

## Vermont Facts, 1999-2003

- ❖ **Incidence:** Colorectal cancer<sup>1</sup> is the third most common cancer diagnosed in men and women. Each year approximately 174 colorectal cancer cases are diagnosed in men, and 173 colorectal cancer cases are diagnosed in women.
- ❖ **Age:** The incidence of colorectal cancer increases dramatically with age. More than 90 percent of colorectal cancer cases are diagnosed in people age 50 and older.
- ❖ **County:** The colorectal cancer incidence rate for men in Franklin County is higher than the U.S. Incidence rates for women in Chittenden and Washington Counties are higher than the U.S.
- ❖ **Mortality:** Colorectal cancer is the third leading cause of cancer death in both men and women. Each year, approximately 62 men and 70 women die from colorectal cancer.
- ❖ **Vermont vs. U.S.:** Colorectal cancer incidence and mortality rates among Vermont men and women do not differ significantly from the U.S. white rates.
- ❖ **Yearly Trends (1994-2003):** Incidence rates of colorectal cancer have decreased among women. There have been no changes in colorectal cancer incidence or mortality rates among men, or mortality rates among women.
- ❖ **Stage:** Over half of colorectal cancers are diagnosed in late stage (either regional or distant).
- ❖ **Advanced Stage (1994-2003):** As a measure of screening effectiveness, colorectal cancer incidence for Vermonters age 50 and older diagnosed at advanced stage (regional or distant stage), has not changed over the past decade.
- ❖ **Screening:** According to the 2004 BRFSS, 59% of Vermonters age 50 and older have met the screening recommendations for colorectal cancer. However, certain subgroups are less likely to be screened, such as those that lack health insurance, have less than a high school education, have a lower level of income, or lack a personal doctor.

<sup>1</sup> The colorectal cancer data provided in this report are for invasive cases only; in situ (non-invasive) are excluded.

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## Background

In Vermont, cancer is the second leading cause of death, with approximately 1,235 people dying from cancer each year. For the past 40 years, the three leading causes of death in Vermont have been heart disease, cancer, and stroke. Unlike the death rates for heart disease and stroke, the death rate for cancer has risen steadily over the last few decades. Roughly one out of every two men and one out of every three women will develop cancer in their lifetime. By monitoring cancer in Vermont we can become better informed of progress towards preventing and treating cancer, and ultimately, reduce illness and death from cancer. Improving the public health of Vermonters requires ongoing assessment to identify problems, inform policy decisions, evaluate existing programs, and direct resources. That assessment includes learning more about people who have cancer (research risk factors) as well as the stage of disease when people were diagnosed (opportunities for early detection).

Any disease in which abnormal cells develop, divide, grow, and have the potential to spread throughout the body can be called cancer. If the spread of these cancer cells is not controlled, death may result. Cancer cells from a malignant tumor can invade nearby tissues either by direct growth into adjacent tissue or by migration through the bloodstream and lymphatic system to other parts of the body. This process is called metastasis. For example, cancer that started in the colon and spread to the liver is still colon cancer.

Located within the digestive system, 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 of similarities between cancer of the colon and rectum, cancers in either of these sites are often grouped as colorectal cancer.

## Incidence

Defined as the number of *new* cases occurring in a population during a defined time interval, incidence rates are a useful measure of the risk of disease.

**Table 1. The five most commonly diagnosed cancers in males and females – Vermont, yearly averages 1999-2003.**

Male Cancer Site	Cases (per year)	Percent (per year)	Female Cancer Site	Cases (per year)	Percent (per year)
Prostate	482	29%	Breast	482	31%
Lung	246	15%	Lung	176	11%
<b>Colon and Rectum</b>	<b>174</b>	<b>11%</b>	<b>Colon and Rectum</b>	<b>173</b>	<b>11%</b>
Bladder	115	7%	Uterus	112	7%
Melanoma of Skin	96	6%	Melanoma	80	5%
All Sites	1,638	100%	All Sites	1,538	100%

*New cases per year exclude basal cell and squamous cell skin cancers and in situ (malignant but non-invasive) carcinomas except urinary bladder.*

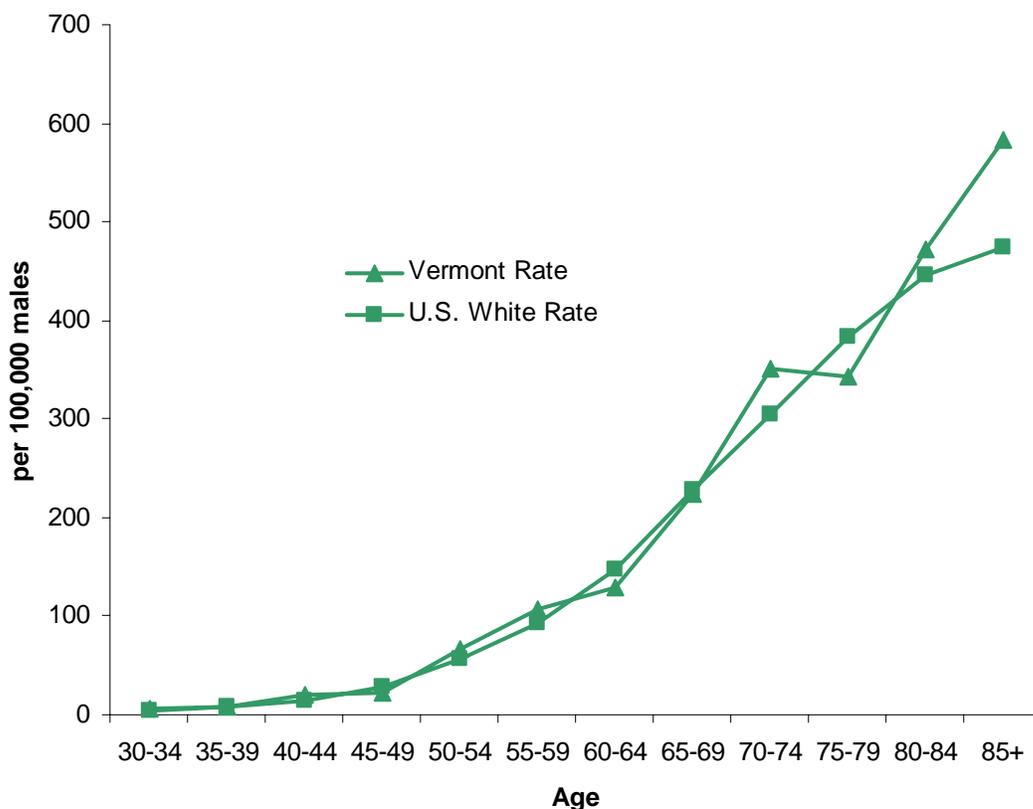
- ❖ An average of 1,638 males and 1,538 females are diagnosed with cancer each year in Vermont. Of those, an average of 174 men and 173 women are diagnosed with colorectal cancer per year.
- ❖ Colorectal cancer is the third most common cancer diagnosed in males after prostate and lung cancer.

