

# Persistence in Breast Cancer Disparities Between African Americans and Whites in Wisconsin

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## ABSTRACT

**Background:** Breast cancer (BC) mortality is higher in African American women compared to white women despite having a lower incidence. The reasons for this remain unclear, despite decades of research. Reducing BC health disparities is a priority but has had limited success.

**Objective:** To assess progress in eliminating breast cancer-related health disparities in Wisconsin by comparing trends in breast cancer outcomes in African American and white women from 1995 to 2006 and comparing results nationally.

**Methods:** Age-adjusted breast cancer (BC) incidence and stage data from the Wisconsin Cancer Reporting System and age-adjusted mortality data from National Center of Health Statistics were used to evaluate trends in incidence and mortality from 1995 to 2006 for African Americans and whites. The relative disparity was evaluated by rate ratios. Trends in distribution of in situ vs malignant disease were examined. National trend data were obtained from the National Cancer Institute (NCI) Surveillance, Epidemiology and End Results (SEER) database.

**Results:** Age-adjusted incidence decreased 10% in Wisconsin compared to 7% nationally. Incidence of BC was lower in African American compared to white women. BC mortality in African American women declined in Wisconsin, but remained higher than white females. Age-adjusted mortality in Wisconsin declined approximately 23%, matching national trends. Non age-adjusted stage data trended toward a decrease in malignant, but increased in situ disease.

**Conclusions:** Despite an overall reduction in BC mortality from 1995 to 2006, a persistent disparity in mortality remains for African American women, demonstrating no significant progress in reducing BC health disparities.

## INTRODUCTION

Breast cancer is the most frequently diagnosed cancer in women. An estimated 192,370 women were diagnosed with, and over 40,000 American women died from the disease in 2009.<sup>1</sup> In Wisconsin, approximately 3800 women were diagnosed annually over the period 2002-2006, while 770 women died due to the disease.<sup>2</sup> There have been many successes in

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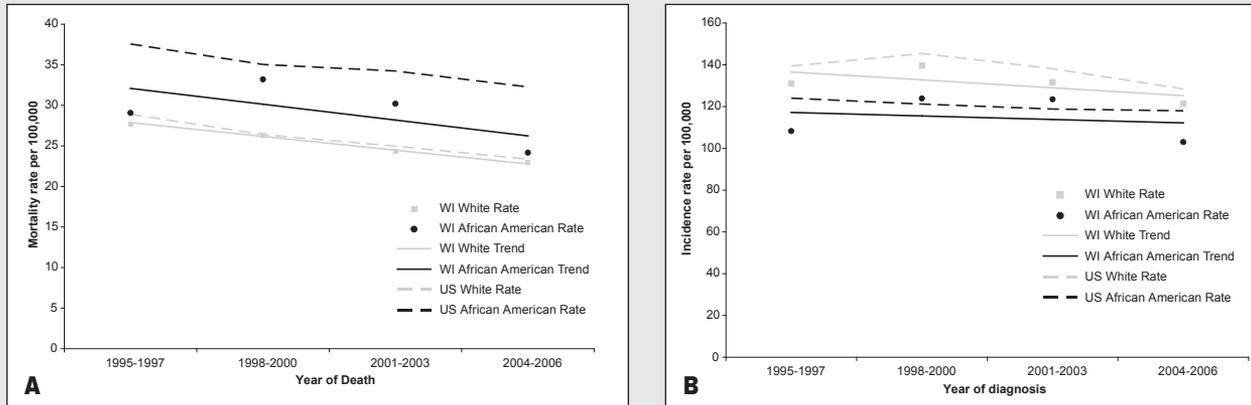
battling breast cancer (BC), with incidence and death rates among African American women decreasing nearly 2% per year over the period 1998-2006.<sup>3</sup> Survival improvements have been attributed to advances in treatment as well as to early detection. The reduction in new cases has been credited to changes in primary care clinical practice, such as reduction in the use of hormone replacement therapy following the Women's Health Initiative in 2002.<sup>4</sup>

However, not all women have benefited equally from these successes. National studies have established that while BC incidence rates among whites are higher than among African Americans, mortality rates are higher and have declined more slowly among African American women.<sup>5-10</sup>

