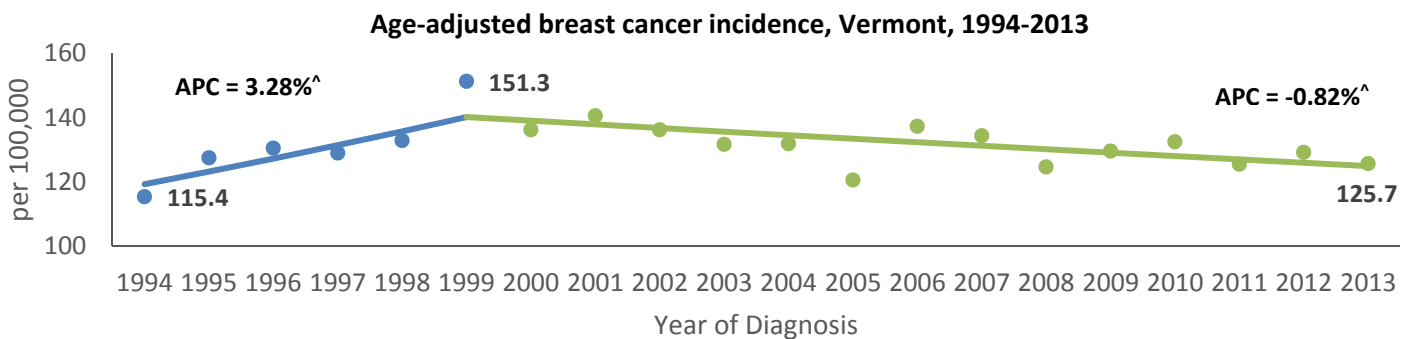# Breast Cancer – Data Brief
Vermont Cancer Registry

Background

"Cancer" is a group of more than 100 diseases characterized by uncontrolled growth and spread of abnormal cells. The abnormal growth of cells eventually forms a tumor and the cancer is named for the part of the body where the tumor originates. Breast cancer is a disease in which malignant cells form in the tissues of the breast[*].
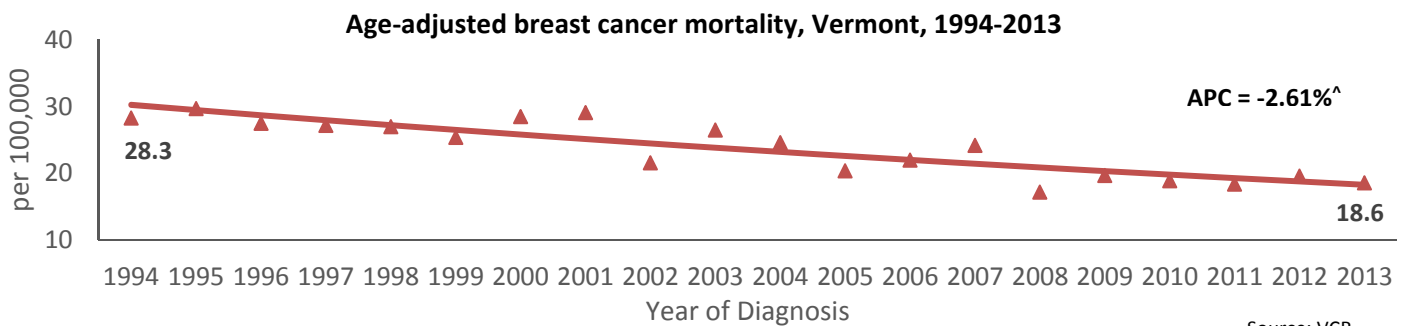
Incidence and Mortality

Among Vermont women, breast cancer is the most commonly diagnosed cancer (29%) and the second leading cause of cancer death (13%), following lung cancer. There are roughly 35,000 adult Vermonters (7%) living with a current or previous diagnosis of cancer[†] (BRFSS, 2015) and 7,000 Vermont women living with a current or previous diagnosis of breast cancer[‡] (BRFSS, 2012). Between 2009 and 2013, Vermont females had a higher[§] rate of breast cancer (128.3 per 100,000) compared to the U.S. rate (122.9 per 100,000). Breast cancer mortality among Vermont females (19.1 per 100,000) is lower compared to the U.S. mortality rate (21.5 per 100,000).

Between 1994 and 2013 approximately 477 women were newly diagnosed with breast cancer each year and incidence rates increased, before decreasing from 2000 to 2013.

