



Kidney & Renal Pelvis Cancer In Ohio, 1999-2003

Ohio
Cancer
Incidence
Surveillance
System

This Report on Kidney & Renal Pelvis Cancer Contains

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

Kidney & Renal Pelvis Cancer Incidence and Mortality

Cancers of the kidney and renal pelvis made up 3 percent of incident (newly diagnosed) cancers reported to the Ohio Cancer Incidence Surveillance System (OCISS) from 1999 to 2003 (Table 1). The average annual age-adjusted kidney and renal pelvis cancer incidence rate in Ohio from 1999 to 2003 was 12.6 cases per 100,000 residents, which was the same as the average annual age-adjusted U.S. (SEER¹) incidence rate for 2000-2003. Reporting of invasive kidney and renal pelvis cancers in Ohio was estimated to be 91 percent complete in 1999-2003, which was lower than the national standard of 95 percent for complete case ascertainment. Therefore, kidney and renal cancer incidence may be underestimated in Ohio. The 1999-2003 Ohio age-adjusted mortality rate for kidney and renal pelvis cancer of 4.6 deaths per 100,000 residents was slightly higher (9.5 percent) than the 2000-2003 U.S. (NCHS²) mortality rate of 4.2 per 100,000 residents.

Table 1: Leading Sites/Types and Kidney & Renal Pelvis Cancer: Average Annual Number (N), Percent and Age-adjusted Rates of Invasive Cancer Cases and Cancer Deaths in Ohio, 1999-2003, with Comparison to the US (SEER and NCHS), 2000-2003

Incidence	N	%	Rate		Mortality	N	%	Rate	
			Ohio	U.S.				Ohio	U.S.
All Sites/Types	55,813		471.3	471.0	All Sites/Types	24,989		208.4	194.5
Lung and Bronchus	9,014	16.2%	75.3	64.8	Lung and Bronchus	7,339	29.4%	61.2	55.1
Breast (Female)	8,235	14.8%	126.4	129.1	Colon and Rectum	2,652	10.6%	22.1	19.8
Prostate	7,887	14.1%	153.8	170.3	Breast (Female)	1,941	7.8%	28.5	25.8
Colon and Rectum	6,625	11.9%	55.3	52.4	Prostate	1,290	5.2%	29.3	28.5
Urinary Bladder	2,657	4.8%	22.1	20.9	Pancreas	1,236	4.9%	10.3	10.5
Non-Hodgkin's Lymphoma	2,265	4.1%	19.0	19.1	Non-Hodgkin's Lymphoma	1,038	4.2%	8.7	7.7
⋮					⋮				
Kidney & Renal Pelvis	1,500	2.7%	12.6	12.6	Kidney & Renal Pelvis	555	2.2%	4.6	4.2

Source: Ohio Cancer Incidence Surveillance System, Chronic Disease and Behavioral Epidemiology Section and the Vital Statistics Program, Ohio Department of Health, 2006.

[1] SEER: Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2006.

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

Technical Notes:

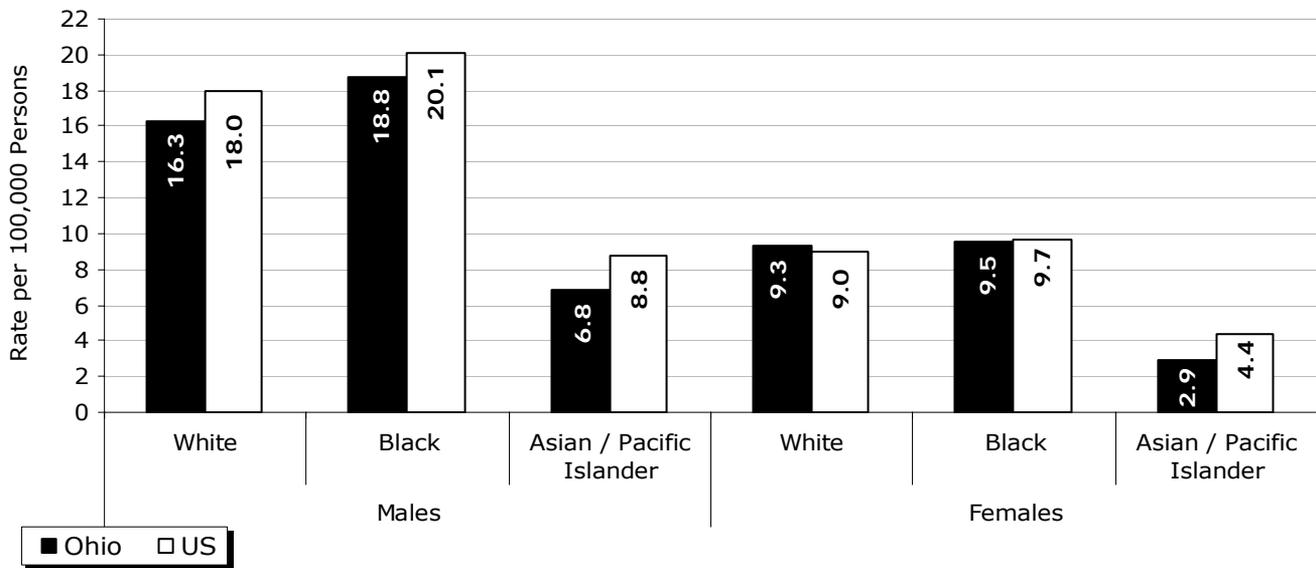
[1] Kidney and renal pelvis cancer cases were defined as follows: International Classification of Diseases for Oncology, Third Edition (ICD-O-3), codes C649; C659, excluding histology types 9590-9989. Kidney and renal pelvis cancer deaths were defined as follows: for 1999, International Classification of Diseases, Ninth Edition (ICD-9), codes 1890; 1891; and for 2000-2003, International Statistical Classification of Diseases and Related Health Problems, Tenth Edition (ICD-10), codes C640-C659.

[2] The 1999-2003 Ohio rates were calculated using the following populations: bridged-race intercensal estimates for July 1, 1999 (U.S. Census Bureau, 2004) and vintage 2004 postcensal estimates for July 1, 2000-2003 (U.S. Census Bureau, 2005). 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.

Kidney & Renal Pelvis Cancer Incidence in Ohio Compared to the United States

Figure 1: Cancer of the Kidney & Renal Pelvis: Average Annual Age-adjusted Incidence Rates per 100,000 Persons, by Gender and Race in Ohio, 1999-2003, with Comparison to the US (SEER), 2000-2003



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2006, and the Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2006.

Figure 1 shows the kidney and renal pelvis cancer age-adjusted incidence rates among males were greater than those of females for whites, blacks and Asian/Pacific Islanders. The gender difference in kidney and renal pelvis cancer incidence rates may be due to a greater prevalence of certain risk factors such as smoking and certain chemical exposures among males. In both Ohio and the United States, a comparison of the data by race reveals Asian/Pacific Islanders had lower gender-specific kidney and renal pelvis cancer incidence rates compared to both blacks and whites, with blacks having the highest incidence rates for both males and females. The Ohio kidney and renal pelvis cancer incidence rates were lower than the rates for the United States for all race/gender groups except for white females. The greatest percent difference between Ohio and the United States was observed for Asian/Pacific Islander females, where the Ohio rate was 34.1 percent less than the U.S. rate.

Kidney & Renal Pelvis Cancer Cases and Rates by County of Residence

Figure 2 presents 1999-2003 average annual age-adjusted kidney and renal pelvis cancer incidence rates by county of residence. The pattern of kidney and renal pelvis cancer in Ohio appears relatively sporadic, although many counties with the highest incidence rates were located in the central, southern and southeastern portions of the state. The following counties had the highest incidence rates for this time period (16.2 or more cases per 100,000 residents): Clinton (N = 8), Lawrence (N = 11), Meigs (N = 5), Scioto (N = 16), Seneca (N = 10), Union (N = 6) and Washington (N = 12).

