Cancer Across the Lifespan in Ohio

August 2022

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Introduction

Cancer risk varies throughout the span of life, from infancy to old age. In general, cancer risk increases with advancing age. However, the risks of some sites/types of cancer are greater among younger or middle-aged individuals. The most common sites/types of cancer also vary by age group. Because cancer incidence and mortality rates vary considerably by age, as do factors linked to cancer risk, it is important to examine the occurrence of cancer across the span of life.

The purpose of this report is to provide information about cancer incidence and mortality rates in Ohio for five age groups across the lifespan: children 0-14 years old; adolescents and young adults, 15-39 years old; adults, 40-64 years old; adults, 65-84 years old; and adults, 85 years old and older. Specifically, for each age group, the following are described: the population distribution of the given age group by county; cancer incidence and mortality rates according to demographic factors; Ohio and U.S. comparisons; the top five sites/types of cancer incidence and mortality by sex; trends in cancer incidence and mortality rates from 1996 to 2019 overall and for the top five sites/types by sex; and the risk of developing cancer (all sites/types combined and the top five sites/types). Cancer prevention, specific to each age group, is also described.

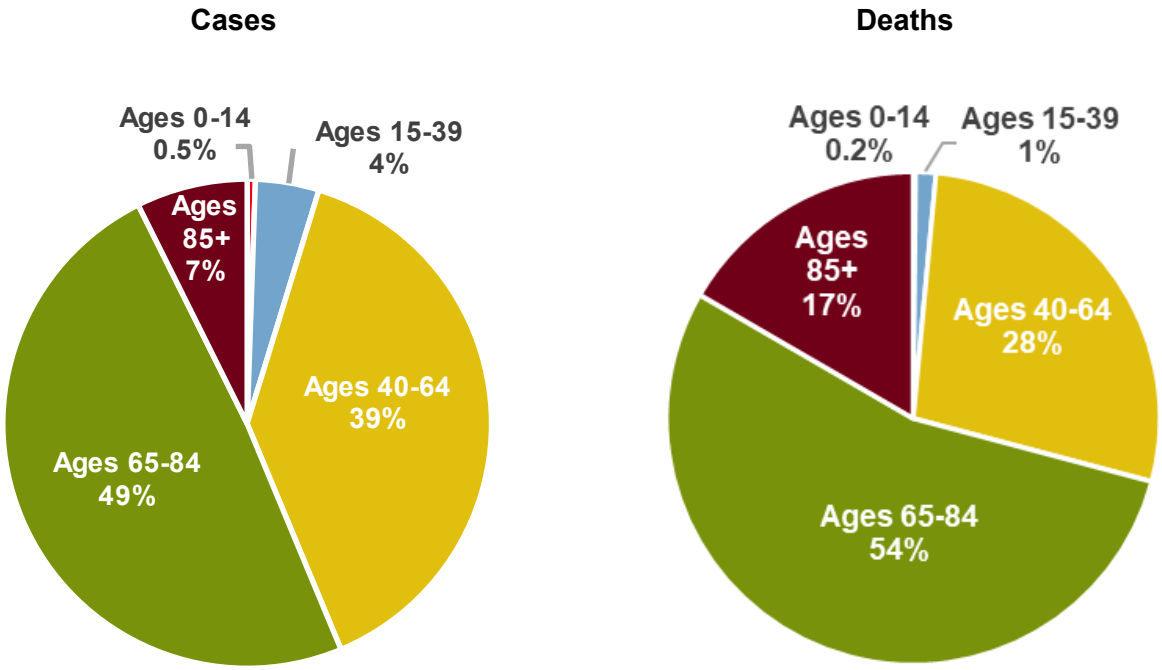
Cancer incidence (new case) data presented in this report are from the Ohio Cancer Incidence Surveillance System (OCISS) at the Ohio Department of Health (ODH). OCISS, the central cancer registry for Ohio, collects cancer incidence data for all Ohio residents diagnosed with cancer. All Ohio medical providers who diagnose or treat patients with cancer are required by state law to report each case of cancer to OCISS within six months of diagnosis or first contact. Cancer mortality (death) data are from the ODH Bureau of Vital Statistics. The ODH Bureau of Vital Statistics receives death certificates from local vital statistics offices and other states when an Ohio resident dies out of state. U.S. cancer incidence rates are from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program, and U.S. mortality rates are from the Center for Disease Control and Prevention's National Center for Health Statistics. Data were accessed through SEER*Explorer (https://seer.cancer.gov/explorer/) and SEER*Stat (https://seer.cancer.gov/seerstat/).

Trends in cancer incidence and mortality rates in this document were interpreted by describing the overall directional change from 1996 through 2019 (most recent data available) and by comparing rates in the first few years (1996-1999) to those in the most recent years (2016-2019). For some cancers and some age groups, 1996 rates stood out as higher or lower than those for 1997-1999; for such comparisons, 1996 rates were not considered in evaluating the overall trend. Trends were described as variable or stable when no clear directional trend was apparent. It should be noted that trends described in text may not be apparent in figures because the scales required to display trends for certain cancer sites/types were larger or smaller than for other sites/types.

Ohio Department of Health

Revised April 2023.

Distribution of Cancer Cases and Deaths by Age Group, Ohio, 2015-2019



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

The distribution of Ohio cancer cases and deaths in 2015-2019 is shown above according to age group.

- Less than 1% of cancer cases and deaths occurred among children 0-14 years old.
- 43% of cancer cases and 29% of cancer deaths occurred among adolescents and adults 15-64 years old.
- 56% of cancer cases and 71% of cancer deaths occurred among adults 65 years of age and older.
- Most cancer cases and deaths occur among those in the 65-84 age group.

Key Findings

- In Ohio, cancer incidence for all cancers combined is higher among females for the 15-39 and 40-64 age groups, while incidence is higher among males for the 0-14, 65-84, and 85 and older age groups.
- Cancer mortality for all cancers combined is higher among males for all age groups except for those 15-39 years old.
- White Ohioans have higher cancer incidence than Black Ohioans for all age groups except those 40-64 years old.
- Black Ohioans have higher cancer mortality rates than white Ohioans for age groups 15-39, 40-64, and 65-84.
- Prostate cancer is the leading cause of cancer incidence among males 40-64 and 65-84 years old.
- Breast cancer is the leading cause of cancer incidence among females 15-39 years old and older.
- Brain cancer is the leading cause of cancer death for both boys and girls 0-14 years old, whereas lung cancer is the leading cause of cancer death for adult men and women 40-64 years old and older.
- Cancer incidence rates increased from 1996 to 2019 for age groups 0-14, 15-39, and 40-64.
- Cancer mortality rates decreased from 1996 to 2019 for all age groups.
- Females have a higher risk of developing cancer for the 15-39 and 40-64 age groups, whereas males have a higher risk of developing cancer for the youngest (0-14) and oldest (85+) age groups.
- Five-year relative cancer survival increased from 1996 to 2014 for each age group except 85 years old and older, which remained stable.

Comparison of Cancer Incidence, Mortality, Leading Cancers, and Trends Across Age Groups

	Age Groups				
	0-14	**15-39**	**40-64**	**65-84**	**85+**
All Cancers Combined: Sex Comparison					
Higher Incidence	Male	Female	Female	Male	Male
Higher Mortality	Male	Female	Male	Male	Male
All Cancers Combined: Race Comparison					
Higher Incidence	White	White	Black	White	White
Higher Mortality	White	Black	Black	Black	Similar
Leading Cancer: Incidence					
Male	Leukemia	Testis	Prostate	Prostate	Lung
Female	Leukemia	Breast	Breast	Breast	Breast
Leading Cancer: Mortality					
Male	Brain	Brain	Lung	Lung	Lung
Female	Brain	Breast	Lung	Lung	Lung
All Cancers Combined: Trends from 1996 to 2019					
Incidence	Increasing	Increasing	Increasing	Stable	Variable
Mortality	Decreasing	Decreasing	Decreasing	Decreasing	Decreasing
Survival	Increasing	Increasing	Increasing	Increasing	Stable

Cancer Prevention

Most cancers are caused by a combination of factors which interact during one's lifetime. Factors that cause cancer are many and often grouped into categories such as genetics (e.g., Lynch syndrome), exposure to environmental factors (e.g., radon, pollution), behaviors (e.g., tobacco/alcohol use, dietary factors), and workplace exposures (e.g., asbestos, pesticides), but overlap between these categories can occur. Some behaviors linked to cancer risk typically start during youth, making interventions particularly important for young people. For example, most smokers begin smoking during their preteen or teen years. Efforts to adopt healthy habits, avoid harmful exposures, and manage associated chronic conditions like obesity can best reduce cancer risk if started at an early age but are effective even when started at older ages.

Youth go through many physical and social changes as they grow into adults. These changes create unique opportunities for cancer prevention. Research suggests that the following behaviors may reduce the cancer risk of infants and children.

Parents can:

- Get enough folic acid during pregnancy.
- Avoid alcohol and tobacco use during pregnancy.
- Breastfeed.
- Ensure safe, stable, nurturing relationships and environments.
- Keep children away from secondhand smoke.
- Reduce exposure to traffic-related air pollution.
- Learn about their family's history of diethylstilbestrol (DES) exposure.
- Ensure that child completes the human papillomavirus (HPV) vaccine series.
- Limit radiation exposures to children during medical imaging procedures.

Children can:

- Eat a diet rich in fruits and vegetables.
- Get enough physical activity.
- Avoid exposure to certain chemicals (e.g., phthalates).
- Avoid smoking and other tobacco use.
- Avoid intentional tanning and excessive sun exposure.
- Avoid alcohol use.

Early adulthood is a time of many life changes, such as leaving home, getting a full-time job, and perhaps becoming a parent, each with challenges and stresses. It is also a unique opportunity to set a course for a long, healthy life. Research suggests that the following behaviors may reduce cancer risk among adolescents and young adults:

Promoting healthy behaviors:

- Eating a diet rich in fruits and vegetables.
- Getting regular physical activity.
- Maintaining a healthy weight.
- Using sun protection when outdoors.
- Breastfeeding after pregnancy.
- Screening for certain sites/types of cancer.

Reducing harmful behaviors:

- Avoiding tobacco products and secondhand smoke.
- Avoiding intentional tanning and excessive sun exposure.
- Limiting consumption of alcohol and sugar-sweetened drinks.

Among middle- and older-aged adults, the effects of harmful exposures and health behaviors often start to appear with the onset of chronic diseases or other health problems. Adults can still make the following positive changes to reduce their cancer risk and support health during midlife and beyond:

Promoting healthy behaviors:

- Getting enough physical activity.
- Maintaining a healthy weight.
- Getting enough sleep.
- Managing chronic diseases such as diabetes.
- Getting help to quit smoking.
- Screening for and managing obesity.
- Screening for hepatitis C virus infection and certain sites/types of cancer.

Reducing harmful exposures:

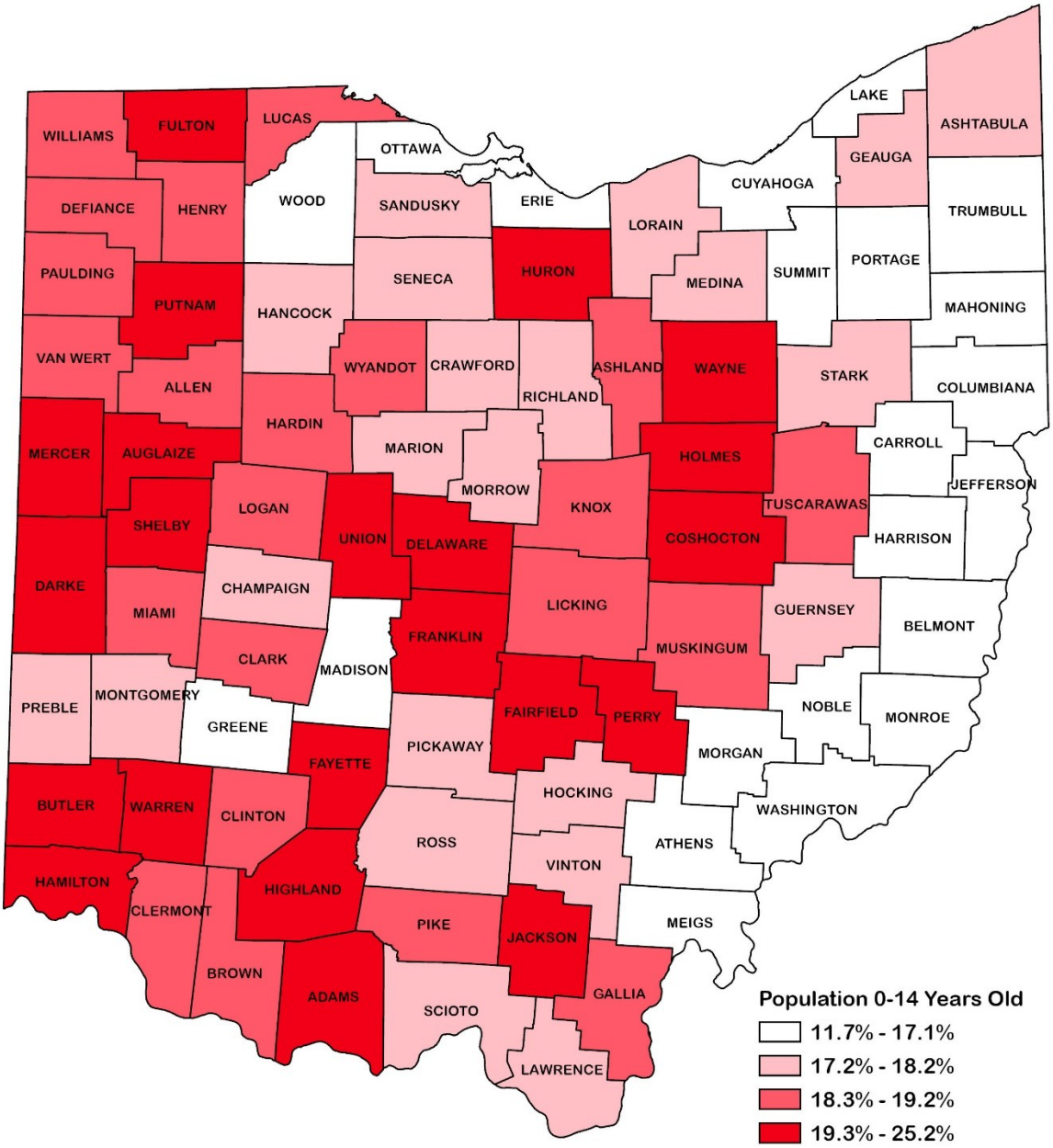
- Avoiding excessive sun exposure.
- Limiting alcohol use.
- Quitting smoking and other tobacco use.
- Avoiding exposure to certain chemicals.
- Limiting radiation exposures from medical imaging procedures.

Population Distribution

There were 2,131,101 children 0-14 years old in Ohio in 2019, making up nearly one-fifth (18%) of Ohio's population.

Figure 1.1 shows the percentage of the population 0-14 years old in each county. The highest percentage of residents in this age group live in metropolitan counties. The majority of counties with the lowest percentage of children 0-14 years old are in the Appalachian region of Ohio.

Figure 1.1. Percentage of Population 0-14 Years Old, by County of Residence, Ohio, 2019



Source: U.S. Census Bureau, Population Division, release date: June 2020.
Each category represents approximately 25% of the 88 Ohio counties.

Cancer Incidence and Mortality

Table 1.1 shows the average annual numbers of invasive cancer cases, deaths, incidence rates, and mortality rates in Ohio among children 0-14 years old in 2015-2019. An average of 374 new invasive cancer cases and 38 cancer deaths occurred each year among Ohioans in this age group. The overall cancer incidence rate among Ohioans 0-14 years old (17.4 per 100,000 population) was similar to the U.S. rate of 17.6 per 100,000; the mortality rate (1.8 per 100,000) was also similar to the U.S. rate (2.0 per 100,000). In Ohio, the incidence rate was 12% higher among males than females, and the cancer mortality rate was 25% higher among males. The average annual incidence rate was 27% higher among white Ohioans, compared with Black Ohioans, while the average annual mortality rate was slightly higher among white Ohioans. Incidence rates decreased with advancing age group, with infants (<1 year old) having almost double the incidence rate of those 10-14 years old. Children ages 1-4, 5-9, and 10-14 had four to five times higher mortality rates than infants.

In Ohio, five-year relative cancer survival among those 0-14 years old increased from 72.6% in 1996 to 86.0% in 2014. In the United States, five-year relative survival increased from 78.6% in 1996 to 85.1% in 2014 for those 0-14 years old.

