

Incidence and Mortality

Oral cavity and pharynx cancer is cancer that forms in the mouth or throat. These cancers made up 2.6 percent of newly diagnosed (incidence) cancer cases in Ohio during 2011-2015 according to data from the Ohio Cancer Incidence Surveillance System (OCISS). An average of 1,650 cases of oral cavity and pharynx cancer were diagnosed annually in Ohio during this time period (Table 1). Between 2011 and 2015, the average annual age-adjusted incidence rate for oral cavity and pharynx cancer in Ohio was 11.7 per 100,000, compared to the national incidence rate of 11.3 per 100,000. The incidence rate among males diagnosed with oral cavity and pharynx cancer (17.6 per 100,000) was 2.8 times higher than the rate among females (6.4 per 100,000), and the incidence rate was 1.4 times higher among whites (12.0 per 100,000) compared to blacks (8.5 per 100,000) in Ohio in 2011-2015.

Oral cavity and pharynx cancer made up 1.5 percent of all cancer deaths in Ohio during 2011-2015, where an average of 372 deaths occurred each year (Table 1). The average annual age-adjusted mortality rate for oral cavity and pharynx cancer in Ohio was 2.6 per 100,000, compared to the U.S. mortality rate of 2.5 per 100,000. The mortality rate was 3.2 times higher for males (4.1 per 100,000) than females (1.3 per 100,000). Mortality rates were similar among whites (2.6 per 100,000) and blacks (2.5 per 100,000) but lower for Asians/Pacific Islanders (1.5 per 100,000) in Ohio in 2011-2015.

Key Findings and Populations at High Risk

- An average of 1,650 cases of oral cavity and pharynx cancer were diagnosed and 372 deaths occurred each year in Ohio during 2011-2015.
- The oral cavity and pharynx cancer incidence rate in Ohio was 11.7 per 100,000, compared to the national rate of 11.3 per 100,000 in 2011-2015.
- Men are more than twice as likely to be diagnosed with oral cavity and pharynx cancer than women.
- White males had the highest incidence rate of oral cavity and pharynx cancer in Ohio and the United States.
- Oral cavity and pharynx cancer was most frequently diagnosed among Ohio men and women ages 55 to 59 in 2011-2015.
- Oral cavity and pharynx cancer incidence rates increased 15 percent for men and increased slightly for women in Ohio from 1996 through 2015.
- There was no clear geographic pattern of incidence rates of oral and pharynx cancer by county in Ohio in 2011-2015.
- For all stages combined, the five-year relative survival probability for oral cavity and pharynx cancer was 64.8 percent based on national data from 2008-2014.

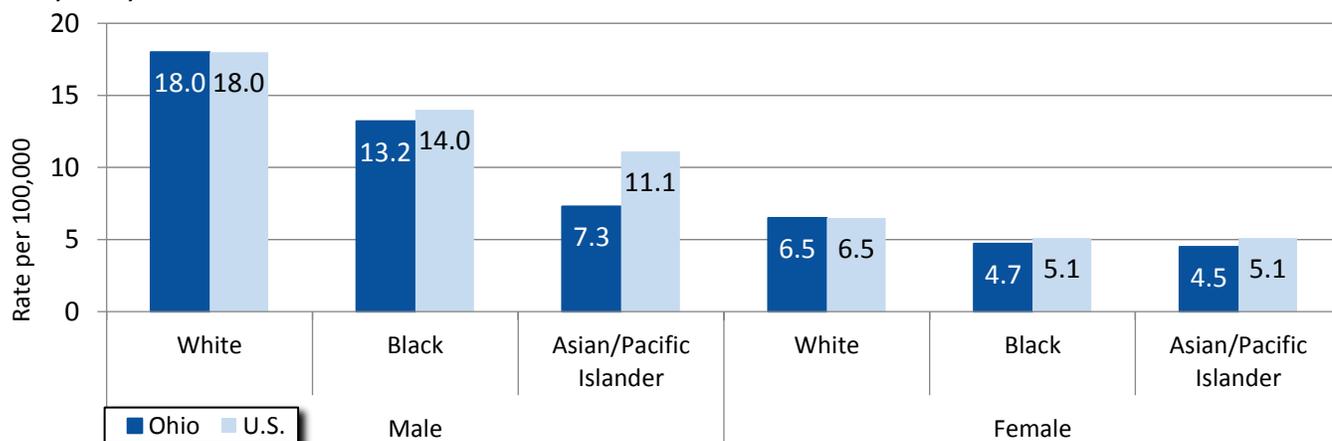
Table 1. Oral Cavity & Pharynx Cancer: Average Annual Number of Cases and Deaths and Age-adjusted Incidence and Mortality Rates per 100,000 Persons by Sex and Race, Ohio and the United States, 2011-2015

