Cancer in Connecticut 2005

With Focus on
Tobacco-Related Cancers
Connecticut Tumor Registry would like to extend special thanks to the cancer registrars and other persons responsible for cancer data collection throughout the state of Connecticut for all of their dedication and hard work.

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Connecticut Tumor Registry
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1 INTRODUCTION

Connecticut Tumor Registry
The Connecticut Tumor Registry is a statewide population-based resource for examining cancer patterns and trends in Connecticut. The registry database includes reported cancers diagnosed since 1935 making it the oldest cancer registry in the USA. Connecticut Tumor Registry is primarily a hospital-based reporting system. All licensed acute-care hospitals in Connecticut are required by public health legislation to report incident cases, along with information on follow-up and treatment. Since 1983, licensed clinical laboratories have been required to report. In addition, the Registry has reciprocal cancer-reporting agreements with all of the adjacent states and several other states (including Florida). These agreements improve the quality of the registry data by allowing identification of Connecticut residents who are diagnosed or treated in other states, which is important in obtaining accurate estimates of cancer rates among Connecticut residents.

The Connecticut Tumor Registry has been part of the Surveillance, Epidemiology and End Results (SEER) Program of the National Cancer Institute since its inception in 1973. Most of the Registry's funding comes from the SEER Program. The SEER program is a unique and important resource: the program currently covers approximately 26% of the total US population, including considerable proportions of the country's minority populations. By 1992, the SEER program comprised registries covering Atlanta, Connecticut, Detroit, Hawaii, Iowa, the Los Angeles area, the San Francisco area, San Jose-Monterey CA, New Mexico, Seattle, and Utah. In order to address the need to better explain the cancer burden in racial/ethnic minorities and medically underserved populations, the program was expanded in 2001 when several new SEER areas were added. Further details about the areas and populations covered by the SEER program are available on the SEER website: http://seer.cancer.gov/

Data in the Connecticut Tumor Registry
The Connecticut Tumor Registry collects information on all invasive cancers (those that have penetrated into cells beyond the layer of tissue in which they developed) and in situ cancers (early cancers that have not spread to neighboring tissue), excluding non-melanoma skin cancers and in situ cancers of the cervix. The registry also collects information on benign (non-cancerous) tumors in the brain and central nervous system (CNS), as these produce similar clinical effects to malignant brain and CNS tumors and can be life-threatening. Data collected include the clinical characteristics of the tumor (site, histology, behavior, extent of disease), treatment details and sociodemographic information on the cancer patient (age, gender, race, ethnicity). The registry has a comprehensive quality assurance program in place to ensure that the data are complete, accurate and timely.

Uses of Registry Data
Connecticut Tumor Registry data are used for the following purposes:
- To contribute to the SEER database on cancer incidence, stage at diagnosis, treatment and survival.
- To provide accurate cancer surveillance statistics to inform public health policy and cancer control efforts at the local, state and national levels.
- To support epidemiological research into the causes and distribution of cancer.
- To address local concerns about cancer rates.

Data from the Connecticut Tumor Registry are included with those from other SEER registries in the National Cancer Institute's annual publication entitled 'Cancer Statistics Review', and in
national publications from the North American Association of Central Cancer Registries (NAACCR). The Connecticut Tumor Registry has provided data to the Central Brain Tumor Registry of the United States (CBTRUS) since 1992. The CBTRUS provides a resource for descriptive statistical data on all primary brain tumors irrespective of behavior. The Connecticut Tumor Registry also contributes data to the International Agency for Research on Cancer (IARC) series of publications ‘Cancer Incidence in Five Continents’, which is updated regularly. The Connecticut Tumor Registry participates in special research studies sponsored by the National Cancer Institute. Further details of research that the registry has undertaken or participated in can be found in the ‘Research Studies’ section at the end of this report.

The Connecticut Tumor Registry has produced a number of monographs examining cancer incidence and trends in Connecticut, a number of which are available to download from the registry website: http://www.ct.gov/dph (select ‘Statistics & Research’ from the main menu on the left side and scroll down for the Tumor Registry page).

Data from the Connecticut Tumor Registry have been used in hundreds of scientific publications by researchers worldwide. A selection of recent publications can be found in the ‘Publications’ section at the end of this report. A full publication list, updated periodically, can be downloaded from the registry website.

Confidentiality of Registry Data
Connecticut Tumor Registry adheres to strict policies and procedures in order to maintain confidentiality. The identities of all patients and institutions reported to the Registry are protected by Connecticut General Statute 19a-25, and may be released to qualified investigators for legitimate cancer studies only if a written protocol, describing the study’s methods and procedures for protecting confidentiality, is approved by the Human Investigations Committee of the Connecticut Department of Public Health.
Although cancer affects people of any age, gender or race, some cancers affect different groups of the population disproportionately. In order to better understand the burden of cancer in the people of Connecticut, a demographic profile of the state is given below.

