Cancer in Oklahoma Data Brief Series:

Oropharyngeal Cancers in Oklahoma

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Introduction

Oklahoma (OK) ranks 8th worst for age-adjusted oropharyngeal incidence and 5th worst for age-adjusted oropharyngeal mortality in the United States (US).[1] Oropharyngeal cancer is primarily caused by tobacco use, excessive alcohol consumption, and human papillomavirus (HPV).[2,3] Oropharyngeal cancer accounts for 3% of cancer diagnoses nationwide and men are three times more likely to be diagnosed with oropharyngeal cancer both in Oklahoma and nationally.[1,2,4] There are multiple treatments for oropharyngeal cancer based on tumor location, stage at diagnosis, histology, and other factors. These include chemotherapy, radiation, epidermal growth factor receptor therapy, immunotherapy, or surgery.[5]

To pursue effective diagnosis and treatment, oropharyngeal cancer must be diagnosed as early as possible. Many oropharyngeal cancers can be detected on physical exams performed by dentists, dental hygienists, physicians, advanced practice providers or other clinicians.[6] Also, preventive measures can be taken to prevent the development of oropharyngeal cancer. For example, smoking and heavy drinking are risky health behaviors that can be avoided, and the HPV vaccine is highly effective in preventing the development of oropharyngeal cancer as HPV is the suspected cause of 70% of oropharyngeal cancers.[7,8] This data brief highlights key data on oropharyngeal cancer incidence and mortality in Oklahoma, and discusses the implications of findings on clinical practice and public health policy.

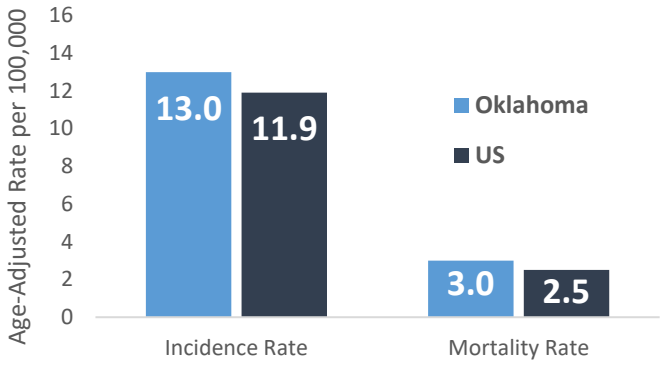
Methods

Data for oropharyngeal cancer incidence were obtained from the Oklahoma Central Cancer Registry (OCCR), the Centers for Disease Control's (CDC) National Program of Cancer Registries (NPCR), and the NCI's Surveillance, Epidemiology, and End Results (SEER) program. Cancer mortality data were from Oklahoma Vital Statistics and the CDC's National Vital Statistics System (NVSS). Information on potential oropharyngeal screening and oropharyngeal risk behaviors was obtained from the Behavioral Risk Factor Surveillance System (BRFSS) accessed through CDC BRFSS.

This data brief defines oropharyngeal cancer as the following cancer sites: lip, base of tongue, gums, floor of mouth, palate, parotid gland, tonsil, oropharynx, nasopharynx, pyriform sinus, hypopharynx (ICD-O-3 C0.00-C14.8). To ensure the stability of estimates and confidentiality, CDC and SEER rates were suppressed if fewer than 16 counts were reported in a specific category and all rates were age-adjusted to the 2000 US standard population. BRFSS estimates were suppressed for stability if the unweighted sample size was less than 50. For all analyses, except stage at diagnosis, unknown values were excluded and resulting percentages were weighted averages estimated from the sample and population sizes. All incidence and mortality rates are per 100,000.

Results

Figure 1: Incidence and mortality rates of oropharyngeal cancer in the US and Oklahoma, 2016-2020