- ❖ Colorectal cancer is the third most common cancer diagnosed in females after breast and lung cancer.
- ❖ Colorectal cancer accounts for roughly 11% of all cancers diagnosed in Vermont.

## Age

The incidence of colorectal cancer, as with many cancers, increases dramatically with age. While younger adults can develop colorectal cancer, over 90 percent of colorectal cancers are diagnosed in men and women over the age of 50.

**Figure 1. Incidence rates of male colorectal cancer, by age – Vermont and United States, 1999-2003.**

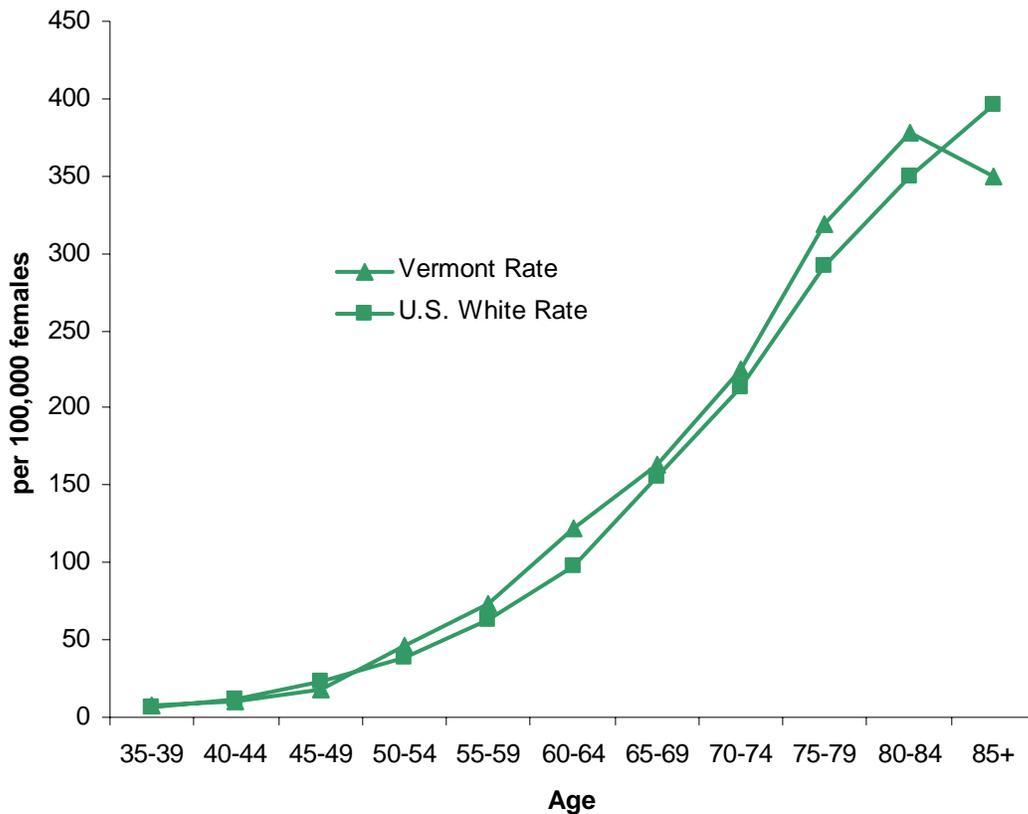


Age Group	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Vermont Rate	6.1	8.7	19.5	22.7	65.6	106.6	128.1	223.3	350.6	343.4	472.7	583.7
U.S. White Rate	3.7	7.7	14.4	27.6	57.3	92.7	148.2	227.8	305.2	384.2	446.5	474.2

*New cases per year exclude in situ (malignant but non-invasive) carcinomas.*

- ❖ Vermont men age 85+ have the highest age-specific incidence of colorectal cancer, at a rate of 583.7 per 100,000.
- ❖ Among Vermont men, there are no differences in age-specific incidence rates of colorectal cancer compared to the U.S.

Figure 2. Incidence rates of female colorectal cancer, by age – Vermont and United States, 1999-2003.



