

Oral Cavity & Pharynx Cancer in Ohio, 2002-2006

This Report on Oral Cavity & Pharynx Cancer Contains:

- Incidence and Mortality Rates in Ohio and the U.S.
- Incidence and Mortality Rates by Age, Gender and Race
- Maps of Incidence Rates by County
- Trends in Incidence, Mortality and Stage at Diagnosis
- Stage at Diagnosis by Race
- Survival Probability by Stage at Diagnosis and Age
- Subtype and Histology Breakdown in Ohio and the U.S.
- Risk Factors
- Signs and Symptoms
- Clinical Trials
- Sources of Data and Additional Information

Oral Cavity & Pharynx Cancer Incidence and Mortality

Cancers of the oral cavity and pharynx represented 2.1 percent of the incident (newly diagnosed) cancers reported to the Ohio Cancer Incidence Surveillance System (OCISS) from 2002 through 2006 (Table 1). The average annual age-adjusted oral cavity and pharynx cancer incidence rate during this time period was 9.6 cases per 100,000 persons, or an average of 1,181 cases per year (N). The 2002-2006 average annual age-adjusted U.S.² (SEER) incidence rate of 10.4 cases per 100,000 persons was 8 percent higher than the rate for Ohio. However, estimated completeness of reporting for oral cavity and pharynx cancer in Ohio (92 percent for 2002-2006) is less than the national standard of 95 percent for complete case ascertainment. Therefore, the oral cavity and pharynx cancer incidence rates presented in this report may underestimate the true burden in Ohio. The Ohio oral cavity and pharynx cancer mortality rate of 2.6 deaths per 100,000 persons in 2002-2006 was identical to the U.S. (NCHS³) mortality rate.

Table 1: Leading Sites/Types of Cancer and Oral Cavity & Pharynx Cancer: Average Annual Number (N), Percent (%) and Age-adjusted Rates of Invasive Cancer Cases and Cancer Deaths in Ohio with Comparison to the U.S. (SEER and NCHS), 2002-2006^{1,2,3}

Incidence	N	%	Ohio		U.S.		Mortality	N	%	Ohio		U.S.	
			Rate	Rate	Rate	Rate							
All Sites/Types	57,110		466.4	462.9			All Sites/Types	24,870		201.4	189.8		
Lung and Bronchus	9,212	16.1%	75.0	63.1			Lung and Bronchus	7,406	29.8%	60.2	53.4		
Breast (Female)*	8,030	14.1%	120.4	123.8			Colon and Rectum	2,479	10.0%	20.0	18.2		
Prostate*	7,774	13.6%	144.7	159.3			Breast (Female)*	1,892	7.6%	27.0	24.5		
Colon and Rectum	6,422	11.2%	52.1	49.1			Pancreas	1,331	5.4%	10.7	10.7		
Bladder	2,660	4.7%	21.6	21.0			Prostate*	1,243	5.0%	26.9	25.6		
Non-Hodgkin's Lymphoma	2,338	4.1%	19.2	19.5			Leukemia	943	3.8%	7.7	7.3		
⋮							⋮						
Oral Cavity & Pharynx	1,181	2.1%	9.6	10.4			Oral Cavity & Pharynx	325	1.3%	2.6	2.6		

[1] Ohio Cancer Incidence Surveillance System, Chronic Disease and Behavioral Epidemiology Section and the Vital Statistics Program, Ohio Department of Health, 2009.

[2] SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2009.

[3] NCHS: National Center for Health Statistics, 2009.

*The rates of breast (female) and prostate cancer are gender specific (i.e., the population denominator is females or males only).

Technical Notes:

- Oral cavity & pharynx cancer cases were defined as follows: International Classification of Diseases for Oncology, Third Edition (ICD-O-3), codes C000-C009, C019-C069, C079-C119, C129-C142, C148, excluding histology types 9590-9989. Oral cavity and pharynx cancer deaths were defined as follows: International Statistical Classification of Diseases and Related Health Problems, Tenth Edition (ICD-10), codes C000-C149.
- The 2002-2006 rates were calculated using vintage 2007 postcensal estimates for July 1, 2002-2006 (U.S. Census Bureau, 2008). Rates are direct age-adjusted to the U.S. 2000 standard population.
- N = Average number of cases per year rounded to the nearest integer.

