# EPIDEMIOLOGICAL EVALUATION

Evaluating Area Demographics and Known Risk Factors Provides Background for Ongoing Breast Cancer Investigation

Summary

State Health Department researchers examined the pattern of breast cancer diagnoses in the CMP area. They looked at the ages of the women and the stage of their disease when diagnosed, as well as the rates of breast cancer in the CMP area over time. They also considered race, income and educational level, which may account for some of the higher breast cancer incidence. Researchers are now looking at information, such as property records, to learn how long the women with breast cancer lived in the CMP area.

Map legend:
- CMP Investigation area
- ZIP Code boundaries
- Suffolk County

1.5   0   1.5   3.0 miles
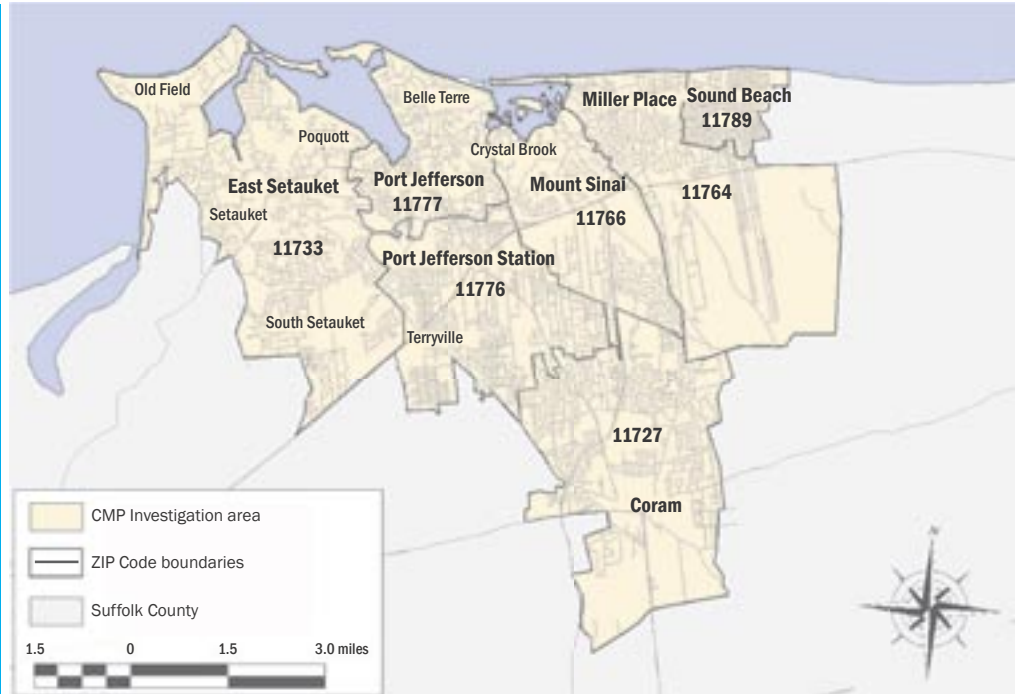
Evaluating Breast Cancer Data

The ZIP Code-level maps that first showed an elevation in breast cancer in this area were based on New York State Cancer Registry data for one window in time: women diagnosed between 1993 and 1997. Early in the investigation, State Health Department researchers began analyzing these data for anything unusual about how breast cancer was diagnosed or reported in this area and checked methods used to calculate breast cancer statistics here and statewide. They also looked for any unusual patterns in age or ethnicity among the women living here who were diagnosed with breast cancer. These efforts showed nothing unusual about this area compared to the rest of the state.

Our researchers analyzed Cancer Registry data for two other three-year time periods, 1990-1992 and 1998-2000, to see if the elevation continued over time. The results showed that the breast cancer elevation observed from 1993 to 1997 has continued through 2000 at roughly the same levels. In the earlier time period, 1990-1992, a much smaller elevation was observed.

Known risk factor— something that has been proven to increase the chance of developing a disease.

Considering Known Risk Factors

As the result of many years of breast cancer research, the scientific literature documents a number of known risk factors for the disease. Because researchers know so much more about these risk factors, evaluating their role in breast cancer incidence in a community helps to understand the possible role of any suspected risk factors for the disease, such as environmental contaminants.

The most important known risk factors for breast cancer include being a woman and aging. A woman's reproductive history also plays an important role. White women are more likely to develop breast cancer than other women. Having a family history of breast cancer or carrying certain gene mutations are other factors that affect a woman's risk. Having certain types of benign breast disease, a prior breast cancer or post-menopausal hormone use also increase a woman's risk. Other risk factors include being tall and obesity after menopause.

