Cancer Health Disparities Persist Among African Americans in Wisconsin

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ABSTRACT

Background: Cancer incidence and mortality rates have decreased over the last few decades, yet not all groups have benefited equally from these successes. This has resulted in increased disparities in cancer burden among various population groups.

Objective: This study examined trends in absolute and relative disparities in overall cancer incidence and mortality rates between African American and white residents of Wisconsin during the period 1995 - 2006.

Methods: Cancer incidence data were obtained from the Wisconsin Cancer Reporting System. Mortality data were accessed from the National Center for Health Statistics’ public use mortality file. Trends in incidence and mortality rates during 1995-2006 for African Americans and whites were calculated and changes in relative disparity were measured using rate ratios.

Results: With few exceptions, African American incidence and mortality rates were higher than white rates in every year of the period 1995-2006. Although cancer mortality and incidence declined for both groups over the period, relative racial disparities in rates persisted over the period and account for about a third of African American cancer deaths.

Conclusions: Elimination of cancer health disparities will require further research into the many contributing factors, as well as into effective interventions to address them. In Wisconsin, policymakers, health administrators, and health care professionals need to balance resources carefully and set appropriate priorities to target racial inequities in cancer burden.

INTRODUCTION

Cancer health disparities are a major public health concern nationally and in Wisconsin. Although treatments for cancer are improving, and cancer mortality is decreasing,1,2 not all Americans benefit equally from these successes.3,4 Many population groups in Wisconsin and nationwide—often identified by race, ethnicity, socioeconomic status, and geography—experience a greater burden of cancer along the continuum from prevention to detection, diagnosis, treatment, survivorship, and end-of-life. For example, recent national data from an American Cancer Society study5 showed that compared to white men, African American men had a 19% higher all-site cancer incidence rate and a 37% higher mortality rate. In Wisconsin, previous reports have revealed similar racial and ethnic disparities in cancer mortality and incidence.6-10 The report Wisconsin Cancer Incidence and Mortality 2000-2004 showed that whites had lower all-site cancer incidence and mortality rates than any other racial group, except Asian/Pacific Islanders.8 Another study found that disparities in cancer incidence and mortality between African Americans and whites were greater in Wisconsin than in the rest of the United States.9 Statewide studies of cancer outcomes by socioeconomic status and geography in Wisconsin are limited.2,11,12

National organizations such as the National Cancer Institute (NCI), US Department of Health and Human Services, and the American Cancer Society have targeted the elimination of health disparities. In Wisconsin, eliminating health disparities is an overarching goal embodied in Healthiest Wisconsin 201013 and is the motivation for the Wisconsin Minority Health Program.6 Cancer health disparities also are a prominent, cross-cutting issue in Wisconsin’s Comprehensive Cancer Control Plan.
Monitoring trends in cancer incidence and mortality is an important part of any coordinated state plan to reduce disparities. This information is useful to cancer prevention programs, clinicians, and policymakers who seek to reduce the burden of cancer. At the national level, there is some evidence that the African American/white disparity in cancer rates has narrowed. There is no such trend data for Wisconsin: previously published reports on cancer health disparities in the state have combined several years of data in order to report on multiple racial groups. While limited to a comparison between African Americans and whites—the 2 largest race groups in the state—the present study is unique in providing annual rates over a 12-year period as well as calculating trends in incidence and mortality. The decision to focus on disparities between African Americans and whites and not other racial or ethnic groups was based on the statistical limitations inherent in analyzing rare events in small populations, as Wisconsin’s minority populations are relatively small in number and geographically clustered.

The purpose of this study is to provide information about trends over time in cancer incidence and mortality among African Americans and whites in Wisconsin. This study features the latest data available in March 2010 covering Wisconsin cancer cases and deaths, displayed by single years for the 2 largest race groups in the state. Finally, this study estimates the potential burden experienced by African Americans by showing how many deaths would have occurred if African Americans experienced the same age-specific cancer death rates as whites.