Previous reports from Wisconsin reveal disparities in breast cancer rates.<sup>2,11-13</sup> The most recent report from the Wisconsin Cancer Reporting System

(WCRS) shows that age-adjusted incidence of breast cancer was 124 per 100,000 for white women compared to 109 per 100,000 for African American women over the period 2002-2006. Despite this lower incidence, African American women had higher BC mortality than whites (26 vs 23 per 100,000).<sup>2</sup> Nationally, these disparities have changed over time.<sup>5</sup> However, trends in Wisconsin BC disparities have not been reported for African Americans, the largest minority population in Wisconsin.<sup>3</sup>

The purpose of this paper is to describe trends in disparities in BC incidence and mortality between African Americans and whites in Wisconsin, and compare them to national trends. We also examine disparities in BC staging at diagnosis in Wisconsin and highlight ongoing clinical, policy, and programmatic activities in the state that seek to address these disparities.



**Figure 1:** Age-adjusted breast cancer incidence (A) and mortality rates (B), females, by race, Wisconsin and the United States, 1995-2006. Source: Wisconsin Cancer Reporting System (Wisconsin incidence), National Center for Health Statistics (Wisconsin mortality), Surveillance, Epidemiology, and End Results (SEER) Registry<sup>3</sup> (US incidence and mortality).

## METHODS

### Data Sources

**Wisconsin.** We obtained female BC incidence data from the WCRS for the period 1995-2006, the most recent years for which data were available. As required by state law, cancer cases are reported to WCRS by Wisconsin hospitals, clinics, and physician offices. All invasive and noninvasive malignant tumors, except basal and squamous cell carcinomas of the skin and in situ cancers of the cervix uteri, are reportable to WCRS. Incidence rates were age-adjusted using the 2000 US standard population and were calculated using NCI's SEER\*Stat software.

We obtained stage at diagnosis information for all incident female BC cases from WCRS, which codes cases based on Surveillance, Epidemiology and End Results (SEER) staging guidelines. Breast cancer was described as either in situ or malignant. Malignant breast cancer was further classified into localized, regional, distant/systemic, and unknown/unstaged. Precise American Joint Commission on Cancer staging is not currently available from WCRS.

Mortality data used in this study reflect Wisconsin resident death records from the Vital Records Section, Wisconsin Department of Health Services. We accessed female BC mortality data from the National Center for Health Statistics (NCHS) public use data file of Wisconsin deaths for the period 1995-2006. Population data used in calculating cancer rates are obtained periodically by NCHS from the Census Bureau; those used in this study were age-adjusted to the 2000 US standard population.<sup>14</sup> We used the SEER\*Stat software package to calculate mortality rates. We also applied race categories used by NCHS.<sup>15</sup>

**United States.** We obtained US female BC incidence and mortality rates between 1995 and 2006 from NCI's SEER public-used database.<sup>3</sup> SEER collects data from population-based

cancer registries covering approximately 26% of the US population. Mortality data reported by SEER are provided by NCHS. All SEER rates are age-adjusted using the 2000 US standard population.

### Analysis

In 2006, Wisconsin's overall population was 6% African American and 88% white, compared to 12% African American and 74% white nationally.<sup>16</sup> There were relatively few African American BC cases in Wisconsin each year; thus, we calculated averages over 3 years of the incidence, mortality, and stage data during the period 1995-2006. We plotted the average female BC incidence and mortality rates over the period by race. To smooth the yearly fluctuation in rates, we plotted linear trends over the decade for the Wisconsin incidence and mortality data, as well as actual rates for US data. Next, we calculated the ratio of the African American incidence and mortality rates to the white rates (rate ratio) at the beginning and end of the period (1995-1997 and 2004-2006). This ratio constitutes our measure of relative disparity.<sup>17</sup> For stage data, we examined trends in the percentage of malignant cases by stage among African Americans and whites in Wisconsin for the period 1995-2006. Due to the small number of malignant cases, we were unable to age-adjust stage data.

