

Pancreatic Cancer in Ohio, 2005-2009

This report contains a summary of incidence and mortality rates, stage at diagnosis, survival, histology, risk factors and signs and symptoms for pancreatic cancer in Ohio and the United States.

Pancreatic Cancer Incidence and Mortality

Pancreatic cancer made up 2.5 percent of the incident (newly diagnosed) cancers reported to the Ohio Cancer Incidence Surveillance System (OCISS) from 2005 through 2009. The average number of cases of pancreatic cancer in Ohio during this time period was 1,518 (N) and the average annual age-adjusted incident rate was 11.8 cases per 100,000 persons, which is slightly lower than the U.S. (SEER: Surveillance, Epidemiology and End Results) rate of 12.1 per 100,000 persons (Table 1). Estimated completeness of reporting for pancreatic cancer in Ohio was 93 percent in 2005-2009, which is slightly less than the national standard of 95 percent for complete case ascertainment. Therefore, the pancreatic cancer incidence rates presented in this report may slightly underestimate the true pancreatic cancer burden in Ohio. The Ohio pancreatic cancer mortality rate of 11.3 deaths per 100,000 persons in 2005-2009 is slightly higher than the U.S. (NCHS: National Center for Health Statistics) mortality rate (10.8 per 100,000 persons). As shown in Table 1, in both Ohio and the United States, pancreatic cancer incidence and mortality rates were greater for males, blacks and those 65 years and older.

Key Findings

- Ohio and U.S. pancreatic cancer incidence and mortality rates were greater for males, blacks and those 65 years and older.
- For most race-gender groups, incidence rates were greater in the United States, compared to Ohio, possibly due to lower completeness of reporting in Ohio.
- There was no clear geographic pattern to pancreatic cancer incidence and mortality rates in Ohio by county.
- From 1996 to 2009, incidence rates were variable but slightly increased for white and black males and females in Ohio.
- About 46 percent of males and 42 percent of females were diagnosed at distant stage in Ohio.
- Only 5.8 percent of individuals diagnosed with pancreatic cancer survive five years after diagnosis.
- Smoking tobacco and obesity are modifiable risk factors.

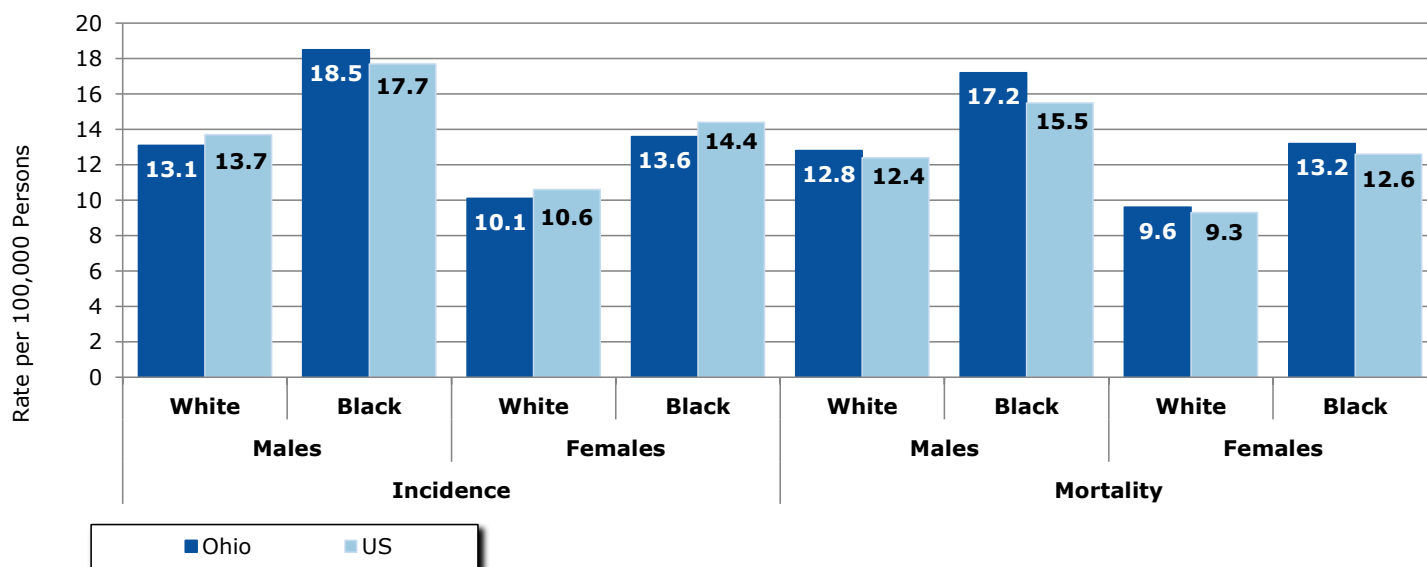
Table 1: Pancreatic Cancer: Average Annual Number (N) and Age-adjusted Rates of Invasive Cancer Cases and Cancer Deaths by Gender, Race and Age Group in Ohio and the U.S., 2005-2009

	Incidence			Mortality		
	N	Ohio Rate	US Rate	N	Ohio Rate	US Rate
Total	1,518	11.8	12.1	1,456	11.3	10.8
Gender						
Males	752	13.6	13.8	715	13.1	12.5
Females	766	10.4	10.8	741	9.9	9.5
Race						
White	1,318	11.4	12.0	1,279	11.1	10.7
Black	181	15.7	15.8	170	14.9	13.8
Asian/Pacific Islander	7	8.9	9.5	6	5.8	7.5
Age						
<64	502	4.2	4.0	424	3.5	3.2
65+	1,016	64.7	68.3	1,032	65.5	63.4

Source: Ohio Cancer Incidence Surveillance System and the Vital Statistics Program, Ohio Department of Health, 2012; SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012; NCHS: National Center for Health Statistics, 2012.

Pancreatic Cancer Incidence and Mortality Rates by Race and Gender in Ohio Compared to the United States

Figure 1: Pancreatic Cancer: Average Annual Age-adjusted Rates of Invasive Cancer Cases and Cancer Deaths by Race and Gender in Ohio and the U.S., 2005-2009



Source: Ohio Cancer Incidence Surveillance System and the Vital Statistics Program, Ohio Department of Health, 2012; SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012; NCHS: National Center for Health Statistics, 2012.

As shown in Figure 1, black males had the highest average annual age-adjusted pancreatic cancer incidence and mortality rates in Ohio and the United States in 2005-2009, whereas white females had the lowest rates. For each gender-race-specific group, incidence rates were greater in the United States, compared to those in Ohio, with the exception of black males. In contrast, for each gender-race-specific group, mortality rates were greater in Ohio, compared to those in the United States.

