

Cervical Cancer in Ohio 2024

January 2024

Key Findings

- An average of 477 cases of cervical cancer were diagnosed each year in Ohio during 2016-2020.
- The cervical cancer incidence rate in Ohio was 7.8 per 100,000 females, compared with the national rate of 7.7 per 100,000 females during 2016-2020.
- In both Ohio and the United States, Black women had higher cervical cancer mortality rates than White women.
- Cervical cancer was most frequently diagnosed among women in the 35-44 age group, while deaths due to cervical cancer was highest among women in the 55-64 age group.
- In Ohio, cervical cancer incidence rates decreased 25% from 1996 to 2020, while mortality rates fell 35% during that time.
- Incidence rates for cervical cancer do not show an apparent geographic pattern by county in Ohio during 2016-2020.
- In Ohio during 2016-2020, 45% of cervical cancer cases were diagnosed at an early (local) stage.
- In Ohio, there was an increase in late-stage cervical cancers and a decrease in early-stage cancers from 1996 to 2020.
- The five-year relative survival for cervical cancer patients was 70.2% overall in Ohio.
- Almost all (91%) cervical cancers are caused by infection with the human papillomavirus (HPV).
- Vaccination is the best way to protect against cancers caused by HPV infections.

New Cases

Cancers of the cervix (also known as cervical cancer) made up 0.7% of newly diagnosed (incidence) cancer cases in Ohio reported to the Ohio Cancer Incidence Surveillance System (OCISS) from 2016 to 2020. An average of 477 cases of cervical cancer were diagnosed annually in Ohio during this time period (Table 1). The average annual age-adjusted cervical cancer incidence rate in Ohio was 7.8 cases per 100,000 females, compared with the national incidence rate of 7.7 per 100,000 females. In Ohio during 2016-2020, the cervical cancer incidence rate was highest among White women (7.9 per 100,000 females) and lowest among Asian/Pacific Islander women (3.4 per 100,000 females). Women younger than 65 years old are more likely to be diagnosed with cervical cancer than those 65 years old and older.

Deaths

An average of 157 deaths from cervical cancer occurred each year in Ohio during 2016-2020 (Table 1). Ohio's average annual age-adjusted cervical cancer mortality rate (2.2 per 100,000 females) was the same as the U.S. mortality rate. The mortality rate was higher for Black Ohio women (3.0 deaths per 100,000 females) than White Ohio women (2.2 per 100,000 females) during this time period. Cervical cancer mortality rates were nearly three times higher for women 65 years old and older than those younger than 65 years old in Ohio and the United States.

Table 1. Average Annual Number of Cervical Cancer Cases and Deaths and Age-Adjusted Incidence and Mortality Rates per 100,000 Females by Race and Age Group, Ohio and the United States, 2016-2020

		Incidence			Mortality		
		Ohio Cases	Ohio Rate	U.S. Rate	Ohio Deaths	Ohio Rate	U.S. Rate
Ohio Total		477	7.8	7.7	157	2.2	2.2
Race	White	400	7.9	7.7	129	2.2	2.1
	Black	61	7.6	8.6	25	3.0	3.2
	A/PI	5	3.4	6.1	<2	*	1.6
Age Group	<65	385	7.8	7.3	101	1.8	1.8
	65+	92	8.2	10.1	56	5.0	5.3

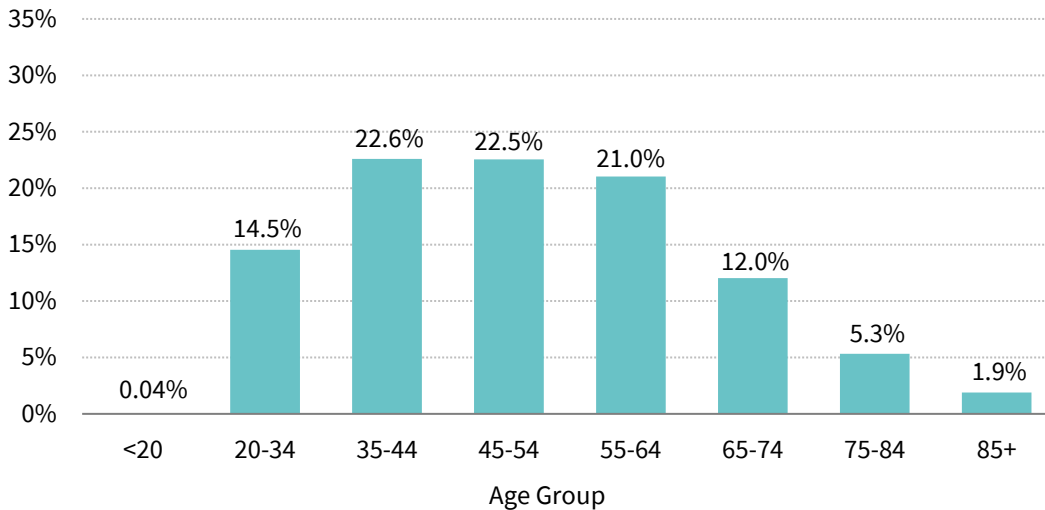
Sources: Ohio Cancer Incidence Surveillance System and the Bureau of Vital Statistics, Ohio Department of Health, 2023; Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, 2023.

