

Breast Cancer in Vermont

Vermont Cancer Registry

August 2012

Vermont Facts

- ❖ **Incidence:** Breast cancer is the most common cancer diagnosed in women. Each year approximately 494 breast cancer cases are diagnosed in women.
- ❖ **Mortality:** Breast cancer is the second leading cause of cancer death among women. Each year, approximately 85 women die from breast cancer.
- ❖ **Trends:** Incidence and mortality rates of breast cancer have declined during 1999-2008.
- ❖ **Vermont vs. U.S.:** The breast cancer incidence and mortality rates are not different from the U.S.
- ❖ **Age:** As with most cancers, the risk for developing breast cancer increases with age. Breast cancer is most often diagnosed among women over the age of 50.
- ❖ **Stage:** In Vermont, 68 percent of invasive breast cancers are diagnosed at the localized stage (the cancer is limited to the organ of origin), and 26 percent are diagnosed at the regional stage, and 4 percent are diagnosed at the distant stages (the cancer has extended beyond the local organ or has metastasized).
- ❖ **Screening:** According to the 2010 BRFSS, 83 percent of women have been screened for breast cancer. Vermont has a higher percentage of women meeting the breast cancer guidelines compared to the U.S. (79 percent).

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Background

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. Cancer that started as breast cancer and spread to the liver or bone is still breast cancer.

In 2007, cancer overtook heart disease as the leading cause of death in Vermont, with approximately 1,200 Vermonters dying from cancer each year. In contrast to the dramatic declines in the death rates for heart disease and stroke, the cancer death rate has risen steadily over the past few decades as a result of the aging population and the continued rise in death rates from lung cancer. Roughly one out of every two men and one out of every three women will develop cancer in their lifetime.

Breast Cancer

Breast cancer is a disease in which malignant cells form in the tissues of the breast. A woman's breast is made up of lobules, ducts, fatty and connective tissue, blood vessels, and lymph vessels. Breast cancer can begin in any part of the breast, and if left untreated, can spread to other parts of the body.

Among women, breast cancer is the most commonly diagnosed cancer and a leading cause of cancer deaths in the United States. Breast cancer accounts for 14 percent of all cancer deaths among women. Nationally, breast cancer death rates are decreasing. This is probably the effect of earlier diagnosis and improved treatment.

While breast cancer also occurs in males, incidences of breast cancer among men are far less common than in women. Because breast cancer among males accounts for less than one percent of cancers diagnosed nationally, only female breast cancer is presented in this report.

Incidence and Mortality

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 most commonly diagnosed cancers in females – Vermont, average number of cases per year, 2004-2008.

Female Cancer Site	Cases (per year)	Percent (per year)
Breast	494	29%
Lung	240	14%
Colon and Rectum	163	9%
Uterus	122	7%
Melanoma	95	6%
All Sites	1,719	100%

New cases per year exclude basal cell and squamous cell skin cancers and in situ carcinomas except urinary bladder.

- ❖ An average 1,719 cancers in women are diagnosed each year in Vermont. Of those, an average of 494 women are diagnosed with breast cancer.
- ❖ Breast cancer is the most commonly diagnosed cancer in females and accounts for roughly 29 percent of all cancers diagnosed in Vermont women.

The mortality rate is a measure of the number of deaths in a population during a specific period of time.