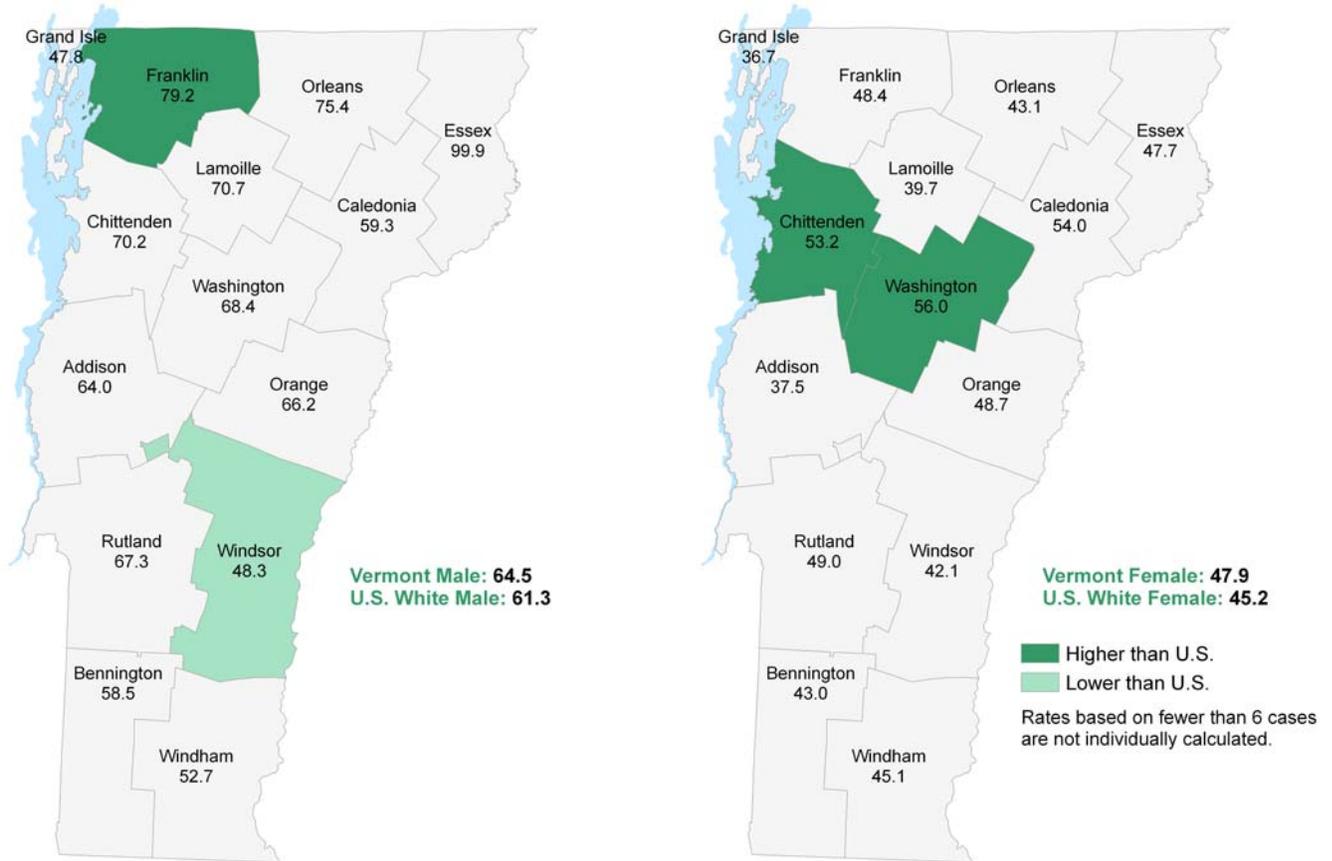
Age Group	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Vermont Rate	7.4	10.6	18.0	46.5	73.0	121.6	163.0	225.3	318.8	377.5	350.2
U.S. White Rate	6.5	12.0	23.2	39.1	62.4	97.1	155.3	213.8	291.9	349.8	396.1

*New cases per year exclude in situ (malignant but non-invasive) carcinomas.*

- ❖ Vermont women age 80-84 have the highest age-specific incidence of colorectal cancer, at a rate of 377.5 per 100,000.
- ❖ Among Vermont women, there are no differences in age-specific incidence rates of colorectal cancer compared to the U.S.

## County

Figure 3. Incidence rates of male and female colorectal cancer, by county – Vermont, per 100,000, 1994-2003.



*New cases per year exclude in situ (malignant but non-invasive) carcinomas.*

- ❖ Among Vermont males, colorectal cancer incidence rates in Franklin County are higher than the U.S.
- ❖ Colorectal cancer incidence rates among males in Windsor County are lower than Vermont and the U.S.
- ❖ Among Vermont females, colorectal cancer incidence rates in Chittenden County and Washington County are higher than the U.S.

## Mortality

**Table 2. The five most common causes of cancer death in males and females – Vermont, yearly averages 1999-2003.**

Male Cancer Site	Deaths (per year)	Percent (per year)	Female Cancer Site	Deaths (per year)	Percent (per year)
Lung	192	30%	Lung	139	23%
Prostate	69	11%	Breast	96	16%
<b>Colon and Rectum</b>	<b>62</b>	<b>10%</b>	<b>Colon and Rectum</b>	<b>70</b>	<b>12%</b>
Pancreas	33	5%	Pancreas	30	5%
Non-Hodgkin Lymphoma	31	5%	Ovary	29	5%
All Sites	639	100%	All Sites	596	100%

- ❖ An average of 639 males and 596 females die each year from cancer in Vermont. Of these, an average of 62 men and 70 women die each year of colorectal cancer.
- ❖ Colorectal cancer is the third leading cause of cancer death for males and females.
- ❖ Colorectal cancer accounts for roughly 10% of all cancer deaths in males, and 12% of all cancer deaths in females, in Vermont.

