



**Evaluation of Cancer
Among Current and Former Employees of
Frank P. Long Intermediate School
Bellport, Suffolk County**

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Center for Community Health, and
Bureau of Environmental and Occupational Epidemiology,
Center for Environmental Health
New York State Department of Health**

December 2019



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SUMMARY

The New York State Department of Health (NYS DOH) conducted a review of cancer among employees at the Frank P. Long Intermediate School in Bellport, Suffolk County. We did this study in response to community concerns that school employees may be experiencing cancer at unusually high rates.

The study included two parts. First, we used information from the New York State Cancer Registry to confirm reports of current and former school employees diagnosed with cancer. We were able to confirm 31 of the 38 reported cancer diagnoses, including 11 cases of breast cancer. Next, we compared the number and types of cancer with what we would expect to find in a similar population over the same time period. We did not find a statistically significant difference between the observed and expected number of cases for all cancers combined or for individual types of cancer.

There are certain features we look for when determining whether cancers in a group of people may be unusual. These include: 1) an unusually high number of cases of the same type of cancer; 2) two or more cases of a particularly rare cancer; 3) cancers occurring at unusual ages for that cancer; 4) many cancers occurring in a short span of years; and 5) adequate latency. Latency refers to the length of time between first exposure to a cancer-causing substance and the diagnosis of cancer. Latency is at least 10 years for most non-blood cancers in adults. These criteria are based on what we know about cancer, its causes, and the way it affects populations.

Based on the information available to us and our comparative review of confirmed cancer cases, the number and pattern of cancer diagnoses do not appear unusual.

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REPORT

INTRODUCTION

The New York State Department of Health (NYS DOH) reviewed cancer among employees at the Frank P. Long Intermediate School in Bellport, Suffolk County. We did this study in response to community concerns that school employees may be experiencing cancer at unusually high rates. Our first step in the study was to review data from the New York State Cancer Registry to confirm reports of cancer among current and former school employees. Next, we compared the number of employees diagnosed with cancer during the recent time period when most of the cancers were diagnosed with the number that we would expect for those employees.

This type of review cannot prove whether there is a causal relationship between specific exposures and health outcomes among school employees, nor can it determine the cause of any specific individual's cancer. The findings of this type of review may be used, together with findings from other similar investigations, to suggest whether more in-depth studies are needed.

METHODS AND FINDINGS

Case Confirmation and Description

The Bellport Teacher's Association provided us with information about current and past employees of the Frank P. Long school who were believed to have been diagnosed with cancer. The list included a total of 38 names, 32 women and six men. We also received dates of employment at the Frank P. Long school for 36 of these individuals from the South Country Central School District. The two people without dates of employment information were not directly employed by the school district. We compared the list of 38 individuals with information from the New York State Cancer Registry to attempt to confirm those people as having been diagnosed with cancer.

Of the 38 individuals matched against the registry, we confirmed 36 tumors in 32 people (one or more people had more than one tumor). When we compared the date of diagnosis with employment information, one person was diagnosed before they were employed by the school district, leaving 31 people with 35 tumors. The remainder of this discussion of confirmed cases pertains only to those individuals whose cancers were diagnosed after the individual began their employment at Frank P. Long.

Ages and Years of diagnosis: At the time the 35 tumors were diagnosed, the individuals' ages ranged from the mid-30s to the late 70s, with most cancers diagnosed at age 50 or older. Twenty-

nine of the tumors were diagnosed in females and six in males. Among the confirmed cases, the earliest date of diagnosis was 1980 and the most recent was 2017, a period of 38 years. Most (28, or 80%) of the cancers confirmed were diagnosed in the year 2000 or later.

Types of cancer: Thirteen different types of cancer were confirmed. Breast cancer was the most common type, with 11 cases diagnosed. Other types of cancer confirmed were colorectal, lung, endometrium, malignant melanoma of the skin, bladder, ovarian, and other types. None of the other types of cancer was particularly rare.

For the women diagnosed with breast cancer, years of diagnosis ranged from the mid-1990s to 2017; half of the breast cancers were diagnosed in 2013 or later. The ages of the women at the time of their diagnosis ranged from the mid-30s to the late 70s, with most of the women diagnosed at age 50 or older.

Potential latency: The length of time these individuals were employed at the school before the diagnosis of cancer ranged from less than a year to over 40 years, with an average of 18.5 years. Most (about 80%) of the people with cancer had been employed for 10 years or more prior to their diagnosis.

Cases that were not confirmed: Of the six people we were not able to confirm as having been diagnosed with cancer, two were reported as having skin cancer. Basal and squamous cell carcinomas of the skin are not reportable to the Cancer Registry because they occur frequently, are easily treated, and are unlikely to spread to other areas of the body. One person was reported to have been living out of state at the time of their diagnosis. The others may have had non-cancerous conditions.

In summary, 38 current and former employees of the Frank P. Long Intermediate School were reported as having been diagnosed with cancer. Thirty-one of these people were confirmed as having been diagnosed with one or more reportable cancers after they had begun their employment at the school. The diagnoses of these 31 people occurred over a period of 38 years, with the majority of diagnoses occurring in the past 18 years. Most of the people were age 50 or older at the time they were diagnosed, and most had been employed at the school for 10 years or more before their diagnosis. As would be expected for a population that was mostly female, the most frequently diagnosed type of cancer was female breast cancer.