		Incidence			Mortality		
		Ohio Cases	Ohio Rate	U.S. Rate	Ohio Deaths	Ohio Rate	U.S. Rate
Total		1,650	11.7	11.3	372	2.6	2.5
Sex	Male	1,170	17.6	17.1	268	4.1	3.9
	Female	480	6.4	6.3	105	1.3	1.3
Race	White	1,493	12.0	11.9	333	2.6	2.5
	Black	125	8.5	9.0	36	2.5	2.8
	Asian/Pacific Islander	12	5.8	7.8	2	1.5	2.0

Sources: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2018; Bureau of Vital Statistics, Ohio Department of Health, 2018; Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, 2018.

Incidence by Sex and Race

Figure 1. Oral Cavity & Pharynx Cancer: Average Annual Age-adjusted Incidence Rates per 100,000 Persons by Sex and Race, Ohio, 2011-2015

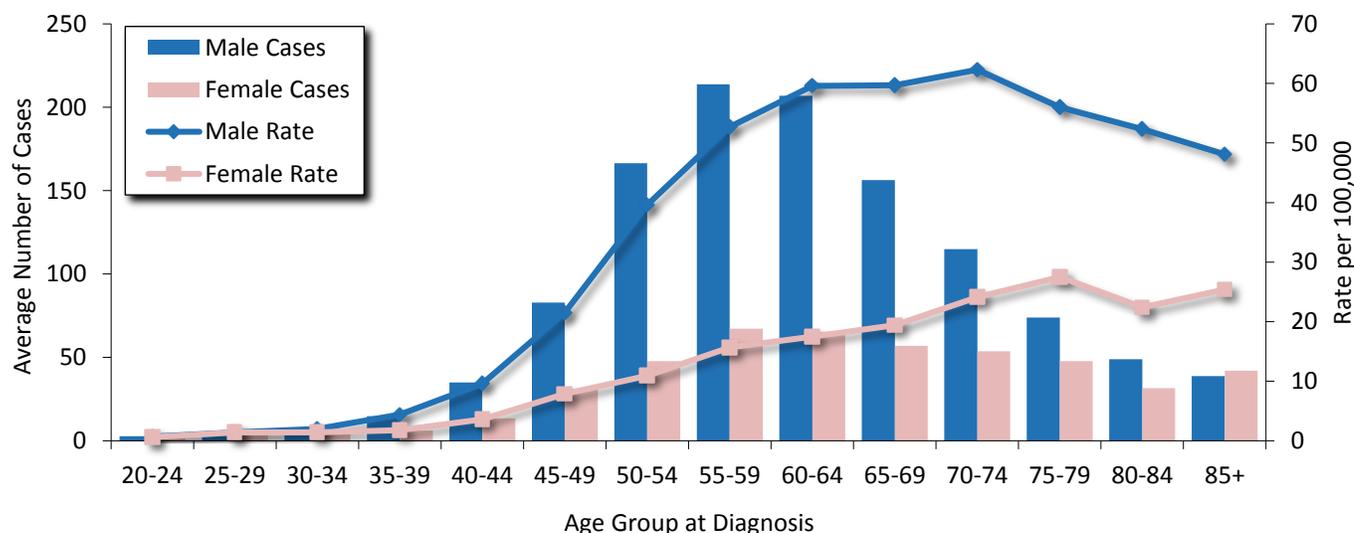


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2018; Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, 2018.

Overall, white males had the highest incidence rate (18.0 per 100,000) of oral cavity and pharynx cancer in both Ohio and the United States, followed by black males and Asian/Pacific Islander males based on data from 2011 to 2015 (Figure 1). Among females, whites also had the highest oral cavity and pharynx cancer incidence rate, followed by blacks and Asians/Pacific Islanders.

