CONNECTICUT CANCER SURVEILLANCE

1990-2000

Department of Public Health
State of Connecticut
August 2004

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1990-2000

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INTRODUCTION

The State of Connecticut Department of Public Health (DPH) has prepared this report, *Connecticut Cancer Surveillance, 1990-2000*, to help Connecticut residents learn more about cancer in their communities.

The report includes:

- General information about cancer
- Connecticut cancer statistics
- Comparison of Connecticut cancer statistics with those for nearby states and the United States
- Maps showing the Standardized Incidence Ratio (SIR) for cancers in each town. The SIR is defined as the number of *observed* cancers in the town divided by the *expected* number for the town. The expected number is calculated using statewide rates.

The cancer statistics in this report are presented primarily as *incidence* and *incidence rates*. "Incidence" means the number of new cancers in a given time period. "Incidence rate" means the number of cancers divided by the total population in the relevant group, and is expressed the number of cancers per 100,000 residents. The population includes all people with or without a recently diagnosed cancer.

Contacts

More information about cancer and cancer data are available from:

- DPH Tumor Registry:
  860-509-7163
  http://www.dph.state.ct.us

- National Cancer Institute:
  http://cancer.gov or http://www.seer.cancer.gov/

- Centers for Disease Control and Prevention
  http://www.cdc.gov

- North American Association of Central Cancer Registries:
  http://www.naaccr.org/

For information about cancer prevention programs for breast, cervical and lung cancer, please contact **860-509-7819**

If you are concerned that cancer rates are elevated in your town, please contact **860-509-7163**

1. ABOUT CANCER

What is cancer?
Cancer is more than one disease, characterized by the abnormal growth of cells in the body.

The body is made up of billions of cells, which reproduce by dividing. Through this process, the body grows and repairs itself. Sometimes, cells begin dividing when they should not, and a tumor forms. Tumors may be *benign* or *malignant.* Benign tumors do not have the potential to invade surrounding tissue. Malignant tumors, are called *cancers*, and can spread to other tissues or organs nearby or to other parts of the body. *Invasive* cancers are those that have penetrated the tissue surrounding the organ. An invasive cancer that has spread to distant parts of the body is a *metastasis*. Cancers grow at different speeds. Some grow very quickly; others may grow slowly over a period of many years.

Some cancers are easily cured, while others are difficult to treat. Treatment depends on the place in the body where the cancer cells grow, how large the tumor is when it is first found, and if it has spread. Doctors consider tumors that originate in different parts of the body (not those that spread, but new tumors) to be separate primary tumors, or different diseases. Generally, each type of cancer has its own symptoms, methods of treatment, and outlook for cure.

What causes cancer?
Although no one knows for sure how a normal cell becomes a cancer cell, many risk factors and causes have been identified. Cancer can result from repeated long-term contact with carcinogens, which are cancer-causing agents. These exposures include tobacco, sunlight, X-rays, and certain chemicals that may be found in the air, water, food, drugs, and in some workplaces. Our personal habits and lifestyle contribute to most cancers. Roughly, about one-third of cancer deaths are due to tobacco and one-third may be related to diet.

How soon after exposure to a carcinogen does the cancer appear?
Cancers tend to develop slowly. Cancers usually appear 5 to 40 years after exposure to a carcinogen. For example, cancer of the lung may not be diagnosed until 30 years or longer after a person starts smoking. The slow development of cancer is one reason why it is difficult to determine causes.

Who gets cancer?
Cancer is a very common disease. According to the National Cancer Institute, about 4 in 10 people will be diagnosed with cancer at some time in their life. In Connecticut, nearly 1 in 4 deaths is due to cancer.

Tips For Lowering Cancer Risk

While many risk factors for cancer are unknown or beyond a person's control, there are some ways to help lower the risk of developing or dying from cancer:

- Stop smoking cigarettes or using tobacco of any kind (e.g., chewing tobacco, snuff, etc.)
- Eat high-fiber, vitamin-rich foods each day (fruits, vegetables, whole-grain bread/ cereals)
- Eat foods low in fat (fruits, vegetables, cereals, lean meat and low-fat dairy products)
- If you are overweight or obese, discuss weight loss with your doctor
- Exercise regularly
- Drink alcoholic beverages in moderation
- Avoid unnecessary x-rays
- Avoid excessive exposure to sunlight; wear protective clothing and use proper sunscreen
- Discuss the risks and benefits of hormone replacement therapy with your doctor

For more information about cancer:

- National Cancer Institute website:
  http://cancer.gov
- Centers for Disease Control and Prevention
  http://www.cdc.gov

Source: Material in this section adapted from the New York State Cancer Registry website:
http://www.health.state.ny.us/nysdoh/cancer/nyscr/about.htm

2. CANCER INCIDENCE IN CONNECTICUT

2.1 Connecticut Tumor Registry (CTR) in the Department of Public Health

- All hospitals and medical laboratories in Connecticut are mandated by State regulation to report all new cases of cancer to the Tumor Registry, along with information on treatment and survival.

- The CTR database contains records of cancer cases starting from 1935. It is the oldest such database in the Nation, and an important resource for cancer researchers.

- In 1973, the Registry became one of the original reporting members of the Surveillance, Epidemiology and End Results Program (SEER) of the National Cancer Institute. More than *430,000* cancers diagnosed among Connecticut residents since1973 are contained in the current database.

2.2 Why and How are Cancer Incidence Rates Age-Adjusted?

In this report, cancer incidence rates are reported as *age-adjusted* incidence rates. A person's risk of cancer increases substantially with age. When comparing two or more populations, it is necessary to calculate incidence rates as if the same distribution of ages were present in both populations. This is referred to as *age-adjustment.* If age-adjustment is not done, it is difficult to determine if a higher incidence rate is real, or merely due to one population (e.g., town, county) having a higher percentage of older persons than another population or time period. The distribution of ages in the entire U.S. population is used to determine adjusted incidence rates. Adjusted rates are "fictitious" but essential for making valid comparisons between groups.

The cancer statistics presented in Table 1 are for Connecticut. These rates were adjusted using the *1970 U.S. population* standard for consistency with past Tumor Registry reports. Figures and table in this report that compare Connecticut with *other* states use rates that were adjusted using the *2000 U.S. population*. Starting in 2003, the 2000 U.S. population was adopted as the standard for all agencies reporting cancer data due to the increase in numbers of older persons in the population since 1970. Cancer risk increases with age, so it is important to use the more recent population standard.

2.3 Ten Most Common Invasive Cancers in Connecticut, 1990 through 2000

Cancer incidence rates among *females* remained largely unchanged from 1990 to 2000 for the 10 most common cancers (Table 1). Breast, lung and colorectal cancers remained the three highest incident malignancies among females during this period. For *males*, cancers with the top three incidence rates were prostate, lung and colorectal. The incidence rate for lung cancer declined slightly during this time period whereas the incidence rate of prostate cancer increased slightly. Incidence rates for the other most common cancers among males did not vary substantially.

Table 1 Ten Most Frequently Diagnosed Invasive[1] Cancers in Connecticut
Estimated Age-Adjusted Annual Incidence Rates per 100,000 residents (1970 U.S. Population Standard), 1990 to 2000

	1990-1994		1995-1999		2000	
FEMALES	**Age-Adjusted[2] Incidence Rate (per 100,000)**	**No. (%)[3]**	**Age-Adjusted[2] Incidence Rate (per 100,000)**	**No. (%)[3]**	**Age-Adjusted Incidence Rate (per 100,000)**	**No. (%)**
Breast	115.9	12681 (30.7)	124.3	13751 (30.7)	119.0	2805 (31.3)
Lung	45.3	5034 (12.2)	49.4	5719 (12.8)	47.4	1126 (12.6)
Colorectal	41.7	5437 (13.2)	42.9	5665 (12.7)	41.5	1149 (12.8)
Cervix	23.5	2519 (6.1)	24.9	2668 (6.0)	24.8	554 (6.2)
Ovary	15.3	1627 (3.9)	14.9	1612 (3.6)	13.9	318 (3.5)
Non-Hodgkin's Lymphoma	12.9	1504 (3.6)	14.9	1768 (3.9)	12.5	318 (3.5)
Melanoma	12.5	1343 (3.3)	14.4	1557 (3.5)	14.1	321 (3.6)
Urinary Bladder[5]	9.8	1185 (2.9)	10.5	1316 (2.9)	9.3	250 (2.8)
Pancreas	7.9	1023 (2.5)	8.6	1129 (2.5)	8.2	224 (2.5)
Leukemia	7.5	848 (2.1)	8.4	937 (2.1)	7.2	176 (2.0)
Other[4]	-	8099 (19.6)	-	8587 (19.2)	-	1723 (19.2)
MALES						
Prostate	138.7	12253 (28.4)	143.1	12626 (28.1)	160.1	2913 (31.1)
Lung	79.1	6862 (15.9)	76.0	6830 (15.2)	66.8	1258 (13.4)
Colorectal	61.9	5414 (12.5)	57.7	5333 (11.9)	57.3	1105 (11.8)
Urinary Bladder[5]	35.8	3218 (7.5)	36.5	3365 (7.5)	38.0	736 (7.8)
Non-Hodgkin's Lymphoma	19.1	1673 (3.9)	21.1	1931 (4.3)	18.9	357 (3.8)
Melanoma	18.2	1601 (3.7)	22.0	1986 (4.4)	20.6	400 (4.3)
Oral Cavity and Pharynx	15.8	1312 (3.0)	14.1	1240 (2.8)	12.3	231 (2.5)
Kidney	13.8	1187 (2.8)	15.7	1395 (3.1)	17.2	317 (3.4)
Leukemia	12.3	1054 (2.4)	13.6	1209 (2.7)	14.2	255 (2.7)
Stomach	12.0	1047 (2.4)	10.8	1004 (2.2)	10.3	198 (2.1)
Other[4]	-	7532 (17.5)	-	7882 (17.6)	-	1585 (16.9)