**METHODS**

*Data Sources*

We obtained incidence data from the Wisconsin Cancer Reporting System (WCRS) for the period 1995-2006, the most recent year for which data were available. As required by state law, cancer cases are reported to the Cancer Reporting System 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 the Cancer Reporting System. Incidence rates were age-adjusted using the 2000 US standard population and were calculated using NCi’s SEER Radiant software.

Mortality data used in this study reflect Wisconsin resident death records from the Vital Records Section, Wisconsin Department of Health Services. We accessed 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. We used the SEER*Stat software package to calculate mortality rates. We also applied race categories used by NCHS.

**Analysis**

First, we plotted the annual incidence and mortality rates over the period 1995-2006 for all Wisconsin residents, by race and gender. Next, we plotted trend lines of the incidence and mortality data, by race and gender, using slopes and intercepts derived from ordinary least squares regressions. Then we calculated the ratio of the African American incidence and mortality rates to the white rates (rate ratio) in 1995 and 2006, based on the 1995-2006 trend line. This ratio constitutes our measure of relative disparity and was compared between the beginning and the end of the period.

To measure the extent of cancer disparities in mortality, we constructed a hypothetical situation in which African Americans experienced the cancer mortality rates observed among whites. We calculated simulated deaths by multiplying the age-specific mortality rates observed among whites by the African American population in each 5-year age group. We used the ratio of modeled to observed deaths among African Americans as an estimate of excess mortality, or deaths that would have been averted if African Americans had experienced the lower age-specific death rates of whites.

**RESULTS**

*Overall Incidence Rates (Both Sexes Combined)*

During 1995-2006, cancer was diagnosed in 319,958 Wisconsin residents, including 303,072 whites and 11,345 African Americans. Overall age-adjusted cancer incidence decreased 5%, from 476 per 100,000 in 1995 to 452 per 100,000 in 2006. For both African Americans and whites, incidence also decreased over the period. However, an absolute disparity in rates persisted, with African American rates higher than white rates in every year (Figure 1). Relative disparity, measured using the ratio of the African American incidence rate to the white incidence rate, persisted over the period at 1.15 in 1995 and 1.14 in 2006 (Table 1). (Note that in all cases, the rate ratios for 1995 and 2006 were not significantly different at the P <.05 level.)
African Americans. Overall age-adjusted cancer incidence among men decreased 10%, from 572 per 100,000 in 1995 to 515 per 100,000 in 2006. Incidence also decreased among African Americans and whites. However, an absolute disparity in cancer incidence between African American and white males persisted over the period, with African American rates higher than white rates in all years (Figure 2). The relative disparity between the 2 groups decreased slightly between 1995 and 2006 (from a rate ratio of 1.34 to 1.27) (Table 1).

**Table 1. Age-Adjusted All-Site Cancer Incidence and Mortality Rates, a African Americans and Whites, Wisconsin, 1995 and 2006**

<table>
<thead>
<tr>
<th>1995</th>
<th>2006</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>African American Rate</td>
</tr>
<tr>
<td>Both sexes</td>
<td>519</td>
</tr>
<tr>
<td>Men</td>
<td>736</td>
</tr>
<tr>
<td>Women</td>
<td>377</td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
</tr>
<tr>
<td>Both sexes</td>
<td>277</td>
</tr>
<tr>
<td>Men</td>
<td>408</td>
</tr>
<tr>
<td>Women</td>
<td>196</td>
</tr>
</tbody>
</table>

^a Rates are per 100,000 population and age-adjusted to the 2000 US standard population.  
^b Ratio of African American rate to white rate, based on 1995-2006 trend line.  
Source: Wisconsin Cancer Reporting System (incidence) and National Center for Health Statistics (mortality).