*Rate not presented when the average annual death count for 2016-2020 is less than two.
A/PI=Asian/Pacific Islander.

Incidence by Age Group

In Ohio, from 2016 to 2020, cervical cancer was most frequently diagnosed among women in the 35-44 age group (22.6%) (Figure 1).

Figure 1. Percent of New Cervical Cancer Cases by Age Group, Ohio, 2016-2020

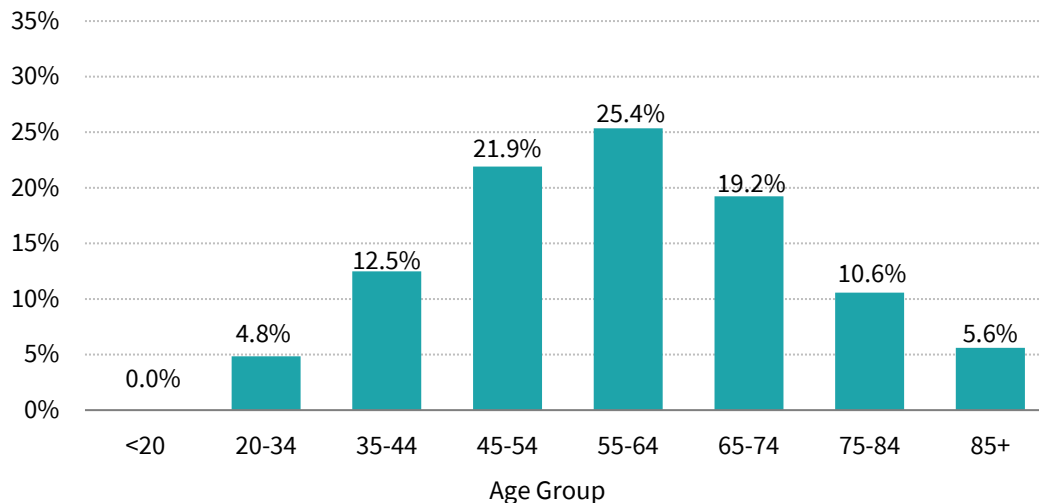


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2023.

Mortality by Age Group

The percent of cervical cancer deaths was highest among women in the 55-64 age group in Ohio from 2016 to 2020 (Figure 2).

