

Female Breast Cancer In Ohio, 2000-2004

This Report on Female Breast Cancer Contains

- Incidence and Mortality Rates in Ohio and the US
- Incidence Rates by County of Residence
- Age-specific Incidence Rates by Race
- Trends in Incidence and Mortality
- Stage at Diagnosis by Age Group
- Survival Probability by Stage at Diagnosis
- Trends in Stage at Diagnosis by Race
- Histology Information
- Risk Factors
- Signs and Symptoms
- Clinical Trials Information
- Sources of Data and Additional Information

Female Breast Cancer Incidence and Mortality

Cancers of the female breast made up approximately 15 percent of incident (newly diagnosed) cancers reported to the Ohio Cancer Incidence Surveillance System (OCISS) from 2000 to 2004 (Table 1). The average annual age-adjusted female breast cancer incidence rate in Ohio from 2000 to 2004 was 123.7 cases per 100,000 females, or an average of 8,118 cases per year (N). The average annual age-adjusted U.S. (SEER¹) incidence rate for this time period (127.8 cases per 100,000 females) was slightly greater than the rate for Ohio. Reporting of invasive female breast cancer in Ohio was estimated to be 88 percent complete in 2000-2004, which is lower than the national standard of 95 percent. Therefore, the Ohio breast cancer incidence rates presented in this report may underestimate the true cancer burden. The 2000-2004 U.S. (NCHS²) age-adjusted female breast cancer mortality rate of 25.5 deaths per 100,000 females was 9 percent lower than the 2000-2004 Ohio mortality rate of 27.9 per 100,000 females.

Table 1: Leading Sites/Types: Average Annual Number (N), Percent and Age-adjusted Rates of Invasive Cancer Cases and Cancer Deaths in Ohio with Comparison to the US (SEER and NCHS), 2000-2004^{1,2}

Incidence	N	%	Ohio U.S.		Mortality	N	%	Ohio U.S.	
			Rate	Rate				Rate	Rate
All Sites/Types	55,880		464.8	470.1	All Sites/Types	24,894		205.4	192.7
Lung and Bronchus	9,028	16.2%	74.9	64.5	Lung and Bronchus	7,326	29.4%	60.6	54.7
Breast (Female)*	8,118	14.5%	123.7	127.8	Colon and Rectum	2,577	10.4%	21.2	19.4
Prostate*	7,778	13.9%	149.6	168.0	Breast (Female)*	1,919	7.7%	27.9	25.5
Colon and Rectum	6,559	11.7%	54.2	51.6	Prostate*	1,272	5.1%	28.3	27.9
Bladder	2,638	4.7%	21.8	21.1	Pancreas	1,266	5.1%	10.4	10.6
Non-Hodgkin's Lymphoma	2,276	4.1%	19.0	19.3	Non-Hodgkin's Lymphoma	998	4.0%	8.2	7.6

Source: Ohio Cancer Incidence Surveillance System, Chronic Disease and Behavioral Epidemiology Section and the Vital Statistics Program, Ohio Department of Health, 2007.

[1] SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2007.

[2] NCHS: National Center for Health Statistics, 2005.

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

Technical Notes:

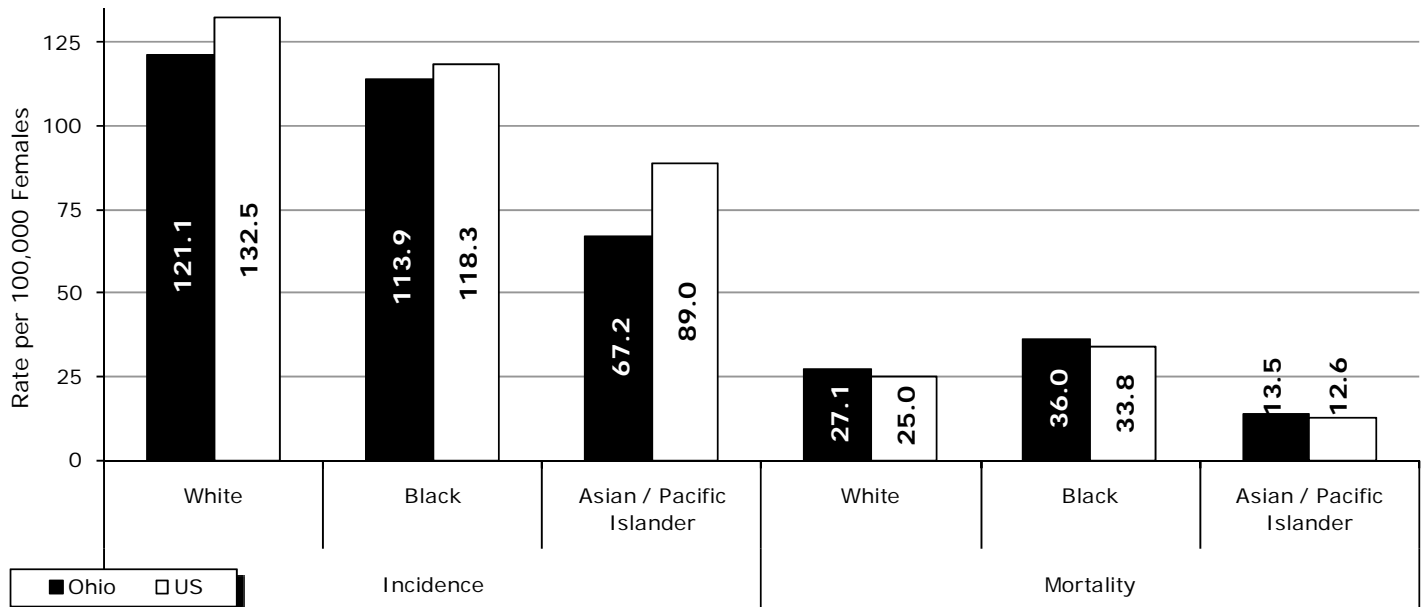
[1] Female breast cancer cases were defined as follows: International Classification of Diseases for Oncology, Third Edition (ICD-O-3), codes C500-C509, excluding histology types 9590-9989. Female breast cancer deaths were defined as follows: International Statistical Classification of Diseases and Related Health Problems, Tenth Edition (ICD-10), codes C500-C509.