## U.S. Comparisons

**Table 3. Incidence and mortality rates of colorectal cancer – Vermont and United States, per 100,000, yearly averages, 1999-2003.**

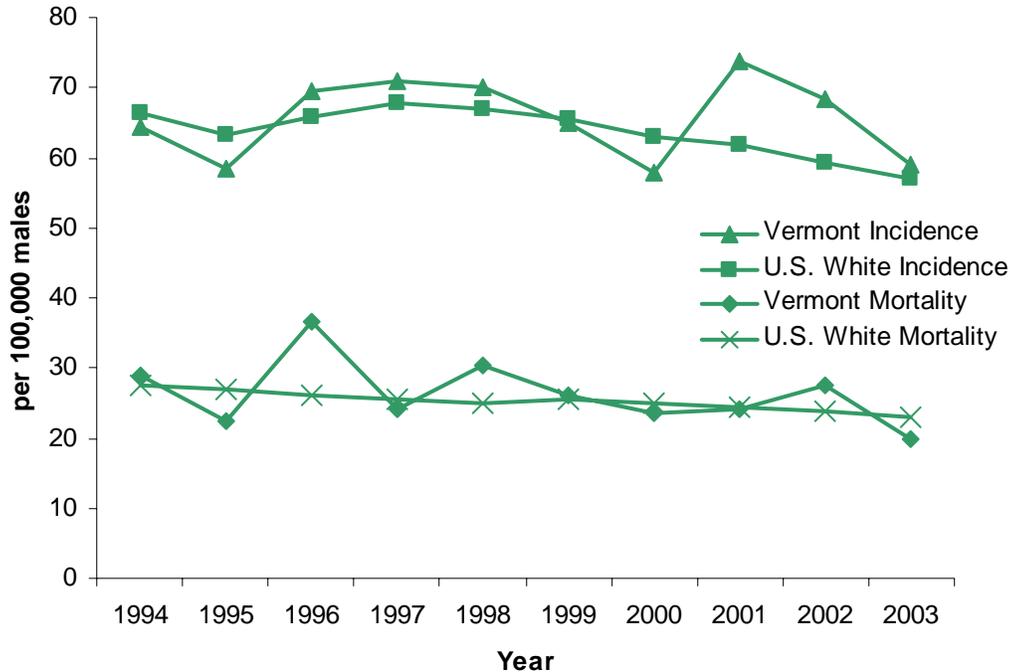
	Incidence	Mortality
VT Females	47.9	18.6
U.S. Females	45.2	17.0
VT Males	64.5	24.1
U.S. Males	61.3	24.2

*New cases per year exclude in situ (malignant but non-invasive) carcinomas.*

- ❖ Colorectal cancer incidence and mortality rates in Vermont are not different from the U.S. white rates.

## Trends

Figure 4. Incidence and mortality rates of male colorectal cancer – Vermont and United States, 1994-2003.

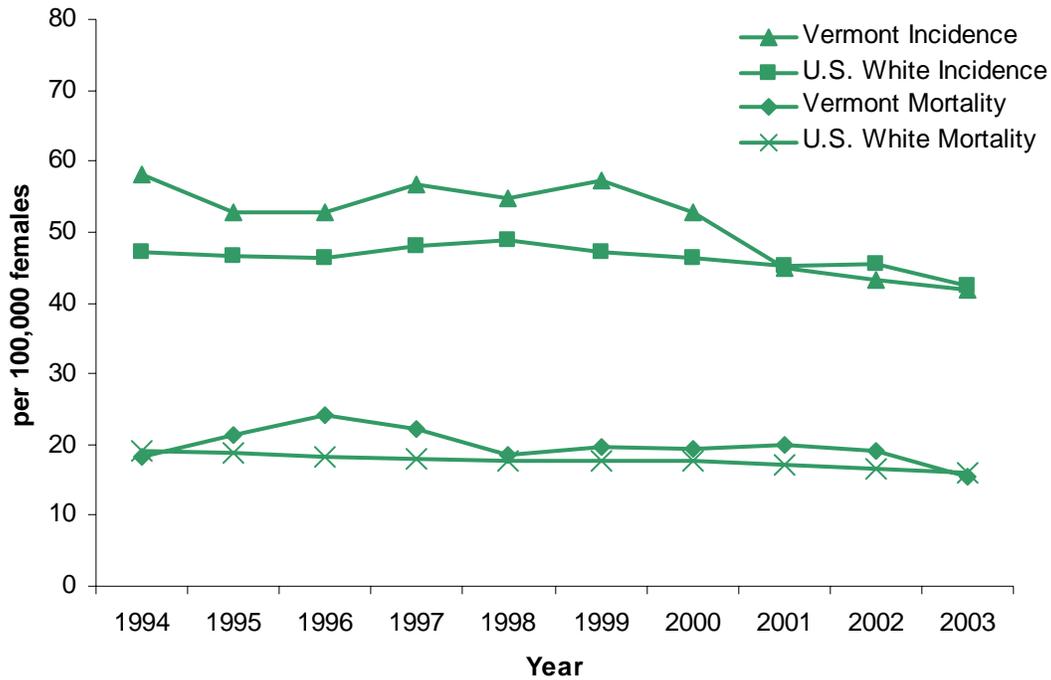


	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Vermont Incidence</b>	64.5	58.4	69.5	71.0	70.2	65.0	57.9	73.8	68.4	58.9
<b>U.S. White Incidence</b>	66.4	63.3	65.8	67.8	66.9	65.5	63.0	61.9	59.3	57.1
<b>Vermont Mortality</b>	29.0	22.3	36.5	24.2	30.4	26.1	23.5	24.2	27.6	19.8
<b>U.S. White Mortality</b>	27.6	27.0	26.1	25.5	24.9	25.5	25.0	24.3	23.7	22.9

*New cases per year exclude in situ (malignant but non-invasive) carcinomas.*

- ❖ From 1994 to 2003, trend analysis shows that there was no change in male colorectal cancer incidence or mortality in Vermont, but during the same time period, male incidence and mortality rates decreased in the U.S.

