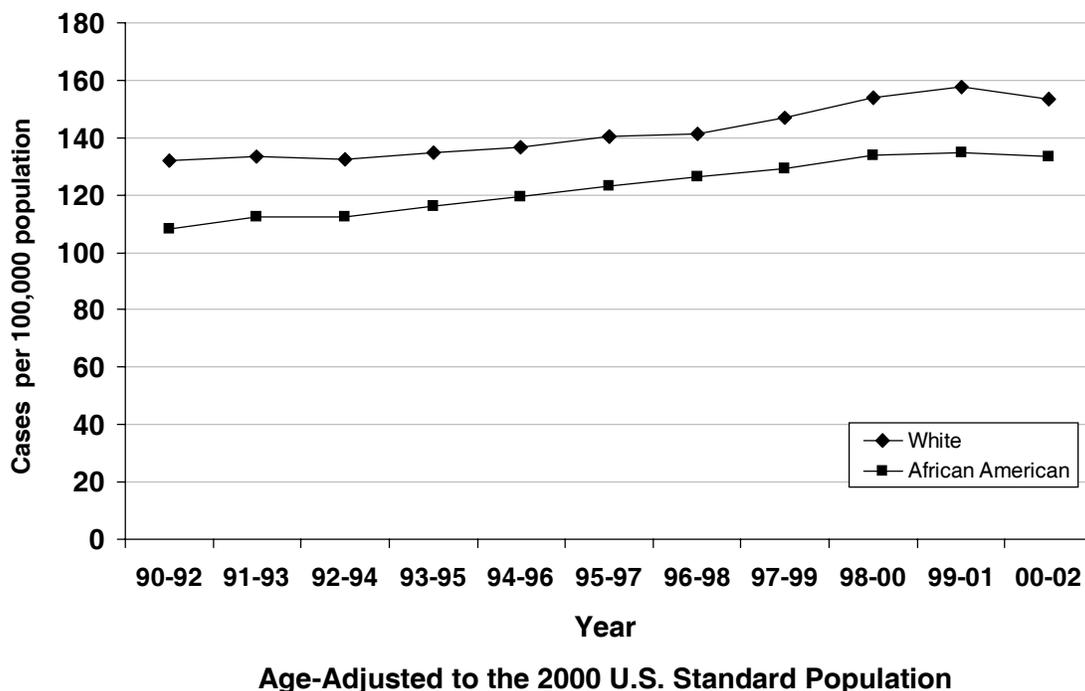
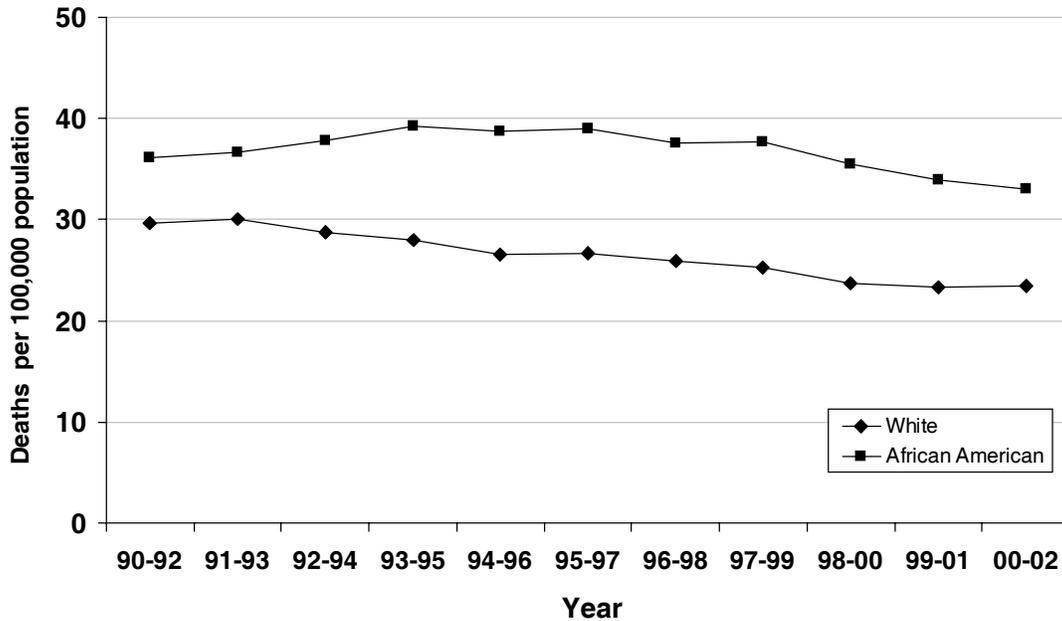


