

Colorectal Cancer in Vermont

Chronic Disease Epidemiology and Cancer Registry
Vermont Department of Health

Background

Together, the colon and rectum make up the large bowel, or large intestine. The colon refers to the upper five or six feet of the large intestine and the rectum refers to the last five or six inches. Because these cancers are similar and sometimes hard to distinguish from one another, they are generally grouped together as colorectal cancer. The colorectal cancer incidence data provided in this report are for invasive cases only; *in situ* are excluded.

The purpose of this report is to present the most recent data on colorectal cancer among Vermonters. The report presents data by year, age, stage, and subsite, and compares Vermont to the United States. A brief overview of Vermont's colorectal cancer data shows the following:

Summary

- ❖ **Incidence:** In Vermont, colorectal cancer is the third most common cancer diagnosed in men and the second most common cancer diagnosed in women. Each year, approximately 186 colorectal cases are diagnosed in women and 173 colorectal cancer cases are diagnosed in men in Vermont.
- ❖ **Mortality:** Colorectal cancer is the third leading cause of cancer death among Vermont men and women. Each year, approximately 72 women and 62 men die from colorectal cancer in Vermont.
- ❖ **Vermont vs. U.S.:** Vermont women have significantly higher rates of colorectal cancer incidence and mortality compared to U.S. white women. Rates among Vermont men do not differ significantly from the United States white rates.
- ❖ **Yearly Trends:** While both the incidence and mortality of colorectal cancer have decreased between 1997 and 2001 in the United States, there has been no significant change in colorectal cancer incidence or mortality in Vermont during the same time period.
- ❖ **Men vs. Women:** In Vermont, both incidence and mortality rates of colorectal cancer are higher among males than females.
- ❖ **Age:** Incidence of colorectal cancer increases with age in Vermont. The majority of colorectal cancer cases occur in those over age 50.
- ❖ **County:** During 1997-2001, colorectal cancer incidence rates for females in Chittenden county were significantly higher than the U.S. female white rate.
- ❖ **Stage:** In Vermont, only 31.6% of colorectal cancers are diagnosed at the localized stage. The percent of invasive colorectal cancers diagnosed at the localized stage in the United States is significantly higher, at 39%. National survival data has shown that 90% of people who have colorectal cancer diagnosed in a localized stage survive their cancers for at least five years. Only 10% of people diagnosed in the late stage survive colorectal cancer for at least 5 years.

Colorectal Cancer Incidence Compared with Other Cancers

Table 1. The five most commonly diagnosed cancers* – Vermont, yearly averages 1997-2001.

Male			Female		
<u>Cancer Site</u>	<u>Cases (per year)</u>	<u>Percent (per year)</u>	<u>Cancer Site</u>	<u>Cases (per year)</u>	<u>Percent (per year)</u>
Prostate	445	28.6%	Breast	465	30.8%
Lung	245	15.8%	Colorectal	186	12.3%
Colorectal	173	11.1%	Lung	176	11.7%
Urinary Bladder	110	7.1%	Uterus	103	6.8%
Melanoma	84	5.4%	Melanoma	73	4.8%
All Sites	1,554	100%	All sites	1,509	100%

* Excluding basal cell and squamous cell skin cancers and in situ (malignant but non-invasive) carcinomas except urinary bladder.

- ❖ During 1997-2001, an average of 1,554 men and 1,509 women were diagnosed with invasive cancer each year in Vermont. Of those, an average of 173 men and 186 women were diagnosed with colorectal cancer per year.
- ❖ Colorectal cancer was the third most common cancer diagnosed in men after prostate and lung in Vermont and in the United States.
- ❖ Colorectal cancer was the second most common cancer diagnosed in women after breast in Vermont. In the United States, colorectal cancer was the third most common cancer diagnosed in women after breast and lung.
- ❖ Colorectal cancer accounted for roughly 11% of all cancers diagnosed in men, and 12% of all cancers diagnosed in women in Vermont during 1997-2001.

Colorectal Cancer Mortality Compared with Other Cancers

Table 2. The five most common causes of cancer death – Vermont, yearly average 1997-2001.