Age and Gender
The population pyramid below shows the sex and age distribution of the Connecticut population as recorded in the last census.

- Age is a major risk factor in almost all cancers, with over 85% of malignant\(^1\) cancers diagnosed in people aged 50 years or older. In 2000, 30% of the Connecticut population was aged 50 or older. This proportion is likely to be much higher in the next census.
- Women have a clear life expectancy advantage over men: in 2000 there were over two and a half times as many women as men aged 85 years or older.

\(^1\) Excluding non-melanoma skin cancers but including in situ bladder cancers, which are difficult to distinguish from invasive bladder tumors.
Race and Ethnicity
Connecticut is a culturally diverse state. Figure 2 shows the racial and ethnic composition of the state as recorded in the 2000 census.

- In 2000, almost 1 in 10 people in Connecticut were of Black/African American race\(^2\).
- In 2000, almost 1 in 10 people in Connecticut were of Hispanic ethnicity\(^2\).

This is of key importance because cancer incidence, mortality and survival rates vary between different racial and ethnic groups\(^3,4\):

\(^2\) Race and ethnicity are not mutually exclusive. People of a particular race may be of any ethnicity and conversely, people of a particular ethnicity may be of any race.


Cancer Disparities by Race-Ethnicity in the United States and in Connecticut

The racial-ethnic diversity of the population in the U.S., and in Connecticut, is of great interest with regard to disparities in cancer risk, cancer screening, treatment of cancer and survival of patients diagnosed with cancer.

Some selected findings on disparities are listed below.

- Black men and women have the highest cancer mortality rates for all cancers combined.
- Black men have the highest cancer incidence rates for all cancers combined.
- Breast cancer incidence is highest in White women but breast cancer mortality is highest, and breast cancer survival poorest, in Black women.
- Black men have considerably higher mortality rates from prostate cancer than any other racial or ethnic group.
- Rates of cervical cancer are highest in Hispanic women.
- Rates of stomach cancer are highest in Asian or Pacific Islanders.
- American Indians and Alaska Natives have the poorest survival from all cancers combined.
- Overall cancer incidence rates are lower in Hispanic populations, but not for certain cancer sites/types.

Reducing cancer health disparities remains a priority for Connecticut, and is being addressed through research, community health initiatives and the state cancer control plan.

The section in this report on tobacco-related cancers includes data for the largest minority group with the most accurate data on cancer (i.e., African Americans / Blacks) in Connecticut.
3 CANCER INCIDENCE

Cancer incidence is a measure of the new occurrence (diagnosis) of cancer in a population and is one indicator of the cancer burden in that population. Cancer incidence is influenced by the demographic profile of the population as well as factors such as the availability of screening (early detection of asymptomatic cancers) and changes in diagnostic techniques and in the reporting of cancers.

Ten Most Common Newly Diagnosed Cancers in Men

The ten most common invasive (malignant) cancers newly diagnosed in 2005 in men in Connecticut are shown in Figure 3. The numbers do not include in situ cancers except for bladder cancers (due to the difficulty in distinguishing in situ from invasive bladder tumors). These ten cancers accounted for 78% of all of the invasive cancers. The most commonly diagnosed cancer was prostate cancer, accounting for 27% of cancers diagnosed, followed by lung cancer (13%) and bladder cancer (8%).

<table>
<thead>
<tr>
<th>Type of Cancer</th>
<th>Number of Cancers</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>2,502</td>
<td>27%</td>
</tr>
<tr>
<td>Lung</td>
<td>1,240</td>
<td>13%</td>
</tr>
<tr>
<td>Bladder*</td>
<td>733</td>
<td>8%</td>
</tr>
<tr>
<td>Colon</td>
<td>639</td>
<td>7%</td>
</tr>
<tr>
<td>Melanoma of the Skin</td>
<td>537</td>
<td>6%</td>
</tr>
<tr>
<td>Non-Hodgkin Lymphoma</td>
<td>428</td>
<td>5%</td>
</tr>
<tr>
<td>Rectum</td>
<td>344</td>
<td>4%</td>
</tr>
<tr>
<td>Kidney and Renal Pelvis</td>
<td>325</td>
<td>3%</td>
</tr>
<tr>
<td>Oral Cavity and Pharynx</td>
<td>276</td>
<td>3%</td>
</tr>
<tr>
<td>Pancreas</td>
<td>272</td>
<td>3%</td>
</tr>
<tr>
<td>Other cancers</td>
<td>2,081</td>
<td>22%</td>
</tr>
<tr>
<td><strong>All invasive cancers</strong></td>
<td><strong>9,377</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

*including in situ bladder cancers (see text)

Figure 3: Ten most commonly diagnosed invasive cancers* in men in Connecticut in 2005.
*Including in situ bladder cancers (see text)
(Source: Connecticut Tumor Registry/SEER Database)