[2] The 2000-2004 Ohio rates were calculated using the following populations: vintage 2005 postcensal estimates for July 1, 2000-2004 (U.S. Census Bureau, 2006). Rates were direct age-adjusted to the U.S. 2000 standard population.

[3] N = Average number of cases per year rounded to the nearest integer.

Female Breast Cancer Incidence in Ohio Compared to the United States

Figure 1: Cancer of the Female Breast: Average Annual Age-adjusted Incidence and Mortality Rates per 100,000 Females, by Race in Ohio with Comparison to the US (SEER), 2000-2004



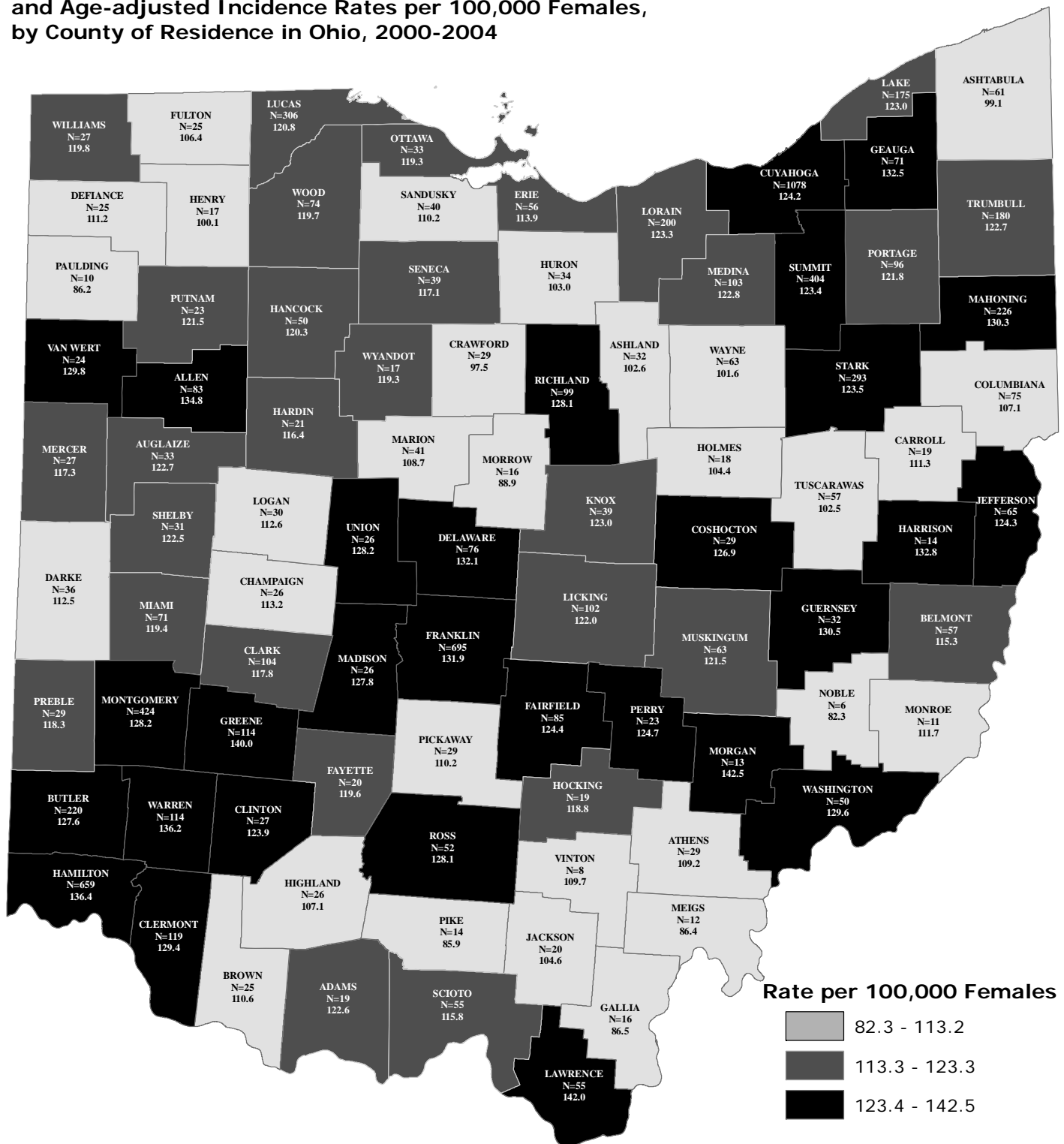
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2007, and the Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2007.