Incidence by Age Group and Sex

Figure 2. Oral Cavity & Pharynx Cancer: Average Annual Number and Age-specific Incidence Rates (Ages 20+) per 100,000 Persons by Age Group and Sex, Ohio, 2011-2015



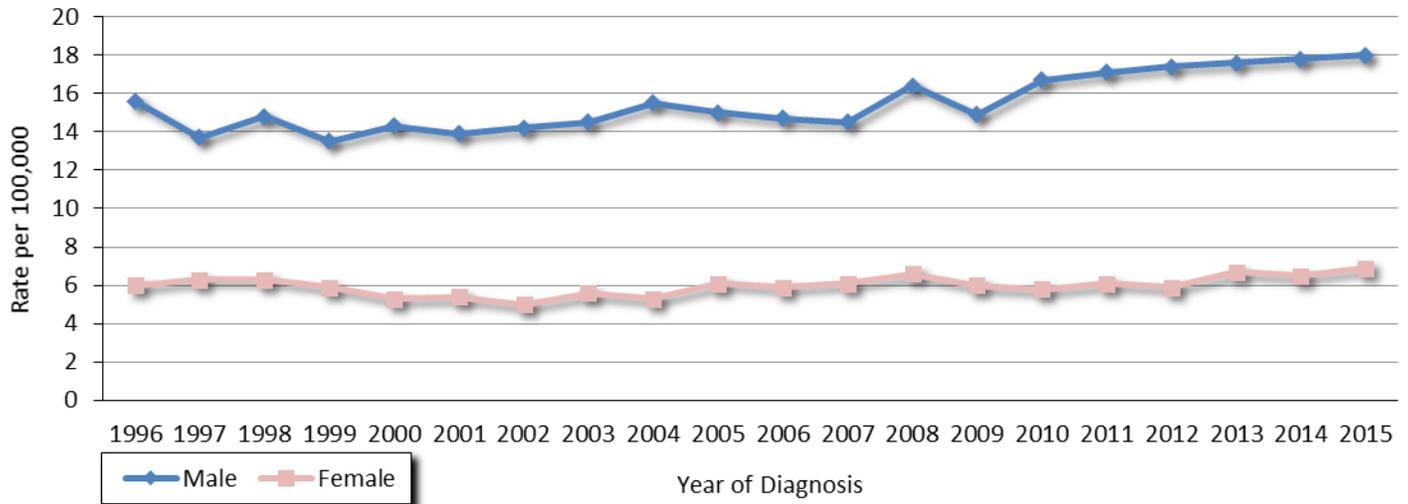
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2018.

In Ohio between 2011 and 2015, oral cavity and pharynx cancer was most frequently diagnosed among men and women ages 55 to 59 (Figure 2). Incidence rates increased with advancing age, reaching a peak among men ages 70-74 and among women ages 75-79.

Trends in Incidence and Mortality

Figure 3 shows incidence rates of oral cavity and pharynx cancer according to year of diagnosis (1996 through 2015) for males and females in Ohio. For each year, the incidence rate was higher among Ohio males compared to females. Oral cavity and pharynx cancer incidence rates increased 15 percent for men (15.6 per 100,000 to 18.0 per 100,000) and increased slightly for women (6.0 per 100,000 to 6.9 per 100,000) in Ohio during this 20-year period.

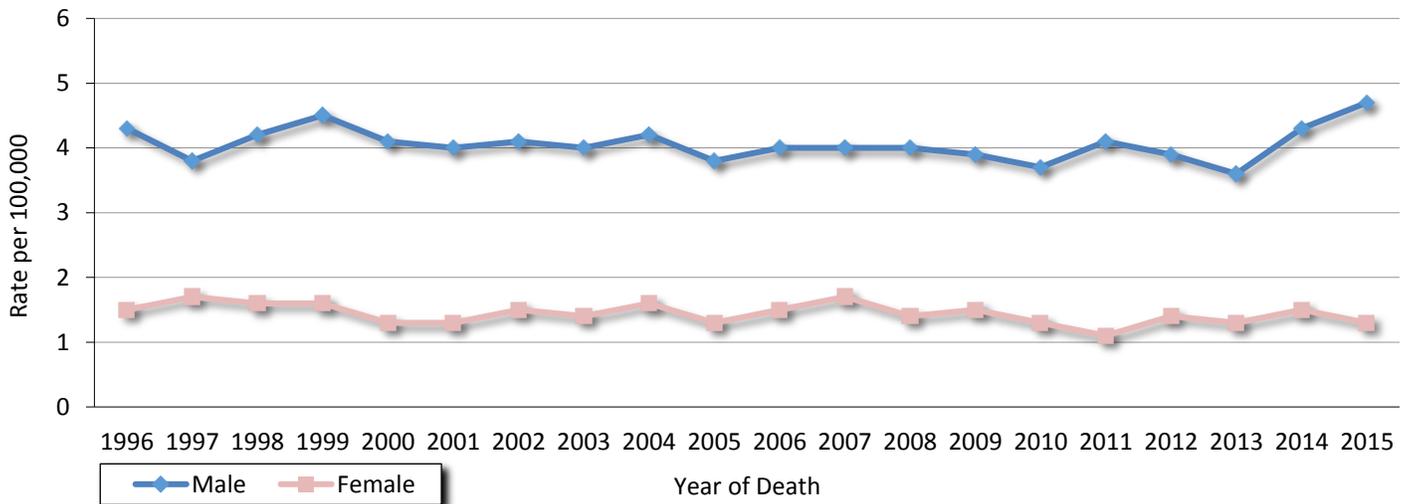
Figure 3. Oral Cavity & Pharynx Cancer: Trends in Age-adjusted Incidence Rates per 100,000 Persons by Sex, Ohio, 1996-2015