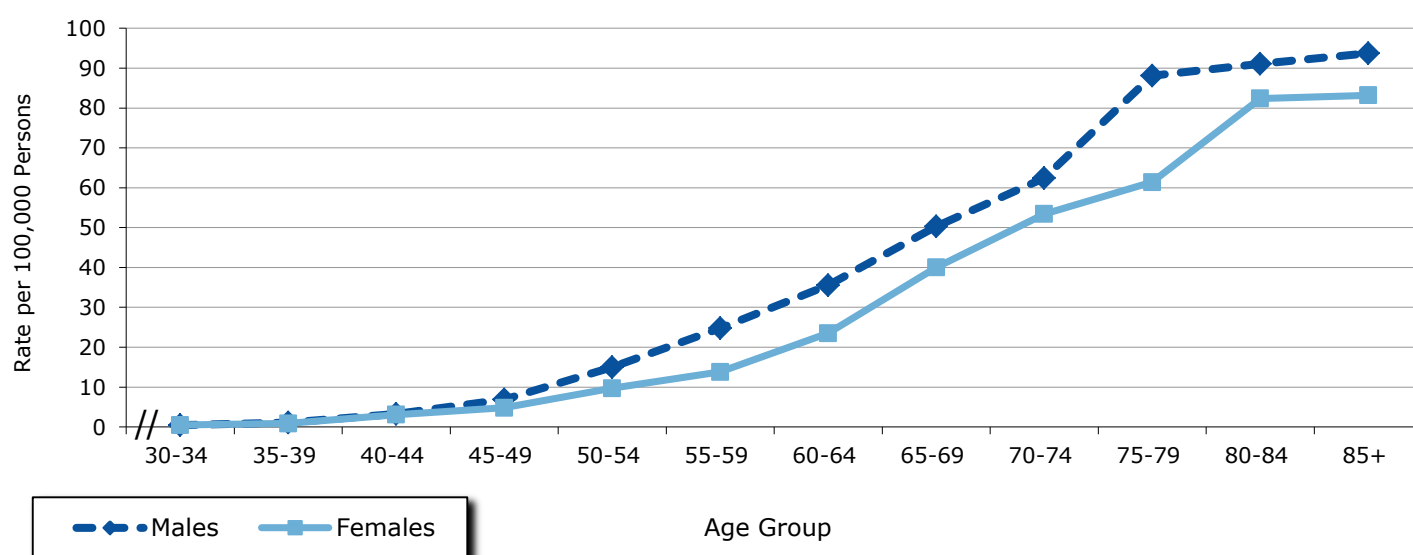
Did You Know?

Lynch Syndrome is a rare inherited condition that increases risk of nonpolyposis colorectal cancer and cancers of the uterus, ovary, small intestine, ureter and renal pelvis. Recent research has been conducted to explore cancer risk in families with Lynch Syndrome. Researchers studied 446 people with a Lynch Syndrome gene mutation, and 1,029 family members who did not carry a gene mutation. After five years of follow-up, results showed that people with Lynch Syndrome also have an increased risk of breast and pancreatic cancers. People who come from a family with Lynch Syndrome, but do not carry the gene mutation are less likely to have increased risk of cancer.

Pancreatic Cancer by Age

As shown in Figure 2, for both males and females, pancreatic cancer incidence rates increased with advancing age up to ages 80-84 years and then remained relatively stable. There were very few pancreatic cancers diagnosed among those younger than 30 years. Pancreatic cancer incidence rates were similar for males and females up to ages 45 to 49 years; whereas males had higher rates in age groups 50-54 years and older.

Figure 2: Pancreatic Cancer: Age-specific Incidence Rates per 100,000 Persons, by Gender in Ohio, 2005-2009

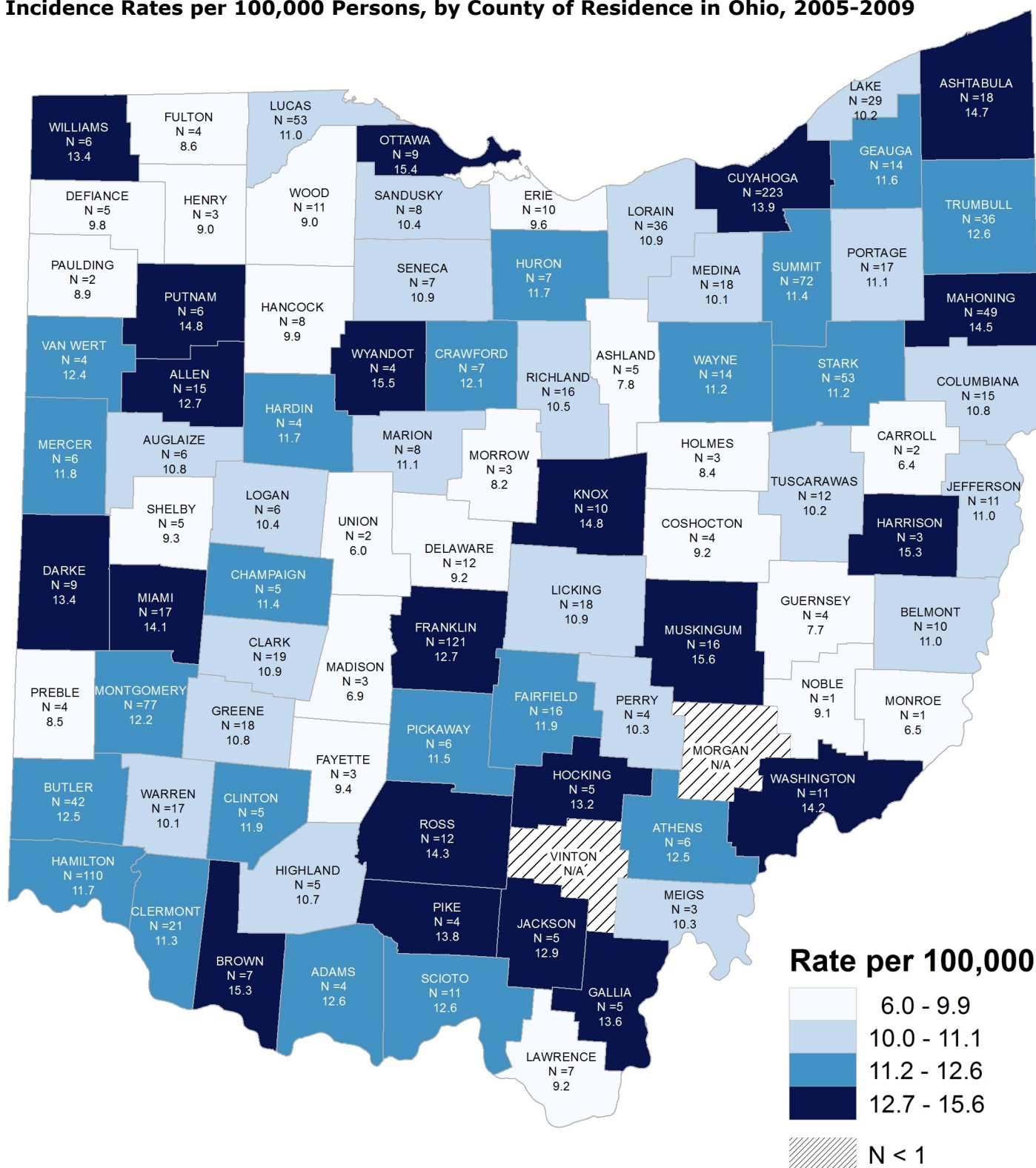


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2012.

Pancreatic Cancer Incidence by County of Residence

Figures 3 (page 4) and Figure 4 (page 5) present 2005-2009 average annual numbers (N) and age-adjusted pancreatic cancer incidence and mortality rates, respectively, by county of residence. As shown in Figures 3 and 4, county-specific incidence rates in Ohio ranged from 6.0 to 15.6 per 100,000 persons and mortality rates ranged from 6.1 to 17.6 per 100,000 persons. Figures 3 and 4 are similar because the survival probability for pancreatic cancer is extremely low; that is, incidence is similar to mortality. Pancreatic cancer incidence and mortality rates by county are relatively sporadic and display no apparent pattern. Data used to generate these maps can be found in Tables 4 and 5 on pages 13 and 14 of this document.

