

**Occupational Blood Lead Surveillance  
Of Construction Workers, II  
Health Programs in Thirteen States**

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CPWR — the research and development arm of the Building and Construction Trades Department, AFL-CI — is uniquely situated to serve workers, contractors, and the scientific community. A major CPWR activity is to improve safety and health in the construction industry in the United States. This report is part of that effort. (Report OSH 1-97)

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## **Abbreviations**

ABLES	Adult Blood Lead Epidemiology and Surveillance
DOT	Department of Transportation (state level)
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
SIC	Standard Industrial Classification
µg/dl	Micrograms per deciliter

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In 1995, researchers at the Irving J. Selikoff-Mount Sinai Center for Occupational and Environmental Medicine and at the New York State Department of Health, Division of Occupational and Environmental Epidemiology, surveyed 12 state departments of health. The results of that survey were published in November 1995 by the Center to Protect Workers' Rights as *Occupational Blood Lead Surveillance of Construction Workers: Health Programs in Twelve States*.

In 1996, the authors continued to survey state health agencies; the results of the survey of 13 additional states are reported here. Both surveys were designed to examine (1) trends in lead surveillance activities, both general and construction-specific; (2) the degree to which cooperative efforts have emerged among state agencies to address construction workers' lead exposures; and (3) perceived barriers to program development and implementation.

## **Background**

According to the National Institute for Occupational Safety and Health (NIOSH), 95% of reported adult blood lead levels result from occupational lead exposure. Home repair and hobbies also contribute to adult lead exposure. In the late 1980s and early 1990s, reports of lead poisoning among construction workers began to rise (National Institute for Occupational Safety and Health 1992). In 1993, the U.S. Occupational Safety and Health Administration (OSHA) promulgated the Lead Exposure in Construction standard (Occupational Safety and Health Administration 1993).

Lead-based paint has been applied to virtually all steel bridges, elevated highways and railways, and storage tanks in the United States. Construction workers employed in rehabilitation or demolition of steel structures — bridges and storage tanks — face an elevated risk of lead exposure and concomitant health effects. Painters, laborers, and ironworkers are particularly at risk on these projects. With infrastructure repair on the rise, the number of workers and the extent of their exposures to lead are likely to increase.

In 1990, the U.S. Public Health Service issued *Healthy People 2000*, announcing a national health objective to eliminate all lead exposures that result in blood lead levels greater than 25 micrograms per deciliter ( $\mu\text{g}/\text{dl}$ ) (Public Health Service 1990). OSHA's Lead Exposure in Construction standard in 1993 set a blood lead level of 40  $\mu\text{g}/\text{dl}$  as the trigger for intervention at a worksite. However, a recent epidemiological study of elderly men with long-term environmental exposure to lead indicated that lower blood lead concentrations may cause health effects, such as impaired renal function (Kim and others 1996). (The definition of an "elevated" blood lead level varies among states.)

Although a handful of states began developing surveillance systems for adult lead poisoning as early as the 1970s, most states established such registries in the 1980s and 1990s. In most cases, states have set up adult blood lead registries following or in conjunction with the establishment of childhood lead poisoning surveillance and prevention programs. NIOSH's Adult Blood Lead Epidemiology and Surveillance (ABLES) program has been a major force in support of states' efforts to establish adult registries. ABLES provides funding and technical support to states to document and prevent adult lead poisoning in high-risk industries and occupations, including construction.

NIOSH publishes ABLES states' combined reports of adult blood lead levels each quarter in the Center for Disease Control and Prevention's publication, *Morbidity and Mortality Weekly Report*.

Registries are created through state legislation or agency administrative procedures, such as amendments to a reportable disease rule. These laws and rules mandate the reporting of blood lead levels to a specific state agency, usually the department of health. Adult blood lead registries generally rely on laboratories, physicians, and/or other health care entities such as clinics and hospitals to report elevated blood lead levels.

A registry's foremost function is surveillance. Registry surveillance activities can include collecting, analyzing, and reporting data in order to examine the distribution of adult lead poisoning. Categories analyzed may include occupation, industry sector, geographic location, and time period. The detection of trends can be useful for determining program priorities for prevention and research initiatives and for evaluating the effectiveness of intervention strategies. Some information needed for this surveillance work is available on a state's blood lead-level reporting form. Most often, however, registry staff must conduct extensive report follow-up to obtain basic information on the characteristics of the individual and the circumstances of the exposure.

In addition to surveillance, some registries intervene to prevent or reduce lead poisoning. Intervention typically includes giving information to lead-poisoned people about the health hazards of lead, methods to control exposures, and appropriate medical care. A registry may also provide information to physicians and/or employers, depending on the registry's intervention protocol. In some instances, an industrial hygiene investigation will occur, or a case will be referred to state or federal OSHA for a follow-up investigation. Some registries have undertaken broad-based public health initiatives such as conferences on occupational lead exposure and targeted mass mailings of educational materials. In addition, as documented in the previous study, some registries have undertaken special programs to prevent lead poisoning of construction workers.

## **Survey Methods**

The states in the current survey were selected based on geographic diversity (table 1). The survey questionnaire covered registry background information, reporting requirements, data-collection and response protocols, and any special surveillance programs in construction (see annexes A and B). The questionnaire used in the 1995 survey was revised for this effort, in order to improve clarity.

As with the first survey, the survey was faxed to an identified contact person in each state and an appointment was made to complete the survey by telephone interview. Interviews took place during the summer. Registry personnel then reviewed their state's summary and changes were made to the summaries accordingly.

## General Findings

### Trends in Surveillance

The survey found that 10 of 13 states require the reporting of adult blood lead levels. Indiana, Mississippi, and West Virginia do not have adult blood lead registries.

Seven of the 10 states implemented reporting requirements for adult blood lead levels in the 1990s. Kentucky, Pennsylvania, and South Carolina have required the reporting of adult blood lead levels since the early 1970s.

NIOSH's ABLES program helps fund registry operations in five states: Alabama, North Carolina, Oregon, Pennsylvania, and South Carolina.

**Table 1. Surveyed states, 1996 and 1995**

1996 (Current report)	1995 (Previous report)
Alabama	California
Alaska	Connecticut
Florida	Georgia
Idaho	Louisiana
Indiana	Maryland
Kentucky	Massachusetts
Mississippi	Michigan
North Carolina	New Jersey
Oregon	New York
Pennsylvania	Ohio
South Carolina	Texas
Tennessee	Washington
West Virginia	

### Reporting and Intervention Practices

In the 10 states with blood lead registries:

- Laboratories are required to report blood lead test results (table 2). Physicians are also required to report test results in all of the states except Pennsylvania.
- Blood lead levels triggering reporting range from all test results (South Carolina) to 40 µg/dl (North Carolina). Six of the states require reporting at 15 µg/dl or higher: Alabama, Alaska, Florida, Idaho, Pennsylvania, and Tennessee. In Pennsylvania, the 15 µg/dl threshold applies only to pregnant women; for others the threshold is 25 µg/dl.
- Four states — Alabama, Idaho, North Carolina, and Oregon — have mechanisms to identify a person's occupation, usually through case follow-up. Alabama and Oregon maintain statistics on occupational versus non-occupational cases. Only Oregon has systematically classified whether occupational cases belong to the construction sector or general industry.
- Seven registries undertake intervention efforts in addition to data collection. The most common intervention activity is providing educational materials on lead's health effects and exposure prevention. Intervention activities also include telephone follow-up with physicians and/or with individuals having elevated blood lead levels.





- Of the seven states that intervene, four have set intervention-triggering levels at 25 µg/dl or greater.
- Six states refer cases of elevated blood lead levels to the state or federal OSHA for investigation.
- No registry conducts industrial hygiene worksite investigations or intervention. The North Carolina Department of Health has industrial hygienists on staff and is developing procedures for deploying them in worksite investigations of elevated blood lead-level cases. Alabama and Oregon also plan to conduct such investigations.