Ten Most Common Newly Diagnosed Cancers in Women

The ten most common invasive cancers newly diagnosed in 2005 in women in Connecticut are shown in Figure 4. The numbers do not include in situ cancers except for bladder cancers (due to the difficulty in distinguishing in situ from invasive bladder tumors). These ten cancers accounted for 79% of all of the invasive cancers. The most commonly diagnosed cancer was breast cancer, accounting for 29% of cancers diagnosed, followed by lung cancer (14%) and colon cancer (8%).
The reasons contributing to these patterns of cancer incidence are complex, and depend on a number of factors:

- **The age of the population** – cancer is predominantly a disease affecting older people.
- **The racial and ethnic distribution in the population** – some cancers are more (or less) common in particular racial and ethnic groups.
- **The lifestyle characteristics and risk factors affecting the population.** The following factors are known to increase the risk of certain cancers:
  - Tobacco use;
  - Drinking alcohol;
  - Obesity;
  - Dietary factors;
  - Lack of physical activity;
  - Exposure to sunlight;
  - Exposure to infectious agents.
- **The availability of screening and diagnostic tools** – usage of techniques such as mammography, colonoscopy, prostate-specific antigen (PSA) testing and Pap smears has an impact on the diagnosis rates of particular cancers.
- **Other factors affecting diagnosis and treatment of cancers, such as access to services and level of (or lack of) health insurance.**

### Figure 4: Ten most commonly diagnosed invasive cancers* in women in Connecticut in 2005.

*Including in situ bladder cancers (see text)
(Source: Connecticut Tumor Registry/SEER Database)
The cancer incidence rate is defined as the number of new cancer cases per 100,000 persons per year. In this chapter the rates are presented as age-specific rates or age-adjusted rates. Age-adjustment allows comparison of rates between different groups of people or between different time periods, ensuring that any differences in rate are not just due to different proportions of older people. All age-adjusted rates are adjusted to the 2000 US Standard Population.

**Cancer Incidence Age Profile**

Figure 5 shows the age specific incidence rates of all invasive cancers (including in situ bladder cancers) in men and women in Connecticut in 2005 by age at diagnosis. In both genders the rates increased with increasing age up to age 80-84 years, and subsequently decreased. 71% of all invasive cancers in men and 63% of all invasive cancers in women were diagnosed in people aged 60 years or older. The rates in men were more than 1.5 times higher than the rates in women, for people aged 65 years or older.

Figure 5: Age specific incidence rates of all invasive cancers* combined in men and women in Connecticut in 2005 by age at diagnosis.

*Including in situ bladder cancers
(Source: Connecticut Tumor Registry/SEER Database)
Trends in Cancer Incidence
Figure 6 shows the annual age-adjusted incidence rates of the five currently most common cancers in men and women in Connecticut from 1973 through 2005.

Figure 6: Trends in age adjusted incidence rates of the five currently most common cancers in men and women in Connecticut 1973-2005. (Source: Connecticut Tumor Registry/SEER Database)
3 CANCER INCIDENCE

Key points
- Lung cancer incidence rates decreased over time in men but increased in women, reflecting differences in the changing patterns of tobacco usage between the sexes.
- Colon cancer incidence rates in both men and women increased until the mid-1980s and decreased thereafter. The reasons contributing to this are complex and include changes in people’s exposures to risk factors and in colonoscopy usage (which can prevent colorectal cancer through detection and removal of pre-malignant polyps).
- Rates of incidence of melanoma of the skin increased over time in both men and women. The reasons contributing to this are complex and include changes in people’s exposure to ultraviolet radiation (sunlight and tanning beds) and in diagnostic and screening practices.
- In men, prostate cancer incidence increased dramatically in the early 1990s, due in part to the introduction of PSA testing. The rate peaked in 1992 and fluctuated somewhat thereafter.
- In women, breast cancer incidence rates increased until 2001, decreased slightly thereafter and leveled off. The reasons contributing to this are complex and include changes in hormonal factors (having children later in life, hormone replacement therapy usage) and in screening mammography usage.
4 CANCER MORTALITY

The cancer mortality rate is the most reliable measure of progress against cancer\(^5\). The recording of death has been stable over time, and mortality rates are less susceptible to external factors (such as screening) than survival rates.

**Ten Most Common Causes of Cancer Death in Men**
The ten most common causes of cancer death in 2005 in men in Connecticut are shown in Figure 7. These ten cancers accounted for 74% of all cancer deaths. The most common cause of cancer death was lung cancer, accounting for 27% of cancer deaths, followed by prostate cancer (12%) and pancreatic cancer (7%).