[1] Invasive cancers are those that have penetrated tissue around the organ or have traveled to distant parts of the body.
[2] Rates are the average per year for 1990-1994 and 1995-1999.
[3] Total cancers for all five years.
[4] Combined number of cancers for those not listed above. Incidence rates were not calculated due to the heterogeneous mix of cancer types.
[5] Also includes cancers coded as not yet having invaded surrounding tissue; this practice, followed by the National Cancer Institute, is due to difficulties in accurately distinguishing between pre-invasive cancers and invasive bladder cancers.

For more information, please visit the DPH web-site: http://www.dph.state.ct.us

3. COMPARISON WITH NEARBY STATES AND THE UNITED STATES

All Cancers

The annual incidence rates (average of 1995 to 1999) of all cancers among both females and males in Connecticut are slightly higher than the corresponding national estimates (Fig.1 and Table 2). The national estimate is calculated by the North American Association of Central Cancer Registries (NAACCR) using data from 28 tumor registries across the United States. Data from NAACCR-certified registries only are included in this report.

Among males in Connecticut, the overall rate of cancer was much higher than for females, which is consistent with patterns in the national estimates and nearby states. How do the Connecticut rates compare with nearby states?

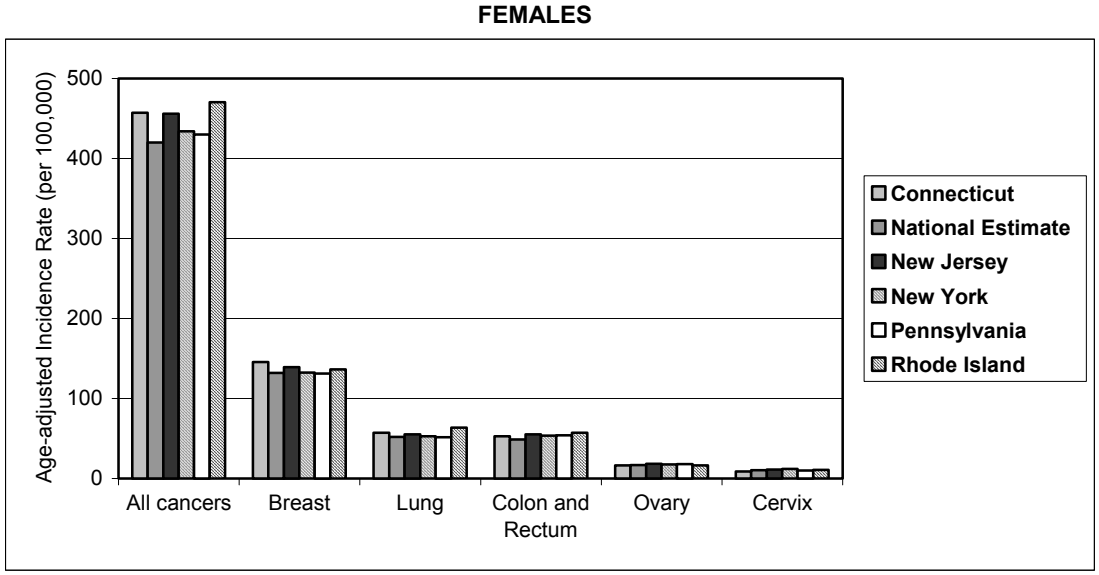
> For females, the incidence rate of all cancers in Connecticut is similar to the rate observed in New Jersey, was slightly higher than those of New York and Pennsylvania, and lower than Rhode Island.
>
> For males, incidence rates in Connecticut are nearly identical to rates in Pennsylvania, and New York, while slightly lower than in Rhode Island and New Jersey.

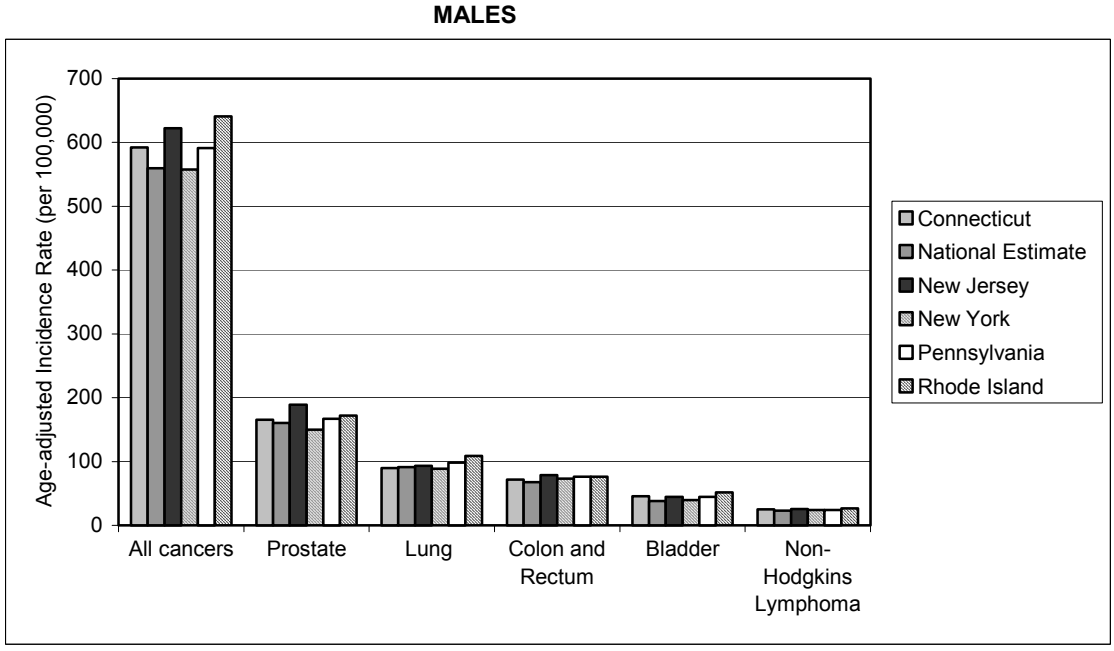
Selected Cancers

Females. The average annual incidence rate of breast cancer in Connecticut was slightly higher than the national estimate and rates in nearby states. Incidence rates of breast cancer tend to be higher in populations of higher socioeconomic status, such as in Connecticut. Research indicates that higher socioeconomic status may be, in part, related to delayed age when having a first child or having no children. These risk factors are thought to reflect increased exposure of breast tissue to reproductive hormones. Rates among females in Connecticut for lung, colorectal, ovarian and cervical cancers were similar to rates in nearby states.

Males. The average annual incidence rate of prostate cancer in Connecticut was comparable to the rates for the national estimate and Pennsylvania, but lower than in Rhode Island and New Jersey. The incidence rate of prostate cancer in New York was somewhat lower than in Connecticut. Incidence rates for colorectal cancer, Non-Hodgkin's lymphoma, and cancer of the urinary bladder among males in Connecticut were comparable to the national estimate as well as the nearby states. The lung cancer incidence rate among males in Connecticut was lower than in Rhode Island but comparable to the national estimate and other nearby states.

Fig. 1 NAACCR[1] Estimated Average Annual Incidence Age Adjusted Rates (2000 U.S. Population Standard) per 100,000 Residents for Selected Invasive[2] Cancers in Connecticut, Nearby States and United States,[3] 1995 through 1999





[1] North American Association of Central Cancer Registries.

[2] For bladder cancer, also includes cancers coded as not yet having invaded surrounding tissue; this practice, followed by the National Cancer Institute, is due to difficulties in accurately distinguishing between pre-invasive and invasive bladder cancers.

[3] NAACCR estimate based on combined incidence data from 28 qualified cancer registries across the United States.