Table 1.1. Cancer Among Children 0-14 Years Old: Average Annual Number of New Invasive Cancer Cases and Incidence Rates and Average Annual Number of Cancer Deaths and Mortality Rates, by Sex, Race, and Age Group, Ohio, 2015-2019

		Incidence		Mortality	
		Cases	Rate	Deaths	Rate
Sex	Male	196	17.8	22	2.0
	Female	177	16.8	17	1.6
Race	White	294	17.6	30	1.8
	Black	56	13.9	6	1.6
Age Group	<1	41	29.9	1	0.4
	1-4	132	23.5	10	1.7
	5-9	86	12.0	14	2.0
	10-14	115	15.6	14	1.9
Total		374	17.4	38	1.8

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Leading Cancer Sites/Types

Table 1.2 shows the number and percentage of new invasive cancer cases and cancer deaths for the five leading cancer sites/types among children 0-14 years old by sex. Leukemia is the most frequently diagnosed cancer among males and females 0-14 years old, representing 27% and 26% of all new invasive cancers. Brain and other central nervous system (CNS) cancer is the leading site/type of cancer mortality in this age group for males and females, accounting for 39% and 34% of cancer deaths.

Table 1.2. Cancer Among Children 0-14 Years Old: Average Annual Number and Percentage of New Invasive Cancer Cases and Cancer Deaths for the Leading Sites/Types, by Sex, Ohio, 2015-2019

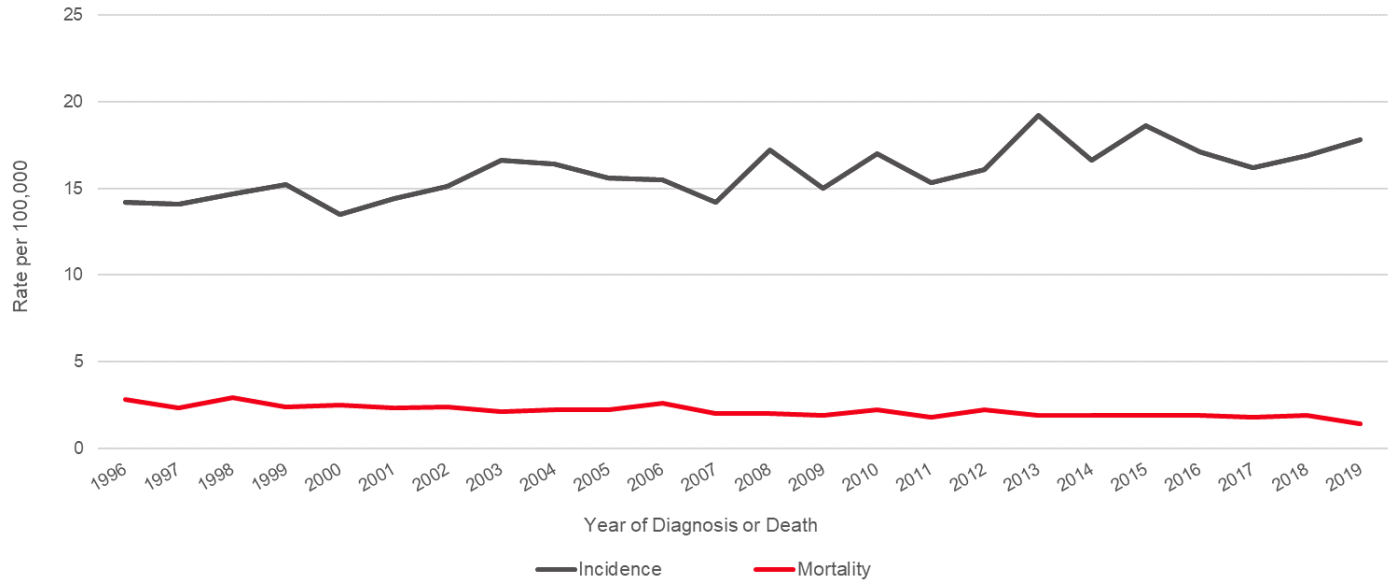
	Male			Female			Total		
Cases	Leukemia	54	27%	Leukemia	46	26%	Leukemia	100	27%
	Brain and Other CNS*	47	24%	Brain and Other CNS*	41	23%	Brain and Other CNS*	88	24%
	Non-Hodgkin Lymphoma	18	9%	Kidney and Renal Pelvis	11	6%	Non-Hodgkin Lymphoma	24	6%
	Kidney and Renal Pelvis	8	4%	Non-Hodgkin Lymphoma	6	3%	Kidney and Renal Pelvis	19	5%
	Hodgkin Lymphoma	5	3%	Thyroid	6	3%	Hodgkin Lymphoma	11	3%
	All Sites/Types	**196**		**All Sites/Types**	**177**		**All Sites/Types**	**374**	
	Male			**Female**			**Total**		
Deaths	Brain and Other CNS*	8	39%	Brain and Other CNS*	6	34%	Brain and Other CNS*	14	37%
	Leukemia	2	10%	Leukemia	4	24%	Leukemia	6	16%
	Non-Hodgkin Lymphoma	1	6%	Kidney and Renal Pelvis	1	5%	Non-Hodgkin Lymphoma	2	5%
	Liver and IBD**	1	4%	Non-Hodgkin Lymphoma	1	5%	Liver and IBD**	1	3%
	Kidney and Renal Pelvis	<1	1%	Liver and IBD**	<1	2%	Kidney and Renal Pelvis	1	3%
	All Sites/Types	**22**		**All Sites/Types**	**17**		**All Sites/Types**	**38**	

*Central Nervous System.
** Intrahepatic Bile Duct.
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence and Mortality Trends

Figure 1.2 shows trends in cancer incidence and mortality rates from 1996 to 2019 among children 0-14 years old. The cancer incidence rate increased 25.4%, from 14.2 per 100,000 in 1996 to 17.8 per 100,000 in 2019. The cancer mortality rate decreased by 50%, from 2.8 per 100,000 in 1996 to 1.4 per 100,000 in 2019. In the U.S., the cancer incidence rate increased 4.8% and the cancer mortality rate decreased 30.8% for this age group during this time period.

Figure 1.2. Cancer Among Children 0-14 Years Old: Trends in Age-adjusted Cancer Incidence and Mortality Rates per 100,000 for All Cancer Sites/Types Combined, Ohio, 1996-2019

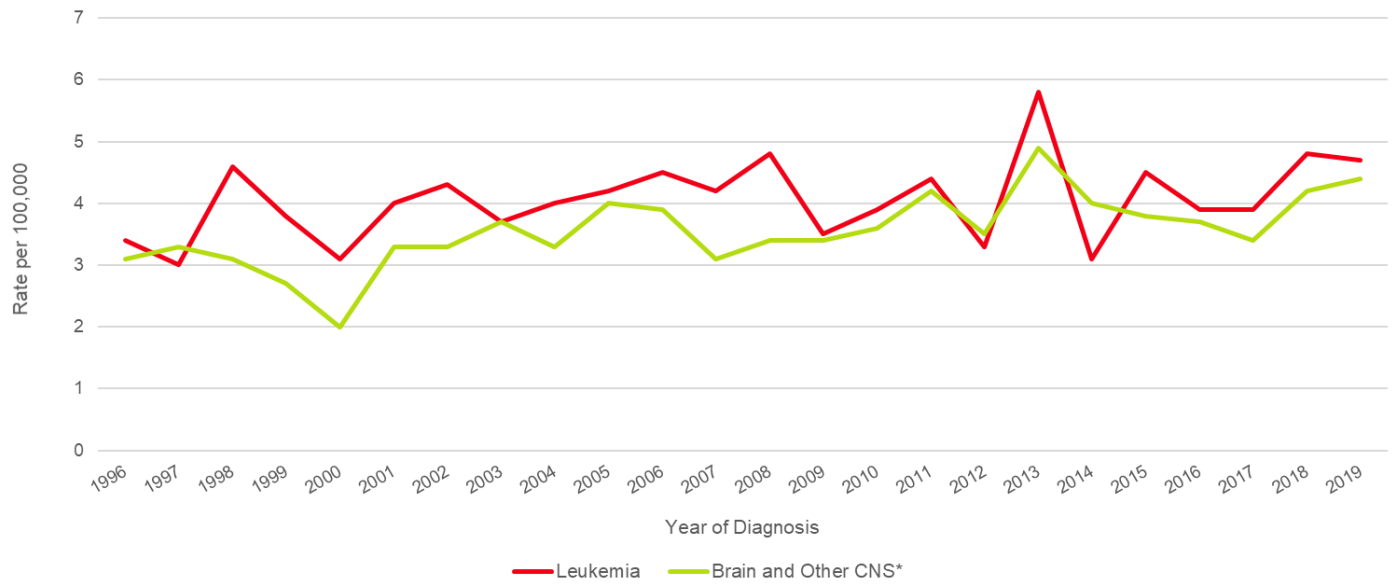


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence Trends Among Females

As shown in figure 1.3, from 1996 to 2019, incidence rates for females 0-14 years old increased by 38% for leukemia and 42% for brain and other central nervous system (CNS) cancer.

Figure 1.3. Cancer Among Females 0-14 Years Old: Trends in Age-adjusted Cancer Incidence Rates per 100,000 Females for the Leading Sites/Types, Ohio, 1996-2019



*Central Nervous System.

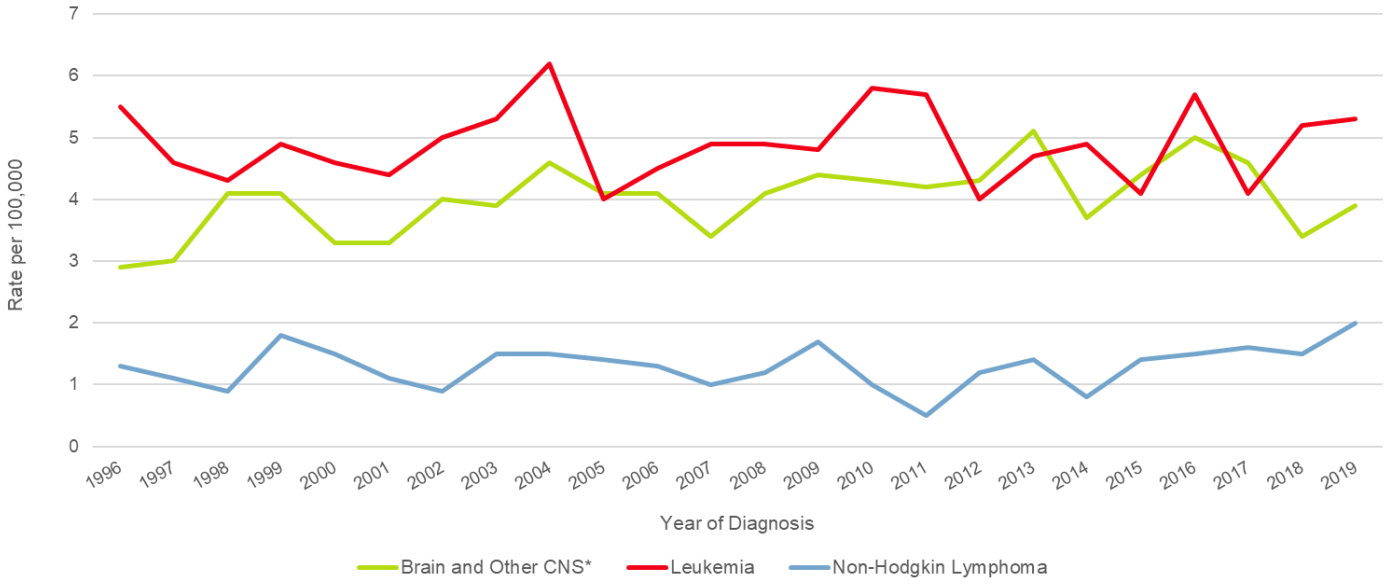
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.

Note: Trends for other leading sites/types (kidney and renal pelvis cancer, non-Hodgkin lymphoma, and thyroid cancer) are not included because rates could not be calculated for some years due to case counts being less than five.

Cancer Incidence Trends Among Males

As shown in Figure 1.4, from 1996 to 2019, incidence rates for males 0-14 years old were variable for brain and other central nervous system (CNS) cancer, leukemia, and non-Hodgkin lymphoma.

Figure 1.4. Cancer Among Males 0-14 Years Old: Trends in Age-adjusted Cancer Incidence Rates per 100,000 Males for the Leading Sites/Types, Ohio, 1996-2019



*Central Nervous System.

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.

Note: Trends for other leading sites/types (liver and intrahepatic bile duct and kidney and renal pelvis cancers) are not included because rates were not calculated for some years due to small numbers (fewer than five cases).

Risk of Cancer

Table 1.3 shows the risk of being diagnosed with invasive cancer before age 15 for all sites/types of cancer combined and the leading cancer sites/types for incidence by sex in the U.S. The risk of developing cancer before age 15 is greater among males than females; one in 360 males and one in 401 females will be diagnosed with cancer before age 15.

Table 1.3. Risk of Being Diagnosed with Cancer Before Age 15 for the Leading Sites/Types of Cancer Incidence, by Sex, United States, 2017-2019

Male		Female	
All Sites/Types	1 in 360	**All Sites/Types**	1 in 401
Leukemia	1 in 1,194	Leukemia	1 in 1,433
Brain and Other CNS*	1 in 1,943	Brain and Other CNS*	1 in 2,113
Non-Hodgkin Lymphoma	1 in 5,300	Kidney and Renal Pelvis	1 in 7,990
Kidney and Renal Pelvis	1 in 8,457	Non-Hodgkin Lymphoma	1 in 10,327
Hodgkin Lymphoma	1 in 8,824	Thyroid	1 in 8,417

*Central Nervous System.

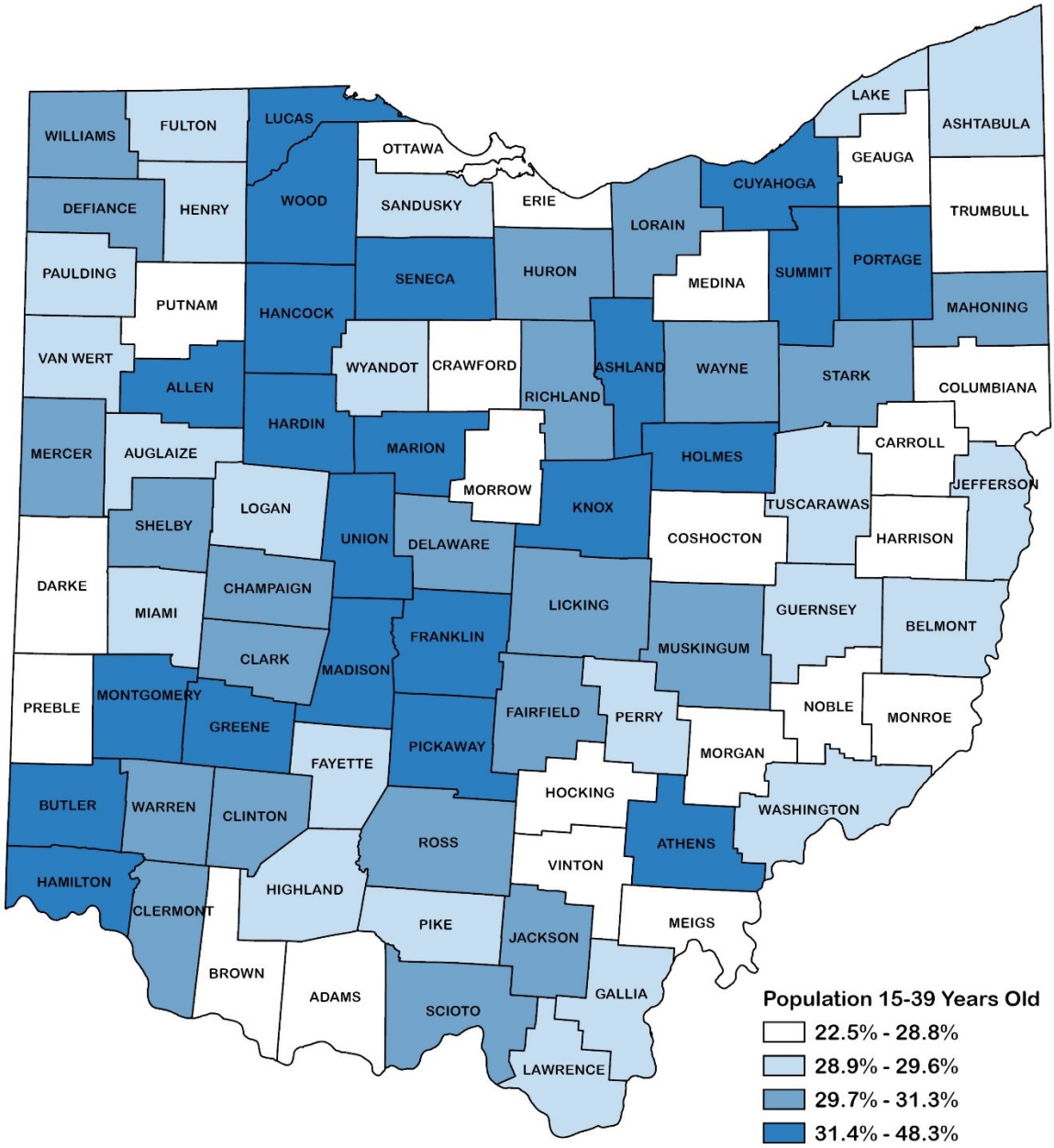
Source: DevCan: Probability of Developing or Dying of Cancer Software, Version 6.8.0. Surveillance Research Program, Statistical Methodology and Applications, National Cancer Institute, 2012. http://surveillance.cancer.gov/devcan/.
Risk of developing cancer before age 15 years, based on cancer cases diagnosed during 2017-2019 in 22 SEER registries.