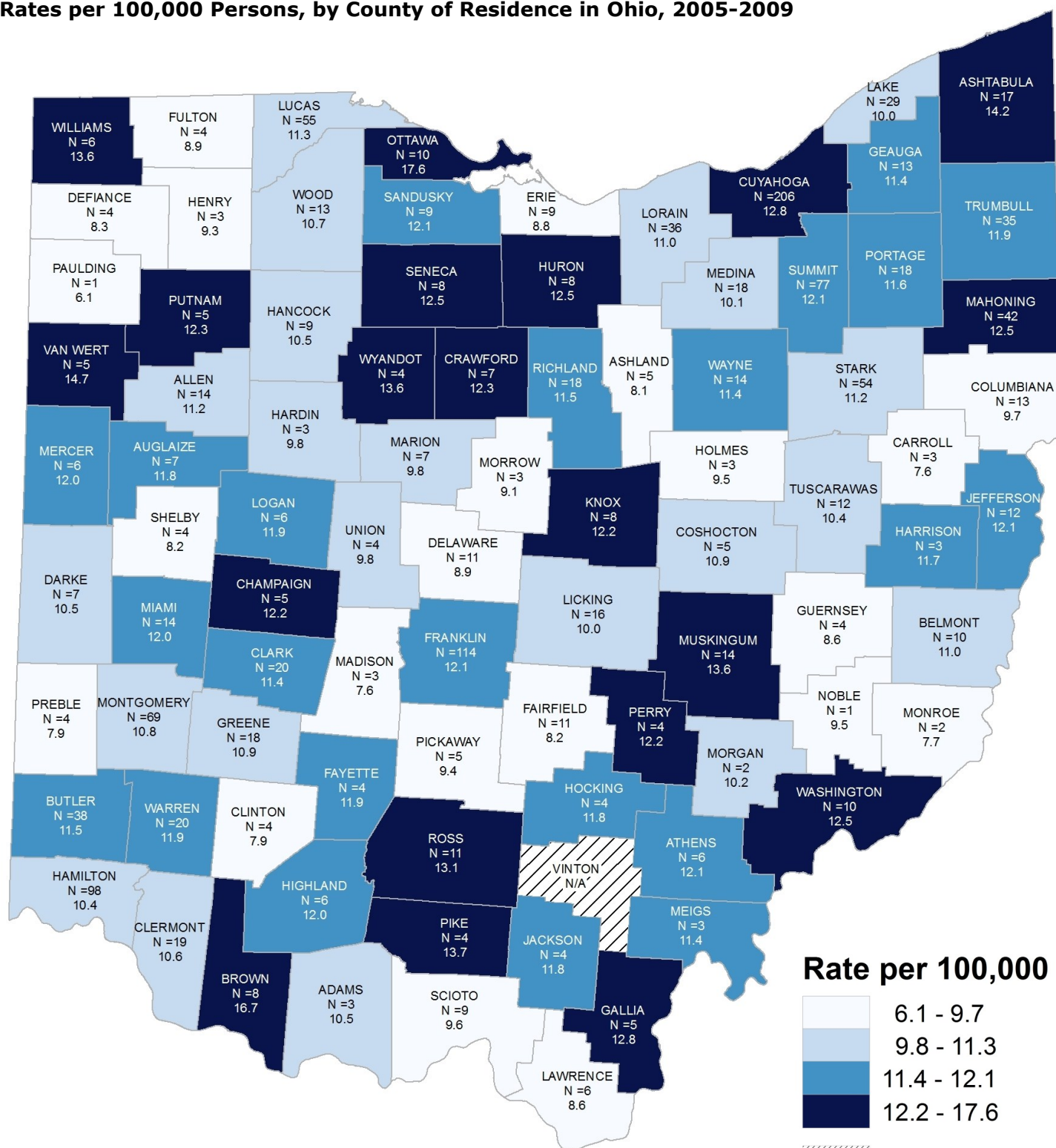
Figure 3: Pancreatic Cancer: Average Annual Number of Cases (N) and Age-adjusted Incidence Rates per 100,000 Persons, by County of Residence in Ohio, 2005-2009



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2012.

- N = Average number of cases *per year* (=Total cases in 2005-2009 ÷ 5 years).
- Each category represents approximately 25% of the 88 Ohio counties.
- N/A: Rates may be unstable and are not presented when the case count for 2005-2009 is less than five (i.e., N<1).

Figure 4: Pancreatic Cancer: Average Annual Number of Cases (N) and Age-adjusted Mortality Rates per 100,000 Persons, by County of Residence in Ohio, 2005-2009



Source: Ohio Cancer Incidence Surveillance System and the Vital Statistics Program, Ohio Department of Health, 2012.

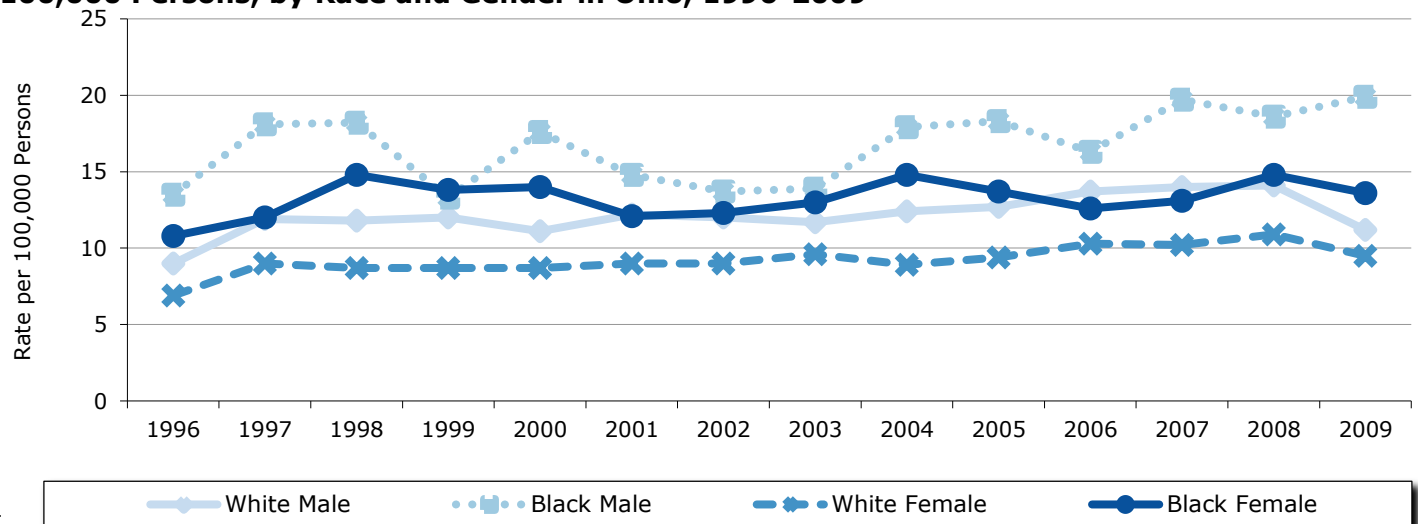
- N = Average number of cases *per year* (= Total cases in 2005-2009 ÷ 5 years).
- Each category represents approximately 25% of the 88 Ohio counties.
- N/A: Rates may be unstable and are not presented when the case count for 2005-2009 is less than five (i.e., N<1).

