



Testicular Cancer in Ohio, 2009-2013

Incidence and Mortality

Compared to other cancers, testicular cancer is rare, representing only 1 percent of cancer diagnoses among U.S. males.

Among Ohio males, testicular cancer made up 0.9 percent of newly diagnosed (incidence) cancer cases reported to the Ohio Cancer Incidence Surveillance System (OCISS) from 2009 to 2013. An average of 284 cases of testicular cancer were diagnosed annually in Ohio during this time period (Table 1). The average annual age-adjusted incidence rate in Ohio was 5.4 cases per 100,000 males, compared to the national (SEER) incidence rate of 5.7 per 100,000. Reporting of testicular cancer in Ohio was 100 percent complete in 2009-2013.

There were differences in incidence rates between races and age groups in 2009-2013; for example, the testicular cancer incidence rate was six times higher among whites compared to blacks in Ohio. In contrast to other types of cancer, the incidence of testicular cancer is higher among men younger than 65.

An average of 14 deaths from testicular cancer occurred each year in Ohio in 2009-2013 (Table 1). Ohio's average annual age-adjusted testicular cancer mortality rate was 0.2 per 100,000, compared to the U.S. mortality rate of 0.3 per 100,000.

Key Findings and Populations at High Risk

- An average of 284 new cases and 14 deaths occurred each year due to testicular cancer in Ohio during 2009-2013.
- In Ohio, the testicular cancer incidence rate among whites was six times higher than blacks and four times higher than Asian/Pacific Islanders in 2009-2013.
- Testicular cancer most often occurs in young and middle-aged men between the ages of 20 and 34.
- Testicular cancer incidence and mortality rates in Ohio have been relatively stable from 1996 to 2013.
- The geographic pattern of testicular cancer was relatively sporadic in Ohio during 2009-2013.
- In Ohio, 68 percent of testicular cancers were diagnosed at an early (*in situ* or local) stage and about 29 percent were diagnosed at a late (regional or distant) stage.
- Nationally, the five-year relative survival probability for patients with testicular cancer is 95 percent.
- The most common histology type of testicular cancer in Ohio is seminoma (54.6 percent of cases).

Table 1. Testicular Cancer: Average Annual Number of Invasive Cancer Cases and Deaths and Age-adjusted Incidence and Mortality Rates per 100,000 Males by Race and Age Group in Ohio and the United States, 2009-2013

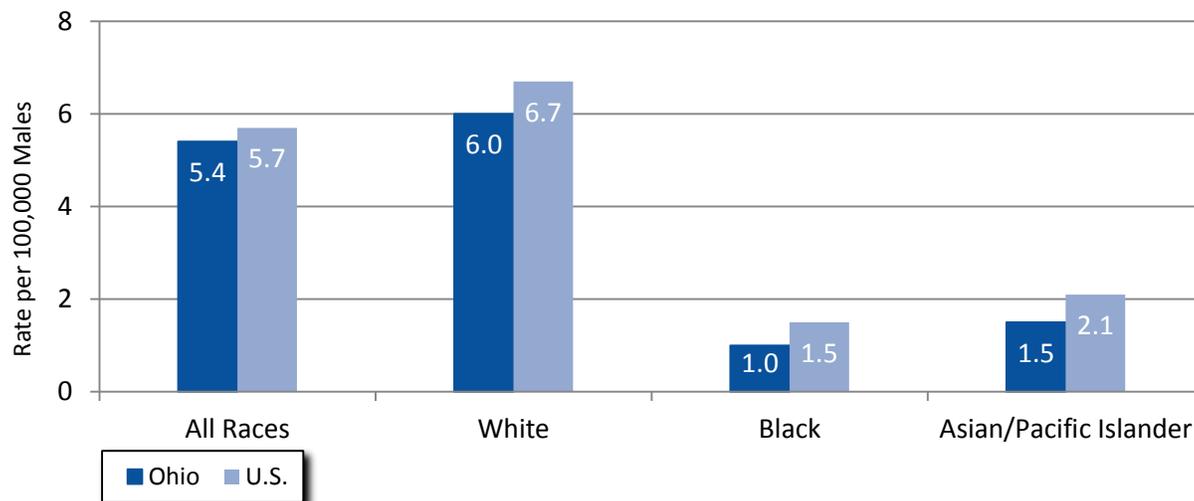
		Incidence			Mortality		
		Ohio Cases	Ohio Rate	U.S. Rate	Ohio Deaths	Ohio Rate	U.S. Rate
Total		284	5.4	5.7	14	0.2	0.3
Race	White	268	6.0	6.7	13	0.3	0.3
	Black	7	1.0	1.5	<1	*	0.1
	Asian/Pacific Islander	2	1.5	2.1	0	*	0.1
Age Group	<65	274	5.9	6.3	12	0.2	0.2
	65+	10	1.4	1.2	2	0.3	0.3

Sources: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2016; Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, 2016; Bureau of Vital Statistics, Ohio Department of Health, 2016; National Center for Health Statistics, 2016.