Population Distribution

There were 3,785,942 adolescents and young adults 15-39 years old in Ohio in 2019, making up one-third (32.4%) of Ohio's population.

Figure 2.1 shows the percentage of the population 15-39 years old in each county. The highest percentage of residents in this age group live in metropolitan counties.

Figure 2.1. Percentage of Adolescents and Young Adults 15-39 Years Old, by County, Ohio, 2019



Source: U.S. Census Bureau, Population Division, release date: June 2020.
Each category represents approximately 25% of the 88 Ohio counties.

Cancer Incidence and Mortality

Table 2.1 shows the average annual numbers of invasive cancer cases, deaths, incidence rates, and mortality rates in Ohio among adolescents and young adults 15-39 years old in 2015-2019. An average of 2,905 new invasive cancer cases and 337 cancer deaths occurred each year among Ohioans in this age group. The overall cancer incidence rate among Ohioans 15-39 years old (81.4 per 100,000 population) was higher than the U.S. rate of 76.2 per 100,000; the mortality rate (9.6 per 100,000) was 9% higher than the U.S. rate (8.8 per 100,000). The incidence rate was 66% higher among females, compared with males, and the cancer mortality rate was 9% higher among females. The average annual incidence rate was 36% higher among white Ohioans, compared with Black Ohioans, while the average annual mortality rate was 17% higher among Black Ohioans compared with white Ohioans. Incidence and mortality rates increased with advancing age group, with those 35-39 years old having an incidence rate more than six times higher, and a mortality rate eight times higher, than those 15-19 years old.

In Ohio, five-year relative cancer survival among those 15-39 years old increased from 73.8% in 1996 to 86.0% in 2014. There was similar five-year relative survival for those 15-39 years old in the U.S.

Table 2.1. Cancer Among Adolescents and Young Adults 15-39 Years Old: Average Annual Number of New Invasive Cancer Cases and Incidence Rates and Average Annual Number of Cancer Deaths and Mortality Rates, by Sex, Race, and Age Group, Ohio, 2015-2019

		Incidence		Mortality	
		Cases	Rate	Deaths	Rate
Sex	Male	1,106	61.1	164	9.2
	Female	1,799	101.7	173	10.2
Race	White	2,409	83.2	269	9.4
	Black	317	61.2	56	11.0
Age Group	15-19	194	25.3	20	2.6
	20-24	300	39.0	30	3.9
	25-29	488	61.7	47	6.0
	30-34	778	106.0	89	12.2
	35-39	1,146	160.8	150	21.1
Total		2,905	77.0	337	9.6

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Leading Cancer Sites/Types

Table 2.2 shows percentages of new invasive cancer cases and cancer deaths for the five leading cancer sites/types among adolescents and young adults 15-39 years old by sex. Testicular cancer is the most frequently diagnosed cancer among males 15-39 years old, representing 18% of all new invasive cancers. Breast cancer is the most frequently diagnosed cancer among females 15-39 years old, representing 21% of all new invasive cancers. Brain and other central nervous system (CNS) cancer is the leading site/type of cancer mortality in this age group for males, accounting for 23% of cancer deaths. Breast cancer is the leading site/type of cancer mortality for females, accounting for 23% of deaths.

Table 2.2. Cancer Among Adolescents and Young Adults 15-39 Years Old: Average Annual Number and Percentage of New Invasive Cancer Cases and Cancer Deaths for the Leading Sites/Types, by Sex, Ohio, 2015-2019

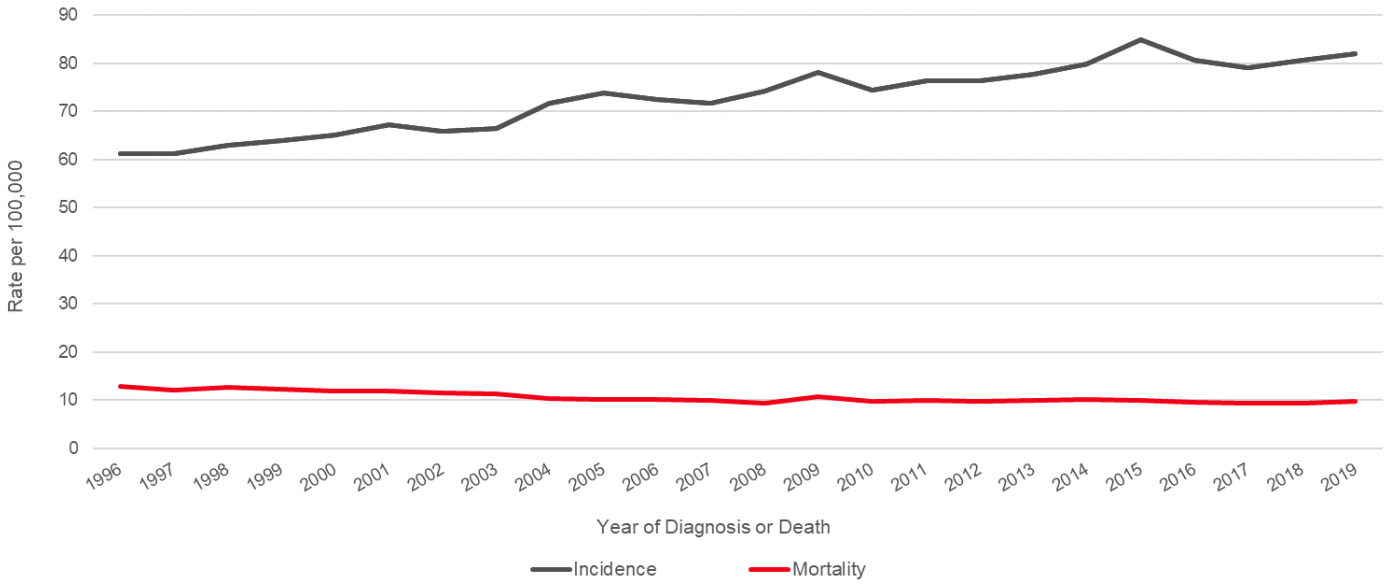
	Male			Female			Total		
Cases	Testis	203	18%	Breast	377	21%	Thyroid	459	16%
	Colon and Rectum	102	9%	Thyroid	376	21%	Breast	378	13%
	Melanoma of the Skin	100	9%	Melanoma of the Skin	212	12%	Melanoma of the Skin	312	11%
	Thyroid	84	8%	Cervix Uteri	119	7%	Testis	203	7%
	Non-Hodgkin Lymphoma	82	7%	Colon and Rectum	95	5%	Colon and Rectum	197	7%
	All Sites/Types	**1,106**		**All Sites/Types**	**1,799**		**All Sites/Types**	**2,904**	
	Male			**Female**			**Total**		
Deaths	Brain and Other CNS*	37	23%	Breast	40	23%	Breast	40	12%
	Leukemia	23	14%	Cervix	28	16%	Brain and Other CNS*	37	11%
	Colon and Rectum	21	13%	Colon and Rectum	18	10%	Colon and Rectum	35	10%
	Lung and Bronchus	19	12%	Brain and Other CNS*	16	9%	Leukemia	34	10%
	Melanoma of the Skin	12	7%	Leukemia	14	8%	Lung and Bronchus	18	5%
	All Sites/Types	**164**		**All Sites/Types**	**173**		**All Sites/Types**	**337**	

*Central Nervous System.
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence and Mortality Trends

Figure 2.2 shows trends in cancer incidence and mortality rates from 1996 to 2019 among adolescents and young adults 15-39 years old. The cancer incidence rate increased 34%, from 61.2 per 100,000 population in 1996 to 82.0 per 100,000 in 2019. The cancer mortality rate decreased 24%, from 12.8 per 100,000 in 1996 to 9.7 per 100,000 in 2019. There was a similar increase in the incidence rate and a similar decrease in the mortality rate among those 15-39 years old in the U.S.

Figure 2.2. Cancer Among Adolescents and Young Adults 15-39 Years Old: Trend in Age-adjusted Incidence and Mortality Rates per 100,000 for All Cancer Sites/Types Combined, Ohio, 1996-2019



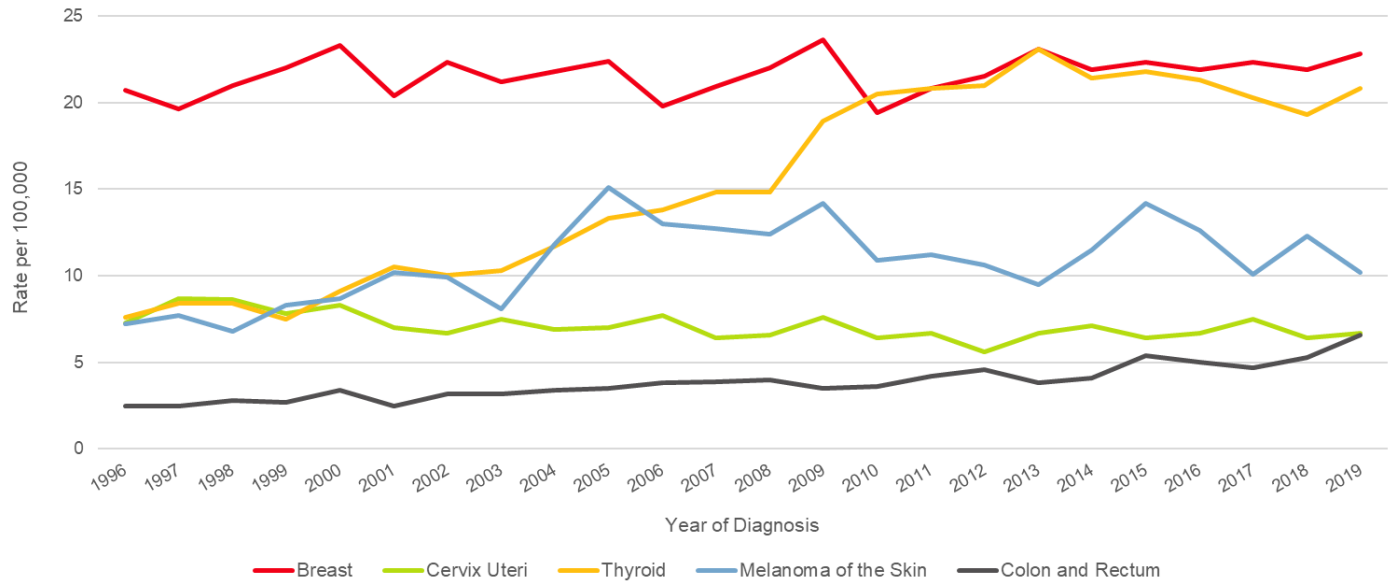
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence Trends Among Females

As shown in Figure 2.3, from 1996 to 2019, cancer incidence rates for females 15-39 years old:

- Increased nearly three-fold for thyroid cancer and colon and rectum cancer.
- Increased 42% for melanoma of the skin and 10% for breast cancer.
- Were relatively stable for cervical cancer.

Figure 2.3. Cancer Among Adolescent and Young Adult Females 15-39 Years Old: Trends in Age-adjusted Cancer Incidence Rates per 100,000 Females for the Leading Sites/Types, Ohio, 1996-2019

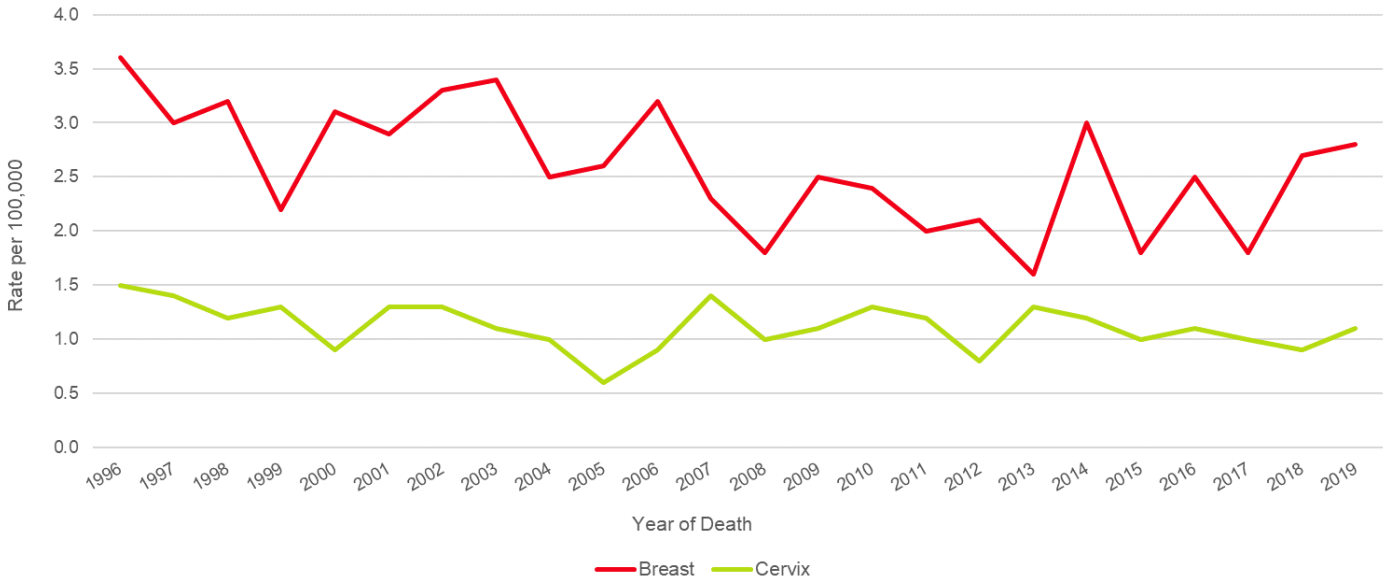


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.

Cancer Mortality Trends Among Females

As shown in Figure 2.4, from 1996 to 2019, breast and cervical cancer mortality rates for females 15-39 years old were variable but slightly decreased.

Figure 2.4. Cancer Among Adolescent and Young Adult Females 15-39 Years Old: Trends in Age-adjusted Cancer Mortality Rates per 100,000 Females for the Leading Sites/Types, Ohio, 1996-2019



Source: Bureau of Vital Statistics, Ohio Department of Health, 2022.

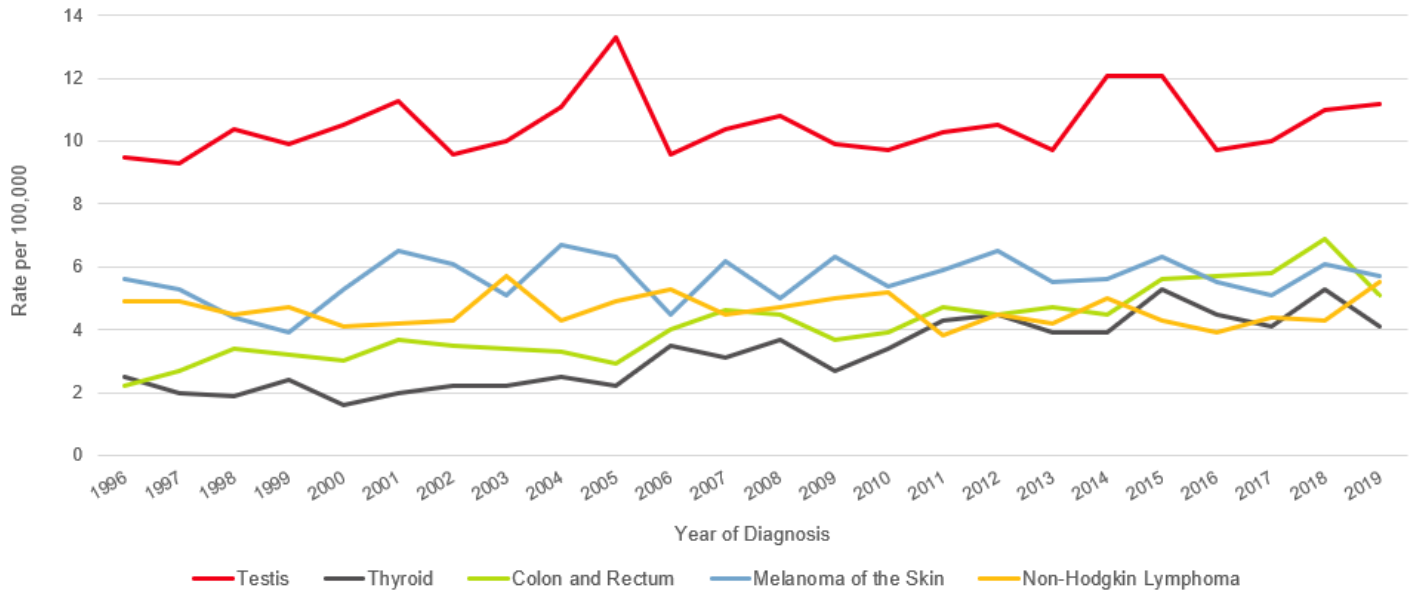
Note: Trends for other leading sites/types (brain and other central nervous system cancer, colon and rectum cancer, and leukemia) are not included because rates could not be calculated for some years due to case counts being less than five.

