Oral Cavity and Pharynx Cancer in Ohio

Department of Health

August 2024

Key Findings

- An average of 1,940 cases of oral cavity and pharynx cancer were diagnosed and 449 deaths occurred each year in Ohio during 2017-2021.
- The oral cavity and pharynx cancer incidence (new case) rate in Ohio was 12.8 per 100,000 population, compared with the U.S. rate of 12.0 per 100,000 during 2017-2021.
- 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.
- Oral cavity and pharynx cancer was most frequently diagnosed among people in the 55 to 64 age group.
- Oral cavity and pharynx cancer incidence rates increased for men and women in Ohio from 1996 through 2021.
- Incidence rates for oral cavity and pharynx cancer were higher in Ohio's Appalachian counties during 2017-2021.
- For all stages combined, the five-year relative survival for oral cavity and pharynx cancer was 70%, based on Ohio cases diagnosed from 2014-2020.
- About 70% of cancers in the oropharynx (which includes the tonsils, soft palate, and base of the tongue) are linked to the human papillomavirus (HPV).

New Cases

Oral cavity and pharynx cancer is cancer that forms in the mouth or throat. These cancers made up 2.8% of incident cancer cases in Ohio from 2017 through 2021, the latest five years of data available from the Ohio Cancer Incidence Surveillance System (OCISS), Ohio's central cancer registry.[1] An average of **1,940 cases** of oral cavity and pharynx cancer were diagnosed annually in Ohio during this time period (Table 1). During 2017-2021, the average annual age-adjusted incidence rate for oral cavity and pharynx cancer in Ohio was 12.8 per 100,000 population, compared with the national incidence rate of 12.0 per 100,000. The incidence rate among Ohio males diagnosed with oral cavity and pharynx cancer (19.1 per 100,000) was 2.7 times higher than the rate among females (7.1 per 100,000). The incidence rate was higher among White Ohioans (13.1 per 100,000), compared with Black Ohioans (9.4 per 100,000), Asian/Pacific Islander (A/PI) Ohioans (8.9 per 100,000), and Hispanic Ohioans (5.4 per 100,000) during 2017-2021.

Deaths

Oral cavity and pharynx cancer made up 1.8% of all cancer deaths in Ohio during 2017-2021, when an average of **449 deaths** occurred each year (Table 1). The average annual age-adjusted mortality rate for oral cavity and pharynx cancer in Ohio was 2.9 per 100,000 population, compared with the U.S. mortality rate of 2.6 per 100,000. In Ohio, the mortality rate for oral cavity and pharynx cancer among males (4.4 per 100,000) was 2.8 times higher than the rate among females (1.6 per 100,000). The mortality rate was higher among White Ohioans (2.9 per 100,000), compared with Black Ohioans (2.5 per 100,000), A/PI Ohioans (2.2 per 100,000), and Hispanic Ohioans (1.4 per 100,000) during 2017-2021.

[1]Due to the complexity of the cancer data collection and quality control process, there is typically a 24-month delay between the time a new cancer is diagnosed and the time the data is ready for analysis. Therefore, the most recent incidence data presented in this report is for cancer cases diagnosed through Dec. 31, 2021.

Table 1. Average Annual Number and Age-Adjusted Rates of Oral Cavity and Pharynx Cancer Cases and Deaths per 100,000 Population by Sex, Race, and Ethnicity, Ohio and the United States, 2017-2021