Male			Female		
<u>Cancer Site</u>	<u>Deaths (per year)</u>	<u>Percent (per year)</u>	<u>Cancer Site</u>	<u>Deaths (per year)</u>	<u>Percent (per year)</u>
Lung	205	32.2%	Lung	135	22.5%
Prostate	66	10.4%	Breast	97	16.2%
Colorectal	62	9.7%	Colorectal	72	12.0%
Pancreas	35	5.5%	Pancreas	31	5.2%
Non-Hodgkin Lymphoma	29	4.6%	Ovary	30	5.0%
All Sites	636	100%	All sites	600	100%

- ❖ During 1997-2001, an average of 636 men and 600 women died each year from cancer in Vermont. Of these, an average of 62 men and 72 women died each year of colorectal cancer.
- ❖ Colorectal cancer was the third leading cause of cancer death in both men and women in Vermont during 1997-2001.
- ❖ Colorectal cancer accounted for roughly 10% of all cancer deaths in men, and 12% of all cancer deaths in women in Vermont during 1997-2001.

Colorectal Cancer in Vermont Compared to the U.S.

Table 3. Rates of colorectal cancer, by sex – Vermont and United States, yearly averages, 1997-2001.

	Male Rates (per 100,000)		Female Rates (per 100,000)	
	<u>Incidence</u>	<u>Mortality</u>	<u>Incidence</u>	<u>Mortality</u>
Vermont	67.0	25.7	53.1	19.9
United States	64.4	24.6	46.8	17.2

All rates are age-adjusted to the 2000 U.S. standard population and exclude *in situ* (malignant but non-invasive) carcinomas except urinary bladder.

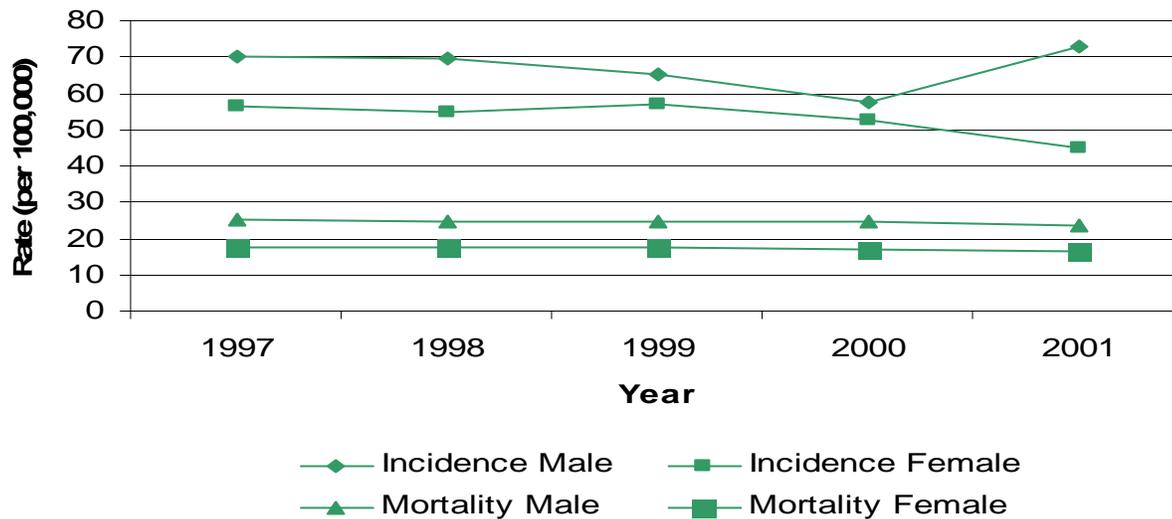
The U.S. mortality rates are based on the Vital Statistics System of the United States Public Use database. U.S. rates are 1997-2001 white population mortality rates.

The U.S. incidence rates are based on the SEER Cancer Incidence Public Use Database. U.S. SEER incidence rates are 1997-2001 white population rates.

- ❖ The incidence of colorectal cancer was about 1.3 times higher among Vermont men than women during 1997-2001. This difference is statistically significant.
- ❖ The mortality of invasive colorectal cancer was about 1.3 times higher among Vermont men than women during 1997-2001. This difference is statistically significant.
- ❖ During 1997-2001, Vermont women had significantly higher incidence and mortality rates of colorectal cancer as compared to the United States female rate. Incidence and mortality rates among Vermont men did not differ significantly from the United States male rate.

Colorectal Cancer Yearly Trends

Figure 1. Incidence and mortality of colorectal cancer, by sex – Vermont, 1997-2001.



