
❖ Southington Cancer Incidence Study ❖

Health Information on Hazardous Waste Sites



**STATE OF
CONNECTICUT
DEPARTMENT
OF PUBLIC
HEALTH**

BACKGROUND

This fact sheet is a summary of a recent cancer incidence study conducted in Southington, Connecticut by the Connecticut Department of Public Health (DPH). The main goal of this study was to analyze the relationship between cancer cases in Southington and exposure to environmental pollution. Data from the community of Southington, Connecticut were analyzed to determine if there was an association between exposure to environmental contaminants from Solvents Recovery Services of New England (SRSNE) and cancer cases identified in Southington.

Solvents Recovery Services of New England (SRSNE) is a National Priorities List (NPL) hazardous waste site located in Southington near Lazy Lane. SRSNE operated as a hazardous waste treatment facility, processing waste solvents from 1955 until May 1991, when the facility closed down all operations permanently. Groundwater and soil, both on-site and off-site were contaminated with waste solvents and metals because of improper disposal practices.

For copies of the complete study monograph, contact the Connecticut Department of Public Health, Division of Environmental Epidemiology and Occupational Health, 410 Capitol Ave, Hartford, CT 06134-0308, (860) 509-7742.

Study Results:

As a whole, Southington had lower rates of the cancers studied in comparison to Connecticut statewide rates. However, the areas within Southington that were likely exposed to air emissions from SRSNE had a slightly higher rate of all cancers (combined) studied in comparison to the areas of Southington that were not exposed. In particular, the rate of non-Hodgkin's lymphoma was higher among women in the areas of town with the highest exposures to air emissions in comparison to the areas of town with no exposure to air emissions.

SRSNE OPERATIONS AND CONTAMINATION

The facility processed between 3 and 5 million gallons of liquid hazardous wastes and 100,000 pounds of solid hazardous wastes annually.

SRSNE operations polluted 2 public water wells with volatile organic compounds (VOCs). The VOCs detected include: acetone, methyl ethyl ketone, 1,1,1-trichloroethane, trichloroethylene (TCE), tetrachloroethylene, and other solvents.

Polluted wells were not used after 1980. The Southington water supply is monitored regularly and is safe to drink.

Solvents were burned in an open pit incinerator which polluted the air around the site. This occurred during the period of time from 1966 until 1974.

Some Southington residents were exposed to environmental pollution in the past because of contamination in public wells and air. The public water supply was contaminated from approximately 1966 until 1980. The air was contaminated during 1966 - 1974.

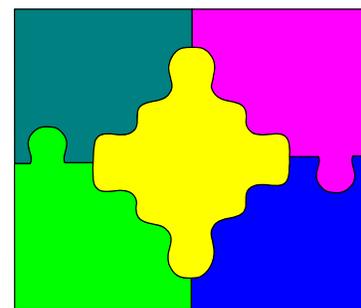
CANCER STUDY METHODS

Previous Cancer Studies: Previous health studies indicated that Southington as a town did not have any excess cancer in comparison to overall Connecticut rates. However, people living near contaminated wells had a slightly higher rate of bladder cancer.

To further investigate possible associations between contaminant exposures and cancer incidence in Southington, the DPH conducted a follow-up study of cancer incidence. This study was not designed to show *direct cause and effect*, but to attempt to find if there might be *associations* between exposures to pollution and cancer.

Tumor Case Information: Southington residents who were diagnosed with bladder, kidney, liver, testicular cancer; Hodgkin’s disease, leukemia, or non-Hodgkin’s lymphoma between 1968 to 1991 were included in the study. An association between these cancers and environmental pollution, such as that from SRSNE, has been

seen in other studies. Cancer case data were obtained from the DPH Tumor Registry. Individual case information included the patient’s residential address at time of diagnosis, primary site of diagnosis, age, sex, and date of diagnosis. The residential address at time of diagnosis was mapped using a computer mapping system. A total of 422 cases were mapped.



ASSESSING EXPOSURE

An important part of this follow-up study was more accurate evaluation of how and where people were likely exposed to SRSNE contamination. This included modeling of water and air exposures. Modeling here means using a computer program to simulate chemicals moving through air and water when they can not be measured (e.g., estimating past exposures to chemicals).

Water Exposure Modeling: Because contamination occurred in a public water system, this supply system was analyzed to determine where the potential for the greatest amount of contamination would have occurred. The estimated daily exposure to contaminants in the public drinking water was broken into four water exposure categories which are presented in Figure 1. Two thirds of the town were not affected by water contamination from SRSNE. The areas

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northeast of the contaminated wells were estimated to have received the highest exposures. The areas receiving the same exposure were grouped for analysis.