## **Blood Lead Levels**

As with our first survey, the survey found that insufficient and noncomparable data made year-to-year and interstate trends impossible to elucidate. Only six states provided data for both 1993 and 1994. Three of those states showed an increase the number of cases or reports. (A report is counted each time an individual takes a test and cases represent an individual's highest blood lead level report for a given year.) One state showed a decrease and two states had too-few reports to chart a change. Interstate comparisons were further complicated by the range in categorization. For example, several states reported their highest categor as 60 µg/dl and above, while Oregon's highest categor was 40 µg/dl and above.

In 1993-94, reports in the highest categor collected (60 µg/dl or greater) in Pennsylvania declined from 2.8% to 0.9% of the total. In South Carolina, although the total number of cases increased dramatically, the number of cases at 60 µg/dl or greater decreased from 5.0% to 2.0% of the total.

Only Oregon had data available on blood lead level by employment sector. Oregon's 1994 data show that 6 of the 49 cases (12%) of blood lead levels 40 µg/dl or greater were from the construction sector. North Carolina had data on cases by employment sector, but not by blood lead level. In 1994, North Carolina registry staff found that 4 of 244 reported cases (1.6%) were from the construction sector.

## **Lead-in-Construction Initiatives**

North Carolina, Pennsylvania, and South Carolina have initiated some construction-focused activities. These activities include attempts at interagency cooperation with the North Carolina and Pennsylvania Departments of Transportation and conferences on lead health issues targeting the construction industry in Pennsylvania and South Carolina (annex C). The South Carolina conference was held in 1994, although the state does not currently have construction-focused activities. Registry staff in Idaho reported that special surveillance of blood lead levels in the construction sector is under consideration.

**Table 2. Adult blood lead surveillance in 13 states, 1996**

State	Registry? <sup>a</sup>	Who reports to the state <sup>b</sup>	Reporting threshold (µg/dl)	Action taken?	Level (µg/dl) triggering state action	Construction- focused activities?
Alabama	Y (1991)	L, P, O	15	N	N	N
Alaska	Y (1996)	L, P, O	10	Y	To be decided	N
Florida	Y (1992)	L, P, O	10	N	N	N
Idaho	Y (1992)	L, P, O	10	Y	10	U
Indiana	N	—	—	—	—	—
Kentucky	Y (1974)	L, P, O	25	N	N	N
Mississippi	N	—	—	—	—	—
North Carolina	Y (1993)	L, P	40 <sup>c</sup>	Y	25	Y
Oregon	Y (1991)	L, P	25	Y	25	N
Pennsylvania	Y (1975)	L	25; 15 for pregnant women	Y	60	Y
South Carolina	Y (1971)	L, P, O	All	Y	40	N
Tennessee	Y (1995)	L, P	10	Y	Case by case	N
West Virginia	N	—	—	—	—	—

Y = yes

N = no

— = not applicable

U = program or initiatives under consideration

a. Year registry was established is given in parentheses.

b. L = laboratory; P = physician; O = others, such as other health care providers, clinics and hospitals.

c. Laboratories in North Carolina voluntarily report blood lead levels less than 40 µg/dl.

*Note:* For details, see individual state summaries (annex A).

Registry staff have sought to implement the following activities to address lead poisoning prevention in construction: interagency-sponsored conferences aimed at contractors, union representatives, and health care providers; review of DOT construction specifications; joint department of health-DOT inspections of worksites, department of health review of blood lead level results for DOT projects; and ongoing communication between registry staff and DOT and department of labor staff.

Among the 13 states surveyed in 1996, Pennsylvania, North Carolina, and Tennessee ranked first through third, respectively, in terms of numbers of construction workers, deficient bridges, and bridge repair dollars (table 3). Registry staff in Pennsylvania and North Carolina are aware of the special lead hazard to construction workers and have initiated efforts to work with their DOTs to address the problem.

**Table 3. Surveyed states' construction worker population, bridge repair funds, and number of deficient bridges, circa 1994**

	Number of construction workers <sup>a</sup>	Bridge repair funds (\$ millions) <sup>b</sup>	Number of deficient bridges <sup>c</sup>
Alabama	81,600	\$36.1	5,201
Alaska	12,100	\$6.4	212
Florida	298,300	\$45.3	2,628
Idaho	29,000	\$6.4	790
Indiana	127,500	\$35.3	5,112
Kentucky	74,000	\$33.8	4,571
Mississippi	44,200	\$41.0	6,580
North Carolina	165,000	\$64.9	6,006
Oregon	61,600	\$35.8	1,789
Pennsylvania	202,800	\$257.1	9,771
South Carolina	84,300	\$27.4	1,884
Tennessee	101,200	\$60.7	5,456
West Virginia	34,100	\$54.4	3,023
<b>Total</b>	<b>1,315,700</b>	<b>\$704.4</b>	<b>53,023</b>
<b>Average</b>	<b>101,208</b>	<b>\$54.2</b>	<b>4,079</b>

a. The seasonally adjusted statewide average number of workers, July 1994.

b. Federal Highway Administration's FY 1994 apportionment of highway and bridge replacement and rehabilitation funds. (These funds exclude state funding and special federal funds for bridge work.)

c. Number of deficient bridges, as of June 1994, defined by criteria set by the Federal Highway Administration. The FHWA defines two types of "deficient" bridges. A structurally deficient bridge "(1) has been restricted to light vehicles only, (2) is closed, or (3) requires immediate rehabilitation to remain open." A functionally obsolete bridge is "one on which the deck geometry, load carrying capacity (comparison of the original design load to the State legal load), clearance, or approach roadway alignment no longer meets the usual criteria for the system of which it is an integral part (Federal Highway Administration 1995)."

Source: For number of construction workers, Bureau of Labor Statistics 1995; for bridge funds and number of deficient bridges, Federal Highway Administration

1995,  
exhibits 4 (bridge funds) and 34-36 (deficient bridges).

## Conclusions

1. As in the first survey, the researchers found that registries are underfunded, understaffed, and overextended. Very often, staff have multiple responsibilities in addition to lead surveillance, including surveillance of other mandated reportable conditions such as infectious diseases. In addition, data collection problems are compounded by a lack of compliance by reporting entities (such as, laboratories), forms that omit important information, and limited resources to perform necessary follow-up.
2. Despite this lack of staff and funding, seven (70%) of the registries surveyed had intervention components in addition to data collection activities. However, these efforts were generally not case-specific and were limited to the provision of educational information to physicians and individuals having elevated blood lead levels. Some registry staff reported that they lacked a legal mandate to intervene in workplaces to prevent lead exposures. Others said it was not their role to intervene, that it was more appropriate for physicians or department of labor staff to contact employers about workplace conditions.
3. While registry personnel in some states have had success in working with DOTs, many still find that DOTs are somewhat reluctant to embrace department of health initiatives to address the lead hazard in construction. Barriers to interagency cooperation include the fact that public health has traditionally been outside the mission of DOTs, a difference in language and working styles between the public health and engineering professions, and budgetary constraints that dictate different priorities in two agencies. Even within their own health agencies, some registry staff did not feel that there was support for construction-focused activities.
4. None of the states surveyed had yet successfully implemented a comprehensive preventive program in the construction sector. Beyond the lack of resources to undertake such efforts, other barriers included a lack of awareness of the problem of lead exposure in the construction trades among health department personnel. Those registries that had made efforts to reach out to state DOTs reported that they often found limited support for prevention activities from transportation agencies.
5. The sparseness of the data provided by the registries does not permit conclusions about the patterns and distribution of blood lead levels in adults. The figures reported are most likely an underestimate of the number of workers with elevated blood lead levels. While this conclusion may apply to workers in all sectors, there is reason to believe that construction workers are especially under-represented in registry data. Given the level of infrastructure repair underway, the fact that 90% of bridges are coated with lead-based paints, and the substantial number of workers currently involved in infrastructure repainting and repair

projects, the low number of reports suggests that construction workers are not being tested or their tests are not being reported to state registries.