## RESULTS

### Incidence

From 1995 to 2006, breast cancer was diagnosed in 46,266 Wisconsin women (44,156 whites and 1465 African Americans). During this period, age-adjusted BC incidence decreased 10% from 130 per 100,000 in 1995 to 117 per 100,000 in 2006. This was greater than the 7% reduction observed in the United States over the same period (132 per 100,000 to 123 per 100,000). BC incidence among African Americans was less than that of whites in all years dur-

**Table 1. Age-Adjusted Breast Cancer Incidence and Mortality Rates<sup>a</sup>, Females, African Americans and Whites, Wisconsin and the United States, 1995-1997, 2004-2006**

Rate	1995 - 1997			2004 - 2006		
	African American Rate	White Ratio <sup>b</sup>	Rate Rate	African American Rate	White Ratio <sup>b</sup>	Rate Rate
<b>Wisconsin</b>						
Incidence	108.3	131.1	0.8	103.0	121.2	0.8
Mortality	29.1	27.7	1.1	24.2	22.9	1.1
<b>National</b>						
Incidence	124.0	139.4	0.9	118.0	128.4	0.9
Mortality	37.6	28.9	1.3	32.3	23.4	1.4

<sup>a</sup> Rates are per 100,000 population and age-adjusted to the 2000 US standard population. Rates presented are 3-year averages.

<sup>b</sup> Ratio of African American rate to white rate.

Source: Wisconsin Cancer Reporting System (Wisconsin incidence); National Center for Health Statistics (Wisconsin mortality); Surveillance, Epidemiology, and End Results (SEER) Registry<sup>3</sup> (US incidence and mortality).

ing 1995-2006 in both Wisconsin and the United States (Figure 1). Compared to the national rates, BC incidence rates among whites were slightly lower in Wisconsin during 1995-2006. For African Americans, national incidence rates were nearly 15% higher than the Wisconsin rates in the beginning and end of the period, but slightly less than Wisconsin rates from 1998 to 2003. The relative disparity in BC incidence rates between African Americans and whites persisted in both Wisconsin and the United States over the period 1995-2006. The African American to white rate ratio was slightly higher nationally compared to Wisconsin (0.9 vs 0.8) during both 1995-1997 and 2004-2006 (Table 1).

### Mortality

Between 1995 and 2006, there were 9610 deaths due to breast cancer among Wisconsin women (9192 whites and 353 African Americans). During this period, age-adjusted BC mortality decreased 23%, from 30 per 100,000 in 1995 to 23 per 100,000 in 2006. This was nearly the same as the reduction observed at the national level (26% reduction from 31 per 100,000 in 1995 to 23 per 100,000 in 2006). BC mortality rates were higher among African Americans than whites during the period 1995-2006 in both Wisconsin and nationally, although the absolute disparity in rates was greater nationally than in Wisconsin (Figure 1). While white rates were similar in Wisconsin and the United States, the mortality rate among African Americans was 4 to 8 points higher nationally. The relative disparity in BC mortality rates between African Americans and whites persisted in Wisconsin over the period (rate ratio 1.1 in 1995-1997 and 2004-2006). The national rate ratio was greater, and increased slightly, over the period (1.3 in 1995-1997 and 1.4 in 2004-2006).

