



Colon & Rectum Cancer In Ohio, 1999-2003



This Report on Colon & Rectum 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 Anatomic Site
- Stage at Diagnosis by Gender and Survival Probability
- Trends in Stage at Diagnosis, Incidence and Mortality
- Risk Factors
- Clinical Trials Information
- Sources of Data and Additional Information

Colon & Rectum Cancer Incidence and Mortality

Cancers of the colon and rectum make up the fourth greatest percentage of incident (newly diagnosed) cancers reported to the Ohio Cancer Incidence Surveillance System (OCISS), comprising 11.9 percent of incident cancers in Ohio in 1999-2003 (Table 1). From 1999 to 2003, the average annual age-adjusted colon and rectum cancer incidence rate in Ohio was 55.3 cases per 100,000 residents, which was 5.5 percent higher than the average annual age-adjusted U.S. (SEER¹) incidence rate of 52.4 cases per 100,000 residents for 2000-2003. Reporting of invasive colon and rectum cancers in Ohio was estimated to be 95 percent complete in 1999-2003, allowing for valid comparisons to U.S. data. Colon and rectum cancer is the second-leading cause of cancer death in Ohio, comprising 10.6 percent of total cancer deaths. Similar to incidence, the 1999-2003 Ohio age-adjusted mortality rate for colon and rectum cancer of 22.1 deaths per 100,000 residents was higher (11.6 percent) than the 1999-2003 U.S. (NCHS²) mortality rate of 19.8 per 100,000 residents.

Table 1: Leading Cancer Sites/Types: 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	%	Ohio Rate	U.S. Rate	Mortality	N	%	Ohio Rate	U.S. Rate
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

Source: Ohio Cancer Incidence Surveillance System 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:

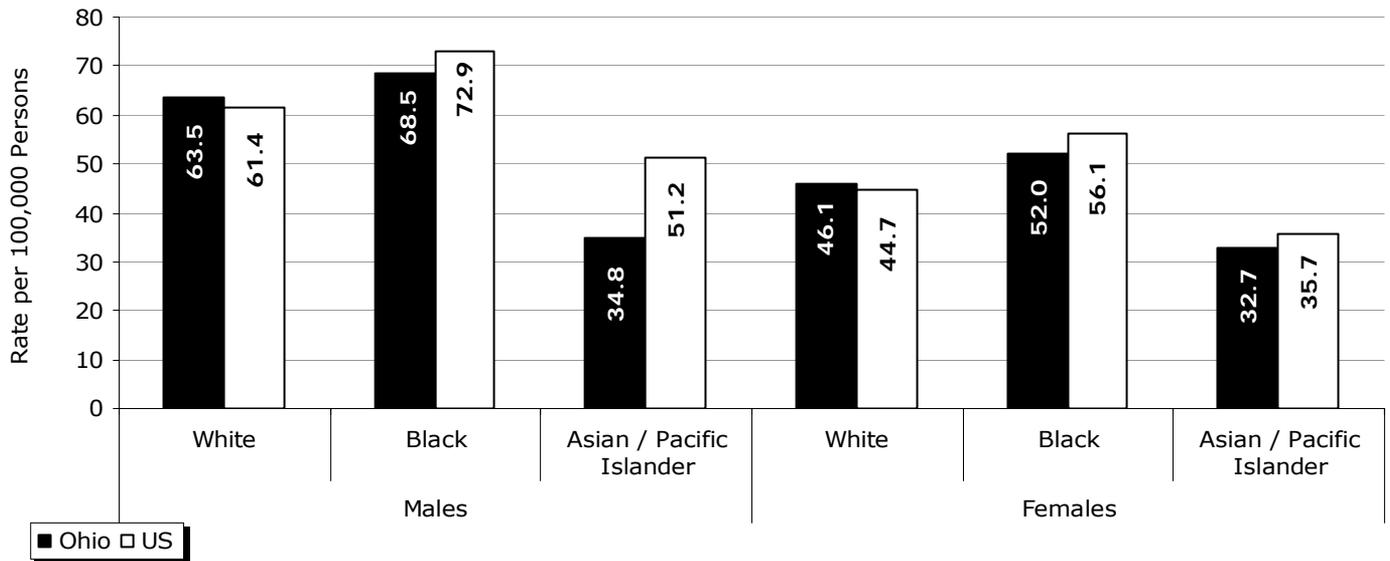
[1] Colon and rectum cancer cases were defined as follows: International Classification of Diseases for Oncology, Third Edition (ICD-O-3), codes C180-C189, C199, C209 and C260 excluding histology types 9590-9989. Colon and rectum cancer deaths were defined as follows: International Statistical Classification of Diseases and Related Health Problems, Tenth Edition (ICD-10), codes C180-C209, C260.

[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.