Figure 2. Percent of Cervical Cancer Deaths by Age Group, Ohio, 2016-2020

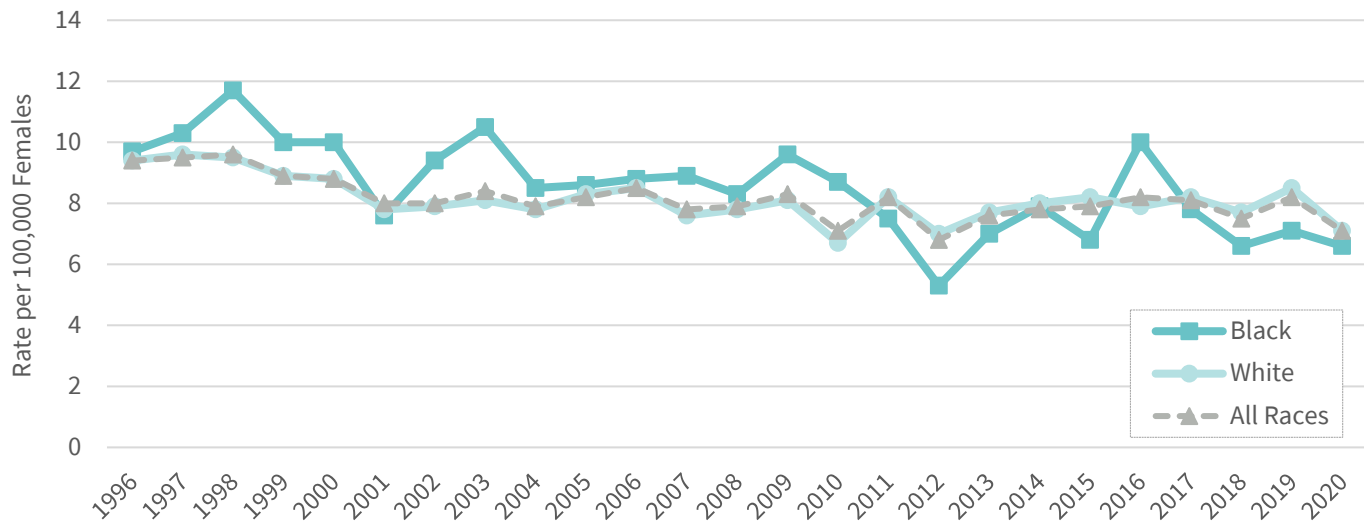


Source: Bureau of Vital Statistics, Ohio Department of Health, 2023.

Trends in Rates

Incidence rates of cervical cancer decreased 25% from 1996 to 2020 (9.4 and 7.1 per 100,000 females, respectively). The decline in cervical cancer incidence rates was higher for Black women (32%), compared with White women (25%) in Ohio during this time period (Figure 3). A goal of the Ohio Comprehensive Cancer Control Plan 2021-2030 is to reduce the rate of invasive cervical cancer to 7.5 per 100,000 females by 2030 for all Ohioans, including among Appalachian and Hispanic populations.

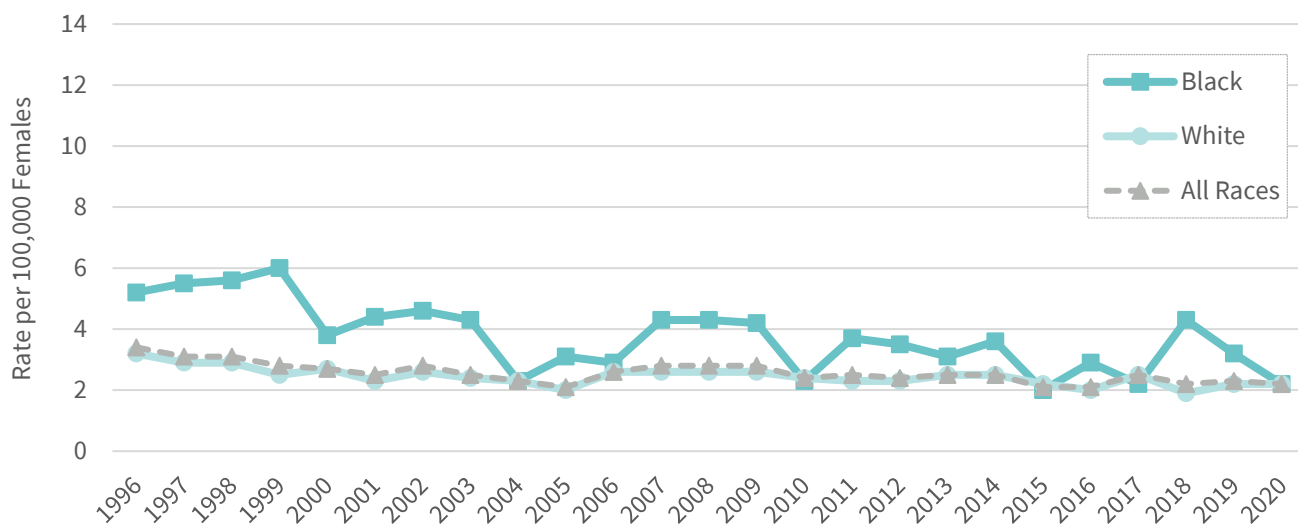
Figure 3. Trends in Age-Adjusted Incidence Rates of Cervical Cancer per 100,000 Females by Race, Ohio, 1996-2020



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2023.

Cervical cancer mortality rates in Ohio fell 35% from 1996 (3.4 per 100,000 females) to 2020 (2.2 per 100,000 females). Mortality rates of cervical cancer among Black women were variable from year to year but decreased 58% overall from 1996 to 2020, compared with a decrease of 31% among White women (Figure 4).