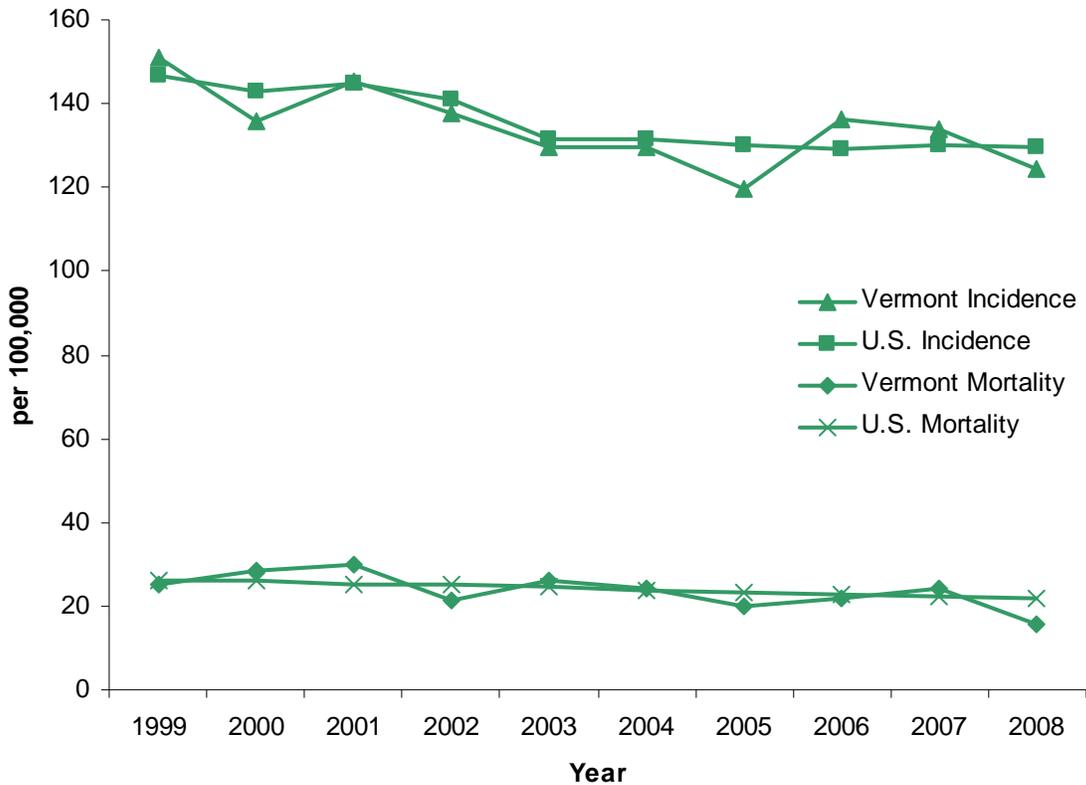
Table 2. The most common cancer deaths in females – Vermont, average number of deaths per year, 2004-2008.

Female Cancer Site	Deaths (per year)	Percent (per year)
Lung	166	27%
Breast	85	14%
Colon and Rectum	62	10%
Pancreas	38	6%
Ovary	29	5%
All Sites	610	100%

- ❖ An average of 610 women die each year from cancer in Vermont. Of these, an average of 85 women die from breast cancer.
- ❖ Breast cancer is the second leading cause of cancer death among females in Vermont and accounts for roughly 14 percent of all cancer deaths in women.

Trends

Figure 1. Incidence and mortality rates of female breast cancer – Vermont and United States¹, 1999-2008.



- ❖ From 1999 to 2008, the declines in the incidence and mortality of breast cancer were statistically significant for Vermont and the U.S.

¹ The U.S. rates represented in this publication are for whites. See Technical Notes section for more information.

U.S. Comparisons

Table 3. Incidence and mortality rates of breast cancer – Vermont and United States, per 100,000, yearly averages, 2004-2008.