Kidney & Renal Pelvis Cancer Cases and Rates by Age at Diagnosis

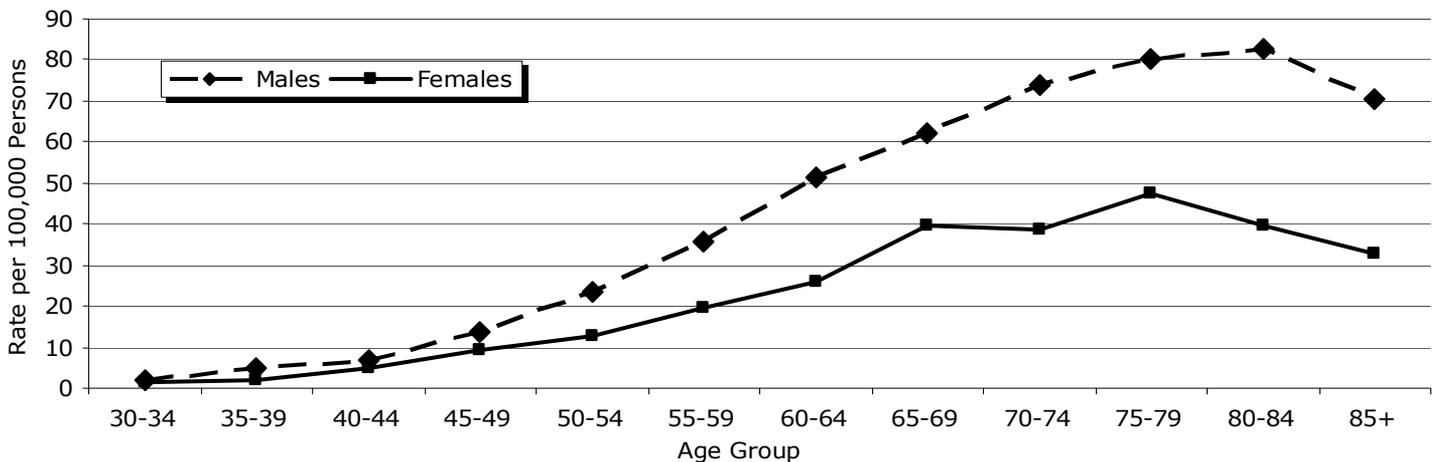
Table 2: Cancer of the Kidney & Renal Pelvis: Average Annual Number of Cases (N), Incidence Rates per 100,000 Persons and Cumulative Percentages (Cum%), by Age Group and Gender in Ohio, 1999-2003

Age Group	Males			Females			Total		
	N	Rate	Cum%	N	Rate	Cum%	N	Rate	Cum%
<1	2	2.6	0.2%	1	1.4	0.2%	3	2.0	0.2%
1-4	5	1.8	0.8%	6	2.0	1.1%	11	1.9	0.9%
5-9	1	0.3	1.0%	4	0.9	1.7%	5	0.6	1.3%
10-14	0	*	1.0%	<1	*	1.7%	<1	*	1.3%
15-19	<1	*	1.1%	<1	*	1.8%	1	0.1	1.4%
20-24	1	0.3	1.2%	2	0.5	2.1%	3	0.4	1.6%
25-29	3	0.7	1.5%	2	0.6	2.5%	5	0.7	1.9%
30-34	7	1.8	2.3%	5	1.3	3.3%	12	1.6	2.7%
35-39	20	4.8	4.6%	9	2.2	4.8%	30	3.5	4.7%
40-44	30	6.7	8.1%	23	4.9	8.4%	53	5.8	8.2%
45-49	58	13.7	14.7%	40	9.1	14.8%	98	11.4	14.8%
50-54	87	23.5	24.7%	49	12.7	22.7%	136	18.0	23.8%
55-59	100	35.8	36.1%	58	19.4	32.0%	159	27.3	34.4%
60-64	114	51.6	49.2%	64	25.9	42.3%	179	38.0	46.3%
65-69	114	62.2	62.2%	87	39.8	56.1%	200	50.0	59.7%
70-74	120	73.9	75.9%	81	38.7	69.1%	202	54.0	73.1%
75-79	106	80.1	88.1%	92	47.4	83.9%	198	60.6	86.3%
80-84	68	82.6	95.8%	57	39.8	93.0%	125	55.4	94.6%
85+	37	70.4	100.0%	44	32.9	100.0%	81	43.4	100.0%

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2006.