## **Recommendations**

### **Increased Funding**

Because registries can play an important role in preventing occupational blood lead poisoning, their surveillance and intervention activities should be funded at higher levels. NIOSH support and development funding through the ABLES program should be directed toward the expansion of state programs and the establishment of registries in states that do not yet have them. Additionally, state government resources should be sought.

### **Targeted Education Efforts**

NIOSH should continue and intensify its efforts to educate state health and transportation departments about the special hazards and exposure issues related to lead in construction, specifically targetin states receivin substantial bridge repair funding. On the state level, health departments should review available data on the construction sector, such as numbers of deficient bridges and construction workers in their states. (“Deficient” is defined in table 3, note c.)These data can be useful, not only to educate health department personnel about the extent of construction activities in their states, but also to target intervention activities.

### **Uniform Data Collection**

As states establish or revise their registry requirements, they should adopt the following policies:

- All adult blood lead test results should be reported, regardless of level.
- The occupation, industry sector, and employer of the patient should be reported with blood lead level results.
- Registries should assign Standard Industrial Classification (SIC) codes to cases, in order to identify trends, target intervention efforts, and standardize categories for analysis.

To facilitate national trackin and state-to-state comparisons with the limited resources present available, the Centers for Disease Control and Prevention (CDC) and NIOSH should intensify efforts to develop a uniform data collection system.

### **Interagency Cooperation**

Health agencies should initiate interagency cooperation among state and local health, labor, and transportation agencies to develop joint programs aimed at protecting workers from lead exposure. Buildin and construction trade unions should be called on to participate in such efforts. In particular, health agencies should advocate for the adoption of DOT project specifications designed to protect construction workers from lead (See The Center to Protect Workers’ Rights 1993, for model specifications produced by a coalition representing government, the private sector, public interest groups, and universities).

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## **Annex A. State Summaries**

### **Alabama**

#### **Blood Lead Registry**

In 1991, lead was added to the list of more than 50 reportable diseases in Alabama. (State agency contacts are listed in annex D.) Physicians, dentists, nurses, medical examiners, hospital administrators, nursing home administrators, laboratory directors, school principals, and day care center directors are required to report blood lead levels of 15  $\mu$ /dl or greater for adults and children. Out-of-state laboratories are not required to report, although some do. On the whole, registry staff say, blood lead level reporting is low because of a lack of enforcement. The registry is concentrating on improving laboratories' compliance with reporting requirements and on setting up a more effective database.

In 1993 and 1994, the registry had funding from the National Institute for Occupational Safety and Health's Adult Blood Lead Epidemiology and Surveillance (ABLES) program, which supported 50% of a staff epidemiologist. This funding was discontinued in 1995, but was reinstated in September 1996. Currently, only 2% of the registry staff time is dedicated to adult blood lead surveillance, with the balance of efforts focused on communicable diseases.

#### **Blood Lead Levels**

In 1993, the registry received reports of 1,089 cases with blood lead levels 15  $\mu$ g/dl or greater. (Information on the levels of these cases was not available.) Occupational information was provided for 35% (380) of these cases. Only one of these cases was construction-related.

In 1994, 1,036 cases were reported. Occupation was reported for 76% (784) of these cases, with 18% (140) of the cases for which occupation was identified having blood lead levels greater than 40  $\mu$ g/dl. No cases were identified from the construction sector.

#### **Follow-Up Protocol**

Currently, there is no follow-up protocol or intervention action, because of limited staff and resources. Blood lead level reports are filed for future entry into an improved database. The registry director occasionally conducts an informal investigation by phone, if he is concerned about a report. Plans for the ABLES funding include contracting for industrial hygiene services to conduct site investigations and provide consultations to companies whose workers have elevated blood lead level reports.

#### **Referrals to OSHA**

Referrals to federal OSHA are made case by case. The registry has referred only two cases in recent years.



## Construction Initiatives

There are no special initiatives in construction, nor are any under consideration. Alabama has 5,201 deficient bridges (see table 3, note c), received \$36.1 million in bridge repair funds in 1994, and had an average of 81,600 construction workers that year.

### Adult blood lead level cases, Alabam

Blood lead level (µg/dl)	Work-related	Cause unknown	Total
Less than 25	255	132	387
25-39	389	73	462
40-59	136	33	169
60-79	3	11	14
80+	1	3	4
Total	784	252	1,036

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## Alaska

### Blood Lead Registry

Alaska established its adult blood lead registry in January 1996. Laboratories and health care professionals, including doctors, nurses, hospitals, and village health aides, are required to report blood lead levels equal to or greater than 10 µg/dl within four weeks of a blood test. Information on a tested individual's occupation may be available if the tests are carried out in an occupational setting. Otherwise, information is obtained through case follow-up.

### Blood Lead Levels

Because the registry was only established in January 1996, data are not yet available. However, in the late 1980s and early 1990s, the Alaska Department of Health conducted blood lead screenings of adults and children in a handful of minin areas. Although several hundred workers, residents, and children were tested in these screenings, very few elevated levels (greater than or equal to 10 µg/dl) were found in any group.

### Follow-Up Protocol

The registry is currentl developing follow-up procedures and has not yet hired a registry administrator. Cases of elevated occupationally related levels identified prior to the establishment

of the registry were dealt with on a case-by-case basis. If the Department of Health received a call from an individual or his or her physician regarding an elevated level, information was obtained on possible sources of exposure. Department of Health staff generally intervened to prevent exposure and followed cases until the situation was resolved. The staff do not include industrial hygienists, however The Department of Health has worked with industrial hygienists from the Department of Labor.

### **Referrals to OSHA**

Cases are not referred to OSHA.

### **Construction Initiatives**

The registry did not anticipate any special initiatives in construction. With its one highway and only 212 “deficient” bridges — as defined by the U.S. Federal Highway Administration (table 3) — compared with an average of more than 4,000 deficient bridges per state in our survey, Alaska may rank as a low-risk state for exposures to lead during construction. Alaska tied Idaho for receiving the lowest amount of federal bridge repair funds in 1994 (\$6.4 million) among the 13 surveyed states. There are 12,100 construction workers (seasonally adjusted average) in Alaska. Registry staff felt that construction would not be contributing many elevated blood lead cases to the registry due to the newness of buildings and structures and the short construction season. Most occupational lead exposure has been observed in the mining and ore-processing sectors.

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## **Florida**

### **Blood Lead Registry**

Lead poisoning, defined as a blood lead level of 10 µg/dl or greater in adults or children, became a reportable disease in Florida in 1992. Physicians, laboratories, other health professionals, and anyone else who comes into possession of a blood lead level test result of 10 µg/dl or greater is required to report it to a county public health unit or the state Health and Rehabilitative Services, State Health Office (the Department of Health equivalent for Florida), which then reports blood lead levels (of adults or children) to the Childhood Lead Poisoning Surveillance Program. There is no surveillance system specifically for adults. Reports received from the state’s public laboratory — a minority of reports received — include complete information on a tested individual’s name, address, birth date, and test result. This information allows the registry to distinguish adults’ from children’s reports. No information on occupation is collected. Reports from private laboratories, which perform most adult blood lead sample analyses, vary in their completeness.

### **Blood Lead Levels**

Public laboratories submitted 16 adult reports in 1993 and 11 in 1994. However, registry staff suspect that these figures underestimate the extent of blood lead poisoning in the state, because most

adult blood lead tests are analyzed by private laboratories.