Age-adjusted breast cancer incidence, Vermont, 1994-2013

APC = 3.28%^   151.3   APC = -0.82%^
115.4   125.7
per 100,000
Year of Diagnosis

Between 1994 and 2013 there were approximately 89 breast cancer deaths each year among Vermont women. During that time mortality rates decreased.

Age-adjusted breast cancer mortality, Vermont, 1994-2013

28.3   APC = -2.61%^
18.6
per 100,000
Year of Diagnosis

Source: VCR

Increasing age is a significant risk factor for breast cancer incidence and mortality. Approximately 70% of breast cancers diagnosed (2009-2013) occurred in women age 55 and older; only 8% were diagnosed in women less than 45 years of age. For women dying from breast cancer, 83% of deaths occurred among Vermont women age 55 and older, while 5% occurred among women less than 45 years of age.
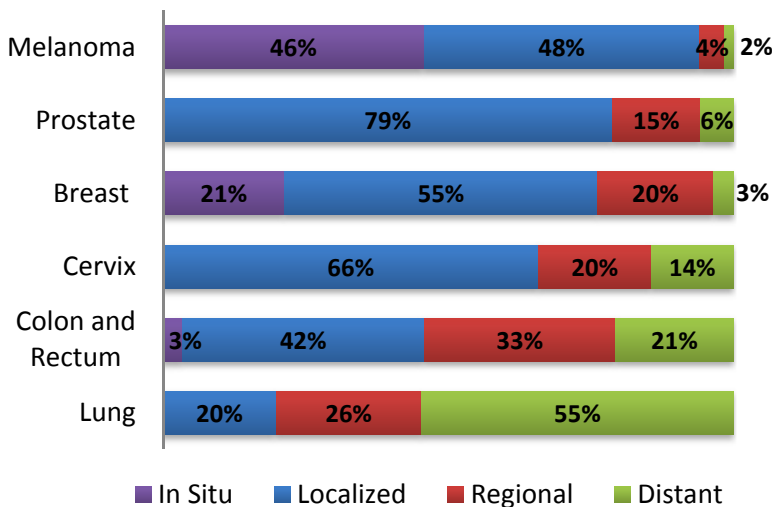
Some risk factors for developing breast cancer such as age, gender, race, breast density, family history or inherited genes cannot be changed. Lifetime exposure to hormones also plays a significant role including early age at first menstruation, late age at menopause, having no children or having a first birth at a later age, breastfeeding,

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[obesity after menopause](#), and long-term use of hormone therapy after menopause or birth control. Certain personal behaviors may also contribute to risk including drinking alcohol, [being overweight or obese](#), and [lack of physical activity](#).
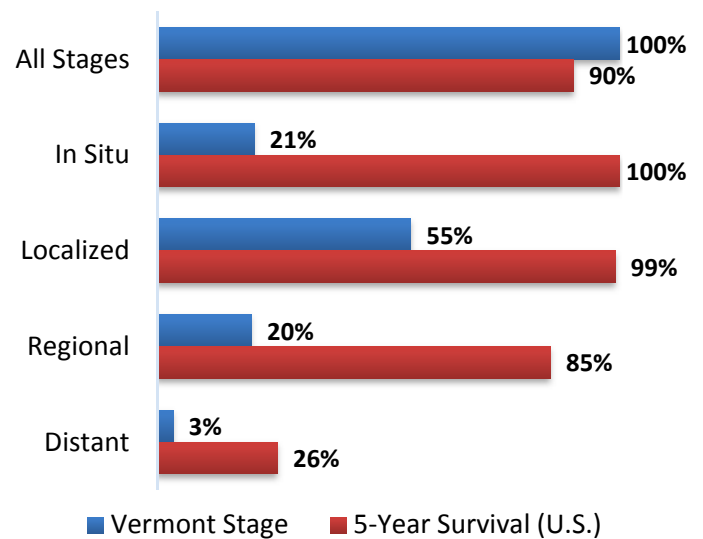
Stage at Diagnosis

Nationally, survival rates for breast cancer have increased due to early detection and advances in effective treatment. Approximately 97% of breast cancers among Vermont women are diagnosed at a localized or regional stage, which has good prognosis. Almost 100% of women whose breast cancer is diagnosed at an early stage (localized) survive their cancer for at least five years. Women diagnosed at later stages, 85% (regional) and 26% (distant), survive for at least five years (SEER Cancer Statistics Review, 2006-2012). A significant portion of Vermont's breast cancer is detected at an early stage (in situ and localized) due to effective mammography screening for adult women of average risk. Vermont women diagnosed at a distant stage account for 3% of breast cancers diagnosis.