	1997	1998	1999	2000	2001
Incidence, male	70.0	69.8	65.0	57.4	72.9
Incidence, female	56.6	54.6	57.2	52.4	44.8
Mortality, male	24.2	30.4	26.1	23.5	24.2
Mortality, female	22.2	18.4	19.7	19.4	19.9

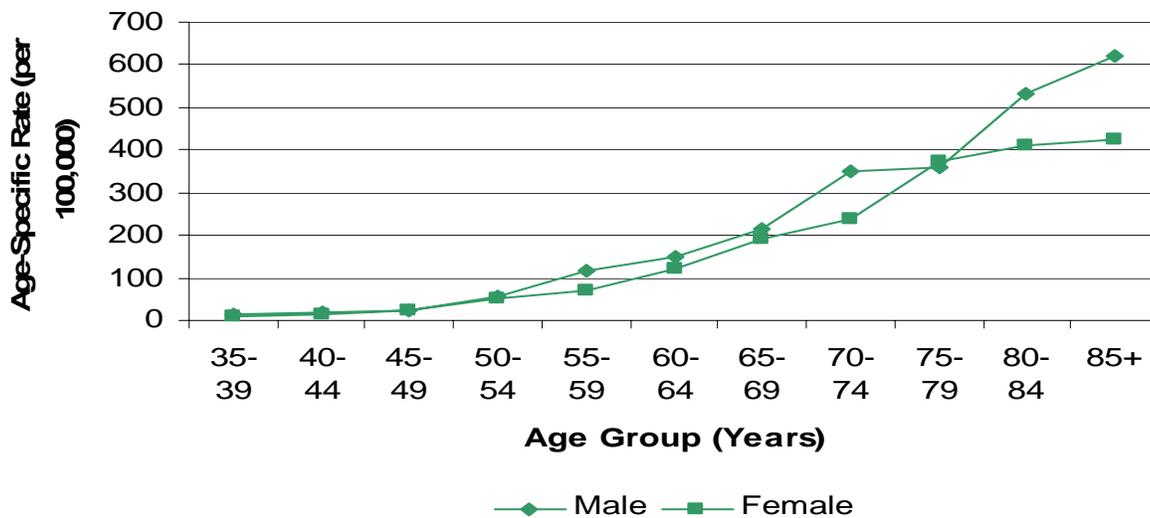
All rates are age-adjusted to the 2000 U.S. Standard population.

❖ From 1997 to 2001, trend analysis has shown that there is no significant change in male or female colorectal cancer incidence in Vermont. In the United States, during the same time period, male incidence rates decreased significantly from 67.9 per 100,000 to 59.9 per 100,000. U.S. female incidence rates also decreased significantly from 48.0 per 100,000 to 44.1 per 100,000.

❖ From 1997 to 2001, trend analysis has shown that there is no significant change in male or female colorectal cancer mortality in Vermont. In the United States, during the same time period, male mortality rates decreased significantly from 25.4 per 100,000 to 23.7 per 100,000. U.S. female mortality rates also decreased significantly from 17.6 per 100,000 to 16.6 per 100,000.

Colorectal Cancer Incidence and Age

Figure 2. Colorectal cancer incidence rates, by age – Vermont, 1997-2001.



	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Male	12.7	16.6	25.6	57.7	116.8	149.2	212.5	347.7	359.5	532.0	622.1
Female	7.2	12.3	23.2	51.1	71.0	119.9	190.2	238.8	371.6	411.6	426.9

All rates are age-adjusted to the 2000 U.S. standard population.

From 1997-2001, there were only 13 cases of colorectal cancer in Vermonters younger than 35 years old. Because of the small number of cases in each age group and gender, these data are not presented. Rates are only presented when the number of cases in a particular age group is at least 6.

❖ The incidence of colorectal cancer, as with many cancers, is extremely low in childhood and increases dramatically with age. Colorectal cancer is most often found among men and women over the age of 50.

❖ During 1997-2001, men aged 85 and older had the highest age-specific incidence of colorectal cancer, at a rate of 622.1 per 100,000.

Colorectal Cancer Incidence and County

Table 4. Colorectal cancer incidence rates, by county and gender – Vermont, 1997-2001.

County	Male Rate (per 100,000)	Female Rate (per 100,000)	County	Male Rate (per 100,000)	Female Rate (per 100,000)
Addison	58.8	46.9	Lamoille	73.0	42.1
Bennington	74.6	40.9	Orange	68.9	57.5
Caledonia	50.7	52.4	Orleans	73.4	55.2
Chittenden	66.5	55.4	Rutland	72.4	56.3
Essex	100.3	58.3	Washington	73.8	57.2
Franklin	70.9	58.4	Windham	65.3	57.0
Grand Isle	55.9	76.0	Windsor	52.8	25.7

All rates are age-adjusted to the 2000 U.S. standard population.

- ❖ During 1997-2001, there were no significant differences in colorectal cancer incidence rates by county in Vermont.
- ❖ During 1997-2001, colorectal cancer incidence rates for females in Chittenden county in Vermont were significantly higher than the U.S. female white rate. There were no other significant differences between Vermont county rates and U.S. rates.

