



Provincial Health Services Authority

March 7th 2023

Dear Harry Dhillon, Superintendent of Schools, School District No. 42 (Maple Ridge – Pitt Meadows),

Thank you for contacting us with your community cancer information request. My name is Dr. Jonathan Simkin and I am the Scientific Director of the BC Cancer Registry, BC Cancer; I am responsible for leading the response to information requests like yours at BC Cancer. I am contacting you to let you know that our team have investigated your request and have summarized our findings within this letter.

CANCER CLUSTER INVESTIGATION AND FINDINGS

SCOPE OF ASSESSMENT

Cancer is a common disease and approximately 1 in 2 British Columbians will develop cancer in their lifetime. Rates of new cancer diagnoses may be variable across populations or groups so that, for any given time period, some populations have rates above or below the overall regional rate. As per BC Cancer's cancer cluster guidelines, our objective was to assess whether the observed number of cancer cases reported was greater than expected based on provincial rates. In other words, our goal was to assess whether there was an excess in the observed rate and whether this excess is consistent with the expected random variability of the population as a whole.

For this assessment, we calculated the rate of new cases of breast cancer (also known as the cancer incidence rate) among the Alouette Elementary School Staff (the group of concern described in the request, hereafter the "Alouette Cohort"). Although other cancers beyond breast cancer were reported, they do not have a common etiological link with breast cancer and were excluded from the assessment. The Alouette Cohort cancer rate was compared to the female breast cancer incidence rate in British Columbia overall. Information on observed cases and the size of the group of concern (i.e. the Alouette Cohort) was provided by the requestors through the request form and follow up communication with the requestor point of contact.

If cancer risk among the Alouette Cohort was not elevated, we would expect the breast cancer incidence rate in this group to be similar to the provincial breast cancer incidence rate. If there was an elevated risk in the Alouette Cohort, we would expect the cancer incidence rate in this group to be statistically significantly elevated compared to the rate observed in BC overall. In other words, the excess would not be consistent with the expected random variability of the population as a whole.

BREAST CANCER INCIDENCE RATE OF THE ALOUETTE COHORT

Cancer risk is influenced by the duration, frequency, and intensity of an exposure of concern. Therefore, the cancer incidence rate that we calculate in these assessments represents the number of new cases of cancer over the total number of years that the cohort members were observed for in the time period of interest. In other words, each member of the cohort contributes follow-up time to the calculation for each year from the time they first enter the cohort to either a diagnosis of cancer or the end of our study period.

There were seven cases of breast cancer reported to BC Cancer among the Alouette Cohort. This included both former and current staff. The earliest year of employment among the reported cases was 1995. Using readily

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available information from the school roster, which included the years 1999 to 2022, the number of unique individuals employed at the school from 1999 to 2022 was 367. The total number of years added up across members of the Alouette Cohort from their first year of employment (or first record readily available to us in the school roster) to either a cancer diagnosis or end of our study period (i.e. 2022) was 4,237 years. Therefore, the breast cancer incidence rate was calculated to be 165.2 cases of cancer per 100,000 persons.

BREAST CANCER INCIDENCE RATE AMONG THE GENERAL POPULATION IN BC

Using data from the BC Cancer Registry, a database that collects information on all reportable cancers diagnosed among BC residents, we calculated the female breast cancer rate for BC females aged 25-75 years of age from the most recent ten years of available data. Over this time, there were 29,123 new cases of breast cancers and using population estimates, this comes to a cancer incidence rate of 182.6 cases per 100,000 persons.

COMPARING THE CANCER INCIDENCE RATE OF THE ALOUETTE COHORT TO THE GENERAL POPULATION

The breast cancer incidence rate of the Alouette Cohort (165.2 per 100,000 persons) was lower than the rate in the general population. Specifically, it was 0.9 times the rate of the general population of BC (182.6 cases per 100,000 persons). When considering the number of cases, size of the Alouette Cohort, and follow-up time of each member, the observed difference in rates does not suggest a statistically meaningful difference in risk. When we examine cancer rates in small communities or groups of people and compare to provincial or other regional rates, we expect to see some difference in the actual rates, even when the risk of cancer in the different populations are really the same. This is because statistical fluctuations (random chance) of cancer rates year to year happen. What we try to do in our assessments is to determine if any differences are large enough that they would be unlikely to occur due to random chance. A way to think about this is, if the Alouette Cohort had the exact same cancer risk as the general population, how likely is it we would see a difference in rates of 165.2 vs 182.6 cases per 100,000 people? In this case, our calculations say that if we took 100 cohorts of the same of the Alouette Cohort, and if they in reality had the exact same cancer risk as the general population, we would observe a cancer rate of 165.2 or higher in 65 of 100 cohorts (or 65% of the time). This suggests what we observed is not an uncommon event.

EXPECTED NUMBER OF CASES IN THE ALOUETTE COHORT BASED ON PROVINCIAL BREAST CANCER RATES

Another approach to assessing the risk in the Alouette Cohort is to compare the observed number of breast cancer cases to what would be expected based on the breast cancer rates in BC. If we were to assume the Alouette Cohort had the exact same cancer risk as the general population, we would expect approximately 8 female breast cancer cases over the follow-up period. Considering statistical fluctuations in cancer rates due to random chance, we would expect a range from 4 to 14 female breast cancer cases in the Alouette Cohort if we were to assume the exact same cancer risk as the general population.

Our normal practice is to assess the rate of cancer over the whole period we have information for (i.e. since 1999). This includes both years with and without cancer diagnoses. If we picked a period closer to when the first



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cases occurred, 2010 for example, the observed number of cases in the Alouette Cohort would still be within the normal range expected based on breast cancer rates in BC. Specifically, we would expect a range between 2 and 9 female breast cancer cases in the Alouette Cohort since 2010, if we were to assume the exact same cancer risk as the general population. This means that the 7 cases that were observed among the Alouette Cohort is within the normal range that we would expect based on breast cancer rates in BC.

CONCLUSION

Breast cancer is the most common cancer diagnosed among women in British Columbia. On average, there are nearly 4,000 new cases of breast cancer diagnosed among women in BC every year. One in seven women will be diagnosed with breast cancer in their lifetime in BC. Similar statistics were reported nationally.

In this case, there were 7 cases of breast cancer observed among 367 people over a period ranging from 1999 to 2022. Compared to the rate of breast cancer in the BC population, there is no evidence, based on the information provided to us, that there is a meaningful difference in the risk of breast cancer among the Alouette Cohort. The same conclusion was drawn when using a study period closer to when the first cases occurred.

Thank you for reaching out to us. I hope this letter provides you with the information you are looking for. If you have any questions or concerns, please contact datareq@bccancer.bc.ca and adding that you would like to get in touch with me.

Sincerely,

A handwritten signature in black ink that reads 'Jonathan Simkin'.

Dr. Jonathan Simkin PhD, MPH
Scientific Director, BC Cancer Registry
BC Cancer
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