Measles — Continued

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Current Trends

Results of Blood Lead Determinations among Workers Potentially Exposed to Lead — United States

Determinations of blood lead levels among adult workers in the United States were recently analyzed by the National Institute for Occupational Safety and Health (NIOSH) and the National Center for Health Statistics (NCHS); data were collected during the Second National Health and Nutrition Evaluation Survey (NHANES-II). Blood lead levels were significantly higher among adults working in occupations with potential exposure to lead than in occupations without such potential exposures. Cigarette smokers had consistently higher blood lead determinations than nonsmokers, and men had higher levels than women.

NHANES II, conducted by NCHS from 1976 to 1980, was a cross-sectional survey of a probability sample of 27,801 persons, aged 6 months to 74 years, who were selected as representative of the total non-institutionalized civilian population of the United States. The survey used medical histories, physicians' examinations, and laboratory tests to collect a broad range of information on health status, including measurements of lead concentrations in whole blood (*1*).

The NHANES-II blood lead determinations were compared with data previously collected during the National Occupational Hazard Survey (NOHS) (*2*), conducted by NIOSH from 1972 to 1974. NOHS collected information on potential exposures of workers to chemical and physical agents in a probability sample survey of approximately 5,000 workplaces across the United States. These data identified occupations with potential occupational exposure* to lead in the workplace.

The results of blood lead determinations among workers, aged 18-74 years, surveyed by NHANES II were divided into two groups: those for persons working in settings previously identified by NOHS as affording potential exposures to lead and those for persons working in settings without such potential exposures. Preliminary results of this comparison indicate that the mean of blood lead determinations for men in the United States with potential occupational exposures to lead (17.9 μg/dL) was significantly greater than that for men without potential occupational exposure to lead (15.5 μg/dL) ($p < 0.001$) (Table 2). Of the male workers with potential occupational exposure to lead, 5.8% had blood lead levels greater than 30 μg/dL. Of male workers without potential occupational exposure to lead, 1.2% had blood lead levels over 30 μg/dL. Hence, 92% of adult men in the United States found in 1976-1980 with blood

*Potential occupational exposure describes an assessment by an industrial hygienist of the relationship between workers and chemicals in workplaces surveyed by NOHS. Surveyors did not collect environmental samples but determined whether a chemical was in use or generated in a workplace. A worker was "potentially exposed" if opportunity for exposure to the chemical existed for at least 30 minutes per week at least 90% of the weeks worked in a year. Assessment rested on the surveyor's judgment of contact between worker and agent in one or more of its physical phases.

Blood Lead — Continued

lead levels over 30 μg/dL worked in occupations that were judged in 1972 to be associated with potential occupational exposure to lead.

Because NHANES-II also recorded information on the smoking status of examinees, it was possible to demonstrate that smokers have significantly higher blood lead levels than nonsmokers (Figure 2). This was true for adults of both sexes and for workers with and without potential occupational exposures to lead. Smoking appeared to have an additive effect to the potential occupational exposure to lead in producing elevated blood lead levels.

Reported by Surveillance Br, Div of Surveillance, Hazard Evaluations, and Field Studies, National Institute for Occupational Safety and Health, CDC.

Editorial Note: Lead poisoning has been recognized since antiquity as a hazard of working with lead (*3*). Present-day occupations associated with exposure to lead and the risk of lead poisoning include smelting, recovery of scrap, cutting of steel, and the manufacturing of batteries, lead pigment, and stained glass. The major route of lead absorption in the occupational setting is inhaling lead dust and fumes (*4*). Ingesting lead dust from fingers, food, and cigarettes (*5*) has also been shown to contribute to occupational exposure.

Chronic occupational exposure to lead has been shown to cause anemia and peripheral neuropathy, the extent and severity of these effects correlating with observed blood lead levels (*6*). Occupational lead exposure has also been associated with central nervous system dysfunction that may lead to premature senility (*7*) and with renal impairment resulting in elevated death rates from end-stage renal disease (*8*). Finally, lead is toxic to reproductive functions and may cause depressed sperm counts in workers (*9*).

It is not possible to establish a blood lead level below which symptoms are never found or to indicate a blood lead level at which symptoms will necessarily occur (*10*). Although various standards have been proposed for maximum blood lead levels and permissible exposure limits (*11,12*), the present analysis focuses on blood lead levels of 30 μg/dL as an indicator of the need for concern. Coincidentally, this level appears to be about two standard deviations above the average blood lead level observed in adults in NHANES II.

The data indicate that exposure in the workplace had and may continue to have a significant impact on blood lead levels of adults in the United States. Although blood lead levels among workers in the lead industries have declined in recent years, they are still significantly higher than among lead workers in the United Kingdom, Sweden, or Finland (*13*).

TABLE 2. Mean* blood lead levels for U.S. workers, 18-74 years of age, by sex and potential exposure to metallic lead, 1976-1980

Observed potential workplace-exposure to metallic lead	Sex	Average† blood lead level, μg/dL (SE)	Percentage† workers with blood lead levels > 30 μg/dL (SE)
Present	Male	17.9 (0.34)	5.8 (0.66)
	Female	12.3 (0.36)	1.1 (0.68)
Absent	Male	15.5 (0.36)	1.2 (0.51)
	Female	11.5 (0.28)	(-)§

*Data sources: The National Center for Health Statistics' National Health and Nutrition Examination Survey (1976-1980). The NIOSH National Occupational Hazard Survey was used to identify workers in types of workplaces with observed potential exposure to lead.

†The estimated standard errors (μg/dL) of the estimates are in parentheses next to the National estimated averages.

