WISCONSIN Comprehensive Cancer Control Program

CCC Issue Brief

September 2017
Volume 12 Number 2

Oral Cancer Trends in Wisconsin, 1995-2014

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Summary

BACKGROUND – Oral cancers are currently a major public health crisis, with over 49,000 new cases in the United States this year alone.

METHODS – Wisconsin oral cancer data were obtained from the Wisconsin Interactive Statistics on Health data query and national data were obtained from publications.

RESULTS – Men have more than twice the risk for oral cancer compared to women. Overall, mortality rates have slightly decreased since 1995 from 2.9 to 2.4 cases per 100,000. Diagnoses of oral cancer cases in Wisconsin are occurring at later stages, potentially reducing 5-year survival rates, which are at 64% for all stages of oral cancer in the United States.

POLICY IMPLICATIONS – Both medical and dental providers can play a key role in reducing oral cancer through screenings and educating on the impact of tobacco and alcohol use, and the relationship between Human papillomavirus (HPV) and oropharyngeal cancer.

BACKGROUND

Cancer is a group of diseases characterized by uncontrolled growth and spread of abnormal cells.[1] As the second leading cause of death in Wisconsin, early detection and intervention is key to reducing a potentially poor outcome regarding cancer.[2,3] Oral cancers (i.e. oral cavity and pharyngeal cancer) currently comprise a major public health crisis.[4] The World Health Organization classifies oral cavity cancer as cancer of the gum, palate, floor of the mouth, lip (internal), specific parts of the tongue, and other parts of the mouth excluding salivary glands; and oropharyngeal cancer as cancer of the tonsil, lingual tonsil, base of the tongue, waldeyer ring, oropharynx, and other parts of the pharynx (**Figure 1**).[5] In the US, it is estimated that 49,670 men and women will be diagnosed with, and 9,700 men and women will die of, cancer of the oral cavity and pharynx in 2017.[3] Diagnoses of oral cancers are occurring at later stages, which can decrease potential survival rates.[3] Oral cancers are caused by behavioral factors (tobacco smoking, alcohol consumption, smokeless tobacco, Human papillomavirus (HPV)/ sexual behaviors, and infectious organisms) and are associated with non-modifiable factors (inherited mutations, hormones, immune conditions, age, and gender).[1,5] HPV is a sexually transmitted virus generally associated with genital infections and cancers of the reproductive system.[3-6] However, HPV can also be transmitted from oral-genital contact, where it can increase risk for oropharyngeal cancers (i.e. cancer of the oropharynx).[3,6] Oropharyngeal cancer is more strongly associated with HPV compared to cancer of the oral cavity and other areas of the pharynx.[3,6] Oral cavity cancer incidence rates have stabilized or slightly increased in the last couple of years, while oropharyngeal cancer incidence rates have increased, especially in those younger than 60 years of age.[5,6]

METHODS

Wisconsin oral cancer incidence rates, incidence rates/ percent by invasive stage, and mortality rates were accessed from the Wisconsin Interactive Statistics on Health (WISH) data query system, Office of Health Informatics, Division of Public Health, Department of Health Services. The incidence and mortality data were age-adjusted to the 2000 U.S. standard population and rates were per 100,000. National oral cancer data were accessed from publications of the American Cancer Society, Centers for Disease Control and Prevention (CDC), Office of Disease Prevention and Health Promotion, and National Institutes of Health.

RESULTS

Tobacco use, including cigarettes, pipes, cigars, hookah, kreteks, bidis and smokeless tobacco (chew, snuff, snus, and dissolvables) and alcohol consumption are the leading risk factors for oral cavity and oropharyngeal cancers.[3,5,7] Smokers are 3.43 times more at risk of oral cancer compared to non-smokers.[7] The risk of developing oral cancer is related to how much and how long tobacco is used.[5,8] The CDC defines heavy drinking as consuming 8 or more drinks per week for women and 15 or more drinks for men.[9] Both persistent (or heavy) alcohol consumption and tobacco use are independent risk factors for oral cancer.[7] However, the clustering of tobacco and heavy alcohol use has a multiplicative effect resulting in a higher risk of oral cancer if both risk factors are present, with a potential 30-fold increased risk.[3,5,10] The combined use of these two risk factors is very common and is

associated with approximately 72% of oropharyngeal cancers and 64% of oral cavity cancers.[5]