For more information, please visit the NAACCR web-site: http://www.naaccr.org/

Table 2 NAACCR[1] Estimated Average Annual Incidence Age Adjusted Rates (2000 U.S. Population Standard) per 100,000 Residents for Selected Invasive[2] Cancers in Connecticut, Nearby States and the United States,[3] 1995 through 1999

FEMALES

	CONNECTICUT[2]	NATIONAL ESTIMATE[3]	NEW JERSEY	NEW YORK	PENNSYLVANIA	RHODE ISLAND
ALL CANCERS	457.1	420.1	455.9	434.0	430.0	470.3
SELECTED CANCERS						
Breast	145.6	131.9	139.4	132.4	131.3	136.6
Lung	57.1	52.0	55.4	53.0	51.5	63.6
Colon and Rectum	52.8	49.0	55.2	53.6	53.9	57.3
Ovary	16.4	16.8	18.5	17.7	18.1	16.3
Cervix	8.8	10.4	11.4	11.9	10.0	10.7

MALES

ALL CANCERS	592.1	559.5	622.4	557.5	591.1	640.9
SELECTED CANCERS						
Prostate	165.6	160.6	188.8	150.1	167.0	172.2
Lung	90.0	91.5	93.1	88.8	98.3	108.7
Colon and Rectum	71.5	67.5	78.6	73.3	76.2	76.1
Urinary Bladder[4]	45.4	38.0	44.8	39.8	44.5	51.8
Non-Hodgkins Lymphoma	25.3	23.0	25.8	24.0	23.9	26.4

[1] North American Association of Central Cancer Registries.
[2] NAACCR rates listed for Connecticut are slightly lower than rates reported by the Connecticut Tumor Registry due to the identification of additional cancer cases by the Connecticut registry.
[3] NAACCR estimate based on combined incidence data from 28 qualified cancer registries across the United States.
[4] Also includes cancers coded as not yet having invaded surrounding tissue; this practice, followed by the National Cancer Institute, is due to difficulties in accurately distinguishing between pre-invasive and invasive bladder cancers.

For more information, please visit the NAACCR web-site: http://www.naaccr.org/

4. CONNECTICUT CANCER MAPS

The maps that follow illustrate the incidence of cancer by town. Below is information to help interpret the maps.

4.1 Questions and Answers

What do the town maps show?

The statistic illustrated on the maps is the *Standardized Incidence Ratio (SIR)*, which is the number of *actual* cases in the town divided by the number of *expected* cases. In previous sections of this report, incidence rates of cancer were statistically adjusted to account for differences in the age make-up of the populations being compared. Population data from 18 different age groups were used (e.g., age 5 to 9). When small populations such as towns are examined, however, this type of statistical adjustment often is not possible. So, SIRs are calculated instead.

What don't the maps show?

The maps do *not* show:

- The number of people with cancer in the town. Please visit the DPH website for detailed Tumor Registry reports containing town statistics: http://www.dph.state.ct.us
- Risk factors for getting cancer, and how those might differ across towns.

How is it determined that a town had a cancer rate that was higher, lower or about the same as expected?

If the town's SIR is 1.0 then the number of cases in the town was the same as the number expected. If the town's SIR is above 1.0, then the town had more cases than expected. If the town's SIR is below 1.0, then the town had fewer cancer cases than would be expected.

What is "expected incidence"?

Expected incidence is the number of cancers in a Connecticut town that would be expected in a five-year period if the estimated population of that town had the *same* cancer rate as all of Connecticut. Usually five years of data is used for calculating expected incidence because the number of some cancers occurring in certain towns in an individual year is small.

How were the categories on the map selected?

SIRs for all towns were ranked from lowest to highest, and divided into four equal-sized groups.

How can I find out if the SIR in my town is higher or lower than for other towns?

There is a key located on each map. The four categories defined above are shaded as follows:

- Towns in the **highest SIR** group are a **dark** shade**.**
- Towns in the **2nd highest SIR** group are a **medium** shade.
- Towns in the **3rd highest SIR** group are a **light** shade.
- Towns in the **lowest SIR** group are **blank**.

Towns with a star have statistically significant SIRs.

For detailed incidence data on each town and other Registry reports, please visit: http://www.dph.state.ct.us and click on "Publications/Statistics".

What does is mean if a town's SIR is statistically significant?

Statistical significance means that there is a low probability (5% or less in these analyses) that an SIR different than 1.0 is due to chance. Statistical significance is simply a tool to spot unexpected SIRs.

Researchers might try to determine if the elevated SIR might have resulted from fluctuations in the number of cancers from year to year. Inaccuracies in the estimate of the population size between census years, and, errors in coding the town of residence at cancer diagnosis can also affect the calculation of SIRs. Researchers will try to determine if the elevated SIR has persisted over time.

For cancers that are common (such as lung, breast, and prostate) a relatively small elevation in an SIR might reach statistical significance due to the increased precision that occurs when a large number of cases is examined. Thus, a "significant" SIR might not be of public health concern if it is close to 1.0.

SIRs do *not* take into account differences in risk factors for cancer between towns. An elevated SIR might reflect personal attributes of residents or availability and utilization of health services. Personal attributes might include a higher proportion of people at higher risk for certain cancers (e.g., lung cancer among tobacco smokers, melanoma among frequent sun-bathers.) A town in which there is limited access to colon cancer screening might have an increased incidence of colon cancer because pre-malignant polyps were not detected.

Which types of cancer were selected for maps?

In addition to maps for all cancer sites combined, the most common cancers were selected: lung cancer, colorectal cancer, breast cancer among females, and prostate cancer among males. Cervical cancer and melanoma of the skin, which have low incidence across the state, were also illustrated on maps because they can be prevented or detected at early stages. For example, an annual "Pap" test for women can identify pre-malignant conditions in the uterine cervix or detect

cervical cancer at a curable stage. Likewise, risk of melanoma can be reduced by periodic skin screening by a medical professional, limiting exposure to ultraviolet light from the sun and tanning lamps, and using sunscreen products.

If I live in a town with a higher-than-expected cancer incidence, what is causing the apparent increase in cancer?

Many factors could contribute including: lifestyle factors (e.g., tobacco smoking, alcohol, hormones, infections, and diet) and other environmental exposures. Cancer develops slowly, and can appear many years after exposure to a cancer-causing agent. Thus, cancer incidence may be related to behavior or exposures that occurred before moving to a particular town.

It has been established that increased rates for certain towns are related to errors in address information for residents. For example, a person's legal address might be listed for one town (e.g., post office box), but the individual actually resides in another town. If that person developed cancer, the incidence would be counted in the town with the post office address. In certain towns in Connecticut, the number of people with "non-resident" post-office addresses is comparatively high.

Am I more likely to get cancer because I live in a town with a higher than expected cancer incidence?

It is improbable that your chance of developing cancer would increase simply because you live in a town with higher than expected incidence of cancer. Cancer risk depends on many factors including lifestyle (smoking, diet), family history of cancer, and history of contact with cancer-causing substances (ultra-violet light, x-rays, tobacco smoke, and certain chemicals).

Certain cancers are associated with socio-economic status (SES) groups, which can vary greatly within and between towns. For example, a lower SES is associated with increased risk for lung cancer and cervical cancer. In particular, higher rates of cigarette smoking among people in lower SES groups are related to increased incidence rates for lung cancer in these SES groups. Also, it has been established that a higher SES is related to increased risk for breast cancer. Increased risk for breast cancer has been associated with having a first child after the age of 30, which is a comparatively more common occurrence among women in higher SES groups.

Urban areas tend to have higher incidence rates for certain kinds of cancer (e.g., lung cancer, urinary bladder, prostate, breast, and colorectal) compared to rural areas but it is uncertain why.

How else can these maps be used?

By showing patterns of cancer incidences across Connecticut, the maps can be used to help local and state health officials plan for services.

I am concerned about my risk for getting cancer. What can I do?

- Talk with your health care provider about your personal risk factors and what you can do to minimize those factors.
- Become familiar with the early warning signs of cancer, and see your health care provider if you notice any.
- Talk with your relatives about your family history for specific types of cancer and share this information with your health care provider.
- Find out about cancer screening programs in your community and discuss them with your health care provider. Screening may find cancer at an early stage, or, certain pre-cancerous conditions.
- See "About Cancer" on pages 2 and 3 of this report.

How can I get more information about cancer incidence in my town?

- Visit the DPH website at http://www.dph.state.ct.us and click on 'Publications/Statistics'. You can then scroll to 'Cancer' and you will find detailed information on cancer statistics at the town, county and state levels.
- Call the Connecticut Tumor Registry at 860-509-7163.

I am concerned that there might be an unusual number of cancers in my town, workplace or school. What can I do?

Please contact **DPH Environmental Epidemiology and Occupational Health** (EEOH) Program at **860-509-7740** to discuss your concerns. EEOH will then determine if there is need for review and analysis of cancer data for your town.