Figure 2: Breast Cancer Mortality Trends in North Carolina, 1990-2002



Age-Adjusted to the 2000 U.S. Standard Population

Figure 3: Race-Specific Percentages of Breast Cancer Cases by Stage at Diagnosis, 2001-2002

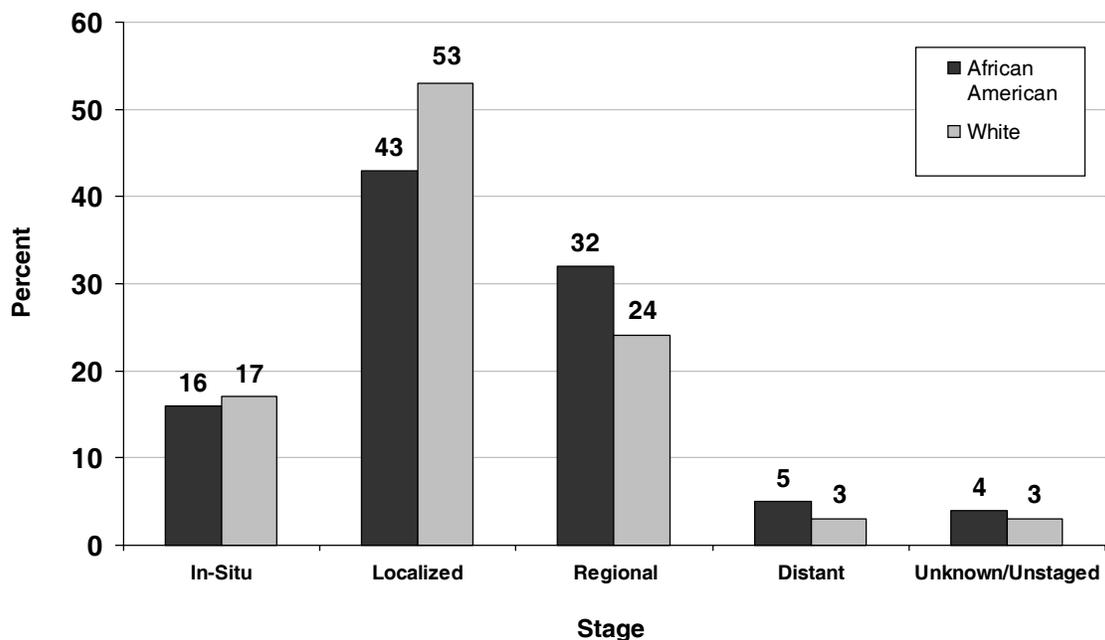


Table 2: Percentage of Breast Cancer Treatments by Type, by Race and Stage at Diagnosis, North Carolina 2001-2002

Race	Treatment Type	In-Situ	Localized	Regional	Distant	Unknown
African American	% Surgery	52.2	44.9	39.9	21.0	29.2
	% Radiation	35.6	30.4	26.5	35.3	56.2
	% Chemotherapy	0.5	13.3	26.5	31.7	10.4
	% Hormone Therapy	11.7	11.4	7.1	12.0	4.2
	Number of Treatments	623	1,965	1,638	224	96
White	% Surgery	51.9	46.2	38.9	24.8	30.6
	% Radiation	35.2	29.2	26.1	34.4	55.3
	% Chemotherapy	0.5	9.7	24.5	23.8	8.6
	% Hormone Therapy	12.4	14.9	10.5	17.0	5.5
	Number of Treatments	3,242	11,580	6,246	646	291

Note: The data here pertain to treatments rather than cases; a case is counted more than once within a column if more than one type of treatment was received. Cases with unknown treatment type (about 4 percent overall) were omitted from this table.