Oral Cavity & Pharynx Cancer Incidence by Age, Gender and Race

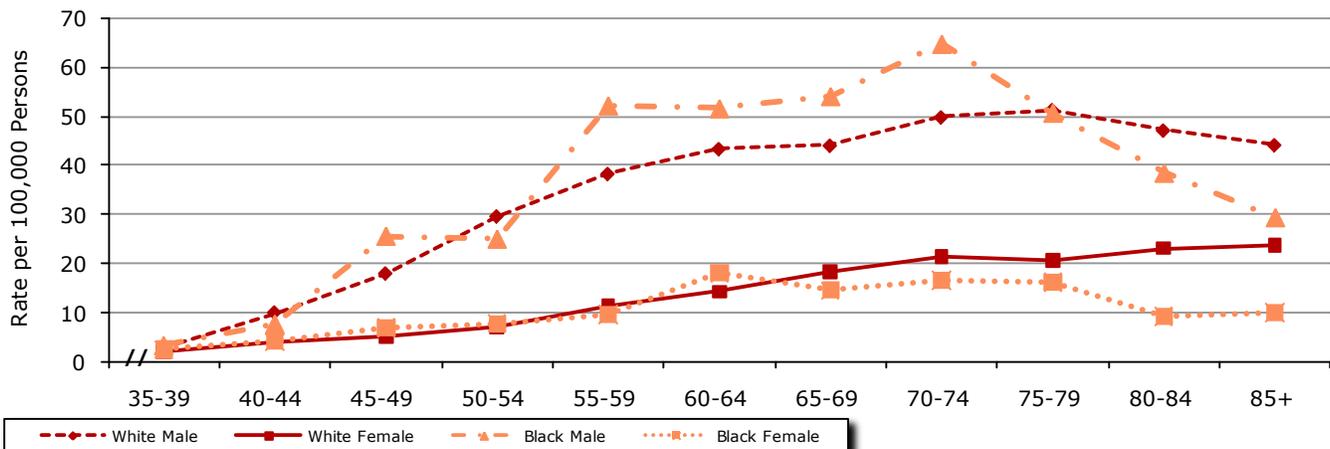
Table 2: Oral Cavity & Pharynx Cancer: Average Annual Number of Cases (N), Age-specific Incidence Rates per 100,000 Persons and Cumulative Percentages (Cum%), by Gender in Ohio, 2002-2006

Age Group	Males			Females			Total		
	N	Rate	Cum%	N	Rate	Cum%	N	Rate	Cum%
<5	<1	*	0.0%	<1	*	0.1%	<1	*	0.1%
5-9	<1	*	0.1%	<1	*	0.3%	1	0.2	0.2%
10-14	1	0.3	0.3%	<1	*	0.5%	2	0.2	0.4%
15-19	2	0.4	0.5%	3	0.7	1.3%	4	0.5	0.7%
20-24	2	0.5	0.7%	3	0.7	2.0%	4	0.6	1.1%
25-29	5	1.3	1.3%	4	1.1	3.1%	9	1.2	1.8%
30-34	8	2.3	2.3%	5	1.2	4.3%	13	1.7	2.9%
35-39	11	2.8	3.7%	9	2.2	6.7%	20	2.5	4.6%
40-44	44	10.1	9.1%	19	4.1	11.8%	63	7.1	9.9%
45-49	83	19.0	19.3%	25	5.4	18.5%	108	12.1	19.1%
50-54	116	29.6	33.5%	28	7.0	26.3%	144	18.0	31.3%
55-59	131	40.4	49.5%	39	11.4	37.0%	170	25.5	45.7%
60-64	106	44.5	62.5%	39	14.6	47.5%	144	28.7	57.9%
65-69	87	46.3	73.2%	41	18.5	58.8%	128	31.2	68.7%
70-74	82	51.7	83.2%	44	21.8	70.7%	125	35.0	79.4%
75-79	69	52.4	91.6%	39	20.9	81.5%	108	33.9	88.5%
80-84	42	48.8	96.8%	33	22.5	90.6%	76	32.2	94.9%
85+	26	44.3	100.0%	34	24.0	100.0%	60	29.9	100.0%

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2009.

* Rates may be unstable and are not presented when the case count for 2002-2006 is less than five (i.e., N<1).