Pancreatic Cancer Incidence and Mortality Trends

Figure 5 shows pancreatic cancer incidence rates according to year of diagnosis (1996 through 2009) by gender-race group. For each year except 1999, black males had the highest incidence rate, while white females had the lowest incidence rate for each year. For each gender-race group, although some incidence rates were sporadic over the time period, incidence rates tended to increase slightly from 1996 to 2009.

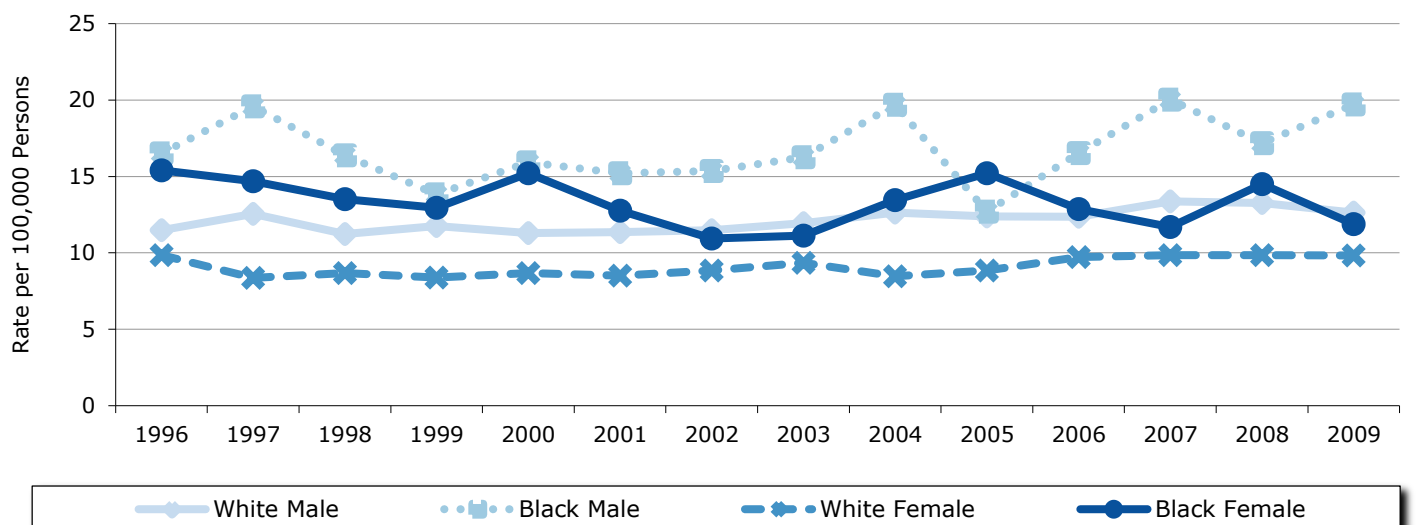
Figure 6 shows pancreatic cancer mortality rates according to year of death (1996 through 2009) by gender-race group. For each year except 2005, blacks males had the highest mortality rate, while white females had the lowest mortality rate for each year. Mortality rates remained relatively stable for white males and females, while mortality rates for black males and females were variable over the 14-year period.

Figure 5: Pancreatic Cancer: Trends in Average Annual Age-adjusted Incidence Rates per 100,000 Persons, by Race and Gender in Ohio, 1996-2009



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2012.

Figure 6: Pancreatic Cancer: Trends in Average Annual Age-adjusted Mortality Rates per 100,000 Persons by Race and Gender in Ohio, 1996-2009

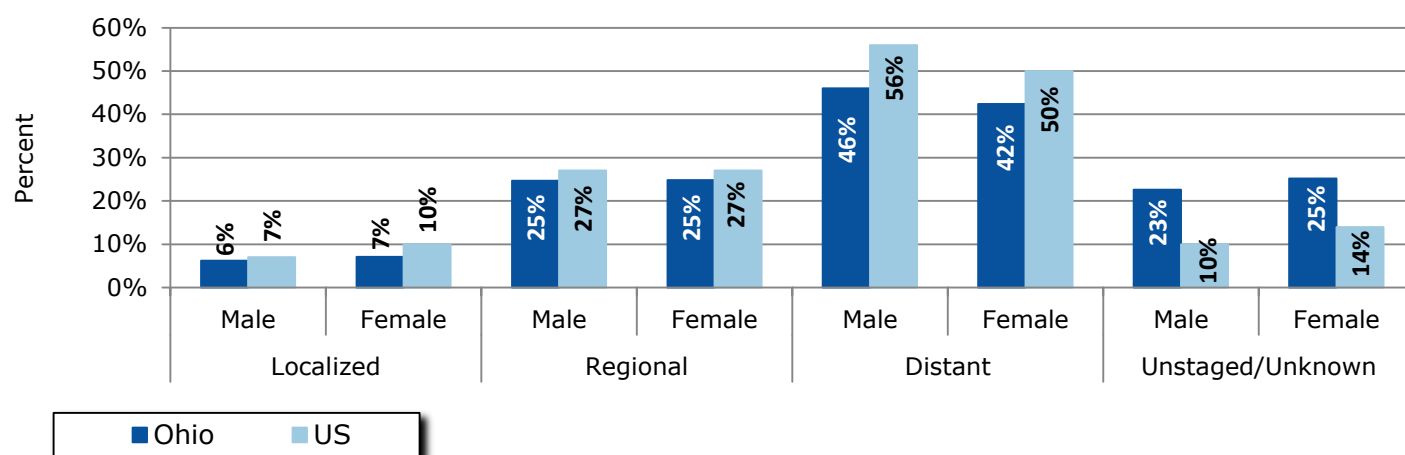


Source: Ohio Cancer Incidence Surveillance System and the Vital Statistics Program, Ohio Department of Health, 2012.

Pancreatic Cancer by Stage at Diagnosis

Figure 7 shows the proportion of pancreatic cancer by stage at diagnosis and gender for Ohio and the United States in 2005-2009. Approximately half of all pancreatic cancer cases were diagnosed at distant stage. The proportion of localized and regional staged cases were similar between Ohio and the United States for both males and females. However, the proportion diagnosed at distant stage was higher for the United States, compared to Ohio. The proportion of males and females reported as unstaged/unknown stage at diagnosis in Ohio suggests some distant Ohio cases may have been classified as unstaged/unknown stage at diagnosis.