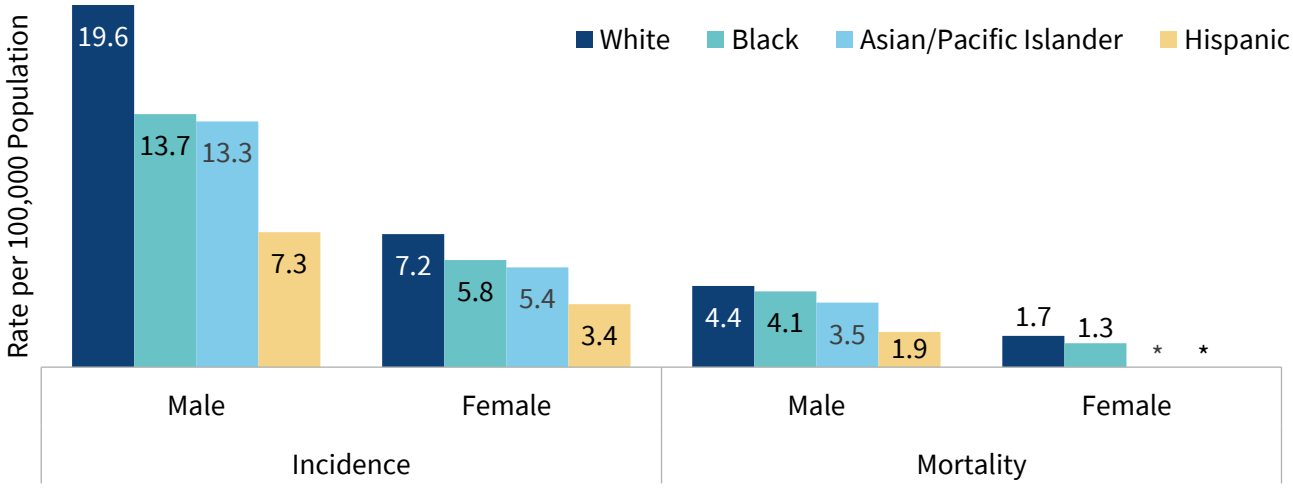
		Incidence			Mortality		
		Ohio Cases	Ohio Rate	U.S. Rate	Ohio Deaths	Ohio Rate	U.S. Rate
Total		1,940	12.8	12.0	449	2.9	2.6
Sex	Male	1,383	19.1	18.0	314	4.4	4.0
	Female	557	7.1	6.6	136	1.6	1.4
Race	White	1,744	13.1	12.5	403	2.9	2.6
	Black	150	9.4	8.2	40	2.5	2.4
	A/PI	24	8.9	8.1	5	2.2	2.0
Ethnicity	Hispanic	17	5.4	7.3	4	1.4	1.5

Sources: Incidence - Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024; U.S. Cancer Statistics, Centers for Disease Control and Prevention and National Cancer Institute, June 2024. SEER*Stat Database: Mortality - All Cause of Death (COD), Aggregated With State, Total U.S. (1990-2022), National Cancer Institute, April 2024. Underlying mortality data provided by the National Center for Health Statistics.
A/PI = Asian/Pacific Islander.

Incidence and Mortality by Race and Sex

Overall, White males had the highest incidence rate (19.6 per 100,000) of oral cavity and pharynx cancer in Ohio, followed by Black males (13.7 per 100,000), Asian/Pacific Islander males (13.3 per 100,000), and Hispanic males (7.3 per 100,000), based on data from the period 2017-2021. Among females, White females had the highest oral cavity and pharynx cancer incidence rate (7.2 per 100,000), followed by Black females (5.8 per 100,000), Asian/Pacific Islander females (5.4 per 100,000), and Hispanic females (3.4 per 100,000). Mortality rates of oral cavity and pharynx cancer were higher among males than females in each of the race/sex categories in Ohio during 2017-2021 (Figure 1), where mortality rates were calculated.

Figure 1. Average Annual Age-Adjusted Incidence and Mortality Rates of Oral Cavity and Pharynx Cancer per 100,000 Population by Sex, Race, and Ethnicity, Ohio, 2017-2021