Figure 1: Oral Cavity & Pharynx Cancer: Age-specific Incidence Rates (Ages 35+) per 100,000 Persons, by Gender and Race in Ohio, 2002-2006

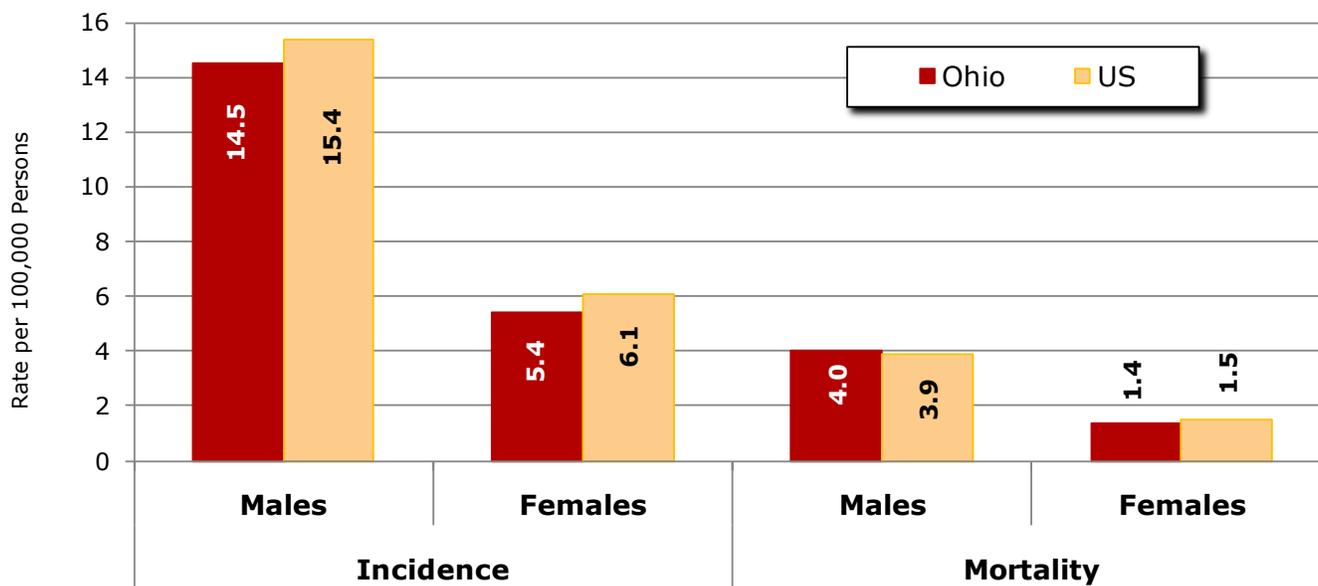


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2009.

Table 2 and Figure 1 show 2002-2006 age-specific incidence rates for oral cavity and pharynx cancer by gender and race. The majority of these cancers were diagnosed among persons 40 and older. Age-specific incidence rates were greater among males, compared to females, among those 25 and older. Among males, oral cavity and pharynx cancer incidence rates increased with advancing age group to 75-79 and then declined. Rates among females increased with advancing age from 20-24 to 70-74, declined in the 75-79 age group, and then increased among females 80 and older. Black males had the highest incidence rates among persons 55-74, compared to white males, white females and black females.

Oral Cavity & Pharynx Cancer Incidence and Mortality Rates by Gender in Ohio Compared to the United States

Figure 2: Oral Cavity & Pharynx Cancer: Average Annual Age-adjusted Incidence and Mortality Rates per 100,000 Persons, by Gender in Ohio with Comparison to the U.S. (SEER and NCHS), 2002-



[1] Ohio Cancer Incidence Surveillance System, Chronic Disease and Behavioral Epidemiology Section and the Vital Statistics Program, Ohio Department of Health, 2009.

[2] SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2009.

[3] NCHS: National Center for Health Statistics, 2009.