While tobacco and alcohol consumption are major known risk factors for oral cancers, HPV has become increasingly associated with the disease.[11] The relationship between oral cavity and oropharyngeal cancers with HPV has been firmly recognized as studies have been able to identify cases of oral cancers linked to HPV infections.[11] Studies have observed HPV more frequently linked to oropharyngeal cancers compared to oral cavity cancers.[4,6,11] Oral HPV infections have been directly associated with the rapid increase in oropharyngeal cancers in the last couple of decades.[12] In a cross-sectional study conducted in 2010, men had higher prevalence of all oral HPV types tested compared to women (10.1% vs. 3.6%).[12] Additionally, men aged 30-34 and 60-64 years were found to have higher prevalence of oral HPV compared to all other ages groups between 14-69 years.[12] In various studies, HPV16 DNA has been frequently detected in biopsy specimens of HPV-positive oropharyngeal cancers, with approximately 90% of HPV-positive oropharyngeal cancers linked to HPV16.[4,6,11,12] HPV16 is considered an oncogenic type of HPV and although it is typically associated with genital infections, the role of sexual behaviors with oral HPV infections and cancers continues to be investigated to further recognize the association and develop preventive interventions.[4,6,11,12]

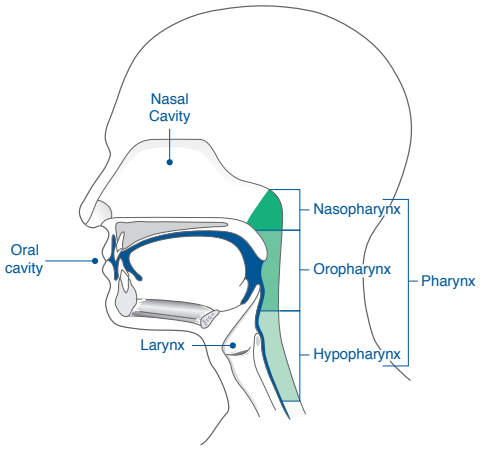
Certain oral cancer symptoms can go undetected even when the patient knows what symptoms to look for or receives regular oral screenings by a physician and/or dentist. In some studies, researchers found a common trend in patients with oral cavity and oral pharyngeal cancers, where they believed symptoms were not serious and would eventually disappear.[13]

Symptoms related to oral cancers are:[14]

- **A sore on the lip or in the mouth that does not heal**
- **A lump on the lip, mouth, or throat**
- **A white or red patch on the gums, tongue, or lining of the mouth**
- **Unusual bleeding, pain, or numbness in the mouth**
- **A sore throat that does not go away, or a feeling that something is caught in the throat**
- **Difficulty or pain with chewing or swallowing**
- **Swelling of the jaw that causes dentures to fit poorly or become uncomfortable**
- **A change in the voice**

Some groups experience a disproportionate burden of oral cancer compared to others.[1] Men have a higher incidence of oral cancers compared to women, with more than two times the rate of cases and accounting for almost two thirds of oral cancer worldwide.[1,5] In the case of oropharyngeal cancer, white males between 35-55 years of age with no history of smoking are four times more at risk than females.[15] Blacks continue to be more likely than whites to develop oral cancer and are more likely to die from oral cancer, but the gap is closing. National incidence rates among blacks have decreased by approximately 2% per year compared to a 1% increase per year among whites, with the increase largely a result of rising rates of oral cancer associated with HPV in whites.[3] In 2009-2013, white men in the US had an age-adjusted incidence rate of 8.2 per 100,000 compared to 6.8 in black men for HPV-associated oropharyngeal cancer, whereas white women had an incidence rate of 1.8 per 100,000 compared to 1.5 for black women.[16]