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2018.

Figure 4 shows oral cavity and pharynx cancer mortality rates in Ohio according to year of death (1996 through 2015) for males and females. For each year, the mortality rate was higher among males compared to females in Ohio. Mortality rates among men and women in Ohio were slightly variable over the time period.

Figure 4. Oral Cavity & Pharynx Cancer: Trends in Age-adjusted Mortality Rates per 100,000 Persons by Sex, Ohio, 1996-2015

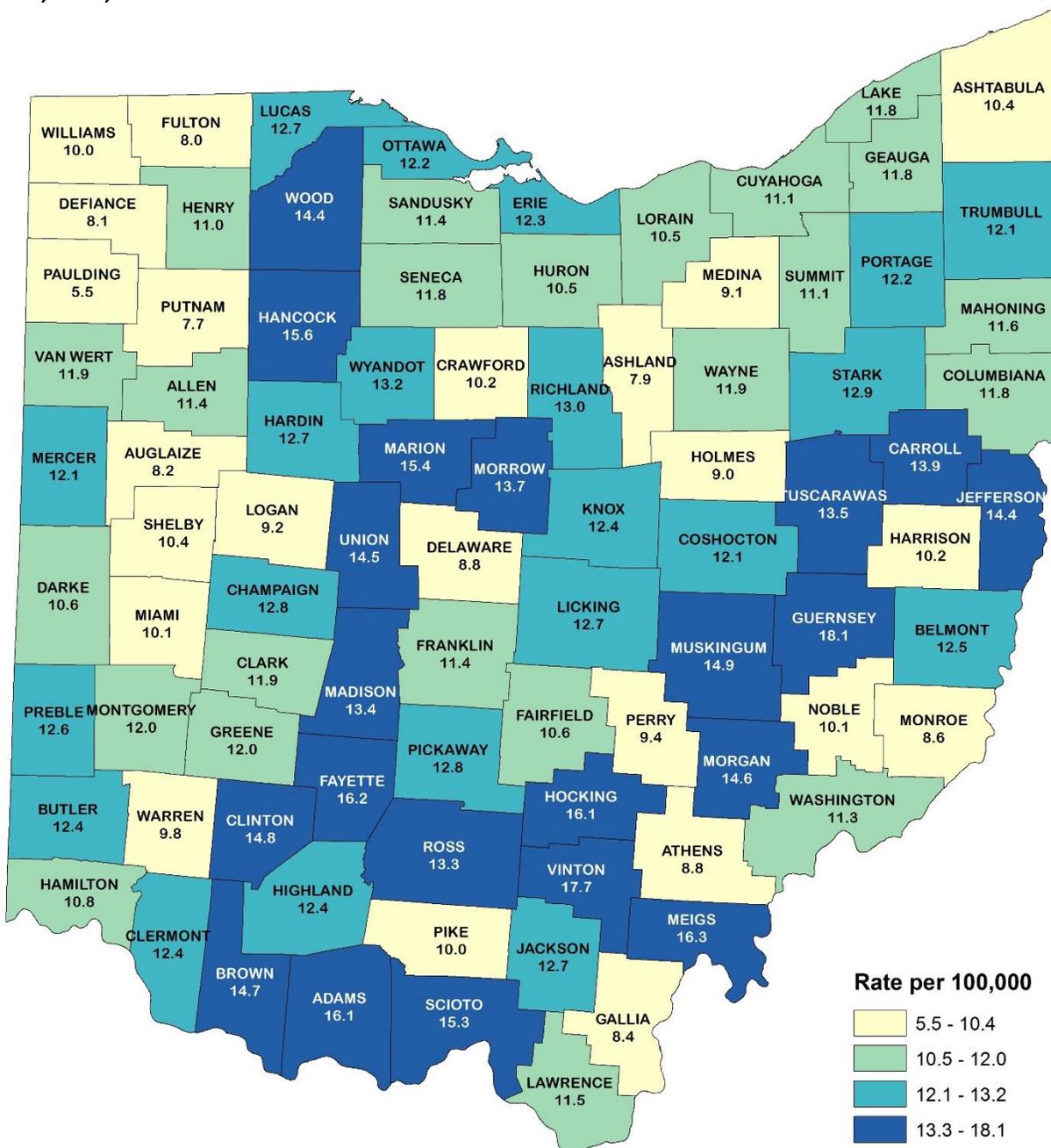


Source: Bureau of Vital Statistics, Ohio Department of Health, 2018.