Colorectal Cancer Prevention and Screening

In the U.S., about 75% of all new cases of colorectal cancer occur in people with no known risks for the disease. The remaining cases occur in people who have a family history of colorectal cancer, previous adenomatous polyps, or a condition such as inflammatory bowel disease. Some studies suggest that a diet low in fat and calories and high in fiber can help prevent colorectal cancer. Individuals can lower their risk of colorectal cancer by being more physically active, eating more vegetables, and getting regular screening tests.

Colorectal cancer is one of the few cancers that can be prevented through a screening test. Research shows that colorectal cancer develops gradually from benign polyps. Polyps detected by sigmoidoscopy or colonoscopy can be removed before they become malignant. Screening recommendations for people over age 50 are:

- ✓ Fecal occult blood test (FOBT) every year, or
- ✓ Sigmoidoscopy every 5 years, or
- ✓ FOBT annually and sigmoidoscopy every 5 years, or
- ✓ Colonoscopy every 10 years, or
- ✓ Double-contrast barium enema every 5-10 years.

The 2002 Vermont Behavioral Risk Factor Surveillance System can be used to evaluate progress toward meeting these recommendations. Data show that of Vermonters over age 50:

- 12% had a FOBT within the past year,
- 26% had a sigmoidoscopy or colonoscopy within the past 5 years,
- 16% had both a FOBT within the past year and a sigmoidoscopy or colonoscopy within the past 5 years, and
- **46% have NOT been screened for colorectal cancer.**

Colorectal Cancer and Stage at Diagnosis

Early detection is the goal of colorectal cancer screening. If colorectal cancer is diagnosed at an earlier stage, the chances for survival are greater. Nationally, 90% of men and women whose cancer is diagnosed in a localized stage survive their colorectal cancers for at least five years. Only 10% of men and women diagnosed with late stage colorectal cancer survive for at least five years.

Table 5. Distribution of colorectal cancer cases by stage at diagnosis – Vermont and the United States, 1995-2000.

Stage at Diagnosis	Vermont	U.S.
Localized (confined to organ where it began)	31.6%	39%
Regional - direct extension only	18.0%	
Regional - regional lymph nodes only	8.6%	
Regional – Not otherwise specified	0.2%	
<u>Regional - direct extension and regional lymph nodes</u>	<u>12.8%</u>	
Total Regional	39.6%	38%
Distant (spread to other parts of the body)	18.1%	19%
Unstaged (stage not assigned)	10.7%	5%

Data only includes those 30 and older.

- ❖ During 1995-2000, only 31.6% of colorectal cancers were diagnosed in Vermont at the early stage (localized). In the U.S., 39% of colorectal cancers were diagnosed at the early stage, which is significantly higher than the Vermont rate.
- ❖ Over half, or 57.7%, of colorectal cancers were diagnosed in late stage (either regional or distant) in Vermont during 1995-2000.

Colorectal Cancer and Bowel Segment

The site of origin of colorectal cancer can be further distinguished as either the right or left bowel. The left bowel includes the descending colon, sigmoid colon, the rectosigmoid junction, and rectum not otherwise specified (NOS). The right bowel includes the cecum, appendix, ascending colon, hepatic flexure of the colon, transverse colon, and the splenic flexure of the colon. The intestinal tract NOS is not included.

Table 6. Colorectal cancer rates by sex, age, and bowel segment – Vermont, 1997-2001.

	Left bowel	Right bowel
	<u>Rate (per 100,000)</u>	<u>Rate (per 100,000)</u>
Sex		
Male	37.1	25.4
Female	26.1	23.8
Age group (years)		
30-39	4.8	1.3
40-49	12.1	6.6
50-59	46.2	22.3
60-69	94.7	66.2
70-79	167.2	139.3
80+	184.3	226.6
All	30.8	24.4

Rates are age-adjusted to the 2000 U.S. standard population and exclude *in situ* (malignant but non-invasive) carcinomas except urinary bladder.

Left bowel refers to the following codes: C18.6-C18.7, C19.9, and C20.9

Right bowel refers to the following codes: C18-18.5

Code C26.0 is not included.

- ❖ Among males, the incidence of colorectal cancer in the left bowel was significantly higher than the incidence in the right bowel, with approximately 1.5 times more cases being diagnosed in the left bowel. There were no significant differences between colorectal cancer in the left and right bowels among females.
- ❖ Colorectal cancer rates in the left bowel were consistently higher than those in the right bowel in all age groups excluding those aged eighty and older.

