# Melanoma of the Skin in Ohio 2022

October 2022

## Key Findings and Populations at High Risk

- Ohio's melanoma mortality rate was nearly 14% higher than the U.S. rate in 2015-2019.
- In Ohio, melanoma incidence and mortality rates were greater for males and white people in 2015-2019.
- Melanoma was most common among Ohioans 65-74 years old.
- Melanoma incidence rates in Ohio increased with advancing age and more among men than women after age 55.
- From 2000 to 2019, melanoma incidence rates almost doubled in Ohio, while melanoma mortality rates remained relatively stable.
- In Ohio, 83% of melanomas were diagnosed at an early (*in situ* or local) stage and about 8% were diagnosed at a late (regional or distant) stage.
- The five-year relative survival for Ohioans with melanoma is 94%. For local-stage melanoma, five-year survival is nearly 100%, whereas survival at the distant stage is 31%.
- UV radiation from both the sun and artificial sources such as sunlamps and tanning booths is the most important risk factor for any type of skin cancer, including melanoma.

Ohio Department of Health

## Incidence and Mortality

Melanoma of the skin (melanoma) is the deadliest form of skin cancer. Melanoma is the fifth most common type of new cancer diagnosis in the United States.

Melanoma made up 5% of incident (newly diagnosed) cancers in Ohio reported to the Ohio Cancer Incidence Surveillance System (OCISS) from 2015 through 2019. An average of 3,564 cases of melanoma were diagnosed annually in Ohio during this time period (Table 1). The average annual age-adjusted melanoma incidence rate in Ohio was 25.6 cases per 100,000 population, compared with the national (SEER*) incidence rate of 21.5 per 100,000. The melanoma incidence rate among Ohio males was 42% higher than the rate among females. The melanoma incidence rate among white Ohioans was about 30 times higher than among Black or Asian/Pacific Islander Ohioans.

An average of 364 deaths from melanoma occurred each year in Ohio in 2015-2019 (Table 1). Ohio's average annual age-adjusted melanoma mortality rate (2.5 per 100,000) was nearly 14% higher than the U.S. mortality rate (2.2 per 100,000). For Ohio males, the melanoma mortality rate (3.7 per 100,000) was more than two times higher than the rate for females (1.6 per 100,000) during this time period.

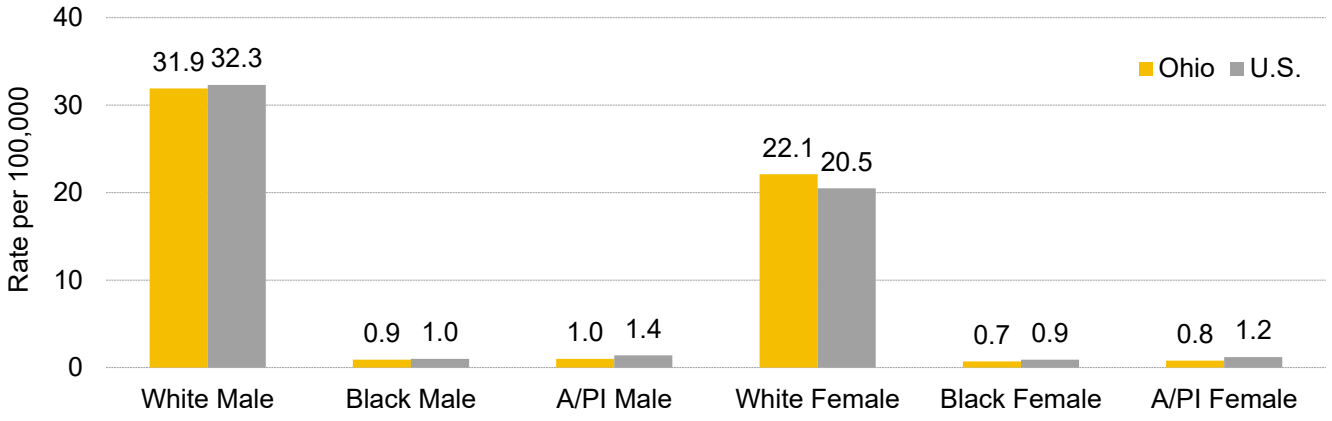
**Table 1. Average Annual Number and Age-Adjusted Rates of Melanoma Cases and Deaths per 100,000 Population by Sex, Race, and Age Group, Ohio and the United States, 2015-2019**