### **Follow-Up Protocol**

The registry does not generally receive information that would allow it to determine if reports are for adults or are occupationally related. However, in instances where the registry or a county public health unit receives a report of 40 µg/dl or greater, and the identity and occupation of a case is known, the agency will report the case to the Florida Department of Labor, if the individual is a public employee, or to OSHA. County public health units have consulted with the registry about case follow-up.

### **Referrals to OSHA**

As mentioned above, it is Florida's policy for the registry and county public health units to report cases of 40 µg/dl or greater to the Florida Department of Labor, if the individual is a public employee, or to OSHA.

### **Construction Initiatives**

There are no special construction initiatives under way or planned in Florida. Florida has more construction workers (298,300) than any other state in this survey. In 1994, Florida received \$45.3 million in bridge rehabilitation funds for its 2,628 bridges (see table 3, note c).

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## **Idaho**

### **Blood Lead Registry**

In September 1992, the Idaho Department of Health and Welfare issued a regulation requiring health care providers, local health departments, and laboratories to report all blood lead levels of 10 µg/dl or higher for both adults and children. Adults are defined as individuals over age 17. Out-of-state laboratories are also required to report blood lead levels of Idaho residents. Registry personnel use the registry to prevent both adult and children's lead poisoning. However, except for the Panhandle, a major mining and smelting area in Idaho, children's lead exposure is thought to be minimal and adult occupational lead exposure is the focus of prevention efforts.

### **Blood Lead Levels**

In 1993, the first year of the registry, only 11 cases were reported to the registry. In 1994 this figure went down to 8. The low level of reporting was attributed to the newness of the requirement. Of reported cases, registry staff estimated that 95% were occupationally related. To date, there have been no reported cases from the construction sector. Although there were too few cases to elucidate trends in 1993-94, it is interesting to note the pattern similar to other states. From 1993 to 1994, there was a decrease in higher-level cases and an increase in lower-level cases, with an overall decrease

in total cases.

### **Follow-Up Protocol**

To date, follow-up has been attempted for all reports over 10 µg/dl. As reports become more numerous, a threshold for action is likely to be established. In all cases, registry staff send follow-up forms to the health care provider or the person who ordered the test in order to solicit information, such as the occupation of the individual tested and the specific source of the exposure (see annex C). Notice of the elevated report is also given to the state epidemiologist and the local health district. Registry personnel generally defer to the physician who ordered the test to handle the case. Registry staff have observed that physicians are lax in returning follow-up forms and are generally not well prepared to intervene on their patient's behalf to prevent occupational lead exposure. However, if the physician or the individual requests assistance, registry or health district staff can provide information and environmental assessment services. In one case, the registry initiated contact with the industrial hygienist of a gunpowder factory, following the receipt of an elevated report. In all cases, registry intervention is by request only.

### **Referrals to OSHA**

Cases are not referred to OSHA.

### **Construction Initiatives**

The registry has not received any reports to date from the construction sector. However, registry staff reported that, as a result of this survey, they intend to start tracking construction-related cases. Idaho has few deficient bridges relative to other states in this survey — 790 compared to an average of more than 4,000 bridges per state surveyed (see table 3, note c). Idaho, along with Alaska, received the least amount of federal bridge repair funds in this group of states (\$6.4 million) in 1994. There is a seasonally adjusted average of 29,000 construction workers in Idaho.

### **Adult blood lead cases, Idaho, 1993 and 1994**

<b>Blood lead level (µg/dl)</b>	<b>1993 Total cases</b>	<b>1994 Total cases</b>
Less than 25	4	6
25-39	5	2
40-59	1	0
60-79	0	0
80+	1	0
Total	11	8

## **Indiana**

Adult blood lead levels are not currently a reportable condition in Indiana. Staff of the Department of Health's Epidemiology Resource Center have been involved in researching and organizing a registry for Indiana since 1994. Policy discussions regarding revisions to the "reportable conditions rule" have included amendments to add adult blood lead levels. However, due to budgetary considerations, resource center staff were not hopeful about the prospects for an adult blood lead registry. According to Department of Health staff, Indiana is home to several lead industries and has a higher relative proportion of lead-exposed workers than most states. Additionally, Indiana has 5,112 bridges (surveyed states averaged 4,000 deficient bridges per state; see table 3), received \$35.3 million in federal bridge money in 1994, and has an average of 127,500 construction workers.

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## **Kentucky**

### **Blood Lead Registry**

Lead poisoning was made a reportable disease in Kentucky in 1974. Physicians, hospitals, clinical laboratories, and employers are required to report adult blood lead levels of 25 µg/dl or greater to the Kentucky Elevated Lead Level Registry. Out-of-state laboratories are required to report blood lead levels and are subject to financial penalties for noncompliance. The registry receives many out-of-state laboratory reports, especially from the large, national labs.

### **Blood Lead Levels**

Registry staff estimate that they receive several hundred adult blood lead level reports per year and that most of the blood lead levels are between 25 and 40 µg/dl. Most laboratory reports do not include age or occupation. Reports from employers are the only source of occupational information. A database for blood lead levels was established in 1990, but due to limited resources, the database is not maintained.

### **Follow-Up Protocol**

When the database was first established, blood lead levels of 10 µg/dl or greater were entered into it. Currently, staff file the hard copies of reports. No follow-up is done.

### **Referrals to OSHA**

Cases are not referred to Kentucky OSHA.

### **Construction Initiatives**

Although a state statute regarding lead abatement activities took effect in July 1996, the registry does not anticipate any special surveillance initiatives in construction. As of 1994, Kentucky had 4,571 deficient bridges and received \$33.8 million in federal bridge repair funding (see table 3, note c). The state has 74,000 construction workers (seasonally adjusted average).

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## **Mississippi**

Mississippi has no adult blood lead surveillance requirement or program. Some adult blood lead levels are reported to the state Childhood Blood Lead Registry, but those records are not maintained nor monitored. If Department of Health personnel conduct an environmental assessment as a result of an elevated level in a child, and find that a parent's "take-home" lead is the source of the child's exposure, the department provides information to the worker on controlling his or her exposure.

Mississippi has 6,580 bridges deemed deficient by the Federal Highway Administration, the second highest number in our survey (see table 3). In 1994, the state received \$41.0 million in bridge repair funds and has a seasonally-adjusted average of 44,200 construction workers.

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## **North Carolina**

### **Occupational Blood Lead Registry**

In 1993 North Carolina enacted an occupational illness reporting requirement that included elevated adult blood lead levels. The law took effect January 1, 1994 and requires that laboratories report adult blood lead levels of 40 µg/dl or greater. Physicians are required to report elevated blood lead levels if the analysis is conducted by an out-of-state laboratory that fails to report a test for the physician's patient. The registry has requested that laboratories voluntarily report all blood lead levels of 25 µg/dl or greater, and has generally received cooperation with this request. The registry is located in the Occupational and Environmental Epidemiology Section of the Department of Environment, Health and Natural Resources.

### **Blood Lead Levels**

In 1994, its first year, the registry catalogued 224 cases of individuals whose blood lead levels were 25 µg/dl or greater. In 1995, 342 cases were reported. The rise in the number of cases from 1994 to 1995 was attributed to increased reporting from smaller and out-of-state laboratories. In 1994, 68% of the cases were related to lead-acid battery manufacture or handling; 2% (4 cases) were related to construction; in 19%, occupationally related status was unknown; and the remaining 11% were from other industries or not occupationally related. Construction blood lead level reports were between 30 and 40 µg/dl. The highest levels reported to the registry were not related to an individual's occupation, but a hobby — home manufacture or drinking of moonshine whiskey. (Homemade stills use vehicle radiators, containing lead solder.)



