Sumas Mountain / Swift Creek Asbestos Cluster Investigation

February 2010

Nancy West, MS
Glen Patrick, MPH

Environmental Epidemiology
Division of Environmental Health
Washington State Department of Health

DOH 334-224 February 2010

Sumas Mountain / Swift Creek Asbestos Cluster Investigation

This report is a follow-up to the Washington State Department of Health epidemiologic cluster investigation conducted in 2008 of health effects resulting from possible exposure to naturally occurring asbestos in the Swift Creek drainage located in Whatcom County, Washington[1].

This update was initiated at the request of the Site Assessment Section within the Department of Health, Division of Environmental Health. It is in response to updated environmental sampling results from the U.S. Environmental Protection Agency's (EPA) May 2009 investigation of asbestos concentrations in surface water, sediment, and flood deposits within a study area consisting of the Swift Creek drainage and downstream Sumas River area[2].

The goal of this epidemiologic cluster investigation was to assess the rate of lung and bronchial cancer, and mesothelioma among people living in the study area compared to rates for Whatcom County and the state overall, taking into account additional years of data and the expanded area of interest. While mesothelioma is rare and specifically linked to exposure to asbestos, lung, and bronchial cancer is prevalent and associated with numerous factors, especially smoking. It was assumed that the population living in the study area may be more exposed to asbestos and therefore likely to experience a higher rate of asbestos related cancer (e.g., cancer of the lung and bronchus, and mesothelioma) than the overall state population.

Methods

To address these goals, mesothelioma and lung and bronchial cancer case data from 1992 through 2006 were obtained from the Washington State Cancer Registry (WSCR) for the study area population in Whatcom County and the state population. Population data were obtained from the 2000 U.S. Census. This investigation included two additional years of data compared to the prior investigation. Additionally, the geographic region included in this investigation was increased compared to the prior investigation and included additional census block groups that encompass the Swift Creek drainage and the Sumas River area to the Canadian border (Figure 1). Human exposure to naturally occurring asbestos was assumed to result from both undisturbed asbestos-containing streambed materials as well from materials moved off-site for use as fill.

Data for the fourteen-year period were combined because of the small number of both cancers among the population of Whatcom County as a whole, and especially among the population living within the selected census blocks comprising the study area. In keeping with standard epidemiologic data analysis practices, the data were age-adjusted to account for differences in the population age structure of Whatcom County and within the study area, compared to the state. The age adjustment of data is necessary since the rate of cancer in the population increases with age. Age-adjusted rates with 95 percent confidence intervals (CI) for mesothelioma and lung and bronchial cancer were then calculated for residents of Whatcom County, the study area, and for the state. The calculation of confidence intervals is necessary to evaluate whether rates that differ from the state rate are different simply due to chance alone. Finally, the rates presented below are presented in terms of a population of 100,000 due to how rarely these conditions occur.

---

[1] Washington State Department of Health. Health Consultation: Swift Creek Sediment Asbestos Site, Everson, Whatcom County, Washington. February 22, 2008. Available at URL: www.atsdr.cdc.gov/HAC/pha/SwiftCreekAsbestos/SwiftCreekAsbestos_2-22-2008.pdf

[2] U.S. EPA Region 10 Office of Environmental Assessment. Soil, Sediment, and Surface Water Sampling, Sumas Mountain Naturally Occurring Asbestos Site Whatcom County, Washington (Draft Report). August, 13, 2009