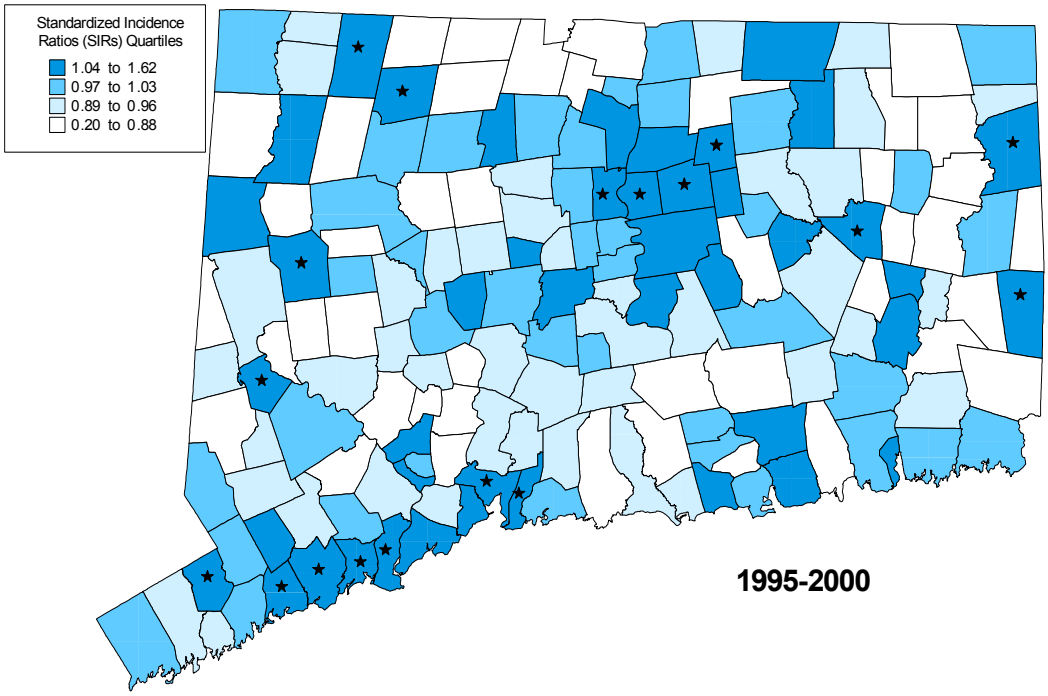
Source: Material in this section adapted from the New York State Cancer Registry website: http://www.health.state.ny.us/nysdoh/cancer/nyscr/about.htm