| | | Incidence | | | Mortality | | |
|---|---|---|---|---|---|---|---|
| | | Ohio Cases | Ohio Rate | U.S. Rate | Ohio Deaths | Ohio Rate | U.S. Rate |
| **Total** | | 3,564 | 25.6 | 21.5 | 364 | 2.5 | 2.2 |
| **Sex** | Male | 2,027 | 31.2 | 27.6 | 233 | 3.7 | 3.2 |
| | Female | 1,537 | 21.9 | 17.0 | 131 | 1.6 | 1.4 |
| **Race** | White | 3,164 | 26.1 | 25.5 | 359 | 2.8 | 2.5 |
| | Black | 11 | 0.8 | 0.9 | 4 | 0.2 | 0.3 |
| | Asian/Pacific Islander | 2 | 0.9 | 1.3 | 1 | * | 0.3 |
| **Age Group** | <65 | 1,751 | 15.5 | 11.8 | 126 | 1.1 | 0.8 |
| | 65+ | 1,813 | 95.5 | 88.5 | 238 | 12.6 | 11.3 |

Source: Ohio Cancer Incidence Surveillance System and Bureau of Vital Statistics, Ohio Department of Health, 2022; *Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2022.
Race data excludes an annual average of 27 cases of other races and 359 cases with unknown or missing data.

# Incidence by Race and Sex

**Figure 1. Average Annual Age-Adjusted Incidence Rates of Melanoma per 100,000 Population by Race and Sex, Ohio and the United States, 2015-2019**

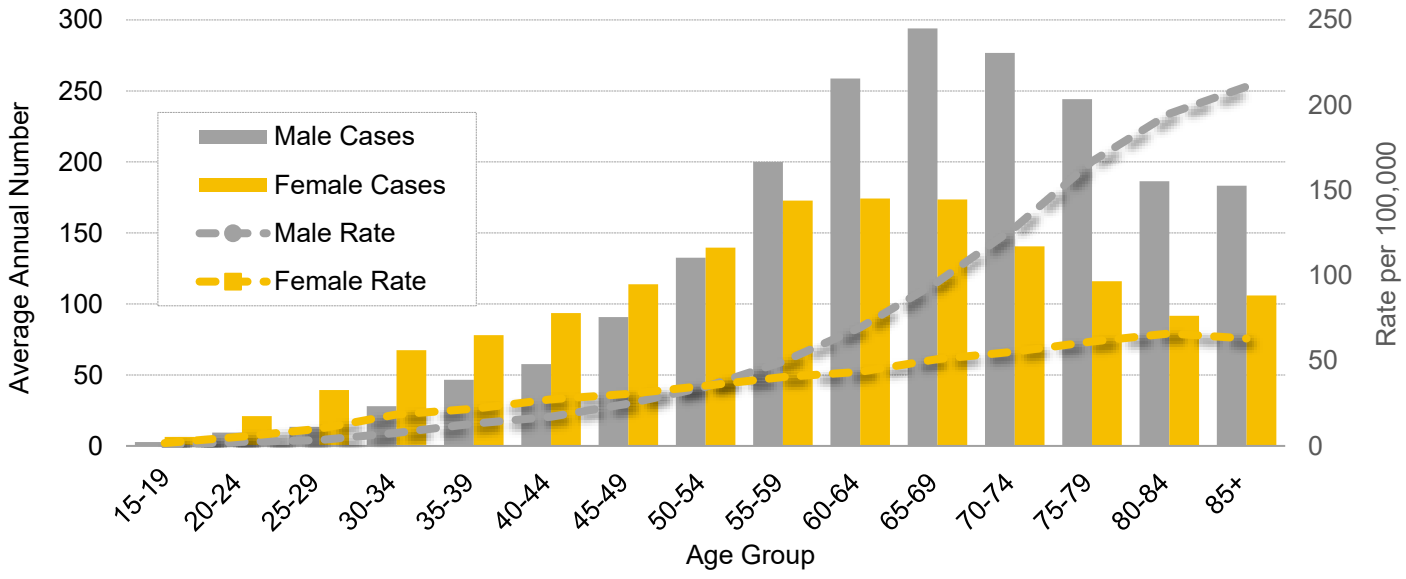



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022; Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2022.
A/PI = Asian/Pacific Islander.