Figure 1 shows, in both Ohio and the United States, female breast cancer age-adjusted incidence rates among whites were greater than those of blacks; whereas, age-adjusted female breast cancer mortality rates were greater among blacks compared to whites. Asian/Pacific Islander incidence and mortality rates of female breast cancer were much lower than those of whites and blacks in Ohio as well as the United States. For each race group, Ohio female breast cancer incidence rates were lower than those of the United States; however, these differences may be due to lower completeness of reporting in Ohio. In contrast, female breast cancer mortality rates were higher in Ohio compared to the United States for each racial category.

Female Breast Cancer Cases and Rates by County of Residence

Figure 2 presents 2000-2004 average annual age-adjusted female breast cancer incidence rates by county of residence. County-specific female breast cancer incidence rates in Ohio ranged from 82.3 to 142.5 per 100,000 female residents. Higher incidence rates were found in eight of the 10 most-populated counties of Ohio, although the geographic pattern is relatively sporadic. Completeness of reporting varies by county, and it is possible that completeness of reporting is lower in more rural areas of the state. The following counties had the highest incidence rates for this time period (132.1 or more cases per 100,000 females): Delaware (N = 76), Geauga (N = 71), Greene (N = 114), Hamilton (N = 659), Harrison (N = 14), Lawrence (N = 55), Morgan (N = 13) and Warren (N = 114).

Figure 2: Cancer of the Female Breast: Average Annual Number of Cases (N) and Age-adjusted Incidence Rates per 100,000 Females, by County of Residence in Ohio, 2000-2004



- Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2007.
- N = Average number of cases per year rounded to the nearest integer.

$$N = \frac{\text{Total cases in 2000-2004}}{5 \text{ years}}$$
- Each category represents approximately 33 percent, or 29 of the 88 Ohio counties.

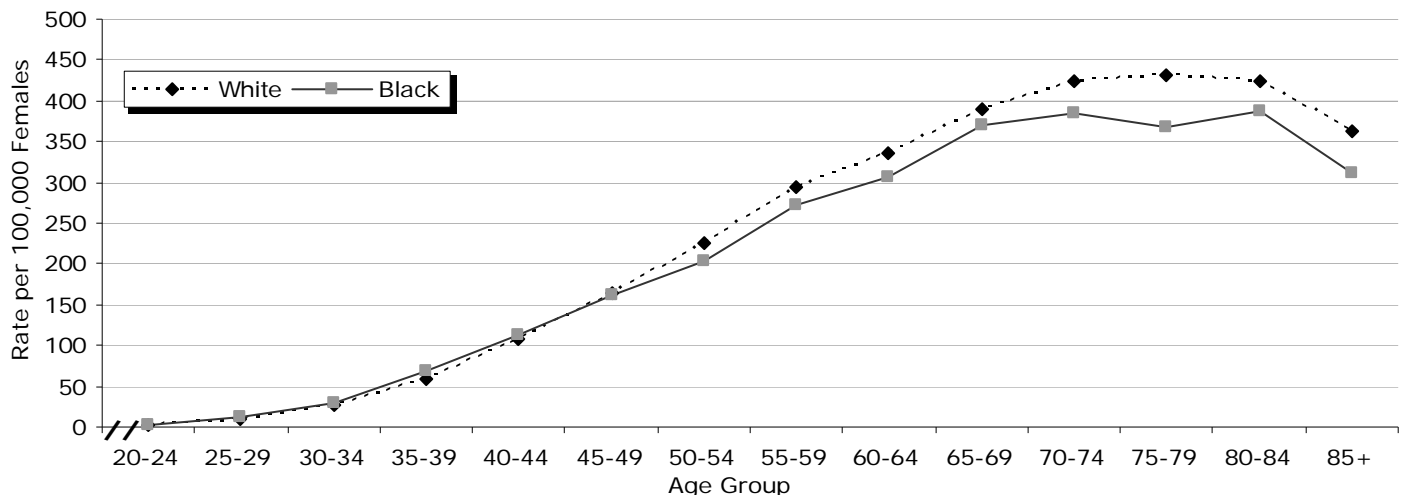
Female Breast Cancer Cases and Rates by Age at Diagnosis

Table 2: Cancer of the Female Breast: Average Annual Number of Cases (N), Incidence Rates per 100,000 Females and Cumulative Percentages (Cum%), by Age Group (Ages 10+) and Race in Ohio, 2000-2004

Age Group	White			Black			All Races		
	N	Rate	Cum%	N	Rate	Cum%	N	Rate	Cum%
10-14	0	*	0.0%	<1	*	0.0%	<1	*	0.0%
15-19	<1	*	0.0%	0	*	0.0%	<1	*	0.0%
20-24	5	1.5	0.1%	1	2.6	0.2%	7	1.8	0.1%
25-29	25	8.6	0.4%	6	11.8	1.0%	33	9.4	0.5%
30-34	91	27.9	1.7%	15	30.2	3.1%	112	28.8	1.9%
35-39	207	57.6	4.6%	36	69.7	8.0%	253	60.3	5.0%
40-44	429	107.5	10.7%	63	113.1	16.6%	516	111.6	11.4%
45-49	634	164.1	19.6%	82	162.5	27.8%	750	169.2	20.6%
50-54	787	225.9	30.7%	85	202.7	39.4%	910	229.6	31.8%
55-59	817	293.6	42.3%	82	271.4	50.7%	937	299.4	43.3%
60-64	761	336.8	53.0%	76	305.2	61.0%	872	343.5	54.1%
65-69	755	390.5	63.6%	82	369.2	72.2%	867	398.0	64.8%
70-74	781	424.9	74.6%	74	384.4	82.3%	882	431.6	75.6%
75-79	761	431.8	85.4%	59	368.4	90.3%	845	437.1	86.0%
80-84	573	423.0	93.5%	41	387.1	95.9%	629	428.7	93.8%
85+	463	363.8	100.0%	30	310.3	100.0%	505	366.9	100.0%

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2007.