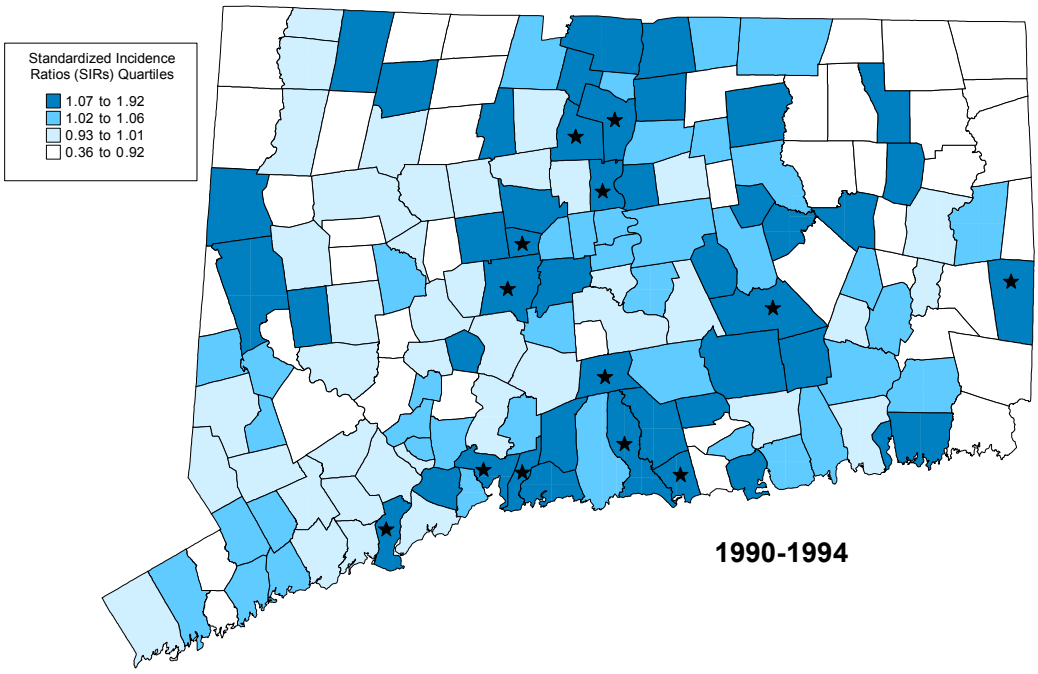
4.2 MAP OF CONNECTICUT TOWNS

4.3 Selected Cancers by Town in Connecticut

All Invasive Cancers

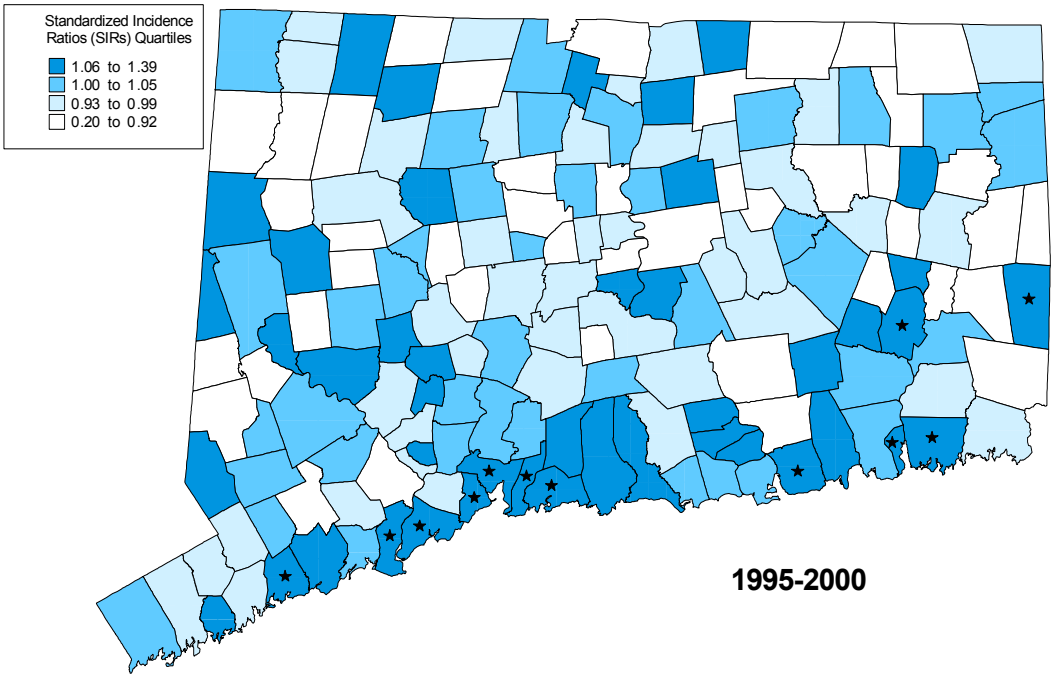
Males

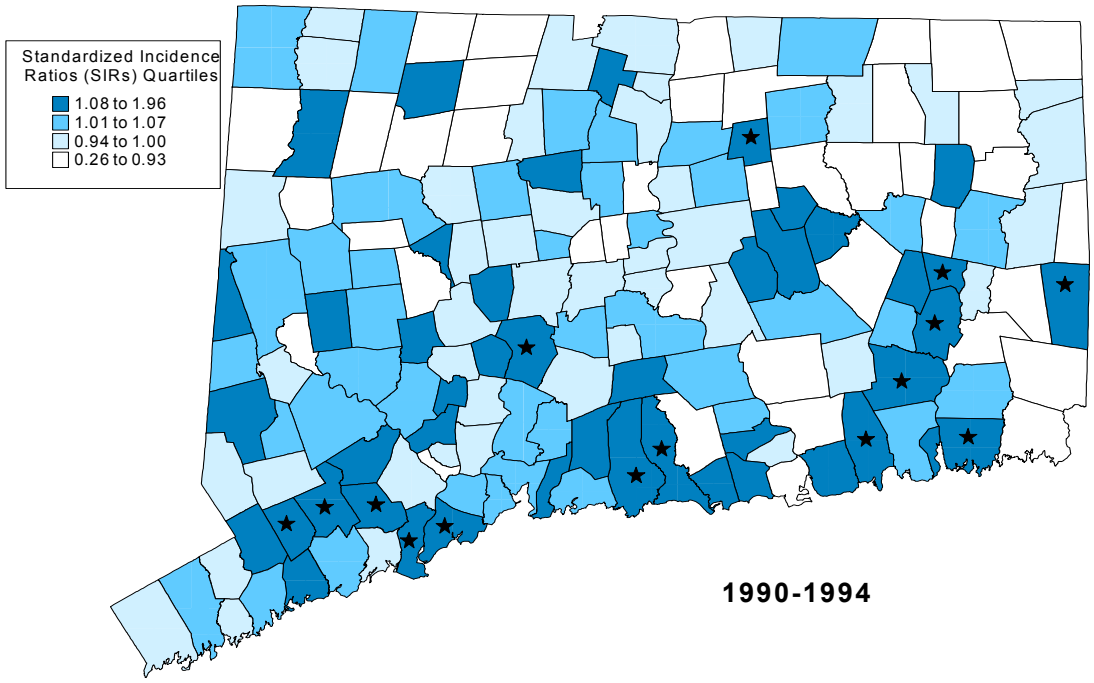




ALL INVASIVE CANCERS

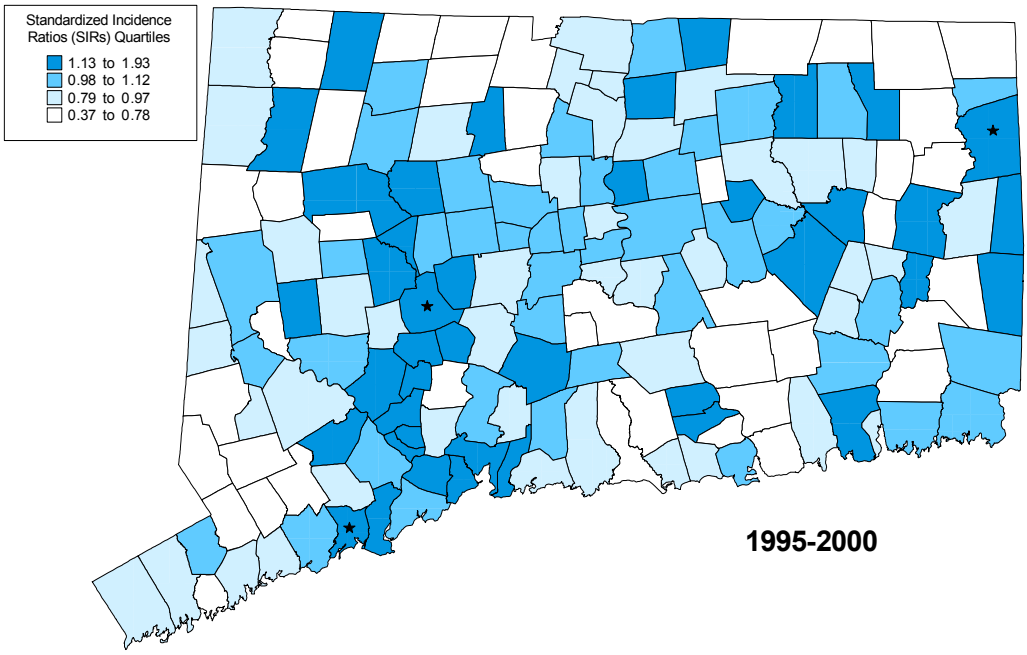