Cancer Stage at Diagnosis, % of total cases of cancer, by type, according to stage at diagnosis, 2009-2013

Type	In Situ	Localized	Regional	Distant
Melanoma	46%	48%	4%	2%
Prostate		79%	15%	6%
Breast	21%	55%	20%	3%
Cervix		66%	20%	14%
Colon and Rectum	3%	42%	33%	21%
Lung		20%	26%	55%

■ In Situ ■ Localized ■ Regional ■ Distant

Source: VCR (Derived SEER Summary Stage 2000)

Distribution of Breast Cancer (Vermont, 2009-2013) and 5-year Relative Survival (U.S., 2006-2012) by Stage

| Stage	Vermont Stage	5-Year Survival (U.S.)
All Stages	100%	90%
In Situ	21%	100%
Localized	55%	99%
Regional	20%	85%
Distant	3%	26%

■ Vermont Stage ■ 5-Year Survival (U.S.)

Source: VCR & CSR

Prevention, Screening and Treatment

Screening, early detection, and treatment can reduce later stage diagnosis and mortality. Detection of a cancer at an early stage where the cancer is confined to the breast has better prognosis than cancers diagnosed at a later stage that have spread beyond the breast. The rate of cases of breast cancer that are diagnosed at an advanced stage (regional or distant) is a measure of the effectiveness of cancer screening efforts. Between 1994 and 2013, the incidence of breast cancer diagnosed at a late stage (regional or distant) among females age 50 and older has not changed significantly in Vermont.

Age-adjusted breast cancer incidence rates, late stage diagnosis (regional and distant), age 50+, Vermont, 1994-2013


per 100,000 — Year of Diagnosis — 93.8 ... 81.5
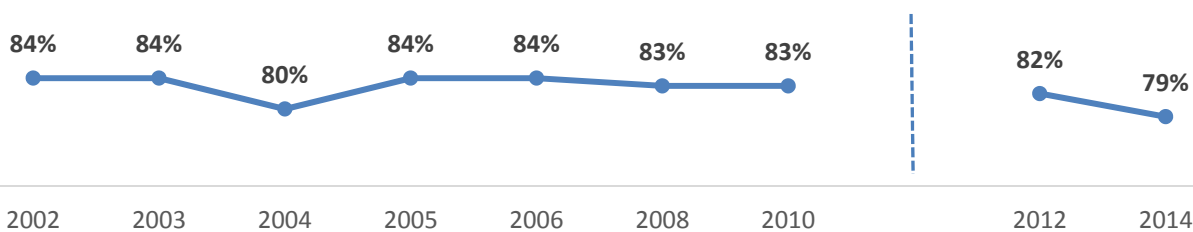
Source: VCR

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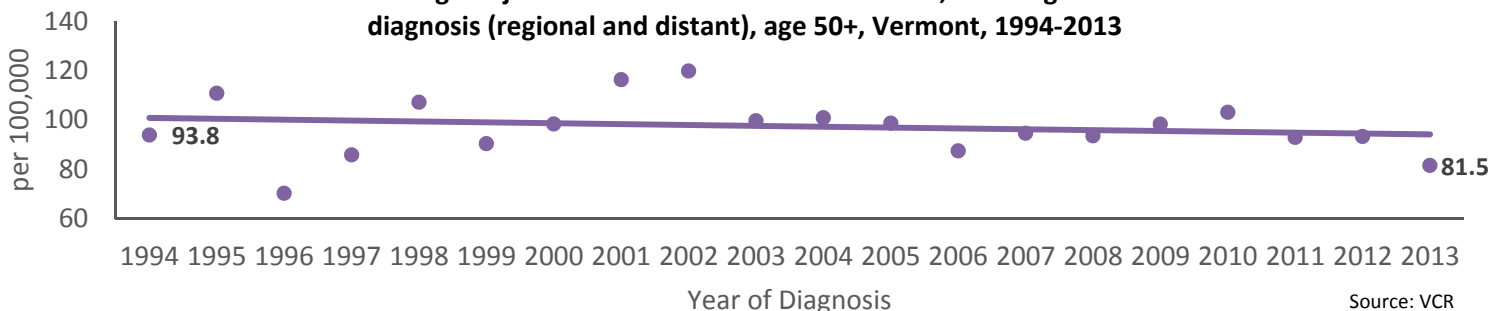
The [United States Preventive Services Task Force](#) (USPSTF) recommends biennial [screening](#) mammography for women who are at average-risk, aged 50 to 74 years. A decision to start screening mammography at an earlier age should be an individual choice and many women place a higher value on the potential benefit over potential harms (false-positive results and unnecessary biopsies) choosing to begin screening between the ages of 40 and 49. Women aged 60 to 69 years are most likely to avoid breast cancer death through mammography screening. Women with increased risk for developing breast cancer (for example having a parent, sibling, or child with breast cancer) may benefit more than average-risk women from beginning screening in their 40s.