Figure 4. Trends in Age-Adjusted Mortality Rates of Cervical Cancer per 100,000 Females by Race, Ohio, 1996-2020

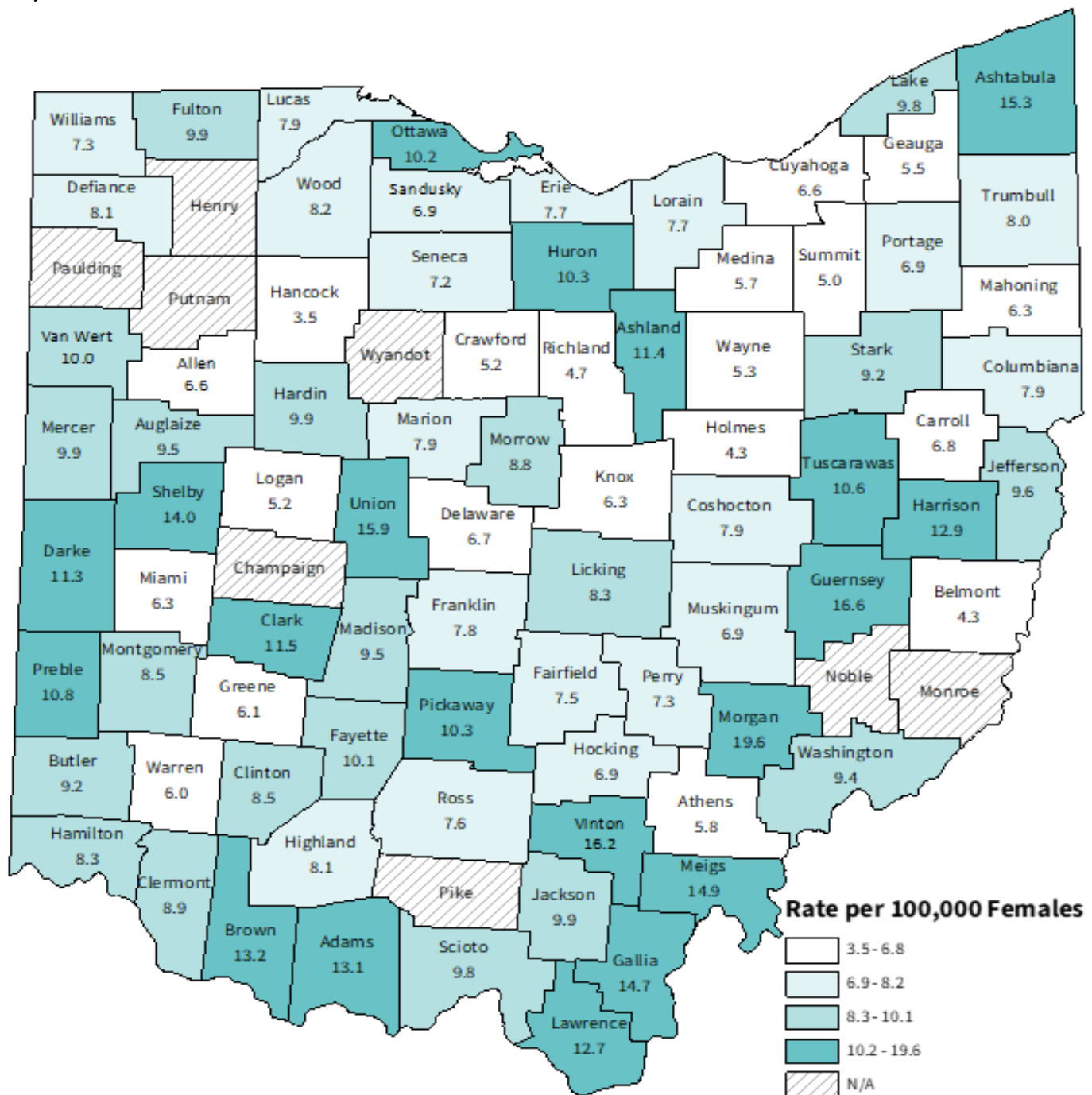


Source: Bureau of Vital Statistics, Ohio Department of Health, 2023.

Incidence by County

Figure 5 shows 2016-2020 average annual age-adjusted cervical cancer incidence rates by county of residence. County-specific cervical cancer incidence rates in Ohio ranged from 3.5 to 19.6 per 100,000 female residents, compared with Ohio's overall rate of 7.8 per 100,000 females. Incidence rates for cervical cancer do not show an apparent geographic pattern in Ohio during 2016-2020.

Figure 5. Average Annual Age-Adjusted Incidence Rates of Cervical Cancer per 100,000 Females by County of Residence, Ohio, 2016-2020



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2023.