<table>
<thead>
<tr>
<th>Cause of Cancer Death</th>
<th>Number of Deaths</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung</td>
<td>957</td>
<td>27%</td>
</tr>
<tr>
<td>Prostate</td>
<td>406</td>
<td>12%</td>
</tr>
<tr>
<td>Pancreas</td>
<td>235</td>
<td>7%</td>
</tr>
<tr>
<td>Colon</td>
<td>222</td>
<td>6%</td>
</tr>
<tr>
<td>Non-Hodgkin Lymphoma</td>
<td>151</td>
<td>4%</td>
</tr>
<tr>
<td>Esophagus</td>
<td>143</td>
<td>4%</td>
</tr>
<tr>
<td>Leukemia</td>
<td>142</td>
<td>4%</td>
</tr>
<tr>
<td>Bladder</td>
<td>138</td>
<td>4%</td>
</tr>
<tr>
<td>Liver</td>
<td>105</td>
<td>3%</td>
</tr>
<tr>
<td>Stomach</td>
<td>100</td>
<td>3%</td>
</tr>
<tr>
<td>Other cancers</td>
<td>924</td>
<td>26%</td>
</tr>
<tr>
<td>All invasive cancers</td>
<td>3,523</td>
<td>100%</td>
</tr>
</tbody>
</table>

Figure 7: Ten most common causes of cancer death in men in Connecticut in 2005. (Source: Connecticut Tumor Registry/SEER Database)

**Ten Most Common Causes of Cancer Death in Women**
The ten most common causes of cancer death in 2005 in women in Connecticut are shown in Figure 8. These ten cancers accounted for 75% of all cancer deaths. The most common cause of cancer death was lung cancer, accounting for 25% of cancer deaths, followed by breast cancer (15%) and colon cancer (9%).

The cancer mortality rate is defined as the number of cancer deaths per 100,000 persons per year. In this chapter the rates are presented as age-specific rates or age-adjusted rates. Age-adjustment allows comparison of rates between different groups of people or between different time periods, ensuring that any differences in rate are not just due to different proportions of older people. All age-adjusted rates are adjusted to the 2000 US Standard Population.

**Cancer Mortality Age Profile**

<table>
<thead>
<tr>
<th>Cause of Cancer Death</th>
<th>Number of Deaths</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung</td>
<td>873</td>
<td>25%</td>
</tr>
<tr>
<td>Breast</td>
<td>532</td>
<td>15%</td>
</tr>
<tr>
<td>Colon</td>
<td>301</td>
<td>9%</td>
</tr>
<tr>
<td>Pancreas</td>
<td>242</td>
<td>7%</td>
</tr>
<tr>
<td>Ovary</td>
<td>174</td>
<td>5%</td>
</tr>
<tr>
<td>Non-Hodgkin Lymphoma</td>
<td>122</td>
<td>3%</td>
</tr>
<tr>
<td>Leukemia</td>
<td>120</td>
<td>3%</td>
</tr>
<tr>
<td>Uterus</td>
<td>106</td>
<td>3%</td>
</tr>
<tr>
<td>Brain and Other Nervous System</td>
<td>85</td>
<td>2%</td>
</tr>
<tr>
<td>Stomach</td>
<td>83</td>
<td>2%</td>
</tr>
<tr>
<td>Other cancers</td>
<td>891</td>
<td>25%</td>
</tr>
<tr>
<td>All invasive cancers</td>
<td>3,529</td>
<td>100%</td>
</tr>
</tbody>
</table>

Figure 8: Ten most common causes of cancer death in women in Connecticut in 2005. (Source: Connecticut Tumor Registry/SEER Database)

Figure 9: Age specific death rates from all invasive cancers combined in men and women in Connecticut in 2005 by age at diagnosis. (Source: Connecticut Tumor Registry/SEER Database)
4 CANCER MORTALITY

Figure 9 shows the age specific mortality rates of all invasive cancers in men and women in Connecticut in 2004 by age at death. In both genders the rate increased with increasing age. Over 80% of all cancer deaths in men and women were in people aged 60 years or older. The rates in men were more than 50% higher than the rates in women, for people aged 60 years or older.

**Trends in Cancer Mortality**

Figure 10: Trends in age adjusted mortality rates of the five most common causes of cancer death in men and women in Connecticut 1973-2005. (NHL: Non-Hodgkin Lymphoma) (Source: Connecticut Tumor Registry/SEER Database)
Key points

- Lung cancer mortality rates in men were stable until the late 1980s then decreased steadily thereafter. In women, rates increased until the mid 1990s and leveled off thereafter. These rates reflect differences in the changing patterns of tobacco usage between the sexes.

- Colon cancer mortality rates in men and women have generally decreased over time. The reasons contributing to this are complex and include changes in people’s exposures to risk factors and in colonoscopy usage (which can prevent colorectal cancer through detection and removal of pre-malignant polyps).

- In men, prostate cancer mortality rates were steady until the early 1990s, and decreased thereafter. The reasons contributing to this are complex and may include PSA testing and changes in treatment.