As shown in Figure 1, white males had the highest melanoma incidence rate in Ohio and the United States in 2015-2019, followed by white females. Ohio's melanoma incidence rates were similar to U.S. rates during this time period.

# Incidence by Age Group and Sex

**Figure 2. Average Annual Number and Age-Specific Incidence Rates of Melanoma per 100,000 Population by Age Group and Sex, Ohio, 2015-2019**

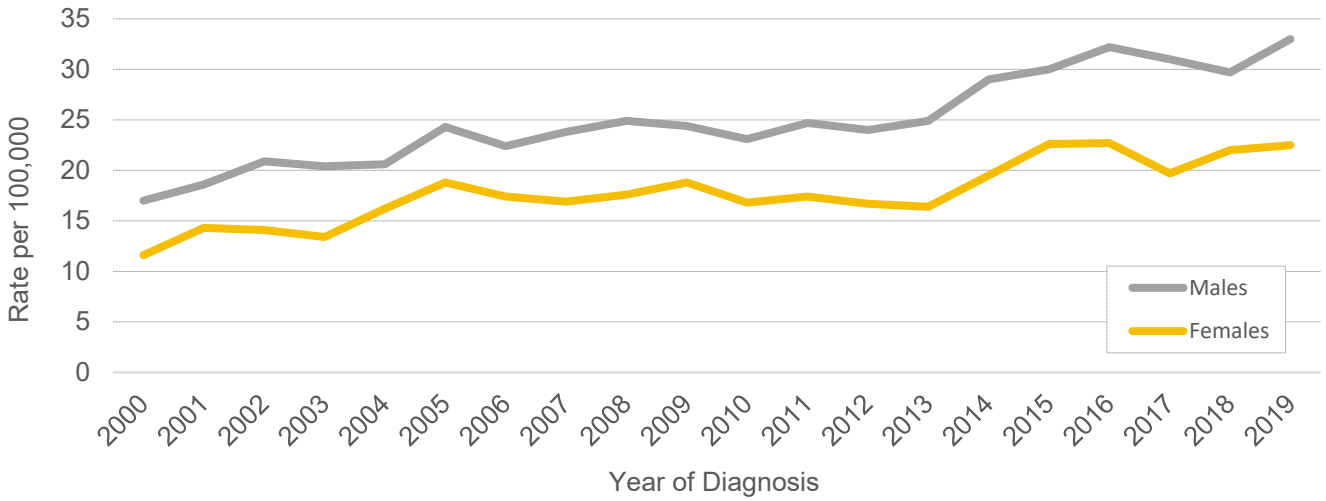



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.

As shown in Figure 2, melanoma incidence rates in Ohio increased with advancing age. In Ohio, incidence rates were higher among females compared with males among younger age groups (15-19 to 50-54), whereas males had significantly higher rates than females among those 55-59 years old and older.

# Trends in Incidence and Mortality

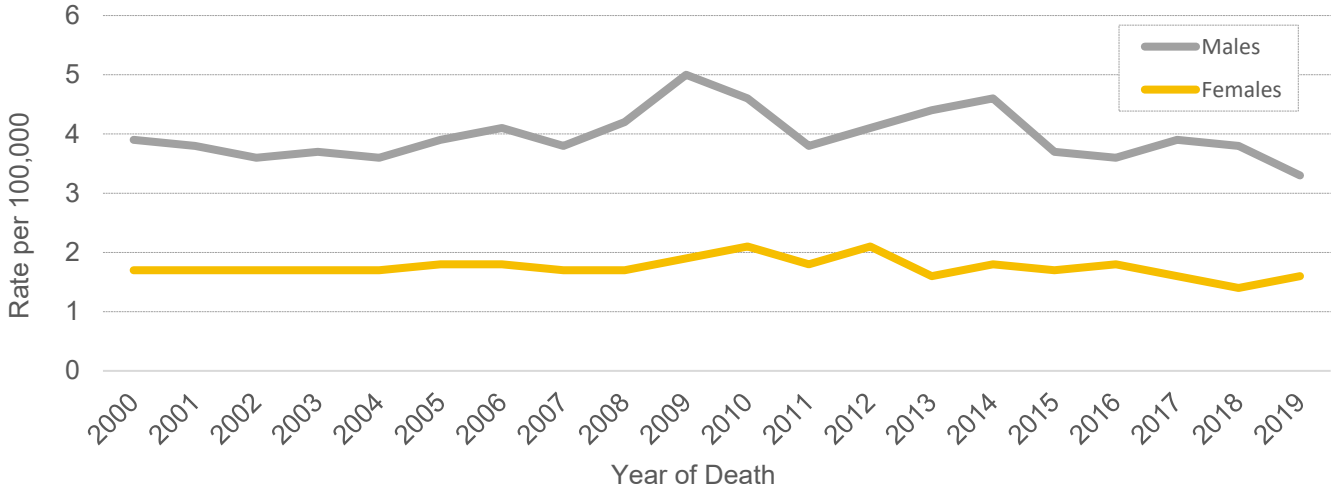
**Figure 3. Trends in Age-Adjusted Incidence Rates of Melanoma per 100,000 Population by Sex in Ohio, 2000-2019**