Figure 3: Cancer of the Female Breast: Age-specific Incidence Rates (Ages 20+) per 100,000 Females, by Race in Ohio, 2000-2004

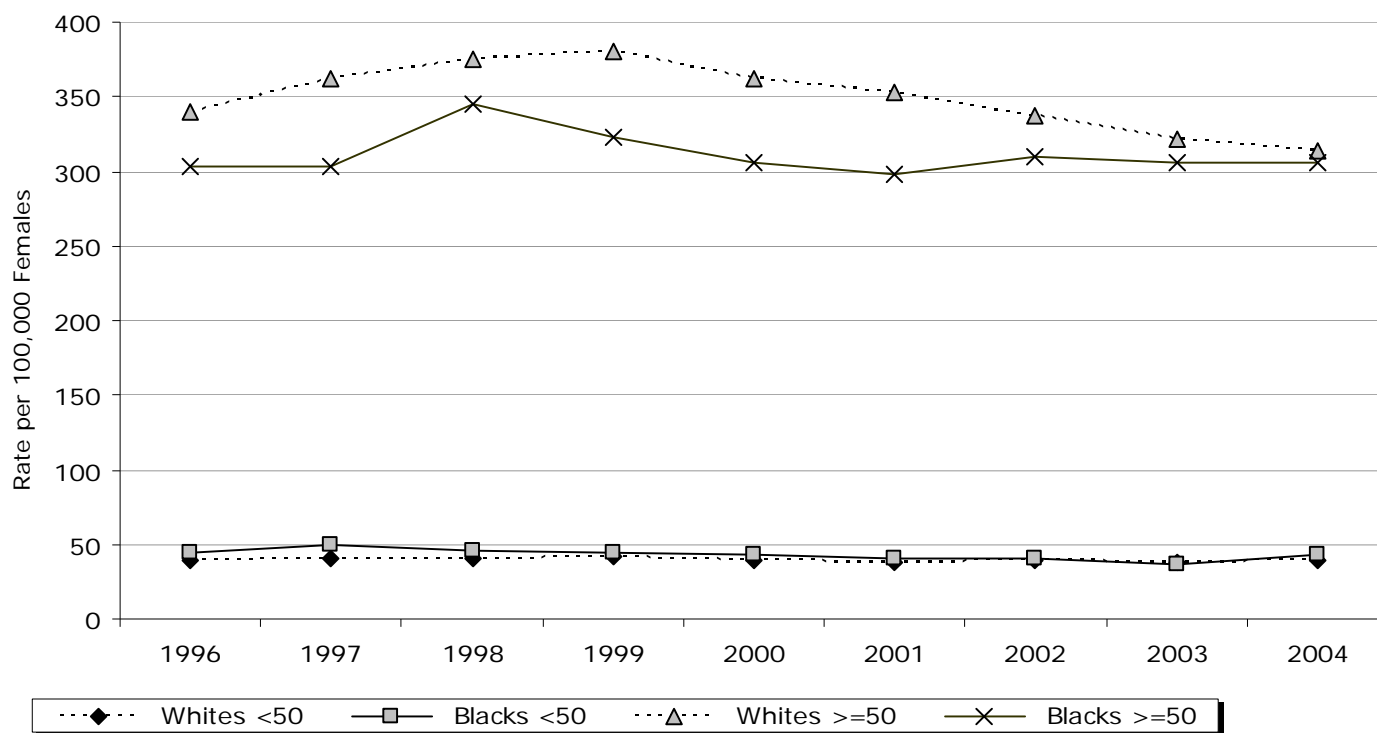


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2007.

Table 2 and Figure 3 show age-specific incidence rates for female breast cancer by race. The median age at diagnosis of female breast cancer occurred in the 60-to-64 years age group for both white and black females. For both races, female breast cancer incidence rates increased with advancing age group from ages 20-24 years to 80-84 years and then declined. From ages 20 to 49 years, female breast cancer incidence rates were similar between whites and blacks; however, among females ages 50 and older, rates were higher among whites compared to blacks. The cumulative percentages in Table 2 indicate 57 percent of female breast cancers were diagnosed among females ages 60 years and older.

Female Breast Cancer Incidence Trends

Figure 4: Cancer of the Female Breast: Trends in Average Annual Age-adjusted Incidence Rates per 100,000 Females, by Race and Age Group (<50, >=50) in Ohio, 1996-2004