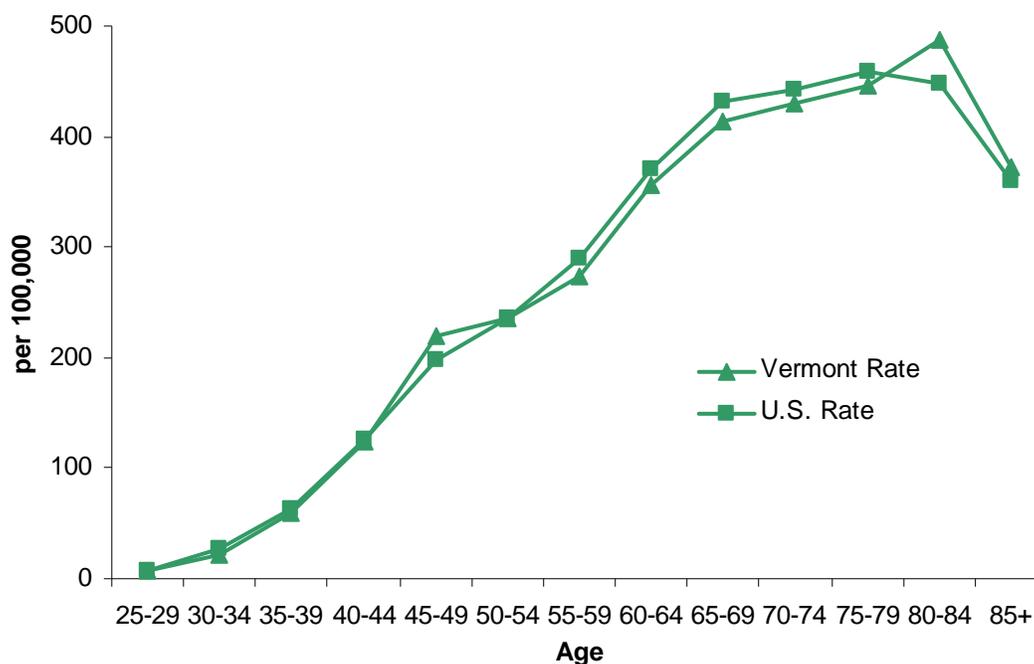
	Incidence	Mortality
Vermont Females	128.9	21.2
U.S. Females	130.0	22.8

- ❖ The breast cancer incidence and mortality rates among Vermont females are not different from the U.S.

Age

The incidence of many cancers increase with age and breast cancer is most often diagnosed among women over the age of 50.

Figure 2. Incidence rates of female breast cancer, by age – Vermont and United States, 2004-2008.



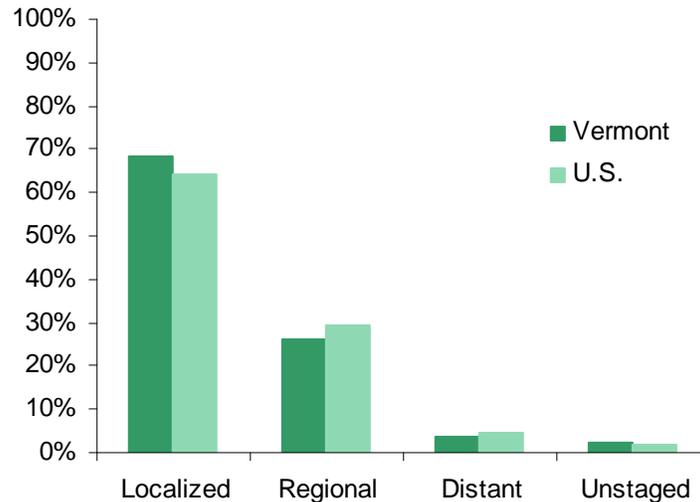
Age Group	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Vermont Rate	6.8	20.8	59.0	124.9	220.0	234.8	272.9	355.9	413.4	429.3	445.7	487.3	372.5
U.S. Rate	7.3	27.1	62.7	125.9	197.6	235.0	289.4	369.8	430.9	441.7	458.9	447.9	360.1

- ❖ Vermont women age 80-84 have the highest age-specific incidence of breast cancer, at a rate of 487.3 per 100,000.
- ❖ Between 2004 and 2008 there were no differences in age-specific incidence rates of breast cancer between Vermont and U.S. females.
- ❖ Over 50 percent of breast cancers are diagnosed among women age 60 and older.

Stage at Diagnosis

Stage describes the extent to which the cancerous cells have spread from the original site to another part of the body; it helps determine prognosis and treatment options. Invasive breast cancer can be grouped into the following stage categories: localized, regional, distant, and unstaged. The earlier a cancer is diagnosed, the better a person's prognosis is likely to be. Cancers occurring in parts of the body that can be easily seen or felt (skin, breast) are easier to detect at a localized stage compared to cancers of internal organs, which require imaging procedures and/or laboratory tests to detect.

Figure 3. Invasive female breast cancer by stage at diagnosis – Vermont and the United States, 2004-2008.