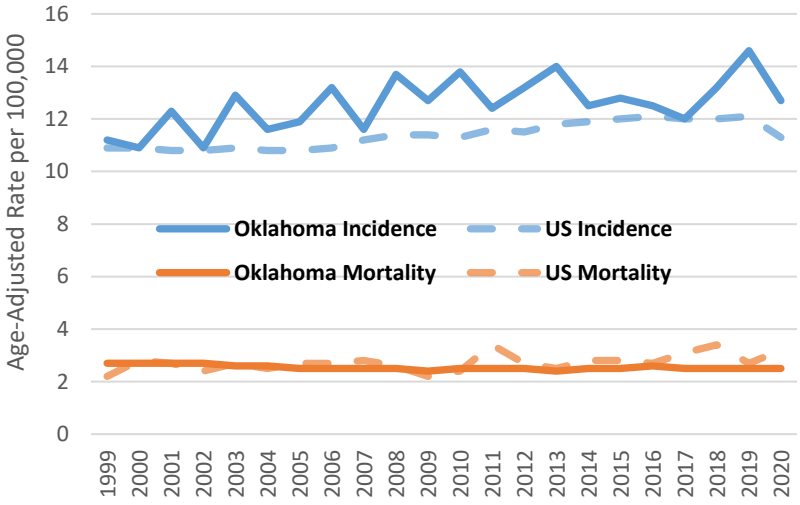
Source: SEER, NPCR and NVSS

In 2016 to 2020 there were 238,183 diagnoses of oropharyngeal cancer in the US and 3,055 diagnoses in Oklahoma. During this period, 51,781 people in the US and 718 people in Oklahoma died of this cancer. **Figure 1** shows that the incidence rate in Oklahoma from 2016 to 2020 was 13.0 cases per 100,000 persons, higher than the corresponding rate for the US at 11.9. The mortality rate in Oklahoma from 2016 to 2020 was 3.0 cases per 100,000 people, which was higher than the corresponding rate for the US at 2.5.

Figure 2 shows that incidence rates have increased in Oklahoma and the US since 1999 and Oklahoma generally has had higher incidence rates than the US. The incidence rate for Oklahoma has increased slightly since 1999, while the mortality rate for the US has been virtually the same.

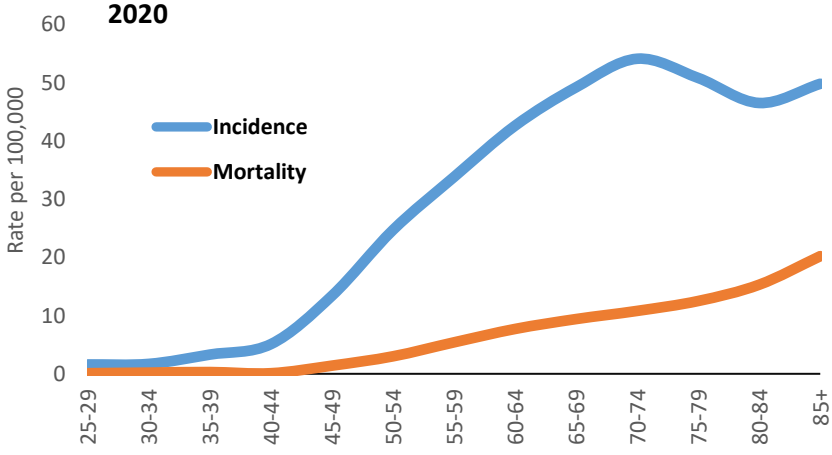
Figure 3 shows that in Oklahoma as age increases people are much more likely to be diagnosed with oropharyngeal cancer. People aged 70-74 had the highest incidence rate of oropharyngeal cancer, at 54.1 per 100,000, while mortality rates consistently increased with age.

Figure 2: Rates of oropharyngeal cancers incidence and mortality in Oklahoma and the US, 1999-2020



Source: SEER, NPCR and NVSS

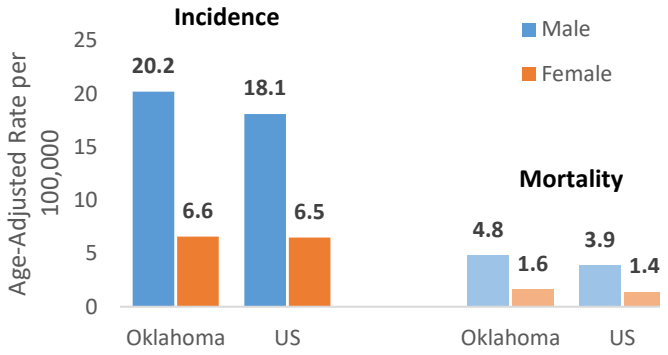
Figure 3: Age-specific oropharyngeal cancer incidence and mortality rates by age group in Oklahoma, 2016-2020



Source: SEER, NPCR and NVSS

Figure 4 highlights the differences in rates of oropharyngeal cancer incidence and mortality between the sexes. In Oklahoma, the incidence rate for men is 3.1 times higher than the incidence rate for women (20.2 vs. 6.6 per 100,000) and the corresponding mortality rate ratio is 3.0 (4.8 vs. 1.6 per 100,000). Despite similar rates between Oklahoma and the US, the rates are slightly higher in Oklahoma compared to the US.