**Figure 5. Incidence and mortality rates of female colorectal cancer – Vermont and United States, 1994-2003.**



	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Vermont Incidence</b>	58.0	52.7	52.7	56.6	54.6	57.2	52.7	44.8	43.3	41.8
<b>U.S. White Incidence</b>	47.2	46.5	46.3	48.0	48.9	47.2	46.2	45.1	45.4	42.4
<b>Vermont Mortality</b>	18.2	21.3	24.1	22.2	18.4	19.7	19.4	19.9	19.0	15.3
<b>U.S. White Mortality</b>	19.0	18.8	18.2	17.9	17.7	17.8	17.6	17.0	16.6	16.1

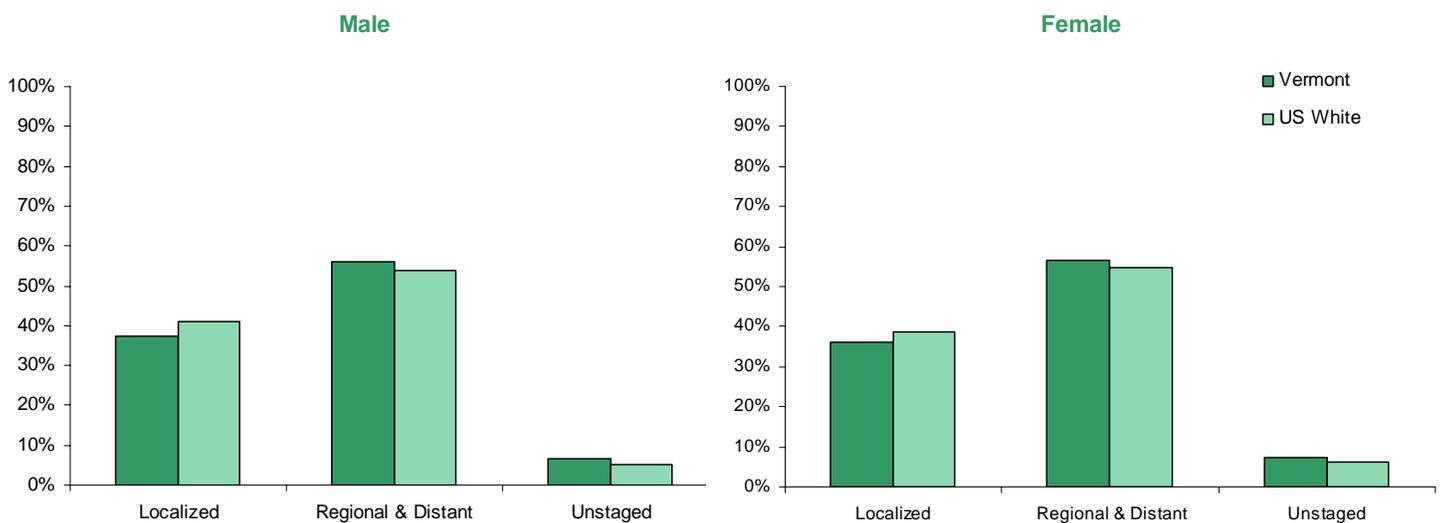
*New cases per year exclude in situ (malignant but non-invasive) carcinomas.*

- ❖ From 1994 to 2003, trend analysis shows that the female colorectal cancer incidence rates decreased in Vermont and the U.S.
- ❖ From 1994 to 2003, trend analysis shows that there was no change in female colorectal cancer mortality in Vermont, but during the same time period, female mortality rates decreased in the U.S.

## Stage at Diagnosis

Stage describes the extent to which the cancerous cells have spread from the original site to another part of the body. Stage can be grouped into the following categories: in situ, localized, regional, distant, and unknown. 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 cancer for at least five years. Only 10% of men and women diagnosed with distant stage colorectal cancer survive for at least five years.

**Figure 6. Distribution of colorectal cancer cases by stage at diagnosis – males and females, Vermont and the United States, 1999-2003.**



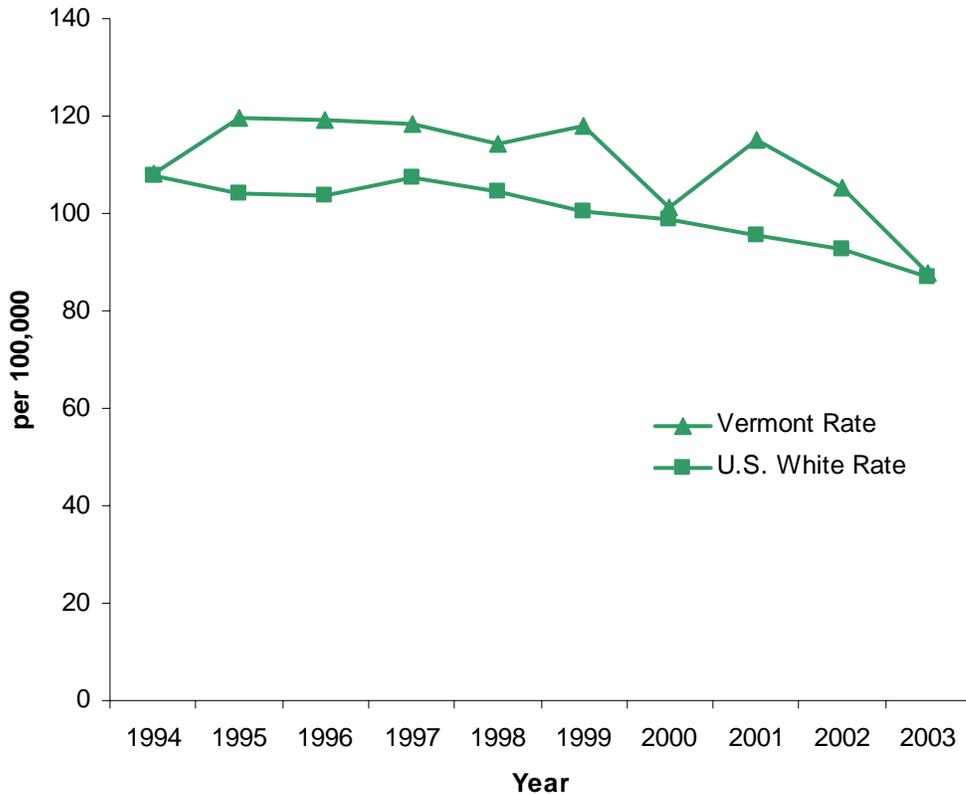
*New cases per year exclude in situ (malignant but non-invasive) carcinomas.*