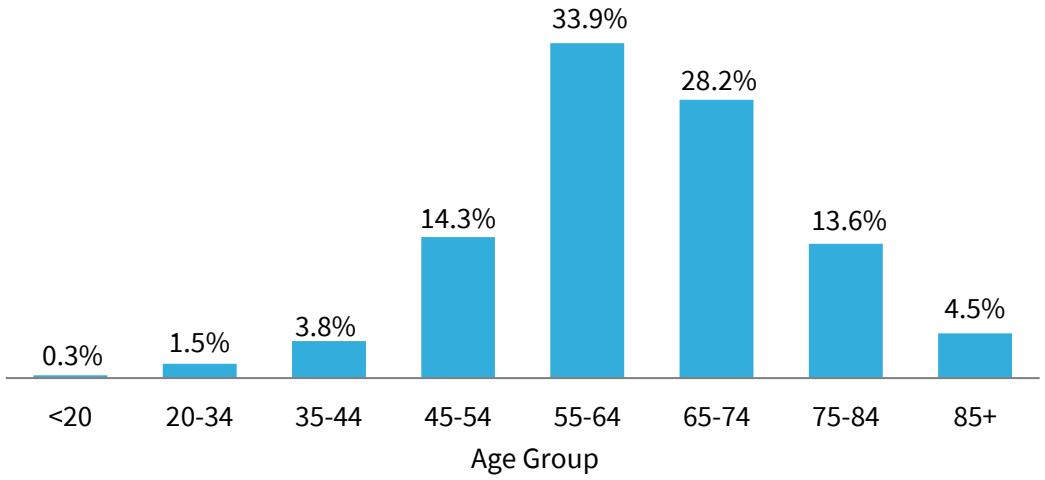


Sources: Incidence - Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024; U.S. Cancer Statistics, Centers for Disease Control and Prevention and National Cancer Institute, June 2024. Mortality – SEER*Stat Database: Mortality - All Cause of Death (COD), Aggregated With State, Total U.S. (1990-2022), National Cancer Institute, April 2024. Underlying mortality data provided by the National Center for Health Statistics.
*Rate not presented when the death count for 2017-2021 is less than 10.

Incidence by Age Group

In Ohio during 2017-2021, oral cavity and pharynx cancer was most frequently diagnosed among people in the 55 to 64 age group (33.9%) (Figure 2).

Figure 2. Percent of New Cases of Oral Cavity and Pharynx Cancer by Age Group, Ohio, 2017-2021

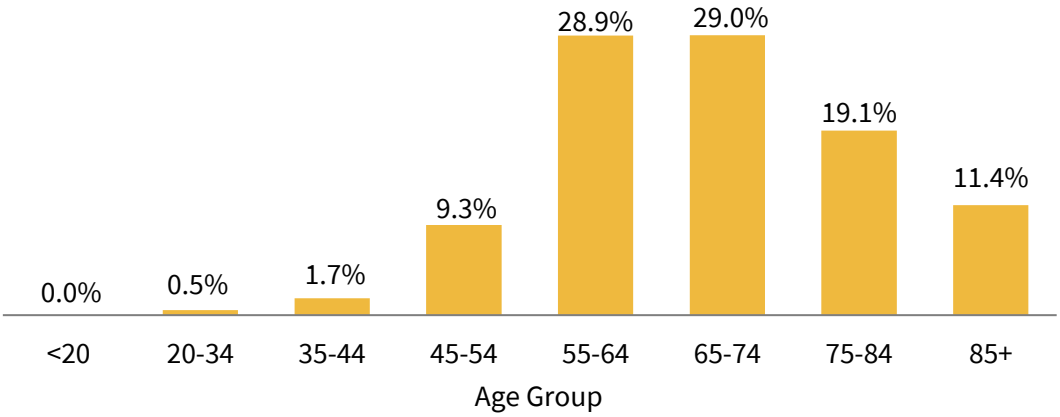


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.

Mortality by Age Group

In Ohio, oral cavity and pharynx cancer deaths occurred most frequently among people in the 65 to 74 age group (29.0%), followed by those in the 55 to 64 age group (28.9%). There were very few deaths due to oral cavity and pharynx cancer among people younger than 35 years old in Ohio during 2017-2021 (Figure 3).

Figure 3. Percent of Deaths from Oral Cavity and Pharynx Cancer by Age Group, Ohio, 2017-2021