Comparison of Confirmed Numbers with Expected Numbers of Cancer Diagnoses

To determine whether the number of reported and confirmed cancer cases among employees represented an excess over what is typically seen, the number of cancers that would be expected in current and former employees of the Frank P. Long Intermediate School was calculated. This calculation was based on employment information provided by the South Country School District, which they obtained from their employee database. The number of employees who would be expected to develop any type of cancer and the number of female employees who would be expected to develop breast cancer were estimated for the years 2004-2017. This timeframe was selected because detailed information on current employees was available for this timeframe and reports of cancers in school staff were likely most complete for this timeframe.

Active employee calculations: For calculating the number, gender, and age distribution of teachers, we used information on the employee listing to generate tabulations of numbers of teachers and other staff who were active employees on January 1, 2004 and January 1, 2018 by 10-year age group and gender. Substitute teachers were not included due to the variable amount of time they would have spent at the school. The listings were also used to obtain estimates of staff turnover (by age group and gender) over the 14 years.

Former employee calculations: It was also necessary to calculate the number of former staff because some of the reported cancer diagnoses occurred among staff no longer employed by the school. To estimate the number of former staff, we started with people employed in 1974, the year the Brookhaven Landfill opened. We assumed that the numbers and age and gender distribution of people employed in 1974 were the same as those employed in 2004, and that the same numbers of people per year left employment as between 2004 and 2018. The age and gender distributions of employees were assumed to be the same from 1974 to 2004, while people who left employment moved to the next 10-year age group every 10 years. There was no information on the listing on deaths for people who had left employment, so it was assumed that all people lived to the age of 84, the last year in the 10-year age group that contained the average life expectancy for this time period.

Estimating expected numbers of cases: The numbers of current and former employees by age and gender were then used to estimate the number of employees who would be expected to develop cancer. This was done by applying cancer incidence rates for a standard population by age and gender to the population of active and former employees by age and gender during the time period 2004-2017, then summing over all age groups. The standard population for this calculation was chosen as New York State, exclusive of New York City. Since Cancer Registry data are currently official only through 2015, cancer incidence rates for 2016 and 2017 were assumed to be the same as the average for 2014-2015.

Comparing expected numbers to confirmed numbers of cases: Numbers of cases expected were then compared with the numbers of cases confirmed to be diagnosed between 2004 and 2017 in comparable persons – direct employees of the school district who were not substitutes and were diagnosed with cancer after they had begun employment at the Frank P. Long school. For all types of cancer combined, it was calculated that 29.9 cases would be expected (7.5 in males, 22.4 in females). Twenty-two cancers (three in males, 19 in females) were actually confirmed among comparable employees who were reported. Breast cancer was the most frequently diagnosed type of cancer in this group of employees. For female breast cancer, it was calculated that 6.5 cases would be diagnosed, compared with 7 confirmed in this time period. None of the differences between observed and expected numbers of cases was statistically significant.

In summary, calculations show that the numbers of confirmed cases of cancer in general and breast cancer taken separately were similar to the numbers of cases that would be expected to occur in the past 14 years given the actual numbers of employees during this time and estimates of the number and ages of former employees.

Study Limitations: There are important limitations associated with the data available for this type of study. Former staff who were diagnosed with cancer, especially those who moved away from the area before being diagnosed, may not have been included in the reported cancer cases. Data on current and former school staff numbers, age, and gender were used to estimate the demographics of the population from which the cancer cases were reported and to calculate expected numbers of tumors in that population. It is possible that the estimates were inaccurate and either overestimated or underestimated the expected numbers of tumors. With these limitations in mind, this study evaluated patterns of cancer diagnoses by age and cancer type, and did not rely solely on numbers of cases diagnosed.

Conclusion

There are certain features we look for when determining whether cancers in a group of people may be unusual. These include: 1) an unusually high number of cases of the same type of cancer; 2) two or more cases of a particularly rare cancer; 3) cancers occurring at unusual ages for that cancer; 4) many cancers occurring in a short span of years; and 5) adequate latency. Latency refers to the length of time between first exposure to a cancer-causing substance and the diagnosis of cancer. Latency is at least 10 years for most non-blood cancers in adults.

In the current investigation, cases of 13 different types of cancer were confirmed. The number of cases of female breast cancer, the only type of cancer confirmed in large numbers, was not statistically unusual given the estimated number and ages of current and former employees. None of the other types of cancer diagnosed was particularly rare. Ages of the people at the time of their diagnosis were typical for the types of cancer they had. While most of the confirmed cases occurred in the last 15-20 years, this was not unexpected given the greater numbers of older, retired staff and likely better information on more recent illnesses. Most of the staff confirmed to have cancer had worked at the school for 10 or more years prior to their diagnosis, allowing for adequate latency. If there had been other indications of an unusual cancer pattern, a lack of sufficient latency would have made it less likely that the pattern was associated with employment at the school. Sufficient latency by itself, however, is not evidence of an unusual pattern of cancers. Based on the information available to us and the characteristics we generally look for, the confirmed cancers therefore do not appear unusual.

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