Colon & Rectum Cancer Incidence in Ohio Compared to the United States

Figure 1: Cancer of the Colon & Rectum: 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



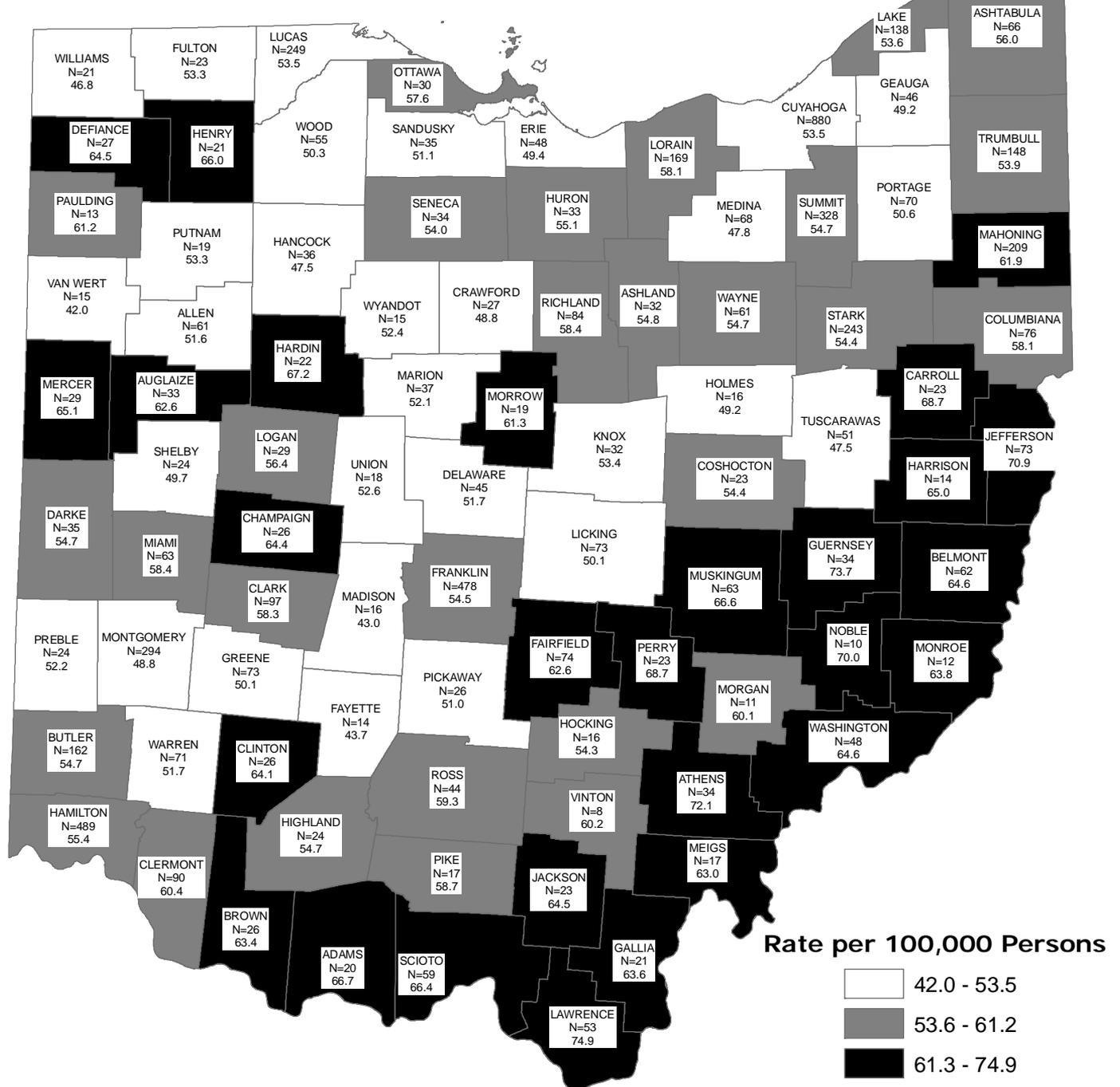
Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2006, and the Surveillance, Epidemiology and End Results Program, National Cancer Institute, 2006.

Figure 1 shows the 1999-2003 colon and rectum cancer average annual age-adjusted incidence rates among males were greater than those among females for whites, blacks and Asian/Pacific Islanders. The gender difference in colon and rectum cancer incidence rates may be due to a greater prevalence of certain risk factors such as a high dietary intake of red meat and tobacco smoking among males. In both Ohio and the United States, a comparison of the data by race reveals Asian/Pacific Islanders had much lower gender-specific colon and rectum cancer incidence rates compared to both blacks and whites, with blacks having the highest incidence rates for both males and females. The Ohio colon and rectum cancer incidence rates were higher than the rates for the United States for white males and females but were lower than the rates for the United States for black and Asian/Pacific Islander males and females. The greatest percent difference between Ohio and the United States was observed for Asian/Pacific Islander males, where the U.S. rate was 47.1 percent higher than the Ohio rate.