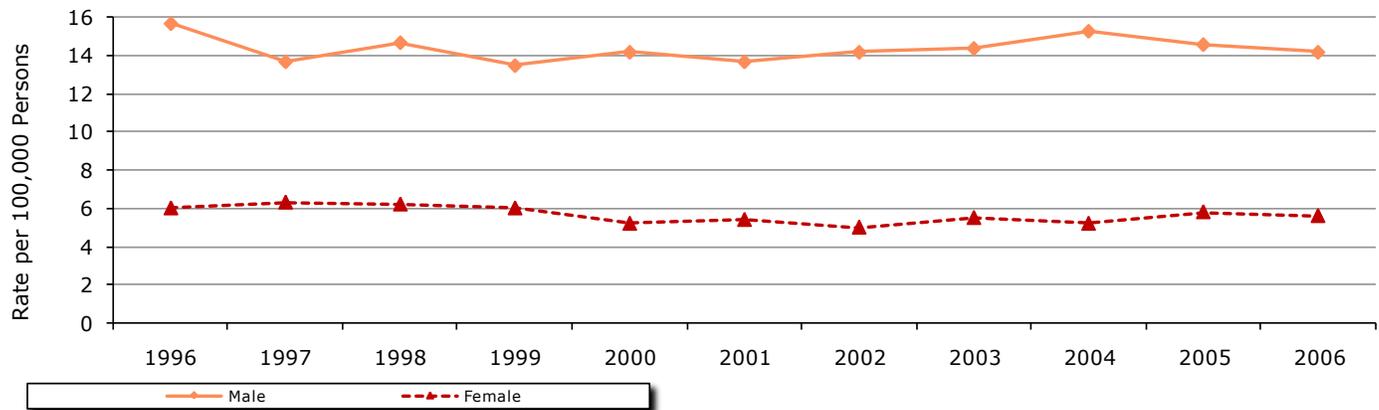
Figure 2 shows that the 2002-2006 oral cavity and pharynx cancer age-adjusted incidence rates for males were more than double the rates for females in both Ohio and the United States. Gender differences in oral cavity and pharynx cancer incidence rates are likely the result of differences in risk factors, such as tobacco and alcohol use. Incidence rates for males and females were greater in the United States compared to Ohio; however, the lower incidence rates in Ohio may be due to lower completeness of case reporting. Similar to incidence, oral cavity and pharynx cancer mortality rates were higher for males than females. Mortality rates in Ohio were similar to rates for the United States for both males and females.

Oral Cavity & Pharynx Cancer Cases and Incidence Rates by County of Residence

Figure 3 presents 2002-2006 average annual age-adjusted oral cavity and pharynx cancer incidence rates by county of residence. As shown in Figure 3, county-specific oral cavity and pharynx cancer incidence rates in Ohio ranged from 4.9 to 16.0 per 100,000 persons. To illustrate the concept that disease patterns do not abruptly change at county boundaries, Figure 4 displays the pattern of incidence after the county rates are smoothed—a statistical method in which rates are adjusted to consider the rates of neighboring geographical areas. Oral cavity and pharynx cancer incidence rates exhibit some geographical variability across the state, with a tendency for higher rates in the eastern and south-central regions of the state.

Oral Cavity & Pharynx Cancer Incidence and Mortality Trends

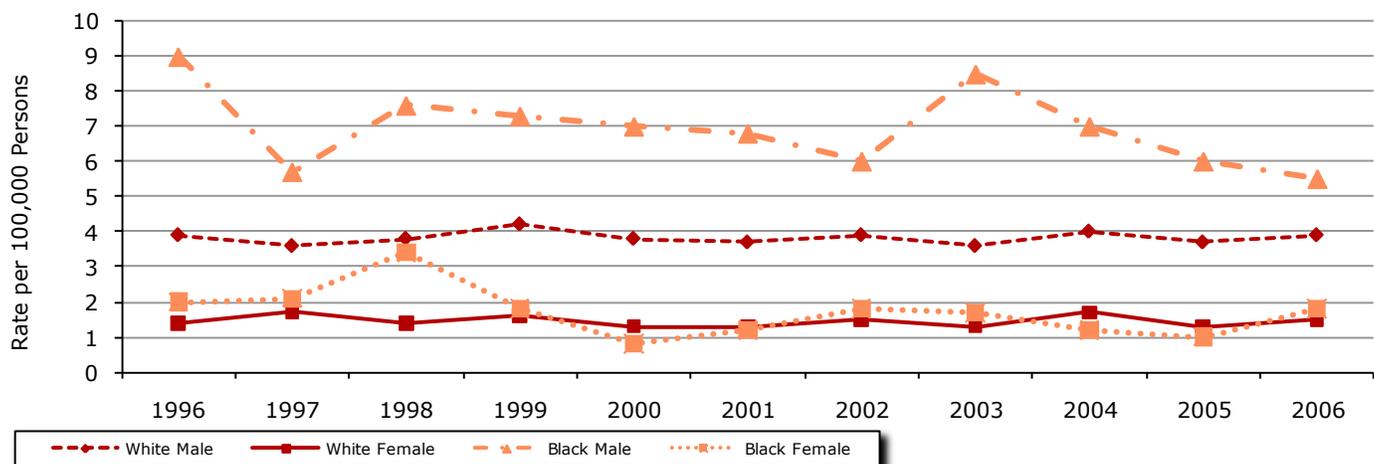
Figure 5: Oral Cavity & Pharynx Cancer: Trends in Average Annual Age-adjusted Incidence Rates per 100,000 Persons, by Gender in Ohio, 1996-2006



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2009.