Incidence by County

Figure 5 shows 2011-2015 average annual age-adjusted oral cavity and pharynx cancer incidence rates by county of residence. County-specific oral cavity and pharynx cancer incidence rates in Ohio ranged from 5.5 to 18.1 per 100,000 persons, compared with Ohio’s rate of 11.7 per 100,000. There was no clear geographic pattern of incidence rates by county. The following counties had the highest oral cavity and pharynx cancer incidence rates, in decreasing order, for this time period: Guernsey, Vinton, Meigs, Fayette, Adams and Hocking.

Figure 5. Oral Cavity & Pharynx Cancer: Average Annual Age-adjusted Incidence Rates per 100,000 Persons by County of Residence, Ohio, 2011-2015



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2018. Each category represents approximately 25 percent of the 88 Ohio counties.

Anatomic Subsites

Table 2. Oral Cavity & Pharynx Cancer: Average Annual Number and Percent Distribution by Anatomic Subsite, Ohio, 2011-2015

Anatomic Subsite	Cases	Percent
All Oral Cavity & Pharynx	1,650	
Tongue	544	32.9%
Tonsil & oropharynx	415	25.1%
Gum & other mouth	221	13.4%
Salivary gland	172	10.4%
Hypopharynx	86	5.2%
Floor of mouth	85	5.2%
Nasopharynx	56	3.4%
Lip	46	2.8%
Other oral cavity & pharynx	26	1.6%

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2018.

Table 2 shows the average annual number and the percent distribution of oral cavity and pharynx cancers by anatomic subsite in Ohio in 2011-2015. In Ohio, 32.9 percent of oral cavity and pharynx cancers were found on the tongue. This is followed by tumors diagnosed on the tonsil and oropharynx (part of the throat just behind the mouth) (25.1 percent), gum and other mouth (13.4 percent), and salivary gland (10.4 percent).

Less common were cancers of the hypopharynx (the bottom of the throat) and the floor of the mouth, which accounted for 5.2 percent of cases each. The nasopharynx (the upper part of the throat behind the nose) and lip made up 3.4 percent and 2.8 percent of cases, respectively.

Histology

Histologic groupings are based on how tissues and cells look under a microscope. The major types of oral cavity and pharynx cancer in Ohio by histologic grouping in 2011-2015 include the following:

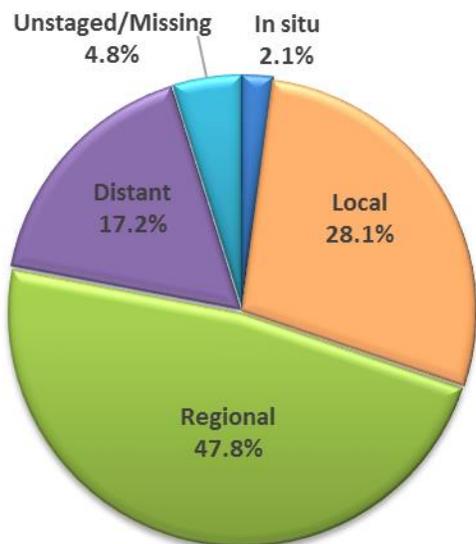
- **Squamous cell carcinoma (SCC)** accounted for 85.3 percent of invasive cancers of the oral cavity and pharynx in Ohio during 2011-2015. Squamous cells are flat, scale-like cells that form the lining of the mouth and throat.
- **Adenocarcinoma** accounted for 8.9 percent of invasive cancers of the oral cavity and pharynx. Adenocarcinoma is cancer that begins in the glandular (secretory) cells of the throat. Glandular cells make and release substances in the body, such as mucus, digestive juices or other fluids.

Did You Know?