Cancer Incidence Trends Among Males

As shown in Figure 2.5, from 1996 to 2019, cancer incidence rates for males 15-39 years old:

- Increased more than two-fold for colon and rectum cancer.
- Increased 64% for thyroid cancer.
- Were relatively stable for melanoma of the skin and non-Hodgkin lymphoma.
- Were variable for testicular cancer.

Figure 2.5. Cancer Among Adolescent and Young Adult Males 15-39 Years Old: Trends in Age-adjusted Cancer Incidence Rates per 100,000 Males for the Leading Sites/Types, Ohio, 1996-2019

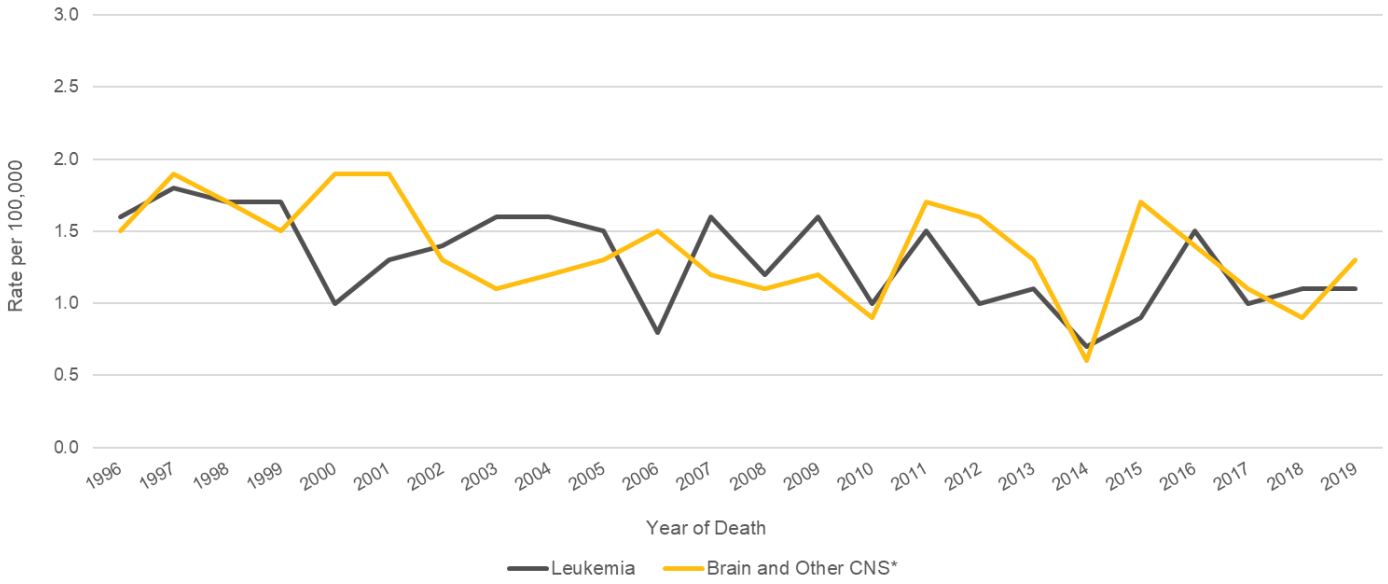


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.

Cancer Mortality Trends Among Males

As shown in Figure 2.6, from 1996 to 2019, leukemia and brain and other central nervous system (CNS) cancer mortality rates for males 15-39 years old were highly variable.

Figure 2.6. Cancer Among Adolescents and Young Adult Males 15-39 Years Old: Trends in Age-adjusted Cancer Mortality Rates per 100,000 Males for the Leading Sites/Types, Ohio, 1996-2019



*Central Nervous System.
Source: Bureau of Vital Statistics, Ohio Department of Health, 2022.
Note: Trends for other leading sites/types (colon and rectum cancer, lung and bronchus cancer, and melanoma of the skin) are not included because rates could not be calculated for some years due to case counts being less than five.

Risk of Cancer

Table 2.3 shows the risk of being diagnosed with invasive cancer before age 40 for all sites/types of cancer combined and the leading cancer sites/types for incidence by sex in the U.S. The risk of developing cancer before age 40 is greater among females than males; one in 63 males and one in 41 females will be diagnosed with invasive cancer before age 40.

Table 2.3. Risk of Being Diagnosed with Cancer Before Age 40 for the Leading Sites/Types of Cancer Incidence, by Sex, United States, 2017-2019

Male		Female	
All Sites/Types	1 in 63	**All Sites/Types**	1 in 41
Testis	1 in 359	Breast	1 in 181
Colon and Rectum	1 in 804	Thyroid	1 in 216
Melanoma of the Skin	1 in 1,081	Melanoma of the Skin	1 in 575
Thyroid	1 in 938	Cervix	1 in 654
Non-Hodgkin Lymphoma	1 in 783	Colon and Rectum	1 in 790

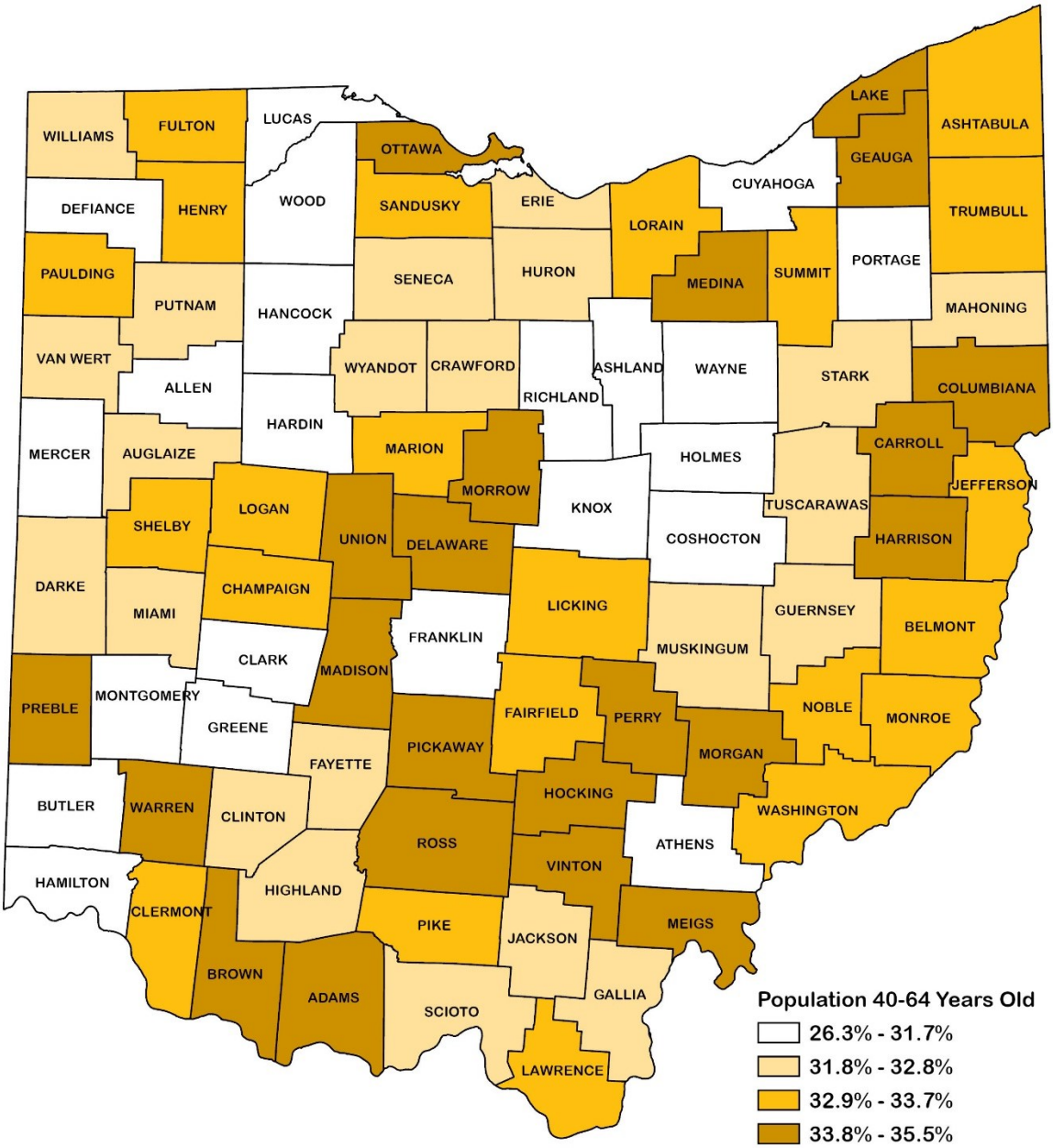
Source: DevCan: Probability of Developing or Dying of Cancer Software, Version 6.8.0. Surveillance Research Program, Statistical Methodology and Applications, National Cancer Institute, 2012. http://surveillance.cancer.gov/devcan/.
Risk of developing cancer before age 40 years, based on cancer cases diagnosed during 2017-2019 in 22 SEER registries.

Population Distribution

There were 3,725,731 adults 40-64 years old in Ohio in 2019, making up nearly one-third (31.9%) of Ohio's population.

Figure 3.1 shows the percentage of the population 40-64 years old in each county. The highest percentage of residents in this age group live in central Ohio and rural/non-metro counties.

Figure 3.1. Percentage of Adults 40-64 Years Old, by County, Ohio, 2019



Source: U.S. Census Bureau, Population Division, release date: June 2020.
Each category represents approximately 25% of the 88 Ohio counties.

Cancer Incidence and Mortality

Table 3.1 shows the average annual numbers of invasive cancer cases, deaths, incidence rates, and mortality rates in Ohio among those 40-64 years old in 2015-2019. An average of 26,877 new invasive cancer cases and 7,016 cancer deaths occurred each year among Ohioans in this age group. The overall cancer incidence rate among Ohioans 40-64 years old (596.8 per 100,000 population) was 10% higher than the U.S. rate of 542.3 per 100,000; the mortality rate (147.8 per 100,000) was 16% higher than the U.S. rate (127.2 per 100,000). The incidence rate was 10% higher among females compared with males, while the cancer mortality rate was 16% higher among males. Average annual incidence and mortality rates were 4% and 24% higher among Black Ohioans compared with white Ohioans. Incidence and mortality rates increased with advancing age group, with those 60-64 years old having five times higher rates than those 40-44 years old.

In Ohio, five-year relative cancer survival among those 40-64 years old increased from 62.2% in 1996 to 71.2% in 2014. Five-year relative survival for those 40-64 years old was slightly higher in the U.S. compared with Ohio.

Table 3.1. Cancer Among Adults 40-64 Years Old: Average Annual Number of New Invasive Cancer Cases and Incidence Rates and Average Annual Number of Cancer Deaths and Mortality Rates, by Sex, Race, and Age Group, Ohio, 2015-2019

		Incidence		Mortality	
		Cases	Rate	Deaths	Rate
Sex	Male	13,045	568.5	3,750	159.4
	Female	13,832	625.7	3,265	136.9
Race	White	22,829	588.5	5,948	145.2
	Black	3,222	614.3	979	179.4
Age Group	40-44	1,678	247.6	256	37.8
	45-49	2,915	395.1	564	76.4
	50-54	4,796	616.9	1,165	149.8
	55-59	7,637	917.6	2,067	248.3
	60-64	9,853	1,275	2,964	383.6
Total		26,877	596.8	7,016	184.7

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Leading Cancer Sites/Types

Table 3.2 shows percentages of new invasive cancer cases and cancer deaths for the five leading cancer sites/types among adults 40-64 years old by sex. Prostate cancer is the most frequently diagnosed cancer among males 40-64 years old, representing 25% of all new invasive cancers. Breast cancer is the most frequently diagnosed cancer among females 40-64 years old, representing 33% of all new invasive cancers. Lung and bronchus cancer is the leading site/type of cancer mortality in this age group for both males and females, accounting for 30% of cancer deaths among males and 27% among females.

Table 3.2. Cancer Among Adults 40-64 Years Old: Average Annual Number and Percentage of New Invasive Cancer Cases and Cancer Deaths for the Leading Sites/Types, by Sex, Ohio, 2015-2019

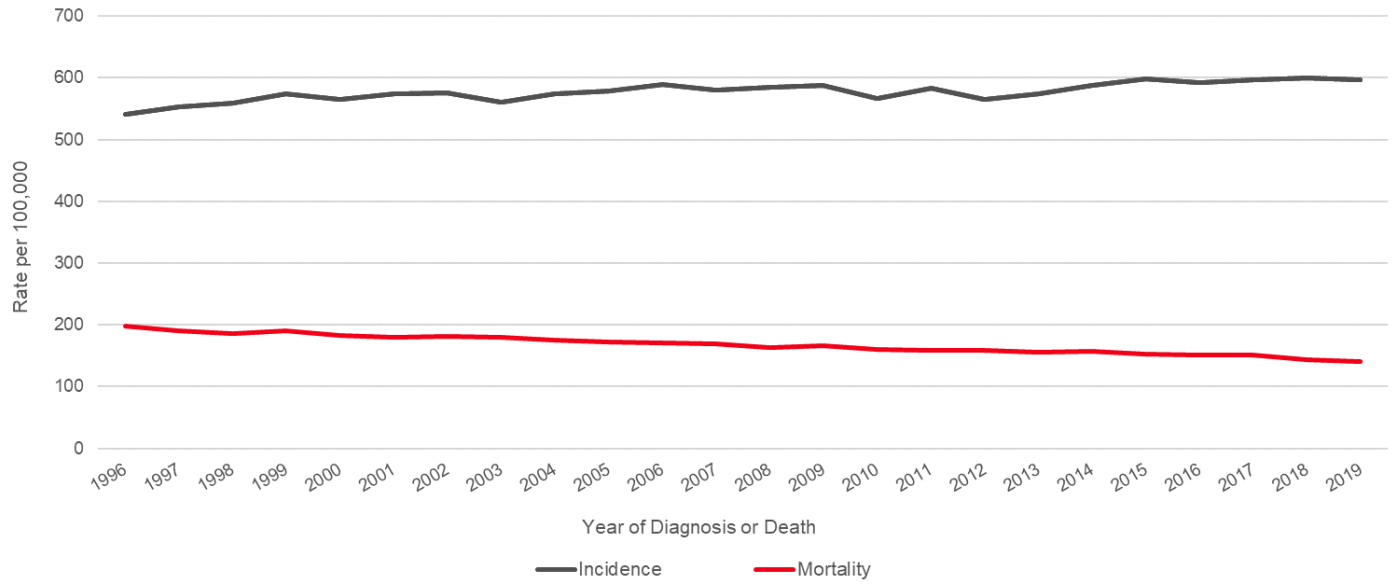
	Male			Female			Total		
Cases	Prostate	3,261	25%	Breast	4,626	33%	Breast	4,657	17%
	Lung and Bronchus	1,763	14%	Lung and Bronchus	1,605	12%	Lung and Bronchus	3,367	13%
	Colon and Rectum	1,275	10%	Uterus	1,265	9%	Prostate	3,261	12%
	Kidney and Renal Pelvis	754	6%	Colon and Rectum	970	7%	Colon and Rectum	2,245	8%
	Oral Cavity and Pharynx	742	6%	Thyroid	730	5%	Melanoma of the Skin	1,434	5%
	All Sites/Types	**13,045**		**All Sites/Types**	**13,832**		**All Sites/Types**	**26,877**	
	Male			**Female**			**Total**		
Deaths	Lung and Bronchus	1,129	30%	Lung and Bronchus	868	27%	Lung and Bronchus	1,997	28%
	Colon and Rectum	363	10%	Breast	592	18%	Colon and Rectum	623	9%
	Pancreas	287	8%	Colon and Rectum	260	8%	Breast	598	9%
	Liver and IBD*	258	7%	Pancreas	211	6%	Pancreas	498	7%
	Esophagus	219	6%	Ovary	160	5%	Liver and IBD*	349	5%
	All Sites/Types	**3,750**		**All Sites/Types**	**3,265**		**All Sites/Types**	**7,016**	

*Intrahepatic Bile Duct.
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence and Mortality

Figure 3.2 shows trends in cancer incidence and mortality rates from 1996 to 2019 among Ohioans 40-64 years old. Cancer incidence rates increased 10%, from 540.9 per 100,000 population in 1996 to 596.0 per 100,000 in 2019. Cancer mortality rates decreased 31%, from 216.9 per 100,000 in 1996 to 150.5 per 100,000 in 2019. There was a similar increase in the incidence rate and a similar decrease in the mortality rate among those 40-64 years old in the U.S.