Colon & Rectum Cancer Cases and Rates by County of Residence

Figure 2 presents 1999-2003 average annual age-adjusted colon and rectum cancer incidence rates by county of residence. Most counties with the highest incidence rates were located in Appalachia Ohio, which is in the southern and southeastern portions of the state. This may be due to differences in diet and tobacco use between Appalachia and non-Appalachia Ohio; according to the 2005 Ohio Behavioral Risk Factor Surveillance System, 81.5 percent of Appalachian residents, compared to 76.8 percent of non-Appalachian residents consumed fewer than five fruits and vegetables per day, and 26.9 percent of Appalachian residents were current smokers compared to 21.8 percent in non-Appalachia. The following counties had the highest incidence rates for this time period (68.7 or more cases per 100,000 residents): Athens (N = 34), Carroll (N = 23), Guernsey (N = 34), Lawrence (N = 53), Jefferson (N = 73), Noble (N = 10) and Perry (N = 23).

Figure 2: Cancer of the Colon & Rectum: Average Annual Number of Cases (N) and Age-adjusted Incidence Rates per 100,000 Persons, by County of Residence in Ohio, 1999-2003



- Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2006.
- N = Average number of cases per year rounded to the nearest integer.
N = $\frac{\text{Total cases in 1999-2003}}{5 \text{ years}}$
- Each category represents approximately 33%, or 29, of the 88 Ohio counties.

Colon & Rectum Cancer Cases and Rates by Age at Diagnosis

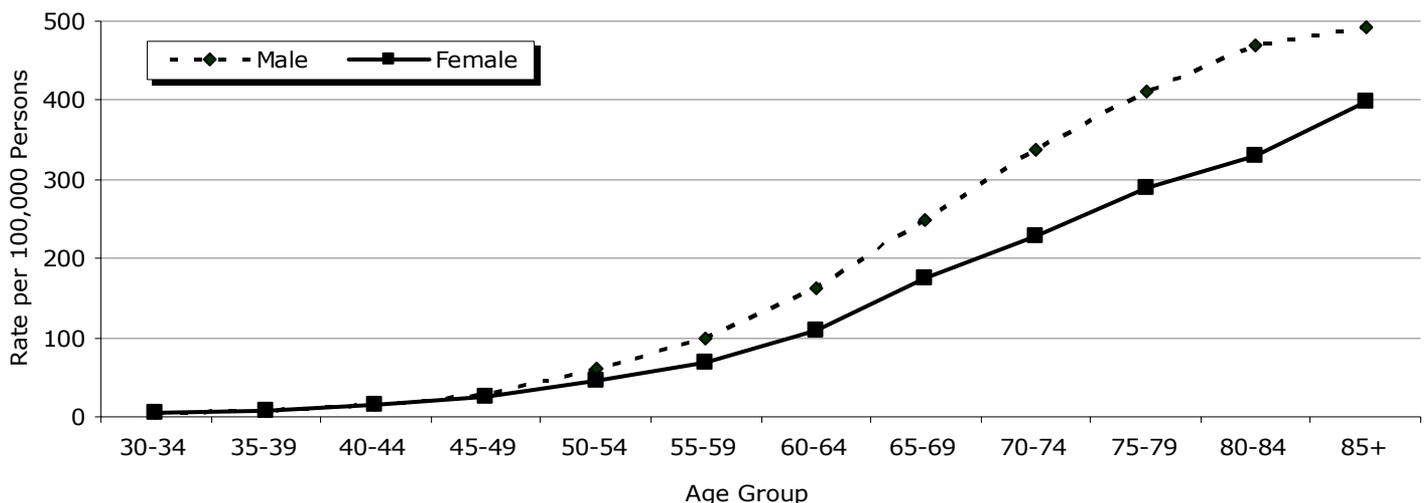
Table 2: Cancer of the Colon & Rectum: Average Annual Number of Cases (N), Incidence Rates per 100,000 Persons and Cumulative Percentages (Cum%), by Age Group and Gender in Ohio, 1999-2003