Figure 5 shows incidence rates of oral cavity and pharynx cancer in Ohio according to year of diagnosis (1996 through 2006) by gender. Incidence rates among males were more than double those of females each year. From 1996 through 2006, the incidence rate decreased 7 percent among males and 3 percent among females. Incidence rates of oral cavity and pharynx cancer declined among both whites and blacks from 1996-2006, although the decline was greater among blacks (35 percent) compared to whites (5 percent) (racial differences not shown).

Figure 6: Oral Cavity & Pharynx Cancer: Trends in Average Annual Age-adjusted Mortality Rates per 100,000 Persons, by Gender and Race in Ohio, 1996-2006

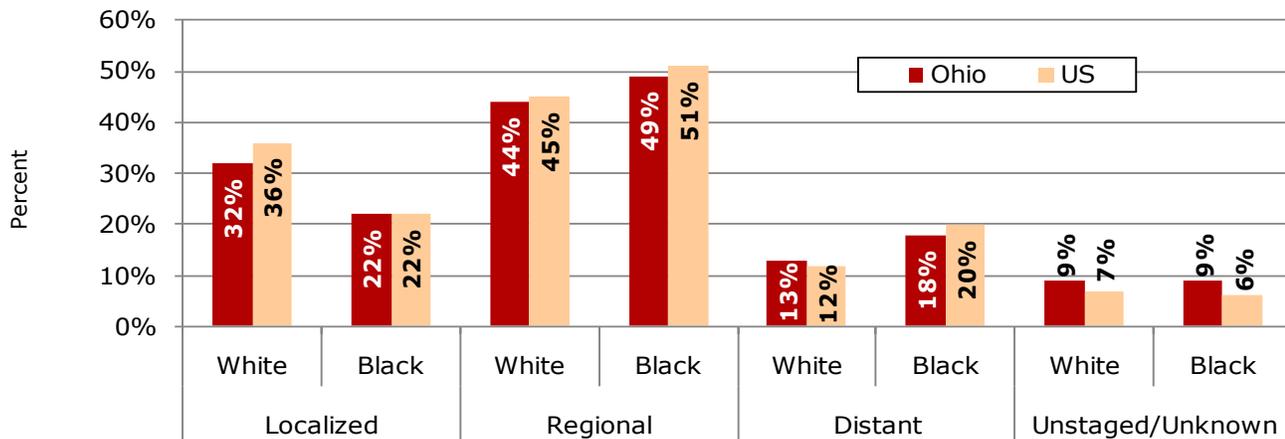


Source: Chronic Disease and Behavioral Epidemiology Section and the Vital Statistics Program, Ohio Department of Health, 2009.

Figure 6 shows trends in mortality rates of oral cavity and pharynx cancer by year of diagnosis (1996 to 2006), gender and race. Black males had the highest mortality rates each year of any gender and race category; although, the mortality rate for black males has been decreasing since 2003. White and black females had similar mortality rates over this time period with the exception of 1998 when the mortality rate for black females was more than double the rate for white females.

Oral Cavity & Pharynx Cancer by Stage at Diagnosis

Figure 7: Oral Cavity & Pharynx Cancer: Proportion of Cases (%) by Stage at Diagnosis and Race in Ohio, 2002-2006^{1,2}