Lifestyle risk factors such as drinking more than three alcoholic beverages per day are gaining acceptance as breast cancer risk factors. Several recent studies have linked cigarette smoking and secondhand cigarette smoke to breast cancer risk.

In some cases, risk factors are not the actual causes of a disease, but are associations that different researchers have consistently found in various studies. Evidence in the literature has established that breast cancer is higher among more affluent women and for those in certain occupations, such as teaching and health care. While researchers have noted several things in common among these women, one of the more important factors is that these women tend to delay

having children. Women who are older when they deliver their first child have a higher risk of breast cancer.

These associations cannot rule out the possibility that other factors, possibly environmental risk factors, common to women in certain occupations or women with high income levels, could also play a role in their breast cancer.

According to U.S. Census statistics, the CMP investigation area has a greater percentage of white women compared to New York State as a whole. This area also has a higher median household income and lower rate of people living below the poverty level than the rest of the state. A higher percentage of people in the area also works in the health care and education fields compared to Suffolk County and the rest of the state.

Our researchers developed a statistical model that considered race, income and educational level in addition to age, which was the only factor considered on the original ZIP Code-level maps. When breast cancer statistics were recalculated accounting for these additional factors, the overall breast cancer excess was reduced from 38% to 24%. If our researchers had more data about women in different communties, characteristics related to family history, lifestyle and reproductive factors might explain a larger percentage of breast cancer here and around the entire state. However, we cannot rule out the possibility that environmental risk factors could also play a role.

Determining Length of Residence Is Important

Cancer takes a long time to develop. It is also a disease with many risk factors that can together to affect a women's risk in ways that are not fully understood. Depending on the age of a woman and the type of exposure, studies have documented it may take between 5 and 40 years to develop breast cancer.

State Health Department researchers are reviewing property records and the *Cole Cross Reference Directory* to collect some additional background information about how long women diagnosed with breast cancer lived in this area. Length of residence information is important for evaluating whether elevated contaminant levels could have resulted in exposure among the women diagnosed with breast cancer. The results of this effort will be reported in the *Final Draft Integration Report.*

In and of itself, this epidemiological evaluation cannot assess whether a particular risk factor is causing breast cancer because it relies on group-level data such as the U.S. Census, rather than individual case data. However, it can help identify patterns that may be useful in our efforts to understand breast cancer here and in other parts of the state.

Risk Factors for Breast Cancer

Personal characteristics
- Female
- Aging
- White ethnicity
- Obesity (post-menopausal)
- Dense breast tissue (post-menopausal)
- High estrogen levels
- Taller women

Reproductive history
- Early age at menstruation
- Postponing having children
- Having no or few children
- Late age at menopause

Health history
- Family history of breast cancer
- Certain genetic mutations
- Certain types of benign breast disease
- Prior breast cancer
- Post-menopausal hormone use

Lifestyle factors
- Heavy alcohol consumption
- Cigarette smoking
- Secondhand cigarette smoke
- Current or recent use of birth control pills
- No or low levels of physical activity
- No or short duration of breast feeding

About the Coram, Mt. Sinai, Port Jefferson Station Follow-up Investigation

The CMP Follow-up Investigation is being conducted as part of the New York State Cancer Mapping Project, also known as the Cancer Surveillance Improvement Initiative. This investigation follows the Unusual Disease Pattern Protocol, which was developed to conduct investigations in areas where the incidence of a disease is significantly greater than expected. This protocol is being used for the first time during the CMP Investigation to identify unusual environmental and other factors that may help to explain elevated breast cancer incidence in this seven ZIP Code area.

Teams of State Health Department researchers have prepared four evaluations as part of this investigation:

- **Epidemiological evaluation.** A team of epidemiologists has been analyzing breast cancer data, researching what is known about breast cancer and evaluating additional information on women living in this seven ZIP Code area.

- **Toxicological evaluation.** A team of toxicologists has been evaluating substances to characterize the likelihood that they are risk factors for breast cancer.

- **Environmental exposure evaluation.** With input from the communities, a team of environmental scientists evaluated a large number of existing environmental data sets to identify possible exposures to elevated levels of contaminants compared to other areas of the state.

- **Integration evaluation.** These research teams have been working collectively to integrate their results and evaluate health risks associated with identified environmental exposures in terms of their relationship to breast cancer and other non-cancer health effects.

The CMP investigation is ongoing. Researchers are providing their findings to date in the *Coram, Mt. Sinai, Port Jefferson Station Follow-up Investigation Working Draft Integration Report.*

**For more information contact
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(800) 458-1158 ext. 27530**

http://www.health.state.ny.us/nysdoh/cancer/sublevel/follow.htm