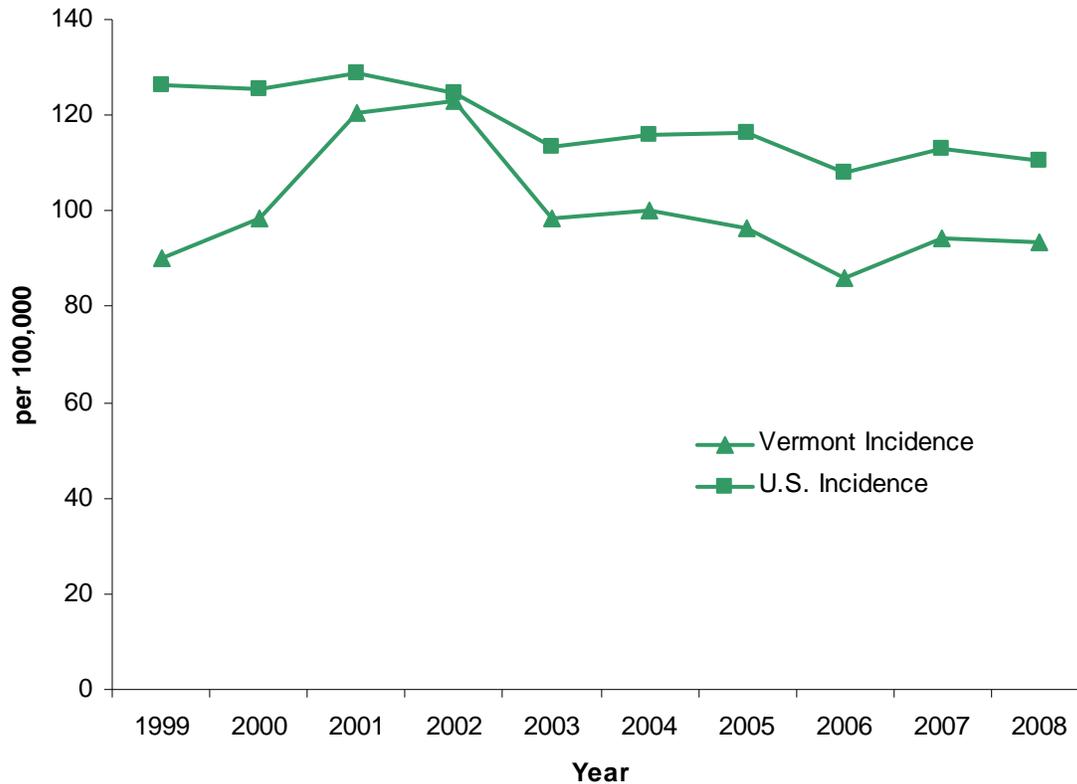


- ❖ Among Vermont women, approximately 68 percent of invasive breast cancers are diagnosed at the localized stage, 26 percent are diagnosed at a regional stage, and 4 percent are diagnosed at a distant stage. In the U.S., 64 percent of breast cancers are diagnosed at the early stage, 29 percent are diagnosed at a regional stage, and 5 percent are diagnosed at a distant stage.
- ❖ Fewer Vermont women are diagnosed at regional stage and more are diagnosed at a localized stage compared to the U.S.

Advanced Stage at Diagnosis

The rate of cases of cancer that are diagnosed at an advanced stage (regional or distant) is a measure of the effectiveness of cancer screening efforts.

Figure 4. Incidence rates of advanced stage breast cancer (age 50+) - Vermont and the United States, 1999-2008.



- ❖ Between 2004 and 2008 the Vermont rate of advanced stage breast cancer among women age 50 and older (93.8 per 100,000) is lower than the U.S. rate (112.7 per 100,000).
- ❖ The declines in advanced stage breast cancer trends were statistically significant for the U.S.; however, the Vermont trends were not statistically significant.