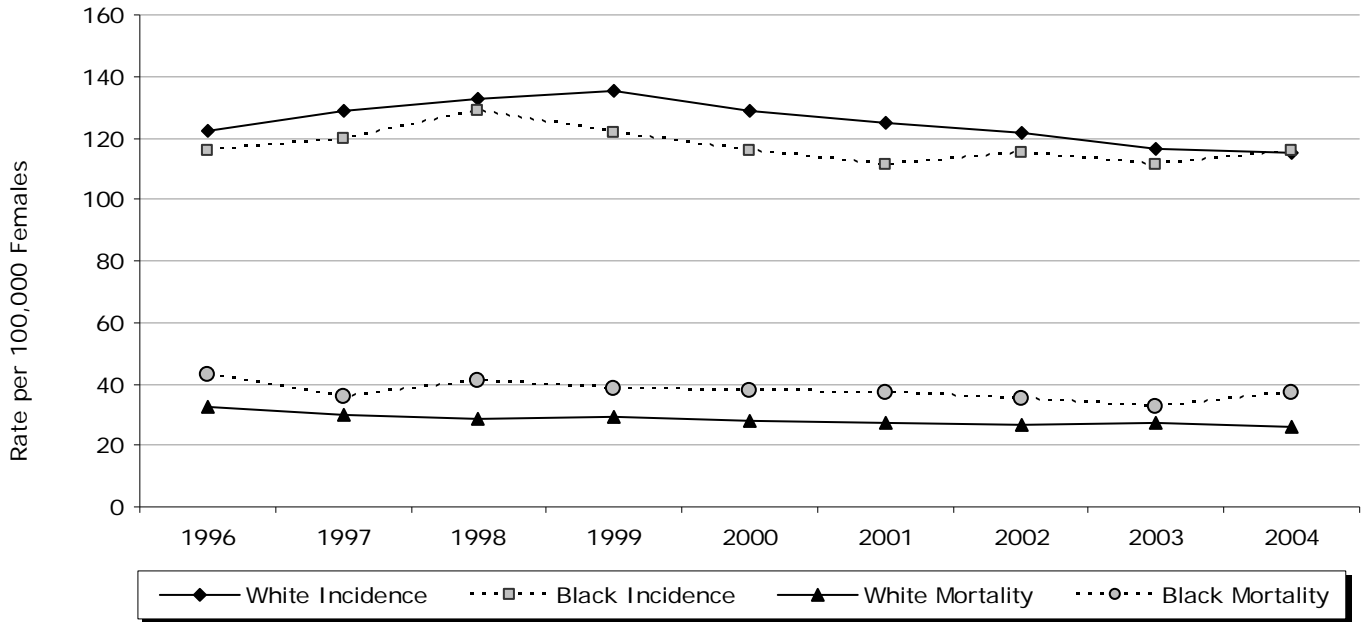
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2007.

Figure 4 shows incidence rates of female breast cancer according to year of diagnosis by race and age group. From 1996 to 2004, incidence rates of female breast cancer remained relatively stable for whites and blacks under 50 years of age. Despite an increase in 1998 and 1999, the incidence rate among blacks 50 years of age and older remained relatively constant from 1996 to 2004. Among whites 50 years of age and older, the incidence rate increased from 1996 to 1999 and then declined from 2000 to 2004. Several recent studies suggest a similar decrease in female breast cancer incidence may be occurring in the United States, especially among whites ages 50 years and older. In the April 19, 2007, issue of the *New England Journal of Medicine (New Eng J Med)*¹, an analysis of SEER data by Ravdin and colleagues "shows that the age-adjusted incidence rate of female breast cancer in the United States fell sharply (by 6.7%) in 2003, as compared with the rate in 2002. Data from 2004 showed a leveling off relative to the 2003 rate, with little additional decrease." "The decrease was evident only in women who were 50 years of age or older and was more evident in cancers that were estrogen-receptor-positive than in those that were estrogen-receptor-negative." The researchers suggest the decrease in breast-cancer incidence may be temporally related to the reduction in use of hormone-replacement therapy (HRT) among postmenopausal women in the United States following the release of a *New Eng J Med* report on the health consequences of HRT. Other factors contributing to the change in incidence seem less likely to have played a major role but were not ruled out. It is possible the decrease in female breast cancer incidence rates among whites 50 years of age and older in Ohio is also related to decreased use of HRT among postmenopausal women.

[1] Ravdin PM, Cronin KA, Howlader N, et al. The decrease in breast-cancer incidence in 2003 in the United States. *New Eng J Med*. April 17, 2007;356(16):1670-1674.

Female Breast Cancer Incidence and Mortality Trends

Figure 5: Cancer of the Female Breast: Trends in Age-adjusted Incidence and Mortality Rates per 100,000 Females, by Race in Ohio, 1996-2004



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2007.

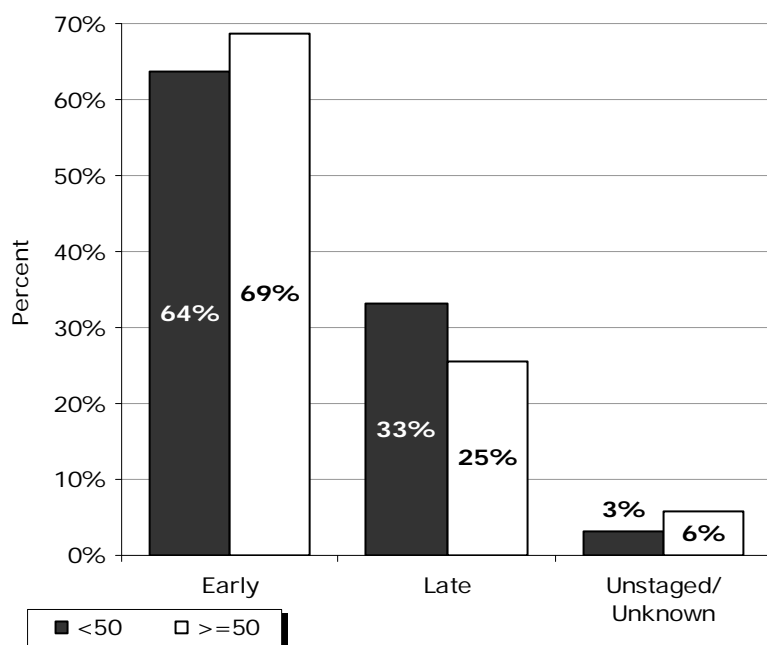
Figure 5 shows trends in female breast cancer incidence and mortality rates from 1996 to 2004 by race. Female breast cancer mortality rates decreased slightly from 1996 to 2004, with blacks having slightly higher mortality rates than whites for each year. Female breast cancer incidence rates among blacks remained relatively constant over time, except for a slight increase in 1998 and 1999. Similar to the trend shown in Figure 4, female breast cancer incidence rates among whites increased from 1996 to 1999 and then decreased through 2004. Some of the decrease in female breast cancer incidence rates among whites may be the result of the decline in use of HRT among postmenopausal women in the United States (as described on page 5 of this report). It is also possible low completeness of reporting explains some portion of the decrease in female breast cancer incidence among whites.