Age Group	Males			Females			Total		
	N	Rate	Cum%	N	Rate	Cum%	N	Rate	Cum%
<19	<1	*	0.0%	2	0.1	0.1%	3	0.1	0.0%
20-24	4	1.1	0.2%	3	0.8	0.2%	7	0.9	0.2%
25-29	6	1.7	0.3%	7	2.0	0.4%	13	1.8	0.4%
30-34	18	4.6	0.9%	16	4.2	0.9%	34	4.4	0.9%
35-39	34	8.0	1.9%	29	6.8	1.7%	63	7.4	1.8%
40-44	64	14.1	3.8%	68	14.6	3.8%	132	14.3	3.8%
45-49	123	29.1	7.6%	116	26.6	7.3%	239	27.9	7.4%
50-54	221	59.8	14.3%	175	45.2	12.5%	396	52.3	13.4%
55-59	275	97.9	22.6%	206	68.6	18.7%	481	82.7	20.7%
60-64	361	162.8	33.6%	272	109.3	26.9%	633	134.5	30.2%
65-69	456	249.8	47.4%	381	175.2	38.3%	837	209.2	42.9%
70-74	547	336.6	64.0%	482	228.9	52.8%	1,029	275.8	58.4%
75-79	546	412.2	80.6%	563	289.7	69.7%	1,108	339.3	75.1%
80-84	384	469.2	92.2%	474	330.8	84.0%	858	381.1	88.1%
85+	257	492.5	100.0%	533	398.1	100.0%	791	424.6	100.0%

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

* Not Applicable. Rates may be unstable and are not presented when the case count for 1999-2003 is less than five (i.e., N<1).

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

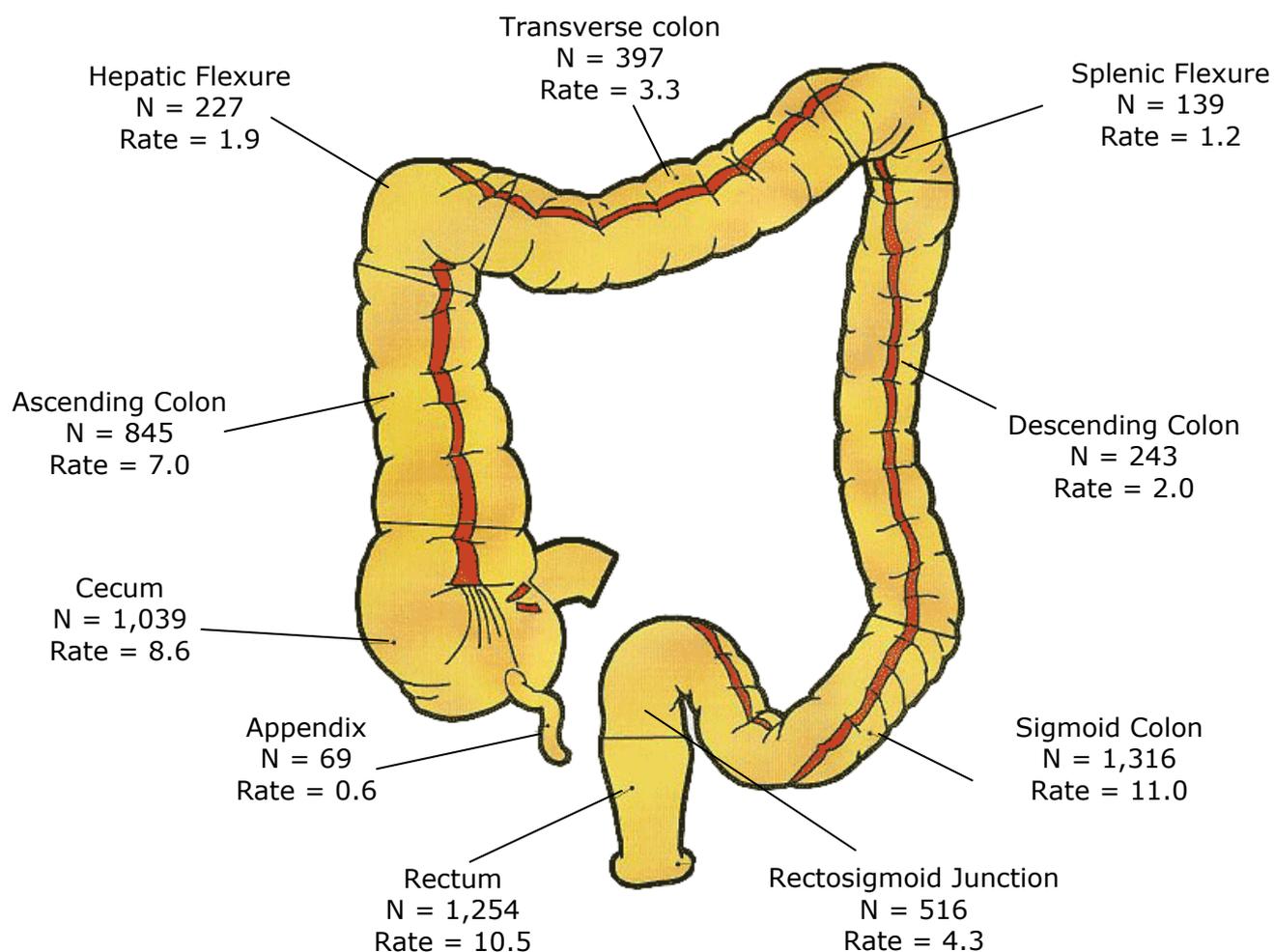


Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2006.