FEMALES

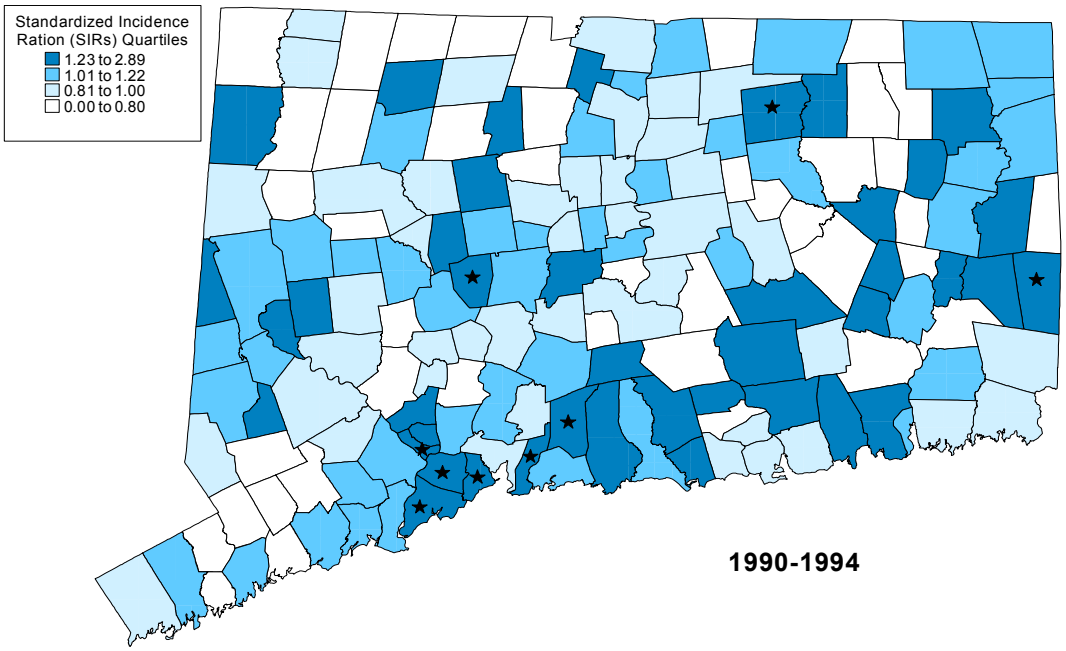




COLORECTAL CANCER

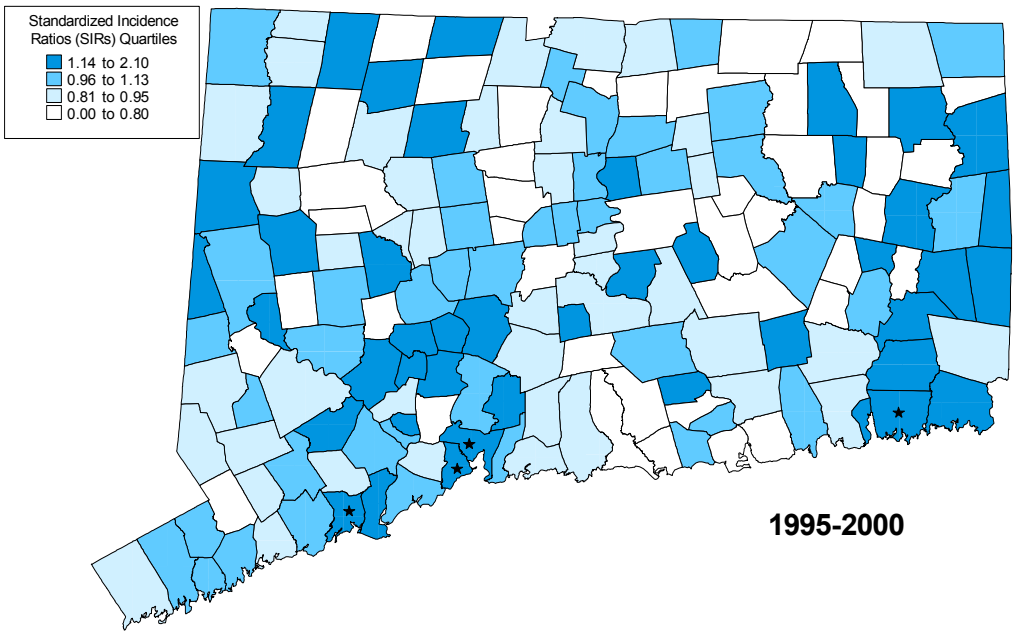
MALES

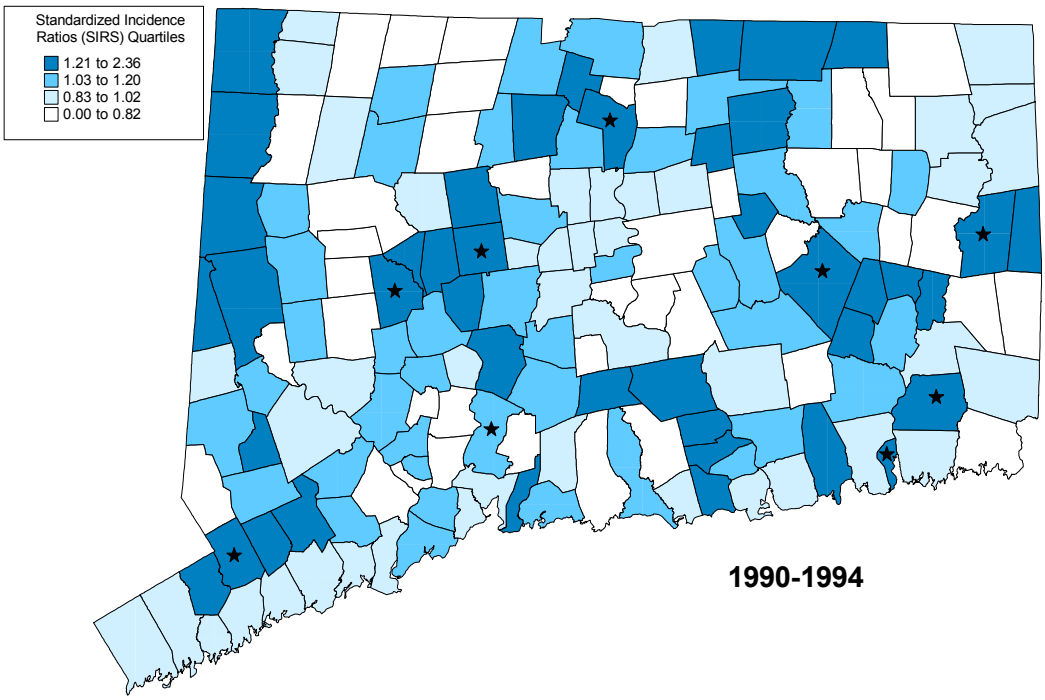




COLORECTAL CANCER

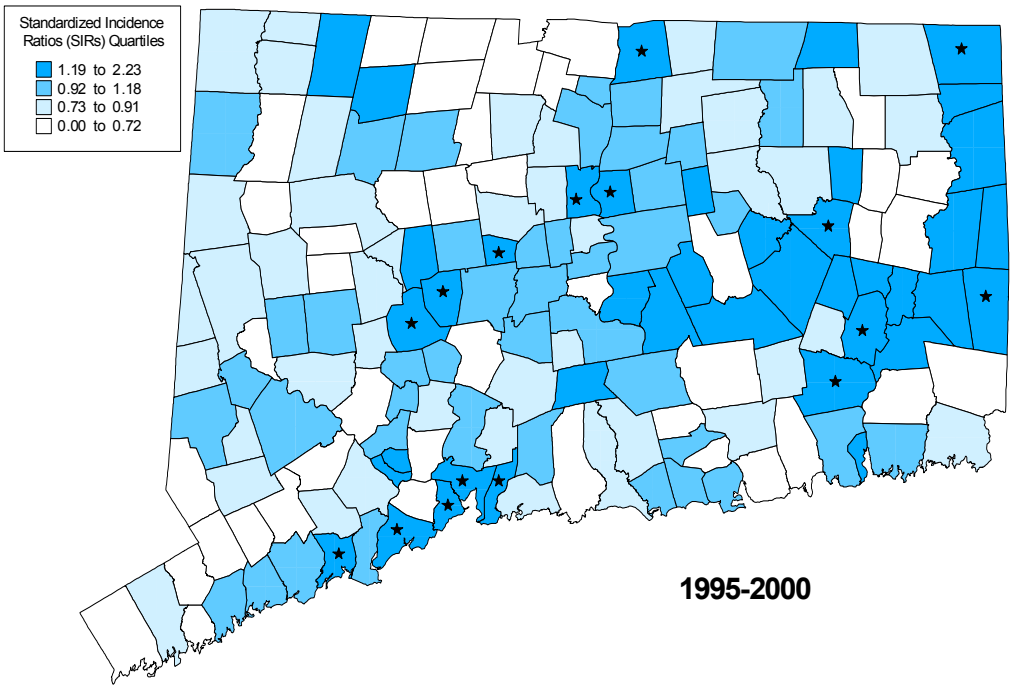
FEMALES

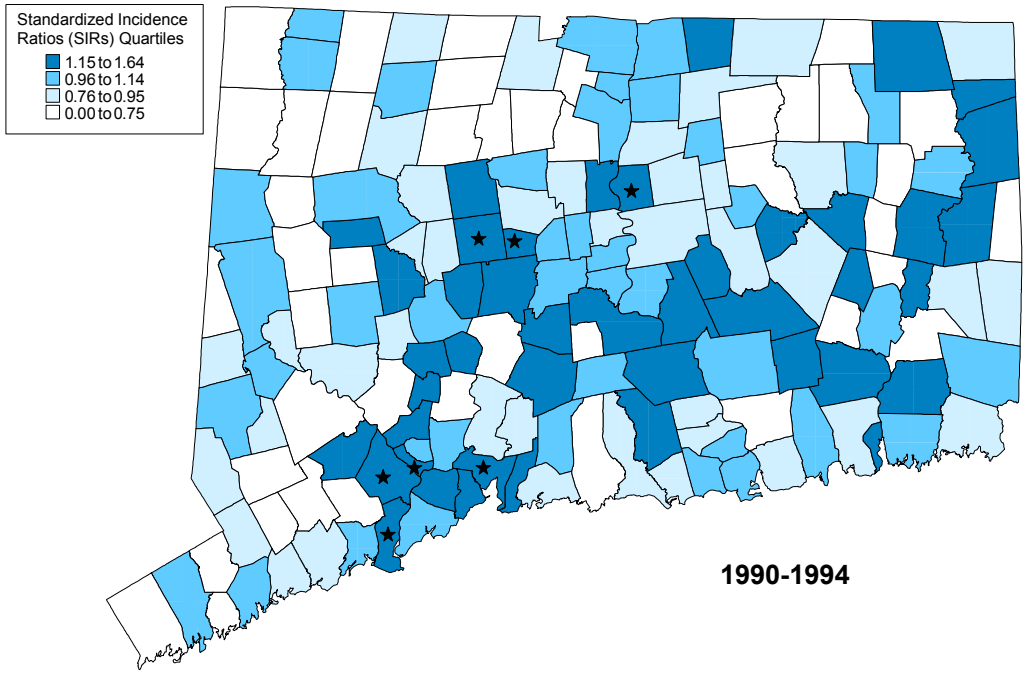