Did You Know?

While the female breast cancer incidence rate in the United States increased from 105.1 per 100,000 females in 1975 to 124.5 per 100,000 females in 2004, the mortality rate decreased from 31.4 per 100,000 females in 1975 to 24.4 per 100,000 females in 2004. This occurred because a greater proportion of cancers were diagnosed at earlier and more treatable stages, due in large part to the increased use of mammography screening.

Female Breast Cancer Cases and Survival by Stage at Diagnosis

Figure 6: Cancer of the Female Breast: Proportion of Cases (%) by Stage at Diagnosis and Age Group in Ohio, 2000-2004



N = 9,920 cases per year

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2007.

The stage at diagnosis of female breast cancer is an important determinant of survival. For *in situ* cancers, the tumor has not invaded or penetrated surrounding tissue. In the localized stage, the tumor is confined to the organ in which it originated. In the regional stage, the tumor has spread to surrounding tissues. In the distant stage, the malignancy has spread, or metastasized, to other organs. The 2000-2004 Ohio data presented in Figure 6 reveal 64 percent of breast cancers among females less than 50 years of age were diagnosed at early (*in situ* and localized) stages, which was slightly less than the 69 percent of females ages 50 years and older diagnosed early stage. A greater proportion of females under 50 years of age were diagnosed at late (regional and distant) stages, as compared to females ages 50 years and older. This is because breast tumors in younger females tend to be of a more aggressive type. Three percent of women under 50 years of age had an unstaged/unknown stage at diagnosis as compared to 6 percent of women ages 50 years and older.

Table 3 shows the U.S. (SEER) five-year survival probability for female breast cancer diagnosed in 1996-2003 was 88.6 percent for all stages combined. The five-year survival probabilities were 98.0 percent at the localized stage, 83.5 percent at the regional stage and only 26.7 percent for distant-stage tumors. Five-year survival probability for all stages combined was higher for whites (89.7 percent) compared to blacks (77.3 percent), and was slightly greater for females 50 years and older (89.4 percent) compared to females under 50 years of age (86.7 percent).

Detecting female breast cancer at an early stage can be achieved through routine physical examinations by a physician, mammography screening and self-examination of the breasts.

Table 3: Cancer of the Female Breast: Five-year Survival Probability (%) by Stage at Diagnosis in the US (SEER), 1996-2003

Stage	Overall Five-year Survival Probability (%)
All Stages	88.6%
Localized	98.0%
Regional	83.5%
Distant	26.7%

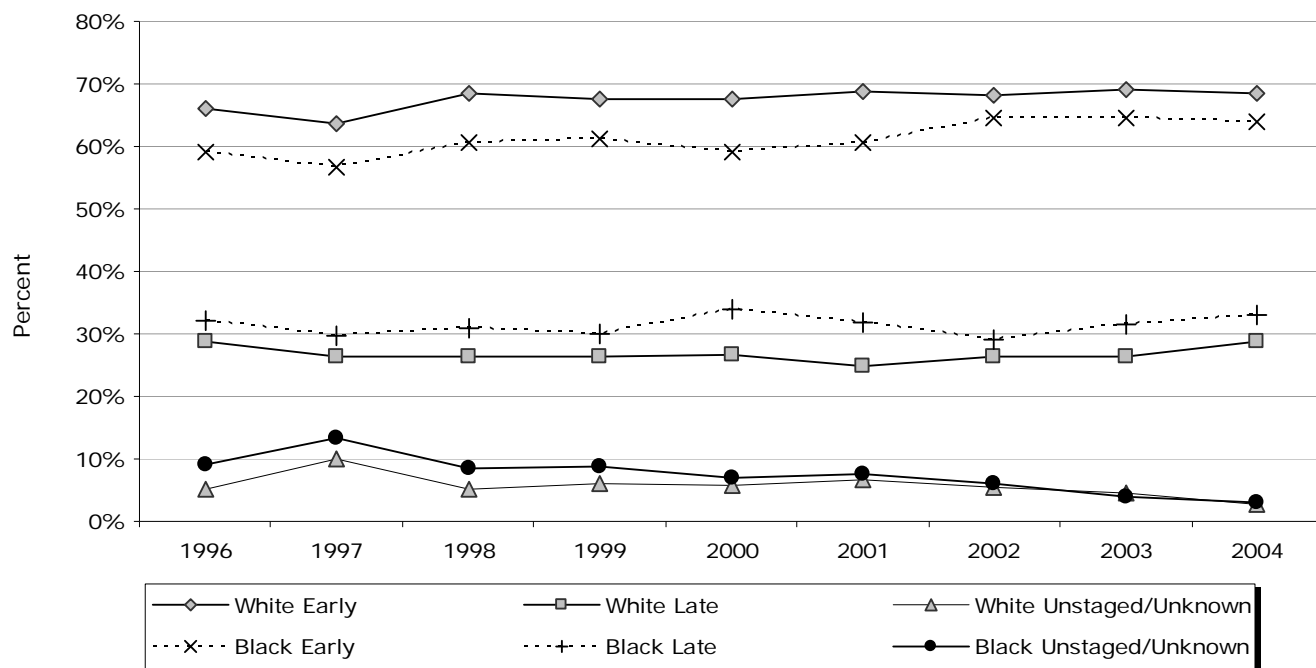
Source: SEER Cancer Statistics Review 1975-2004, National Cancer Institute, 2007.