Air Exposure Modeling: An air contamination model was developed for the study to estimate the portions of town that were most likely exposed to emissions from SRSNE. Four air exposure categories were identified as a result of the air modeling. These are presented in Figure 2. Only about one third of the Southington population was exposed to SRSNE air emissions. The area closest to the site received the highest contamination. No persons lived in this portion of the town.

STUDY RESULTS

BLADDER CANCER: When a more assessment of water exposure was done, bladder cancer was **not** higher in areas likely exposed to air or water emissions. The risks for bladder cancer tends to **decrease** with increasing exposure to contaminants in the water in comparison to the no exposure categories. **HODGKIN'S DISEASE:**

The risk of Hodgkin's disease among females was slightly higher with exposure to contaminants in the air. However, a higher risk was not found among males. Hodgkin's Disease was not higher among women or men with water exposure.

KIDNEY CANCER: The risk for kidney cancer was not elevated in the air or water exposure areas.

LEUKEMIA: The risk of leukemia was slightly higher in the portion of the town exposed to contaminants in either air or water, in comparison to the

unexposed portion of town.

LIVER CANCER : The risk of liver cancer was elevated for both females and males in the air exposure areas, however it is based on only a few cases. There was no increased risk of liver cancer for the water exposure areas.

NON-HODGKIN'S LYMPHOMA: No increasing trend in risk with increasing exposure to either air or water emissions was seen for males. Among females, the risk of non-Hodgkin's lymphoma was higher in the areas of Southington exposed to either air or water contamination in comparison to areas of no exposure.

TESTICULAR CANCER: There were no statistically significant increases in risk of testicular cancer for the portions of Southington exposed to contaminants from SRSNE.

ALL SITES: For all of the cancer sites included in the study, the overall cancer rate was lower in Southington than the State. However, the geographic area likely exposed to air emissions had an overall increase in these cancers compared to the unexposed part of town. A similar increase in risk was not apparent for the water exposure areas.



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STUDY LIMITATIONS

- The study data contained only limited individual information, such as smoking history, family history, and occupation. These are all important risk factors for cancer.
- Population estimates for calculation of the risk measurements were derived from the 1980 census data and do not take growth of the population or migration into consideration (the 1980 date was selected because it represents the midpoint of the study period).
- Studies like this one are not intended to demonstrate a cause and effect relationship, but rather used to investigate possible associations between pollution exposures and disease.
- Although the water modeling was helpful in estimating past exposures, there is little or no sampling data available at the point where people were exposed. This data would help to validate the modeling in evaluating exposure.

CONCLUSIONS

As a whole, Southington had lower rates of the cancers studied in comparison to Connecticut statewide rates. However, the areas within Southington that were likely exposed to air emissions had slightly higher rates of all cancers studied in comparison to the areas of Southington that were not exposed. Also, the results from this study suggest that female non-Hodgkin's lymphoma may be associated with exposure to air

pollution. Since there were a variety of emissions into the air from SRSNE, no specific contaminant can be singled out as a possible agent. While no conclusions regarding cause and effect can be drawn from this study, it does support the need for further investigation in general of long-term low level exposures to air contaminants as a potential risk for cancer, and specifically non-Hodgkin's lymphoma.

Two important points:

- Environmental exposures caused by SRSNE have stopped and there is no current risk to public health.
- The increases in cancer rates that were identified were small and do not indicate a major outbreak or epidemic.

RECOMMENDATIONS

A. No further population-based studies of cancer incidence in relation to Solvents Recovery Services of New England are recommended.

B. Further study of the causes of non-Hodgkin's lymphoma is needed. Other studies should consider air pollution as a possible cause.

FOR MORE INFORMATION:

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Glossary: What Do These Words Mean?

Cancer incidence: New cases of cancer diagnosed in a population.

Cancer incidence rate: The number of new cases of cancer divided by the population. Rates are usually expressed as number of cases per 1,000, 10,000 or 100,000 persons. Rates allow the comparison of cancer incidence in populations that are of different sizes.

Hodgkin's disease: Cancer in the lymphatic system. Modern medical therapies have made Hodgkin's disease often curable. The incidence increases for young adults in the 20's and 30's, drops and then increases later in life.