* Rates may be unstable and are not presented when the case count for 1999-2003 is less than five (i.e., $N < 5$).

Figure 3: Cancer of the Kidney & Renal Pelvis: Age-specific Incidence Rates (Ages 30+) per 100,000 Persons, by Gender in Ohio, 1999-2003

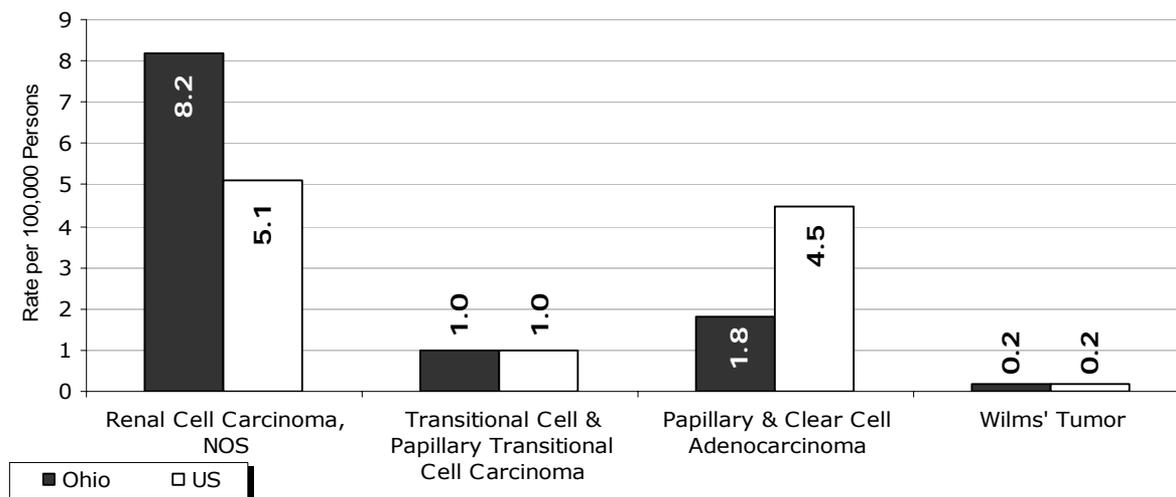


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2006.

Table 2 and Figure 3 show age-specific incidence rates for kidney and renal pelvis cancer by gender. The median age at diagnosis of kidney and renal pelvis cancer occurred in the 65 to 69 years age group for both males and females. Kidney and renal pelvis cancer incidence rates increased with advancing age group from ages 20-24 years to 80-84 years among males and 75-79 years among females, followed by a decline. The cumulative percentages in Table 2 indicate more than three-fourths of kidney and renal pelvis cancers were diagnosed among persons ages 55 years and older.

Kidney & Renal Pelvis Cancer By Histology

Figure 4: Cancer of the Kidney & Renal Pelvis: Average Annual Age-adjusted Incidence Rates per 100,000 Persons, by Histological Subgroup in Ohio, 1999-2003, with Comparison to the US (SEER), 2000-2003



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2006, and the Surveillance, Epidemiology and End Re-