Screening Recommendations

According to the American Cancer Society, women ages 20 to 39 years should have clinical breast examinations every three years and should perform monthly breast self-exams; and women ages 40 years and older should have annual mammograms in addition to annual clinical breast exams and monthly breast self-exams. You should talk with your doctor about these recommendations.

Female Breast Cancer Stage at Diagnosis Trends

Figure 7: Cancer of the Female Breast: Trends in the Proportion of Cases (%) by Stage at Diagnosis (Early, Late & Unstaged/Unknown) and Race in Ohio, 1996-2004



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2007.

Figure 7 shows the distribution of stage at diagnosis of female breast cancer according to race and year of diagnosis from 1996 to 2004. The proportion of both white and black cases diagnosed at the early stages slightly increased from 1996 to 2004, and for each year a greater proportion of white females were diagnosed at early stages compared to black females. The proportion of both white and black females diagnosed at late stages remained relatively constant from 1996 to 2004, and for each year a greater proportion of black females were diagnosed at late stages. For both race groups, these slight changes were accompanied by a decrease in the proportion with an unstaged/unknown stage at diagnosis during this time period. The race differences shown in Figure 7 for Ohio are similar to those seen in the United States.

Female Breast Cancer Histology

Histology refers to the cancer tissue or cell type. Table 4 shows the distribution of invasive female breast cancer by histological type for both Ohio (2000-2004) and the United States (2001-2004). In both Ohio and the United States, more than 93 percent of female breast cancers were adenocarcinomas, which are cancers originating in glandular (or secretory) tissue. The majority of female breast adenocarcinomas were infiltrating duct carcinomas, named because they begin in the cells of the ducts of the breasts. In Ohio, a slightly greater proportion of invasive female breast cancers were infiltrating duct carcinomas (70.9 percent) as compared to the United States (67.3 percent). Other common female breast adenocarcinomas included infiltrating lobular carcinoma, which begins in the lobules or milk-producing glands, and infiltrating duct and lobular carcinoma, which has characteristics of both infiltrating duct and lobular carcinoma. In Ohio, a slightly greater proportion of invasive female breast cancers were infiltrating lobular carcinomas (8.5 percent) compared to the United States (8.0 percent); whereas, infiltrating duct and lobular carcinomas were twice as common in the United States compared to Ohio. Sarcomas, cancers of supportive or connective tissue, made up very few female breast cancers in both Ohio and the United States (0.3 percent). In Ohio, the proportion of invasive female breast cancers that were neither adenocarcinomas nor sarcomas ("other histologies") was more than double that of the United States. There is no known reason for these differences in proportions.

Table 4: Cancer of the Female Breast: Average Annual Number of Cases (N) and Percent Distribution by Histological Type in Ohio, 2000-2004, and the US, 2001-2004

Histological Type (Histology)	Ohio		US
	N	Percent	Percent
Adenocarcinoma	7,617	93.8%	96.9%
Adenocarcinoma, NOS (8140)	173	2.1%	1.1%
Infiltrating duct carcinoma (8500)	5,755	70.9%	67.3%
Infiltrating lobular carcinoma, NOS (8520)	688	8.5%	8.0%
Inflammatory adenocarcinoma (8230)	2	0.0%	0.1%
Infiltrating duct and lobular carcinoma (8522-8524)	535	6.6%	12.7%
Mucinous and mucin-producing adenocarcinoma (8480, 8481)	175	2.2%	2.6%
Tubular adenocarcinoma (8211)	90	1.1%	1.6%
Papillary adenocarcinoma (8260, 8503, 8504)	19	0.2%	0.4%
Paget disease (8540-8543)	25	0.3%	0.6%
Medullary adenocarcinoma (8510-8513)	48	0.6%	0.7%
Other adenocarcinomas ¹	107	1.3%	1.9%
Sarcoma	25	0.3%	0.3%
Cystosarcoma phyllodes (9020)	19	0.2%	0.2%
Hemangiosarcomas (9120-9126, 9170)	4	0.1%	0.1%
Other sarcomas (8890, 8935, 8980)	2	0.0%	0.0%
Other histologies²	475	5.8%	2.7%

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2007, and the Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2007.