*Rate not presented when the count for 2009-2013 is less than five (i.e., the average annual count is less than one).

Incidence by Race

Figure 1. Testicular Cancer: Average Annual Age-adjusted Incidence Rates per 100,000 Males by Race in Ohio and the United States, 2009-2013



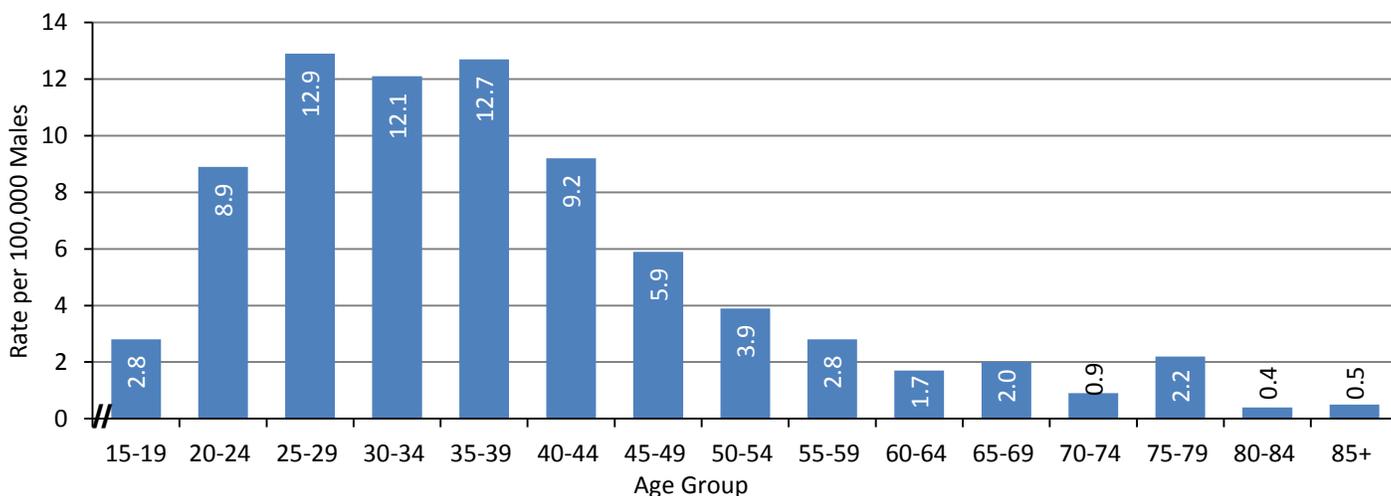
Sources: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2016; Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, 2016.

Figure 1 shows the testicular cancer age-adjusted incidence rate among whites in Ohio was six times higher than blacks and four times greater than Asian/Pacific Islanders in 2009-2013. The Ohio testicular cancer incidence rate (5.4 per 100,000 males) was slightly lower than the U.S. rate (5.7 per 100,000 males). In addition, Ohio testicular cancer incidence rates were lower than the U.S. rates for whites, blacks and Asian/Pacific Islanders.

Incidence by Age Group

Testicular cancer is most common in young adults. Nationally, testicular cancer is most frequently diagnosed among men aged 20-34, with a median age at diagnosis of 33 years. In Ohio, testicular cancer incidence rates were highest among men between the ages of 25 to 39 and then declined among men 40 and older (Figure 2).