LUNG CANCER

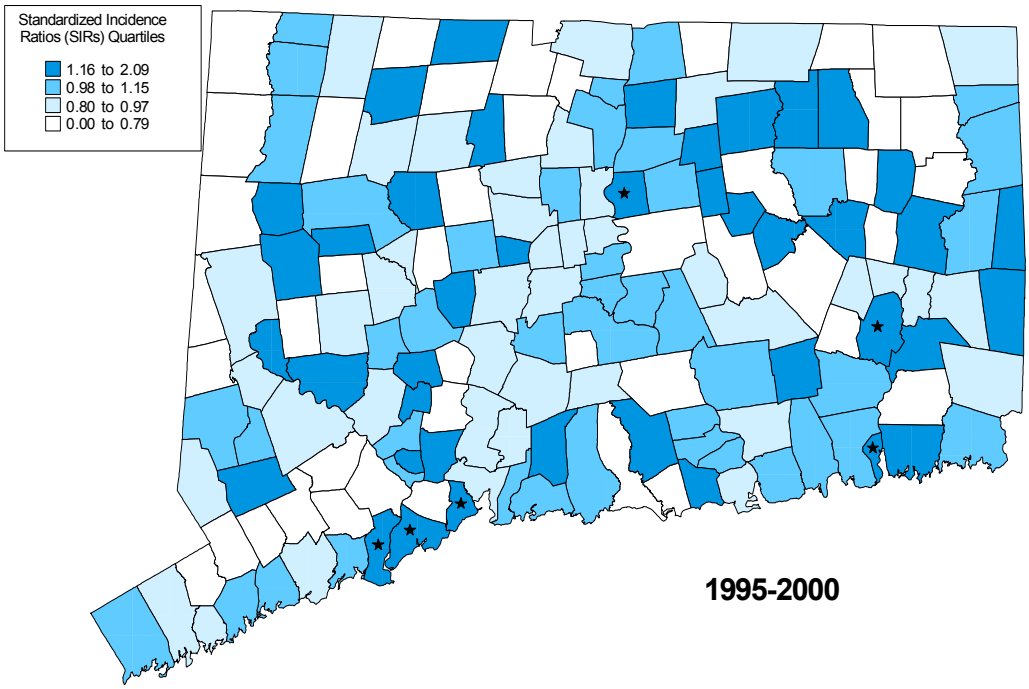
MALES

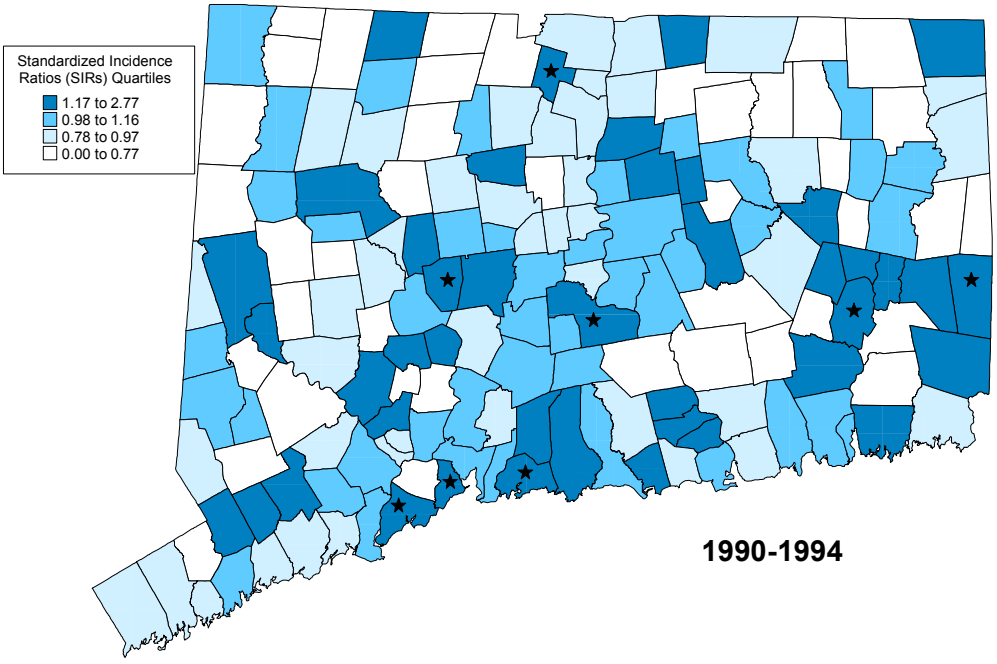




LUNG CANCER

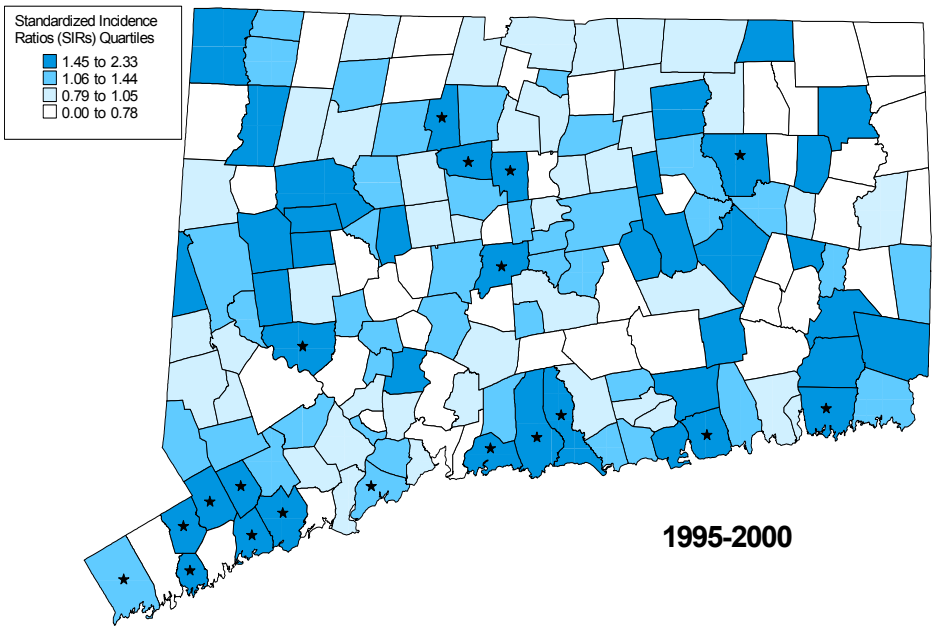
FEMALES

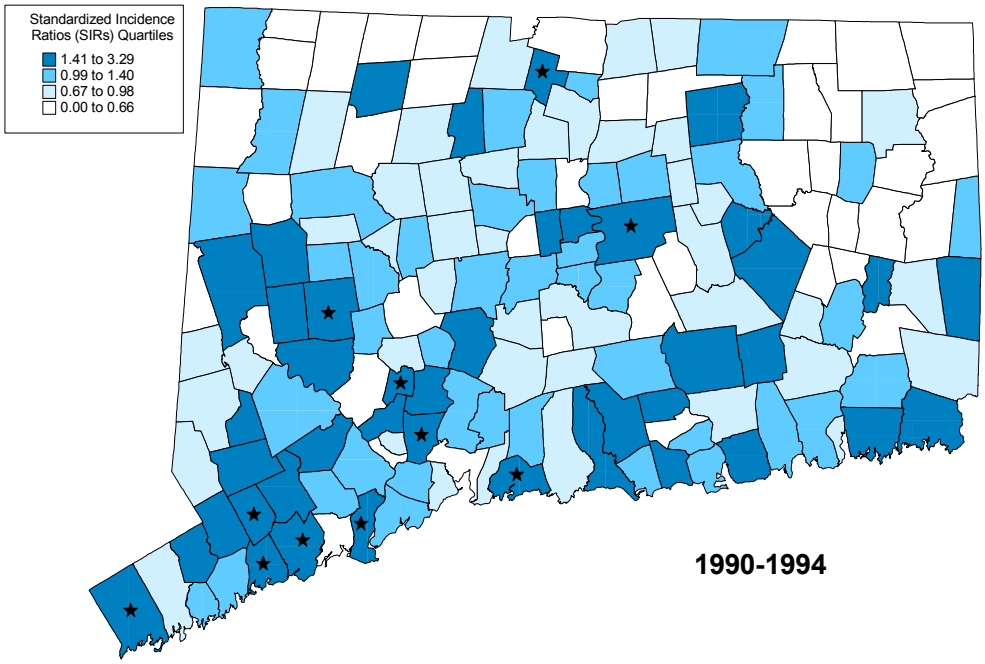




MELANOMA

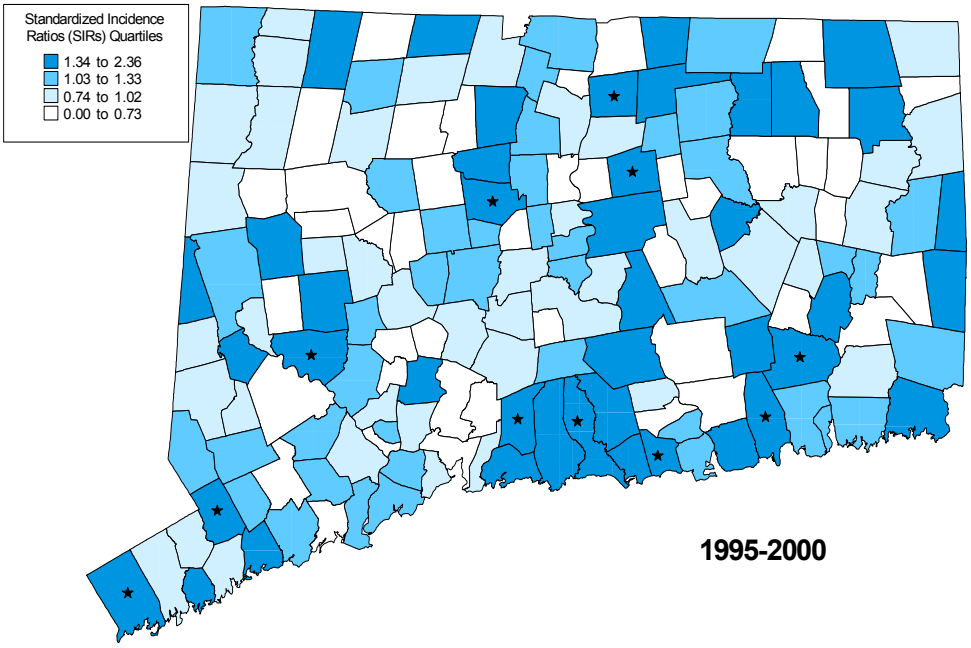
MALES