Figure 3.2. Cancer Among Adults 40-64 Years Old: Trends in Age-adjusted Incidence and Mortality Rates per 100,000 for All Cancer Sites/Types Combined, Ohio, 1996-2019



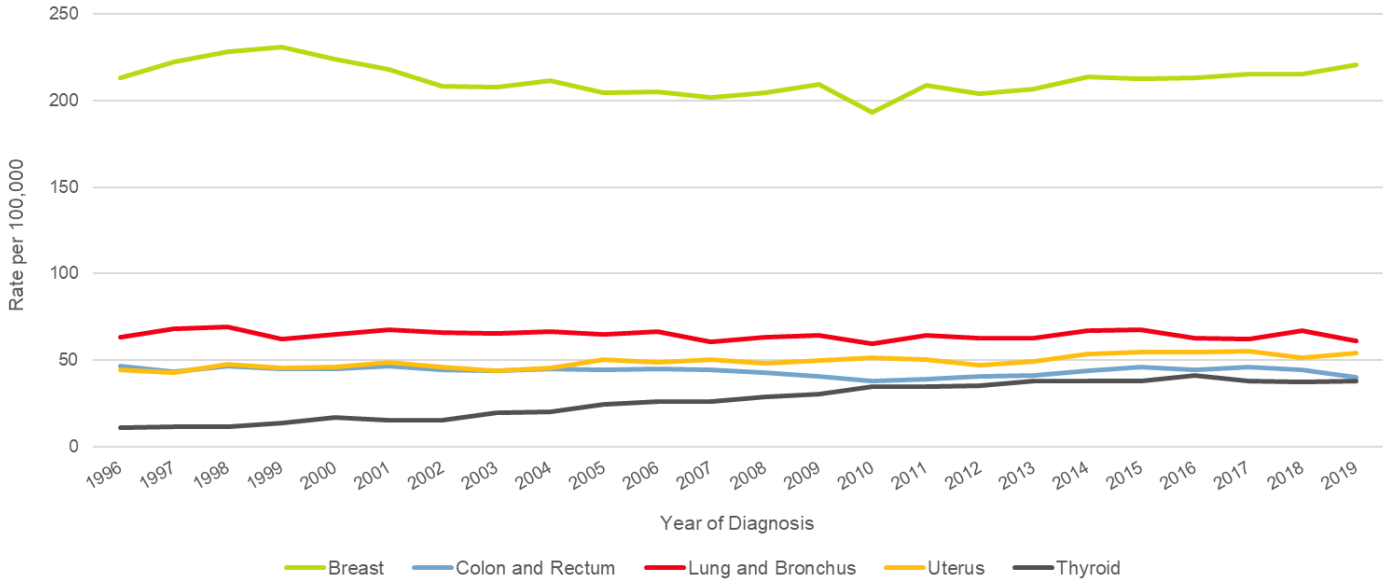
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence Trends Among Females

As shown in Figure 3.3, from 1996 to 2019, cancer incidence rates for females 40-64 years old:

- Increased more than three-fold for thyroid cancer.
- Increased slightly for uterine cancer.
- Were relatively stable for breast, colon and rectum, and lung and bronchus cancer.

Figure 3.3. Cancer Among Females 40-64 Years Old: Trends in Age-adjusted Cancer Incidence Rates per 100,000 Females for the Leading Sites/Types, Ohio, 1996-2019



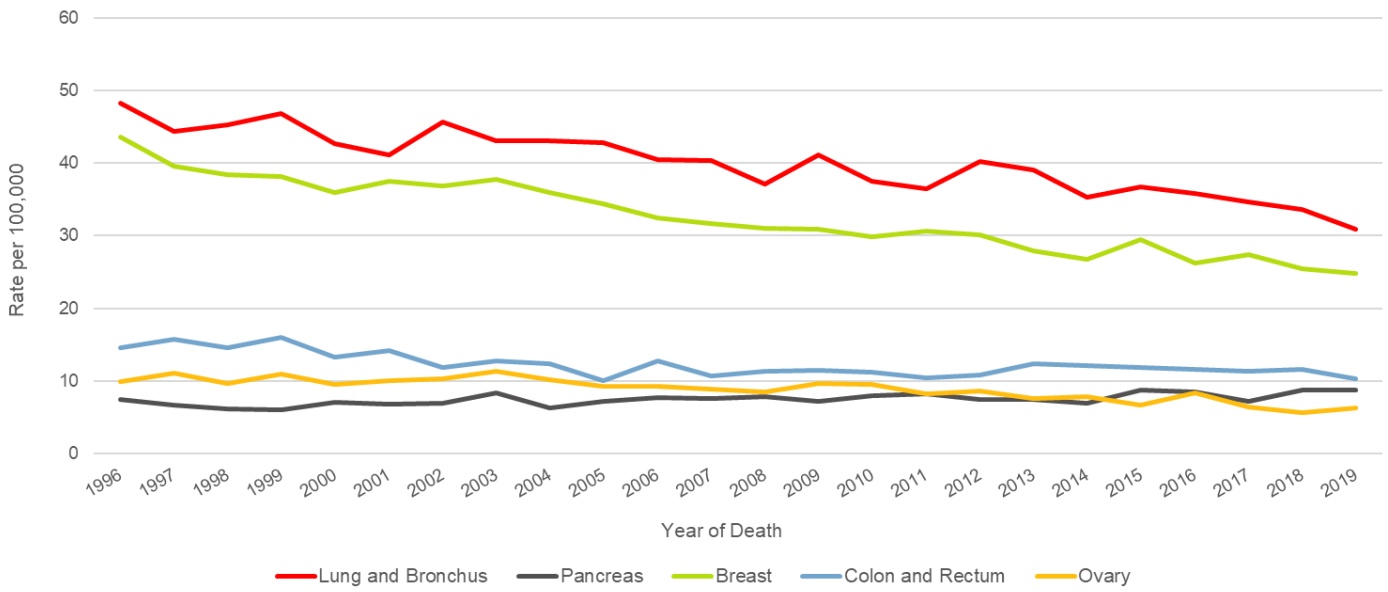
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.

Cancer Mortality Trends Among Females

As shown in figure 3.4, from 1996 to 2019, cancer mortality rates for females 40-64 years old:

- Increased slightly for pancreatic cancer.
- Decreased considerably for cancers of the lung and bronchus (43%), ovary (36%), breast (36%), and colon and rectum (29%).

Figure 3.4. Cancer Among Females 40-64 Years Old: Trends in Age-adjusted Cancer Mortality Rates per 100,000 Females for the Leading Sites/Types, Ohio, 1996-2019



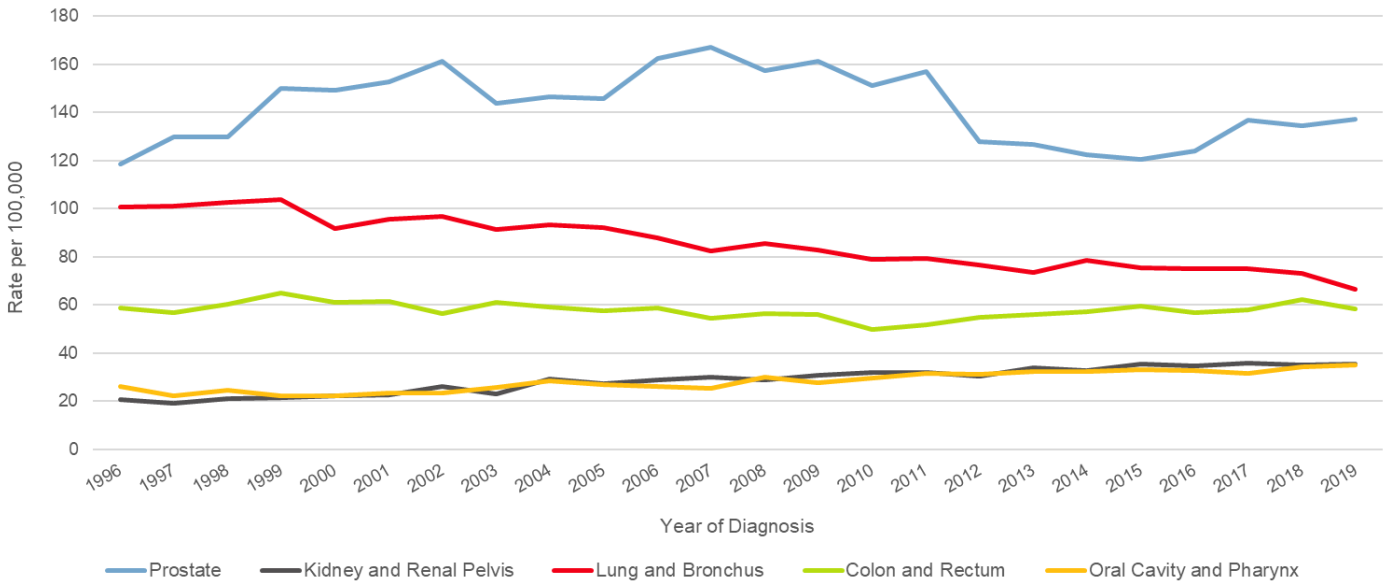
Source: Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence Trends Among Males

As shown in Figure 3.5, from 1996 to 2019, cancer incidence rates for males 40-64 years old:

- Increased considerably for kidney and renal pelvis cancer (72%) and oral cavity and pharynx cancer (36%).
- Decreased considerably (34%) for lung and bronchus cancer.
- Were variable for prostate cancer.
- Were relatively stable for colon and rectum cancer.

Figure 3.5. Cancer Among Males 40-64 Years Old: Trends in Age-adjusted Cancer Incidence Rates per 100,000 Males for the Leading Sites/Types, Ohio, 1996-2019



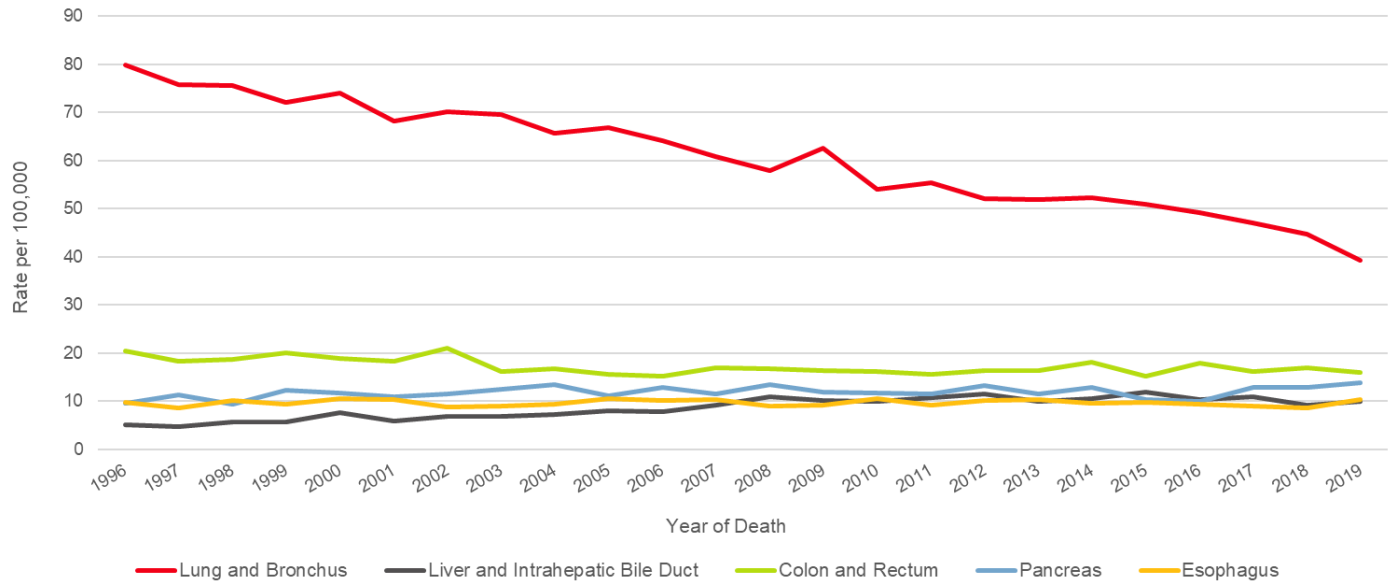
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.

Cancer Mortality Trends Among Males

As shown in Figure 3.6, from 1996 to 2019, cancer mortality rates for males 40-64 years old:

- Increased two-fold for liver and intrahepatic bile duct cancer.
- Increased slightly for pancreatic cancer.
- Decreased considerably for lung and bronchus cancer (by 51%).
- Decreased slightly for colon and rectum cancer.
- Were relatively stable for esophageal cancer.

Figure 3.6. Cancer Among Males 40-64 Years Old: Trends in Age-adjusted Cancer Mortality Rates per 100,000 Males for the Leading Cancer Sites/Types, Ohio, 1996-2019



Source: Bureau of Vital Statistics, Ohio Department of Health, 2022.

Risk of Cancer Among Adults

Table 3.3 shows the risk of being diagnosed with invasive cancer before age 65 for all sites/types of cancer combined and the leading cancer sites/types for incidence by sex in the U.S. The risk of developing cancer before age 65 is slightly higher among females than males; one in seven males and one in six females will be diagnosed with invasive cancer before age 65.

Table 3.3. Risk of Being Diagnosed with Cancer Before Age 65 for All Cancer Sites/Types Combined and the Leading Sites/Types of Cancer Incidence, by Sex, United States, 2017-2019

Male		Female	
All Sites/Types	1 in 7	**All Sites/Types**	1 in 6
Prostate	1 in 27	Breast	1 in 17
Lung and Bronchus	1 in 81	Lung and Bronchus	1 in 84
Colon and Rectum	1 in 66	Uterus	1 in 73
Kidney and Renal Pelvis	1 in 111	Colon and Rectum	1 in 84
Oral Cavity and Pharynx	1 in 141	Thyroid	1 in 79

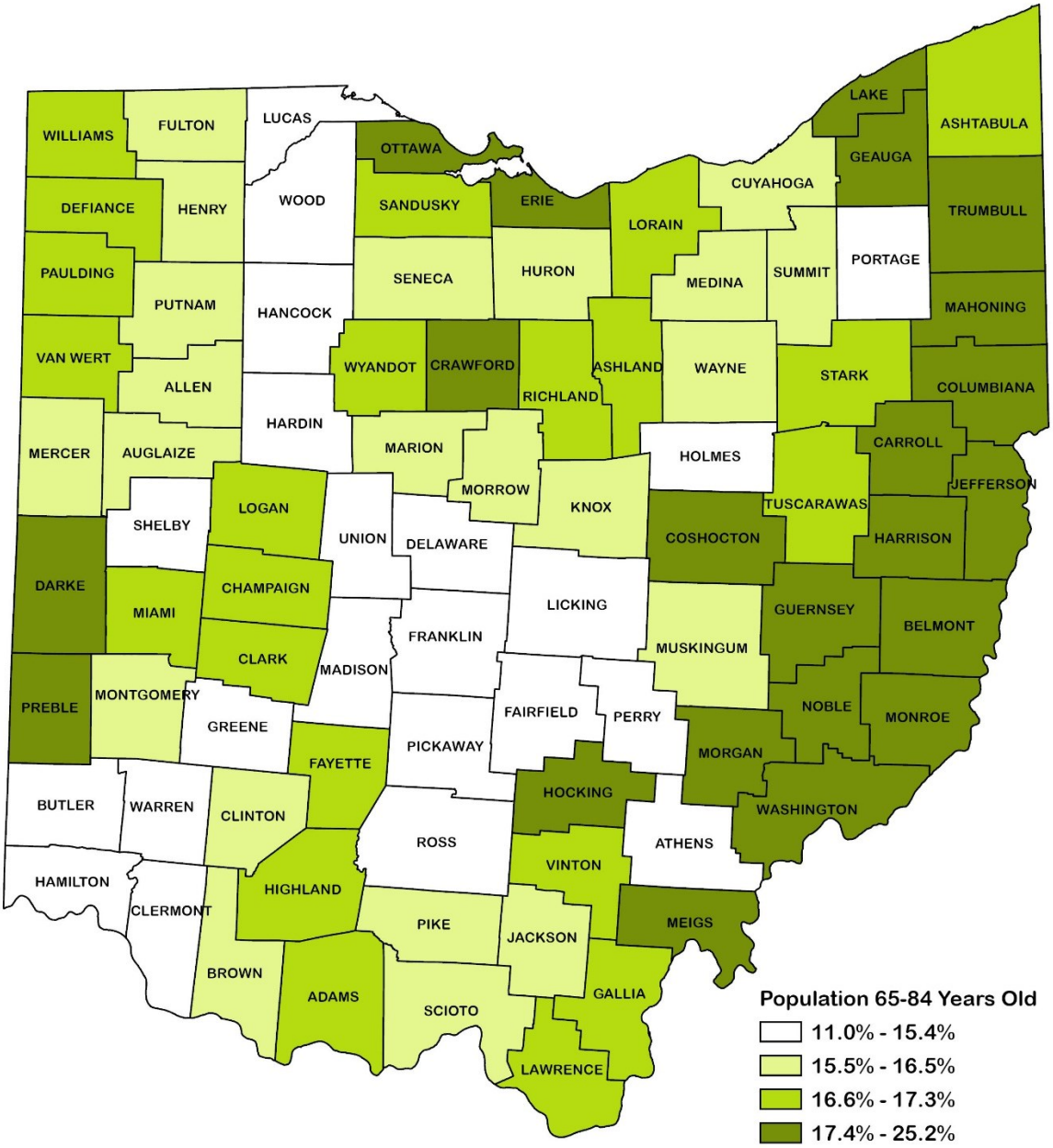
Source: DevCan: Probability of Developing or Dying of Cancer Software, Version 6.8.0. Surveillance Research Program, Statistical Methodology and Applications, National Cancer Institute, 2012. http://surveillance.cancer.gov/devcan/.
Risk of developing cancer before age 65 years, based on cancer cases diagnosed during 2017-2019 in 22 SEER registries.