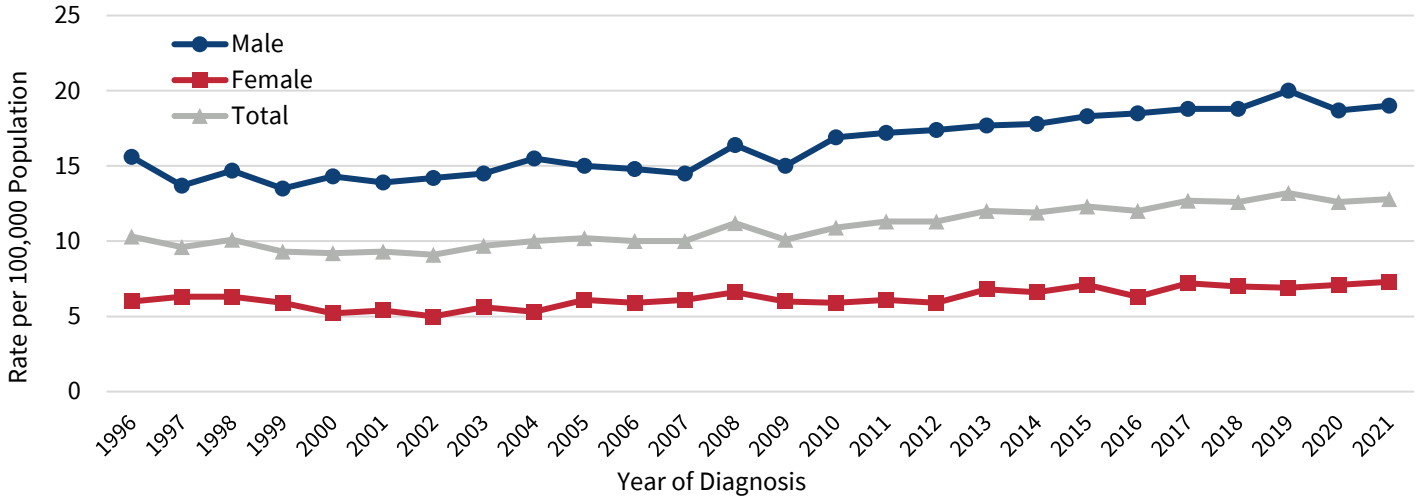


Source: Bureau of Vital Statistics, Ohio Department of Health, 2024; SEER*Stat Database: Mortality - All Cause of Death (COD), Aggregated With State, Total U.S. (1990-2022), National Cancer Institute, April 2024. Underlying mortality data provided by the National Center for Health Statistics.

Trends in Incidence

From 1996 to 2021, oral cavity and pharynx cancer incidence rates increased for men (15.6 per 100,000 to 19.0 per 100,000) and for women (6.0 per 100,000 to 7.3 per 100,000) in Ohio. For each year, the incidence rate was higher among Ohio males, compared with females (Figure 4).

Figure 4. Trends in Age-Adjusted Incidence Rates of Oral Cavity and Pharynx Cancer per 100,000 Population by Sex, Ohio, 1996-2021

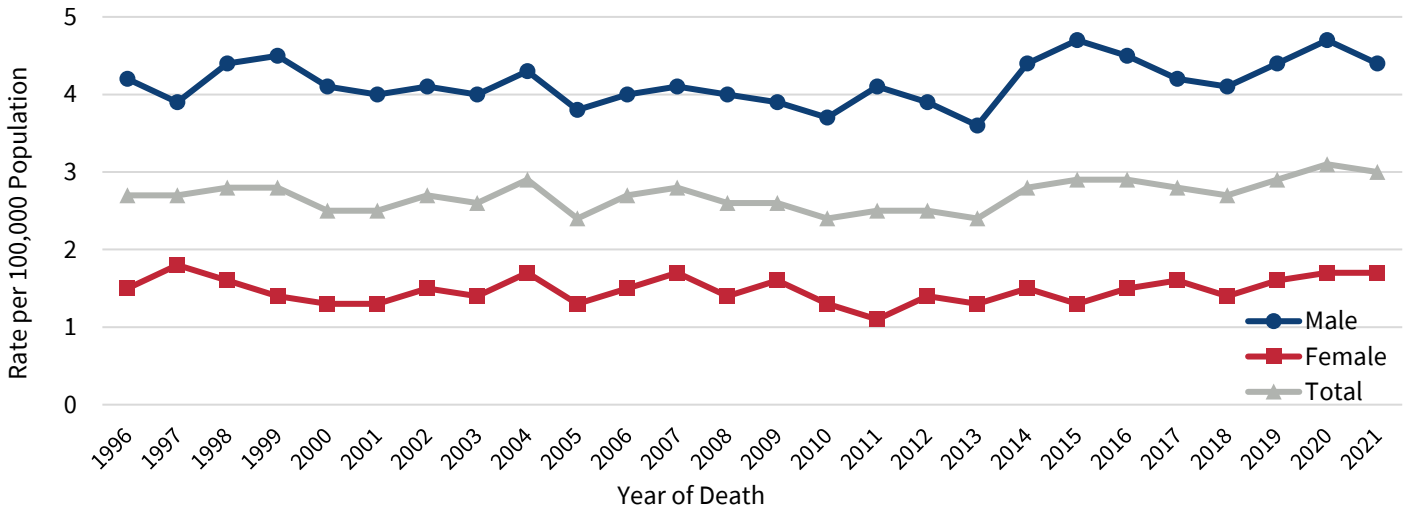


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.