## **Follow-Up Protocol**

Following the receipt of a blood lead level greater than 25 µg/dl, the registry solicits complete information on the individual, including his or her employer and occupation, by a letter to the laboratory client, usually a physician. The individual with the elevated blood lead level is then sent a brochure on occupational lead poisoning. Registry staff are currently developing new educational materials: one for individuals with elevated blood lead levels, one for employers on their responsibilities under OSHA, and one for physicians on their reporting responsibilities. In rare cases of very high levels, phone interviews are conducted to determine the cause of the elevated lead level. Staff are also developing new procedures to determine when telephone interviews should be conducted; when cases should be referred to the Division of Occupational Safety and Health, in the state Department of Labor; and when inspections should be carried out by industrial hygienist staff from the registry.

## **Referrals to OSHA**

The Department of Environment, Health and Natural Resources signed a Memorandum of Agreement with the Division of Occupational Safety and Health in February 1995. The agreement states that the registry can make referrals to the Division of Occupational Safety and Health for worksite investigations and must notify the agency if registry staff plan to conduct a worksite investigation themselves.

## **Construction Initiatives**

As of yet there are no special initiatives to track blood lead levels among construction workers. However, the registry has approached DOT about an intervention project that would include medical surveillance. The registry is interested in pursuing the project in the future if funding is available. Additionally, legislation is pending at the state level for the certification and training of lead abatement workers.

North Carolina ranks second-highest in bridge repair money (\$64.9 million in 1994) among the states surveyed here. There are 6,006 deficient bridges in North Carolina, compared to the surveyed states' average of 4,000, and 165,000 construction workers — more on average than in all but two of the surveyed states — work in North Carolina (see table 3).



### Adult blood lead cases, North Carolina, 1994

Blood lead level ( $\mu\text{g}/\text{dl}$ )	Total cases
Less than 25	n.a.
25-39	87
40-59	94
60-79	26
80+	17
Total	224

n.a. = Not available.

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## Oregon

### Blood Lead Registry

Since 1991, physicians and laboratories have been required to report adult (18 years old and above) blood lead levels of 25  $\mu\text{g}/\text{dl}$  or greater to their local health department. All blood lead level reports must include a referring physician's name, address, and phone number. The local health department then forwards the reports to the Oregon ABLES registry located in the Oregon Health Division. However, most reports go directly from the laboratories to the Oregon Health Division. Three of the five major blood lead laboratories voluntarily report all blood lead levels. Out-of-state laboratories are also required to report. Although there is no enforcement mechanism, most of the large, national laboratories comply. ABLES funding supports 16% of a research analyst's time to maintain the database of blood lead levels and 12% of an industrial hygienist's time for follow-up activities.

### Blood Lead Levels

In 1993, a total of 778 adult blood lead reports (representing 231 cases) of 25  $\mu\text{g}/\text{dl}$  or greater were received. The source of exposure was known for 84% (194) of these cases. Where exposure history was known, occupational exposure accounted for 99% (192) of the cases. Of the occupationally related cases, 5.7% (11) were from the construction sector. One case greater than 40  $\mu\text{g}/\text{dl}$  was construction-related; 612 of the reports were for workers in one battery manufacturing plant.

In 1994, the registry received 679 reports representing 271 cases. The source of exposure was known for 97% of these cases. Occupational exposure accounted for 97.3% (256) of those cases where exposure history was known. Of the occupationally related cases, 7.8% (20) were from the construction sector and 30% of the construction-related cases had blood lead levels of 40  $\mu\text{g}/\text{dl}$  or above. The number of cases at 40  $\mu\text{g}/\text{dl}$  or greater more than tripled from 1993 to 1994, while the total number of cases increased by 17%.

## Follow-Up Protocol

If registry staff determine that the lead exposure accounting for a report is occupational related, the follow-up protocol is as follows:

**Blood lead level 25 - 39 µg/dl - The registry industrial hygienist sends a letter to the physician requesting that the physician provide lead-related information to the individual involved.** Registry staff have not investigated whether physicians communicate such information to the patient. Case follow-up activities involving the referring physician are complicated by the practice of health care organizations using physicians who travel from one rural community to another.

**40 - 49 µg/dl - The registry industrial hygienist contacts the referring physician.**

1. The physician is given general information about the Oregon Lead in Industry and Lead in Construction standards and the industrial hygienist summarizes lead-related medical guidelines including testing-frequency requirements. Information on case management is gathered and the physician is asked for permission for the industrial hygienist to contact the patient directly.
2. If physician grants permission, the registry industrial hygienist contacts and interviews the patient regarding symptoms, activities on and off the job, and personal habits. Information about lead and lead exposure prevention is provided by phone and mail.
3. If the patient agrees, the registry industrial hygienist will contact the employer and provide the employer with exposure prevention information. Site investigations are not conducted by the staff industrial hygienist due to lack of resources.

**50 µg/dl or greater - In addition to the above, the registry reports case information to Oregon OSHA (OR-OSHA) via a written quarterly report.**

## Referrals to OSHA

Currently, there is no formal agreement between the registry and Oregon OSHA. As per verbal agreement, employers having one or more workers with blood lead levels of 50 µg/dl or above are reported to Oregon OSHA on a quarterly basis. The registry reports approximately 10 to 12 reports per year to Oregon OSHA by this method. Oregon OSHA is not required to take action on these cases and, in most cases, it does not. If a physician or an employee requests a referral to Oregon OSHA, or a specific situation is of concern to registry staff, the registry will refer the case to Oregon OSHA immediately. These special referrals represent fewer than 5 cases per year. The registry tracks cases referred to Oregon OSHA and may be informed of Oregon OSHA's response to referrals. Oregon OSHA may also inform the registry about workplaces where workers are exposed to lead.

## Construction Initiatives

Registry efforts are currently focused on storage battery manufacturing, primary metal manufacturing, and automotive repair shops (radiator repair). Although staff are aware of the lead hazard in the construction sector, there is no special surveillance of structural steel repair and

repainting work. According to the Federal Highway Administration, Oregon has 1,789 deficient bridges (see table 3). In 1994, Oregon received \$35.8 million in federal bridge funds and had 61,600 construction workers.

#### Adult blood lead cases, Oregon, 1993

Blood lead level (µg/dl)	Construction	All other occupations	Unknown	Non-occupational	Total cases
Less than 25	n.a.	n.a.	n.a.	n.a.	n.a.
25-39	10	175	30	1	216
40+	1	6	7	1	15
Total	11	181	37	2	231

#### Adult blood lead cases, Oregon, 1994

Blood lead level (µg/dl)	Construction	All other occupations	Unknown	Non-occupational	Total cases
Less than 25	n.a.	n.a.	n.a.	n.a.	n.a.
25-39	14	195	8	5	222
40+	6	41	0	2	49
Total	20	236	8	7	271

n.a. = Not available.

## Pennsylvania

### Occupational Health Program Adult Blood Lead Registry

Pennsylvania has required laboratories to report adult blood lead levels to the Department of Health since 1975, although the registry has been staffed only since 1992. Out-of-state laboratories are required to report lead levels of Pennsylvania residents, but effective enforcement mechanisms have not been discovered to assure compliance with this requirement. The Department of Health's Occupational Health Program administers the registry and carries out its intervention activities. Pennsylvania's adult blood lead reporting threshold is 25 µg/dl or greater for anyone over age 16 and 15 µg/dl or greater for pregnant women.

### Blood Lead Levels

In 1993, the registry received a total of 6,139 reports (the number of cases was not available). A total of 5,971 of these reports were equal to or greater than 25 µg/dl. In 1994, 6,976 reports were received,

of which 6,502 were equal to or greater than 25 µg/dl. While the number of reports increased at the lower levels (less than 40 µg/dl) and overall, reports decreased at the higher levels (greater than 40 µg/dl).

Because the Department of Health form submitted with the blood sample does not ask for the occupation of the individual, registry personnel do not know what share of these reports are due to occupational exposure or exposure to lead on construction sites. However, staff estimate that about half of the cases that the registry refers to OSHA (see below) are from the construction sector. The Department of Health form is being revised and the new form is expected to request information about the individual's occupation.