In 2014 the Vermont and national mammography cancer screening rate among women aged 50-74 years was 79% (U.S. and VT, BRFSS, 2014). Women aged 50-74 living in households with a higher annual income ($75,000 or more per year) were more likely (86%) to have received a mammogram in the last two years compared to women living in middle ($25,000-<$50,000 annually) income (77%) and low income (less than $25,000 annually) households (69%). Women in high ($50,000-<$75,000) income households (80%) were also more likely to have received a mammogram compared to women in low income homes.

Meet breast cancer screening recommendations, Vermont women, age 50-74, 2014

U.S.	79%
Vermont	79%
Low (<$25K)	69%
Middle ($25K-<$50K)	77%
High ($50K-<$75K)	80%
Highest ($75K+)	86%
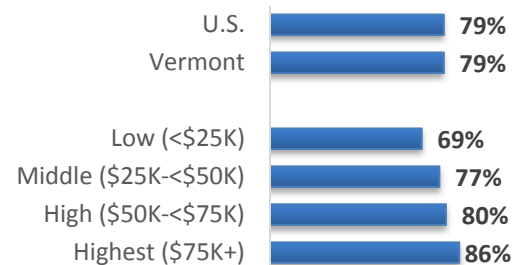
Meet breast cancer screening recommendations, Vermont women, age 50-74, 2002-2014

2002	2003	2004	2005	2006	2008	2010		2012	2014
84%	84%	80%	84%	84%	83%	83%		82%	79%

Source: BRFSS

Early detection and improved treatment has been credited with improvements in breast cancer prognosis and survival. For many types of breast cancer radiation and surgery are likely treatment options. However, identifying a specific type of cancer may support additional treatment decisions that are specific to the type of cancer such as chemotherapy, hormone therapies, and targeted therapies.

Cancer cells collected from a biopsy or surgery can be tested to determine the presence or absence of hormone markers (estrogen (ER) or progesterone (PR) receptors) and excess levels of growth-promoting protein (human epidermal growth factor receptor 2 (HER2)). Some breast cancer subtypes need hormones to grow and are categorized as hormone receptor-positive (HR+) or hormone receptor-negative (HR-). Treatment options may be determined based on the presence or absence of these receptors. If a test for hormone receptors shows that receptors are present, a tumor may respond to anti-estrogen therapy as part of the treatment. Breast cancers with large amounts of HER2 proteins may respond to targeted therapy against HER2.

Breast cancers can be grouped into four main types that can guide treatment decisions:
- Hormone receptor-positive (HR+/HER2-): The most common types of breast cancer have the estrogen receptor (ER+) and/or the progesterone receptor (PR+) but do not have HER2 proteins (HER2-). These cancers can be slow growing and less aggressive and respond to anti-estrogen therapy. Hormone receptor-positive cancers are more common in women following menopause.
- Triple-Negative (HR-/HER2-): Triple-negative breast cancer are less common and are characterized by the absence of estrogen (ER-) and progesterone receptors (PR-) and HER2 (HER2-). These cancers can be more common in younger women and women who are African-American or Hispanic. These cancers can grow and

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spread quickly and without the presence of hormone receptors and HER2 proteins they do not respond to hormone or targeted therapy treatments.

- Triple-positive (HR+/HER2+): These cancers are also less common and are characterized by the presence of estrogen receptor (ER+) and/or progesterone receptor (PR+) and the presence of HER2 (HER2+). They tend to be higher grade and more aggressive but can respond to anti-estrogen and targeted therapies.
- Hormone receptor-negative (HR-/HER2+): A small number of cancers are categorized as HER2-enriched and produce excess HER2 proteins (HER2+) without the presence of estrogen (ER-) or progesterone receptors (PR-). These cancers tend to grow and spread aggressively and tend to have poorer prognosis compared to cancers that are ER+. However, they can respond positively to targeted therapy. Hormone receptor-negative cancers are more common in women who have not yet experienced menopause.