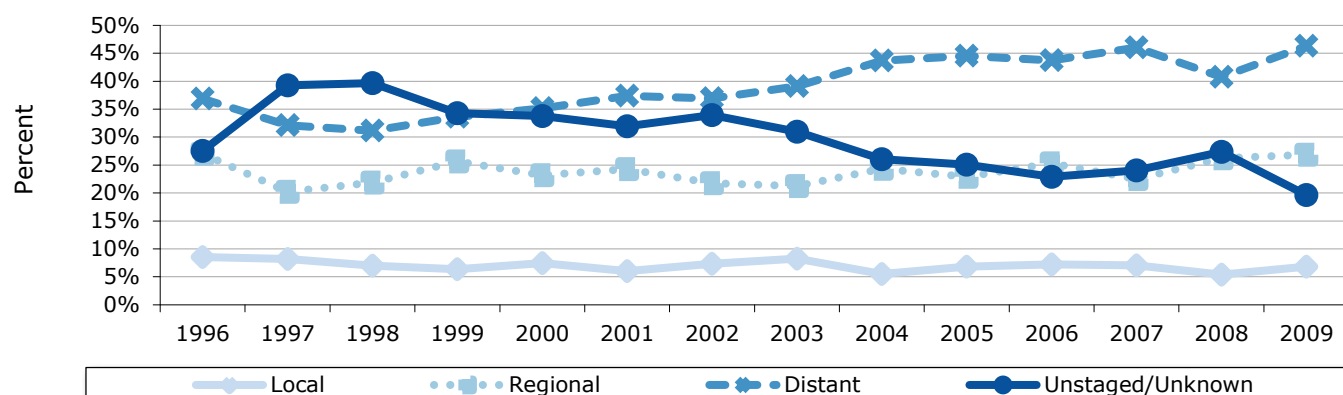
Figure 7: Pancreatic Cancer: Proportion of Cases (%) by Stage at Diagnosis and Gender in Ohio and the U.S. (SEER), 2005-2009



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2012; SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012; NCHS: National Center for Health Statistics, 2012.

The proportion of pancreatic cases diagnosed at the local and regional stages remained fairly constant from 1996 to 2009, as seen in Figure 8. The proportion of cases diagnosed at distant stage or unstaged/unknown stage was more sporadic in this time frame, ranging from 37 percent to 46 percent for distant stage and from 20 percent to 40 percent for unstaged/unknown stage. The distant stage and unstaged/unknown stage trends are almost mirror images of each other, with the proportion of unstaged/unknown stage decreasing over time and the proportion of distant stage increasing over time.

Figure 8: Pancreatic Cancer: Trends in Proportion of Cases (%) by Stage at Diagnosis in Ohio, 2005-2009



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2012.

Pancreatic Cancer Survival Probability

Table 2: Pancreatic Cancer: Five-year Survival Probability (%) by Stage at Diagnosis, Race and Gender in the U.S. (SEER), 2002-2008

Stage	Five-year Survival Probability (%)				
	Overall	White Male	White Female	Black Male	Black Female
All Stages	5.8%	5.4%	6.0%	4.6%	5.4%
Localized	23.3%	22.0%	23.8%	13.7%	21.4%
Regional	8.9%	8.5%	9.2%	8.5%	7.9%
Distant	1.8%	2.0%	1.7%	1.2%	1.3%
Unstaged/ Unknown Stage	3.9%	4.0%	3.1%	8.2%	4.8%

Source: SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

Table 2 shows that the U.S. (SEER) five-year pancreatic cancer survival probability in 2002-2008 for all stages combined was only 5.8 percent. For each race-gender group, the overwhelming majority of individuals diagnosed with pancreatic cancer do not survive years after diagnosis. Black males had the lowest five-year survival probability (4.6 percent) and white females had the highest (6.0 percent). Survival probability decreased with advancing stage for all race-gender groups. Survival probability also decreased with advancing age (not shown in Table 2). Over the past three decades, five-year survival probability for pancreatic cancer has more than doubled, from 2.4 percent among those diagnosed in 1975-1977 to 5.8 percent among those diagnosed in 2002-2008 (not shown in Table 2.)

Pancreatic Cancer Treatment

Surgery, radiation therapy and chemotherapy are treatment options for pancreatic cancer that may extend survival and/or relieve symptoms in many patients, but seldom produce a cure. Less than 20 percent of patients are candidates for surgery because pancreatic cancer is usually detected after it has spread beyond the pancreas; even when surgery is performed, it often cannot remove all of the cancer. For patients who do undergo surgery, adjuvant treatment with the chemotherapy drug gemcitabine lengthens survival. The targeted anticancer drug erlotinib (Tarceva) has demonstrated a small improvement in advanced pancreatic cancer survival when used in combination with gemcitabine. Clinical trials with several new agents, combined with radiation and surgery, may offer improved survival and should be considered as a treatment option.

Pancreatic Cancer by Histology

Table 3 shows average annual numbers and percents of pancreatic cancers in Ohio and the United States according to histology. The majority of pancreatic cancer cases diagnosed from 2005 to 2009 in both Ohio and the United States were carcinomas (97.9 percent). A higher percentage of pancreatic cancers in Ohio were diagnosed as 'unspecified, carcinoma, NOS' or as 'unspecified' (17.6 percent), compared to the United States (2.0 percent). That is, in Ohio, fewer pancreatic cancers were diagnosed with specific histologies. Because of this, percentages of all specific histologies shown in Table 3 (e.g. infiltrating duct carcinoma) are higher for the United States, compared to Ohio. There is no known reason for these differences.

Table 3: Pancreatic Cancer: Average Annual Number (N) and Percent Distribution by Histology in Ohio and the U.S. (SEER), 2005-2009 (Average Annual N= 1,518)

Histology	Ohio		US
	N	Percent	Percent
Carcinoma	1,230	81.0%	97.9%
Epidermoid carcinoma (8051-8131)^a	3	0.2%	0.2%
Adenocarcinoma^b	1,019	67.1%	86.0%
Adenocarcinoma, NOS (8140)	891	58.7%	69.8%
Papillary adenocarcinoma, NOS (8260)	1	<0.1%	0.2%
Mucinous adenocarcinoma (8480, 8482)	24	1.6%	2.7%
Mucin-producing adenocarcinoma (8481)	11	0.7%	1.4%
Infiltrating duct carcinoma (8500-8503, 8507, 8514)	66	4.3%	9.4%
Other adenocarcinoma ^c	27	1.8%	2.6%
Other specific carcinomas^d	49	3.2%	5.9%
Islet cell carcinoma (8150-8155)	8	0.5%	1.1%
Other carcinomas ^e	13	0.9%	4.8%
Unspecified, "Carcinoma, NOS" (8010, 8020-8005)	159	10.5%	5.8%
Sarcoma and other soft tissue tumors^f	0	0.0%	0.1%
Other specific types^g	<1	<0.1%	0.1%
Unspecified (8000-8005)	267	17.6%	2.0%

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2012; SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

a Epidermoid carcinoma includes squamous, basal, and transitional cell carcinomas.

b Adenocarcinoma includes histologies 8050,8140-8147,8160-8162,8180-8221,8250-8507,8514,8520-8551,8560,8570-8574,8576,8940-8941.

c Other adenocarcinoma include histologies 8050,8141-8147,8160-8162,8180-8221,8250-8259,8261-8479,8483-8499,8504-8506,8520-8551,8560,8570-8574,8576,8940-8941.

d Other specific carcinomas include histologies 8012-8015,8030-8046,8150-8155,8170-8180,8230-8249,8508,8510-8513,8561-8562,8575, 8580-8671.

e Other carcinomas include histologies 8012-8015,8030-8046,8170-8180,8230-8249,8508,8510-8513,8561-8562,8575,8580-8671.

f Sarcoma and other soft tissue tumors include histologies 8680-8713,8800-8921,8990-8991,9040-9044,9120-9136,9150-9252,9370-9373,9540-9582.

g Other specific types include histologies 8720-8790,8930-8936,8950-9030,9060-9110,9260-9365,9380-9539.