FIGURE 1. Oral Cavity and Pharynx



The US 5-year survival rate for oral cancer is 64% in all stages at diagnosis.[3] Survival rates vary greatly based on stage at the time of diagnosis, with a 5-year relative survival rate of 83% for cases diagnosed at the earliest stage (i.e. localized).[1,3] In contrast, the 5-year survival rate is 63% once the cancer has spread to regional lymph nodes and 38% for cases with distant metastasis.[3] Oral cancer mortality rates in Wisconsin have decreased slightly from 2.9 to 2.4 deaths per 100,000 from 1995 to 2014, compared to the US, where 3.2 and 2.5 deaths per 100,000 were observed for the same years (**Figure 2**).[17,18] Despite mortality rates decreasing in general, possibly due to improved treatment options, male mortality rates in Wisconsin have increased slightly since 2009.[13,17] It is important to continue monitoring the changes mortality rates, as it is possible mortality rate trends may change with the increase in incidence of oral cancers.[3,17]

In Wisconsin, the age-adjusted incidence rate for males was 17.7 compared to 6.9 in females for oral cancer during 2010-2014 (**Figure 2**).[17] In 2014, diagnoses at the localized stage decreased to 34.2% compared to 44.1% of cases diagnosed at this stage in 1995.[17] In contrast, diagnoses at the regional

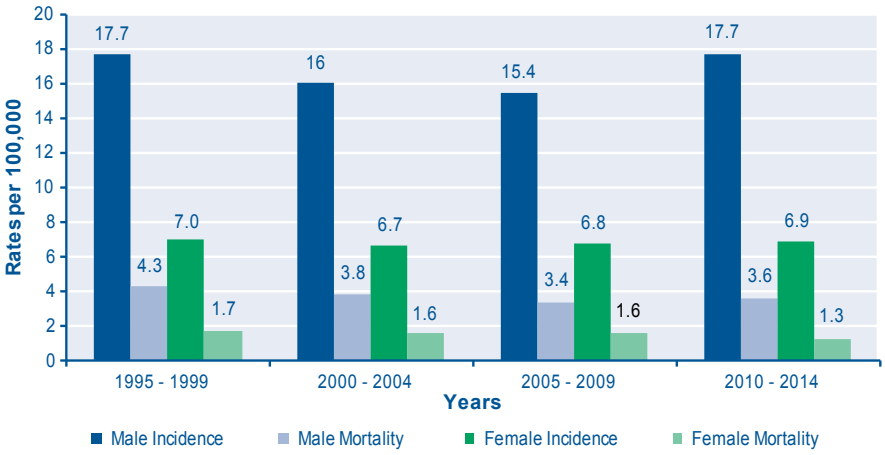
stage increased to 44.2% compared to 37.7% of cases diagnosed at this stage in 1995 (**Figure 3**).[17] Unfortunately, the diagnosis trend is going in the wrong direction with more cases being diagnosed at later stages. This is especially true for males, where 30.5% of cases were diagnosed at the localized stage from 2010-2014, compared to 43.2% from 1995-1999.[17] The change in trend may be related to the rise in oropharyngeal cancer cases, which can be harder to detect and diagnose.[3,5,12,13] In females, an increase in distant/systemic stage diagnoses have been observed since 1995, with 14.8% cases being diagnosed between 2010-2014 compared to 5.6% of cases between 1995-1999 at this specific stage.[17] Although this has occurred, the number of cases of localized stage diagnoses have gone from 48.3% to 50.0% from 1995 to 2014 in females; a positive change in trend.[17] National trends and rates follow a similar pattern to Wisconsin.[3]

As with all cancers, a later diagnosis of oral cancer decreases the chance of survival, thus cases diagnosed at the earliest stage have a better prognosis.[3,8] Healthy People 2020 (HP2020) specifically addresses early detection of oral cancer: Objective 6 (OH-6) is to "Increase the proportion of oral and pharyngeal cancers detected at earliest (localized) stage," and Objective 14.2 (OH-14.2) is to "Increase the proportion of adults who received an oral and pharyngeal cancer screening from a dentist or dental hygienist in the past year".[19] The HP2020 target for OH-6 is 35.9% and Wisconsin's current rate has met this HP2020 target with 37.3% of total cases detected at the earliest stage for the combined years of 2007-2013, surpassing the national rate of 30% for the same years.[17-19] However, Wisconsin observed higher incidence rates of oral cancer cases compared to national rates, with an age-adjusted incidence rate of 12.1 cases per 100,000 compared to 11.5.[17,20] Therefore, Wisconsin needs to strive to maintain high rates of diagnoses at the earliest stage, through oral cancer screenings, to achieve the best survival rates and continue to reduce mortality rates.