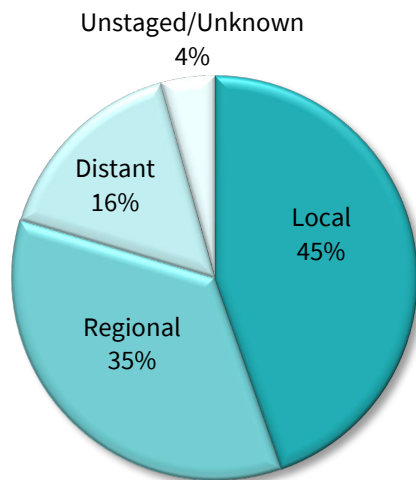
Each category represents approximately 25% of the 80 Ohio counties for which rates were calculated.

N/A: Rate not calculated when the case count during 2016-2020 was less than five.

Stage at Diagnosis

Cancer stage at diagnosis, which refers to the extent or spread of a cancer in the body, is used to select appropriate treatment and is an important determinant of survival. Non-invasive cancers that have not penetrated surrounding tissue are *in situ* stage. If a malignant tumor is confined to the organ in which it originated, it is localized (local stage). In the regional stage, the tumor has spread to surrounding organs, tissues, or regional lymph nodes. In the distant stage, the malignancy has spread, or metastasized, to distant organs, tissues, or lymph nodes remote from the primary tumor. *In situ* and local stage cancers are known as “early stage” cancers, and regional and distant stage cancers are known as “late stage” cancers.

Figure 6. Proportion of Cervical Cancer Cases (%) by Stage at Diagnosis, Ohio, 2016-2020

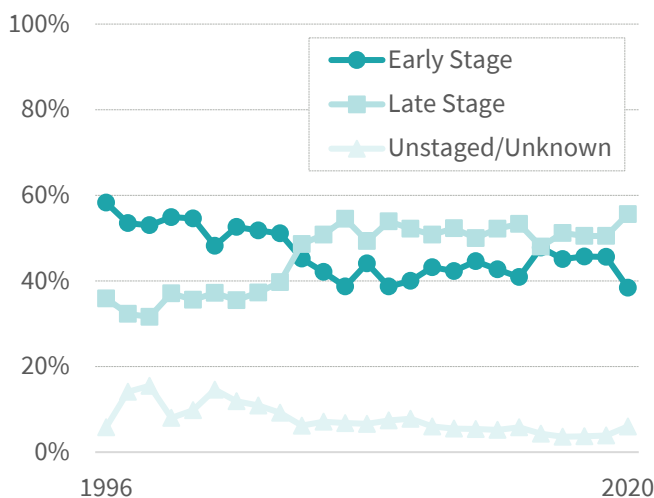


- In Ohio during 2016-2020, 45% of cancer cases were diagnosed at a local stage, 35% at a regional stage, 16% at a distant (latest) stage, and 4% were unstaged/unknown stage (Figure 6). *In situ* cervical cancers are not required to be reported in Ohio and thus are not presented.

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2023.

Stage Trends

Figure 7. Trends in Cervical Cancer by Stage Group, Ohio, 1996-2020



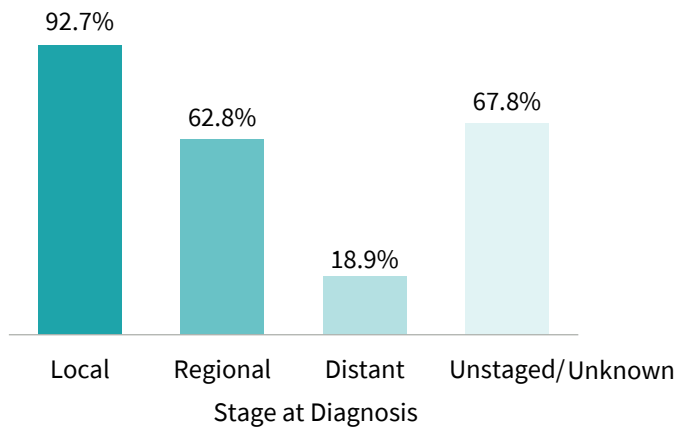
- In Ohio, there was an increase in late-stage cervical cancers and a corresponding decrease in early-stage cancers from 1996 to 2020 (Figure 7).
- A goal of the Ohio Comprehensive Cancer Control Plan 2021-2030 is to reduce the percentage of Ohioans diagnosed with late-stage cervical cancer to 45% by 2030.

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2023.

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.