- In women, breast cancer mortality rates decreased over time. The reasons contributing to this are complex and include earlier detection through mammography screening and changes in treatment.

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6 The U.S. Preventive Services Task Force deem evidence on the benefits of PSA testing to be insufficient to make a recommendation for its use in men aged less than 75 years. They recommend against its use in men aged 75 years and older (http://www.ahrq.gov/clinic/uspstf/uspsprca.htm).
5 CANCER SURVIVAL

Cancer survival is measured in a number of different ways depending on the intended purpose of the measure. The survival rate is a measure of how long people live after diagnosis with cancer. The relative survival rate adjusts for mortality in the general population, and is defined as the ratio of a cancer patient's chance of surviving their cancer a given period of time relative to that of a person of the same age and sex in the general US population. Hence a group of cancer patients with a 100% 5-year relative survival rate indicates that they are just as likely to survive 5 years as people in the general population of the same age and sex. It does not mean that all patients will survive for 5 years after diagnosis of cancer.

5-Year Relative Survival from the Five Most Commonly Diagnosed Cancers

Figure 11 shows 5-year relative survival from the five most commonly diagnosed cancers in men and women in Connecticut in 2005.

<table>
<thead>
<tr>
<th>Type of Cancer</th>
<th>5-Year Relative Survival</th>
<th>Type of Cancer</th>
<th>5-Year Relative Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>98%</td>
<td>Breast</td>
<td>89%</td>
</tr>
<tr>
<td>Lung</td>
<td>15%</td>
<td>Lung</td>
<td>20%</td>
</tr>
<tr>
<td>Bladder</td>
<td>81%</td>
<td>Colon</td>
<td>63%</td>
</tr>
<tr>
<td>Colon</td>
<td>66%</td>
<td>Uterus</td>
<td>86%</td>
</tr>
<tr>
<td>Melanoma of the Skin</td>
<td>92%</td>
<td>Melanoma of the Skin</td>
<td>93%</td>
</tr>
</tbody>
</table>

In men, 5-year survival ranged from 98% for men diagnosed with prostate cancer to 15% for men diagnosed with lung cancer. In women, 5-year survival ranged from 93% for women diagnosed with melanoma of the skin to 20% for women diagnosed with lung cancer. Where the cancer affected men and women (i.e., lung cancer, colon cancer and melanoma of the skin), the 5-year relative survival rate was higher in women although only statistically significantly higher for lung cancer.
Variation in 5-Year Relative Survival with Stage at Diagnosis

Figure 12 shows the variation in 5-year relative survival with stage at diagnosis for the five most commonly diagnosed cancers in men and women in Connecticut in 2005. Also shown is the stage distribution of these cancers.


*Prostate: Localized and regional stages are combined into a single stage category.
**Bladder: ‘Localized’ also includes in situ cancers.
(Source: Connecticut Tumor Registry/SEER Database)
Key Points

- For all of the cancers shown, the more advanced the stage of the cancer at diagnosis the poorer the 5-year relative survival.
- 5-Year relative survival was highest in men for prostate cancer and in women for breast cancer in all stage groups.
- 5-Year relative survival was poorest in both men and women for lung cancer; more than 2 in 5 lung cancers were diagnosed at a late (distant) stage.

Trends in 5-Year Relative Survival

Figure 13 shows trends in 5-year relative survival from the five most commonly diagnosed cancers in men and women in Connecticut in 2005, for cancers diagnosed 1973-2000.

Key Points

- 5-Year relative survival rates have improved over time for all of the cancers shown.
- In men, the greatest improvement in survival has been for prostate cancer, due in part to PSA testing, which can detect early prostate cancer in asymptomatic men, and improvements in treatment. However, PSA testing may lead to inflated survival rates due to various biases.
- In women, the greatest improvement in survival has been for breast cancer, due in part to mammography screening, which can detect early breast cancer in asymptomatic women, and improvements in treatment. Although mammography screening is subject to the same biases as PSA testing (see above), it has been proven to reduce mortality from breast cancer and is recommended by the U.S. Preventive Services Task Force for women aged 40 years and older.
- Although lung cancer survival has seen slight improvement in both men and women, prognosis remains poor and prevention, early detection and effective treatments must continue to be research priorities.
- As an indicator of overall progress in cancer control, age-adjusted mortality rates provide a more reliable measure than survival since the recording of mortality has been stable over time and mortality rates are less susceptible to biases.