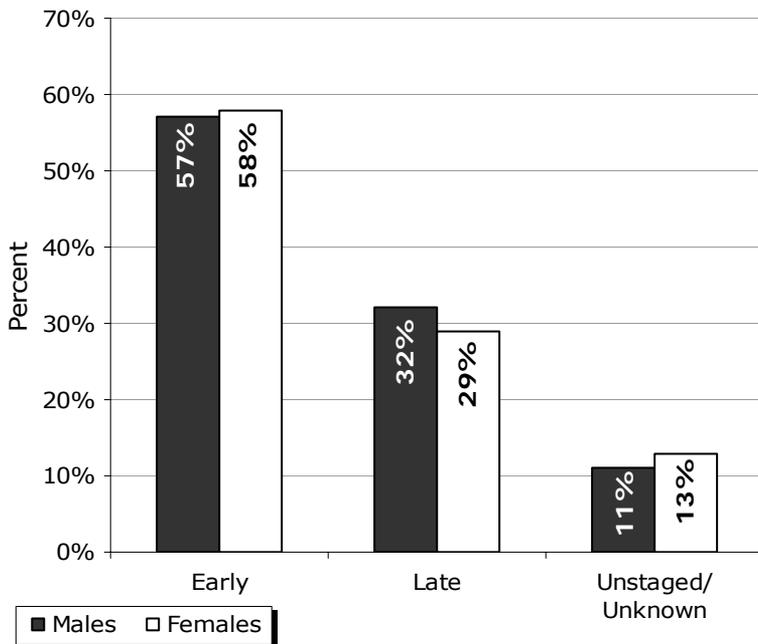
Histology refers to the cancer tissue or cell type. For kidney and renal pelvis cancer, we examined four histological subgroups: renal cell carcinoma, not otherwise specified (NOS); transitional cell and papillary transitional cell carcinoma; papillary and clear cell adenocarcinoma; and Wilms' tumor. The most common histological subgroup is renal cell carcinoma, NOS, a carcinoma that begins in the lining layer (epithelial cells) of the kidney. Transitional cell carcinomas begin in the renal pelvis and look and act like urinary bladder cancer. When papillary structures are affected, the tumor is called papillary transitional cell carcinoma. Adenocarcinomas begin in the lining layer of the kidney and have glandular properties. Cells of clear cell adenocarcinomas have a distinctive clear (versus granular) appearance, and some studies have reported longer survival for clear cell adenocarcinomas as compared to other histological subgroups. Wilms' tumors contain blastema (a mass of undifferentiated cells capable of growth and regeneration into organs or body parts), mesenchyme (a mass of tissue developing mainly from the mesoderm) and epithelial derivatives. Wilms' tumor is the most common kidney cancer affecting children.

Figure 4 shows age-adjusted incidence rates for kidney and renal pelvis cancer in Ohio (1999-2003) and the United States (2000-2003) by histological subgroup. Incidence rates of renal cell carcinoma, NOS were the greatest of the histological subgroups. The incidence rate of renal cell carcinoma, NOS was more than 60 percent greater in Ohio compared to the United States. The diagnosis of renal cell carcinoma, NOS should be made when a more specific diagnosis cannot be determined; and it is likely the large difference between Ohio and the United States is the result of over-diagnosis of this non-specific histology in Ohio. The incidence rate of the second-most common histological subgroup, papillary and clear cell adenocarcinoma, was 150 percent greater in the United States compared to Ohio; again, it is likely this difference is the result of more specific diagnoses in the United States as compared to Ohio. Ohio incidence rates of transitional cell and papillary transitional cell carcinoma, as well as Wilms' tumor, were identical to those in the United States.

Technical Note: Renal cell carcinomas, NOS were defined as ICD-O-3 histology code 8312; transitional cell carcinomas and papillary transitional cell carcinomas were defined as ICD-O-3 histology code 8120 and 8130; papillary and clear cell adenocarcinomas were defined as ICD-O-3 histology code 8260 and 8310; and Wilms' tumor cancer cases were defined as ICD-O-3 histology code 8960.

Kidney & Renal Pelvis Cancer Cases and Survival by Stage at Diagnosis

Figure 5: Cancer of the Kidney & Renal Pelvis: Proportion of Cases (%) by Stage at Diagnosis and Gender in Ohio, 1999-2003



N = 1,523 cases per year

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2006.

Table 3 shows the U.S. (SEER) five-year survival probability for kidney and renal pelvis cancer in 1996-2002 was 65.6 percent for all stages combined. Five-year survival probabilities were 90.4 percent at the localized stage, 61.7 percent at the regional stage and only 9.5 percent for distant-stage tumors. Five-year survival probability for all stages combined was slightly higher for whites (65.7 percent) compared to blacks (64.4 percent) and was greater for those under 65 years of age at diagnosis (70.6 percent) compared to those 65 years and older (58.7 percent).