### **Follow-Up Protocol**

The program coordinator sends a letter with a brochure to all individuals (with addresses) who have a report of a blood lead level of 60 µg/dl and above. The brochure covers risk factors for occupational exposure to lead, the effects of exposure to lead, ways to avoid lead exposure, OSHA requirements, and sources of assistance. For extremely high-level reports (greater than 80 µg/dl), the program coordinator may make a follow-up phone call to the individual. Under certain conditions, the coordinator will report an employer to OSHA for further investigation.

### **Referrals to OSHA**

Referral to OSHA is the primary direct intervention activity of the registry. Referrals to OSHA are made on a case-by-case basis. Factors influencing a referral include whether the employer is identifiable, how many elevated reports originate from that employer's worksite, and the extent of employees' elevated blood lead levels. Although there is no memorandum of understanding between OSHA and the Occupational Health Program, a cooperative relationship exists between the agencies. OSHA has pursued all referred employers and has sent a report to the registry after its visit to the referred employer's facility or site. Staff estimate that 50% of referred employers are in the construction sector.

### **Construction Initiatives**

Although the registry does not have sufficient staff (the registry itself is a small part of the Occupational Health Program) to support a special emphasis program in construction, the program received NIOSH funding to organize two statewide lead-in-construction conferences for contractors and unions (see annex C). The Pennsylvania Department of Transportation (PENNDOT) and OSHA were cosponsors of the conferences, were represented on the planning committee, and were presenters at one of the conferences.

The registry program coordinator, an industrial hygienist, has been working to establish a relationship with the Pennsylvania Department of Transportation since 1994 and has been invited to participate in the department's bridge inspections, review lead-related contract specifications, and

provide the Department of Transportation with written evaluation of her findings. Additionally, in 1995, the Occupational Health Program commissioned a focus-group survey of both industrial and construction workers entitled, “Knowledge, Attitudes and Experience about Occupational Lead Exposure among Pennsylvania Workers.”

Pennsylvania leads the 13 surveyed states in bridges defined as deficient by the Federal Highway Administration (9,771) and in dollars for bridge repainting and repair (\$257.1 million in 1994) (see table 3). The state has a seasonally adjusted average of 202,800 construction workers.

**Adult blood lead reports, Pennsylvania, 1993 and 1994**

<b>Blood lead level (µg/dl)</b>	<b>1993 Total reports</b>	<b>1994 Total reports</b>
Less than 25	168	474
25-39	4,098	4,837
40-59	1,704	1,602
60+	169	63
<b>Total</b>	<b>6,139</b>	<b>6,976</b>

*Note:* The number of cases was not available.

**South Carolina**

**Adult Blood Lead Registry**

South Carolina’s Reportable Disease Law requiring the reporting of adult blood lead levels dates back to 1971. All blood lead test results must be reported, regardless of their level. The registry is located in the Department of Health and Environmental Control’s Division of Health Hazard Evaluation. All laboratories, hospitals, and physicians are required to report blood lead levels.

**Blood Lead Levels**

In 1993, 1,248 cases were reported to the registry, 40% of which were equal to or greater than 25 µg/dl. In 1994, cases increased by over 100% to 2,588, although the share of cases greater than 25 µg/dl declined to 20% of the total. Because South Carolina’s reporting requirements were instituted in 1971, the increase in cases from 1993 to 1994 is not likely to be due solely to increased compliance with reporting requirements. However, 1994 was the first full year of blood lead testing requirements under the OSHA Lead Exposure in Construction standard and it is possible that the dramatic increase in cases less than 25 µg/dl is due to the increased testing of this population. As with other states, cases in South Carolina at the highest levels — greater than 60 µg/dl — decreased 1993 to 1994. Registry staff have determined that 97% of cases reported to the registry are

occupationally related, but the staff are not aware of any cases from the construction sector.

### **Follow-Up Protocol**

Registry staff attempt to contact all individuals having blood lead levels over 40 µg/dl. If phone numbers are available, registry staff conduct a telephone interview to determine the source of the exposure. If no phone number is available, a questionnaire is mailed to the individual. Educational materials on applicable laws, health effects, and control techniques are mailed to all cases over 40 µg/dl. Additionally, the registry reports the employers of cases over 40 µg/dl to OSHA.

### **Referrals to OSHA**

Through an informal agreement with South Carolina OSHA, the registry refers the employers of workers with blood lead levels over 40 µg/dl to OSHA's Consultation and Training Division. Employers of cases over 50 µg/dl are reported to OSHA's Compliance Division.

### **Construction Initiatives**

There are no programs focusing on the prevention of elevated blood lead levels in construction workers. In 1994, the Department of Health and Environmental Control held a conference on lead in construction that was well attended by construction workers. Although the problem has been acknowledged in departmental meetings, the prevention of lead poisoning in construction workers is not considered a priority for public health intervention efforts.

South Carolina has only 1,884 deficient bridges (compared to the 13-state average of 4,000), received \$27.4 million in bridge repair funds in 1994, and has 84,300 construction workers, on average (see table 3).

### **Adult blood lead cases, South Carolina, 1993 and 1994**

<b>Blood lead level (µg/dl)</b>	<b>1993 Total cases</b>	<b>1994 Total cases</b>
Less than 25	755	2,055
25-39	212	145
40-59	219	336
60+	62	52
Total	1,248	2,588

## Tennessee

### Blood Lead Registry

Lead poisoning, defined as a blood lead level of 10 µg/dl or greater, was added to Tennessee's list of notifiable diseases on November 28, 1995. Any laboratory, in or out of state, conducting a blood lead test on a Tennessee resident must report the results to the Tennessee Department of Health, Maternal and Child Health Section. Physicians are also required to report test results. Unlike the laboratory reporting form, the physician's report must include the reason for the test, the treatment provided, and the suspected source of exposure.

### Blood Lead Levels

Data are not available on adult blood lead levels or on the occupations of adults whose blood lead levels have been reported.

### Follow-Up Protocol

Tennessee has 13 Department of Health administrative regions. The registry sends blood lead data to nurses in each of these regions. Follow-up activities primarily focus on children with blood lead levels 10 µg/dl or greater. Some intervention activities do target adults who are occupationally exposed to lead. If the regional nurse receives a report for an adult working in his or her administrative region, the nurse may contact the employer and offer to organize a health fair to distribute information and test workers' children.

### Referrals to OSHA

The registry does not report cases to Tennessee OSHA.

### Construction Initiatives

The registry does not have any initiatives in construction. Tennessee has 5,456 deficient bridges (surveyed states averaged 4,000 deficient bridges per state), received a relatively large amount of federal bridge money in 1994 (\$60.7 million), and has an average of 101,200 construction workers (see table 3).

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## West Virginia

West Virginia does not have a surveillance program for adult blood lead levels. Children's blood lead levels are monitored, however. When an adult's exposure is identified as the source of a child's elevated lead level, the Office of Maternal and Child Health provides educational materials to advise the worker on ways of preventing lead from leaving worksites on his or her clothing and body. The

office is planning workshops for employers on controlling the “take-home” lead hazard. Construction employers may or may not be targeted for participation in the workshops.

West Virginia has 3,023 deficient bridges, received \$54.4 million in bridge repair funds in 1994, and has only 34,100 construction workers, on average.



## Annex B. Questionnaire Sent to States

### Construction Lead Surveillance Survey

I. Is there a legal requirement for adult blood leads to be reported to the Department of Health/registry? If so,

1. When was the law passed
2. Who is required to report?
3. Do you require out-of-state laboratories to report adult blood lead levels of individuals who reside in your State?
  - a. If so, how is this enforced?
4. Is it a requirement to report all adult blood lead levels or is there a threshold below which labs/physicians are not required to report blood lead levels
  - a. If so, what is the threshold
5. Does your department report elevated adult blood lead levels to OSHA? Is it done routinely or is it done on a case by case basis
  - a. If reporting is done through a formal agreement with OSHA, what year did this go into effect
6. What kind of action is taken by DOH upon receipt of reports of elevated adult blood leads (e.g. none, phone interviews, industrial hygiene evaluations, inspections)
  - a. What triggers action

II. We are particularly interested in blood lead levels reported for workers employed in the construction industry as compared to the total number of adult blood lead levels reported. In addition, we are interested in any special initiatives which have been developed to target this industry.