Pancreatic Cancer Risk Factors and Populations at High Risk

Having one or more risk factors does not mean that a person will develop pancreatic cancer. Most people who have risk factors never develop pancreatic cancer. According to the National Cancer Institute, the following have been identified in studies as pancreatic cancer risk factors or as populations with high risk of pancreatic cancer:

- **Age:** Pancreatic cancer risk increases with age. More than 70 percent of pancreatic cancers occur in people over the age of 65.
- **Gender:** Males are more likely than females to develop pancreatic cancer.
- **Race:** Blacks are more likely to develop pancreatic cancer compared to other races.
- **Smoking:** Smoking tobacco is the most important risk factor for pancreatic cancer. People who smoke tobacco are more likely than nonsmokers to develop this disease. Heavy smokers are most at risk.
- **Diabetes:** People with diabetes are more likely than other people to develop pancreatic cancer.
- **Family history:** Having a mother, father, sister or brother with pancreatic cancer increases the risk of developing the disease.
- **Inflammation of the pancreas:** Pancreatitis is a painful inflammation of the pancreas. Having pancreatitis for a long time may increase the risk of pancreatic cancer.
- **Obesity:** People who are overweight or obese are slightly more likely than other people to develop pancreatic cancer.

Many other possible risk factors are under active study. For example, researchers are studying whether a diet high in fat (especially animal fat) or heavy drinking of alcoholic beverages may increase the risk of pancreatic cancer. Another area of active research is whether certain inherited variations in genes increase the risk of disease.

Pancreatic Cancer Signs and Symptoms

Signs and symptoms of pancreatic cancer often do not occur until the disease is advanced—when the cancer has grown outside of the pancreas. When they do occur, signs and symptoms may include:

- Jaundice (yellowing of the skin and whites of the eyes)
- Digestive problems, including abnormal stools, nausea or vomiting
- Pain in the upper abdomen that can extend to your back
- Loss of appetite
- Nausea
- Sudden weight loss
- Blood clots

It is possible that one or more of these signs and symptoms may be the result of other health problems. If you have any of these symptoms, you should consult with your health care 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 five-year age groups, i.e., <1, 1-4, 5-9, 10-14...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 and summed to give an overall age-adjusted rate. Rates are presented as the number of cases per 100,000 persons per year. Age-adjustment allows for the comparison of rates between populations with different age distributions.

Average Annual Number—The number of cases or deaths diagnosed per year, on average, for the time period of interest (e.g., 2005-2009). 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.

Incidence—The number of cases diagnosed during a specified time period (e.g., 2005-2009). Pancreatic cancer cases were defined as follows: International Classification of Diseases for Oncology, Third Edition (ICD-O-3), C250-C259, excluding types 9590-9989.

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 pancreatic cancer incidence rates.

Mortality—The number of deaths during a specified time period (e.g., 2005-2009). Pancreatic deaths were defined as follows: International Statistical Classification of Diseases and Related Health Problems, Tenth Edition (ICD-10), codes C250-C259.

Rate—The number of cases or deaths per unit of population (e.g., per 100,000 persons), over a specified time period (e.g., 2005-2009). Rates may be unstable and are not presented when the case count for 2005-2009 is less than five. The 2005-2009 rates were calculated using vintage 2009 postcensal estimates for July 1, 2005-2009 (U.S. Census Bureau, 2011).

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

in situ—Noninvasive cancer that has not penetrated surrounding tissue.

Localized—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.

Survival Probability—The probability that an individual will survive five years after diagnosis. Five-year relative survival probabilities are from the SEER 18 areas for diagnosis years 2002-2008. Probabilities are based on follow-up of patients into 2009.

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 pancreatic cancer, please talk with your health care provider 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
- **The Ohio State University Comprehensive Cancer Center—Arthur G. James Cancer Hospital and Richard J. Solove Research Institute:**
http://cancer.osu.edu/patientsandvisitors/cancerinfo/clinical_trials/Pages/index.aspx
- **The Cleveland Clinic:**
http://my.clevelandclinic.org/cancer/clinical_trials/default.aspx
- **Case Western Reserve University Comprehensive Cancer Center:**
<http://cancer.case.edu/sharedresources/clinicaltrials>
- **University of Cincinnati:**
<http://uccancer.com/PatientCare/ClinicalTrials/Overview.aspx>
- **Toledo Community Hospital Oncology Program:**
<http://tchop.com/clinical/-trials>
- **Dayton Clinical Oncology Program:**
<http://www.med.wright.edu/dcop/Clinical%20Trials.htm>
- **Columbus Community Clinical Oncology Program:**
<http://columbusccop.org>

Sources of Data and Additional Information

- **Ohio Cancer Incidence Surveillance System:**
http://www.odh.ohio.gov/healthstats/ocisshs/ci_surv1.aspx
 - **National Cancer Institute:**
<http://www.cancer.gov/cancertopics/types/pancreatic>
 - **American Cancer Society:**
<http://www.cancer.org/cancer/pancreaticcancer/index>
-

Table 4: Pancreatic Cancer: Average Annual Number of Invasive Cancer Cases and Age-adjusted Incidence Rates per 100,000 Persons, by County of Residence and Gender, Ohio, 2005-2009