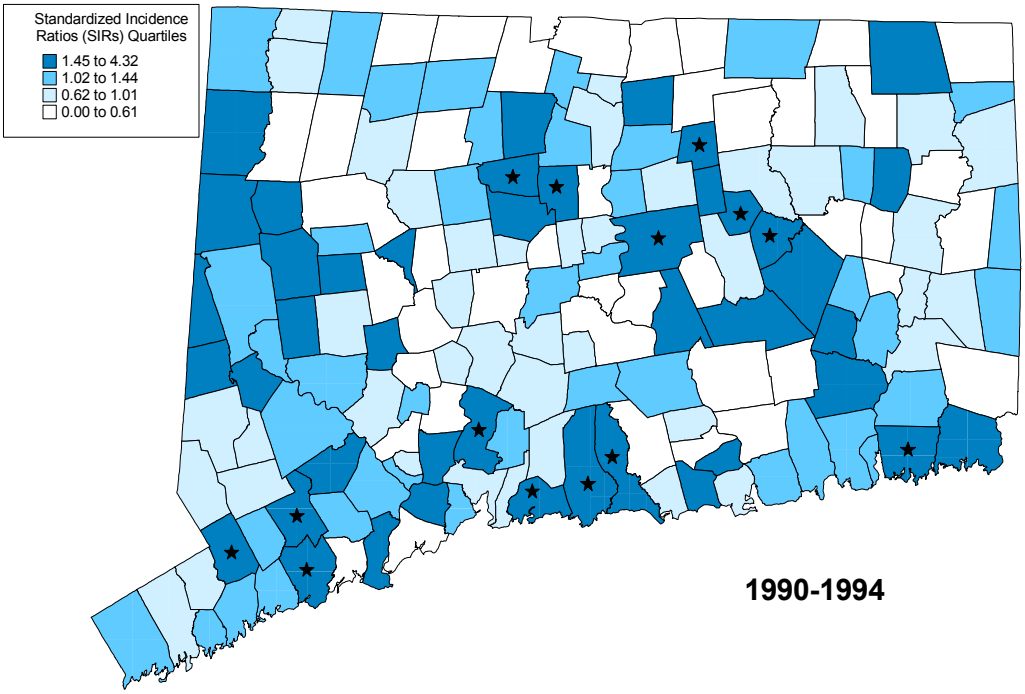




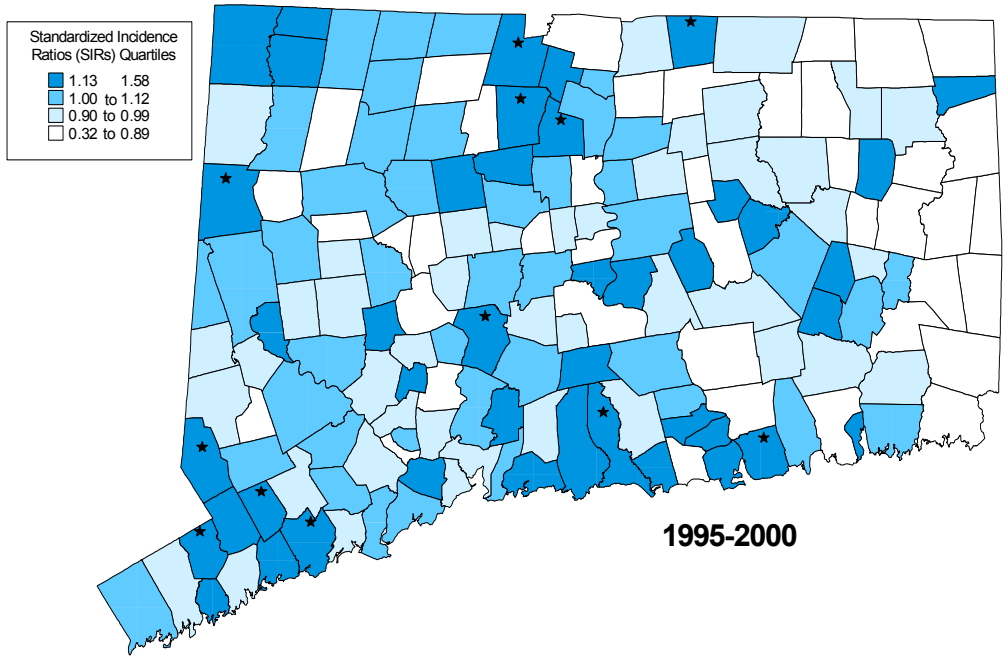
MELANOMA

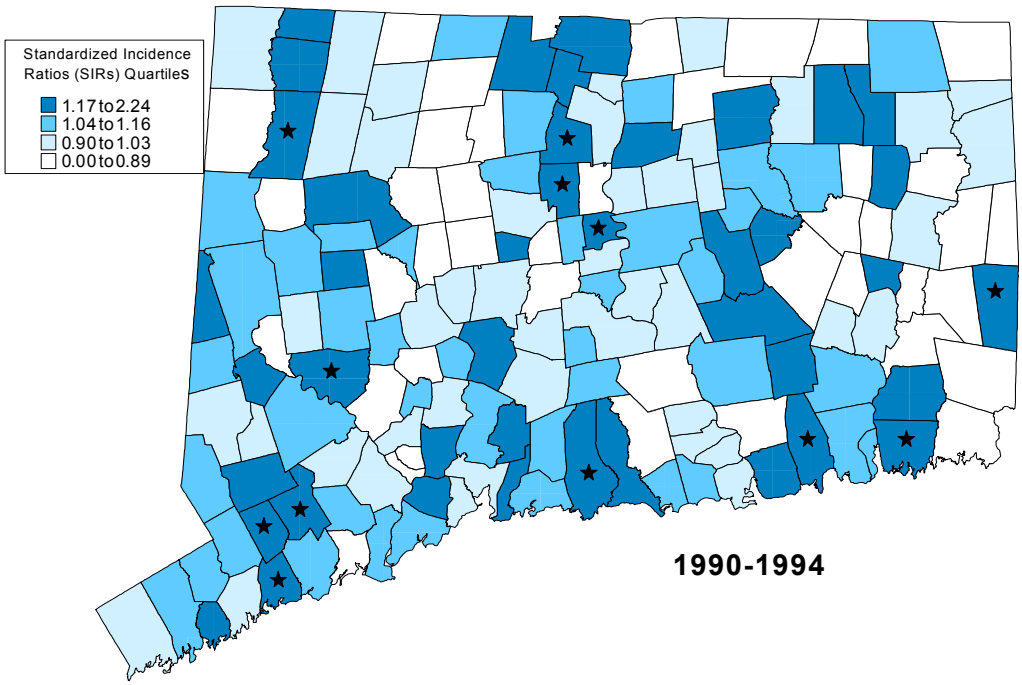
FEMALES



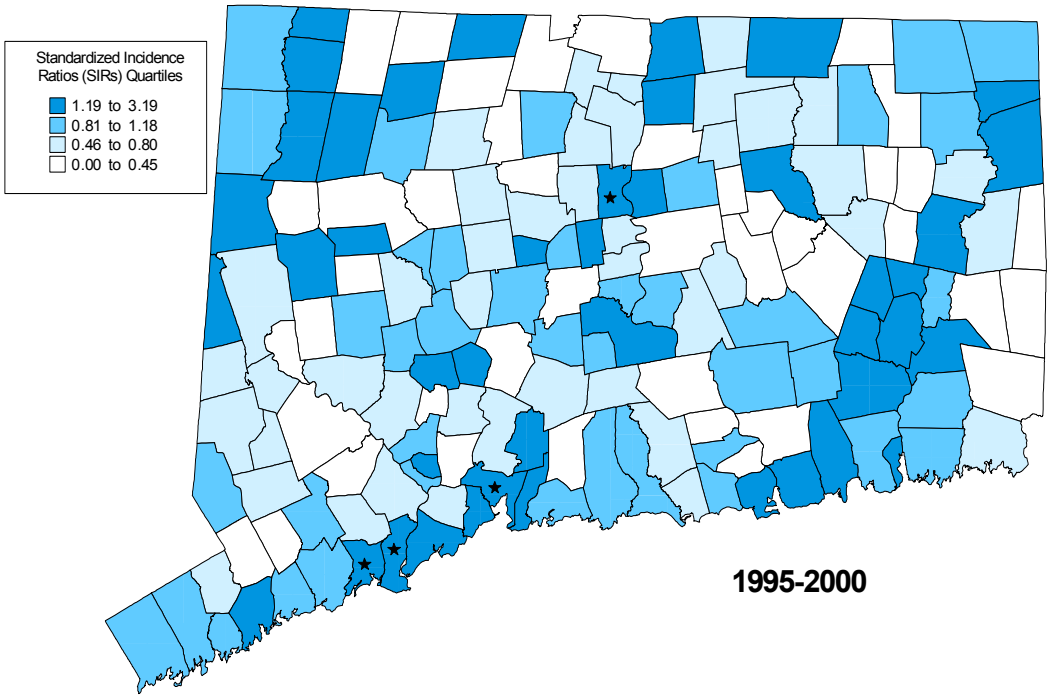


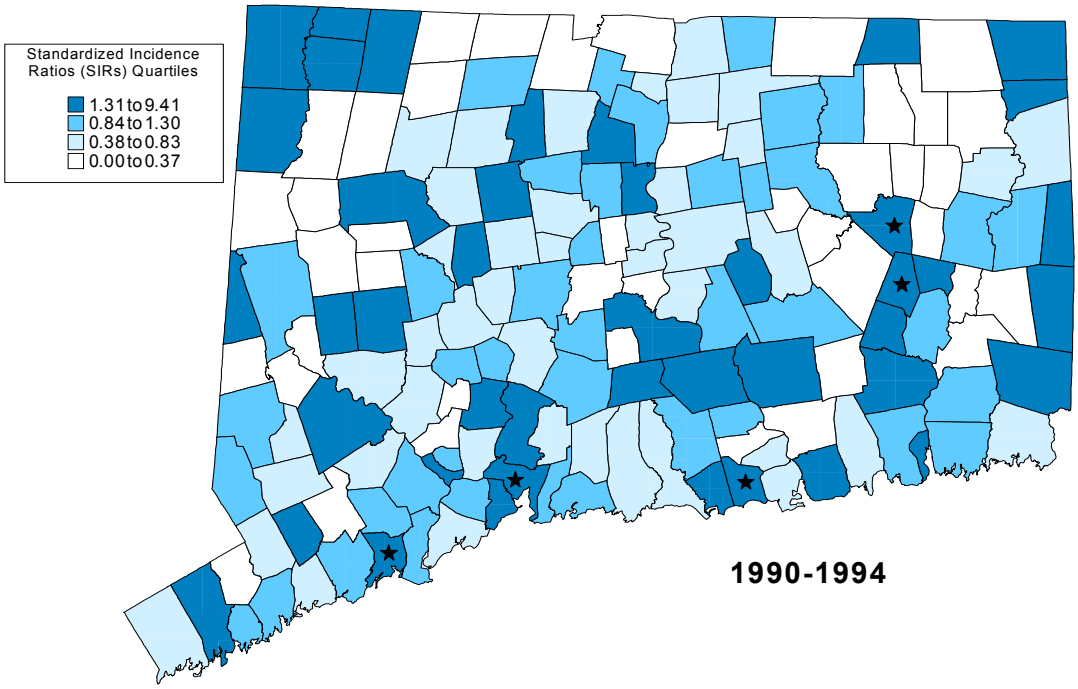
FEMALE BREAST CANCER





CERVICAL CANCER





PROSTATE CANCER