Population Distribution

There were 1,790,048 adults 65-84 years old in Ohio in 2019, making up 15.3% of Ohio's population.

Figure 4.1 shows the percentage of residents 65-84 years old in each county. The highest percentage of residents in this age group live in Appalachian counties. There were lower percentages of residents in this age group in central Ohio counties.

Figure 4.1. Percentage of Adults 65-84 Years Old, by County, Ohio, 2019



Source: U.S. Census Bureau, Population Division, release date: June 2020.
Each category represents approximately 25% of the 88 Ohio counties.

Cancer Incidence and Mortality

Table 4.1 shows the average annual numbers of invasive cancer cases, deaths, incidence rates, and mortality rates in Ohio among those 65-84 years old in 2015-2019. An average of 33,740 new invasive cancer cases and 13,760 cancer deaths occurred each year among Ohioans in this age group. The overall cancer incidence rate among Ohioans 65-84 years old (2,043.6 per 100,000 population) was 9% higher than the U.S. rate of 1,861.2 per 100,000; the mortality rate (857.5 per 100,000) was 10% higher than the U.S. rate (769.9 per 100,000). The incidence rate was 42% higher among males compared with females, while the cancer mortality rate was 46% higher among males. The average annual incidence rate was 6% higher among white Ohioans compared with Black Ohioans, while the average annual mortality rate was 9% higher among Black Ohioans. Incidence and mortality rates increased with advancing age group, with those 80-84 years old having a mortality rate more than two times higher than those 65-69 years old.

In Ohio, five-year relative cancer survival among those 65-84 years old increased from 54.5% in 1996 to 62.4% in 2014. There was similar five-year relative survival for those 65-84 years old in the U.S.

Table 4.1. Cancer Among Adults 65-84 Years Old: Average Annual Number of New Invasive Cancer Cases and Incidence Rates and Average Annual Number of Cancer Deaths and Mortality Rates, by Sex, Race, and Age Group, Ohio, 2015-2019

		Incidence		Mortality	
		Cases	Rate	Deaths	Rate
Sex	Male	18,098	2,443.3	7,396	1,040.5
	Female	15,642	1,722.4	6,365	714.2
Race	White	30,036	2,042.5	12,237	855.1
	Black	2,969	1,918.7	1,386	929.8
Age Group	65-69	10,985	1,699.2	3,512	543.3
	70-74	9,607	2,041.7	3,593	763.6
	75-79	7,727	2,304.3	3,490	1,040.6
	80-84	5,422	2,314.5	3,166	1,351.3
Total		33,740	2,043.6	13,760	857.5

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Leading Cancer Sites/Types

Table 4.2 shows percentages of new invasive cancer cases and cancer deaths for the five leading cancer sites/types by sex among Ohio adults 65-84 years old. Prostate cancer was the most frequently diagnosed cancer among males 65-84 years old, representing 26% of all new invasive cancers. Breast cancer was the most frequently diagnosed cancer among females 65-84 years old, representing 28% of all new invasive cancers. Lung and bronchus cancer was the leading site/type of cancer mortality in this age group for both males and females, accounting for 30% of cancer deaths among males and 29% among females.

Table 4.2. Cancer Among Adults 65-84 Years Old: Average Annual Number and Percentage of New Invasive Cancer Cases and Cancer Deaths for the Leading Sites/Types, by Sex, Ohio, 2015-2019

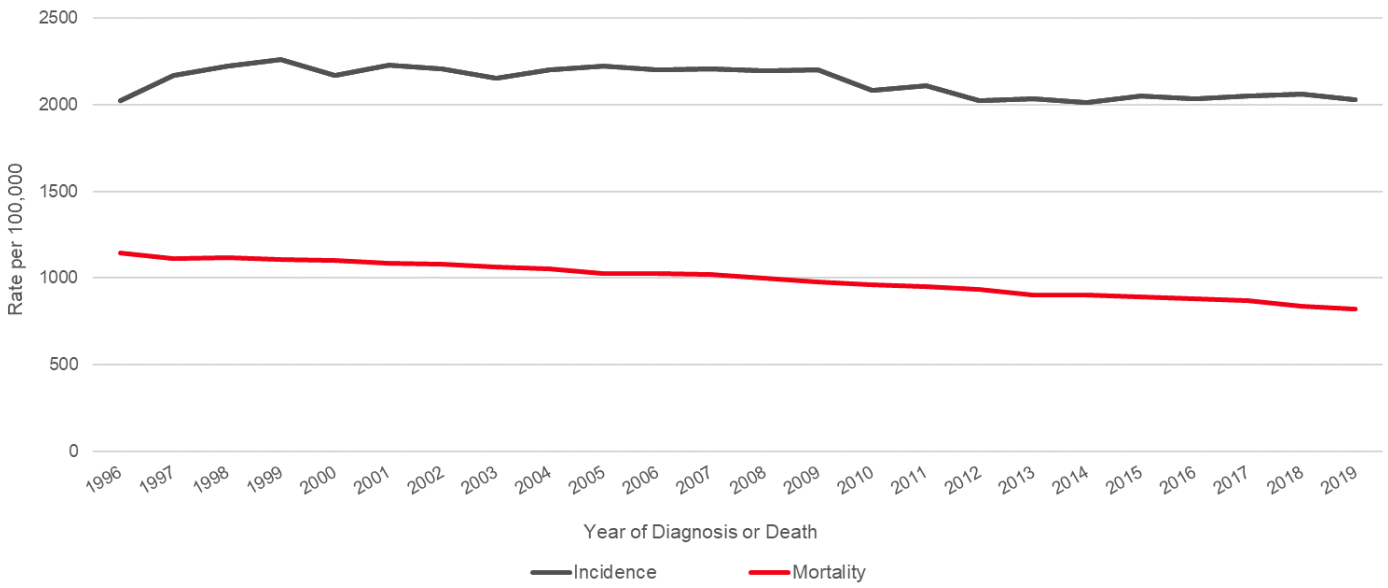
	Male			Female			Total		
Cases	Prostate	4,734	26%	Breast	4,316	28%	Lung and Bronchus	5,998	18%
	Lung and Bronchus	3,131	17%	Lung and Bronchus	2,867	18%	Prostate	4,734	14%
	Bladder	1,527	8%	Colon and Rectum	1,349	9%	Breast	4,356	13%
	Colon and Rectum	1,427	8%	Uterus	1,069	7%	Colon and Rectum	2,776	8%
	Melanoma of the Skin	1,001	6%	Non-Hodgkin Lymphoma	638	4%	Bladder	1,971	6%
	All Sites/Types	**18,098**		**All Sites/Types**	**15,642**		**All Sites/Types**	**33,740**	
	Male			**Female**			**Total**		
Deaths	Lung and Bronchus	2,216	30%	Lung and Bronchus	1,818	29%	Lung and Bronchus	4,034	29%
	Prostate	678	9%	Breast	795	12%	Colon and Rectum	1,081	8%
	Colon and Rectum	579	8%	Pancreas	527	8%	Pancreas	1,071	8%
	Pancreas	543	7%	Colon and Rectum	502	8%	Breast	806	6%
	Liver and IBD*	333	5%	Ovary	294	5%	Prostate	678	5%
	All Sites/Types	**7,396**		**All Sites/Types**	**6,365**		**All Sites/Types**	**13,760**	

* Intrahepatic Bile Duct.
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence and Mortality Trends

Figure 4.2 shows trends in cancer incidence and mortality rates from 1996 to 2019 among those 65-84 years old. Cancer incidence rates increased then stabilized from 1996 to 2009, then decreased and stabilized from 2010 to 2019. Cancer mortality rates decreased 28%, from 1,142.8 per 100,000 population in 1996 to 821.5 per 100,000 in 2019. There was a similar increase in the incidence rate and a similar decrease in the mortality rate among those 65-84 years old in the U.S.

Figure 4.2. Trends in Age-adjusted Incidence and Mortality Rates per 100,000 Population for All Cancer Sites/Types Combined Among Adults 65-84 Years Old, Ohio, 1996-2019



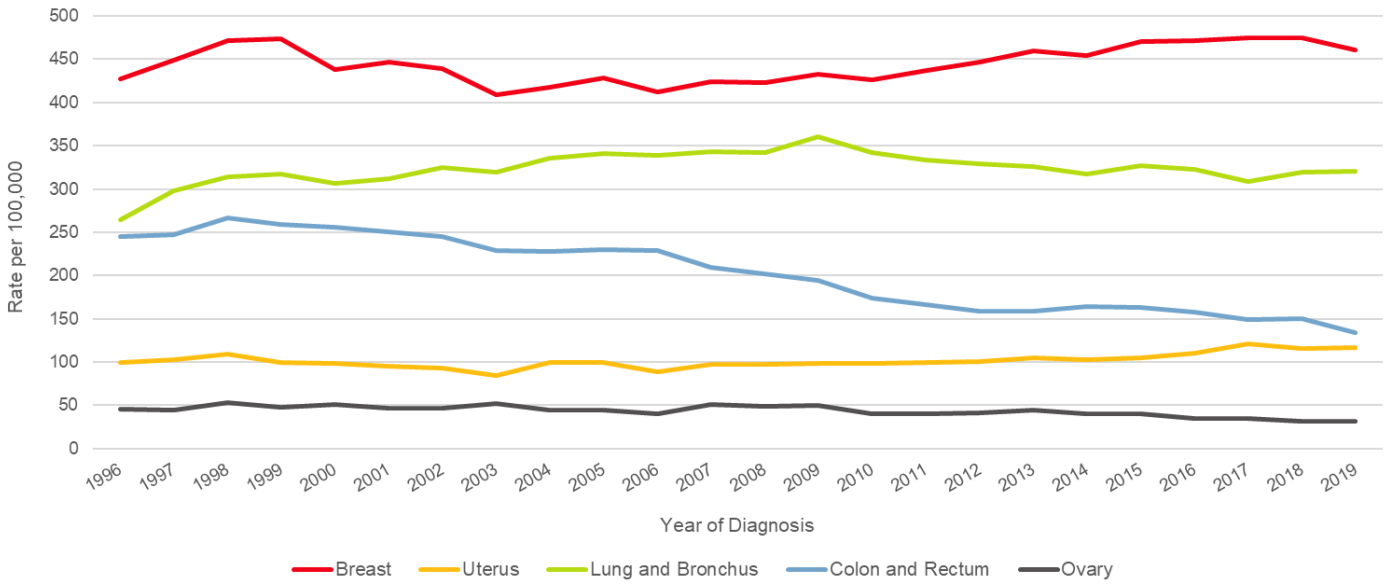
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence Trends Among Females

As shown in Figure 4.3, from 1996 to 2019, cancer incidence rates for females 65-84 years old:

- Increased 21% for lung and bronchus cancer and 17.3% for uterine cancer.
- Decreased 30% for ovarian cancer and 45% for colon and rectum cancer.
- Were variable for breast cancer.

Figure 4.3. Cancer Among Females 65-84 Years Old: Trends in Age-adjusted Cancer Incidence Rates per 100,000 Females for the Leading Sites/Types, Ohio, 1996-2019



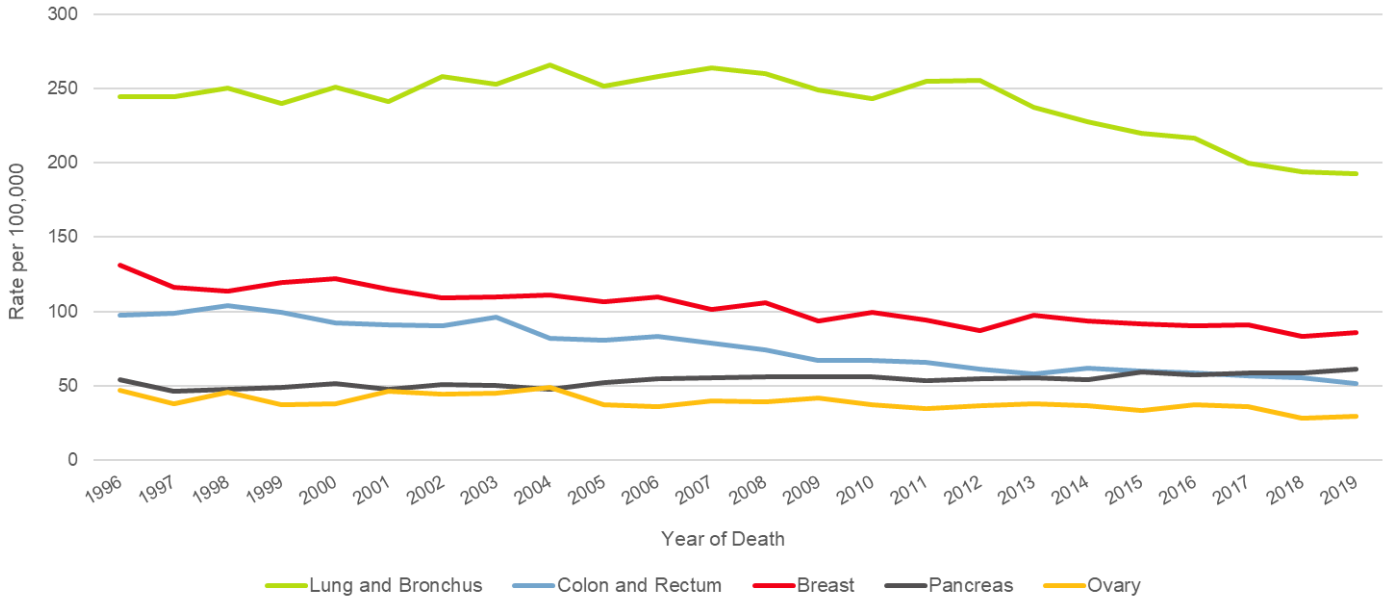
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.

Cancer Mortality Trends Among Females

As shown in Figure 4.4, from 1996 to 2019, cancer mortality rates for females 65-84 years old:

- Increased slightly for pancreatic cancer.
- Decreased for cancers of the colon and rectum (47%), ovary (37%), breast (34%), and lung and bronchus (21%).