Table 2 and Figure 3 show age-specific incidence rates for colon and rectum cancer by gender. The median age at diagnosis of colon and rectum cancer occurred in the 70-to-74 years age group for both males and females. Among males and females, colon and rectum cancer incidence rates increased with advancing age group to ages 85 years and older. The cumulative percentages in Table 2 indicate about 70 percent of colon and rectum cancers are diagnosed among persons ages 60 and older.

Colon & Rectum Cancer By Anatomic Site

Figure 4: Cancer of the Colon & Rectum: Average Annual Number of Cases (N) and Age-adjusted Incidence Rates per 100,000 Persons, by Anatomic Site in Ohio, 1999-2003



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

Photo adapted and used with permission from the Colon & Rectum Surgery Associates, Ltd, Minneapolis, MN, November 2006.

Figure 4 shows the colon and rectum cancer incidence rates in Ohio according to specific anatomic site. The highest average annual age-adjusted incidence rates were observed for cancer of the sigmoid colon (11.0 per 100,000 residents) and rectum (10.5 per 100,000 residents). In Ohio, more than 46 percent of invasive colon and rectum cancers occurred in the sigmoid colon and rectum. Cancers of the cecum (8.6 per 100,000 residents) and ascending colon (7.0 per 100,000 residents) were more common than cancers of the rectosigmoid junction (4.3 per 100,000 residents) and transverse colon (3.3 per 100,000 residents). The remaining specific anatomic sites (descending colon, splenic flexure, hepatic flexure and appendix) had average annual incidence rates of 2.0 or fewer per 100,000 residents.

Technical Note: The anatomic sites of the colon and rectum are defined by the following ICD-O-3 histology codes: Cecum: C180; Appendix: C181; Ascending colon: C182; Hepatic flexure: C183; Transverse colon: C184; Splenic flexure: C185; Descending colon: C186; Sigmoid colon: C187; Large intestine, NOS: C188-C189, C260; Rectosigmoid junction: C199; and Rectum: C209.

Colon & Rectum Cancer By Anatomic Site

Table 3: Cancer of the Colon & Rectum: Age-adjusted Incidence Rates per 100,000 Persons, by Anatomic Site, Race and Gender in Ohio, 1999-2003

	Males			Females			Total		
	All Races	White	Black	All Races	White	Black	All Races	White	Black
Cecum	9.3	8.9	11.6	8.2	7.9	9.6	8.6	8.3	10.4
Appendix	0.6	0.5	0.7	0.6	0.6	0.6	0.6	0.6	0.7
Ascending Colon	7.7	7.4	8.2	6.6	6.4	6.5	7.0	6.8	7.3
Hepatic Flexure	2.3	2.1	2.9	1.6	1.6	1.9	1.9	1.8	2.3
Transverse Colon	3.7	3.6	4.4	3.0	2.9	3.2	3.3	3.2	3.7
Splenic Flexure	1.4	1.3	2.3	1.0	0.9	1.5	1.2	1.1	1.8
Descending Colon	2.5	2.3	3.5	1.7	1.6	2.7	2.0	1.9	3.0
Sigmoid Colon	13.6	13.3	12.2	9.1	8.8	9.3	11.0	10.7	10.5
Large Intestine, NOS	5.4	5.2	7.1	4.3	4.1	6.0	4.8	4.6	6.5
Rectosigmoid Junction	5.5	5.4	4.4	3.4	3.4	2.8	4.3	4.3	3.5
Rectum	13.7	13.4	11.1	8.1	7.9	7.9	10.5	10.2	9.3

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

Table 3 shows average annual age-adjusted incidence rates of specific anatomic sites for colon and rectum cancer. Incidence rates of each of the specific anatomic sites were greater among males compared to females, with the exception of cancer of the appendix for which the incidence rate among males is identical to that for females. The greatest percent differences in incidence rates between males and females occurred for cancers of the rectosigmoid junction (61.8 percent) and rectum (69.1 percent). Incidence rates of each of the following specific anatomic sites are greater among blacks as compared to whites: cecum; appendix; ascending colon; hepatic flexure; transverse colon; splenic flexure; descending colon; and large intestine, not otherwise specified (NOS); while whites had greater incidence rates of cancer of the sigmoid colon; rectosigmoid junction; and rectum. The greatest percent differences in incidence rates between blacks compared to whites occurred for cancers of the splenic flexure (63.6 percent) and descending colon (57.9 percent).

Talk to your doctor about which of the following colon and rectum cancer screening tests is right for you.

Fecal occult blood test (FOBT) checks for hidden blood in the stool.

Sigmoidoscopy is an examination of the rectum and *lower* colon. Sigmoidoscopy can find precancerous or cancerous growths in the rectum and lower colon.