- ❖ Approximately 37 percent of colorectal cancers were diagnosed among Vermont males at the early stage (localized) and 56 percent were diagnosed at a regional or distant stage.
- ❖ Among Vermont females, 36 percent of colorectal cancers were diagnosed at the early stage (localized) and 57 percent were diagnosed at a regional or distant stage.
- ❖ There is no difference between Vermont and the U.S. for stage at diagnosis.

## Advanced Stage Diagnosis

The rate of cases of cancer that are diagnosed at late or advanced stages is a measure of the effectiveness of cancer screening efforts.

**Figure 7. Incidence rates of advanced stage colorectal cancer, men and women age 50 and older - Vermont and the United States, 1994-2003**



- ❖ During the past ten years, colorectal cancer incidence per 100,000 Vermonters age 50 and older diagnosed at advanced stage (regional or distant stage) has not declined but has declined among the U.S. population.
- ❖ During the last five years, the rates for Vermont did decline.
- ❖ Between 1994 and 2003, the Vermont advanced stage colorectal cancer incidence rate of 110.4 per 100,000 was higher than the U.S. rate of 99.9.

## Risk Factors

A risk factor is a condition, an activity or an exposure that increases a person's chance of developing cancer. Cancer develops gradually as a result of a complex mix of factors related to lifestyle choices, environment and genetics. Each type of cancer is caused by a different set of factors, some well established, some uncertain, and some unknown. A majority of all new cases of colorectal cancer occur in people with no known risks for the disease. While the exact cause of most colorectal cancers is unknown, researchers have identified several risk factors that may increase a person's chance of getting colorectal cancer:

- ❖ **Age:** The incidence of colorectal cancer, as with many cancers, increases dramatically with age. More than 90 percent of people with this disease are diagnosed after age 50. The average age at diagnosis is in the mid-60s.
- ❖ **Family History:** Close relatives (parents, brothers, sisters, or children) of an individual with a history of colorectal cancer are more likely to develop this disease.
- ❖ **Polyps:** Polyps are growths on the inner wall of the colon or rectum. They are common in people over the age of 50. Most polyps are benign (non-cancerous) growths, but some types of polyps increase the risk of colorectal cancer, especially if they are large or if there are many of them.
- ❖ **Previous Cancer:** Even if a person's colorectal cancer has been completely removed, new cancers may start in other areas of the colon or rectum. Women with a history of cancer of the ovary, uterus (endometrium), or breast are at a somewhat higher risk of developing colorectal cancer.
- ❖ **Chronic Inflammatory Bowel Disease:** Chronic inflammatory bowel disease (IBD), including ulcerative colitis and Crohn's disease, is a condition in which the colon is inflamed over a long period of time. A personal history of chronic inflammatory bowel disease increases the risk of developing colorectal cancer.
- ❖ **Genetic Alterations:** Changes in certain genes increase the risk of colorectal cancer. A small percentage of colorectal cancers are associated with the inherited colorectal cancer syndrome, called hereditary non-polyposis colorectal cancer (HNPCC), or Lynch syndrome. Another small percentage of colorectal cancer cases are associated with the inherited syndrome, called familial adenomatous polyposis (FAP), which involves having hundreds of polyps in the colon or rectum. Cancer can develop in one or more of these polyps.
- ❖ **Ethnic Background:** Jews of Eastern European descent (Ashkenazi Jews) have a higher risk for developing colorectal cancer (due to hereditary nonpolyposis colorectal cancer (HNPCC)).
- ❖ **Diet:** Studies suggest that diets high in fat (especially animal fat) and low in folate and fiber may increase the risk of colorectal cancer. Also, some studies suggest that people who eat a diet very low in fruits and vegetables may have a higher risk of colorectal cancer.
- ❖ **Physical Inactivity and Obesity:** If you are not physically active, you have a greater chance of developing colorectal cancer. If you are very overweight, your risk of dying from colorectal cancer is increased.
- ❖ **Tobacco:** A person who smokes cigarettes may be at increased risk of developing polyps and colorectal cancer.

## Prevention and Screening

While many of the risk factors for colorectal cancer can not be modified, some studies suggest that a diet low in fat and calories and high in fiber can help prevent colorectal cancer. Individuals may also be able to lower their risk of colorectal cancer by being more physically active and not smoking. These healthy lifestyle choices also significantly reduce the risk of other chronic diseases, such as heart disease and diabetes.

### Screening Recommendations

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. If caught early, these polyps may be removed, preventing the development of cancer. There are several tests used to screen for colorectal cancer:

**Fecal Occult Blood Test:** The fecal occult blood test (FOBT) is used to find occult (hidden) blood in feces. Blood vessels at the surface of colorectal polyps or adenomas or cancers are often fragile and easily damaged by the passage of feces. The damaged vessels usually release a small amount of blood into the feces. If this test is positive, a colonoscopy is needed to see if there is a cancer, polyp, or other cause of bleeding.