- *Cigarette smoking accounts for about half of oral cavity and pharynx cancer deaths.*
- *Cancers of the oropharynx, which occur more often among men, accounted for about 40 percent of cancers associated with the human papillomavirus (HPV) in Ohio, second only to cervical cancers.*

Stage at Diagnosis

Figure 6. Oral Cavity & Pharynx Cancer: Proportion of Cases (%) by Stage at Diagnosis, Ohio, 2011-2015



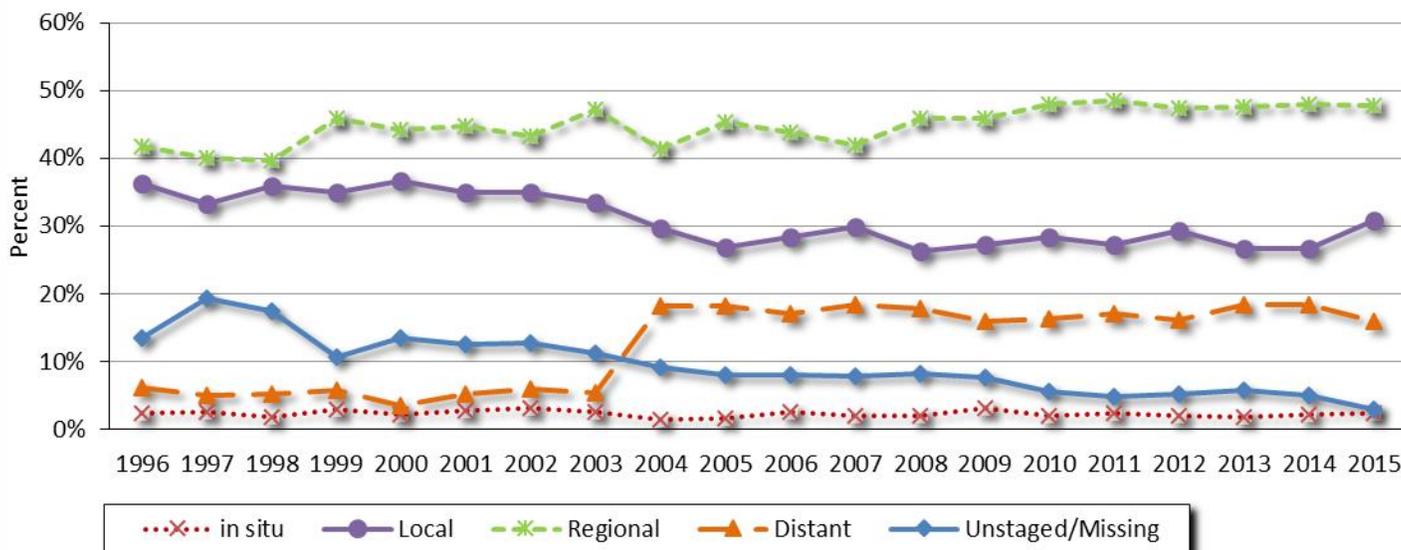
The stage at diagnosis is an important determinant of survival. If cancer cells are present only in the layer of cells where they developed and have not spread, the stage is *in situ*. If cancer cells have penetrated beyond the original layer of tissue, the cancer has become invasive and is categorized as local, regional or distant based on the extent of spread. Regional stage, where the tumor has spread to nearby lymph nodes, tissues or organs, was the most common stage at diagnosis (47.8 percent) for oral cavity and pharynx cancer in Ohio during 2011-2015 (Figure 6). Local stage, where the tumor is confined to the oral cavity or pharynx, made up 28.1 percent of diagnoses in Ohio. Distant stage indicates that the malignancy has spread through the blood or lymphatic system to other organs; these tumors made up 17.2 percent of diagnoses in Ohio in 2011-2015.

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2018.

Trends in Stage at Diagnosis

Figure 7 shows the distribution of stage at diagnosis of oral cavity and pharynx cancer cases according to year of diagnosis from 1996 to 2015. The proportion of cases diagnosed at the distant stage in Ohio increased from 6.2 percent in 1996 to 15.9 percent in 2015. There was a corresponding decrease in cases diagnosed as unstaged/missing stage during this 20-year period, from 13.5 percent in 1996 to 3.0 percent in 2015. The proportion of cases diagnosed at a local stage decreased 14.9 percent, while regional stage diagnoses increased 14.6 percent in Ohio from 1996 to 2015.

Figure 7. Oral Cavity & Pharynx Cancer: Trends in Stage at Diagnosis, Ohio, 1996-2015



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2018.