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

Figure 3 shows incidence rates of melanoma for the 20-year period from 2000 to 2019 for males and females in Ohio. For each year, males had the highest incidence rate. Incidence rates nearly doubled for both males and females from 2000 to 2019.

**Figure 4. Trends in Age-Adjusted Mortality Rates of Melanoma per 100,000 Population by Sex in Ohio, 2000-2019**



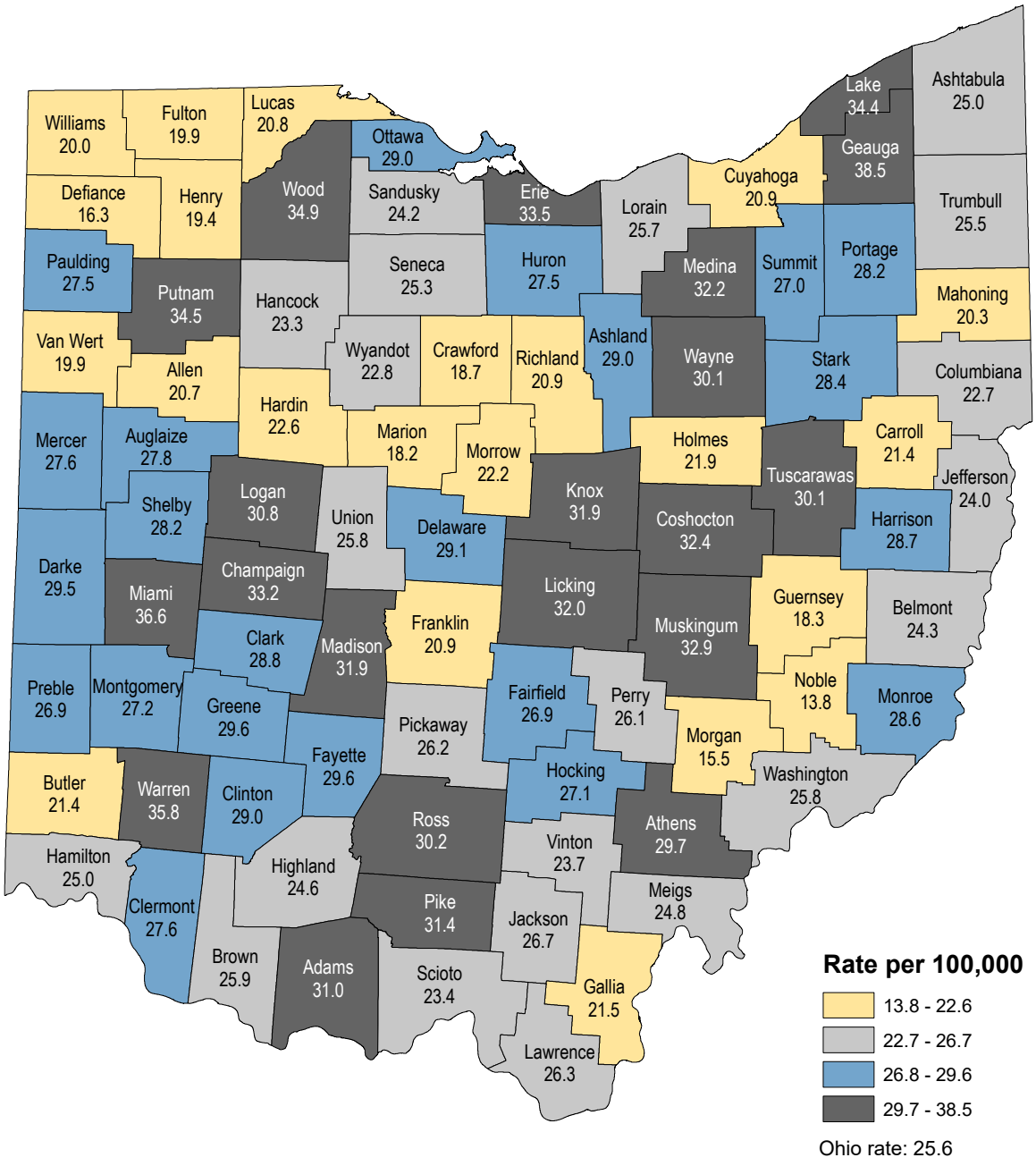

Source: Bureau of Vital Statistics, Ohio Department of Health, 2022.

Figure 4 shows melanoma mortality rates in Ohio according to year of death (2000 through 2019) for males and females. For each year of comparison, males had about two times the mortality rate of females. Mortality rates were relatively stable among both males and females from 2000 to 2019.

# Incidence by County

Figure 5 shows 2015-2019 average annual age-adjusted melanoma incidence rates by county of residence. County melanoma incidence rates in Ohio ranged from 13.8 to 38.5 per 100,000 population. The geographic pattern of melanoma is relatively sporadic. The following five counties had the highest incidence rates for this time period: Geauga, Miami, Warren, Wood, and Putnam.