Figure 2. Testicular Cancer: Average Annual Age-specific Incidence Rates per 100,000 Males by Age Group in Ohio, 2009-2013

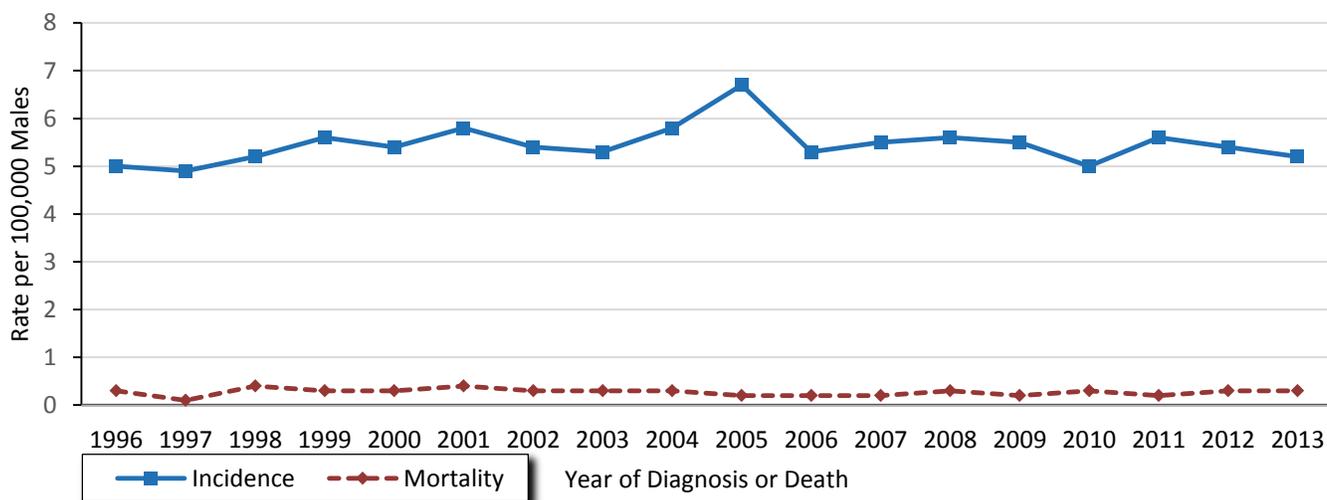


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2016.

Trends in Rates

Figure 4 shows incidence and mortality rates of testicular cancer by year of diagnosis or death (1996 through 2013) for Ohio males. Incidence rates for new testicular cancer cases in Ohio were relatively stable from 1996 to 2013. In contrast, rates for new testicular cancer cases in the United States rose an average of 0.8 percent per year from 2004 to 2013. Similar to the United States, mortality rates in Ohio were stable during this time period.

Figure 4. Testicular Cancer: Trends in Age-adjusted Incidence and Mortality Rates per 100,000 Males in Ohio, 1996-2013



Source: Ohio Cancer Incidence Surveillance System, Chronic Disease Epidemiology and Evaluation Section and the Bureau of Vital Statistics, Ohio Department of Health, 2016.

Signs and Symptoms

The most common sign of testicular cancer is a lump or swelling in the testicle.

Early Detection

There is no standard or routine screening test used for the early detection of testicular cancer. Most often, testicular cancer is first found by men themselves, either by chance or during self-exam. Sometimes the cancer is found by a healthcare provider during a routine physical exam.

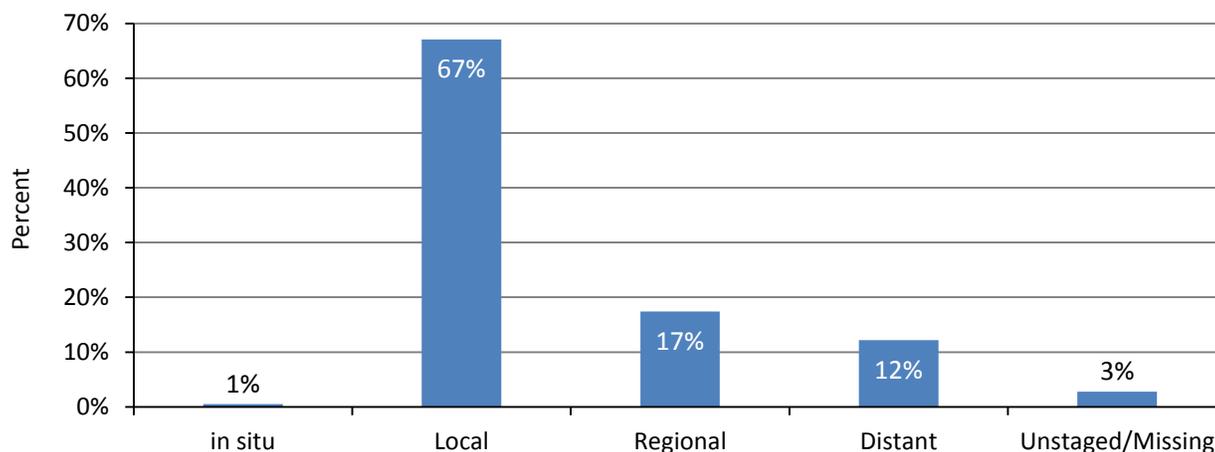
Did You Know?