Trends in Mortality

Oral cavity and pharynx cancer mortality rates among men and women in Ohio were slightly variable from 1996 to 2021. For each year, the mortality rate was higher among males, compared with females in Ohio (Figure 5).

Figure 5. Trends in Age-Adjusted Mortality Rates of Oral Cavity and Pharynx Cancer per 100,000 Population by Sex, Ohio, 1996-2021

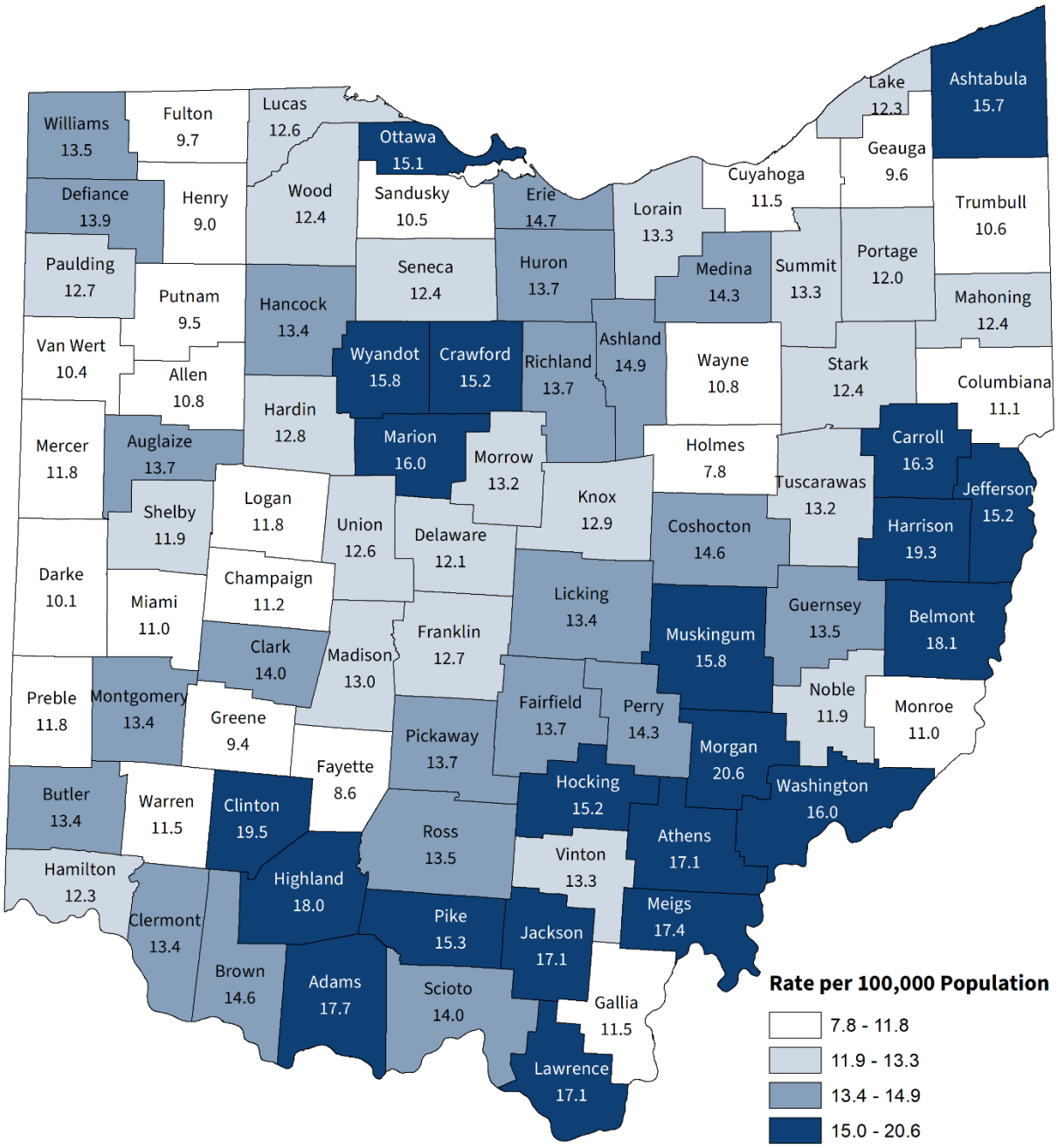


Source: SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1990-2022), National Cancer Institute, April 2024. Underlying mortality data provided by the National Center for Health Statistics.