**Figure 5. Average Annual Age-Adjusted Incidence Rates of Melanoma per 100,000 Population by County of Residence, Ohio, 2015-2019**

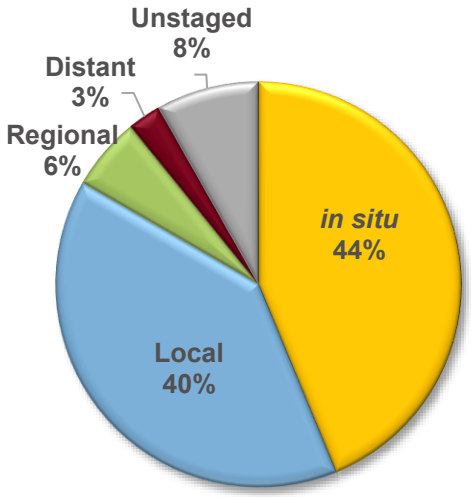



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.
Each category represents approximately 25 percent of the 88 Ohio counties.

# Stage at Diagnosis

The stage at diagnosis of melanoma is an important determinant of survival. For *in situ* cancers, the tumor has not invaded or penetrated surrounding tissue. In the local 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 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 Melanoma Cases by Stage at Diagnosis, Ohio, 2015-2019**




In Ohio:

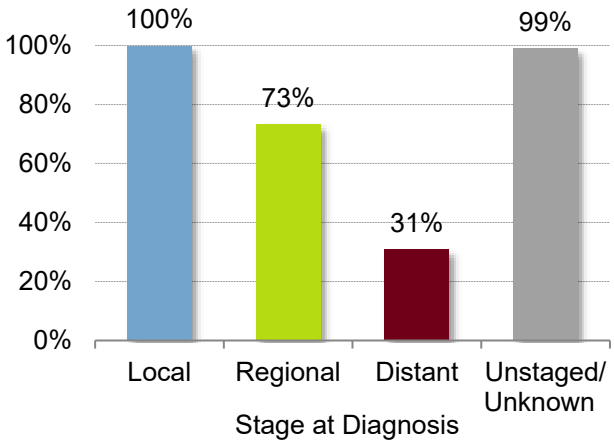
- 84% of melanomas were diagnosed at an early stage, i.e., 44% were *in situ* and 40% were at a local stage.
- About 6% of melanomas were diagnosed at a regional stage in Ohio.
- Nearly 3% of melanomas were diagnosed at the distant stage.
- The percentage of melanomas reported unstaged/unknown stage in Ohio was 8%.