1. Please fill out the following table for 1993 and 1994 as completely as possible. For each of these years, please identify the highest blood lead level ( $\mu\text{g}/\text{dl}$ ) for each reported case (*not report*.) By case we mean each individual, since an individual may have more than one blood lead level report per year, depending upon the number of times they have been tested.

If no occupational breakdown is available, please provide the total number of adult blood lead

cases reported for each of these two years.

**1993**

Blood lead level (µg/dl)	Construction	All other occupations	Unknown	Non-occupational	Total
Less than 25 µg/dl					
25-39					
40-59					
60-79					
80+					
Total					

**1994**

Blood lead level (µg/dl)	Construction	All other occupations	Unknown	Non-occupational	Total
Less than 25 µg/dl					
25-39					
40-59					
60-79					
80+					
Total					

2a. If you do not have the information to complete the above tables, do you know or can you estimate the percentage of blood lead level cases that are occupationally related

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes,  
% occupationally related: \_\_\_\_\_

number of cases occupationally related: \_\_\_\_\_

b. Do you know or can you estimate the percentage of the occupationally related cases that are in construction

% construction related: \_\_\_\_\_

number of cases construction related: \_\_\_\_\_

c. What is the basis for your information or estimates

3. Are elevated blood lead levels from a construction setting handled differently from other occupationally related elevated blood lead levels

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes;

a. What triggers reporting

b. Who is required to report to what agency/entity?

c. What kind of action is taken, e.g. none, phone interviews, industrial hygiene evaluations, inspections

d. What triggers action

4. Is there any surveillance program or activity for lead specific to construction

If yes, please answer the following questions.

a. When was this program/activity started

b. Does the program/activity have a special focus on steel structures, residential settings, commercial buildings or other settings

c. What agencies and/or institutions are involved (such as Department of Transportation, Department of Health, Occupational Safety and Health Administration, Department of Environmental Protection)

- Describe the responsibilities of the agencies/institutions involved.

d. How is it funded and what is the annual funding amount

e. Does your department have staff dedicated to this construction emphasis program

Yes \_\_\_\_\_ No \_\_\_\_\_

- Please specify job title and time allocated (i.e. clerk - part-time, industrial hygienist- full time, etc.)

f. Does the Department of Transportation or any other agency have separate contract specifications which deal with worker lead health programs in construction

Yes \_\_\_\_\_ No \_\_\_\_\_

if so, what type of work is covered

I. Do the contract specifications require the contractor to report blood lead levels to the registry or other entity (e.g. DOT)? Yes \_\_\_\_ No \_\_\_\_\_

If yes, who is required to report and where do they report?

ii. Please describe the worker health provisions of the contract specifications such as medical surveillance, industrial hygiene evaluation and intervention, lead health programs, enforcement, etc.

iii. Could you send us a copy of the contract specifications

g. Does the DOH/registry have a Memorandum of Understanding or other type of arrangement with the DOT or other agency regarding lead in construction activities

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, please describe:

- type of arrangement/agreement
- how the DOH/registry and DOT/program interface
- in-kind staff for data collection and/or intervention
- agreement on protocols for medical surveillance, inspections, interventions
- special reporting requirements to DOH (who reports - DOT, contractor)
- use of DOH industrial hygiene staff

h. Are there any additional elements of this program that we have not covered? Please describe.

I. Is there any other mechanism by which DOH and/or the registry is informed about blood lead levels in construction? If so, please describe.

5. If the DOH/Registry does not have a construction emphasis program for blood lead level surveillance and intervention:

- Is one under consideration

- What kinds of problems are you facing in starting such a program

6. Did your State have a lead in construction standard which preceded the federal OSHA Interim Standard of April, 1993

- If yes, could you please send us a copy?

7. Do you have medical questionnaires, lead exposure occupational history questionnaires, outreach materials, etc. used as part of your medical surveillance program? Could you send copies to us?

8. Would you be interested in reviewing the report summarizing the information we collect from this survey?

## Annex C. Samples of Registry Materials

**CONFIDENTIAL**

Submit To: *Idaho Blood Lead Registry  
Department of Health and Welfare  
430 West State Street - 4th Floor  
Boise, ID 83720-0036  
Phone: 208/334-0566*



# Blood Lead Lab Report Follow-Up Form

(Office Use Only)  
IBLR, ID Number \_\_\_\_\_

Parent Name (Last, First, MI)		Date of Birth	Age	Sex <input type="checkbox"/> M <input type="checkbox"/> F	Race W E N A N Am Other																																			
Address (Residence) - Number and Street		City, State, Zip		County	District 1 2 3 4 5 6 7 8																																			
Parent/Guardian		Patient Phone Number		Work Phone																																				
Health Care Provider	Health Care Provider Phone	Consentation (if child, include both parents' education)			Pregnant? <input type="checkbox"/> Yes <input type="checkbox"/> No																																			
Health Care Provider Address																																								
<b>SUSPECTED EXPOSURE SOURCE:</b> _____ (Please Circle <input checked="" type="checkbox"/> That Apply): <table style="width: 100%; font-size: small;"> <tr> <td><input type="checkbox"/> Occupational ...</td> <td>-Hooded Hooder Shop -Auto Repair/Mechanic</td> <td>-Firing Range -Gas Station</td> <td>-Miner -Metal Lead Weights</td> <td>-Lead Smelter/Refiner -MEL</td> <td>-Brigs/Tunnel -Munitions</td> <td>Other _____</td> </tr> <tr> <td><input type="checkbox"/> Environmental ...</td> <td>-Lead Based Paint</td> <td>-Soil</td> <td>-Painting/Water</td> <td>-Pre 1960 home</td> <td>-Smelter Site</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Hobbies ...</td> <td>-Pottery Making -Target Shooting</td> <td>-Lead Soldering -Home Remodeling</td> <td>-Lead Shot</td> <td>-Fishing Weights</td> <td>-Stained Glass</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Other ...</td> <td>-Home Remedies</td> <td>-Cosmetics</td> <td>-Gasoline Sniffing</td> <td>-Pica</td> <td></td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Unknown</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>_____</td> </tr> </table>						<input type="checkbox"/> Occupational ...	-Hooded Hooder Shop -Auto Repair/Mechanic	-Firing Range -Gas Station	-Miner -Metal Lead Weights	-Lead Smelter/Refiner -MEL	-Brigs/Tunnel -Munitions	Other _____	<input type="checkbox"/> Environmental ...	-Lead Based Paint	-Soil	-Painting/Water	-Pre 1960 home	-Smelter Site	_____	<input type="checkbox"/> Hobbies ...	-Pottery Making -Target Shooting	-Lead Soldering -Home Remodeling	-Lead Shot	-Fishing Weights	-Stained Glass	_____	<input type="checkbox"/> Other ...	-Home Remedies	-Cosmetics	-Gasoline Sniffing	-Pica		_____	<input type="checkbox"/> Unknown						_____
<input type="checkbox"/> Occupational ...	-Hooded Hooder Shop -Auto Repair/Mechanic	-Firing Range -Gas Station	-Miner -Metal Lead Weights	-Lead Smelter/Refiner -MEL	-Brigs/Tunnel -Munitions	Other _____																																		
<input type="checkbox"/> Environmental ...	-Lead Based Paint	-Soil	-Painting/Water	-Pre 1960 home	-Smelter Site	_____																																		
<input type="checkbox"/> Hobbies ...	-Pottery Making -Target Shooting	-Lead Soldering -Home Remodeling	-Lead Shot	-Fishing Weights	-Stained Glass	_____																																		
<input type="checkbox"/> Other ...	-Home Remedies	-Cosmetics	-Gasoline Sniffing	-Pica		_____																																		
<input type="checkbox"/> Unknown						_____																																		
Collection Date: ____/____/____	COLLECTION SITE: _____ (Dr Office, Lab, Home, PHC, Home, etc)	Nurse/Tech _____ Initials	Follow-Up Action (if > 10 µg/dL):																																					
SPECIMEN: Capillary _____ Venous _____	REASON FOR TEST: Screen _____ Follow-up _____																																							
ONSET OF CONDITION: ____/____/____	COMMENTS: _____																																							
<b>LABORATORY REPORT</b>																																								
BLOOD LEAD _____ µg/dL			DATE ANALYZED ____/____/____																																					
LAB Name:	Address:	Phone:																																						