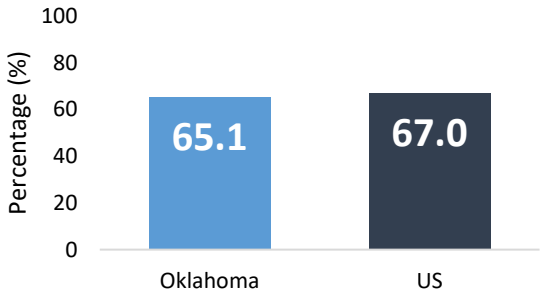
Figure 4: Oropharyngeal cancer incidence and mortality by sex in Oklahoma and US, 2016-2020



Source: SEER, NPCR and NVSS

Figure 6 shows that Oklahoma and the United States have similar 5-year oropharyngeal cancer survival rates. 65.8% of Oklahoma cases survive 5-years post diagnosis while 65.1% of US cases survive 5-years post diagnosis.

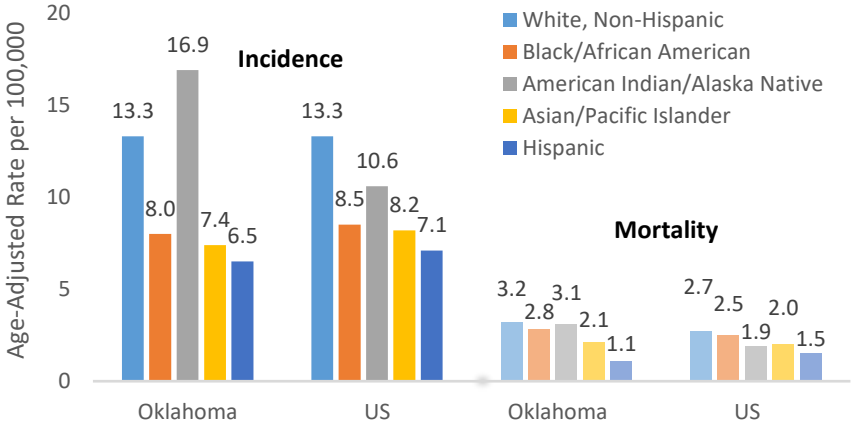
Figure 6: 5-Year relative survival (%) of oropharyngeal cancer, 2016-2020



Source: SEER and NPCR

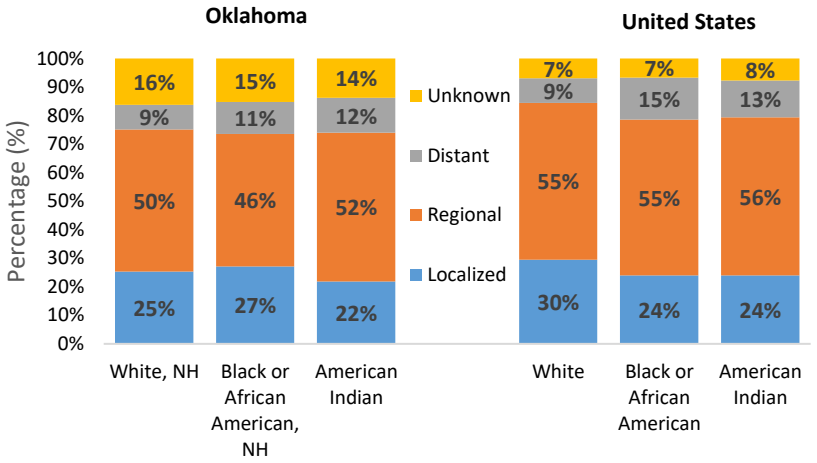
Figure 5 shows oropharyngeal cancer incidence and mortality rates by race and ethnicity in Oklahoma and the US. In Oklahoma, the American Indian population has the highest incidence rate and the White population has the highest mortality rate. In Oklahoma, the mortality rates for White, Black, American India and Asian populations are higher than the corresponding US rates.