Risk Factors and Prevention

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. Some factors, like a person's age or race, can't be changed. Others can be linked to cancer-causing factors in the environment. Still others are related personal behaviors, such as smoking, drinking, and diet. Many women with known risk factors never develop breast cancer, and many who do develop cancer have none of the known risk factors. Some factors influence risk more than others, and a person's risk for breast cancer can change over time, due to factors such as aging or lifestyle. The exact causes of breast cancer are unknown, but some of the factors associated with an increased risk of developing breast cancer are:

- ❖ **Gender:** Women are much more likely to develop breast cancer than men. Women develop more breast cancer because female breast cells are constantly exposed to the growth-promoting effects of the female hormones estrogen and progesterone. Breast cancer also develops in men, and in 2012 approximately 2,200 men in this country will be diagnosed with breast cancer. However, this accounts for less than one percent of total breast cancer diagnosed in the U.S.
- ❖ **Age:** Breast cancer incidence increases with age. Most women who develop breast cancer are over the age of 60.
- ❖ **Race and ethnicity:** Breast cancer is diagnosed more frequently in white women than Hispanic/Latina, Asian/Pacific Islander, African American/black, or American Indian/Alaska Native women.
- ❖ **Family history and genetics:** Women who have had breast cancer or have a mother, sister, daughter or other relative who have had breast (or ovarian) cancer, have an increased risk of developing it themselves. This risk is greater if the family member developed breast cancer before the age of 50. Most women who are diagnosed with breast cancer do not have a family history of this disease.

Women who inherit specific genes are at a greater risk for developing breast cancer. BRCA1 and BRCA2 are the most common cause of hereditary breast cancer. In normal cells, these genes help prevent cancer by making proteins that keep the cells from growing abnormally, but if a mutated copy is inherited there is a greater risk of developing breast (or ovarian) cancers. Other gene mutations can also cause inherited breast cancers. However, they are much rarer and usually do not increase the risk as much as the BRCA gene mutations.

- ❖ **Dense breast tissue or certain breast changes:** Some women have cells in the breast that look abnormal under a microscope. Having certain types of abnormal cells (atypical hyperplasia, lobular carcinoma in situ (LCIS), or ductal carcinoma in situ (DCIS)) increases the risk of breast cancer. Additionally, breast tissue may be dense or fatty. Older women whose mammograms (breast x-rays) show more dense tissue are at increased risk of breast cancer.
- ❖ **Personal history:** Women with breast cancer in one breast have an increased risk of developing cancer in the other breast or in another part of the same breast (separate from a recurrence).
- ❖ **Previous chest radiation:** Women who had radiation therapy to the chest (including breasts) before age 30 are at increased risk of breast cancer.
- ❖ **DES (Diethylstilbestrol) exposure:** DES was given to some pregnant women in the United States between 1940 and 1971. Women who took DES during pregnancy may have a slightly increased risk of breast cancer. Women whose mothers took DES during pregnancy may also have a slightly higher risk of breast cancer.

- ❖ **Hormonal factors:** Women who began menstruation before 12 years old, or who began menopause after age 55, have an increased risk of developing breast cancer. Other risk factors include: the use of menopausal hormone therapy drugs for many years; having a first child after age 30; never breastfeeding; or never bearing children. Women using oral contraceptives (birth control pills) have a slightly greater risk of breast cancer than women who have never used them. This risk seems to go back to normal over time once the pills are stopped. Studies have shown no link between abortion or miscarriage and breast cancer.
- ❖ **Diet and lifestyle:** Lifestyle factors that can increase risk include: postmenopausal weight gain; physical inactivity; and alcohol consumption. Being active may help reduce risk by preventing weight gain and obesity.

Many other possible risk factors have been studied with conflicting, uncertain, or unproven results, including diet and vitamin intake, antiperspirants, bras, induced abortion, breast implants, chemicals in the environment, tobacco smoke, and night work. Researchers continue to study possible risk factors.

Prevention

Although there is no certain way to prevent breast cancer, there are ways to reduce a person's risk. Risk factors such as age and family history cannot be controlled, but it may be possible to reduce risk for breast cancer by making some lifestyle changes. Body weight, physical activity, and diet have all been linked to risk for developing breast cancer, and these are all personal behaviors that can potentially be influenced. The following actions can reduce a women's risk of developing breast cancer:

- Moderate to vigorous physical activity can reduce risk. Regular physical activity and maintaining a healthy weight may reduce risk.
- Diets that are rich in fruits and vegetables, poultry and fish, and low fat dairy products also may reduce risk. However, specific foods that may decrease risk have not been identified.
- Consuming alcohol in moderation or not at all may reduce risk.
- Women who choose to breastfeed for at least several months may also have an added benefit of reducing their risk.
- Foregoing hormone therapy after menopause may decrease risk.