Figure 4.4. Cancer Among Females 65-84 Years Old: Trends in Age-adjusted Cancer Mortality Rates per 100,000 Females for the Leading Sites/Types, Ohio 1996-2019



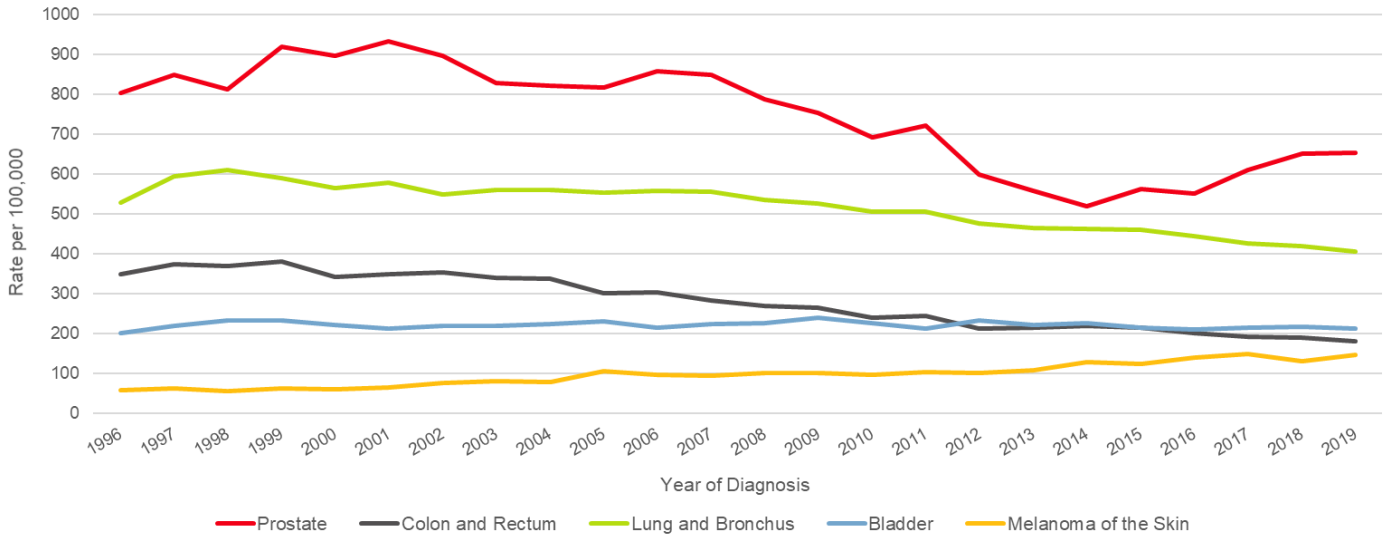
Source: Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence Trends Among Males

As shown in Figure 4.5, from 1996 to 2019, cancer incidence rates for males 65-84 years old:

- Increased more than two-fold for melanoma of the skin.
- Decreased 45% for colon and rectum cancer and 21% for lung and bronchus cancer.
- Decreased 19% for prostate cancer.
- Were relatively stable for bladder cancer.

Figure 4.5. Cancer Among Males 65-84 Years Old: Trends in Age-adjusted Cancer Incidence Rates per 100,000 Males for the Leading Sites/Types, Ohio 1996-2019



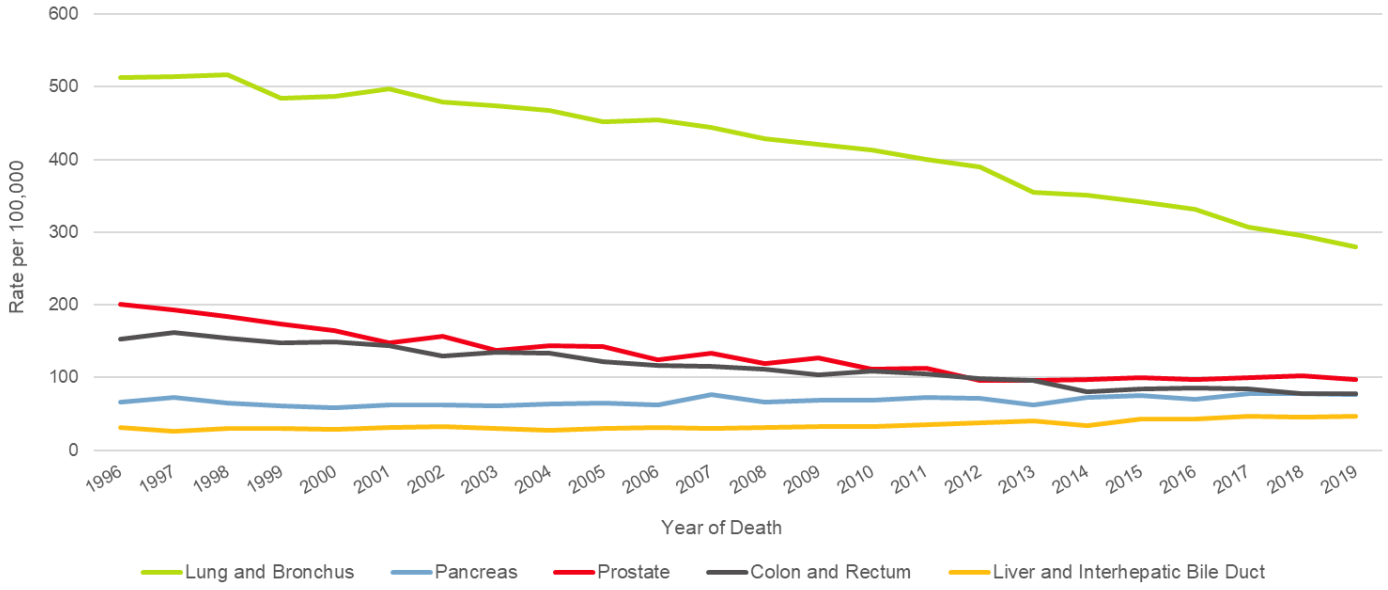
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.

Cancer Mortality Trends Among Males

As shown in figure 4.6, from 1996 to 2019, cancer mortality rates for males 65-84 years old:

- Increased 48% for liver and intrahepatic bile duct cancer and 18% for pancreatic cancer.
- Decreased 51% for prostate cancer, 49% for colon and rectum cancer, and 45% for lung and bronchus cancer.

Figure 4.6. Cancer Among Males 65-84 Years Old: Trends in Age-adjusted Cancer Mortality Rates per 100,000 Males for the Leading Cancer Sites/Types, Ohio 1996-2019



Source: Bureau of Vital Statistics, Ohio Department of Health, 2022.

Risk of Cancer

Table 4.3 shows the risk of being diagnosed with invasive cancer before age 85 for all sites/types of cancer combined and the leading cancer sites/types for incidence by sex in the U.S. The risk of developing cancer before age 85 is similar among males and females; one in three males and one in three females will be diagnosed with invasive cancer before age 85.

Table 4.3. Risk of Being Diagnosed with Cancer Before age 85 for the Leading Sites/Types of Cancer Incidence, by Sex, United States, 2017-2019

Male		Female	
All Sites/Types	1 in 3	**All Sites/Types**	1 in 3
Prostate	1 in 9	Breast	1 in 8
Lung and Bronchus	1 in 19	Lung and Bronchus	1 in 20
Bladder	1 in 36	Colon and Rectum	1 in 33
Colon and Rectum	1 in 27	Uterus	1 in 35
Melanoma of the Skin	1 in 45	Non-Hodgkin Lymphoma	1 in 64

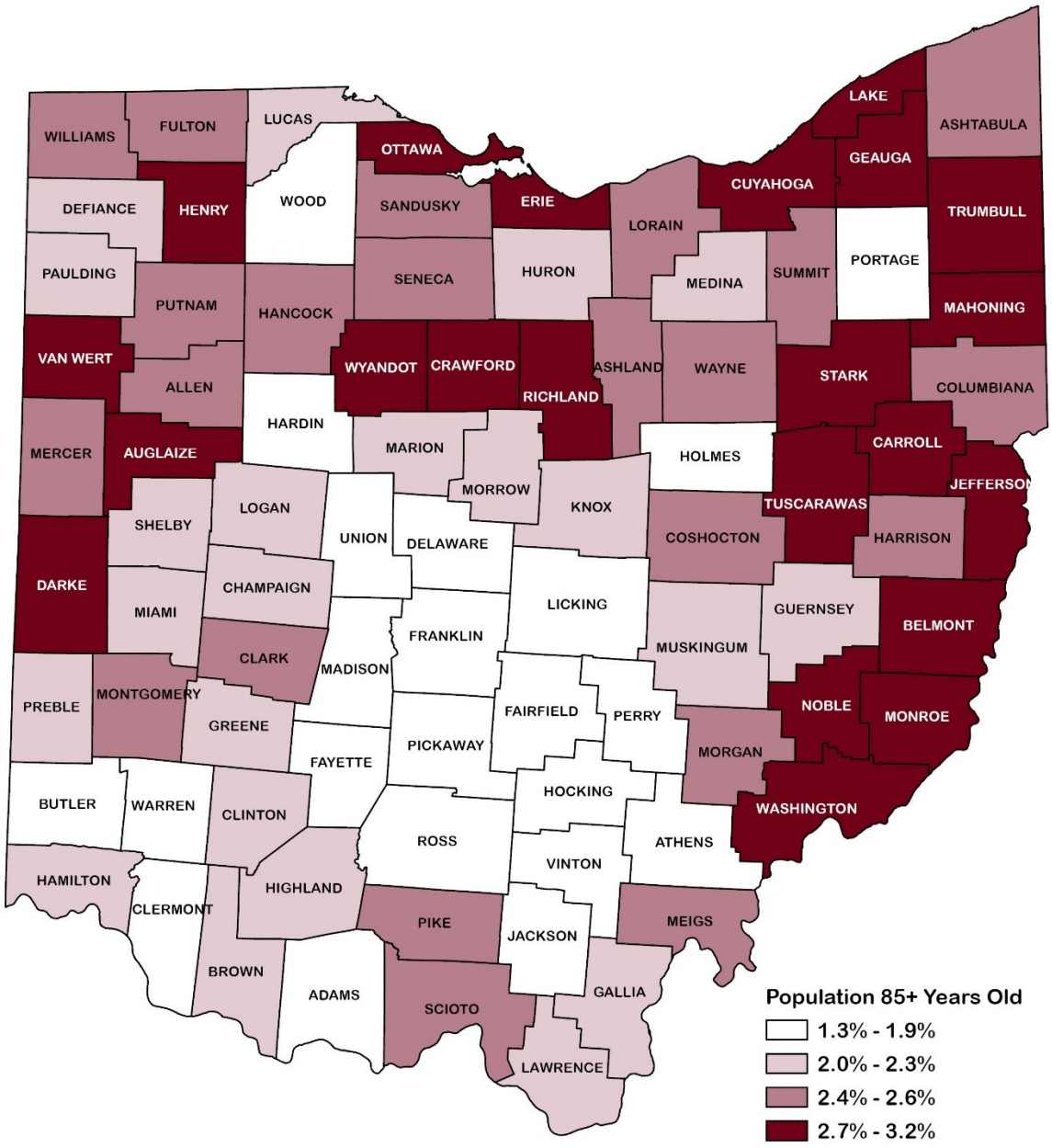
Source: DevCan: Probability of Developing or Dying of Cancer Software, Version 6.8.0. Surveillance Research Program, Statistical Methodology and Applications, National Cancer Institute, 2012. http://surveillance.cancer.gov/devcan/.
Risk of developing cancer before age 85 years, based on cancer cases diagnosed during 2017-2019 in 22 SEER registries.

Population Distribution

There were 256,272 adults 85+ years old in Ohio in 2019, making up 2.2% of Ohio's population.

Figure 5.1 shows the percentage of residents 85+ years old in each county. The highest percentage of residents in this age group live in northeastern Ohio and Appalachian counties. There were lower percentages of residents in this age group in central Ohio counties.

Figure 5.1. Percentage of Adults 85+ Years Old, by County, Ohio, 2019



Source: U.S. Census Bureau, Population Division, release date: June 2020.
Each category represents approximately 25% of the 88 Ohio counties.

Cancer Incidence and Mortality

Table 5.1 shows the average annual numbers of invasive cancer cases, deaths, incidence rates, and mortality rates in Ohio among those 85+ years old in 2015-2019. An average of 5,077 new invasive cancer cases and 4,221 cancer deaths occurred each year among Ohioans in this age group. The overall cancer incidence rate among Ohioans 85+ years old (1,990.1 per 100,000 population) was 7% lower than the U.S. rate of 2,143.2 per 100,000; the Ohio mortality rate (1,654.7 per 100,000) was 3% higher than the U.S. rate (1,600.2 per 100,000). The incidence and mortality rates among males were 64% and 75% higher than those among females. The average annual incidence rate was 64% higher among white Ohioans compared with Black Ohioans, while the average annual mortality rates were similar for white Ohioans and Black Ohioans.

In Ohio, five-year relative cancer survival among those 85+ years old was relatively stable from 1996 (46.0%) to 2014 (45.8%). In the U.S., five-year relative survival for those 85+ years old was slightly lower than that for Ohioans.

Table 5.1. Cancer Among Adults 85+ Years Old: Average Annual Number of New Invasive Cancer Cases and Incidence Rates and Average Annual Number of Cancer Deaths and Mortality Rates, by Sex and Race, Ohio, 2015-2019

		Incidence		Mortality	
		Cases	Rate	Deaths	Rate
Sex	Male	2,236	2,678.3	2,005	2,308.5
	Female	2,751	1,635.9	2,216	1,317.2
Race	White	2,326	2,678.3	3,848	1,662.6
	Black	2,751	1,634.9	344	1,639.1
Total		5,077	1,990.1	4,221	1,654.7

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Leading Cancer Sites/Types

Table 5.2 shows percentages of new invasive cancer cases and cancer deaths for the five leading cancer sites/types by sex. Lung and bronchus cancer is the most frequently diagnosed cancer among males 85+ years old, representing 16% of all new invasive cancers. Breast cancer is the most frequently diagnosed cancer among females 85+ years old, representing 20% of all new invasive cancers. Lung and bronchus cancer is the leading site/type of cancer mortality in this age group for both males and females, accounting for 20% of cancer deaths among males and 18% among females.

Table 5.2. Cancer Among Adults 85+ Years Old: Average Annual Number and Percentage of New Invasive Cancer Cases and Cancer Deaths for the Leading Sites/Types, by Sex, Ohio, 2015-2019

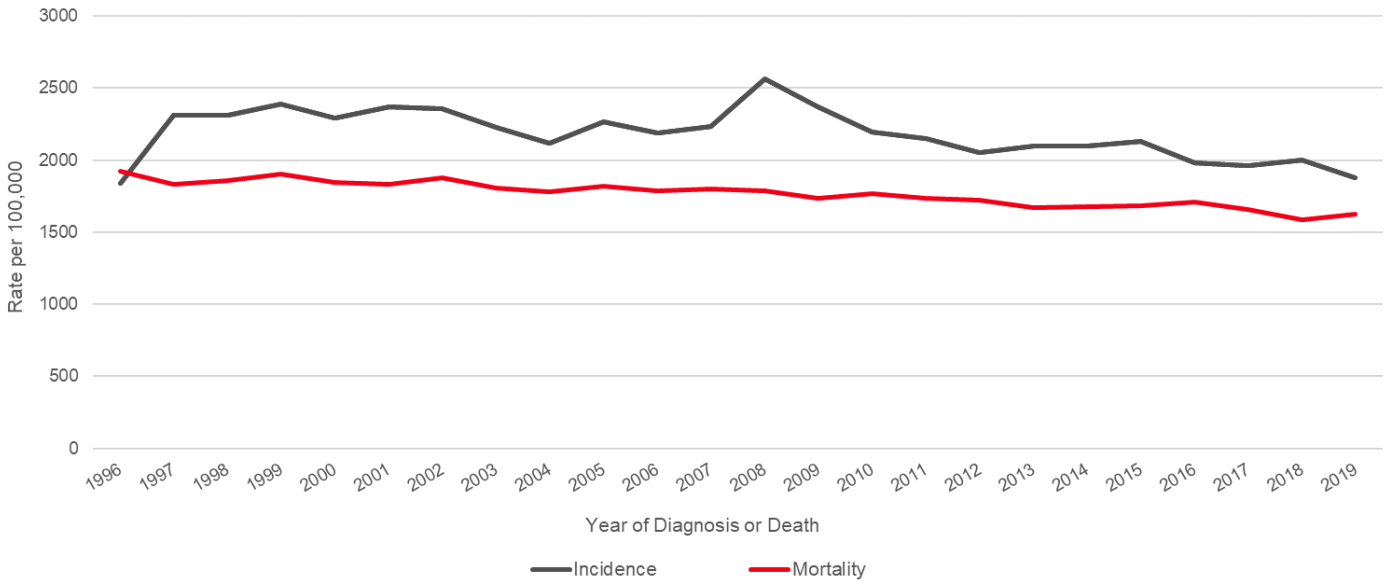
	Male			Female			Total		
Cases	Lung and Bronchus	370	16%	Breast	551	20%	Lung and Bronchus	741	15%
	Bladder	323	14%	Colon and Rectum	394	14%	Colon and Rectum	648	13%
	Prostate	295	13%	Lung and Bronchus	371	13%	Breast	558	11%
	Colon and Rectum	253	11%	Pancreas	145	5%	Bladder	454	9%
	Melanoma of the Skin	183	8%	Bladder	131	5%	Prostate	295	6%
	All Sites/Types	**2,326**		**All Sites/Types**	**2,751**		**All Sites/Types**	**5,077**	
	Male			**Female**			**Total**		
Deaths	Lung and Bronchus	401	20%	Lung and Bronchus	389	18%	Lung and Bronchus	790	19%
	Prostate	382	19%	Breast	316	14%	Colon and Rectum	449	11%
	Colon and Rectum	185	9%	Colon and Rectum	265	12%	Prostate	382	9%
	Bladder	151	8%	Pancreas	175	8%	Breast	318	8%
	Leukemia	110	5%	Leukemia	117	5%	Pancreas	272	6%
	All Sites/Types	**2,005**		**All Sites/Types**	**2,216**		**All Sites/Types**	**4,221**	

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence and Mortality

Figure 5.2 shows trends in cancer incidence and mortality rates from 1996 to 2019 among those 85+ years old. Cancer incidence rates generally increased from 1996 to 2008, and then decreased through 2019. Cancer mortality rates decreased 15.6% from 1,923.2 per 100,000 population in 1996 to 1,624.1 per 100,000 in 2019. In the U.S., there was a similar decrease in the incidence rate after 2008 and a similar decrease in the mortality rate from 1996 to 2019 among those 85+ years old.