POLICY IMPLICATIONS

Both medical and dental providers can play a key role in reducing incidence rates and mortality from oral cancer. Providers should screen all adult patients annually for oral cancer, which should include a visual screening, palpation, and questions about symptoms since oropharyngeal cancers can be difficult to detect through visual screenings. Also, alcohol and tobacco use should be assessed

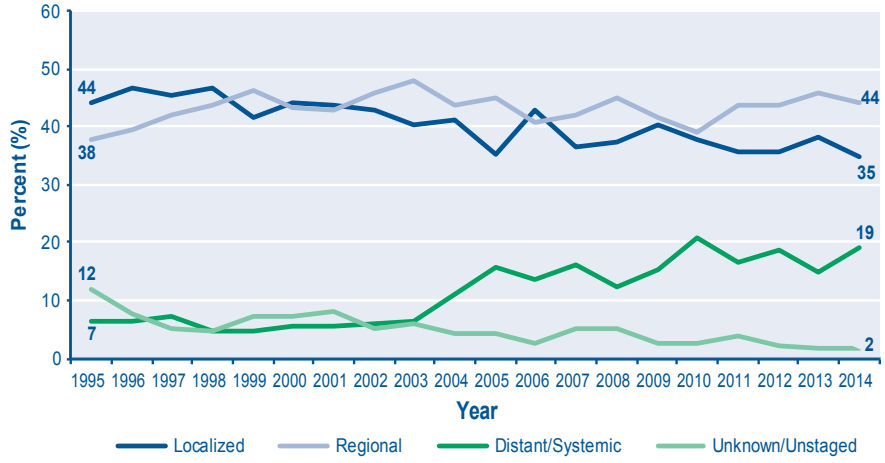
FIGURE 2. Age-Adjusted Oral Cancer Incidence and Mortality Rates per 100,000 by Sex, Wisconsin, 1995-2014



Note: Rates are age-adjusted to the 2000 U.S. standard population and per 100,000.

Source: Wisconsin Interactive Statistics on Health (WISH) data query system, Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.[17]

FIGURE 3. Percent of New Oral Cancer Cases by Stage of Diagnosis, Wisconsin, 1995-2014



Source: Wisconsin Interactive Statistics on Health (WISH) data query system, Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services.[17]

and recorded in the medical history at every visit. Motivational interviewing can be used to educate on the impact that tobacco and heavy alcohol use have on oral health. Providers can deliver brief counseling on reducing alcohol consumption and eliminating tobacco use. Both doctors and dentists can prescribe tobacco cessation medications and can refer for counseling through the Wisconsin Tobacco Quit Line. The resource Treating Tobacco Use and Dependence: A Toolkit for Dental Office Teams is available to assist dental offices in developing the necessary skills and policies to help their patients quit tobacco.[21]

Providers can also discuss the relationship between HPV and oropharyngeal cancer with patients and parents of adolescent patients and how the HPV vaccine can reduce the risk for oropharyngeal cancer. While dental providers in Wisconsin are not able to administer immunizations, they can refer patients to a primary care provider or pharmacist for vaccination. HPV vaccination completion rates are exceptionally low in Wisconsin, with only 30% of adolescents aged 13 to 18 and 25% of adults completing the series.[22,23] Parents who receive strong recommendations to vaccinate from both dental and medical providers may be more likely to have their child vaccinated.

Dental providers may be uncomfortable discussing sensitive subjects including tobacco and heavy alcohol use, sexual behaviors, and sexually transmitted diseases, but state and local public health departments and professional associations can help to craft messages that providers can use to facilitate these discussions. These organizations can also provide education through webinars and continuing education courses. In addition, training on having conversations about sensitive topics should be incorporated into dental, dental hygiene, and other health professional curricula, which will increase the comfort level of new providers.[15]

Through a collaborative effort, we can improve oral cancer rates by continuing to monitor the data, increase access to oral cancer screenings, educate patients on risk factors, and improve HPV vaccination rates.

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Editors: Amy Conlon, MPH
Courtney Harris, MSW
Layout and Design: Media Solutions

Funding is provided by
The Centers for Disease Control and Prevention,
The Wisconsin Department of Health Services

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