Screening

Mammography is a low energy x-ray to screen for breast cancer that images the breast to identify and evaluate breast changes that are not normal. New screening guidelines issued in October 2009 by U.S. Preventive Services Task Force (USPTF) made the recommendation that women younger than 50 who have no elevated risk factors should discontinue regular mammography and clinical breast exams. The new guidelines also recommend against teaching younger women how to do monthly self-breast exams. *Mammograms every two years, as well as clinical and self-breast exams for women age 50 to 74, are still recommended.*

While current research supports the USPTF guidelines many advocates, providers, and cancer survivors continue to support regular screening for all women as young as 40 to detect possible breast cancers as early as possible. *Women under age 50 who have risk factors such as family history of breast cancer should discuss the specific benefits and harms of screening with their health care provider.*

As part of the Vermont State Cancer Plan 2015 and Healthy Vermonters 2010, the breast cancer screening objective is to increase percentage of women (age 50-74) who have had a mammography in the past two years.

Goal: 91 percent
VT 2010: 83 percent (BRFSS, 2010)

Additionally, there is an objective to increase the percentage of women age 40-49 who report having a discussion with their healthcare provider regarding the potential benefits and risks of breast cancer screening.

Barriers to Breast Cancer Screening

In Vermont, mammography screening rates have increased from 77 percent in 2000 (women age 40+) to 83 percent in 2010 (women age 50-74). Vermont has a higher percentage of women meeting the breast cancer guidelines compared to the U.S. (79 percent). However, certain populations report lower rates of mammography screening than other populations. The following characteristics are significant predictors of breast cancer screening among women age 50 to 74:

- **Having a personal doctor:** 85 percent of women with a personal doctor are getting screened for breast cancer compared to 47 percent of those without a personal doctor.
- **Health insurance:** 84 percent of women with health insurance get screened for breast cancer compared to 53 percent of those without insurance.
- **Income at or below 125 percent of the Federal Poverty Level:** 89 percent of Vermont women with an income at or above 350 percent of the Federal Poverty Level (FPL) report having a mammogram in the preceding two years compared to 73 percent at or below 125 percent of the FPL.
- **Race:** among Vermont women, 78 percent of racial and ethnic minorities are getting screened for breast cancer, compared to 84 percent of white non-Hispanics. However, these differences are not statistically different.
- **Education:** there are no differences in overall rates of screening by level of education.

Survival and Treatment

Survival rate refers to the percentage of people who are alive for a given period of time after diagnosis and is an indication of the prognosis of the disease. The prognosis and treatment of breast cancer is largely determined by the stage of the disease, which considers the size of the tumor, involvement of nearby organs, lymph node status, and whether metastatic disease is present. The five-year survival rate refers to the percentage of women who live at least five years after being diagnosed, and many women live much longer than five years. Nationally, 98 percent of women whose breast cancer is diagnosed at a localized stage survive their cancer for at least five years compared to 24 percent of those diagnosed with distant stage breast cancer.

Treatment and prognosis depend upon the histological type of cancer, the stage, and one's overall health. Possible treatments or combinations of treatments include **surgery**, **sentinel lymph node biopsy** followed by surgery, **radiation** therapy (ionizing radiation to kill cancer cells), **chemotherapy** (method that uses drugs to destroy cancer cells), **hormone therapy**, or **targeted therapy** (drugs to block the growth and spread of cancer cells).

Chemotherapy may be administered before surgery (neoadjuvant therapy) to shrink the tumor and reduce the amount of tissue that needs to be removed during surgery. Following surgery, some patients may receive radiation therapy, chemotherapy, or hormone therapy to kill any remaining cancer (adjuvant therapy).

Many patients with breast cancer undergo **surgery** to remove the cancer from the breast. Additionally, some of the lymph nodes under the arms may also be removed and examined to see if they contain cancer cells (**lymph node dissection**). **Breast-conserving surgery** removes the cancer but not the entire breast and includes lumpectomy (removes the tumor and a portion of normal tissue around it) or **partial mastectomy** (removes the part of the breast that has the cancer, some normal tissue, and possibly the lining over the chest muscles below the cancer). Other types of surgery include **total** (or simple) **mastectomy** to remove the entire breast and some lymph nodes. **Modified radical mastectomy** removes the whole breast, many of the lymph nodes under the arm, the lining over the chest muscles, and sometimes the chest wall muscles. Following mastectomy, some patients may consider **breast reconstruction surgery** to rebuild a breast's shape.