**Overall Mortality Rates (Both Sexes Combined)**
From 1995 to 2006, there were 128,920 deaths due to cancer among Wisconsin residents, including 122,866 whites and 4899 African Americans. Overall age-adjusted cancer mortality declined 9.5%, from 200 per 100,000 in 1995 to 181 per 100,000 in 2006. While mortality decreased over the period among both African Americans and whites, the African American rate was greater than the white rate in every year (Figure 1). The relative disparity persisted over the period, as evidenced by the rate ratio of 1.39 in 1995 and 1.40 in 2006 (Table 1). Moreover, if African Americans had experienced the same age-specific mortality rates as whites, about a third of African American cancer deaths would have been averted in 1995 and 2006 (Table 2).

**Male Incidence Rates**
From 1995 to 2006, cancer was diagnosed in 165,660 Wisconsin men, including 156,490 whites and 6189 African Americans. Overall age-adjusted cancer incidence among men decreased 10%, from 572 per 100,000 in 1995 to 515 per 100,000 in 2006. Incidence also decreased among African Americans and whites. However, an absolute disparity in cancer incidence between African American and white males persisted over the period, with African American rates higher than white rates in all years (Figure 2). The relative disparity between the 2 groups decreased slightly between 1995 and 2006 (from a rate ratio of 1.34 to 1.27) (Table 1).

**Male Mortality Rates**
From 1995 to 2006, there were 67,042 deaths due to cancer among Wisconsin men, including 63,766 whites and 2698 African Americans. The age-adjusted cancer mortality rate among men declined 15.9%, from 258 per 100,000 in 1995 to 217 per 100,000 in 2006. For both African Americans and whites, mortality decreased over
Female Mortality Rates

From 1995 to 2006, there were 61,878 deaths due to cancer among Wisconsin women, including 59,100 whites and 2,201 African Americans. The overall age-adjusted cancer mortality rate among women declined 4.8%, from 165 per 100,000 in 1995 to 157 per 100,000 in 2006. The mortality rate among African Americans remained the same and for whites decreased slightly over the period, although the African American rate was consistently higher than the white rate (Figure 3). The relative disparity between African American and white female cancer mortality rates persisted at 1.24 in 1995 to 1.26 in 2006 (Table 1). If African American women had experienced the lower age-specific death rates of whites, about 20% of cancer deaths among African American women in 1995 and 2006 would have been averted (Table 2).

DISCUSSION

For all Wisconsin residents, all-site cancer incidence and mortality rates decreased over the period 1995-2006. This decline was observed among whites and African American males. For African American females, cancer mortality rates remained constant over the period, while incidence rates increased. There was a persistent
absolute disparity in African American and white cancer incidence and mortality rates, with African American rates exceeding white rates in nearly every year. The only exception was African American females, for whom incidence rates started lower than white rates in 1995, but increased to meet the (decreasing) white rate by 2006. The relative disparities in cancer incidence and mortality between African Americans and whites persisted over the period. This result differs from national data, which show a recent narrowing in all-site cancer disparities.15

Other reports2,6–10 also have found that African Americans in Wisconsin have a higher risk of developing and dying from cancer than whites. However, these reports aggregated data over several years. Only one of these Wisconsin reports used a measure of relative disparities,9 but it did not measure change over time. By measuring trends in rate ratios, the present study provides evidence that, while cancer mortality and incidence have declined in general, Wisconsin has not made sufficient progress toward the overarching goal of eliminating racial disparities.11 The elimination of disparities has proven to be a long-term process that may take a generation to achieve.19

Factors known to contribute to racial disparities in cancer incidence and mortality vary by disease site but include differences in exposure to risk factors as well as access to screening, diagnosis, and treatment.5 Socioeconomic factors (such as poverty, inadequate education, and lack of health insurance) and their interaction with known risk factors (such as tobacco use, physical inactivity, and obesity) have been shown in some studies to be more important in explaining racial disparities in cancer than biological differences.2,4,20 However, some recent studies have shown genetic and tumor morphology associations with survival and prognosis disparities among racial groups.21,22 Other factors that have been shown to influence racial health disparities include quality of care, exposure to environmental risk factors, and discrimination.4,20,23,24 In Wisconsin, African Americans have higher exposure than whites to several factors known to contribute to cancer disparities, including higher rates of tobacco use and obesity, and lower screening rates, lower quality of health care, and less insurance coverage.6,14