### Staging

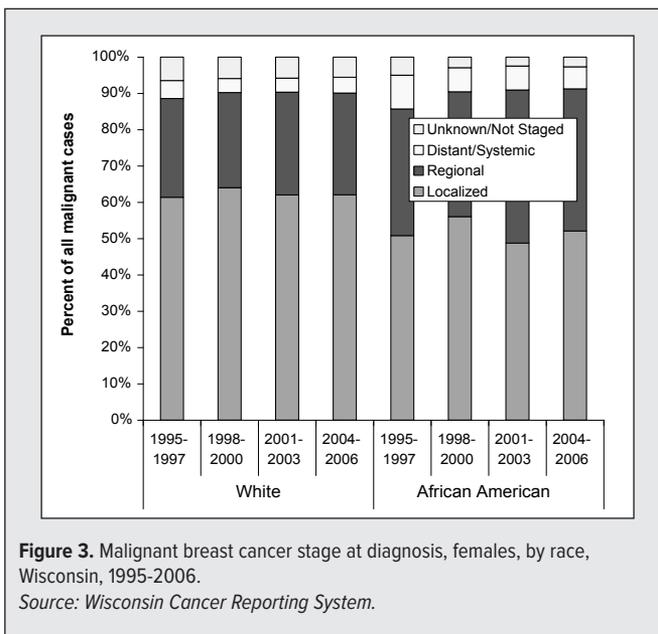
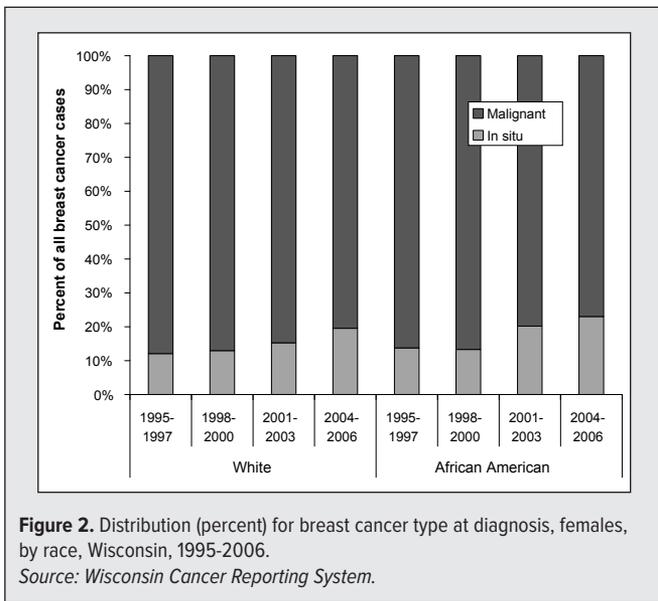
Figure 2 shows breast cancer type at diagnosis over the period 1995-2006 for African Americans and whites in Wisconsin. For both racial groups, the proportion of all BC cases that were diag-

nosed as in situ increased over the period (from 12% to 20% for whites and from 14% to 23% for African Americans). Figure 3 shows that a greater percentage of malignant BC was detected at a later (regional or distant) stage for African Americans than whites (30% to 32% for whites compared to 41% to 48% for African Americans) during 1995-2006. The stage distribution in Wisconsin paralleled national patterns over the period 2000-2007.<sup>18</sup> Because stage data were not age-adjusted, these findings must be interpreted cautiously since differences in the age distribution of African Americans and whites may play a role in the distribution of breast cancers by stage.

### DISCUSSION

Breast cancer incidence and mortality decreased over the period 1995-2006 among all women in Wisconsin, similar to declines observed nationally. In Wisconsin, incidence was consistently higher among white women than among African American women, while the opposite was observed for mortality. This pattern was similar to national trends. Wisconsin also paralleled national stage distribution data, revealing that a higher percentage of BC was detected at a later stage for African Americans than for whites. The relative disparity in cancer incidence and mortality between African Americans and whites in Wisconsin and nationally persisted over the period. Other Wisconsin reports have found that African Americans have a lower risk of receiving a diagnosis of BC but higher risk of dying from it.<sup>2,11-13</sup> These reports aggregated data over several years, but did not present trends. The comprehensive analysis by Foote<sup>12</sup> from 2003 is the only Wisconsin report to measure relative disparities, but the author did not report change over time. By measuring trends in rate ratios, the present study provides evidence that while BC incidence and mortality have declined in general, Wisconsin has not made sufficient progress reducing BC mortality to eliminate racial disparities in survival.

A number of limitations should be considered when inter-



interpreting the results of this study. First, the scope is limited to differences in BC incidence and mortality rates between African Americans and whites. The decision to focus on these 2 groups was determined by the demographic composition of Wisconsin and the rarity of cancer events. Wisconsin has relatively small non-white populations, making the comparisons in this report difficult to replicate between other racial or ethnic groups in the state. Second, WCRS, as a central state cancer registry participating in the National Program of Cancer Registries, maintains a passive system of data collection, and therefore, the various reporting facilities are largely responsible for the quality and timeliness of the data submissions to WCRS. The reliability of WCRS data has been detailed in previous reports.<sup>2,12</sup> In short, reporting variability may impact

the relatively small numbers used in this analysis. In addition, there was an unknown degree of misclassification or under-reporting of race.

