

# Disparities in Oral and Pharyngeal Cancer Incidence and Mortality Among Wisconsin Residents, 1999-2002

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## ABSTRACT

*Objective:* Compare incidence, mortality, and trends of oral cancer (including the pharynx) in Wisconsin and the United States by race and gender from 1999-2002.

*Methods:* Age-adjusted incidence rates were compared using data from the Centers for Disease Control and Prevention (CDC WONDER). Mortality rates were compared using data from the Wisconsin Interactive Statistics on Health (WISH) and CDC US Cancer Statistics.

*Results:* Incidence rates for oral cancer were higher among males than females in both Wisconsin and the United States. Trends in the incidence rate show the gender disparity has not changed. Furthermore, the incidence rate for African American males is higher in Wisconsin than in the United States. Mortality rates for males were approximately 2 times higher than females in Wisconsin and the United States. Additionally, African American males are more likely than white males to die from this form of cancer, and the likelihood is higher in Wisconsin than in the United States (2.4 versus 1.8, respectively).

*Conclusion:* Racial disparities in oral cancer for African American males are greater in Wisconsin than in the United States. This may result from variation in access to oral health care, tobacco and alcohol use, as well as limited resources in detection and prevention methods. Wisconsin should focus its oral cancer prevention activities on this high-risk group.

## INTRODUCTION

Approximately 30,990 new cases of oral cancer (including cancer of the pharynx) are estimated to be diagnosed in the United States in 2006.<sup>1</sup> Oral cancer accounts for 3% of all cancers diagnosed in the United States. In the same year, 7340 deaths are projected to be associated with this form of cancer.<sup>1</sup> Oral cancer can be recognized and diagnosed in the early stages of development through various signs and symptoms, including difficulty swallowing or speaking, hoarseness, sores that do not heal quickly, and white or red patches of tissue in the mouth. Failure to recognize these signs and symptoms in the early stages may necessitate radical treatment, which can result in disfigurement of the face, potentially requiring reconstructive surgery and therapy for speech, chewing, or emotional problems.

The most important risk factors for oral cancer are tobacco use and heavy alcohol consumption, which account for the majority (75%) of all cases.<sup>2,3</sup> Research has shown that excessive levels of drinking and smoking are independently associated with higher risks of emergent oral cancer.<sup>4,5</sup> Furthermore, the risk of developing oral cancer for those who concurrently smoke and drink is synergistic.<sup>4,5</sup> The incidence of oral cancer has also been shown to increase with age, with 90% of cases occurring in people >45 years of age.<sup>6</sup> Certain viruses, predominantly human papillomavirus (HPV) 16 and 18, have been associated with oral cancer.<sup>7,8</sup> The literature also indicates that gastroesophageal reflux disease (GERD) is a possible co-promoting factor of oral cancer in some patients.<sup>9,10,11</sup> However,

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dietary factors such as fruit consumption have been shown to be protective against the development of oral cancer.<sup>12,13</sup>

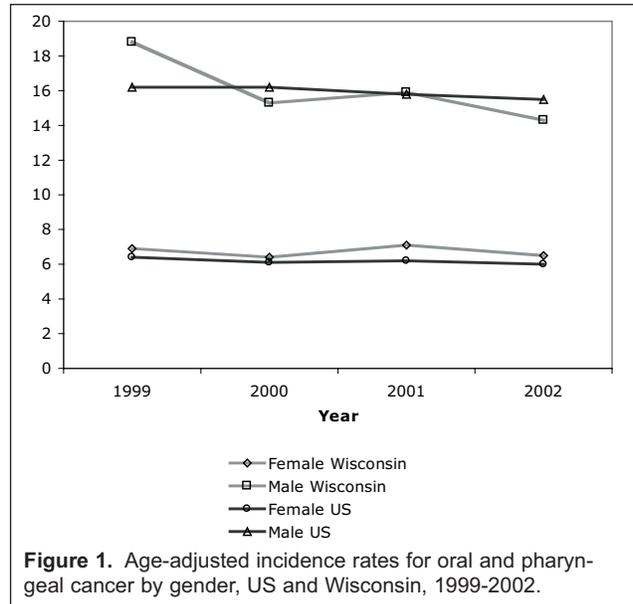
The Wisconsin oral cancer incidence is similar to the national rate. However, disparities exist in the incidence and mortality rates by race and gender.<sup>5,14-16</sup> Such racial disparities were recently highlighted in a report from the Wisconsin Department of Health and Family Services (DHFS) on Minority Health.<sup>17</sup> The purpose of this paper is to compare incidence, mortality rates, and trends of oral cancer, including cancer of the pharynx, among Wisconsin residents by race and gender. Furthermore, national rates are compared to Wisconsin rates to determine which populations in Wisconsin have the highest risk of oral cancer and whether any differences exist between Wisconsin and the United States. Interventions targeting such high-risk populations in Wisconsin may accelerate progress in decreasing the incidence and mortality rates of oral cancer in the state.