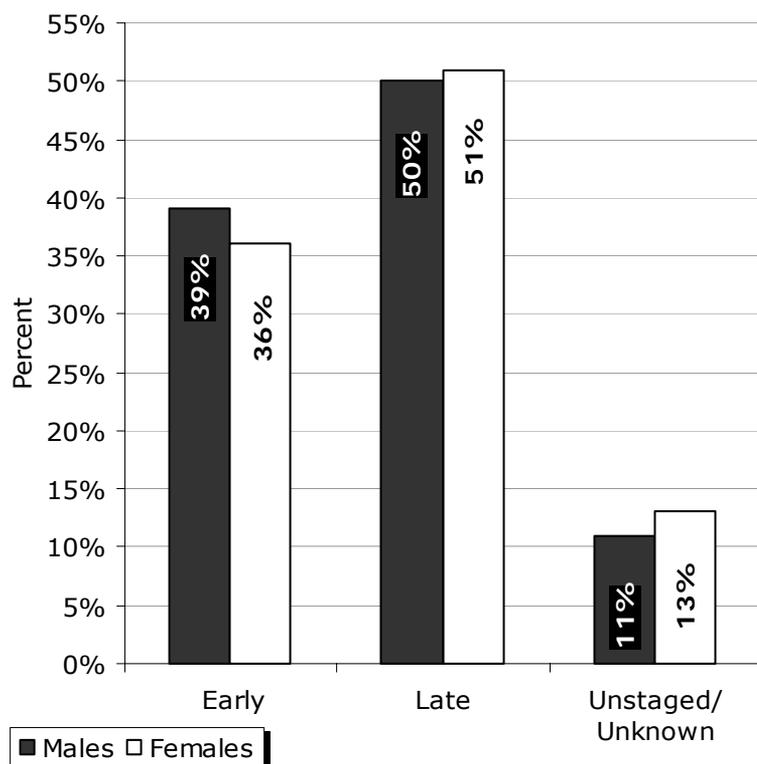
Colonoscopy is an examination of the rectum and *entire* colon. Colonoscopy can find precancerous or cancerous growths throughout the colon, including the upper part of the colon, where they would be missed by sigmoidoscopy.

Double contrast barium enema (DCBE) is a series of X-rays of the entire colon and rectum. The X-rays are taken after the patient is given an enema with a barium solution and air is introduced into the colon. The barium and air help to outline the colon and rectum on the X-rays. Research shows that DCBE may miss small polyps.

Digital rectal exam (DRE) is often part of a routine physical examination. The health care provider inserts a lubricated, gloved finger into the rectum to feel for abnormal areas. DRE allows for examination of only the lower part of the rectum.

Colon & Rectum Cancer Cases and Survival by Stage at Diagnosis

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



N = 7,143 cases per year

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

The stage at diagnosis of colon and rectum 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 39 percent of colon and rectum cancers among males were diagnosed at the localized (early) stage, while 36 percent of females were diagnosed at this earlier stage. Fifty percent of males and 51 percent of females were diagnosed at later (regional and distant) stages. Eleven percent of males and 13 percent of females diagnosed with colon and rectum cancer were reported with an unstaged/unknown stage at diagnosis.

Table 4 shows the U.S. (SEER) five-year survival probability for colon and rectum cancer in 1996-2002 was 64.1 percent for all stages combined. Five-year survival probabilities were 90.4 percent at the localized stage, 68.1 percent at the regional stage and only 9.8 percent for distant-stage tumors. Five-year survival probability for all stages combined was higher for: males (65.0 percent) compared to females (63.2 percent); whites (65.1) compared to blacks (54.7 percent); and those diagnosed with rectum cancer (65.1 percent) compared to colon cancer (63.7 percent).