Unlike many other cancers, testicular cancer is largely a disease of young and middle-aged men. The average age at the time of diagnosis is about 33. However, testicular cancer can affect males of any age, including children, adolescents and elderly men.

Stage at Diagnosis

Cancer stage at diagnosis, which refers to the extent or spread of a cancer in the body, helps to determine treatment options and is an important determinant of survival. For *in situ* cancers, the tumor has not invaded or penetrated surrounding tissue. In the local (or localized) stage, the tumor is confined to the organ in which it originated. In the regional stage, the tumor has spread to surrounding tissues. In the distant stage, the malignancy has spread, or metastasized, to other organs. In Ohio, 68 percent of testicular cancers were diagnosed at an early (*in situ* or local) stage, and about 29 percent were diagnosed at a late (regional or distant) stage in 2009-2013. The percentage of testicular cancers reported unstaged or missing stage in Ohio was approximately 3 percent (Figure 5).

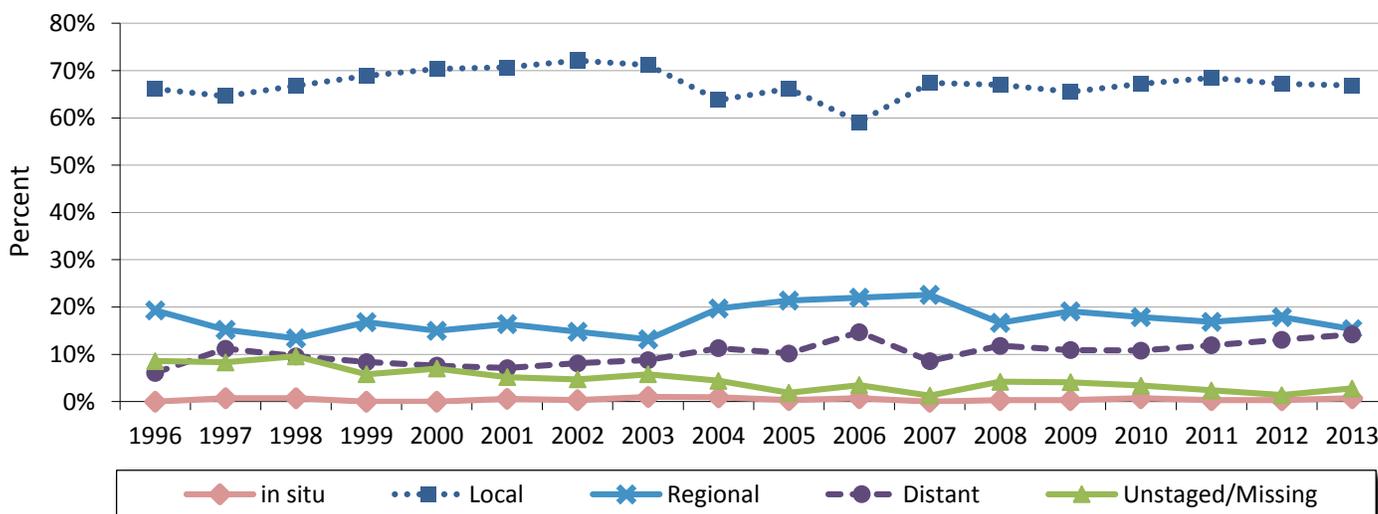
Figure 5. Testicular Cancer: Proportion of Cases by Stage at Diagnosis in Ohio, 2009-2013



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2016.

Figure 6 shows the proportions of testicular cancer cases diagnosed in Ohio at each stage from 1996 to 2013. The proportion of testicular cancers diagnosed at the *in situ* stage remained less than or equal to 1 percent, and the proportions diagnosed at the local and regional stages remained relatively stable during this time period. The proportion of testicular cancers diagnosed at the distant stage trended slightly upward from 1996 to 2013, while the proportion with an unstaged/missing stage at diagnosis decreased from 9 percent in 1996 to 3 percent in 2013.

Figure 6. Testicular Cancer: Trends in Proportion of Cases (%) by Stage at Diagnosis in Ohio, 1996-2013



Source: Ohio Cancer Incidence Surveillance Program, Ohio Department of Health, 2016.