## METHODS

Oral cancer incidence rates for Wisconsin and the United States were compared by race and gender using data from the Centers for Disease Control and Prevention (CDC WONDER).<sup>18</sup> Mortality rates for oral cancer were compared by race and gender using data from the Wisconsin Interactive Statistics on Health (WISH), which is based on Wisconsin death certificates.<sup>19</sup> The mortality data for the United States was obtained from the CDC US Cancer Statistics.<sup>20</sup>

In this study, oral cancer is defined as those cancers that arise in the lip (C000-C009), tongue (C010-C029), salivary gland (C079-C089), floor of mouth (C040-C049), gum and other mouth (C030-C039, C050-C059, C060-C069), nasopharynx (C110-C119), tonsil (C090-C099), oropharynx (C100-C109), hypopharynx (C129, C130-C139), and other oral cavity and pharynx (C140, C142-C148). All codes for cancer sites were based on the International Classification of Disease for Oncology, Third Edition (ICD-O-3).<sup>21</sup>

Disparities in incidence and mortality rates of oral cancer between African Americans and whites in Wisconsin and the United States were evaluated for the most recently reported 4 years, 1999 through 2002. Disparities between males and females were also assessed. All rates were age-adjusted to the 2000 US standard population. To compare rates, standard errors and 95% confidence intervals were calculated. Furthermore, rate ratios were calculated by dividing the rate of oral cancer in African Americans by the rate in whites, and males by the rate in females.



**Figure 1.** Age-adjusted incidence rates for oral and pharyngeal cancer by gender, US and Wisconsin, 1999-2002.

## RESULTS

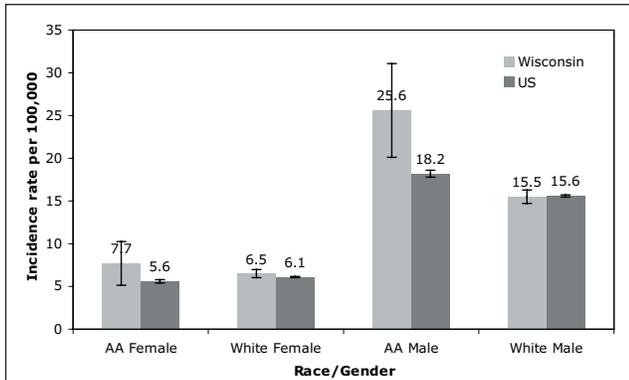
### *Wisconsin and United States Oral Cancer Incidence Rates: Gender and Racial Disparities*

When comparing incidence rates of oral cancer by gender, the rate for males in Wisconsin and the United States is substantially higher than the rate for females. Males are approximately 2.5 times more likely than females to develop oral cancer. The age-adjusted incidence rate for US males is 15.9 per 100,000 and for Wisconsin males is 16.1 per 100,000. The age-adjusted incidence rate for US females is 6.2 per 100,000 and for Wisconsin females is 6.7 per 100,000. The trends in incidence rates of oral cancer show that the disparity between males and females in Wisconsin and the United States has not changed much from 1999 to 2002 (Figure 1). The variability in Wisconsin incidence rates from 1999 to 2002 is due to small numbers.