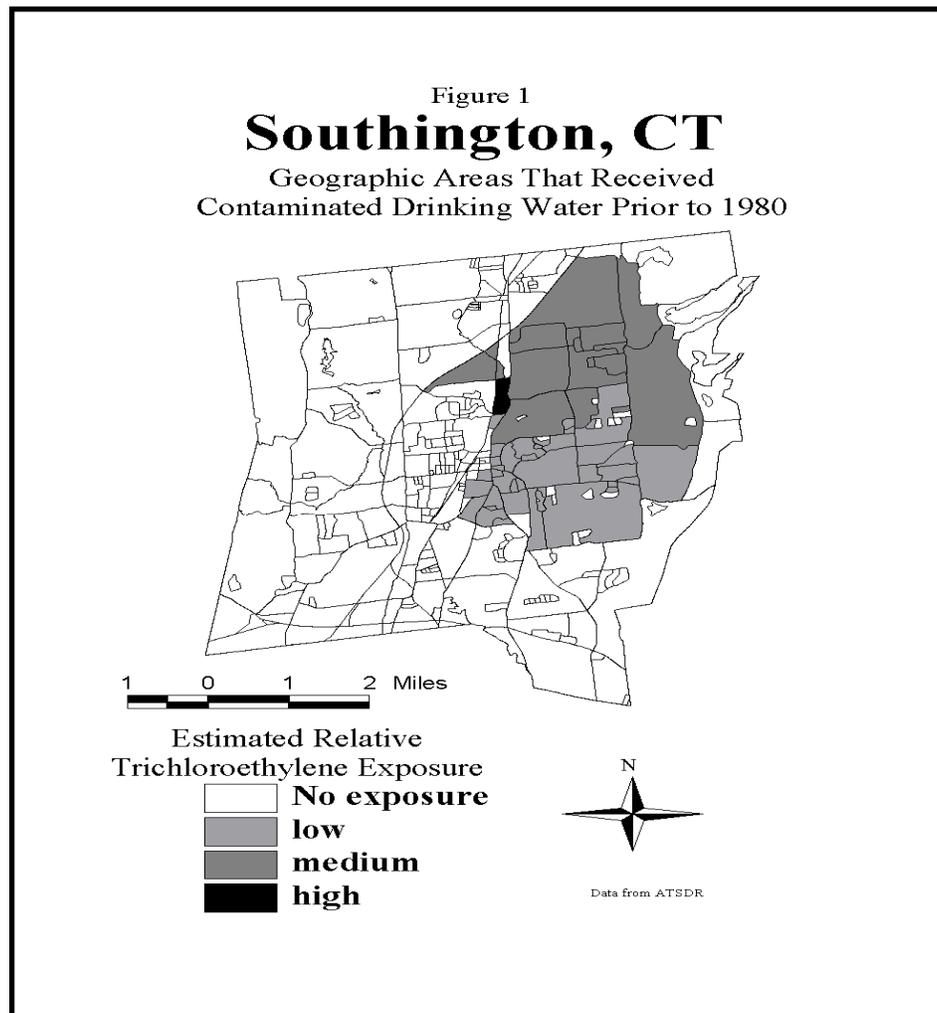
Non-Hodgkin's lymphoma: Cancer in the lymphatic system. Likely to spread more quickly and respond less well to treatment than Hodgkin's disease. Non-Hodgkin's lymphoma incidence increases with increasing age. It also has been increasing in incidence nationwide during the past few decades.

Risk Factors: Traits, exposures or habits that may influence the development of disease. For example, a person who has the risk factor of smoking has an increased risk of developing emphysema.

Site of Diagnosis: The place in the body where the cancer is found (e.g. breast, lung, colon).

Statistically significant: When the results are unlikely to be due to random chance.

Volatile Organic Compounds (VOCs): Chemicals that can easily evaporate. Gasoline and other solvents are VOCs.



Solvents Recovery Service, NE Site Cleanup Update

The SRSNE Superfund Site was closed in 1991. In 1990 the Environmental Protection Agency (EPA) began long-term studies to determine the best cleanup method for the site. When it became apparent that these studies would take longer to complete than expected, the EPA decided a short-term cleanup was needed. In 1995, a groundwater extraction and treatment system began operating to address part of the site's contamination problem while the long-term studies were completed. This system limited the the spread of contaminants in the shallow ground water.

EPA also decided that a second short-term cleanup should be done to expand the groundwater containment system and limit exposure to contaminated soils.

Additional field work testing has been proceeding at the site to better understand how groundwater is flowing and spreading contamination. The test also seeks to find pockets of highly concentrated liquid contamination that can make groundwater cleanup more difficult.

For more information on SRSNE site cleanup activities, contact:

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Figure 2

Southington, CT

Geographic Areas Exposed to Air Emissions
from Solvents Recovery Services of New England