[1] "Other adenocarcinomas" includes histologies 8141-8210, 8212-8229, 8231-8259, 8261-8389, 8401, 8408, 8410, 8411, 8413, 8441, 8450, 8460, 8470, 8482, 8490, 8525, 8530, 8571-8574, 8576, 8650, 9070, 9110.

[2] "Other histologies" is defined as any other type of breast cancer not specifically listed in the table or footnote above.

Risk Factors for Female Breast Cancer

- **Age** — The risk for developing female breast cancer increases with advancing age. Approximately half of all women diagnosed with breast cancer are over the age of 65 years.
- **Race/Ethnicity** — White females are at slightly greater risk of developing breast cancer compared to black females, while Asian, Hispanic and American Indian females are at lower risk compared to whites and blacks.
- **Genetic Factors** — Approximately 10 percent of female breast cancers are linked to genetic factors, including BRCA1 and BRCA2 gene mutations. Women with a blood relative who has had breast cancer are at greater risk, especially if the relative is a mother, sister or daughter. BRCA gene mutations are more common in certain populations such as Ashkenazi Jewish females. Mutations in additional genes, including the ATM gene, CHEK-2 and p53 also increase risk.
- **Previous Breast Cancer or Benign Breast Disease** — A diagnosis of breast cancer in one breast increases the risk of diagnosis in the other breast or another area of the affected breast. In addition, a personal history of benign breast disease increases risk. An abnormal breast biopsy showing proliferative lesion(s) (excessive growth of cells in the ducts or lobules of the breast) without atypia (abnormal cells) slightly raises breast cancer risk, while proliferative lesion(s) with atypia increases female breast cancer risk about fivefold.
- **Family Cancer History** — A family history of female or male breast, ovarian, cervical, uterine or colon cancer, especially occurring in a mother or sister, increases risk. Having more than one blood relative diagnosed with female breast cancer more than doubles the risk compared to those having only one blood relative diagnosed with female breast cancer.
- **Radiation** — Having received radiation to the chest as a child or young adult increases risk, and the highest risk occurs among those receiving radiation during puberty.
- **Menstrual Cycles** — Menstruating before age 12 or starting menopause after age 55 increases risk.
- **Childbirth** — Not having children or having a first child after age 30 increases risk.
- **Hormone Replacement Therapy** — Long-term use of hormone replacement therapy, particularly estrogen and progesterone combined, increases female breast cancer risk. Evidence concerning estrogen-only therapy is mixed.
- **Weight** — Being overweight or obese increases female breast cancer risk in postmenopausal women, especially if the weight gain occurred as an adult.
- **Physical Inactivity** — There is growing evidence that physical inactivity increases risk. Although there is no consistent guideline as to exactly how much physical activity is necessary to decrease risk, exercising more than four hours per week has been shown to decrease risk.
- **Alcohol** — Consumption of alcohol increases risk; persons who drink two to five alcoholic drinks per day have 1 1/2 times the risk of nondrinkers. Risk increases in a dose-dependent fashion with the amount of alcohol consumed.

In addition to the above factors, the following factors *may* increase risk: a diet high in fat; not breast-feeding; the use of birth control pills; working at night; tobacco smoking; and secondhand tobacco smoke. There is **no** scientific evidence that the following factors increase risk: use of certain antiperspirants; underwire bras; induced abortion; breast implants (although breast implants make it more difficult to view breast tissue through the use of mammography); and environmental pollution (including polychlorinated biphenyls or the pesticide DDE).

Female Breast Cancer Signs and Symptoms

Usually, early stage female breast cancer does not cause pain. Common symptoms of female breast cancer include nipple discharge, a change in how the breast or nipple feels (e.g. tenderness, lumpiness, thickening in or near the breast) and/or a change in how the breast or nipple looks (e.g. changes in size or shape of the breast or a nipple that is turned slightly inward). In addition, the skin of the breast, areola or nipple may appear scaly, red or swollen or may have ridges or pitting that resembles the skin of an orange. If you have any of these symptoms, you should talk with your doctor.

Clinical Trials Information

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

- **National Cancer Institute:**
<http://www.cancer.gov/clinicaltrials>
- **American Cancer Society:**
http://www.cancer.org/docroot/ETO/ETO_6.asp?sitearea=ETO
- **Ohio State University Comprehensive Cancer Center—The Arthur G. James Cancer Hospital and Richard J. Solove Research Institute:**
<http://www.jamesline.com/trials>
- **The Cleveland Clinic:**
<http://cms.clevelandclinic.org/cancer/body.cfm?id=68&oTopID=68>
- **Case Western Reserve University Comprehensive Cancer Center:**
<http://henge.case.edu/sip/SIPControlServlet>
- **University of Cincinnati:**
<http://uccancercenter.uc.edu/research/clinicaltrials>
- **Toledo Community Hospital Oncology Program:**
<http://www.tchop.com>
- **Dayton Clinical Oncology Program:**
<http://www.med.wright.edu/dcop>
- **Columbus Community Clinical Oncology Program:**
<http://www.columbusccop.org>

Sources of Data and Additional Information

- **Ohio Cancer Incidence Surveillance System:**
http://www.odh.ohio.gov/ODHPrograms/svio/ci_surv/ci_surv1.aspx
 - **National Cancer Institute:**
<http://www.cancer.gov/cancertopics/types/breast>
 - **American Cancer Society:**
http://www.cancer.org/docroot/CRI/CRI_2x.asp?sitearea=&dt=5
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The Ohio Cancer Incidence Surveillance System (OCISS)

Ohio Department of Health

and

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