Sentinel lymph node biopsy is the surgical removal of the sentinel lymph node, which is the first lymph node to receive lymphatic drainage from a tumor, and is the first lymph node that cancer is most likely to spread to from a tumor. Radioactive dye is injected near the tumor to highlight the closest lymph node, which is removed and then examined by a pathologist for cancer cells. Following the biopsy, surgery is usually done to remove the tumor.

Radiation therapy uses ionizing radiation to kill cancer cells. Normal cells are able to repair radiation damage, while cancer cells are not. Radiation therapy can be directed at the breast cancer from outside the body, called **external radiation**, or it can be put inside seeds or pellets placed directly into or near the cancer, **internal radiation** or **brachytherapy**.

Chemotherapy uses drugs to kill cancer cells. One or more chemotherapy drugs may be administered intravenously or taken orally. A combination of drugs usually is given in a series of treatments over a period of weeks or months, with breaks in between so that the body can recover.

Hormone therapy removes hormones or blocks their activity, preventing cancer cell growth. Some hormones can cause cancer cell growth, and if tests determine that cancer cells have receptors (places where hormones can attach), drugs, surgery, and radiation are used to reduce the levels of hormones or block them from working. Treatment that stops the ovaries from producing estrogen is called ovarian ablation. Tamoxifen is a drug that is used to block estrogen in the breast for premenopausal patients with early stage and metastatic disease. Hormone therapy with an aromatase inhibitor is given to some postmenopausal women who have hormone-dependent cancers which need estrogen to grow.

Targeted therapies are newer cancer treatments that work by targeting specific abnormalities in cancer cells without harming normal cells.

Clinical trials are generally designed to compare potentially better therapy with therapy that is currently accepted as standard and can be an important option for many individuals when considering treatment of this disease. Most of the progress made in identifying curative therapies for cancers has been achieved through clinical trials.

Information about ongoing clinical trials is available from the National Cancer Institute at: <http://www.cancer.gov/clinicaltrials/search>.

Palliative care may be offered when treatments no longer offer a cure and a decision is made to choose supportive care instead. Palliative care is any form of medical care or treatment that concentrates on reducing the severity of disease symptoms, rather than halting or delaying progression of the disease itself or providing a cure. The goal is to prevent and relieve suffering and to improve quality of life for people facing serious, complex illness.

Intervention, Policy, and Recommendations

The **Vermont Ladies First Program**² provides low-income, uninsured, and underserved women access to timely, high-quality screening and diagnostic services to detect breast cancer, cervical cancer, and cardiovascular disease at the earliest stages. This program is funded by the Center for Disease Control's (CDC) National Breast and Cervical Cancer Early Detection Program (NBCCEDP) and WISEWOMAN program. Based on federal guidelines, Ladies First provides services to uninsured and underinsured women at or below 250% of the federal poverty level. The Vermont program provides cardiovascular, cervical, and breast cancer screening to women ages 21 and older. Between January 2006 and December 2010, the Ladies First Program provided screening to 4,500 Vermont women and breast cancer screening for 2,556 women age 40 and older. The program provided 4,050 mammograms and followed up on 516 abnormal findings during this time period.

Treatment for cancer is costly, and many private health insurance plans will pay a percentage of the fees. However, these costs are insurmountable for the millions of Americans who are uninsured. In recognition of the complexity of the issue of treatment costs, coverage and access to care, the United States Congress passed the Breast and Cervical Cancer Prevention and Treatment Act in 2000. In addition to providing funds for screening and diagnostic testing as discussed earlier, the "Medicaid Treatment Act" allows states to provide medical assistance through Medicaid to eligible women who were found to have breast or cervical cancer or pre-cancerous conditions. Vermont passed legislation in 2001 to adopt this Act. In order for a woman to be eligible for Medicaid under this Act, she must have been found to have breast or cervical cancer (including precancerous conditions), be under age 65, be uninsured and otherwise not eligible for Medicaid.