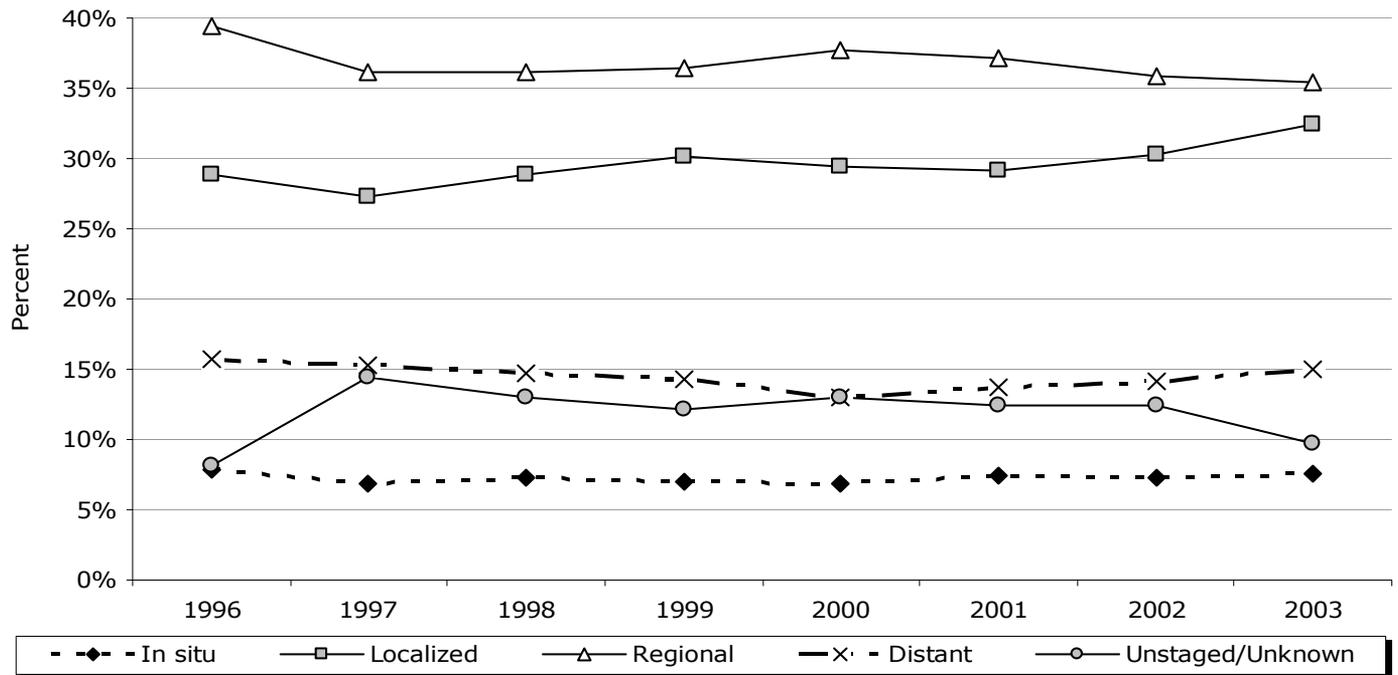
Table 4: Cancer of the Colon & Rectum: Five-year Survival Probability (%) by Stage at Diagnosis in the US (SEER), 1996-2002

Stage	Overall Five-year Survival Probability (%)
All Stages	64.1%
Localized	90.4%
Regional	68.1%
Distant	9.8%

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

Colon & Rectum Cancer Stage at Diagnosis Trends

Figure 6: Colon & Rectum Cancer: Trends 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 colon and rectum cancer according to year of diagnosis from 1996 to 2003. There does not appear to be any change over time in the proportions of colon and rectum cancers diagnosed at both the *in situ* and distant stages; however, there has been an increase in the proportion diagnosed at the localized stage. The proportion of colon and rectum cancers diagnosed at the regional stage decreased between 1996 and 1997, then remained relatively stable to 2003. The proportion reported with an unstaged/unknown stage at diagnosis increased from 1996 to 1997, followed by a gradual decrease between 1997 and 2003.

What YOU Can Do to Prevent Colon and Rectum Cancer:

- Reduce the intake of animal fats and increase fruit and vegetable consumption.
- Participate in regular physical activity.
- Maintain suggested body weight.
- Avoid tobacco use.
- Follow recommended screening guidelines to detect pre-cancerous conditions and early-stage disease.