Frequency of breast cancer subtype, Vermont, 2011-2013

Unknown
9%

HR-/HER2+
4%

HR+/HER2+
9%

Triple Negative
9%

HR+/HER2-
69%

Source: VCR
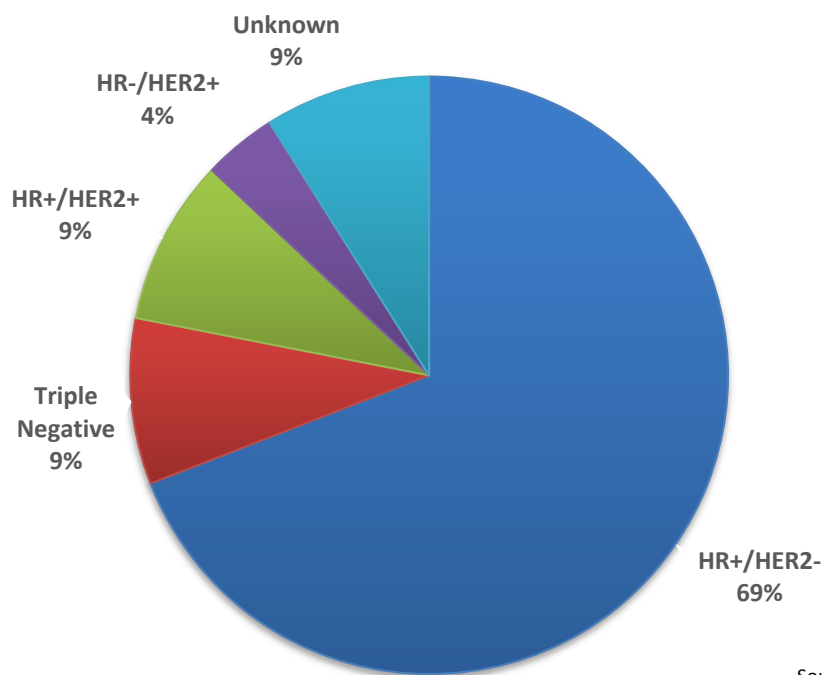
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Technical Notes

These data were collected by the Vermont Cancer Registry participating in the National Program of Cancer Registries (NPCR) of the Centers for Disease Control and Prevention (CDC). Incidence rates are per 100,000 and are age adjusted to the 2000 U.S. standard population and exclude basal cell and squamous cell skin cancers. Incidence rates exclude in situ carcinomas unless otherwise specified. Incidence was coded using the International Classification of Disease for Oncology (ICD-O). Vermont cases include Vermont residents only. A reporting delay by Department of Veterans Affairs (VA) has resulted in incomplete reporting of Vermont VA incident cases in 2011-2013. Mortality data were coded using the International Classification of Disease Tenth Revision (ICD-10) coding system. Vermont deaths include Vermont residents only.

Sources: Vermont Cancer Registry (VCR), Vermont Department of Health (1994-2013). National Program of Cancer Registries (NPCR) and Surveillance, Epidemiology, and End Results (SEER) Program - Incidence State Restricted Access Data File (1999-2013). SEER Cancer Statistics Review (CSR), 1975-2013, National Cancer Institute, April 2016. Vermont Vital Statistics System, Vermont Department of Health (1994-2014). United States and Vermont Behavioral Risk Factor Surveillance Survey (BRFSS), 2002-2015.

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

A statistically significant difference indicates that there is statistical evidence that there is a difference that is unlikely to have occurred by chance alone. In this document, statistically differences in rates or trends are indicated as higher, lower, increased, decreased, not changed, and not different.

[†] Cancer prevalence is the number of people alive today who have ever been diagnosed with cancer. This includes individuals who are newly diagnosed, in active treatment, have completed active treatment, and those living with progressive symptoms of their disease.

[‡] This estimate represents women diagnosed with cancer who said their most *recent* cancer diagnosis was breast cancer. This likely results in an underestimate of the number of women ever diagnosed with breast cancer if they have experienced more than one cancer diagnosis and breast cancer was a preceding diagnosis.

[§] A statistically significant difference indicates that there is statistical evidence that there is a difference that is unlikely to have occurred by chance alone. In this document, statistically differences in rates or trends are indicated as higher, lower, increased, decreased, not changed, and not different.

[^] Annual Percent Change (APC) is used to measure trends in cancer rates over time where cancer rates are assumed to change at a constant percentage of the rate of the previous year. In this document, the APC is reported when it is significantly different from zero (alpha = 0.05).

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