Figure 8: Five-Year Relative Survival (%) for Cervical Cancer by Stage at Diagnosis, Ohio, 2013-2019

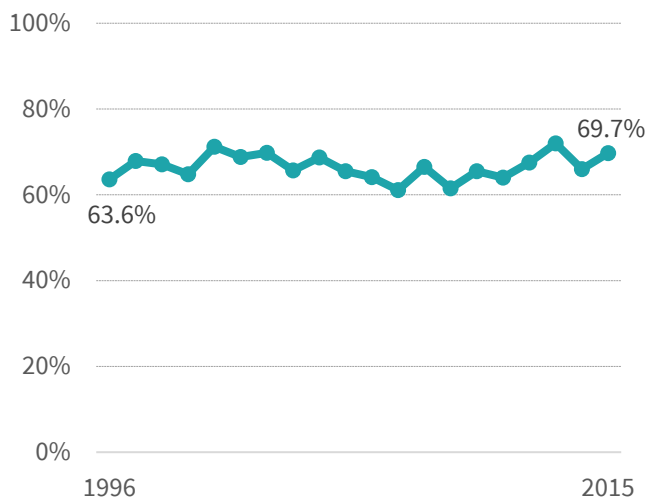


- In Ohio, the five-year relative survival for cervical cancer patients diagnosed in 2013-2019 was 70.2% for all stages combined (not shown).
- Five-year relative survival was 92.7% among those diagnosed at a local stage, 62.8% at a regional stage, 18.9% when the cancer was diagnosed at a distant stage, and 67.8% for unstaged/unknown stage cases (Figure 8).

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2023.

Survival Trends

Figure 9. Trend in Five-Year Relative Survival (%) for Cervical Cancer, Ohio, 1996-2015



- There was no statistically significant improvement in five-year relative survival for cervical cancer in Ohio from 1996 (63.6%) to 2015 (69.7%) (Figure 9).

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2023.

Types of Cervical Cancer

Cervical cancers and cervical pre-cancers are classified by how they look under a microscope. The main types (histologies) of cervical cancer are:

Squamous cell carcinoma: Squamous cell carcinomas develop from the cells lining the inner part of the cervix. Most cervical cancers are of this type.

Adenocarcinoma: Adenocarcinomas of the cervix develop from the column-shaped cells that line the mucous-producing glands of the cervix.

Less commonly, cervical cancers have features of both squamous cell carcinomas and adenocarcinomas – these are called adenosquamous carcinomas or mixed carcinomas.

As shown in Table 2, squamous cell carcinomas made up most cervical cancer cases (65.3%) during 2016-2020 in Ohio. Black women had a greater proportion (76.4%) of squamous cell cervical carcinomas, compared with White women (63.8%) during this time period. White women had a greater proportion (24.9%) of cervical adenocarcinomas, compared with Black women (12.1%) in Ohio from 2016 to 2020. Adenosquamous carcinomas were not as common, making up 3.1% and 0.7% of cervical cancer cases among White and Black women, respectively, in Ohio during 2016-2020.

Table 2: Average Annual Number of Cervical Cancer Cases and Proportion (%) by Race and Histology, Ohio, 2016-2020

Histological Type (Histology Code)	Total		White		Black	
	Cases	Percent	Cases	Percent	Cases	Percent
Squamous cell carcinoma (8052-8078, 8083-8084)	312	65.3%	255	63.8%	47	76.4%
Adenocarcinoma (8140-8147, 8255-8384, 8480-8482, 8570-8575)	111	23.2%	100	24.9%	7	12.1%
Adenosquamous carcinoma (8560, 8562)	13	2.8%	13	3.1%	0	0.7%
Other types (Includes those not listed above.)	42	8.7%	33	8.2%	7	10.8%

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2023.

Risk Factors

- **Human papillomavirus (HPV) infection:** Nearly all (91%) cervical cancers are attributable to HPV.* Not all women with HPV infection, however, will develop cervical cancer. Women who do not regularly have tests to detect HPV or abnormal cells in the cervix are at increased risk of cervical cancer. Factors that affect the risk of contracting HPV include having multiple sexual partners, having a partner with multiple partners, and early age of sexual activity.

*Source: Centers for Disease Control and Prevention, 2023: [How Many Cancers Are Linked with HPV Each Year? | CDC](#).

In addition to HPV infection, the following are potentially modifiable risk factors for cervical cancer:

- **Smoking:** Women who smoke are about twice as likely as nonsmokers to develop cervical cancer.
- **Oral contraceptives:** Long-term use of oral contraceptives increases risk of cervical cancer.
- **Giving birth to many children:** Risk of cervical cancer increases with the number of childbirths.

The following are non-modifiable risk factors for cervical cancer:

- **Diethylstilbestrol (DES):** Being exposed to DES while in the mother's womb increases the risk of cervical dysplasia and clear cell adenocarcinoma of the cervix.
- **Immunosuppression:** Having a weakened immune system caused by immunosuppression increases the risk of HPV infection and cervical cancer.