In the past decade, there has been increasing discussion of strategies to reduce cancer health disparities. National reports have outlined interventions focused on modifiable risk factors for cancer, such as smoking, physical inactivity, and obesity, the expanded use of recommended screening tests among vulnerable populations, and expanded access to clinical trials.20,24 In 2004, the Trans-Health and Human Services Cancer Health Disparities Progress Review Group stressed the need for community engagement in design of health care delivery systems, a culturally competent health care work force, more participatory research conducted with communities facing high cancer disparities, and expanded access to health care.25

Modeled after national and state plans, Wisconsin’s Comprehensive Cancer Control Plan (WCCC)14 outlines opportunities to reduce the cancer burden through a variety of initiatives—including prevention, screening and detection, treatment, palliative care, and improved data collection—as well as to reduce cancer health disparities as a cross-cutting issue. To meet the state’s prevention needs, several groups are working to reduce the burden of tobacco and improve diet and physical fitness. SmokeFree Wisconsin and many other stakeholders were successful in passing a state-
wide smoking ban in public areas that took effect in July 2010. The Center for Tobacco Research and Intervention (CTRI) provides cessation assistance for Wisconsin residents who decide to quit smoking. CTRI works with the Wisconsin Department of Public Health’s Tobacco Prevention and Poverty Network to target disparities by improving access to tobacco control resources for lower socioeconomic populations. To reduce disparities in diet and exercise-related factors that affect cancer risk, Wisconsin’s Nutrition and Physical Activity State Plan to Prevent Obesity and Other Chronic Diseases is working to identify and implement culturally sensitive and evidence-based strategies to reduce health disparities.

To meet the state’s cancer screening needs, the WCCC plan seeks to expand colorectal screening for populations facing economic, geographic, or cultural barriers. The Wisconsin Well Woman Program provides breast and cervical screening to approximately 12,000 low-income, uninsured, and underinsured women each year, of whom approximately 15% are African American women from southeastern Wisconsin. Despite the earnest work by these programs and institutions, more research on effective interventions is needed to overcome cancer disparities such as those identified in this study.23,25

A number of limitations should be considered when interpreting this study’s results. First, the scope is limited to differences in cancer 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. Cancer incidence and mortality rates among many minority populations vary widely from year to year. However this variation is likely due to the small size of the population groups rather than real changes in disease burden. Discussion of cancer incidence and mortality trends in Wisconsin’s other minority populations is important and should be featured in future research that identifies and discusses the statistical issues involved in observing rare events in small populations.

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. Reporting variability may impact the relatively small annual numbers reported in this analysis. Despite data collection improvements and suggestions, WCRS has made in determining the race and ethnicity of cancer cases (the numerator for incidence rates), it is likely that an unknown degree of misclassification or under-reporting of race still exists. There are no national standards for collecting race data; facilities vary in the methods used for collecting racial and ethnic data. Patients’ race may be recorded on the admission form, physician’s notes, insurance forms, or not recorded at all. Some facilities do not ask patients to self-identify or do not collect data for place of birth, although both are strongly recommended by state cancer registries. Especially when the number of cases is relatively small, the quality of data collection and reporting can greatly impact annual incidence numbers and rates.

CONCLUSIONS
The results of this research indicate that disparities in cancer incidence and mortality between African Americans and whites in Wisconsin have persisted over the past decade. Elimination of these chronic disparities will require further research into a multitude of contributing factors, and into effective intervention strategies. Any solution will require a careful balance of resources and appropriate priorities to target these inequities and engagement of the populations and communities affected.23,25 There is current promise in the Wisconsin programs directed at reducing racial and ethnic disparities in cancer rates. To help inform those programs, data in this report serve to demonstrate the temporal persistence of African Americans’ disproportionate cancer burden.

REFERENCES