Risk Factors

Anything that increases your risk of getting a disease is called a risk factor. Having a risk factor does not mean that you will get cancer; not having risk factors doesn't mean that you will not get cancer. The following is a list of risk factors for oral cavity and pharynx cancer:

Non-Modifiable Risk Factors

Age: Most patients with oral cavity and pharynx cancer are older than 55.

Sex: Oral cavity and pharynx cancer is twice as common in men as in women.

Personal history: People who have had oral cavity and pharynx cancer are at increased risk of developing another oral cavity and pharynx cancer.

Genetics: People with certain genetic conditions (e.g., Fanconi anemia, dyskeratosis congenita) have a very high risk of oral cavity and pharynx cancer.

Modifiable Risk Factors

Tobacco: Smoking cigarettes, cigars or pipes causes oral cavity and pharynx cancer, and using smokeless tobacco (such as snuff and chewing tobacco) causes oral cavity cancer. For cigarette smokers, risk increases with the number of cigarettes smoked per day. The risk is greater for people who use both tobacco and alcohol than for those who use only tobacco or alcohol.

Heavy alcohol use: People who are heavy drinkers are more likely to develop oral cavity cancer than people who do not drink alcohol. The risk increases with the amount of alcohol that a person drinks.

HPV infection: Some members of the HPV family of viruses can infect the mouth and throat. Cancer at the base of the tongue, at the back of the throat, in the tonsils or in the soft palate is linked with HPV infection.

Sun: Cancer of the lip can be caused by exposure to the sun. The risk of cancer of the lip increases if the person also smokes.

Betel nut use: Most common in Asia, chewing betel nut (a type of palm seed wrapped with a betel leaf and sometimes mixed with spices, sweeteners and tobacco) causes oral cancer. The risk increases even more if the person also drinks alcohol and uses tobacco.

Weakened immune system: Oral cavity and pharynx cancers are more common in people who have a weak immune system.

Graft-versus-host disease: Graft-versus-host disease (GVHD) is a condition that sometimes occurs after a stem cell transplant. GVHD can affect many tissues of the body, including those in the mouth, which increases the risk of oral cancer.

Early Detection

Cancer can affect any part of the oral cavity, including the lip, tongue, mouth and throat. Through visual inspection, dentists and physicians can often detect premalignant abnormalities and cancer at an early stage, when treatment is both less extensive and more successful.

Signs and Symptoms

- Patches inside the mouth or on the lips:
 - White patches are the most common.
 - Mixed red and white patches are more likely than white patches to become malignant.
 - Red patches are brightly colored, smooth areas that often become malignant.
- A sore on the lip or in the mouth that does not heal
- Bleeding in the mouth
- Loose teeth
- Difficulty or pain when swallowing
- Difficulty wearing dentures
- A lump in the neck
- An earache that does not go away
- Numbness of lower lip and chin

Any of these signs/symptoms may be caused by cancer or by other, less serious health problems. If you have any of these signs/symptoms, see your healthcare provider or dentist.

Survival

Relative survival probability is the percentage of people who are alive at a designated time period (usually five years) after a diagnosis divided by the percentage expected to be alive in the absence of a diagnosis based on normal life expectancy. Table 3 shows that the U.S. five-year relative survival probability for oral cavity and pharynx cancer in 2008-2014 for all races and both sexes combined was 64.8 percent for all stages combined. White females had the greatest five-year survival probability for all stages combined (67.5 percent), followed closely by white males (66.3 percent). Black females (53.0 percent) and black males (46.0 percent) had considerably lower survival probabilities for all stages combined. Some of the disparity in survival rates may be due to a later stage of diagnosis among black men and women. Overall, the five-year relative survival probability was 83.7 percent for patients diagnosed with local stage tumors, but only 39.1 percent for those diagnosed with distant stage tumors.

Table 3: Oral Cavity & Pharynx Cancer: Five-year Relative Survival Probability (%) by Stage at Diagnosis, Sex and Race, United States, 2008-2014

Stage at Diagnosis	All Races			Whites			Blacks		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
All Stages	64.8%	64.0%	66.9%	66.3%	65.8%	67.5%	48.1%	46.0%	53.0%
Local	83.7%	82.7%	85.1%	83.6%	83.0%	84.5%	79.6%	75.7%	84.1%
Regional	65.0%	66.2%	60.9%	66.6%	68.0%	61.7%	47.7%	48.0%	46.8%
Distant	39.1%	39.2%	38.6%	39.9%	40.4%	38.0%	29.1%	28.9%	29.3%
Unstaged/Missing	49.2%	48.4%	50.9%	47.0%	46.4%	48.5%	40.7%	44.9%	33.3%

Source: Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, 2018.