Survival

Table 2 shows the five-year relative survival probability for patients with testicular cancer in 2006-2012 was 95 percent, based on SEER data. Five-year relative survival probabilities were 99 percent at the local stage, 96 percent at the regional stage and 74 percent at the distant stage. The five-year relative survival probability was higher among whites compared to blacks at each stage of diagnosis. The earlier testicular cancer is diagnosed and treated, the better chance a person has of surviving five years after being diagnosed.

Table 2. Testicular Cancer: Five-year Survival Probability (%) by Stage at Diagnosis the United States, 2006-2012

	Five-year Survival Probability		
	All Races	White	Black
All Stages	95.4%	95.5%	90.6%
Local	99.3%	99.4%	97.2%
Regional	96.1%	96.3%	89.2%
Distant	73.9%	74.3%	66.3%
Unstaged/Missing	77.4%	76.1%	*

Source: Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, 2016.

* Statistic could not be calculated due to fewer than 25 cases during this time period.

Histology

Histology refers to the cancer tissue or cell type. Most testicular cancers are germ cell tumors. The five subtypes of testicular germ cell tumors include seminomas, embryonal carcinomas, teratomas, yolk sac tumors and choriocarcinomas. Seminoma is a subtype of testicular cancer that develops from cells that give rise to sperm cells. Tumors that are 100 percent seminoma are considered seminomas. All other subtypes, including those that have a mixture of seminoma and non-seminoma components, are considered non-seminomas. Table 3 shows the distribution of invasive testicular cancer cases in Ohio and the United States by histology during 2009-2013. The majority of testicular cancers in Ohio and the United States were seminomas during this time period.

Table 3. Testicular Cancer: Percent Distribution by Histology in Ohio and the United States, 2009-2013

Histology (ICD-O-3 Histology Code)	Ohio	U.S.
	Percent	Percent
Seminoma (9061-9063)	54.6%	53.2%
Non-seminoma*	45.4%	46.7%

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2016; Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, 2016.

Percents may not sum to 100 due to rounding.

*All testicular cancer histology codes not including 9061-9063.

Risk Factors and Populations at High Risk

A cancer risk factor is anything that increases a person's risk of developing cancer. However, having one or more risk factors does not mean that a person will develop cancer. The following have been identified as risk factors for testicular cancer:

- **Age:** Half of all testicular cancers occur in men between the ages of 20 and 34.
- **Race:** Risk of testicular cancer is higher among whites than blacks and Asian/Pacific Islanders.
- **Family history:** Risk is increased in men with a family history of testicular cancer, particularly if a father or brother has had testicular cancer.
- **Cryptorchidism:** This condition, in which the testicles do not descend into the scrotum before birth, increases risk.
- **Personal history:** A man who has developed cancer in one testicle has increased risk of developing cancer in the other.

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 testicular cancer, please talk with your healthcare provider or visit one of the following websites:

National Cancer Institute:

<http://www.cancer.gov/about-cancer/treatment/clinical-trials>

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://cancer.osu.edu/patientsandvisitors/cancerinfo/clinical_trials/Pages/index.aspx

The Cleveland Clinic:

http://my.clevelandclinic.org/cancer/clinical_trials/default.aspx

Case Western Reserve University Comprehensive Cancer Center:

<http://cancer.case.edu/patientinfo/clinical-trials/>

University of Cincinnati:

<http://cancer.uc.edu/patientcare/ClinicalTrials/Overview.aspx>

Toledo Community Hospital Oncology Program:

<http://trials.tcop.info/clinical-trials/>

Dayton Clinical Oncology Program:

<http://www.med.wright.edu/dcop/Clinical%20Trials.htm>

Columbus Community Clinical Oncology Program:

<http://columbusccop.org/>

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., 2009-2013). 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 1996-2013 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 2014 bridged-race postcensal population estimates for July 1, 2010-July 1, 2014 (released 6/30/2015).

Five-year Relative Survival: The percentage of people who are alive five years after a cancer diagnosis divided by the percentage of people in the general population of the same age and sex and who have not been diagnosed with cancer. Five-year relative survival statistics are from the SEER Program 18 areas for diagnosis years 2006-2012.

Incidence: The number of cases diagnosed during a specified time period (e.g., 2009-2013). Testicular cancer cases were defined as follows: International Classification of Diseases for Oncology, Third Edition (ICD-O-3), codes C62.0-C62.9 and histology types 0000-9049, 9056-9139, 9141-9589, or 9993-9999.