**Flexible sigmoidoscopy:** A sigmoidoscope is a slender, flexible, hollow, lighted tube. When inserted through the rectum, it enables the physician to view the inside of the large intestine, from the rectum through the last part of the colon, called the sigmoid or descending colon. Polyps that are visualized during the procedure can be removed, however, flexible sigmoidoscopy is not sufficient to detect polyps or cancer in the ascending or transverse colon (two-thirds of the colon). If an adenomatous polyp or colorectal cancer is found during the procedure, a colonoscopy is needed to look for polyps or cancer in the rest of the colon.

**Colonoscopy:** A colonoscope is a longer version of a sigmoidoscope. When inserted through the rectum it allows the doctor to see the lining of the entire colon. If a small polyp is found, it may be removed by the physician during the procedure. The colonoscopy enables viewing of the entire colon and can be used as both a screening and preventive tool.

**Barium enema with air contrast (or double-contrast barium enema):** The barium enema uses barium sulfate, a chalky substance, and air to fill and expand the colon in order to produce pictures of the lining of the colon. If any abnormalities are found, the procedure should be followed up with a colonoscopy.

Based on individual variation in comfort level, logistical difficulties, and financial barriers, people age 50 and older can select from the following screening recommendations<sup>2</sup>:

- 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.

If a person is identified as being at high risk for colorectal cancer, some physicians recommend beginning colorectal screening before age 50.

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<sup>2</sup> U.S. Preventive Services Task Force, Screening for Colorectal Cancer, July 2002.  
<http://www.ahrq.gov/clinic/uspstf/uspscolo.htm>.

## Screening Rates in Vermont

According to a recent study<sup>3</sup>, Vermont has the capacity to screen all adults age 50 and older for colorectal cancer using either flexible sigmoidoscopies or colonoscopies in numbers sufficient to meet the recommended screening guidelines. However, based on the 2004 Behavioral Risk Factor Surveillance System, among Vermonters age 50 and older:

- 19.3% had an FOBT in the past year,
- 16.5% had a colonoscopy or sigmoidoscopy in the past year,
- 49.6% had a colonoscopy or sigmoidoscopy in the past 5 years, and
- 55.1% had a colonoscopy or sigmoidoscopy in the past 10 years.

Combining these data, we find approximately 59% of Vermonters age 50 and older have met the screening recommendations for colorectal cancer (had either a sigmoidoscopy or colonoscopy in the past 5 years, or an FOBT in the past year). Overall screening rates for Vermont are significantly higher than for the U.S. (52%). As part of the Vermont State Cancer Plan 2006-2010, an objective was set to increase the percentage of Vermonters (age 50+) who have received the recommended colorectal cancer screening tests to 65 percent.

## Disparities in Screening Rates

Data indicate that certain subgroups are more or less likely to be screened for colorectal cancer. Based on data from the 2004 Behavioral Risk Factor Surveillance System (BRFSS), we observe the following disparities in compliance with colorectal cancer screening guidelines (had either a sigmoidoscopy or colonoscopy in the past 5 years, or an FOBT in the past year):

- **Personal Doctor:** 61.4% of Vermonters with a personal doctor were screened for colorectal cancer compared to 19.7% of those without a personal doctor.
- **Income:** 68.9% of Vermonters making over 500% of the Federal Poverty Guidelines were screened for colorectal cancer compared to only 44.7% of those making less than 125% of the Federal Poverty Guidelines.
- **Education:** 65.4% of Vermonters with a college degree or greater were screened for colorectal cancer compared to only 48.0% of those with less than a high school education.
- **Health Insurance:** 60.2% of Vermonters with health insurance were screened for colorectal cancer compared to 34.3% of those without health insurance.
- **Gender:** There are no differences in overall rates of screening compliance by gender.

Using BRFSS data we can also look at whether Vermonters with known risk factors for colorectal cancer are getting screened:

- **Age:** 50.4% of Vermonters age 50 to 59 were screened for colorectal cancer compared to 64.6% of those age 60 to 69, 68.0% of those aged 70 to 79, and 56.8% of those age 80 and older.
- **Physical Activity:** 60.7% of Vermonters who reported any physical activity in the past month have been screened for colorectal cancer compared to 53.2% who reported being physically inactive.
- **Obesity:** There are no differences in overall rates of screening compliance between Vermonters who are considered to be underweight, overweight, or of healthy weight.
- **Smoking Status:** 60.4% of non-smokers were screened for colorectal cancer compared to 48.0% of current smokers.

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<sup>3</sup> Access to Colorectal Cancer Screening: Can Vermont screen all those who need it? UVM College of Medicine, 2006.

## Intervention, Policy, and Recommendations

The Vermont State Cancer Plan, published by Vermonters Taking Action Against Cancer (VTAAC)<sup>4</sup> and the Vermont Department of Health, provides a strategic roadmap to reduce the burden of all cancers by 2010. Strategic priorities include preventing future cancers, detecting new cancers early, increasing access to optimal treatment and follow up, improving the quality of life for cancer survivors, and improving pain management and end-of-life care.

The burden of colorectal cancer in Vermont can be reduced by achieving the following objectives:

**Prevent** future cancers by reducing exposure to known risk factors including:

- Decrease the prevalence of obesity among all Vermonters.
- Increase daily fruit and vegetable consumption among all Vermonters.
- Increase regular, moderate physical activity among all Vermonters.

**Detect** new cancers as early as possible through appropriate screening:

- Increase colon cancer screening among Vermonters ages 50+.