Figure 5.2. Trends in Age-adjusted Incidence and Mortality Rates per 100,000 Population for All Cancer Sites/Types Combined Among Adults 85+ Years Old, Ohio, 1996-2019



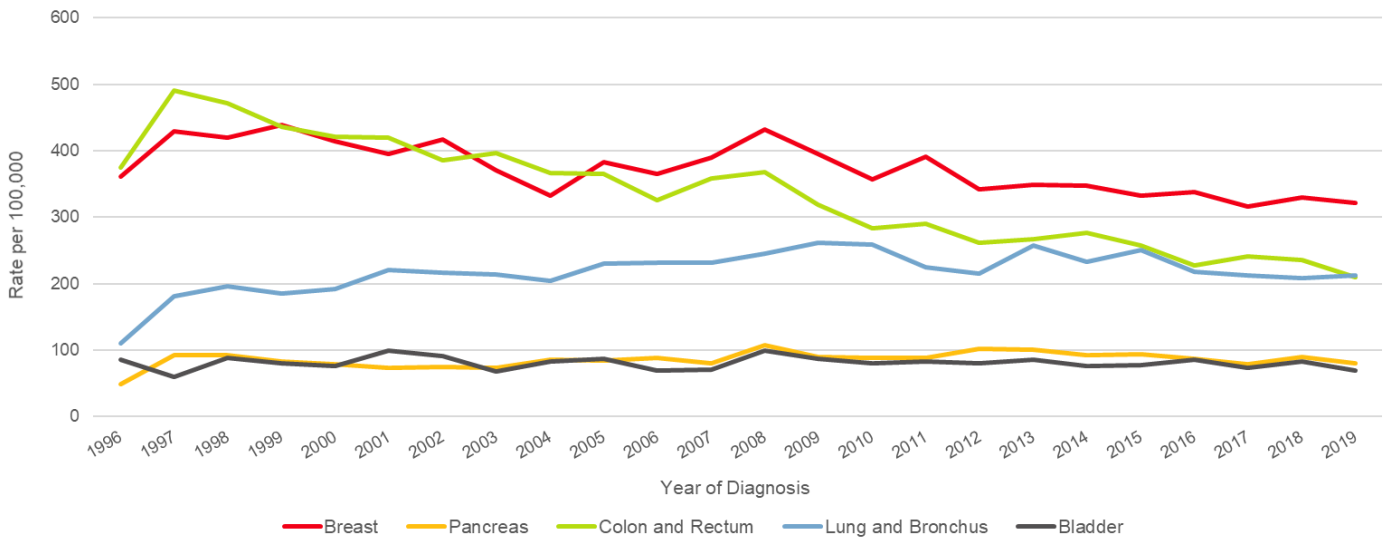
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence Trends Among Females

As shown in figure 5.3, from 1996 to 2019, cancer incidence rates for females 85+ years old:

- Increased for lung and bronchus cancer.
- Decreased 44% for colon and rectum cancer and 11% for breast cancer.
- Were relatively stable for pancreatic and bladder cancers.

Figure 5.3. Cancer Among Females 85+ Years Old: Trends in Age-adjusted Cancer Incidence Rates per 100,000 Females for the Leading Sites/Types, Ohio, 1996-2019



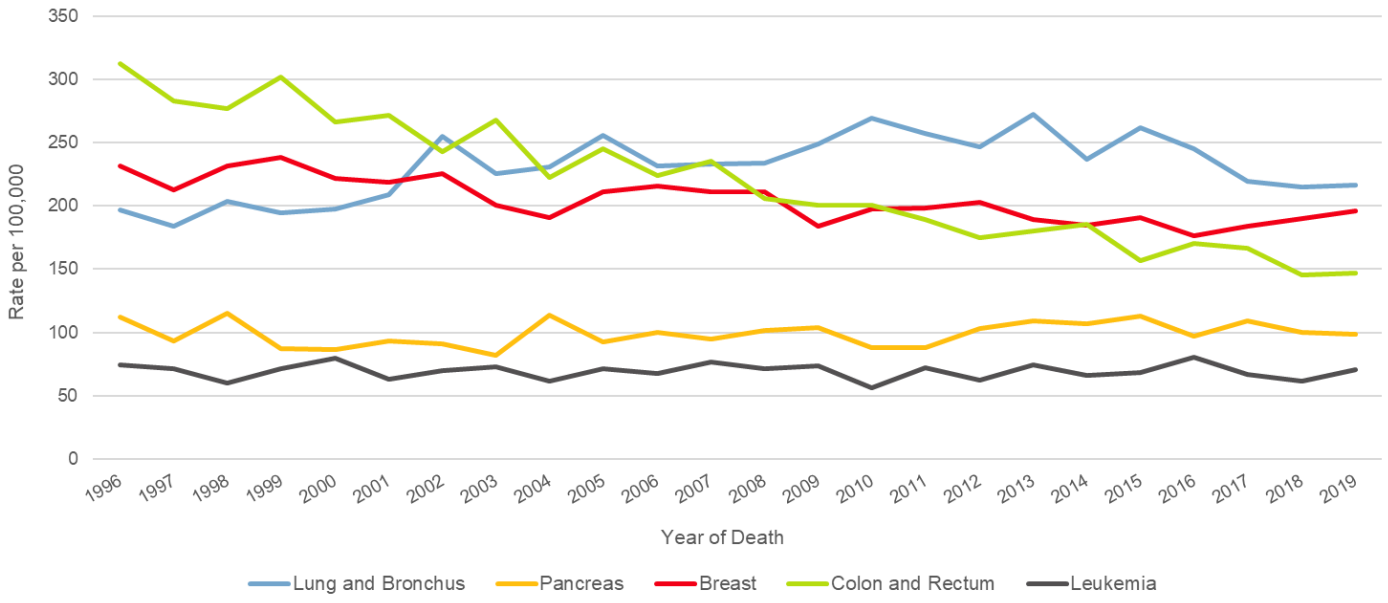
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.

Cancer Mortality Trends Among Females

As shown in Figure 5.4, from 1996 to 2019, cancer mortality rates for females 85+ years old:

- Were variable but increased for lung and bronchus cancer.
- Decreased by 53% for colon and rectum cancer and 16% for breast cancer.
- Were variable for pancreatic cancer and leukemia.

Figure 5.4. Cancer Among Females 85+ Years Old: Trends in Age-adjusted Cancer Mortality Rates per 100,000 Females for the Leading Sites/Types, Ohio, 1996-2019



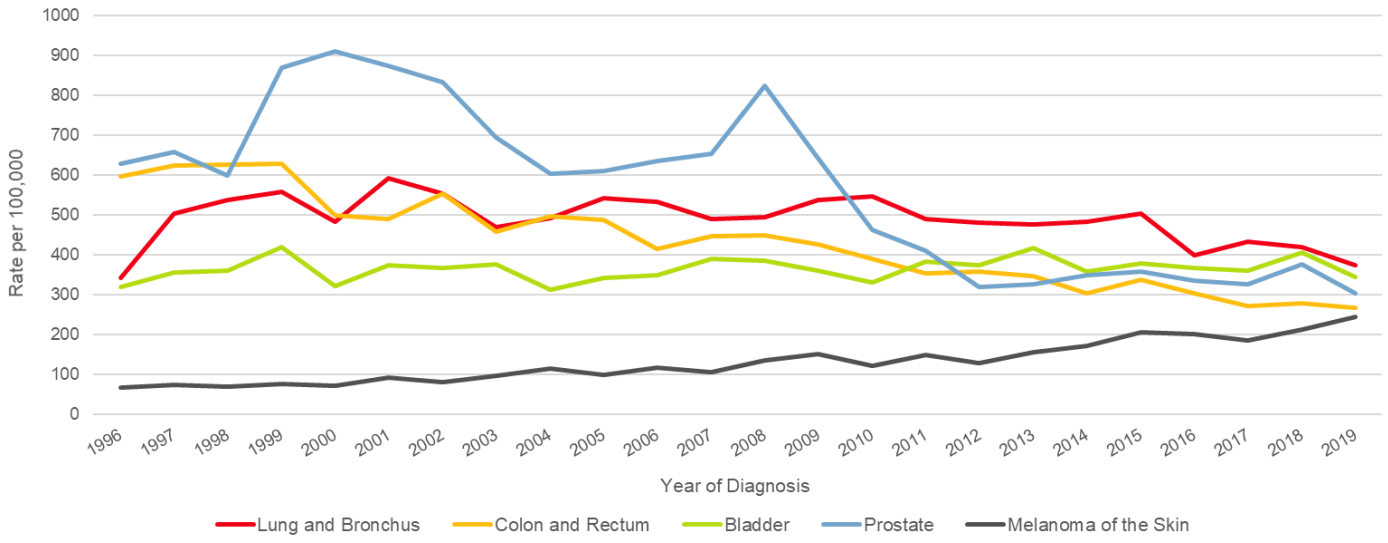
Source: Bureau of Vital Statistics, Ohio Department of Health, 2022.

Cancer Incidence Trends Among Males

As shown in Figure 5.5, from 1996 to 2019, cancer incidence rates for males 85+ years old:

- Increased more than three-fold for melanoma of the skin.
- Decreased 53% for colon and rectum cancer.
- Were variable for prostate cancer until 2008, then declined through 2012 and remained relatively stable through 2019.
- Were variable for lung and bronchus, and bladder cancers.

Figure 5.5. Cancer Among Males 85+ Years Old: Trends in Age-adjusted Cancer Incidence Rates per 100,000 Males for the Leading Sites/Types, Ohio, 1996-2019



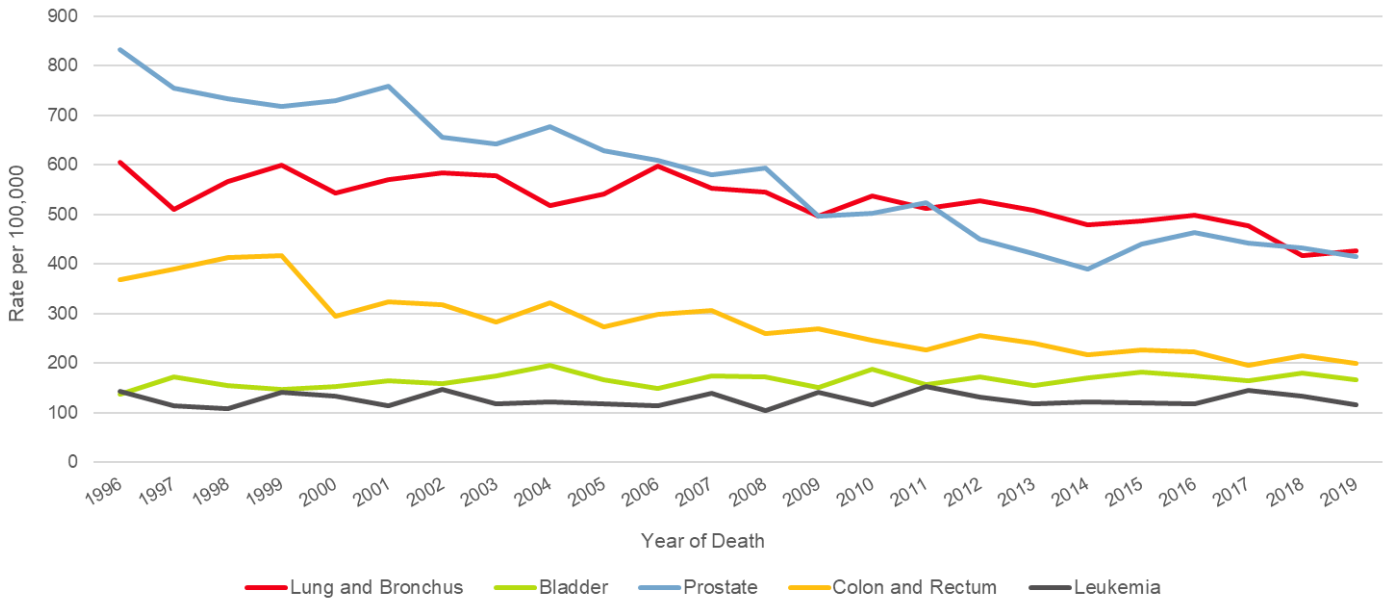
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.

Cancer Mortality Trends Among Males

As shown in Figure 5.6, from 1996 to 2019, cancer mortality rates for males 85+ years old:

- Decreased 48% for prostate cancer and 41% for colon and rectum cancer.
- Were variable for lung and bronchus cancer but decreased 31%.
- Were variable for bladder cancer and leukemia.

Figure 5.6. Cancer Among Males 85+ Years Old: Trends in Age-adjusted Cancer Mortality Rates per 100,000 Males for the Leading Cancer Sites/Types, Ohio, 1996-2019



Source: Bureau of Vital Statistics, Ohio Department of Health, 2022.

Risk of Cancer

Table 5.3 shows the risk of being diagnosed with invasive cancer during one's lifetime for all sites/types of cancer combined and the leading cancer sites/types for incidence by sex in the U.S. The risk of developing cancer is higher among males than females; one in two males and one in three females will be diagnosed with invasive cancer during their lifetime.

Table 5.3. Risk of Being Diagnosed with Cancer for the Leading Sites/Types of Cancer Incidence, by Sex, United States, 2017-2019

Male		Female	
All Sites/Types	1 in 2	**All Sites/Types**	1 in 3
Lung and Bronchus	1 in 16	Breast	1 in 8
Bladder	1 in 28	Colon and Rectum	1 in 26
Prostate	1 in 8	Lung and Bronchus	1 in 17
Colon and Rectum	1 in 23	Pancreas	1 in 61
Melanoma of the Skin	1 in 38	Bladder	1 in 91

Source: DevCan: Probability of Developing or Dying of Cancer Software, Version 6.8.0. Surveillance Research Program, Statistical Methodology and Applications, National Cancer Institute, 2012. http://surveillance.cancer.gov/devcan/.
Risk of developing cancer during one's lifetime, based on cancer cases diagnosed during 2017-2019 in 22 SEER registries.

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 multiplied by the standard population proportion for the respective age group.

Census Data: The 1996 to 2019 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 to July 1, 1999 (released July 26, 2004); revised bridged-race intercensal population estimates for July 1, 2000 to July 1, 2004 (released Oct. 26, 2012); revised bridged-race intercensal population estimates for July 1, 2005 to July 1, 2009 (released June 26, 2014), and vintage 2020 bridged-race postcensal population estimates for July 1, 2010 to July 1, 2020 (released Sept. 22, 2021).

Incidence: The number of cases diagnosed during a specified period (e.g., 2015-2019). Cancer cases were coded to the International Classification of Diseases for Oncology, Third Edition (ICD-O-3).

Invasive Cancer: Cancer that has spread beyond the layer of cells where it first developed. Invasive cancers are 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, with the exception of *in situ* bladder cancers.

Mortality: The number of deaths during a specified period (e.g., 2015-2019). Cancer deaths were coded using the International Statistical Classification of Diseases and Related Health Problems, Tenth Edition (ICD-10).

Rate: The number of cases or deaths per unit of population (e.g., per 100,000 persons) during a specified period (e.g., 2015-2019).

Relative Survival: The percentage of people who are alive at a designated time period (e.g., five years) after a cancer diagnosis, divided by the percentage expected to be alive in the absence of cancer, based on normal life expectancy. Relative survival does not distinguish between patients who have no evidence of cancer and those who have relapsed or are still in treatment. Relative survival data in this report were calculated using SEER*Stat software version 8.3.9.

Sources of Data and Additional Information

Ohio Cancer Incidence Surveillance System (OCISS):
https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/ohio-cancer-incidence-surveillance-system

Ohio Public Health Data Warehouse:
http://publicapps.odh.ohio.gov/EDW/DataCatalog

National Cancer Institute:
http://www.cancer.gov

Centers for Disease Control and Prevention: Preventing Cancer Across a Lifetime:
Preventing Cancer Across a Lifetime | CDC

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Ohio Department of Health

The James
The Ohio State University
Comprehensive Cancer Center

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