At present, there is no known screening test for use in detecting kidney and renal pelvis cancers at earlier stages.

Table 3: Cancer of the Kidney & Renal Pelvis: Five-year Survival Probability (%) by Stage at Diagnosis in the US (SEER), 1996-2002

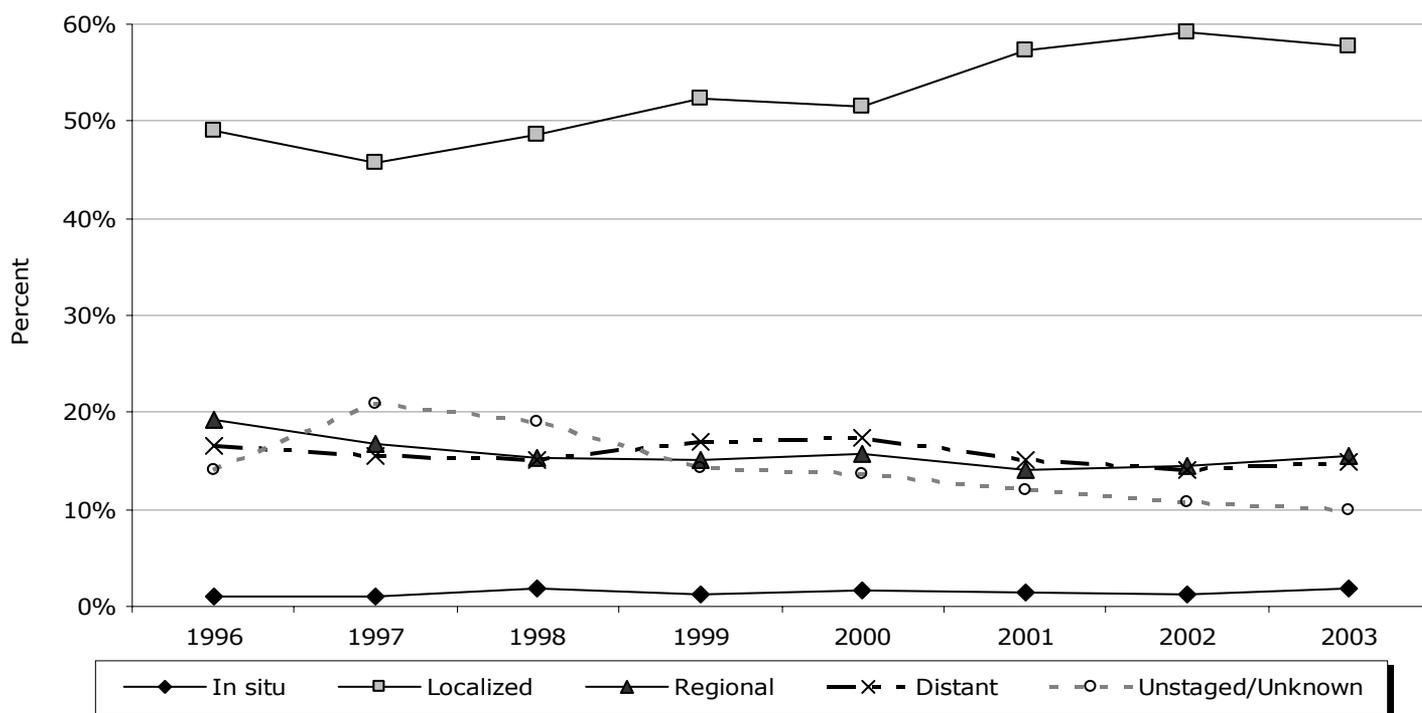
Stage	Overall Five-year Survival Probability (%)
All Stages	65.6%
Localized	90.4%
Regional	61.7%
Distant	9.5%

Source: SEER Cancer Statistics Review 1975-2003, National Cancer Institute, 2006.