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8 http://www.ahrq.gov/clinic/uspstf/uspsbrca.htm
Figure 13: Trends in 5-year relative survival from the five most commonly diagnosed cancers in men and women in Connecticut in 2005. Cancers diagnosed 1973-2000 and followed up through the end of December 2005. (Source: Connecticut Tumor Registry/SEER Database)
6 TOBACCO-RELATED CANCERS

Exposure to tobacco smoke is a major cause of morbidity and mortality, and is implicated in a number of diseases and conditions including cancer, cardiovascular disease, respiratory disease and reproductive effects\(^\text{10}\). Substantial evidence points to strong a causal relationship between smoking and the following cancers\(^\text{10,11}\):

- Lung
- Bladder
- Oral cavity and pharynx
- Esophageal
- Laryngeal

Smoking habits vary greatly between men and women, and between different races. This chapter examines the variation in incidence, mortality and survival rates of the above tobacco-related cancers in Connecticut residents by gender and race.

**Note.** Rates are presented for the SEER race categories Black and White, which include people of both Hispanic and non-Hispanic ethnicities. Data for other race categories (American Indian/Alaskan Native, Asian or Pacific Islander) are not presented because of small numbers leading to unstable rate estimates. Where rates presented here are based on <16 cases (or deaths), they are highlighted with an asterisk. Such rates are considered unreliable\(^\text{12}\).

**Incidence of Tobacco-Related Cancers**

Figure 14 shows age-adjusted incidence rates of tobacco-related cancers in Black and White men and women in Connecticut, diagnosed in six 5-year time periods from 1976-1980 to 2001-2005.

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(Source: Connecticut Tumor Registry/SEER Database)
6 TOBACCO-RELATED CANCERS - INCIDENCE

Lung cancer:
- In all time periods incidence rates were higher in men than in women although the difference has been decreasing over time. The rates in men have decreased over time while the rates in women have increased, reflecting patterns of smoking in Connecticut men and women\textsuperscript{13,14}.
- In men, the rates were consistently higher in Black men than White men, although the difference has decreased over time. This is consistent with changes in smoking habits: smoking prevalence has seen greater decreases in White men than Black men \textsuperscript{13,14}.
- In women, the rates were consistently higher in White women than Black women and the difference has increased over time.

Bladder cancer:
- In all time periods, incidence rates were higher in men that in women. The rates have increased slightly over time.
- In men, the rates were twice as high in White men as in Black men.
- In women, the rates were consistently higher in White women than in Black women.

Cancer of the oral cavity and pharynx
- In all time periods, incidence rates were higher in men than in women although the difference has decreased over time. The rates in men have decreased while the rates in women have remained relatively stable.
- In men, the rates were consistently higher in Black men than in White men.
- In women, the rates in Black and White women were not significantly different.

Esophageal cancer
- In all time periods within race groups, incidence rates in men were consistently higher than in women. In Black men and women, the difference has decreased while in White men and women the difference has increased.
- In men, the rates in Black men were higher than in White men although the difference has decreased significantly over time. The rates in Black men have decreased considerably while the rates in White men have increased gradually.
- In women, the rates in Black women have decreased slightly over time while the rates in White women have remained stable.

Laryngeal cancer
- In all time periods, incidence rates were higher in men than in women although the difference has decreased over time. The rates in men have decreased while the rates in women have remained relatively stable.
- In men, the rates in Black men were higher than in White men although the difference has decreased over time. The rates in Black men have decreased more quickly than the rates in White men.
- In women, the rates in Black women were consistently higher than in White women.

\textsuperscript{13} Centers for Disease Control and Prevention, National Health Information Survey. Available on line: http://www.cdc.gov/nchs/about/major/nhis/tobacco/nhis_tobhoma.htm

\textsuperscript{14} Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System. Available on line: http://www.cdc.gov/brfss/
Mortality from Tobacco-Related Cancers

Figure 15 shows age-adjusted mortality rates in Black and White men and women in Connecticut, in six 5-year time periods from 1976-1980 to 2001-2005.

**Lung cancer:**
- In all time periods mortality rates were higher in men than in women although the difference has been decreasing over time. The rates in men have decreased over time while the rates in women have increased, reflecting patterns of smoking in Connecticut men and women\(^\text{13,14}\).
- In men, the rates were consistently higher in Black men than White men, although the difference has decreased over time. This is consistent with changes in smoking habits: smoking prevalence has seen greater decreases in White men than Black men over time\(^\text{13,14}\).
- In women, the rates were higher in White women than Black women and the difference has increased over time.

**Bladder cancer:**
- In all time periods, mortality rates were higher in men that in women. The rates have decreased slightly over time.
- In men, the rates were higher in White men than in Black men.
- In women, the rates were lower in White women than in Black women in the earlier time periods but higher in the later time periods.

**Cancer of the oral cavity and pharynx**
- In all time periods, mortality rates were higher in men than in women although the difference has decreased over time. The rates in men have decreased more rapidly than the rates in women.
- In men, the rates were consistently higher in Black men than in White men.
- In women, except for the earliest time period the rates in Black and White women were not significantly different. In 1976-1980 the rate was higher in Black women than in White women.