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

# Survival

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

**Figure 7: Five-Year Relative Survival (%) for Melanoma by Stage at Diagnosis, Ohio, 2012-2018**




In Ohio, the five-year relative survival for melanoma cases diagnosed in 2012-2018 was:

- 94% for all stages combined (not shown).
- Nearly 100% among those diagnosed at a local stage.
- 73% at the regional stage.
- 31% when the cancer was diagnosed at the latest (distant) stage.
- 99% for unstaged or unknown stage cases.

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

# Anatomic Site

Table 2 shows the distribution of invasive melanoma cases in Ohio by anatomic site and sex during 2015-2019. In general, the majority of melanomas occurred on the skin of the trunk and the skin of the upper limb and shoulders. For males, a greater proportion of melanomas occurred on the external ear, skin of other and unspecified parts of the face, skin of the scalp and neck, skin of the trunk, and skin not otherwise specified (NOS). Females had a greater proportion of melanomas on the skin of the upper limb and shoulder, and the skin of the lower limb and hip. Reasons for these sex differences are largely unknown but may be partially explained by the different areas of the body in men and women that are commonly exposed to ultraviolet radiation.

**Table 2: Percent Distribution of Melanoma Cases by Anatomic Site and Sex in Ohio, 2015-2019**

| Cancer Site (ICD-O-3 Code) | Male | Female | Total |
|---|---|---|---|
| Skin of the Lip, NOS (C44.0) | 0.2% | 0.0% | 0.1% |
| Eyelid (C44.1) | 0.2% | 0.3% | 0.2% |
| External ear (C44.2) | 4.4% | 0.8% | 2.8% |
| Skin of other/unspecified parts of face (C44.3) | 9.9% | 6.5% | 8.4% |
| Skin of scalp and neck (C44.4) | 11.0% | 4.1% | 8.0% |
| Skin of trunk (C44.5) | 37.5% | 28.4% | 33.6% |
| Skin of upper limb and shoulder (C44.6) | 23.5% | 28.2% | 25.6% |
| Skin of lower limb and hip (C44.7) | 8.1% | 28.1% | 16.7% |
| Overlapping lesion of skin (C44.8) | 0.1% | 0.1% | 0.1% |
| Skin, NOS (C44.9) | 5.1% | 3.5% | 4.4% |

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2022.
NOS: Not Otherwise Specified.
Percentages may not sum to 100 due to rounding.

# Early Detection

Recognition of changes in skin growths or the appearance of new growths is the best way to find skin cancer early. All major areas of the skin should be examined regularly. Any new or suspicious lesions or a sudden or progressive change in a lesion's appearance should be evaluated promptly by a healthcare provider.

A simple **ABCDE** rule outlines the warning signs of the most common type of melanoma:

**A** is for **Asymmetry** – one half does not match the other half.

**B** is for **Border** – borders are ragged, notched, blurred, or irregular.

**C** is for **Color** – uneven color and multiple colors, including black, tan, brown, red, pink, blue, and white.

**D** is for **Diameter** – change in the size of the mole and/or the mole is larger than the size of a pencil eraser (¼ inch or 6 millimeters). 6mm

**E** is for **Evolving** – change in size, shape, or color.

# 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 melanoma:

**Ultraviolet (UV) radiation**: UV radiation from both the sun and artificial sources such as sunlamps and tanning booths is the most important risk factor for any type of skin cancer, including melanoma.

**Blistering sunburns**: People who have had at least one severe, blistering sunburn as a child or teenager are at increased risk of melanoma. Sunburns in adulthood also increase risk.

**Certain physical characteristics**: Having fair (pale) skin that burns in the sun easily, blue or green eyes, red or blond hair, or many freckles increases the risk of skin cancer.

**Dysplastic nevi**: A dysplastic nevus is a type of mole that looks different from a common mole. It is often bigger and has an abnormal shape or color. Having these atypical moles increases the risk of melanoma.

**Many moles**: Usually, a common mole is smaller than a pea, has an even color (pink, tan, or brown), and is round or oval with a smooth surface. Having many common moles increases the risk of developing melanoma.