The stage at diagnosis of kidney and renal pelvis 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 1999-2003 Ohio data presented in Figure 5 reveal 57 percent of kidney and renal pelvis cancers among males were diagnosed at the *in situ* or localized (early) stage, similar to the 58 percent of females diagnosed at these earlier stages. Thirty-two percent of males and 29 percent of females were diagnosed at later (regional and distant) stages. The percentage of kidney and renal pelvis cancer cases reported unstaged/unknown stage was slightly greater among females (13 percent) compared to males (11 percent).

Kidney & Renal Pelvis Cancer Stage at Diagnosis Trends

Figure 6: Cancer of the Kidney & Renal Pelvis:
Trend in the Proportion of Cases (%) by Stage at Diagnosis in Ohio, 1996-2003



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2006.

Figure 6 shows the distribution of stage at diagnosis of kidney and renal pelvis cancer according to year of diagnosis from 1996 to 2003. The proportions of kidney and renal pelvis cancer cases diagnosed at the *in situ*, regional and distant stages were relatively similar for each year, whereas the proportion diagnosed at the localized stage increased from 49 percent in 1996 to 58 percent in 2003. This was accompanied by a slight decrease in the proportion of kidney and renal pelvis cancers with an unstaged/unknown stage at diagnosis during this time period.

Did You Know?

Tobacco smoking increases kidney and renal pelvis cancer risk by about 40 percent; this risk decreases with smoking cessation.