Increase **access** to optimal cancer treatment and follow-up care:

- Increase referrals for multi-modality treatment assessment.
- Reduce financial, geographic and cultural barriers to appropriate cancer treatments.
- Increase availability and use of transportation services to access cancer treatment.
- Increase participation in therapeutic clinical trials.
- Increase the proportion of Vermonters covered by health insurance.

Improve the **quality of life** for people living with, through and beyond cancer, as well as improve **end-of-life** care for cancer patients.

Progress towards these objectives is routinely assessed and is reported annually<sup>5</sup>. A Colorectal Cancer Workgroup was formed by VTAAC in 2005 and is implementing the following strategies and interventions to reach these objectives:

- Collaborate with UVM's College of Medicine to conduct a capacity assessment for colorectal cancer screening in Vermont;
- Host statewide summits;
- Partner with the state's health insurers to promote colorectal cancer screening among healthcare providers and insured Vermonters over age 50;
- Evaluate progress on current activities;
- Increase screening for under-insured Vermonters.

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<sup>4</sup> VTAAC is a statewide partnership of more than 150 individuals, professionals and organizations working together to reduce the impact of cancer on all Vermonters. A comprehensive strategic plan addressing prevention, detection, treatment, survivorship needs, and palliative care related to Vermont's leading cancers is available at <http://healthvermont.gov/cancer> or call (802) 865-7706.

<sup>5</sup> Vermont Cancer Plan Status Report, 2006:  
<http://healthvermont.gov/prevent/cancer/documents/102606Progresssheet.pdf>.

## National Screening Efforts

The Centers for Disease Control and Prevention (CDC) engages in numerous colorectal cancer prevention and control efforts, all with the primary aim of reducing the number of people who are diagnosed with and die from colorectal cancer. The CDC contributes to the fight against colorectal cancer by:

- Increasing public awareness through the Screen for Life: National Colorectal Cancer Action Campaign.
- Supporting research efforts and translating research into public health programs, practices and services.
- Building state and national partnerships.
- Monitoring and reporting on national screening rates.
- Increasing awareness of screening guidelines among health care providers.
- Promoting increased patient-provider communication about colorectal cancer screening.

CDC's Screen for Life: National Colorectal Cancer Action Campaign informs men and women aged 50 years or older about the importance of having regular colorectal cancer screening tests. This campaign addresses the following central messages through public service announcements, educational materials and national partnerships:

- Colorectal cancer is the second leading cancer killer in the U.S.
- Screening saves lives.
- Colorectal cancer often can be prevented. Regular screening tests can find precancerous colorectal polyps so they can be removed before they turn into cancer.
- Screening can find colorectal cancer early, when treatment can be very effective.
- Polyps and colorectal cancer may not cause symptoms, especially at first.
- Both men and women are at risk.
- Many insurance plans, including Medicare, help pay for colorectal cancer screening.

For more information, visit [http://www.cdc.gov/cancer/colorectal/what\\_cdc\\_is\\_doing/](http://www.cdc.gov/cancer/colorectal/what_cdc_is_doing/).

VTAAC's Colorectal Cancer Workgroup has been considering how to incorporate campaigns like Screen For Life into their efforts in Vermont, as well as adapting initiatives that have been successful in other states.

## 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, 1994-2003. 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, 1994-2003.

**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, 2004.

**Hospital Discharge Data (HDD):** Vermont's acute care hospitals participate in the state's hospital data system by supplying discharge abstracts of comparable information to Health Care Investment Analysts, a subsidiary of AMBAC, under contract with the Vermont Association of Hospitals and Health Systems (VAHHS). VAHHS, using its

EXPLOR data system, then provides data to the Department of Health, the hospital discharge data management designee of the Division of Health Care Administration. Records from New Hampshire and New York hospitals are obtained from the New Hampshire Division of Public Health and the New York Department of Health respectively. The Veterans Administration provides discharge records from the VA hospital in White River Junction.

**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, 1975-2003, National Cancer Institute. Bethesda, MD, 2006.  
[http://www.seer.cancer.gov/csr/1975\\_2003](http://www.seer.cancer.gov/csr/1975_2003)

**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 1999-2003, 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 colorectal cancers diagnosed in the state during one year divided by the number of residents in the state during the same 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 as invasive neoplasms with ICD-O-3 codes of C18.0-C18.9, C19.9, C20.9, and C26.0 with the exception of histology 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). Cause of death before 1999 was coded according to ICD-9; beginning with deaths in 1999, ICD-10 was used. Comparability ratios were applied to pre-1999 mortality rates to allow for continuity in trends.

**Race:** U.S. incidence and mortality rates for whites, rather than those for all races, are used for comparison because racial minority groups were estimated to make up 3.1 percent of the total Vermont population, compared with the total U.S. non-white population of 19.6 percent in 2004. 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.

**Federal Poverty Level (FPL):** The set minimum amount of income that a family needs for food, clothing, transportation, shelter and other necessities. In the United States, this level is determined by the Department of Health and Human Services. FPL varies according to family size. The number is adjusted for inflation and reported annually in the form of poverty guidelines. Public assistance programs, such as Medicaid in the U.S., define eligibility income limits as some percentage of FPL.

**Confidence Intervals:** 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. For example, the age adjusted Vermont male cancer incidence rate is 580.9 (567.8, 594.2) per 100,000 and the Vermont female cancer incidence rate is 446.8 (436.7, 457.0). Since the Vermont female confidence interval and the Vermont male confidence interval do not overlap, a statistical difference exists between the two rates.

**Statistical Significance:** The use of the terms “higher” and “lower” in this document refer to a “statistically significant” difference. A statistically significant difference indicates that there is statistical evidence that there is a difference that is unlikely to have occurred by chance alone.

**Small Numbers:** Rates are not presented in this report if they are based on fewer than 6 cases.

### Suggested Citation

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