Incidence by County

County-specific oral cavity and pharynx cancer incidence rates in Ohio ranged from 7.8 to 20.6 per 100,000 population, compared with Ohio's rate of 12.8 per 100,000. Incidence rates for oral cavity and pharyngeal cancer were higher in the Appalachian region of Ohio. The following counties had the highest oral cavity and pharynx cancer incidence rates, in decreasing order, for this time period: Morgan, Clinton, Harrison, Belmont, Highland, and Adams (Figure 6).

Figure 6. Average Annual Age-Adjusted Incidence Rates of Oral Cavity and Pharynx Cancer per 100,000 Population by County of Residence, Ohio, 2017-2021



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.
Each category represents approximately 25% of the 88 Ohio counties.

Anatomic Subsites

Table 2. Average Annual Number and Percent Distribution of Oral Cavity and Pharynx Cancer by Anatomic Subsite, Ohio, 2017-2021

Anatomic Subsite	Cases	Percent
Tongue	656	33.8%
Tonsil and Oropharynx	524	27.0%
Gum and other mouth	269	13.8%
Salivary gland	191	9.8%
Floor of mouth	91	4.7%
Hypopharynx	91	4.7%
Nasopharynx	61	3.2%
Lip	35	1.8%
Other oral cavity and pharynx	23	1.2%
Total	**1,940**	

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.

In Ohio, 33.8% 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) (27.0%), gum and other mouth (13.8%), and salivary gland (9.8%).

Less common were cancers of the floor of the mouth and hypopharynx (the bottom of the throat), each of which accounted for 4.7% of cases. The nasopharynx (the upper part of the throat behind the nose) and lip made up 3.2% and 1.8% of cases, respectively. (Table 2).

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 2017-2021 include the following:

- **Squamous cell carcinoma (SCC)** accounted for 82.1% of invasive cancers of the oral cavity and pharynx in Ohio during 2017-2021. Squamous cells are flat, scale-like cells that form the lining of the mouth and throat.
- **Adenocarcinoma** accounted for 8.4% 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?

About 70% of cancers in the oropharynx (which includes the tonsils, soft palate, and base of the tongue) are linked to the human papillomavirus (HPV), a common sexually transmitted virus.

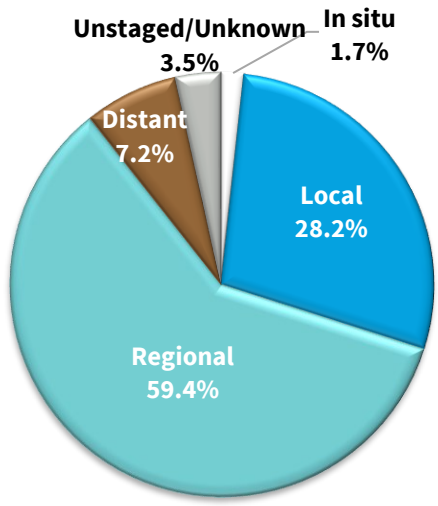
The HPV vaccine protects against the types of HPV that can cause oropharyngeal cancers, so it may also prevent oropharyngeal cancers.

CDC recommends HPV vaccination for 11- to 12-year-olds. CDC also recommends HPV vaccination for everyone through age 26, if not vaccinated already.

Stage at Diagnosis

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.

Figure 7. Proportion of Oral Cavity and Pharynx Cancer Cases (%) by Stage at Diagnosis, Ohio, 2017-2021



At the regional stage, cancer has spread to nearby lymph nodes, tissues, or organs; this was the most common stage at diagnosis (59.4%) for oral cavity and pharynx cancer in Ohio during 2017-2021.

Local stage, where cancer is confined to the oral cavity or pharynx, made up 28.2% of diagnoses in Ohio.