Figure 5: Oropharyngeal cancer incidence and mortality by race/ethnicity in Oklahoma and US, 2016-2020



Source: SEER, NPCR and NVSS

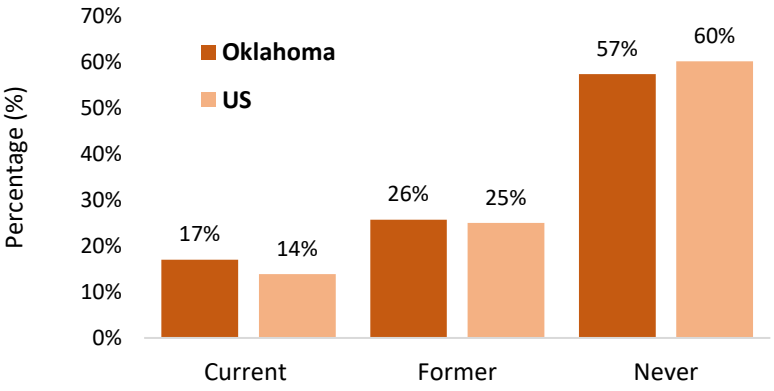
Figure 7: Stage of oropharyngeal cancer at diagnosis by race in Oklahoma from 2016 to 2020



Source: SEER and NPCR

Figure 7 shows that most oropharyngeal cancer cases are diagnosed at the regional stage regardless of race. Localized stage at diagnosis is associated with better prognosis. The proportions of the population with localized stage at the time of diagnosis was lower in Oklahoma than the US for the Non-Hispanic White and American Indian populations. Compared to their US counterparts, a higher proportion of Oklahomans regardless of race had unknown stage at diagnosis. In Oklahoma, American Indians are more likely to be diagnosed at distant stage while in the United States Black and African Americans are more likely to be diagnosed at distant stage.

Figure 8: Smoker Status in Oklahoma and the United States, 2021



Source: Behavioral Risk Factor Survey 2021

Smoking is one of the major risk factors for oropharyngeal cancer. **Figure 8** shows that in 2021, most of the population in both the US and Oklahoma have never been smokers (60% in the US and 57% in Oklahoma). However, 25% of people in the US and 26% in Oklahoma were former smokers. 17% of people in Oklahoma and 14% of those in the US were current smokers.

Another risk factor for oropharyngeal cancer is the use of smokeless tobacco, such as dip and chewing tobacco. Oklahomans were twice as likely as their US counterparts to use smokeless tobacco (4% vs. 2%, data not shown in figures). Oropharyngeal cancers are often diagnosed at dental visits. For the Oklahoma population in 2021, 40% had not visited a dentist in the past year compared to 33% of the US population (data not shown). For Oklahoma's population in 2021, 41% had at least one drink of alcohol in the prior 30 days compared to 53% for the US population (data not shown). Oklahoma's 2019 HPV vaccination rate was 42% compared to 54% for the US overall.[9]

Conclusions and Implications for Practice and Policy

Oropharyngeal cancer incidence and mortality rates in Oklahoma remain higher than the corresponding US rates. Findings from this brief suggest several recommendations that could be used to reduce the disproportionate burden of oropharyngeal cancer in Oklahoma.

Tobacco use is a well-established risk factor for oropharyngeal cancer. The risk for head and neck cancer among cigarette smokers is approximately ten times higher than that of never-smokers.[10] Anti-smoking campaigns, smoking cessation programs, and policies that discourage tobacco use are evidence-based measures that can reduce the risk of oropharyngeal cancer and other tobacco-related diseases, such as lung cancer, heart disease, and respiratory disorders. The increase of interventions to prevent and reduce the use of cigarettes, other combustible tobacco products and smokeless tobacco products (chewing tobacco, dip, snuff) are necessitated.

The HPV (human papillomavirus) vaccine has been proven to be highly effective in preventing HPV-related cancers, including oropharyngeal cancer. It is estimated that HPV vaccination could potentially prevent around 70% of oropharyngeal cancers caused by the HPV strains included in the vaccine.[11] By vaccinating individuals against HPV the transmission of the virus can be reduced, subsequently lowering the risk of developing associated cancers, including oropharyngeal cancer.

Interventions to improve the quality of oropharyngeal treatment are also warranted. For example, clinical trials advance cancer treatment and persons participating in clinical trials have been shown to receive high-quality care.[12] This is why it is imperative that clinical trials enroll participants from diverse backgrounds. Funding for research should be directed in ways that ensure diversity among patients enrolled into oropharyngeal cancer clinical trials.

Taken together, these and additional actions would enable Oklahoma to reduce the high burden of oropharyngeal cancer in the state.

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