Prevention

Vaccines are the best way to protect men and women against some of the most common types of HPV, including types 16 and 18, which have been linked to cancer in both men and women. The HPV vaccine, Gardasil 9, is safe and effective. It protects against cancers and genital warts caused by HPV infections.

Although the series can be initiated as early as age 9, HPV vaccination is recommended for all boys and girls at age 11 or 12. The body develops better protection against HPV at this age than in the late teens and early 20s. Adolescents vaccinated before their 15th birthday need two doses of the HPV vaccine given six to 12 months apart. Teens and young adults who start the series at ages 15-26 years need three doses of HPV vaccine to protect against cancer-causing HPV infections.

Data from the National Immunization Survey-Teen indicate that 62.7% of 13- to 17-year-olds in Ohio received the recommended doses of the HPV vaccine in 2022, compared with 62.6% in the United States.

Signs and Symptoms

Signs and symptoms of cervical cancer usually do not appear until abnormal cervical cells become cancerous and invade nearby tissue. Signs and symptoms include:

- Vaginal bleeding (including bleeding after sexual intercourse).
- Unusual vaginal discharge.
- Pain during urination.
- Pain during intercourse.
- Pelvic pain.

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.

Cervical Cancer Screening

The U.S. Preventive Services Task Force (USPSTF) recommends screening for cervical cancer every three years with cervical cytology (Pap test) alone in women 21-29 years old. For women 30-65 years old, the USPSTF recommends screening every three years with cervical cytology alone, every five years with high-risk human papillomavirus (hrHPV) testing alone, or every five years with hrHPV testing in combination with cytology (co-testing).

Table 3. Prevalence of Pap Testing (Past Three Years) Among Women 21-65 Years Old by Demographics, Ohio, 2020

Demographic Characteristics	Prevalence (%)	95% Confidence Interval
Total	77.4	75.3 - 79.5
Age		
21-24	57.2	48.2 - 66.2
25-34	81.4	76.8 - 85.9
35-44	81.7	77.9 - 85.5
45-54	80.6	76.9 - 84.4
55-65	74.6	71.0 - 78.1
Race/Ethnicity		
White, Non-Hispanic	76.3	74.0 - 78.6
Black, Non-Hispanic	85.1	78.6 - 91.5
Hispanic	77.4	64.3 - 90.6
Other, Non-Hispanic	77.1	63.8 - 90.3
Multi-Racial	80.2	69.2 - 91.1
Annual Household Income		
<\$15,000	71.0	63.2 - 78.8
\$15,000-\$24,999	70.4	63.9 - 76.9
\$25,000-\$34,999	75.5	67.8 - 83.3
\$35,000-\$49,999	75.4	69.2 - 81.5
\$50,000-\$74,999	80.2	75.2 - 85.3
\$75,000+	84.7	81.5 - 87.9
Education		
Less than High School	65.6	55.3 - 76.0
High School Diploma	75.2	71.1 - 79.3
Some College	74.9	71.1 - 78.7
College Graduate	84.6	82.0 - 87.2

Source: 2020 Ohio Behavioral Risk Factor Surveillance System, Ohio Department of Health, 2021.

Pap testing is defined here as a women 21-65 years old who reported having had a Pap test in the past three years.

- The prevalence of Pap testing within the past three years was 77.4% among Ohio women 21-65 years old.
- The prevalence of Pap testing in the past three years among women 25-34, 35-44, and 45-54 years old was statistically significantly higher, compared with women 21-24 years old.
- The prevalence of Pap testing in the past three years generally increased with increasing annual household income.
- College graduates were statistically significantly more likely to have had a Pap test in the past three years, compared with those with some college or less education (Table 3).

Did You Know?

The Ohio Department of Health **Breast and Cervical Cancer Project (BCCP)** can help all women navigate cancer screenings. BCCP's Patient Navigation Program helps guide women through the healthcare system, find providers and community resources, and answer questions about scheduling appointments, using insurance, and more.

The Ohio BCCP also offers no-cost breast and cervical cancer screenings and diagnostic testing to qualified participants.

For more information about the Ohio BCCP or to see if you qualify for no-cost screenings, call 1-844-430-BCCP (2227) or visit [Breast & Cervical Cancer Project | Ohio Department of Health](#).

A goal of the Ohio Comprehensive Cancer Control Plan 2021-2030 is to increase the percentage of women 21 to 65 years of age who have been screened for cervical cancer, including Appalachian and Hispanic women, to 85% by 2030.