Kidney & Renal Pelvis Cancer Incidence and Mortality Trends

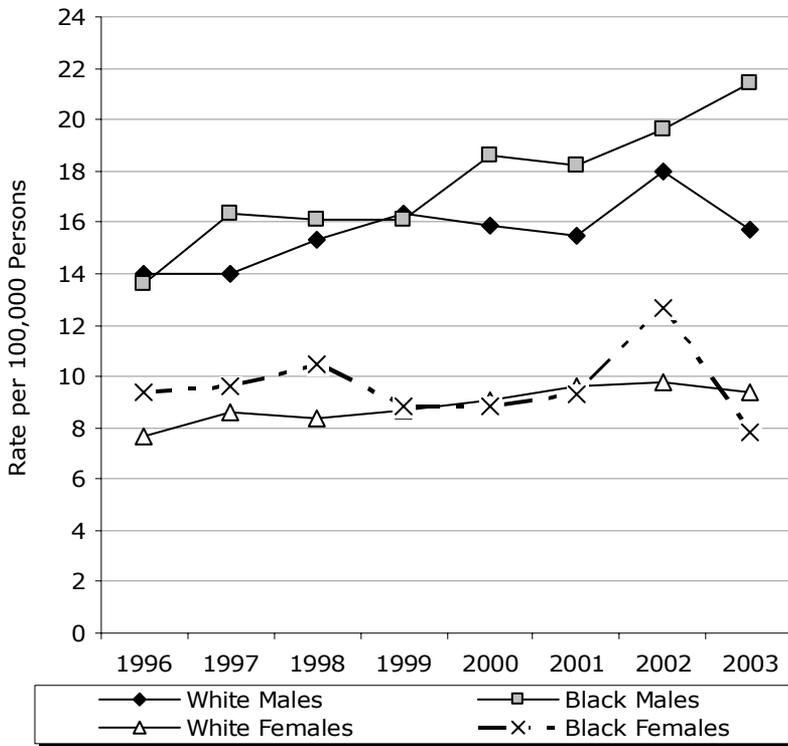


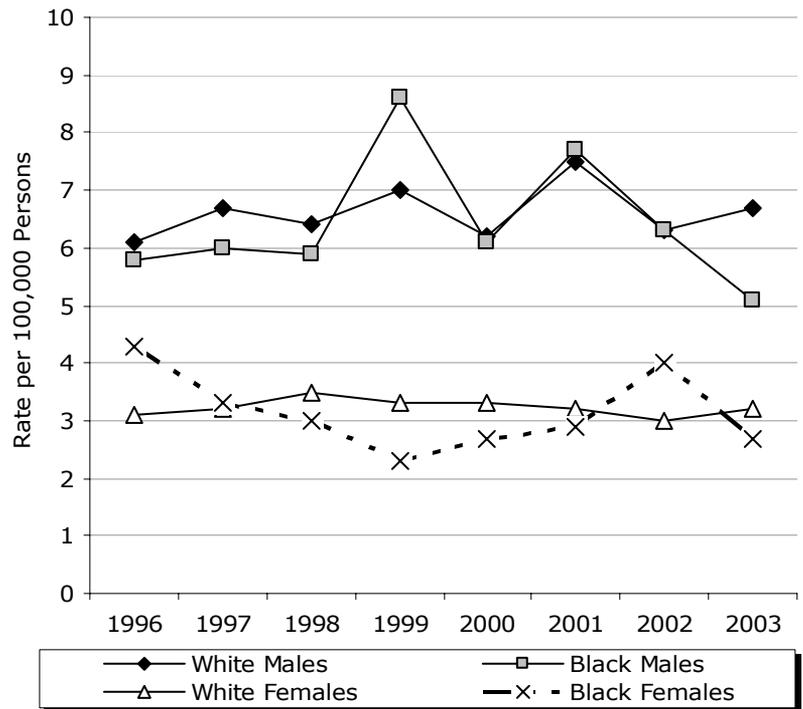
Figure 7: Cancer of the Kidney & Renal Pelvis: Trends in Average Annual Age-adjusted Incidence Rates per 100,000 Persons, by Gender and Race in Ohio, 1996-2003

Figure 7 shows incidence rates of kidney and renal pelvis cancer according to year of diagnosis by race/gender group. There does not appear to be a consistent trend in kidney and renal pelvis cancer incidence rates among black females from 1996 to 2003, although the rate in 2003 was lower than the rate in 1996. There was an increase in kidney and renal pelvis cancer incidence rates among white males and females, as well as black males, during this time period. The greatest increase in kidney and renal pelvis cancer incidence from 1996 to 2003 occurred for black males (57.4 percent).

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2006.

Figure 8: Cancer of the Kidney & Renal Pelvis: Trends in Average Annual Age-adjusted Mortality Rates per 100,000 Persons, by Gender and Race in Ohio, 1996-2003

Figure 8 shows trends in mortality rates of kidney and renal pelvis cancer according to year of death (1996-2003) by race/gender group. There does not appear to be a significant change in kidney and renal pelvis cancer mortality rates for white females, as the mortality rate in 1996 was nearly identical to that in 2003. However, between 1996 and 2003, there was a decrease in kidney and renal pelvis cancer mortality rates among both black males and females (although the trends are not consistent over the time period). For white males, the kidney and renal pelvis cancer death rate increased 9.8 percent from 1996 to 2003.



Source: Chronic Disease and Behavioral Epidemiology Section and the Vital Statistics Program, Ohio Department of Health, 2006.

Risk Factors for Kidney & Renal Pelvis Cancer

- **Gender** - Kidney cancer is twice as common among males as compared to females. This could be because men are more likely to smoke and be exposed to cancer-causing chemicals at work.
- **Tobacco smoking** - Smoking cigarettes increases risk by about 40 percent.
- **Weight** - Overweight and obese people have higher risk.
- **Physical Inactivity** - Inactive people are at greater risk.
- **Job hazards** - Many studies suggest exposure to certain chemicals on the job such as cadmium, asbestos and organic solvents increases the risk of kidney cancer.
- **Family history** - People with family members who have kidney or renal pelvis cancer are at greater risk. Children with a family member with Wilms' tumor are also at greater risk of this disease.
- **Syndromic birth defects** - Children with a syndromic birth defect are at greater risk of Wilms' tumor.
- **High blood pressure** - High blood pressure may increase risk.
- **Medicines** - Some drugs used to treat high blood pressure and certain heart problems have been linked to kidney cancer. It is not clear whether the higher risk is caused by the drugs or the disease.
- **Kidney disease** - People with advanced kidney disease who need to be on dialysis have a higher risk of kidney cancer.

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 kidney and renal pelvis 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
 - **Comprehensive Cancer Center at The Ohio State University/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>
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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/kidney>
 - **American Cancer Society:**
http://www.cancer.org/docroot/lrn/lrn_0.asp
-

The Ohio Cancer Incidence Surveillance System (OCISS)

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