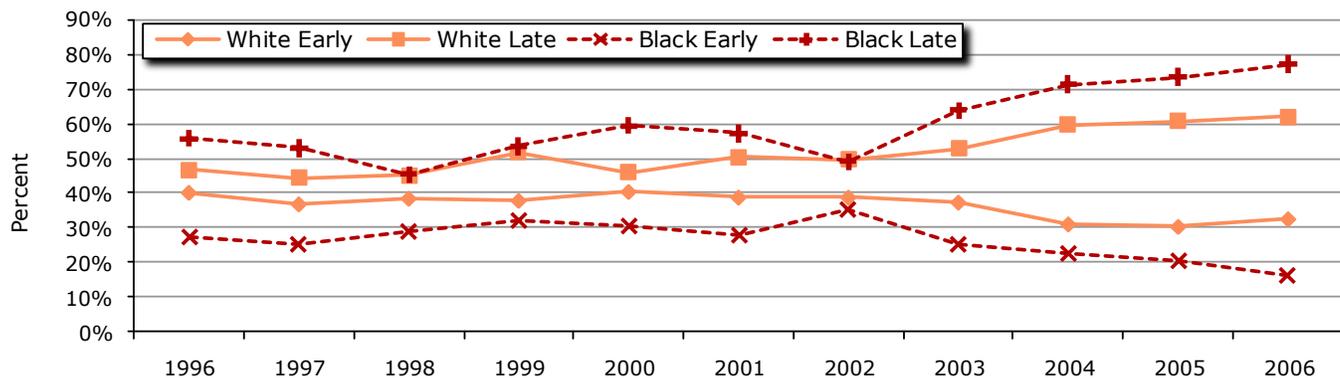


[1] Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2009.

[2] Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2009.

The stage at diagnosis of oral cavity and pharynx cancer is an important determinant of survival. In the localized stage, the tumor is confined to the oral cavity or pharynx. In the regional stage, the tumor has spread to surrounding tissues, and in the distant stage the malignancy has spread through the blood or lymphatic system to other organs. The 2002-2006 Ohio data presented in Figure 7 reveal that the percent of oral cavity and pharynx cancers diagnosed local stage was higher among whites (32 percent), compared to blacks (22 percent). Greater proportions of blacks in Ohio were diagnosed regional stage (49 percent) and distant stage (18 percent), compared to whites (44 percent and 13 percent, respectively). Proportions of cases by stage at diagnosis were similar in Ohio and the United States.

Figure 8: Oral Cavity & Pharynx Cancer: Trends in the Proportion of Cases (%) by Stage at Diagnosis and Race in Ohio, 1996-2006



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2009.

Figure 8 shows the distribution of early (local) and late (regional or distant) stage at diagnosis of oral cavity and pharynx cancer by year of diagnosis and race. For both whites and blacks, there was a steady increase in the proportion of late-stage diagnoses from 2002 through 2006. In contrast, the proportion of whites and blacks diagnosed early stage and unstaged/unknown stage (not shown) declined from 2002 through 2006.

Oral Cavity & Pharynx Cancer Survival Probability

Table 3: Oral Cavity & Pharynx Cancer: Five-year Survival Probability (%) by Stage at Diagnosis, Gender and Race in the U.S. (SEER), 1999-2005

Stage at Diagnosis	Overall	White Male	White Female	Black Male	Black Female
All Stages	61.0%	62.4%	63.8%	38.2%	53.2%
Localized	82.7%	82.9%	83.4%	65.7%	85.1%
Regional	54.3%	58.2%	50.9%	34.8%	40.6%
Distant	31.8%	31.3%	34.1%	23.5%	27.5%
Unstaged/Unknown	53.4%	53.3%	53.8%	35.9%	47.4%

Source: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2009.

Table 3 shows that the U.S. (SEER) five-year oral cavity and pharynx cancer survival probability for all races and both genders combined was 61.0 percent for all stages combined. White females had the greatest five-year survival probability for all stages combined (63.8 percent), followed closely by white males (62.4 percent). Black females (53.2 percent) and black males (38.2 percent) had considerably lower survival probabilities for all stages combined. The reason for this racial disparity may be due to a greater proportion of distant stage diagnoses among black males (21 percent) and black females (18 percent), compared to white males (13 percent) and white females (11 percent) (not shown).

Table 4: Oral Cavity & Pharynx Cancer: Five-year Survival Probability (%) by Age at Diagnosis (< 65 and ≥ 65), Gender and Race in the U.S. (SEER), 1999-2005

Age at Diagnosis	Overall	White Male	White Female	Black Male	Black Female
< 65 Years	65.5%	66.4%	73.1%	40.2%	55.0%
≥ 65 Years	52.5%	54.1%	53.3%	30.4%	47.3%

Source: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2009.