§This percentage and its standard error are estimated to be zero. The true percentage is more likely greater than zero.

Blood Lead — Continued

Methods of preventing occupational absorption of lead include: 1) replacing lead with less toxic materials; 2) enclosing work processes that produce exposure to lead; 3) adequately ventilating work areas; 4) altering work practices; 5) using personal protective equipment, such as coveralls and respirators; and 6) modifying personal hygiene practices. The first three measures, which tend to reduce airborne lead at its source, are the most effective.

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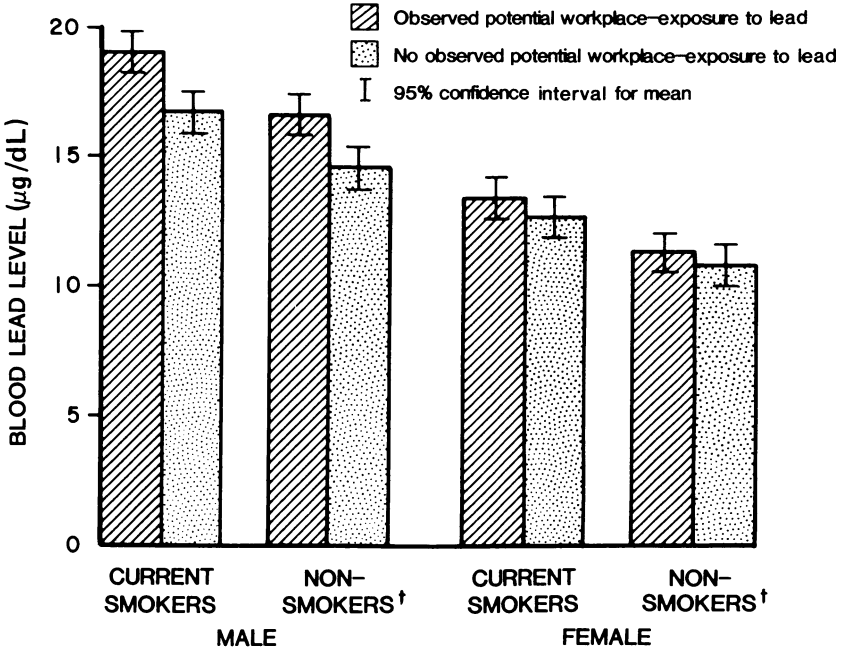
FIGURE 2. Mean* blood lead levels for workers 18-74 years of age, by potential occupational lead exposure, sex, and smoking status — United States, 1976-1980



*Data sources: The National Center for Health Statistics' National Health and Nutrition Examination Survey (1976-1980). The National Institute for Occupational Safety and Health's National Occupational Hazard Survey was used to identify those in types of workplaces with observed potential exposure to lead.

†Includes ex-smokers.

Blood Lead — Continued

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Erratum, Vol. 32, No. 14

p. 183. In the article, "Interstate Common-Source Outbreaks of Staphylococcal Food Poisoning—North Carolina, Pennsylvania," the credits on p. 184 should include WD Mashburn, MPH, Iredell County Health Dept, North Carolina.

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MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

International Notes

Epidemic of Acute Illness—West Bank

The Centers for Disease Control received a request through the U.S. Department of State to provide a team of physicians to investigate a health problem on the West Bank. The following is a report of the findings.

From March 21 to April 3, 1983, 943 cases of an acute, non-fatal illness characterized by headache, dizziness, photophobia, blurred vision, abdominal pain, myalgia, weakness, difficulty breathing, fainting, mydriasis, and peripheral cyanosis occurred in residents of communities throughout the West Bank. Six hundred sixty (70%) of patients were school girls between the ages of 12 and 17 years. Clinical, epidemiologic, and toxicologic analyses indicated the illness was of psychogenic origin and was induced by stress. The outbreak, which began at a girls' secondary school, may have been triggered by the odor of low concentrations of hydrogen sulfide (H_2S) gas near the school.

To evaluate the clinical features of the illness and possible antecedent risk factors, a questionnaire interview of 124 patients and 57 age- and sex-matched controls from two affected villages was conducted. In the northern village of Arrabah, site of the initial outbreak, 58 (95%) of 61 affected school girls and four affected adults participated in the study; at Yattah, in the southern West Bank, 56 (64%) of 88 affected high school girls and six affected adults participated. The most frequently reported symptoms were headache (98%), dizziness (96%), and abdominal pain (76%)(Table 1). Patients reported no common exposures to food, drink, or agricultural chemicals. Eight (15%) of 54 patients at Arrabah and 50 (89%) of 56 at Yattah

TABLE 1. Reported incidence of symptoms of acute illness — Arrabah and Yattah, West Bank, March-April, 1983

	Number of patients			
Location	**Arrabah**		**Yattah**	
Total patients	**62**		**62**	
Symptoms				
Headache	60	(97)*	62	(100)
Dizziness	57	(92)	62	(100)
Abdominal pain	40	(65)	54	(87)
Blurred vision	38	(61)	42	(68)
Weakness of limbs	37	(60)	52	(84)
Myalgia	26	(42)	20	(32)
Loss of consciousness	18	(29)	23	(37)
Paralysis	9	(15)	7	(11)
Blindness	6	(10)	7	(11)

*Figure in parenthesis represents percentage of patients with symptoms.

The *Morbidity and Mortality Weekly Report* is prepared by the Centers for Disease Control, Atlanta, Georgia, and available on a paid subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, (202) 783-3238.

The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday.

The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: ATTN: Editor, *Morbidity and Mortality Weekly Report*, Centers for Disease Control, Atlanta, Georgia 30333.

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