Nevertheless, our results demonstrate that the “unacceptable reality”<sup>19</sup> of BC disparity persists not only nationally, but within Wisconsin. The higher mortality rates observed in Wisconsin and nationally can be partially explained by the more advanced-stage distribution at diagnosis observed among African American women.<sup>14</sup> Others have attributed the disparity to evidence that African American women are at greater risk for early onset of breast cancer and are often diagnosed with biologically more aggressive forms of disease.<sup>16,17</sup> Social, economic, and cultural factors may impact African American women disproportionately and may mediate the biological expression of disease.<sup>17, 20-21</sup> As many of these factors—such as poverty, inadequate health insurance, poor access to prevention, screening, treatment, fear of testing, and provider bias—are potentially modifiable, future efforts to reduce BC disparities should address them.

Many organizations in Wisconsin have focused on reducing disparities in breast cancer survival. The Wisconsin Well Woman Program, funded by the Centers for Disease Control and Prevention’s National Breast and Cervical Cancer Early Detection Program, provides breast and cervical cancer screening each year to approximately 10,000 low income, uninsured, and underinsured women, of whom approximately 10% are African American (compared to 6% of the general population). Various organizations, such as Susan G. Komen for the Cure, the American Cancer Society, the Wisconsin Women’s Health Foundation, and the Kohl’s Corporation, support programs that provide BC outreach and education, and facilitate access to BC clinical and treatment services for African American and other underserved populations. The state’s Minority Health Program by the Wisconsin Cancer Council and the Wisconsin Breast Cancer Coalition, among others, succeeded in passing the Breast and Cervical Cancer Prevention and Treatment Act in 2000 and further ensured that the state of Wisconsin exercised its option to provide medical assistance through Medicaid to eligible women who are screened through the Well Woman program and who require treatment for breast or cervical cancer. More recent advocacy activity resulted in legislation that established an income tax check off box, creating the Wisconsin Breast Cancer Research Fund.

The Wisconsin Comprehensive Cancer Control Program, in collaboration with the Milwaukee Regional Cancer Care Network and the Center for Urban Population Health, created a publication titled “*Expanding Pathways to Care: Assessment of Cancer Care Capacity for Milwaukee and Waukesha Counties.*” This publication is a reference with online access for providers to review recommendations for implementing Wisconsin’s

Comprehensive Cancer Control Plan and Healthiest Wisconsin 2010. This resource is important because a large portion of Wisconsin's African American population lives in Milwaukee County.<sup>16</sup> Finally, implementation of the 2010 Patient Protection and Affordable Care Act will expand access to BC prevention and screening services, particularly among Medicaid recipients.

However, these efforts also fail to address important new revelations about BC in African Americans. Recently presented data suggest that even when all suspected sources of disparity are controlled for (including socioeconomic status, stage, and hormone and human epidermal growth factor [HER2] receptor status), disparities in recurrence and survival still persist between African Americans and whites.<sup>22,23</sup> This suggests an underlying and probably biologic difference. This can be further elucidated only by evaluating these differences in a controlled clinical trial setting. However, a review of 197 trials found only 17% reported accrual by race and only 2% analyzed by race.<sup>22</sup> Inclusion of diverse groups, including African Americans, in clinical trials will be crucial to interpret and extrapolate results to a diverse population. Increasing accrual of minority populations and improving reporting should be a priority in Wisconsin to reduce health disparities and achieve cancer control.

## CONCLUSIONS

This study provides the most recent assessment of breast cancer health disparities in Wisconsin. Despite reductions in breast cancer mortality among both African American and white women during the period 1995-2006, disparities in BC mortality persist. This study identified a continued local need to evaluate and conduct research that targets disparities in BC outcomes. Understanding the causes of these disparities, barriers to access to prevention, screening and treatment, and obstacles to accruing minorities in clinical trials will help to reduce BC disparities.

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