**Family history**: Having two or more close relatives who have had melanoma increases risk.

**Personal history**: People who have had melanoma have an increased risk of developing other melanomas.

**Sex**: Men are more likely to develop melanoma than women.

**Race**: Melanoma is much more common among white individuals than among other races.

# Protective Factors

The American Cancer Society recommends the following for the prevention of melanoma and skin cancer:

- Minimize skin exposure to intense UV radiation by seeking shade.
- When outdoors, wear protective clothing, e.g., long sleeves, long pants or skirts, tightly woven fabrics, and a wide-brimmed hat.
- Wear sunglasses that block UV rays.
- Apply a broad-spectrum sunscreen with a sun protection factor (SPF) of 30 or higher.
- Avoid tanning booths and sun lamps, which are additional sources of UV radiation which damage the skin and can lead to cancer including melanoma, basal cell carcinoma, and squamous cell carcinoma.

# Signs and Symptoms

Key warning signs of melanoma include the following:

- Sore that does not heal.
- Spread of pigment from the border into surrounding skin.
- Redness or a new swelling beyond the border.
- Change in sensation (itchiness, tenderness, pain).
- Change in surface of a mole (scaliness, oozing, bleeding, appearance of bump or nodule).

*If you have any of these signs or symptoms, see your healthcare provider.*

# 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., 2015-2019). 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 2000-2019 rates were calculated using population estimates from the U.S. Census Bureau and National Center for Health Statistics. Population data were compiled from 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 2020 bridged-race postcensal population estimates for July 1, 2010-July 1, 2020 (released 9/22/2021).

**Incidence:** The number of cases diagnosed during a specified time period (e.g., 2015-2019). Melanoma of the skin cases were defined as follows: International Classification of Diseases for Oncology, Third Edition (ICD-O-3), codes C44.0-C44.9 and histology types 8720-8790.

**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/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., 2015-2019). Melanoma cancer deaths were defined as follows: International Statistical Classification of Diseases and Related Health Problems, Tenth Edition (ICD-10), codes C43.0-C43.9 for 1999-2019.

**Rate:** The number of cases or deaths per unit of population (e.g., per 100,000 persons) during a specified time period (e.g., 2015-2019). Rates may be unstable and are not presented when the count is less than five for incidence and 10 for mortality.

**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.

**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.

**Table 3. Average Annual Number and Age-adjusted Rates of Melanoma Cancer Cases and Deaths per 100,000 Population by County of Residence, Ohio and the United States, 2015-2019**