Invasive Cancer: A malignant tumor that has infiltrated the organ in which the tumor originated. Invasive cancers consist of those diagnosed at the localized, 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., 2009-2013). Testicular cancer deaths were defined as follows: International Statistical Classification of Diseases and Related Health Problems, Ninth Edition (ICD-9), codes 186 for 1996-1998 and International Statistical Classification of Diseases and Related Health Problems, Tenth Edition (ICD-10), codes C62.0-C62.9 for 1999-2013.

Rate: The number of cases or deaths per unit of population (e.g., per 100,000 persons) during a specified time period (e.g., 2009-2013). Rates may be unstable and are not presented when the count is less than five.

Stage at Diagnosis: The degree to which a tumor has spread from its site of origin at the time of diagnosis. Cancer stage is often related to survival and is used to select appropriate treatment. Patients with early stage disease often have better long-term survival, and detecting cancers at an early stage may lead to a reduction in mortality. The stages presented in this report, in the order of increasing spread, are *in situ*, local, regional and distant. *In situ* and localized tumors are referred to as early stage tumors, and regional and distant tumors are termed late stage. Cancers diagnosed at the local, regional, distant and unstaged/missing stages are categorized as invasive.

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.

Table 4. Testicular Cancer: Average Annual Number of Invasive Cancer Cases and Age-adjusted Incidence Rates per 100,000 Persons by County of Residence in Ohio, 2009-2013

	Cases	Rate		Cases	Rate
Ohio	284	5.4	Lawrence	1	5.3
U.S.		5.7	Licking	5	7.0
Adams	<1	*	Logan	<1	*
Allen	2	3.7	Lorain	8	5.6
Ashland	1	5.6	Lucas	9	4.4
Ashtabula	4	9.5	Madison	2	6.6
Athens	1	5.1	Mahoning	7	6.2
Auglaize	2	8.9	Marion	1	3.2
Belmont	1	3.7	Medina	4	5.7
Brown	<1	*	Meigs	<1	*
Butler	9	4.9	Mercer	2	8.5
Carroll	<1	*	Miami	3	7.6
Champaign	1	7.2	Monroe	<1	*
Clark	3	4.5	Montgomery	13	5.6
Clermont	5	5.1	Morgan	<1	*
Clinton	2	9.6	Morrow	<1	*
Columbiana	3	6.1	Muskingum	2	5.5
Coshocton	1	6.4	Noble	<1	*
Crawford	<1	*	Ottawa	1	8.4
Cuyahoga	30	5.3	Paulding	<1	*
Darke	2	6.2	Perry	<1	*
Defiance	1	5.7	Pickaway	1	3.2
Delaware	4	5.2	Pike	<1	*
Erie	2	4.6	Portage	5	7.0
Fairfield	4	5.4	Preble	<1	*
Fayette	2	13.6	Putnam	1	7.2
Franklin	30	4.7	Richland	4	6.3
Fulton	<1	*	Ross	1	3.6
Gallia	<1	*	Sandusky	<1	*
Geauga	3	7.9	Scioto	3	8.8
Greene	3	3.7	Seneca	1	3.9
Guernsey	<1	*	Shelby	1	4.6
Hamilton	14	3.6	Stark	10	5.8
Hancock	2	6.0	Summit	15	6.0
Hardin	<1	*	Trumbull	7	8.6
Harrison	<1	*	Tuscarawas	4	9.6
Henry	<1	*	Union	<1	*
Highland	<1	*	Van Wert	1	8.1
Hocking	1	7.7	Vinton	<1	*
Holmes	1	4.6	Warren	4	3.7
Huron	1	5.1	Washington	1	4.8
Jackson	<1	*	Wayne	3	6.9
Jefferson	2	5.9	Williams	1	5.7
Knox	2	7.7	Wood	4	5.9
Lake	9	8.9	Wyandot	<1	*

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2016; Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, 2016.

*Rate not presented when the count for 2009-2013 is less than five (i.e., the average annual count is less than one).

Sources of Data and Additional Information

Ohio Cancer Incidence Surveillance System:

http://www.healthy.ohio.gov/cancer/ocisshs/ci_surv1.aspx

National Cancer Institute:

<http://www.cancer.gov/types/testicular>

<http://www.cancer.gov/types/testicular/hp>

American Cancer Society:

<http://www.cancer.org/cancer/testicularcancer/detailedguide/index>

To address comments and information requests:

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Columbus, OH 43215

Phone: (614) 752-2689

Fax: (614) 644-8028

E-mail: ociss@odh.ohio.gov

OCISS website: http://www.healthy.ohio.gov/cancer/ocisshs/ci_surv1.aspx

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