DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL
ATLANTA, GEORGIA 30333

CDC--MOUNT ST. HELENS VOLCANO HEALTH REPORT #15 July 25, 1980

Survivors of the May 18, 1980, Eruption of Mount St. Helens

The volcano surveillance team of CDC is completing a study of the survivors of the May 18, 1980, eruption of Mount St. Helens. This investigation seeks to answer 2 different sets of questions. The first centers on factors that distinguish survivors from those who died from causes associated with the eruption. The aim of the analysis is to find out how survivors protected themselves and how their specific location on the mountain and health status contributed to their survival. The second set of questions relates to the impact of the eruption on survivors' health. At this point, it appears that most health problems of survivors derived from the initial physical trauma suffered in the first few minutes of the eruption. Significant respiratory distress does not seem to have been a problem.

About 300 people who were in the area of Mount St. Helens on the morning of May 18 have been contacted. Approximately 100 survivors have been defined by criteria based on geographic location and exposure to physical trauma. A questionnaire has been completed for each survivor, either by telephone or personal interview. Each survivor's location is plotted on a map of the area. These locations are compared with those of the confirmed and presumed dead, and are also being analyzed with geologic and topographic overlays. Analyses of this information and of the interview data are now being performed. Results of this study will be reported in future issues of the CDC Mount St. Helens Volcano Health Report.

This study could not have been conducted without the gratefully acknowledged support of many agencies and individuals involved in the disaster relief effort.

Eruption of Mount St. Helens--Tuesday, July 22, 1980

Following a period of earthquake activity (Richter scale--approximately 2), lasting about 4-5 hours and unassociated with harmonic tremors, Mount St. Helens erupted 3 times on the evening of July 22. The eruptions (and their approximate duration) were at 5:13 pm (2 minutes), 6:26 pm (10 minutes), and 7:00 pm (3 hours), and effectively blew out the developing dome.

Individuals with permits to be on the mountain were cleared from the hazardous zone after the earthquake activity began; no fatalities occurred. There was some pyroclastic flow in the direction of the Spirit Lake area, but no mudflows or significant ashfall on the mountain. These eruptions, therefore, should not significantly increase any existing risks of flooding or other dislocations in the area.

The ashfall was east-northeast of the mountain, in the general direction of the plume from the first eruption (May 18), although the total ashfall was less, and the most heavily impacted area was in northeast Washington north of Spokane. The hospitals in the CDC surveillance network, as well as other hospitals in the plume trajectory, rapidly provided unofficial estimates of ashfall in their communities. All of the hospitals reported a 0-1/8 inch accumulation, except for the area in northeast Washington (north of Spokane), where 1/8-1/4 inch of ashfall was reported in Chewelah, Colville, Ruby, and Metaline Falls.

The hospital surveillance program in Washington, Oregon, and Idaho was established with the assistance of CDC and the respective state health departments to monitor post-eruption illness trends, but the established communication channels were adapted to monitor the path of the ashfall from the July 22 eruptions. Data on ashfall were provided via telephone to the Vancouver headquarters of FEMA and CDC, and much of the information about peripheral areas, which turned out to be quite reliable, was transmitted by midnight, only hours after the third eruption ended.

Preliminary data on total suspended particulates (TSP) from the Environmental Protection Agency (EPA) Region X (Table 1) show TSP increases in the plume path during the 24-hour post-eruption period; the peak levels measured were considerably lower, however, than those measured after the May 18 eruption. Addy, which is in the area receiving the heaviest fallout, had an unconfirmed report of TSP of 4,497 ug/m^3. Yakima and Richland on the fringe of the plume, as well as Spokane, showed lesser increases. Additional data will be forthcoming.

Table 1
Preliminary Reports of Total Suspended Particulates (TSP) Measurements
July 21-24, 1980

Station	Date	Time Frame (hours)	TSP (ug/m^3)
Addy	7/23/80	0-2400	4,997
Yakima	7/20-21/80	900-900	100
	7/22-23/80	1800-1100	850
	7/23-24/80	1100-900	427
Richland	7/22-23/80	600-600	1,394
Spokane	7/21/80	0-2400	165
	7/22/80	0-2400	271
	7/23/80	0-2400	655
	7/24/80	0-800	278

Particulate Air-Quality Standards

EPA is following and participating in a number of studies related to the Mount St. Helens eruptions. Of particular concern is the evaluation of the health effects of high levels of suspended

particulate matter. Besides the obvious need to assess both acute and long-term effects in order to deal with possible future eruptions and continued resuspension of ash, CDC's results and those of other investigations may have implications for particulate national ambient air-quality standards. The air-quality standards (Table 2) and supporting criteria for particulate matter are currently undergoing review by EPA as mandated by the Clean Air Act. The epidemiologic support for these standards comes largely from studies in areas dominated by fossil-fuel combustion and industrial emissions. The Mount St. Helens eruption may provide a data base on community exposures to high levels of crustal, predominantly coarse-mode (>2.5 μm MMAD) particles. This is especially important because crustal-derived coarse particles (at lower concentrations) form a significant fraction of suspended particulate matter in many parts of the United States.

Table 2
Primary (Health) Standards for Particulate Matter

	260 $\mu g/m^3$	24 hours not to be exceeded more than once a year
	75 $\mu g/m^3$	Annual geometric mean
Significant harm level:	1000 $\mu g/m^3$	24 hours

Submitted by: John Bachman, Environmental Engineer, Ambient Standards Branch, Strategies and Air Standards Division, EPA, Research Triangle Park, North Carolina.

The CDC--Mount St. Helens Volcano Health Report will be published once a week until further notice. Information in this report represents the latest data reported to CDC, much of which is preliminary in nature and subject to confirmation or change. It is distributed for the purpose of providing up-to-date health data from CDC and the many other groups involved in public-health assessment. We hope to continue to receive relevant reports and data from others working on this problem.

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