The **Vermont State Cancer Plan**³, published by the Vermont Department of Health and **Vermonters Taking Action Against Cancer (VTAAC)**, provides a strategic roadmap for reducing the burden of cancer in Vermont by 2015. The Plan identifies state-wide priorities in the following areas: prevention, early detection, treatment access and quality, quality of life, and end-of-life care.

² For membership and eligibility information visit http://healthvermont.gov/prevent/ladies_first.aspx or contact Ladies First at 1-800-508-2222.

³ Vermont State Cancer Plan, 2015: <http://healthvermont.gov/prevent/cancer/documents/2015VermontStateCancerPlan-1-21-11.pdf>.

The burden of cancer for all Vermonters can be reduced and the 2015 Vermont State Cancer Plan provides specific goals to move our state forward. Goals related to breast cancer are:

Prevent future cancers by reducing exposure to known risk factors:

- Decrease the prevalence of obesity through nutrition and physical activity. For more information about the Fit & Healthy Vermonters Plan visit: <http://healthvermont.gov/fitandhealthy.aspx>.
- The Fit & Healthy Vermonters Plan also addresses the importance of breastfeeding which may decrease a woman's risk for developing breast cancer.

Detect new cancers as early as possible through appropriate screening:

- Increase early detection of breast cancer among Vermont women.

Increase access to optimal cancer treatment and care:

- Increase informed decision making for Vermont cancer patients and oncologists.
- Increase adherence to NCCN treatment standards for breast cancers at Vermont ACoS cancer centers.
- Reduce pain, discomfort, and distress among Vermont cancer patients and survivors.
- Increase integration of complementary and alternative medicine (CAM) and oncology.
- Reduce financial and practical barriers to optimal cancer care among Vermonters.

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

- Promote optimal health among cancer survivors in Vermont.
- Increase the use of hospice care for Vermont cancer survivors.
- Improve planning for end of life care for cancer survivors and other Vermonters.

Vermonters Taking Action Against Cancer (VTAAC) is a statewide coalition of more than 240 people – cancer survivors, advocates, public health and health care professionals, and others – all dedicated to reducing the impact of cancer for all Vermonters. The Vermont Department of Health and VTAAC are working together to raise awareness, prevent cancer where possible, and improve the prospect of survival for those who are diagnosed with cancer.

For more information about VTAAC visit <http://vtaac.org>. For more information on the State Cancer Plan or current activities and progress, visit: <http://healthvermont.gov/cancer>.

Data Sources

Vermont Cancer Registry: The Vermont Cancer Registry is a central bank of information on all cancer cases diagnosed among Vermont residents as well as out of state residents who are diagnosed or treated in Vermont. The registry enables the state to collect information on new cases (incidence) of cancer since January 1, 1994. The information maintained by the registry allows the Health Department to study cancer trends and improve cancer education and prevention efforts. Vermont Department of Health Cancer Registry, 1999-2008. The Vermont Cancer Registry can be contacted at 802-865-7749 (http://healthvermont.gov/research/cancer_registry/registry.aspx).

Vermont Vital Statistics: In Vermont, all deaths are registered using an Electronic Death Registration System which is maintained by the Vermont Department of Health (VDH), Vital Statistics. Death certificates are available from towns with appropriate jurisdiction or the VDH Vital Records Office. Vital Statistics Bulletins are posted at: <http://healthvermont.gov/research/index.aspx#vital>.

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, 2010.

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, 1975-2008, National Cancer Institute. Bethesda, MD, 2011 (http://www.seer.cancer.gov/csr/1975_2008).

U.S. Vital Statistics: The U.S. Public Use Database Vital Statistical System maintains the U.S. mortality rates. Rates represented in this report are for the U.S. white population. Suggested Citation: Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Public-Use With State, Total U.S. (1969-2008), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2011. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

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 breast cancer cases 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. Breast cancer cases were defined as invasive neoplasms with ICD-O-3 histology code C50.0-C50.9 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 Tenth Edition (ICD-10).

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 4.7 percent of the total Vermont population, compared with the total U.S. non-white population of 28 percent in 2010. 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.

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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.

Statistical Significance: 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.