Technical Notes

Age-Adjusted Rate: A summary rate that is a weighted average of age-specific rates, where the weights represent the age distribution of a standard population (direct adjustment). The incidence and mortality rates presented in this report were standardized to the age distribution of the 2000 U.S. Standard Population. Under the direct method, the population was first divided into 19 five-year age groups, i.e., <1, 1-4, 5-9, 10-14, 15-19...85+, and the age-specific rate was calculated for each age group. Each age-specific rate was then multiplied by the standard population proportion for the respective age group.

Average Annual Number: The number of cases or deaths diagnosed per year, on average, for the time period of interest (e.g., 2011-2015). Average annual numbers are calculated by summing the number of cases or deaths for a given time period, dividing by the number of years that comprise the time period and rounding to the nearest whole number.

Census Data: The 1996-2015 rates were calculated using population estimates from the U.S. Census Bureau and National Center for Health Statistics. Population data were compiled from bridged-race intercensal population estimates for July 1, 1990-July 1, 1999; revised bridged-race intercensal population estimates for July 1, 2000-July 1, 2004 (released 10/26/2012); revised bridged-race intercensal population estimates for July 1, 2005-July 1, 2009 (released 6/26/2014) and vintage 2016 bridged-race postcensal population estimates for July 1, 2010-July 1, 2016 (released 6/26/2017).

Incidence: The number of cases diagnosed during a specified time period (e.g., 2011-2015). Oral cavity and pharynx cancer cases were defined by the International Classification of Diseases for Oncology, Third Edition (ICD-O-3), and categorized by site codes C000-C148 and all histology codes excluding 9050-9055, 9140, 9590-9992 in accordance with the Surveillance, Epidemiology and End Results (SEER) Program of the National Cancer Institute.

Invasive Cancer: A malignant tumor that has infiltrated the organ in which the tumor originated. Invasive cancers consist of those diagnosed at the local, regional, distant and unstaged/missing stages. Only invasive cancers were included in the calculation of incidence rates in this document.

Mortality: The number of deaths during a specified time period (e.g., 2011-2015). Oral cavity and pharynx cancer deaths were defined by the International Statistical Classification of Diseases and Related Health Problems, Ninth Edition (ICD-9) for 1996-1998 and the International Statistical Classification of Diseases and Related Health Problems, Tenth Edition (ICD-10) for 1999-2015, and categorized by site codes C000-C149 in accordance with the Surveillance, Epidemiology and End Results (SEER) Program of the National Cancer Institute.

Rate: The number of cases or deaths per unit of population (e.g., per 100,000 persons) during a specified time period (e.g., 2011-2015). Rates may be unstable and are not presented when the count is less than five.

Relative Survival: The percentage of people who are alive at a designated time period (usually five years) after a cancer diagnosis divided by the percentage expected to be alive in the absence of cancer based on normal life expectancy. It does not distinguish between patients who have no evidence of cancer and those who have relapsed or are still in treatment.

Stage at diagnosis: The extent or spread of the disease from the site of origin often classified into the following stages:

in situ - Noninvasive cancer that has not penetrated surrounding tissue.

Local - A malignant tumor confined entirely to the organ of origin.

Regional - A malignant tumor that has extended beyond the organ of origin directly into surrounding organs or tissues or into regional lymph nodes.

Distant - A malignant tumor that has spread to parts of the body (distant organs, tissues and/or lymph nodes) remote from the primary tumor.

Unstaged/Missing - Insufficient information is available to determine the stage or extent of the disease at diagnosis.

Sources of Data and Additional Information

Ohio Cancer Incidence Surveillance System:

http://www.odh.ohio.gov/health/cancer/ocisshs/ci_surv1.aspx

National Cancer Institute:

<https://www.cancer.gov/types/head-and-neck>

American Cancer Society:

<https://www.cancer.org/cancer/oral-cavity-and-oropharyngeal-cancer.html>

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Acknowledgements

The following individuals contributed to this report:

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Sincere appreciation to the OCISS, cancer registrars, medical records technicians and other health professionals who improve the collection and quality of cancer data in Ohio.

Suggested Citation

Oral Cavity & Pharynx Cancer in Ohio, 2011-2015. Ohio Cancer Incidence Surveillance System, Ohio Department of Health, November 2018.

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The OCISS is supported in part by the State of Ohio and the Centers for Disease Control and Prevention (CDC), National Program of Cancer Registries, cooperative agreement number NU58DP006284. The contents are the sole responsibility of the authors and do not necessarily represent the official views of the CDC.