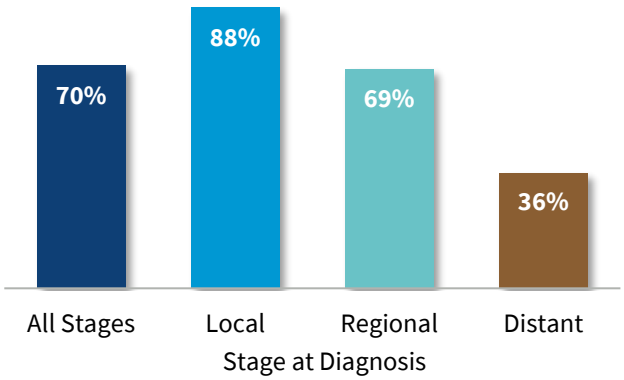
Distant stage indicates that the malignancy has spread through the blood or lymphatic system to other organs; these tumors made up 7.2% of diagnoses in Ohio in 2017-2021. (Figure 7).

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.

Survival

In general, cancer survival is estimated as the proportion of people alive at some point after cancer diagnosis, usually five years. Five-year relative survival, the estimate used here, compares the survival of people diagnosed with cancer with the survival of people in the general population who are the same age, race, and sex, and who have not been diagnosed with cancer.

Figure 8: Five-Year Relative Survival (%) for Oral Cavity and Pharynx Cancer by Stage at Diagnosis, Ohio



For all stages combined, the five-year relative survival for oral cavity and pharynx cancer in Ohio was 70%.

In Ohio, the five-year relative survival was 88% among those diagnosed at a local stage, 69% at the regional stage, and 36% when the cancer is diagnosed at the latest (distant) stage. (Figure 8).

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.
Based on Ohio cases diagnosed in 2014-2020, followed through 2021.

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:

Modifiable Risk Factors

Tobacco: Smoking cigarettes, cigars, or pipes can cause oral cavity and pharynx cancer, and using smokeless tobacco (such as snuff and chewing tobacco) can cause oral cavity cancer. For cigarette smokers, risk increases with the number of cigarettes smoked per day.

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.

Tobacco and alcohol use: Individuals who consumed more than a pack of cigarettes and three or more alcoholic drinks per day had a **15-fold** increased risk of oral cavity cancer and a **14-fold** increased risk of oropharyngeal cancer, compared with individuals who neither smoked nor drank.

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) can cause 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.

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.

Race: Oral cavity and pharynx cancer incidence rates among White individuals are approximately 50% higher than Black individuals and Asians/Pacific Islanders.

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.

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.

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. Using the direct method of age adjustment, the population was first divided into 19 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., 2017-2021). 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.

Incidence: The number of cases diagnosed during a specified time period (e.g., 2017-2021). 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/unknown 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., 2017-2021). 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 1999-2021 and categorized by site codes C000-C149 in accordance with the SEER Program of the National Cancer Institute.

Rate: The number of cases or deaths per unit of population (e.g., per 100,000 population) during a specified time period (e.g., 2017-2021). Rates may be unstable and are not presented when the case count is less than five or the death count is less than 10.

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/Unknown – Insufficient information is available to determine the stage or extent of the disease at diagnosis.

Table 3. Average Annual Number and Age-Adjusted Incidence and Mortality Rates of Oral Cavity and Pharynx Cancer per 100,000 Population by County of Residence, Ohio and the United States, 2017-2021