	Male		Female		Total			Male		Female		Total	
	Cases	Rate	Cases	Rate	Cases	Rate		Cases	Rate	Cases	Rate	Cases	Rate
Ohio	752	13.6	766	10.4	1,518	11.8	Lawrence	3	8.0	4	9.7	7	9.2
SEER		13.8		10.8		12.1	Licking	9	12.0	9	9.7	18	10.9
Adams	2	15.1	2	9.4	4	12.6	Logan	3	11.9	3	9.4	6	10.4
Allen	7	13.4	8	11.4	15	12.7	Lorain	16	11.0	20	11.0	36	10.9
Ashland	3	9.3	2	6.5	5	7.8	Lucas	26	12.8	27	9.7	53	11.0
Ashtabula	9	15.7	9	13.6	18	14.7	Madison	3	11.5	1	2.5	3	6.9
Athens	2	10.2	4	14.2	6	12.5	Mahoning	22	15.9	27	13.2	49	14.5
Auglaize	3	11.7	3	10.2	6	10.8	Marion	5	17.2	3	7.2	8	11.1
Belmont	5	12.9	5	9.9	10	11.0	Medina	10	11.6	8	8.4	18	10.1
Brown	3	13.8	4	16.2	7	15.3	Meigs	2	16.3	1	5.4	3	10.3
Butler	21	14.6	21	10.9	42	12.5	Mercer	4	19.1	1	5.4	6	11.8
Carroll	2	11.0	<1	*	2	6.4	Miami	9	17.7	8	11.3	17	14.1
Champaign	2	13.2	3	10.7	5	11.4	Monroe	1	11.1	<1	*	1	6.5
Clark	8	10.8	11	10.9	19	10.9	Montgomery	41	15.1	37	10.0	77	12.2
Clermont	12	14.9	9	8.5	21	11.3	Morgan	1	5.8	<1	*	1	4.0
Clinton	2	10.3	3	12.9	5	11.9	Morrow	2	10.7	1	6.2	3	8.2
Columbiana	8	13.0	7	9.0	15	10.8	Muskingum	7	17.1	8	14.5	16	15.6
Coshocton	2	11.1	2	7.6	4	9.2	Noble	1	10.5	1	7.0	1	9.1
Crawford	4	15.4	3	9.8	7	12.1	Ottawa	4	16.6	4	14.5	9	15.4
Cuyahoga	105	16.0	118	12.3	223	13.9	Paulding	1	6.3	1	10.5	2	8.9
Darke	4	13.3	5	13.6	9	13.4	Perry	2	12.1	2	9.3	4	10.3
Defiance	2	10.9	2	8.7	5	9.8	Pickaway	3	11.4	3	10.5	6	11.5
Delaware	6	9.9	6	8.3	12	9.2	Pike	3	20.2	2	8.8	4	13.8
Erie	5	10.2	5	8.8	10	9.6	Portage	8	10.9	9	11.2	17	11.1
Fairfield	8	12.5	8	11.3	16	11.9	Preble	2	8.5	2	8.3	4	8.5
Fayette	2	10.5	2	8.2	3	9.4	Putnam	3	15.3	3	14.0	6	14.8
Franklin	64	15.9	57	10.4	121	12.7	Richland	8	12.2	8	9.0	16	10.5
Fulton	3	12.0	2	5.6	4	8.6	Ross	6	16.3	6	12.5	12	14.3
Gallia	3	16.3	2	11.8	5	13.6	Sandusky	3	7.8	5	11.8	8	10.4
Geauga	8	14.6	6	8.4	14	11.6	Scioto	7	17.4	4	8.3	11	12.6
Greene	9	12.9	8	9.2	18	10.8	Seneca	3	9.3	5	11.3	7	10.9
Guernsey	3	13.1	1	3.4	4	7.7	Shelby	3	15.0	1	4.9	5	9.3
Hamilton	51	13.1	59	10.5	110	11.7	Stark	26	12.5	27	10.2	53	11.2
Hancock	4	10.3	4	9.2	8	9.9	Summit	33	12.1	39	10.8	72	11.4
Hardin	2	13.9	2	9.5	4	11.7	Trumbull	20	16.5	16	9.7	36	12.6
Harrison	2	16.3	2	14.6	3	15.3	Tuscarawas	6	11.7	6	9.5	12	10.2
Henry	2	14.2	1	5.9	3	9.0	Union	1	9.2	1	4.0	2	6.0
Highland	3	14.6	2	6.8	5	10.7	Van Wert	2	16.1	2	10.3	4	12.4
Hocking	3	18.7	1	8.0	5	13.2	Vinton	<1	*	<1	*	1	4.2
Holmes	1	8.8	2	8.0	3	8.4	Warren	7	9.1	10	10.8	17	10.1
Huron	5	17.5	3	7.9	7	11.7	Washington	6	17.6	5	11.9	11	14.2
Jackson	2	10.8	3	13.8	5	12.9	Wayne	7	13.4	7	9.9	14	11.2
Jefferson	6	12.6	6	9.7	11	11.0	Williams	2	12.7	4	14.9	6	13.4
Knox	4	14.5	6	14.2	10	14.8	Wood	5	8.4	6	9.3	11	9.0
Lake	14	11.1	15	9.5	29	10.2	Wyandot	2	13.2	3	17.4	4	15.5

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2012; SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

*Rates may be unstable and are not presented when the case count for 2005-2009 is less than five (i.e. the average annual count is less than one).

Note: Low county numbers and rates may reflect underreporting for that county.

Table 5: Pancreatic Cancer: Average Annual Number of Cancer Deaths and Age-adjusted Mortality Rates per 100,000 Persons, by County of Residence and Gender, Ohio, 2005-2009

	Male		Female		Total			Male		Female		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate		Deaths	Rate	Deaths	Rate	Deaths	Rate
Ohio	715	13.1	741	9.9	1,456	11.3	Lawrence	3	8.9	4	8.4	6	8.6
SEER		12.5		9.5		10.8	Licking	9	12.3	8	8.2	16	10.0
Adams	2	9.4	2	10.5	3	10.5	Logan	3	12.0	4	12.1	6	11.9
Allen	5	9.5	9	12.2	14	11.2	Lorain	15	10.8	21	11.3	36	11.0
Ashland	3	9.5	2	6.6	5	8.1	Lucas	26	12.9	29	10.2	55	11.3
Ashtabula	9	15.8	9	12.2	17	14.2	Madison	3	14.6	<1	*	3	7.6
Athens	3	15.0	3	10.0	6	12.1	Mahoning	20	14.5	23	10.8	42	12.5
Auglaize	3	12.6	4	11.2	7	11.8	Marion	5	16.3	3	5.9	7	9.8
Belmont	5	13.6	5	9.1	10	11.0	Medina	9	11.8	9	8.7	18	10.1
Brown	3	14.6	5	18.1	8	16.7	Meigs	2	16.4	1	6.9	3	11.4
Butler	19	13.2	20	10.3	38	11.5	Mercer	4	20.0	2	5.6	6	12.0
Carroll	2	12.7	1	3.4	3	7.6	Miami	8	14.6	7	9.7	14	12.0
Champaign	2	14.0	3	11.2	5	12.2	Monroe	1	11.4	1	5.1	2	7.7
Clark	8	11.1	12	11.7	20	11.4	Montgomery	38	14.3	31	8.2	69	10.8
Clermont	11	13.6	8	8.4	19	10.6	Morgan	1	14.7	1	5.6	2	10.2
Clinton	1	6.0	2	8.8	4	7.9	Morrow	2	11.9	1	6.9	3	9.1
Columbiana	7	11.9	6	7.8	13	9.7	Muskingum	7	17.2	6	10.8	14	13.6
Coshocton	3	14.7	2	7.5	5	10.9	Noble	<1	*	1	12.2	1	9.5
Crawford	4	16.0	3	9.5	7	12.3	Ottawa	6	22.1	4	13.8	10	17.5
Cuyahoga	93	14.2	114	11.7	206	12.8	Paulding	1	4.8	1	6.6	1	6.1
Darke	3	9.7	4	11.1	7	10.5	Perry	2	15.2	2	10.0	4	12.2
Defiance	2	9.8	2	7.1	4	8.3	Pickaway	2	8.6	3	9.4	5	9.4
Delaware	5	9.0	6	8.4	11	8.9	Pike	3	22.8	1	6.1	4	13.7
Erie	5	10.2	5	7.4	9	8.8	Portage	7	9.7	11	12.9	18	11.6
Fairfield	5	8.2	6	8.2	11	8.2	Preble	2	8.8	2	6.9	4	7.9
Fayette	2	12.4	2	12.1	4	11.9	Putnam	2	13.3	3	11.3	5	12.3
Franklin	61	15.6	53	9.6	114	12.1	Richland	9	14.7	9	9.4	18	11.5
Fulton	2	10.3	2	7.4	4	8.9	Ross	5	13.4	6	12.6	11	13.1
Gallia	3	16.7	2	9.9	5	12.8	Sandusky	3	9.2	6	13.6	9	12.1
Geauga	8	14.1	6	8.3	13	11.4	Scioto	5	13.0	4	6.5	9	9.6
Greene	9	13.4	8	9.2	18	10.9	Seneca	4	15.5	4	9.7	8	12.5
Guernsey	3	13.1	1	4.7	4	8.6	Shelby	3	12.4	1	5.0	4	8.2
Hamilton	45	11.6	53	9.2	98	10.4	Stark	26	12.9	28	9.7	54	11.2
Hancock	4	11.4	4	9.2	9	10.5	Summit	36	13.2	42	11.3	77	12.1
Hardin	2	11.7	2	8.0	3	9.8	Trumbull	18	14.1	17	10.2	35	11.9
Harrison	1	11.5	1	12.0	3	11.7	Tuscarawas	7	14.0	5	7.8	12	10.4
Henry	2	15.6	1	5.6	3	9.3	Union	2	9.9	2	10.2	4	9.8
Highland	3	15.2	2	9.4	6	12.0	Van Wert	3	21.4	2	9.2	5	14.7
Hocking	3	16.9	1	6.7	4	11.8	Vinton	0	0.0	<1	*	1	4.2
Holmes	2	11.5	2	7.9	3	9.5	Warren	9	11.5	11	12.0	20	11.9
Huron	5	18.8	3	7.8	8	12.4	Washington	5	15.0	5	10.5	10	12.5
Jackson	2	12.3	2	10.8	4	11.8	Wayne	7	12.2	8	11.1	14	11.4
Jefferson	6	15.0	6	9.8	12	12.1	Williams	3	13.1	4	14.9	6	13.6
Knox	3	10.9	5	12.8	8	12.2	Wood	6	11.5	7	10.1	13	10.7
Lake	14	11.0	15	9.0	29	10.0	Wyandot	1	10.2	2	16.1	4	13.6