Treatment by stage

Table 2 shows type of treatments received in each breast cancer stage among African American women and white women. Four types of treatment were portrayed in this analysis: surgery, radiation therapy, chemotherapy, and hormone therapy. Breast cancer can have a high survival rate if the patient’s cancer is detected and treated at an early stage. The results in Table 2 indicate that African American women were somewhat less likely to receive hormone therapy and more likely to receive chemotherapy than white women, regardless of stage. The surgery and radiation treatment patterns were similar for white and African American women, regardless of stage. Overall, unknown treatments were about the same for African American women (4.2%) and for white women (3.8%).

DISCUSSION

This paper presents descriptive results for breast cancer incidence, stage at diagnosis, treatment, and mortality among African American and white women. African American women are, on average, of lower socioeconomic status than white women. Income, education, and health insurance coverage strongly influence access to appropriate early detection and treatment.³ Mammography use has been historically higher in white than African American women.⁴ Higher breast cancer screening could be one of the reasons the incidence rate is higher for white than for African American women. African American women have their breast cancer diagnosed at a later stage than white women. This certainly contributes to the higher death rates among African American women. The results of this study are consistent with other studies showing

that a lower percentage of breast cancer cases are diagnosed at the localized stage and a higher percentage are diagnosed at more advanced stages among women of lower socioeconomic status.⁵ These results suggest the need for increased preventive breast cancer screening for African American women, so that more cancer cases can be diagnosed at an earlier stage, as a means of reducing racial disparities in breast cancer mortality. The decline in death rates for both white women and African American women suggests earlier diagnosis of breast cancer and more effective treatment for all women in recent years.

REFERENCES

1. Gargiullo P, Wingo PA, Coates RJ, Thompson TD. Recent trends in mortality rates for four major cancers, by sex and race/ethnicity – United States, 1990-1998. *MMWR* 2002; 51(03):49-53.
2. Eley JW, Hill HA, Chen VW, et al. Racial differences in survival from breast cancer: results of the National Cancer Institute black/white cancer survival study. *Journal of the American Medical Association* 1994; 272:947-954.
3. Ward E, Jemal A, Cokkinides V, et al. Cancer disparities by race/ethnicity and socioeconomic status. *CA: Cancer Journal for Clinicians* 2004; 54:78-93.
4. Ghafoor A, Jemal A, Ward E, et al. Trends in breast cancer by race and ethnicity. *CA: Cancer Journal for Clinicians* 2003; 53:342-355.
5. Sing GK, Miller BA, Hankey BF, Edwards BK. Area socioeconomic variations in US cancer incidence, mortality, stage, treatment, and survival 1975-1999. *NCI Cancer Surveillance Monograph Series, Number 4*. Bethesda, MD: National Cancer Institute, 2003. NIH Publication No. 03-5417.

Acknowledgments

The author would like to thank Karen Knight, Director of the North Carolina Central Cancer Registry, Chandrika Jayathirtha, Statistical Supervisor in the NC Central Cancer Registry, Melissa Pearson, Quality Management Specialist in the NC Central Cancer Registry, Paul Buescher, Director of the State Center for Health Statistics, and Amy Denham of the Chronic Disease and Injury Section for their valuable contributions to this study. The data used in this publication were collected by the North Carolina Central Cancer Registry, which participates in the National Program of Cancer Registries (NPCR) of the Centers for Disease Control and Prevention (CDC). The Central Cancer Registry acknowledges the CDC for its financial support of this project under cooperative agreement U55/CCU421885-04-1. The contents of this report are the responsibility of the authors and do not necessarily represent the official views of the CDC.

For more information about this publication, contact:

Sohrab Ali at (919) 715-8036
e-mail: Sohrab.Ali@ncmail.net

For a list of other publications by the State Center for Health Statistics call:
(919) 733-4728
or check the website at:
www.schs.state.nc.us/SCHS/

State of North Carolina
Michael F. Easley, Governor

Department of Health and Human Services
Carmen Hooker Odom, Secretary

Division of Public Health
Leah Devlin, D.D.S., M.P.H., State Health Director

State Center for Health Statistics
Paul A. Buescher, Ph.D., Director

www.schs.state.nc.us/SCHS/



The NC Department of Health and Human Services does not discriminate on the basis of race, color, national origin, sex, religion, age or disability in employment or the provision of services.

450 copies of this public document were printed at a cost of \$134.06 or 30¢ per copy. 6/06



Department of Health and Human Services
State Center for Health Statistics
1908 Mail Service Center
Raleigh, NC 27699-1908
919-733-4728