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 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., 2016-2020). 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 1996-2020 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 (Oct. 26, 2012); revised bridged-race intercensal population estimates for July 1, 2005-July 1, 2009 (released June 26, 2014); and vintage 2020 bridged-race postcensal population estimates for July 1, 2010-July 1, 2020 (released Sept. 22, 2021).

Incidence: The number of cases diagnosed during a specified time period (e.g., 2016-2020). Cervical cancer cases were defined as follows: International Classification of Diseases for Oncology, Third Edition (ICD-O-3), codes C530-C539.

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., 2016-2020). Cervical cancer deaths were defined as follows: International Statistical Classification of Diseases and Related Health Problems, Ninth Edition (ICD-9), code 180 for 1996-1998 and International Statistical Classification of Diseases and Related Health Problems, Tenth Edition (ICD-10), codes C53.0-C53.9 for 1999-2020.

Rate: The number of cases or deaths per unit of population (e.g., per 100,000 persons) during a specified time period (e.g., 2016-2020). 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. In this report, five-year relative survival is based on Ohio cancer cases diagnosed from 2013-2019 with follow-up through December 2020.

Stage at Diagnosis: The degree to which a tumor has spread from its site of origin at the time of diagnosis. A system of summary staging is often used to group cases 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.

Statistical Significance: Statistical differences between populations were determined by comparing 95% confidence intervals (CI); if the CIs do not overlap, the difference was determined to be statistically significant.

Table 4. Average Annual Number of Invasive Cervical Cancer Cases and Age-Adjusted Incidence Rates per 100,000 Females by County of Residence, Ohio, 2016-2020

	Cases	Rate		Cases	Rate		Cases	Rate
Ohio	477	7.8	Greene	5	6.1	Morrow	2	8.8
U.S.		7.7	Guernsey	3	16.6	Muskingum	3	6.9
Adams	2	13.1	Hamilton	35	8.3	Noble	<1	*
Allen	3	6.6	Hancock	2	3.5	Ottawa	2	10.2
Ashland	3	11.4	Hardin	2	9.9	Paulding	<1	*
Ashtabula	7	15.3	Harrison	1	12.9	Perry	2	7.3
Athens	2	5.8	Henry	<1	*	Pickaway	3	10.3
Auglaize	2	9.5	Highland	2	8.1	Pike	<1	*
Belmont	1	4.3	Hocking	1	6.9	Portage	6	6.9
Brown	3	13.2	Holmes	1	4.3	Preble	2	10.8
Butler	17	9.2	Huron	3	10.3	Putnam	<1	*
Carroll	1	6.8	Jackson	2	9.9	Richland	3	4.7
Champaign	<1	*	Jefferson	3	9.6	Ross	3	7.6
Clark	8	11.5	Knox	2	6.3	Sandusky	2	6.9
Clermont	10	8.9	Lake	11	9.8	Scioto	4	9.8
Clinton	2	8.5	Lawrence	4	12.7	Seneca	2	7.2
Columbiana	4	7.9	Licking	8	8.3	Shelby	3	14.0
Coshocton	2	7.9	Logan	1	5.2	Stark	19	9.2
Crawford	1	5.2	Lorain	12	7.7	Summit	16	5.0
Cuyahoga	45	6.6	Lucas	17	7.9	Trumbull	9	8.0
Darke	3	11.3	Madison	2	9.5	Tuscarawas	5	10.6
Defiance	2	8.1	Mahoning	9	6.3	Union	5	15.9
Delaware	8	6.7	Marion	3	7.9	Van Wert	1	10.0
Erie	4	7.7	Medina	5	5.7	Vinton	1	16.2
Fairfield	6	7.5	Meigs	2	14.9	Warren	7	6.0
Fayette	1	10.1	Mercer	2	9.9	Washington	3	9.4
Franklin	52	7.8	Miami	4	6.3	Wayne	3	5.3
Fulton	2	9.9	Monroe	<1	*	Williams	1	7.3
Gallia	2	14.7	Montgomery	23	8.5	Wood	5	8.2
Geauga	2	5.5	Morgan	1	19.6	Wyandot	<1	*

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2023; Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2023.

*Rate not presented when the count for 2016-2020 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:

<https://odh.ohio.gov/know-our-programs/ohio-cancer-incidence-surveillance-system/welcome>

Ohio Comprehensive Cancer Control Plan 2021-2030

<https://ohiocancerpartners.org/cancerplan/>

National Cancer Institute:

<https://www.cancer.gov/types/cervical>

American Cancer Society:

<https://www.cancer.org/cancer/cervical-cancer.html>

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