	Incidence		Mortality			Incidence		Mortality	
	Cases	Rate	Deaths	Rate		Cases	Rate	Deaths	Rate
Ohio	**1,940**	**12.8**	**449**	**2.9**	Lawrence	14	17.1	4	5.2
U.S.		**12.0**		**2.6**	Licking	30	13.4	8	3.5
Adams	6	17.7	<2	*	Logan	7	11.8	<2	*
Allen	14	10.8	4	3.2	Lorain	56	13.3	14	3.3
Ashland	11	14.9	3	4.4	Lucas	67	12.6	21	3.9
Ashtabula	22	15.7	5	3.7	Madison	7	13.0	<2	*
Athens	11	17.1	2	3.5	Mahoning	41	12.4	8	2.4
Auglaize	8	13.7	<2	*	Marion	13	16.0	2	2.5
Belmont	18	18.1	3	3.5	Medina	37	14.3	6	2.4
Brown	8	14.6	<2	*	Meigs	5	17.4	<2	*
Butler	64	13.4	12	2.5	Mercer	7	11.8	<2	*
Carroll	6	16.3	2	4.9	Miami	16	11.0	4	2.4
Champaign	6	11.2	<2	*	Monroe	2	11.0	<2	*
Clark	26	14.0	6	3.4	Montgomery	95	13.4	20	2.8
Clermont	37	13.4	7	2.9	Morgan	4	20.6	<2	*
Clinton	10	19.5	2	4.0	Morrow	7	13.2	<2	*
Columbiana	18	11.1	5	2.8	Muskingum	18	15.8	4	3.8
Coshocton	8	14.6	<2	*	Noble	3	11.9	<2	*
Crawford	9	15.2	2	4.6	Ottawa	11	15.1	3	3.5
Cuyahoga	193	11.5	50	2.9	Paulding	3	12.7	<2	*
Darke	8	10.1	3	3.5	Perry	7	14.3	3	7.5
Defiance	7	13.9	<2	*	Pickaway	10	13.7	2	2.6
Delaware	29	12.1	6	2.6	Pike	5	15.3	<2	*
Erie	17	14.7	2	2.0	Portage	25	12.0	7	3.2
Fairfield	27	13.7	7	3.8	Preble	7	11.8	<2	*
Fayette	3	8.6	<2	*	Putnam	4	9.5	<2	*
Franklin	173	12.7	32	2.4	Richland	24	13.7	6	3.5
Fulton	6	9.7	2	3.3	Ross	14	13.5	3	2.7
Gallia	4	11.5	<2	*	Sandusky	8	10.5	<2	*
Geauga	15	9.6	3	1.7	Scioto	14	14.0	2	2.5
Greene	20	9.4	6	3.0	Seneca	9	12.4	<2	*
Guernsey	8	13.5	3	4.6	Shelby	7	11.9	2	3.2
Hamilton	120	12.3	21	2.1	Stark	65	12.4	20	3.5
Hancock	13	13.4	4	4.1	Summit	95	13.3	23	3.2
Hardin	5	12.8	<2	*	Trumbull	31	10.6	6	1.9
Harrison	4	19.3	<2	*	Tuscarawas	16	13.2	5	3.9
Henry	4	9.0	<2	*	Union	9	12.6	<2	*
Highland	10	18.0	2	3.9	Van Wert	4	10.4	<2	*
Hocking	7	15.2	2	5.3	Vinton	3	13.3	<2	*
Holmes	4	7.8	<2	*	Warren	33	11.5	7	2.3
Huron	11	13.7	3	4.1	Washington	15	16.0	<2	*
Jackson	7	17.1	<2	*	Wayne	16	10.8	4	2.5
Jefferson	15	15.2	4	3.7	Williams	7	13.5	3	5.5
Knox	11	12.9	3	4.0	Wood	19	12.4	5	2.9
Lake	42	12.3	8	2.1	Wyandot	5	15.8	<2	*

Sources: Incidence – Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024; Mortality – All COD, Aggregated With State, Total U.S. (1990-2022) SEER*Stat Database, National Cancer Institute, April 2024. Underlying mortality data provided by the National Center for Health Statistics.
* Rate not calculated when the 2017-2021 death count is less than 10 (i.e., the average annual count is less than two).

Sources of Data and Additional Information

Ohio Cancer Incidence Surveillance System – Data and Statistics:
https://odh.ohio.gov/know-our-programs/ohio-cancer-incidence-surveillance-system/data-statistics/data-statistics

National Cancer Institute:
https://www.cancer.gov/types/head-and-neck

American Cancer Society:
https://www.cancer.org/cancer/types/oral-cavity-and-oropharyngeal-cancer.html
https://www.cancer.org/cancer/types/head-neck-cancer.html

Centers for Disease Control and Prevention (CDC) – Head and Neck Cancers:
https://www.cdc.gov/head-neck-cancer/about/index.html

To address comments and information requests:

Ohio Cancer Incidence Surveillance System (OCISS)
Ohio Department of Health
246 North High Street
Columbus, OH 43215
Phone: (614) 752-2689
E-mail: ociss@odh.ohio.gov

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