Table 4 shows that the U.S. (SEER) five-year survival probabilities for all stages combined were higher for persons younger than 65 (65.5 percent), compared to those 65 and older (52.5 percent). This age disparity was also observed for whites and blacks of both genders. This breakdown shows that black males and females had lower survival than both white males and females in both age groups, with younger white females (less than 65) having the highest survival probability of all age, gender and race combinations.

Did You Know?

Early detection of oral cavity and pharynx cancer greatly improves survival probability. Dentists play an important role in screening for oral cavity and pharynx cancer and should conduct this screening at each routine dental examination.

Oral Cavity & Pharynx Cancer By Subtype

Table 5: Oral Cavity & Pharynx Cancer: Average Annual Number (N), Age-adjusted Incidence Rates per 100,000 Persons and Percent Distribution by Subtype in Ohio with Comparison to the U.S. (SEER), 2002-2006^{1,2,3}

Subtype	Ohio			US	
	N	Rate	Percent	Rate	Percent
All Oral Cavity and Pharynx	1,181	9.6		10.6	
Lip	44	0.4	4%	0.8	8%
Tongue	333	2.9	28%	2.8	26%
Gum and Other Mouth	171	1.5	15%	1.5	14%
Floor of Mouth	80	0.7	7%	0.6	6%
Tonsil and Oropharynx	244	2.1	21%	1.9	18%
Hypopharynx	83	0.7	7%	0.7	7%
Salivary Gland	143	1.2	12%	1.2	11%
Nasopharynx	55	0.5	5%	0.7	7%
Other Oral Cavity and Pharynx	27	0.2	2%	0.2	2%

[1] Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2009.

[2] SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2009.

[3] Histology subtypes were defined using the International Classification of Diseases for Oncology, Third Edition (ICD-O-3).

Table 5 shows the average annual age-adjusted incidence rate per 100,000 persons and the percent distribution of oral cavity and pharynx cancers overall and by subtype in Ohio and the United States (SEER). In both Ohio and the United States, more than 25 percent of the oral cavity and pharynx cancers were found on the tongue. This is followed closely by tumors diagnosed on the tonsil and oropharynx. The average annual age-adjusted incidence rates were similar in Ohio and the United States for all subtypes, with the exception of lip, for which the U.S. rate (0.8 per 100,000) was two times higher than the Ohio rate (0.4 per 100,000).

Oral Cavity & Pharynx Cancer By Histology

Table 6: Oral Cavity & Pharynx Cancer: Average Annual Number (N) and Percent Distribution by Histology in Ohio with Comparison to the U.S. (SEER), 2002-2006^{1,2,3}

Histology (ICD-O-3 codes)	Ohio		U.S.
	N	Percent	Percent
Epidermoid carcinoma (8051-8131)	968	82.0%	82.8%
Squamous cell carcinoma (8070-8078, 8083-8084)	944	79.9%	80.2%
Adenocarcinoma (8050, 8140-8147, 8160-8162, 8180-8221, 8250-8507, 8514, 8520-8551, 8560, 8570-8574, 8576, 8940-8941)	131	11.1%	11.2%
Other specific carcinomas (8012-8015, 8030-8046, 8150-8155, 8170-8180, 8230-8249, 8508, 8510-8513, 8561-8562, 8575, 8580-8671)	14	1.2%	1.1%
Unspecified, Carcinoma, NOS (8010-8011, 8020-8022)	41	3.5%	3.7%
Sarcoma and soft tissue (8680-8713, 8800-8921, 8990-8991, 9040-9044, 9120-9136, 9150-9252, 9370-9373, 9540-9582,)	4	0.4%	0.5%
Other specific types (8720-8790, 8930-8936, 8950-8983, 9060-9110, 9260-9365, 9380-9539)	5	0.4%	0.5%
Unspecified (8000-8005)	16	1.4%	0.3%

[1] Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2009.

[2] SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2009.

[3] Histology types were defined using the International Classification of Diseases for Oncology, Third Edition (ICD-O-3).

Table 6 shows the distribution of oral cavity and pharynx cancer in Ohio and the United States by histologic grouping. The proportions for most histologic groupings are similar to but slightly higher in the United States, compared to Ohio; although, this may be due to a lower completeness of reporting in Ohio.

Did You Know?

The probability of surviving oral cavity and pharynx cancer is largely dependent on the specific anatomic site of the tumor and the histologic grouping. For example, only 29.2 percent of individuals diagnosed with hypopharynx cancer survive five years, while 91.1 percent of those diagnosed with lip cancer survive five years.