**Esophageal cancer**
- In all time periods within race groups, mortality rates in men were consistently higher than in women. In Black men and women, the difference has decreased while in White men and women the difference has increased slightly.
- In men, the rates in Black men were higher than in White men although the difference has decreased significantly over time. The rates in Black men have decreased considerably while the rates in White men have increased slightly.
- In women, the rates in Black women were consistently higher than in White women. The rates in Black women have decreased gradually over time while the rates in White women have remained stable.

**Laryngeal cancer**
- In all time periods, mortality rates were higher in men than in women. The rates in men have decreased while the rates in women have remained relatively stable.
- In men, the rates in Black men were higher than in White men although the difference has decreased over time. The rates in Black men have decreased more quickly than the rates in White men.
- In women, the rates in Black women were higher than in White women.
5-Year Relative Survival from Tobacco-Related Cancers

Figure 16 shows 5-year relative survival rates in Black and White men and women in Connecticut, diagnosed in five 5-year time periods from 1976-1980 to 1996-2000.

**Lung cancer:**
- In all time periods within race groups, 5-year relative survival rates were lower in men than in women. The rates have not improved significantly over time except in White men, where there has been slight improvement.
- In men, the rates were consistently lower in Black men than White men. The rates in White men have improved slightly and the rates in Black men have not changed over time.
- In women, except for the earlier time period, the rates were lower in Black women than White women.

**Bladder cancer:**
- In all time periods within race groups, 5-year relative survival rates were higher in men than in women. The rates have improved slightly over time, the greatest improvement seen in Black women.
- In men, the rates were lower in Black men than in White men.
- In women, the rates were lower in Black women than in White women although the difference has decreased slightly over time.

**Cancer of the oral cavity and pharynx**
- In all time periods within race groups, 5-year relative survival rates were lower in men than in women. The rates have improved slightly over time.
- In men, the rates were consistently lower in Black men than in White men.
- In women, the rates were consistently lower in Black women than in White women.

**Esophageal cancer**
- In all time periods except 1986-1990 and within race groups, 5-year relative survival rates in men were lower than in women. The rates have improved over time but the improvements have been slower in the rates for Black men and Women.
- In men, the rates in Black men were consistently lower than in White men.
- In women, the rates in Black women were consistently lower than in White women.

**Laryngeal cancer**
- In all time periods within race groups, 5-year relative survival rates were consistently lower in White women than in White men but similar in Black women and Black men. The rates have decreased slightly over time.
- In men, the rates in Black men were consistently lower than in White men.
- In women, the rates in Black women were lower than in White women.
7 RESEARCH STUDIES

A selection of research studies undertaken by Connecticut Tumor Registry, or using Connecticut Tumor Registry data, are described below. Several of the studies have resulted in articles published in peer-reviewed journals; details of these are given in the ‘Publications’ section of this report.

SEER Patterns of Care
The SEER Patterns of Care (POC) study aims to evaluate the diffusion of state-of-the-art cancer therapy into community practice, to disseminate findings in scientific journals and through professional meetings, and to work with professional organizations to develop educational opportunities to increase the use of state-of-the-art cancer therapy and quality of care in community practice. Each year, NCI selects different cancer sites to be included in the POC studies and randomly samples cases from those ascertained by the SEER registries. In the most recent study, the cancer sites under study were thyroid, glioblastoma, and adolescent/young adult cancers (acute lymphoblastic leukemia, germ cell, lymphoma, sarcoma) diagnosed in 2006. Hospital and physician reports have been obtained in order to verify and supplement information on the first course of treatment. Additionally, POC questionnaires have been mailed to almost 400 physicians in the state. Other information, including insurance status and co-morbidity, has also been collected for the patients. The CTR has participated in all of the SEER POC studies conducted by the SEER Program.

Myelodysplastic Syndromes in Connecticut
Myelodysplastic syndromes (MDS) are a group of diseases in which the production of blood cells by the bone marrow is disrupted. Since 2001, MDS have been reportable to the SEER program, of which Connecticut Tumor Registry is part. A study was undertaken using registry data to examine the incidence, survival and spatial distribution of MDS in Connecticut. This study was a SEER Program-funded Rapid Response Surveillance Study (RRSS).

HER2 Reporting in Pathology Reports
Expression of Human Epidermal growth factor Receptor 2 (HER2) is an important prognostic indicator in breast cancer. Reporting of HER2 status is not, however, currently mandated by the SEER program. Researchers at the University of Connecticut Health Center, in collaboration with staff at the Connecticut Tumor Registry, examined the reporting of HER2 status in breast cancer pathology reports received by the registry.

Geospatial Analysis of Cancer
Researchers from the University of Connecticut Health Center have utilized geo-coded data from the Connecticut Tumor Registry to probe the spatial distributions of breast and prostate cancer incidence and survival using a spatial scan statistic technique.