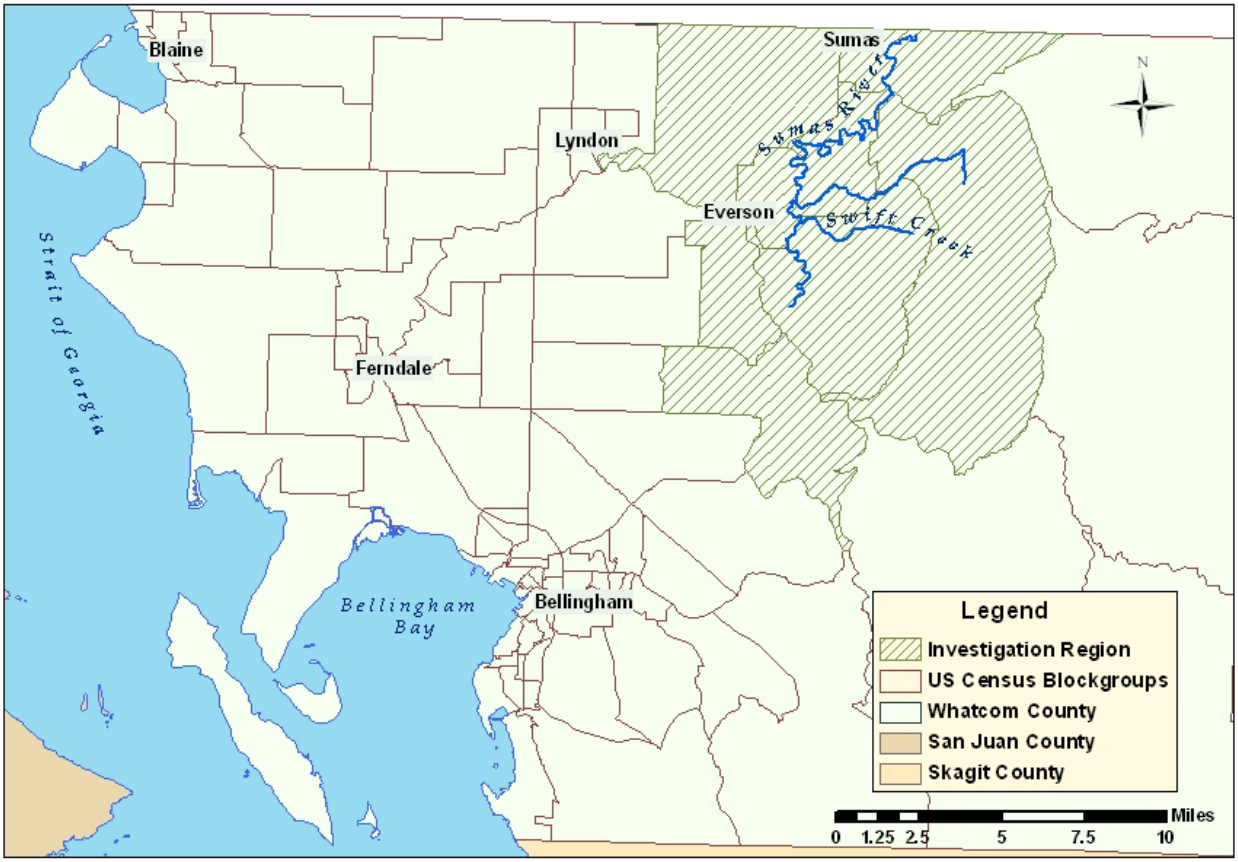

Figure 1. Swift Creek-Sumas River Study Area.

Results

Lung and Bronchial Cancer

Between 1992 and 2006, 1,449 cases of lung and bronchial cancer were identified in the WSCR for Whatcom County, resulting in an age-adjusted rate of 889 cases per 100,000 population. This rate was less than the overall rate for Washington State (1011 cases per 100,000) and was lower than would be expected by chance alone. Within the study area, the rate for lung and bronchial cancer was 814 per 100,000 and while lower than the overall state rate and the rate for Whatcom County, this finding may be due to chance alone (Table 1).

Table 1. Lung and Bronchial Cancer Data (1992 – 2006)

Geographic Area	Population	Age-adjusted Rate per 100,000	95% Confidence Interval	
			Lower Bound	Upper Bound
Washington State	5,894,092	1011	1003	1020
Whatcom County	166,814	889	843	937
Swift Creek/Sumas River Study Area	*12,393	814	636	1033

*Reflects a value corrected due to a transcription error, which had no influence on the analytic results

Mesothelioma

Between 1992 and 2006, the age-adjusted rate for mesothelioma in Washington State was 23 cases per 100,000 population and the rate for Whatcom County was the same (23 cases per 100,000 population). Among the population living within the study area, the rate of mesothelioma was 9.3

per 100,000 population. This rate is considerably lower than the rate for the state and Whatcom County (Table 2). Due to the small number of cases, however, this rate may be due to chance alone.

Table 2. Mesothelioma Cancer Data (1992 – 2006)

Geographic Area	Population	Age-adjusted Rate per 100,000	95% Confidence Interval	
			Lower Bound	Upper Bound
Washington State	5,894,092	22.94	21.68	24.25
Whatcom County	166,814	22.87	15.95	31.81
Swift Creek/Sumas River Study Area	*12,393	9.26	0.23	71.66

*Reflects a value corrected due to a transcription error, which had no influence on the analytic results

Conclusions

The age-adjusted rate for lung and bronchial cancer among the population in Whatcom County was found to be lower than the state rate by more than would be expected by chance alone. The age-adjusted rate for the study area consisting of the Swift Creek/Sumas River drainage area, while lower than either the state or county rates may have occurred by chance alone and could be the same.

With regard to mesothelioma, the age-adjusted rate for the population in both Whatcom County and the Swift Creek/Sumas River drainage area, while lower than the rate for the state overall, may have occurred by chance alone and could be the same.

These results are consistent with study results provided previously and provide no indication that naturally occurring asbestos in the study area consisting of the Swift Creek/Sumas River drainage area has contributed to an increase in the occurrence of lung and bronchial cancer or mesothelioma among the potentially exposed populations.

These conclusions, however, are based on available data and analytic methods at our disposal, both of which have limitations. With regard to mesothelioma, we have limited ability to identify with certainty small increases or decreases due to the relatively small number of cases among the Whatcom County or study area populations. Thus, we cannot distinguish true increases or decreases from random fluctuations. Additionally, the number of cases reported for Whatcom County and the study area may under or over represent the true number of cases resulting from local asbestos exposure. This is due to the long disease latency period[3] (time between exposure and disease occurrence) and population migration.

[3] Medline Plus, Mesothelioma. http://vsearch.nlm.nih.gov/vivisimo/cgi-bin/query-meta?v%3Aproject=medlineplus&query=mesothelioma Accessed Oct 7, 2009.