Oral Cavity & Pharynx Cancer Risk Factors

There are three primary risk factors that contribute to the development of oral cavity and pharynx cancer: tobacco and alcohol use (especially in combination) and exposure to the human papillomavirus type 16 (HPV-16), a recently identified cause. Confirmed oral cavity and pharynx cancer risk factors include:

- **Gender** — Males have about two times the risk as compared to females.
- **Age** — Risk increases with advancing age, especially after 40.
- **Tobacco use** — Tobacco use, which includes smoking cigarettes, cigars or pipes; chewing tobacco; or dipping snuff, accounts for about 90 percent of cases. The risk increases with the amount and duration of use.
- **Alcohol use** — Chronic and/or heavy alcohol consumption increases risk and is a factor in about 75 to 80 percent of cases. Persons who use both alcohol and tobacco in combination are at especially high risk.
- **HPV infection** — Infection with HPV-16 has recently been identified as a leading risk factor, and infection with additional types of HPV may play a role in the development of some oral cavity and pharynx cancers.
- **UV exposure** — Exposure to the sun/ultraviolet light increases risk for cancer of the lip.
- **Precancerous lesions** — History of leukoplakia (whitish patch inside the mouth) and erythroplakia (reddish patch inside the mouth) increases risk.
- **Insufficient fruit and vegetable consumption** — A diet low in fruits and vegetables is associated with increased risk.
- **Personal History** — People who have had oral cavity and pharynx cancer are at increased risk of de-

Oral Cavity & Pharynx Cancer Signs and Symptoms

The most common symptoms of oral cavity and pharynx cancer include:

- Swelling, thickening, lumps, bumps, rough spots, crusts or erosion on the lips, gums or other areas inside the mouth
- The development of velvety white, red or speckled (white and red) patches in the mouth
- Unexplained bleeding in the mouth
- Unexplained numbness, loss of feeling or pain/tenderness in any area of the face, mouth or neck
- Persistent sores on the face, neck or mouth that bleed easily and do not heal within 2 weeks
- A soreness or feeling that something is caught in the back of the throat
- Difficulty chewing or swallowing, speaking or moving the jaw or tongue
- Hoarseness, chronic sore throat or change in voice
- Ear pain
- Loosening of teeth, swelling around the teeth or jaws or a change in the way teeth or dentures fit together
- Dramatic weight loss
- Numbness of the tongue or other areas of the mouth
- Lump or mass in the neck
- Persistent bad breath

It is possible that one or more of these signs and symptoms may be the result of other health problems. If you have any of these symptoms, consult your health care provider.

Clinical Trials Information

Clinical trials test many types of treatments including new drugs, surgical procedures, radiation therapy and combinations of these. The goal of conducting clinical trials is to find better ways to treat cancer. To obtain information concerning clinical trials for oral cavity and pharynx cancer, please talk with your health care provider or visit one of the following Web sites:

- **National Cancer Institute:**
<http://www.cancer.gov/clinicaltrials>
- **American Cancer Society:**
http://www.cancer.org/docroot/ETO/ETO_6.asp?sitearea=ETO
- **The Ohio State University Comprehensive Cancer Center—Arthur G. James Cancer Hospital and Richard J. Solove Research Institute:**
<http://www.jamesline.com/trials>
- **The Cleveland Clinic:**
http://my.clevelandclinic.org/cancer/clinical_trials/default.aspx
- **Case Western Reserve University Comprehensive Cancer Center:**
<http://cancer.case.edu/sharedresources/clinicaltrials>
- **University of Cincinnati:**
<http://uccancercenter.uc.edu/research/clinicaltrials>
- **Toledo Community Hospital Oncology Program:**
<http://www.tchop.com/clinical/default.asp>
-
- **Dayton Clinical Oncology Program:**
<http://www.med.wright.edu/dcop>
-
- **Columbus Community Clinical Oncology Program:**
<http://www.columbusccop.org>

Sources of Data and Additional Information

- **Ohio Cancer Incidence Surveillance System:**
http://www.odh.ohio.gov/odhPrograms/dis/ociss/ci_surv1.aspx
 - **National Cancer Institute:**
<http://www.cancer.gov/cancertopics/types/oral>
 - **American Cancer Society:**
http://www.cancer.org/docroot/CRI/CRI_2_3x.asp?dt=60
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Ohio Cancer Incidence Surveillance System (OCISS)

Ohio Department of Health

and

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