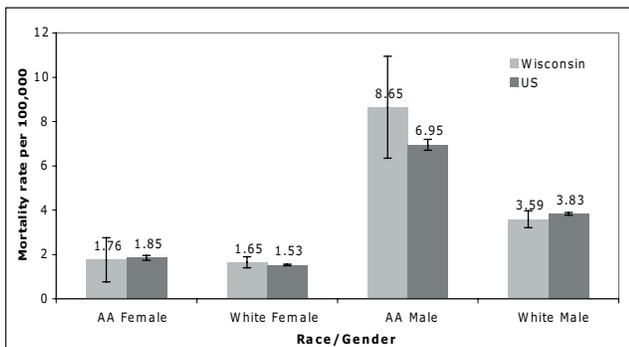
A significant difference was observed between Wisconsin and US African American males with respect to oral cancer rates. In Wisconsin, African American males were 1.7 times as likely as white males to develop oral cancer, compared to US African American males, which were about 1.2 times as likely as white males to develop oral cancer (Figure 2).

### *Wisconsin and United States Oral Cancer Mortality Rates: Gender and Racial Disparities*

The same disparities exist in oral cancer mortality rates. Males are approximately 2 times as likely to die from oral cancer as females in both Wisconsin and the United States. The age-adjusted mortality rate for US males is 4.25 per 100,000 and for Wisconsin males is 3.77 per 100,000. The age-adjusted mortality rate for US females



**Figure 2.** Age-adjusted incidence rates for oral and pharyngeal cancer by race and gender, US and Wisconsin, 1999-2002. AA=African American.



**Figure 3.** Age-adjusted mortality rates for oral and pharyngeal cancer by race and gender, US and Wisconsin, 1999-2002. AA=African American.

is 1.58 per 100,000 and for Wisconsin females is 1.68 per 100,000. Again, African American males in Wisconsin have the highest rate. Figure 3 shows that in Wisconsin, African American males were 2.4 times as likely as white males to die from oral cancer, compared to US African American males, who were about 1.8 times as likely as white males to die from oral cancer.

## DISCUSSION

Gender and racial disparities in incidence of and mortality rates for oral cancer exist in Wisconsin, just as they do in the United States. However, the racial disparities, specifically those of African American males in Wisconsin compared to white males in Wisconsin, are larger than the racial disparities seen in the United States as a whole. This disparity in the African American male population must be considered when developing targeted programs to reduce the burden of oral disease in Wisconsin.

There are several determinants that may explain

the racial disparity present in oral cancer. Such determinants include socioeconomic factors, such as access to and provision of oral health care, as well as limited knowledge and awareness of detection and prevention methods. Limited resources are also available for primary prevention programs for the reduction of alcohol and tobacco use. Additionally, limited knowledge and awareness of detection and prevention methods among dentists and dental hygienists could contribute to such disparities. Results of a study published in 2005 in Florida stated that only 19.5% of adults reported receiving an oral cancer examination within the last 12 months and “Blacks and Hispanics were significantly less likely than non-Hispanic Whites” to have received an examination.<sup>22</sup>

Personal behaviors such as alcohol and tobacco use may also play a considerable role. A paper summarizing the findings from the 2003 Wisconsin Tobacco Survey showed that the prevalence of smoking among African American males in Wisconsin was substantially different from white males (35% versus 21%, respectively).<sup>23</sup> Furthermore, when comparing smoking prevalence rates of Wisconsin to national rates, the authors found that the smoking prevalence was lower than the national average among white males in Wisconsin, but higher than the national average for African American males.<sup>23</sup> This could be a possible explanation for the larger disparity in oral cancer incidence and mortality between African American males and white males in Wisconsin as compared to the United States.

The 2003-2004 National Survey on Drug Use and Health reported that nationwide, 7.6% of the population aged 12 years and older was dependent on or abused alcohol in the past year.<sup>24</sup> Wisconsin was well above the national average and had the highest rate of all states at 11.32%.<sup>24</sup> The high prevalence of alcohol dependency and abuse among Wisconsin residents could also help explain the disparity in the incidence and mortality of oral cancer.

Approaches to reducing the incidence and mortality rates of oral cancer in the general population should include decreasing excessive consumption of tobacco products and alcohol, in addition to increasing individual and health care professionals knowledge and awareness of oral cancer detection and prevention methods. Prevention and educational programs should start early, due to data indicating pre-teen and teen use of alcohol and tobacco products. Prevention and educational programs should be targeted at African American males specifically, as this is a high-risk group in Wisconsin. In addition, educational programs

should target dentists and dental hygienists to increase the percentage of adults receiving oral cancer examinations.

## ACKNOWLEDGMENTS

We would like to acknowledge Dr Rachel Klos and Dr KyungMann Kim for their helpful comments during the preparation of this manuscript.

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