Data Sources

Vermont Cancer Registry: The Vermont Cancer Registry is a central bank of information on all cancer cases diagnosed or treated in Vermont since January 1, 1994. The registry enables the state to collect information on new cases (incidence) of cancer. Previously, the state only kept records on deaths from cancer. The information maintained by the registry allows the Health Department to study cancer trends and improve cancer education and prevention efforts. Suggested Citation: Vermont Department of Health Cancer Registry, 1995-2001. The Vermont Cancer Registry can be contacted at 802-865-7749.

Vermont Vital Statistics: In Vermont, towns are required to file certified copies of death certificates with the Department of Health for all deaths occurring in their jurisdictions. The Health Department is responsible for maintaining the vital statistics system. Suggested Citation: VT Department of Health Vital Statistics System, 1997-2001.

Behavioral Risk Factor Surveillance System: Since 1990, Vermont and 49 other states and three territories track risk behaviors using a telephone survey of adults called the Behavioral Risk Factor Survey. Suggested Citation: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2002.

Surveillance, Epidemiology, and End Results:

The National Cancer Institute funds a network of Surveillance, Epidemiology and End Results (SEER) registries. The SEER Program currently collects and publishes cancer incidence and survival data from 14 population-based cancer registries and three supplemental registries covering approximately 26 percent of the U.S. population. These rates are used to estimate the U.S. cancer incidence rates. U.S. incidence is based on the SEER 9 Registries white rates. Suggested Citation: Ries LAG, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg L, Mariotto A, Feuer EJ, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2001, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2001/, 2004.

U.S. Vital Statistics: The U.S. Public Use Database Vital Statistical System maintains the U.S. mortality rates. Rates presented in this report are for the U.S. white population and were obtained using CDC Wonder. Suggested Citation: United States Department of Health and Human Services (U.S. DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Office of Analysis, Epidemiology, and Health Promotion (OAEHP), Compressed Mortality File (CMF) compiled from CMF 1968-1988, Series 20, No. 2A 2000, CMF 1989-1998, Series 20, No. 2E 2003 and CMF 1999-2001, Series 20, No. 2G 2004 on CDC WONDER On-line Database.

Technical Notes and Definitions

Age Adjustment: All rates in this document are age-adjusted to the 2000 U.S. standard population. This allows the comparison of rates among populations having different age distributions by standardizing the age-specific rates in each population to one standard population.

Incidence: Incidence refers to the number or rate of newly diagnosed cases of cancer. The incidence rate is calculated as the number of new cancers diagnosed in the state during one year divided by the number of residents in the state during the year. The incidence data presented in this report were coded using the International Classification of Disease for Oncology (ICD-O) coding system. Colorectal cancer cases were defined with ICD-O-3 codes of C18.0-C18.9, C19.9, C20.9, and C26.0 with the exception of histologies 9590-9989 (or equivalent for older data).

Mortality: Mortality refers to the number or rate of deaths from cancer. The mortality data presented here were coded using the International Classification of Diseases (ICD). From 1999 on, cancer mortality site groupings are defined by NCHS and based on ICD-10 classification. Cause of death before 1999 was coded according to ICD-9. Comparability ratios were applied to pre-1999 mortality rates to allow for continuity in trends across the ICD revisions.

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Suggested Citation

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Race: U.S. comparison rates for whites, instead of those for all races, are used because racial minority groups were estimated to make up 3.2 percent of the total Vermont population in 2000, compared with the total U.S. non-white population of 24.9 percent in 2000. Nationwide, whites have a higher risk compared to people of other races for female breast, melanoma, and bladder cancer incidence. Whites have a lower risk compared to other races for prostate, colorectal, and cervical cancer. The much smaller populations of Vermont residents of other races may have very different risks of these cancers. Combining data over many years will be required to determine cancer rates.

Statistical Significance: A confidence interval is a range of values within which the true rate is expected to fall. If the confidence intervals of two groups (such as males and females, or Vermont and the U.S.) overlap, then any difference between the two rates is not statistically significant. All rates in this report are calculated at a 95 percent confidence level.

Small Numbers: Rates are not presented in this report if the number of cases is fewer than 6. For example, if there were 5 cases of colorectal cancer in women aged 30-34 during 1997-2001, these data would not be presented.

Vermont Cancer Coalition

The Vermont Cancer Coalition is a statewide partnership of more than 100 individuals, professionals and organizations working together to reduce the impact of cancer on all Vermonters. In 2005 we will publish a comprehensive strategic plan addressing prevention, detection, treatment, survivorship needs, and palliative care related to Vermont's leading cancers. For more information or to get involved call (802) 865-7706 or click www.HealthyVermonters.info/cancer.