Central Nervous System Tumors in an Occupational Cohort
The Connecticut Tumor Registry is participating with researchers from the University of Pittsburgh and the University of Illinois at Chicago on a study of central nervous system (CNS) tumors in a cohort of aerospace workers in CT. The multi-year study focused first on CNS and all cause mortality. These two studies have been published. CNS tumor incidence is currently being analyzed. Data from the CTR will be used for the denominators when calculating benign CNS tumors, since these tumors have been reportable in CT since 1962.
Data Linkage with Cancer Screening Data
The Connecticut Tumor Registry has undertaken a pilot data linkage study with the Connecticut Breast and Cervical Cancer Early Detection Program (CBCCEDP), part of the Centers for Disease Control and Prevention’s National Breast and Cervical Cancer Early Detection Program (http://www.cdc.gov/cancer/nbccedp/). The aim of the study was to develop protocols and methods for the routine linkage of data between the two programs in order to enhance the quality of the data held by the CBCCEDP.
8 PUBLICATIONS

Reports


Published Articles

The articles listed below are selected recent publications involving researchers in the Connecticut area who used data from the Connecticut Tumor Registry (CTR) or the Yale Rapid Case Ascertainment Shared Resource, which acts as an agent of the CTR.

2006:


2007:


2008:


# GLOSSARY OF TERMS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Rate, Age-adjusted rate</td>
<td>Rates of new cancer cases or deaths are the numbers of cases or deaths in a given number of men or women (usually 100,000) in a year. Because the risk of cancer increases with age, rates are usually age-adjusted, which allows rates in different groups of people to be compared even when one group has a higher proportion of older people.</td>
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<tr>
<td>Benign</td>
<td>A benign tumor is histologically (microscopically) non-cancerous and does not spread to other parts of the body.</td>
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<td>Incidence</td>
<td>Incidence is the number of newly diagnosed cases during a specific time period.</td>
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<tr>
<td>In situ</td>
<td>“In situ” cancers are pre-invasive, early-stage cancers that have not invaded through the immediate microscopic layer of tissue and cannot spread through the lymph or blood vessels.</td>
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<tr>
<td>Invasive (Malignant)</td>
<td>Invasive (malignant) cancers are those that have spread (or 'invaded') into cells beyond the microscopic layer of tissue in which they first developed.</td>
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<tr>
<td>Metastatic</td>
<td>Metastatic or distant stage cancer has spread from the primary site to distant organs or distant lymph nodes.</td>
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<tr>
<td>Mortality</td>
<td>Mortality is the number of deaths during a specific time period.</td>
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<tr>
<td>Screening</td>
<td>Cancer screening is testing people for very early signs of a particular cancer before they have any symptoms. Examples of cancer screening tests include:</td>
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<td></td>
<td>• Mammography for breast cancer;</td>
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<td>• Pap smears for cervical cancer;</td>
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<td>• Colonoscopy and fecal occult blood testing for colorectal cancer.</td>
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<tr>
<td>Survival, Relative survival</td>
<td>The survival rate is a measure of how long people live after diagnosis with cancer. The relative survival rate is defined as the ratio of a cancer patient's chance of surviving a given time interval to that of a person of the same age and sex in the general US population (i.e., the rate has been adjusted for mortality in the general population).</td>
</tr>
<tr>
<td>SEER</td>
<td>The Surveillance, Epidemiology and End Results program of the National Cancer Institute.</td>
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<td></td>
<td><a href="http://seer.cancer.gov/">http://seer.cancer.gov/</a></td>
</tr>
<tr>
<td>Stage at diagnosis</td>
<td>The stage of a cancer is a measure of how far the cancer has spread at the time of diagnosis. Stage is usually based on the size of the tumor, whether lymph nodes contain cancer, and whether the cancer has spread (metastasized) from the original site to other parts of the body. &quot;In situ&quot; cancer is pre-invasive cancer that has not invaded through the immediate microscopic layer of tissue and cannot spread through the lymph or blood vessels. <em>Localized</em> cancer is limited to the organ in which it began, without evidence of spread. <em>Regional</em> cancer has spread beyond the original (primary) site to nearby lymph nodes or organs and tissues. <em>Distant</em> stage cancer has spread from the primary site to distant organs or distant lymph nodes. Unstaged cancers are those for which there is not enough information to indicate a stage.</td>
</tr>
</tbody>
</table>
10 DATA SOURCES

Software:


Databases

Incidence:
Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov/)

Mortality:
Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov/)

Survival:
Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov/)
For more information about cancer in Connecticut, contact:
Connecticut Tumor Registry
Connecticut Department of Public Health
410 Capitol Avenue, MS# 13TMR
P.O. Box 340308
Hartford, CT 06134-0308
Telephone: (860) 509-7163

Or visit our website:
www.ct.gov/dph (select ‘Statistics & Research’ from main menu on left side and scroll down for Tumor Registry page)