| | Incidence | | Mortality | |
|---|---|---|---|---|
| | Cases | Rate | Deaths | Rate |
| Ohio | 3,564 | 25.6 | 364 | 2.5 |
| U.S. | | 21.5 | | 2.2 |
| Adams | 10 | 31.0 | <2 | * |
| Allen | 27 | 20.7 | 3 | 1.6 |
| Ashland | 19 | 29.0 | 3 | 4.1 |
| Ashtabula | 32 | 25.0 | 2 | 1.5 |
| Athens | 19 | 29.7 | <2 | * |
| Auglaize | 15 | 27.8 | <2 | * |
| Belmont | 22 | 24.3 | 3 | 2.5 |
| Brown | 14 | 25.9 | <2 | * |
| Butler | 90 | 21.4 | 11 | 2.7 |
| Carroll | 8 | 21.4 | <2 | * |
| Champaign | 16 | 33.2 | <2 | * |
| Clark | 47 | 28.8 | 5 | 3.1 |
| Clermont | 66 | 27.6 | 6 | 2.5 |
| Clinton | 15 | 29.0 | <2 | * |
| Columbiana | 32 | 22.7 | 5 | 3.9 |
| Coshocton | 14 | 32.4 | <2 | * |
| Crawford | 10 | 18.7 | <2 | * |
| Cuyahoga | 332 | 20.9 | 25 | 1.5 |
| Darke | 19 | 29.5 | 2 | 2.4 |
| Defiance | 8 | 16.3 | <2 | * |
| Delaware | 62 | 29.1 | 5 | 2.5 |
| Erie | 36 | 33.5 | 3 | 2.3 |
| Fairfield | 48 | 26.9 | 5 | 2.9 |
| Fayette | 10 | 29.6 | <2 | * |
| Franklin | 265 | 20.9 | 29 | 2.3 |
| Fulton | 9 | 19.9 | <2 | * |
| Gallia | 8 | 21.5 | <2 | * |
| Geauga | 48 | 38.5 | 3 | 1.7 |
| Greene | 59 | 29.6 | 4 | 1.8 |
| Guernsey | 9 | 18.3 | <2 | * |
| Hamilton | 233 | 25.0 | 23 | 2.4 |
| Hancock | 21 | 23.3 | 3 | 3.8 |
| Hardin | 8 | 22.6 | <2 | * |
| Harrison | 5 | 28.7 | <2 | * |
| Henry | 7 | 19.4 | <2 | * |
| Highland | 13 | 24.6 | <2 | * |
| Hocking | 10 | 27.1 | <2 | * |
| Holmes | 10 | 21.9 | <2 | * |
| Huron | 19 | 27.5 | <2 | * |
| Jackson | 10 | 26.7 | <2 | * |
| Jefferson | 21 | 24.0 | 3 | 2.9 |
| Knox | 24 | 31.9 | 3 | 4.4 |
| Lake | 105 | 34.4 | 11 | 3.3 |
| Lawrence | 20 | 26.3 | 3 | 3.8 |
| Licking | 64 | 32.0 | 4 | 2.0 |
| Logan | 17 | 30.8 | 2 | 4.5 |
| Lorain | 100 | 25.7 | 8 | 1.8 |
| Lucas | 106 | 20.8 | 13 | 2.4 |
| Madison | 16 | 31.9 | <2 | * |
| Mahoning | 63 | 20.3 | 6 | 2.1 |
| Marion | 15 | 18.2 | <2 | * |
| Medina | 71 | 32.2 | 10 | 4.6 |
| Meigs | 7 | 24.8 | <2 | * |
| Mercer | 13 | 27.6 | 3 | 5.7 |
| Miami | 47 | 36.6 | 5 | 3.6 |
| Monroe | 6 | 28.6 | <2 | * |
| Montgomery | 178 | 27.2 | 19 | 2.7 |
| Morgan | 4 | 15.5 | <2 | * |
| Morrow | 9 | 22.2 | <2 | * |
| Muskingum | 34 | 32.9 | 4 | 3.8 |
| Noble | 3 | 13.8 | <2 | * |
| Ottawa | 19 | 29.0 | <2 | * |
| Paulding | 6 | 27.5 | <2 | * |
| Perry | 11 | 26.1 | <2 | * |
| Pickaway | 17 | 26.2 | 2 | 3.3 |
| Pike | 9 | 31.4 | <2 | * |
| Portage | 53 | 28.2 | 6 | 3.1 |
| Preble | 14 | 26.9 | 2 | 4.1 |
| Putnam | 14 | 34.5 | <2 | * |
| Richland | 32 | 20.9 | 6 | 3.2 |
| Ross | 28 | 30.2 | 3 | 2.6 |
| Sandusky | 19 | 24.2 | <2 | * |
| Scioto | 22 | 23.4 | 5 | 5.0 |
| Seneca | 17 | 25.3 | 3 | 3.1 |
| Shelby | 16 | 28.2 | <2 | * |
| Stark | 134 | 28.4 | 14 | 2.9 |
| Summit | 179 | 27.0 | 13 | 1.9 |
| Trumbull | 69 | 25.5 | 8 | 2.6 |
| Tuscarawas | 35 | 30.1 | 3 | 2.4 |
| Union | 15 | 25.8 | 3 | 5.3 |
| Van Wert | 7 | 19.9 | <2 | * |
| Vinton | 4 | 23.7 | <2 | * |
| Warren | 91 | 35.8 | 9 | 3.3 |
| Washington | 20 | 25.8 | 2 | 2.3 |
| Wayne | 42 | 30.1 | 3 | 1.9 |
| Williams | 9 | 20.0 | <2 | * |
| Wood | 49 | 34.9 | 6 | 4.1 |
| Wyandot | 7 | 22.8 | <2 | * |

Source: Ohio Cancer Incidence Surveillance System and the Bureau of Vital Statistics, Ohio Department of Health, 2022; Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2022.

*Rate not presented when the mortality count for 2015-2019 is less than 10.

# Sources of Data and Additional Information

**Ohio Cancer Incidence Surveillance System:**
https://odh.ohio.gov/know-our-programs/ohio-cancer-incidence-surveillance-system/welcome

**National Cancer Institute:**
https://www.cancer.gov/types/skin
https://www.cancer.gov/types/skin/hp

**American Cancer Society:**
https://www.cancer.org/cancer/melanoma-skin-cancer.html

## To address comments and information requests:

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