Colon & Rectum Cancer Incidence and Mortality Trends

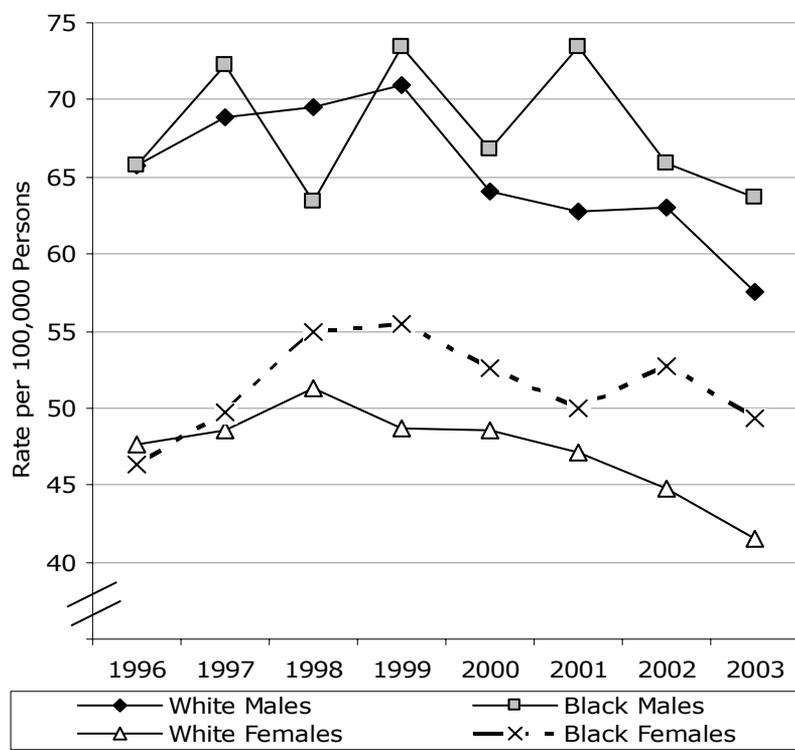


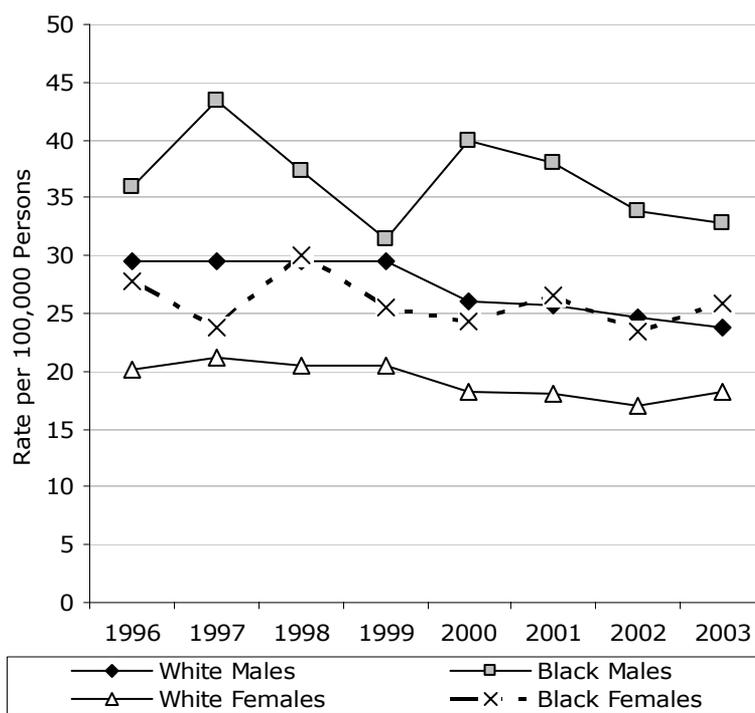
Figure 7: Cancer of the Colon & Rectum: Trends in Average Annual Age-adjusted Incidence Rates per 100,000 Persons, by Gender and Race in Ohio, 1996-2003

Figure 7 shows incidence rates of colon and rectum cancer according to year of diagnosis by race/gender group. There is no consistent trend in colon and rectum cancer incidence rates among black males from 1996 to 2003; however, the incidence rate in 1996 is similar to the rate in 2003. There has been an increase in colon and rectum cancer incidence rates among black females over the time period. Among white males the incidence rate of colon and rectum cancer decreased from 1996 to 2003, and, for white females, from 1998 to 2003.

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

Figure 8: Cancer of the Colon & Rectum: 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 colon and rectum cancer according to year of death (1996-2003) by race/gender group. Comparing the mortality rates for 1996 with those for 2003, there has been a decrease in colon and rectum cancer mortality rates among both white and black males and females. The greatest decrease between 1996 and 2003 (24.5 percent) occurred among white males.



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

Risk Factors for Colon & Rectum Cancer

- **Age** — Colon and rectum cancer risk increases with age. Ninety percent of colon and rectum cancers occur among people over the age of 50 years.
- **Ethnic Descent** — Jews of Eastern European descent (Ashkenazi Jews) have an increased risk.
- **Personal Medical History** — Women with a history of cancer of the ovary, uterus or breast have somewhat increased risk.
- **Diseases of the Colon and Rectum** — Risk is higher among persons previously diagnosed with colon or rectum cancer, intestinal polyps or chronic inflammatory bowel disease/ulcerative colitis/Crohn's Disease.
- **Family History** — Having a blood relative previously diagnosed with cancer of the colon or rectum increases risk.
- **Inherited Diseases** - Three to 5 percent of colon and rectum cancers are associated with an inherited disease called hereditary nonpolyposis colon cancer (HNPCC) and another 1 percent are associated with an inherited disease called familial adenomatous polyposis (FAP).
- **Diet** — A diet high in animal fat increases risk.
- **Physical Inactivity** — Increases risk.
- **Overweight/Obesity** — Persons who are overweight (Body Mass Index [BMI] ≥ 25 kg/m²) or obese (BMI ≥ 30 kg/m²) are at increased risk.
- **Tobacco Use** — Increases risk.
- **Heavy Alcohol Use** — Increases risk.

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 colon and rectum cancer, please visit one of the following Web sites from this non-comprehensive list:

- **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/colon-and-rectal>
 - **American Cancer Society:**
http://www.cancer.org/docroot/CRI/CRI_2x.asp?sitearea=&dt=10
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