Source: Ohio Cancer Incidence Surveillance System and the Vital Statistics Program, Ohio Department of Health, 2012; NCHS: National Center for Health Statistics, 2012.

*Rates may be unstable and are not presented when the case count for 2005-2009 is less than five (i.e. the average annual count is less than one).

Note: Low county numbers and rates may reflect underreporting for that county.

Table 6: Pancreatic Cancer: Percentage of New Cases by County of Residence and Stage at Diagnosis in Ohio, 2005-2009

	Early Stage %	Late Stage %	Unstaged/Unknown %	Average Annual Cases		Early Stage %	Late Stage %	Unstaged/Unknown %	Average Annual Cases
Ohio	7%	69%	24%	1,526	Lawrence	3%	71%	26%	7
SEER	8%	80%	12%		Licking	9%	71%	20%	18
Adams	10%	71%	19%	4	Logan	4%	61%	36%	6
Allen	5%	71%	24%	15	Lorain	4%	77%	18%	36
Ashland	0%	60%	40%	5	Lucas	7%	67%	26%	54
Ashtabula	10%	65%	25%	18	Madison	0%	81%	19%	3
Athens	6%	72%	22%	6	Mahoning	6%	64%	31%	49
Auglaize	6%	58%	35%	6	Marion	12%	52%	36%	8
Belmont	13%	67%	19%	10	Medina	8%	72%	20%	18
Brown	14%	43%	43%	7	Meigs	23%	62%	15%	3
Butler	9%	77%	14%	42	Mercer	0%	72%	28%	6
Carroll	8%	67%	25%	2	Miami	14%	69%	17%	17
Champaign	4%	68%	28%	5	Monroe	0%	71%	29%	1
Clark	8%	54%	38%	20	Montgomery	8%	72%	20%	78
Clermont	7%	77%	17%	21	Morgan	25%	50%	25%	1
Clinton	4%	93%	4%	5	Morrow	13%	73%	13%	3
Columbiana	4%	56%	40%	15	Muskingum	5%	65%	29%	16
Coshocton	15%	45%	40%	4	Noble	0%	86%	14%	1
Crawford	3%	69%	28%	7	Ottawa	12%	58%	30%	9
Cuyahoga	7%	68%	25%	223	Paulding	30%	60%	10%	2
Darke	2%	70%	28%	9	Perry	0%	79%	21%	4
Defiance	0%	65%	35%	5	Pickaway	3%	74%	23%	6
Delaware	10%	76%	14%	13	Pike	5%	68%	27%	4
Erie	6%	62%	32%	10	Portage	8%	61%	31%	17
Fairfield	6%	80%	14%	16	Preble	0%	48%	52%	4
Fayette	0%	56%	44%	3	Putnam	0%	79%	21%	6
Franklin	6%	77%	18%	121	Richland	13%	62%	24%	16
Fulton	5%	76%	19%	4	Ross	5%	69%	25%	12
Gallia	24%	64%	12%	5	Sandusky	3%	63%	35%	8
Geauga	7%	56%	37%	14	Scioto	9%	68%	23%	11
Greene	11%	65%	24%	18	Seneca	5%	78%	16%	7
Guernsey	0%	58%	42%	4	Shelby	4%	83%	13%	5
Hamilton	8%	76%	16%	111	Stark	10%	63%	27%	53
Hancock	5%	63%	32%	8	Summit	8%	61%	30%	73
Hardin	10%	55%	35%	4	Trumbull	3%	76%	21%	36
Harrison	19%	63%	19%	3	Tuscarawas	5%	58%	37%	12
Henry	0%	75%	25%	3	Union	0%	82%	18%	2
Highland	12%	62%	27%	5	Van Wert	9%	73%	18%	4
Hocking	9%	65%	26%	5	Vinton	0%	100%	0%	1
Holmes	20%	20%	60%	3	Warren	5%	78%	17%	17
Huron	8%	61%	32%	8	Washington	9%	72%	19%	11
Jackson	4%	58%	38%	5	Wayne	4%	69%	27%	14
Jefferson	0%	70%	30%	11	Williams	3%	56%	41%	6
Knox	6%	76%	18%	10	Wood	5%	70%	25%	11
Lake	5%	67%	27%	29	Wyandot	0%	76%	24%	4

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2012; SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2012.

The total case counts in tables by stage at diagnosis include *in situ* cancers and thus differ from tables with counts and rates of invasive cancer cases only.

Early stage includes tumors diagnosed at *in situ* and localized stages, and late stage includes tumors diagnosed at regional and distant stages.

To address comments and information requests:

Ohio Cancer Incidence Surveillance System

Ohio Department of Health

246 North High Street

Columbus, OH 43215

Phone: (614) 752-2689

Fax: (614) 644-8028

E-mail: ociss@odh.ohio.gov

Web site: http://www.odh.ohio.gov/healthstats/ocisshs/ci_surv1.aspx

Acknowledgements

The following individuals contributed to this report:

Holly L. Sobotka, M.S.; Marjorie Jean-Baptiste, B.S.; Robert W. Indian, M.S.; Mary B. Lynn, M.S.; Ohio Department of Health

James L. Fisher, Ph.D.; Julie A. Stephens, M.S.; Jesse Plascak, M.S.; Electra D. Paskett, Ph.D.; The Ohio State University

Sincere appreciation to all the cancer registrars, medical records staff and other health professionals reporting cancer cases in Ohio who made this report possible.

Suggested Citation

Pancreatic Cancer in Ohio, 2005-2009. Ohio Cancer Incidence Surveillance System, Ohio Department of Health and The Ohio State University, Columbus, Ohio, June 2012.

This report is public information. Reproduction and copying of this report for cancer prevention and control, education and program planning are greatly encouraged. Citation of source, however, is appreciated.



The OCISS is supported in part by the State of Ohio and the Centers for Disease Control and Prevention (CDC), National Program of Cancer Registries