Study Participant?  Yes  No      Name of Study: \_\_\_\_\_

Report Submitted By	Name: _____	Comments: _____
	Address: _____	
	Phone: ____/____/____      Date: ____/____/____	

*Rules and Regulations  
Governing  
Idaho Reportable Diseases*

Blood Lead Levels > 10 µg/dL are considered Reportable Conditions by the Idaho Administrative Procedures Act (IDAPA)

02.1001.01.k.vii Reportable Diseases and Conditions

03.1000.01 Lead Poisoning or Excess Lead Exposure

Idaho Department of Health and Welfare  
September 1992

(Office Use Only)  
IBLR FOLLOW-UP ACTION

<input type="checkbox"/> Educational Materials Sent	Comments:  _____ Date      Initials
<input type="checkbox"/> Medical Follow-up recommendation Date: _____	
<input type="checkbox"/> Environmental Home Visit Date: _____	
<input type="checkbox"/> Follow-up Testing Recommended	
<input type="checkbox"/> Report to BCPS	

Idaho Lead Poisoning Prevention Blood Lead Registry  
REVISED 1/94

REGISTRATION FORM

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIPCODE \_\_\_\_\_

NUMBER OF REGISTRATIONS \_\_\_\_\_

-Advanced Registration: \$35.00 per person  
-WALK-IN REGISTRATION: \$40.00 per person

Registration includes lunch, morning and afternoon refreshment breaks and all materials

Make checks payable to:

Commonwealth of Pennsylvania - PA DOH  
We cannot accept credit cards, purchase orders or vouchers.

Send registrations form to:

Occupational Health Program  
PA Department of Health  
P.O. Box 90, Room 1020  
Harrisburg, PA 17108

The Pennsylvania Department of Health is an equal opportunity provider of grants, contracts, services, and employment.

Tom Ridge  
Governor  
Daniel F. Hoffmann  
Acting Secretary  
Department of Health



WILDWOOD CONFERENCE CENTER  
Harrisburg Area Community College  
One HACC Drive  
Harrisburg, PA 17110  
(717) 780-2367

DIRECTIONS:

From PA Turnpike, and South - Take Exit 19 to 83 North to 81 South/322W. Take Exit 23 to Cameron Street. At first light, turn right onto Elinction Avenue. Go past HACC Main Entrance, over bridge and turn right onto Industrial Road. Turn right into entrance marked 14. Follow signs for conference center parking lot. Take walkway to conference center, first building on left.

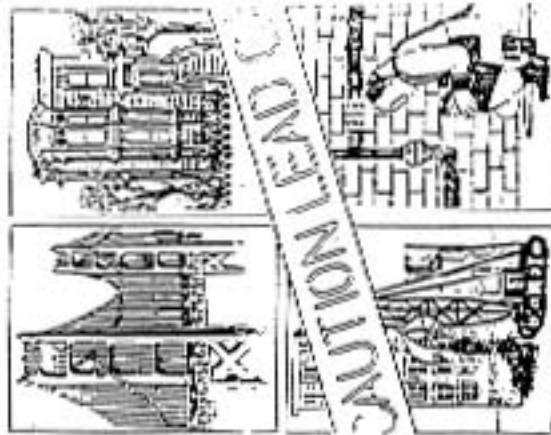
From 81 North or South - Take Exit 23, Cameron Street. Follow above directions.

From U.S. 322/2 - A181, Take Exit 23, Cameron Street. Follow above directions.



Conference is partially funded by a grant from the National Institute for Occupational Safety and Health.

LEAD  
IN  
CONSTRUCTION



-COMPLIANCE ISSUES-  
for  
Pennsylvania Contractors

July 30, 1996

Wildwood Conference Center  
Harrisburg Area Community College  
Harrisburg, PA

It's summer, it's hot, it's your busy season BUT here's a conference you can't afford to miss.

**WHO SHOULD ATTEND:**

- Industrial partners
- General contractors & Sub-contractors
- Structural steel contractors
- Business Agents and other representatives of the trades
- Facility owners/managers
- Representatives of state and local government
- Environmental contractors
- Training providers

**WHAT YOU CAN'T AFFORD TO MISS:**

- NEW PA state regulations
- NEW Title X and HLDI information
- Ways to comply with federal and state regulations and still make a profit
- Information on the PA Adult Blood Lead Registry
- How to make sense out of medical surveillance and HLDI's
- Advice from contractors who've been there
- Legal issues that you can't ignore
- What non-compliance really costs

**QUESTIONS ON ATTENDING?**

Call (717) 783-1588 and speak with Judith Goslin, PA Department of Health, Occupational Health Program

**PROGRAM**

**MORNING**

Registration & Coffee - 8:00 a.m. - 8:30 a.m.

Welcome and introduction

**KEYNOTE - Confronting Construction Lead Hazards: Compliance and Beyond**

*William H. Kopyla  
Laborers' Health & Safety Fund of North America*

**Making Sense Out of Medical Surveillance**

*Dr. Janis Githelman  
Medical College of Pennsylvania*

**Overview of Federal Regulations & Guidelines (TUD & Title X)**

*Jonathan Wilton  
National Center for Lead-Safe Housing*

**Complying with NEW State Regulations**

*Marcia Jurewsky  
PA Department of Labor & Industry*

**Compliance Lessons From a Leadback Case**

*Maria Jurewsky  
Pittsburgh Area OSHA Office*

**LUNCH**

**AFTERNOON**

**Contractor-to-Contractor: How to Comply & Still Stay in Business**

*Paula K. Connor  
First Capital Installation, Inc.*

*Larry L. Morris*

*The Council Economist*

**PROGRAM CONTINUED**

**Legal Issues for Contractors - How NOT to Get Sued**

*Attorney Thomas F. Johnson  
Johnson & Cleblat*

**Where to Get Help**

**Closing & Adjourns - 2:30 p.m.**



**SPONSORS**

Keystone Contractors' Association  
Occupational Safety & Health Administration,  
Eggleston III Office

Pennsylvania Department of Health  
Pennsylvania Department of Labor & Industry  
Pennsylvania Department of Transportation

**COMMITTEE**

Kenneth Becker - Industrial Safety Services  
Int.

Eddy Brecanitz, M.D. - Medical College of PA  
Robert Fink - OSHA, Harrisburg Office

Judith Goslin - PA Department of Health

Michael Katz - M. Gonsen & Sons

Sharon Lawson - PA Department of Labor & Industry

Terence McDonough - Keystone Contractors' Association

Joseph Miller - Painters Local 411

James Wellington - Laborers District Council of Eastern Pennsylvania

Mary Zetke - PA Department of Transportation



REGISTRATION FORM

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_  
STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
TELEPHONE NUMBER \_\_\_\_\_

NAMES OF REGISTRANTS

-Advanced Registration: \$35.00 per person  
MUST BE RECEIVED BY SEPT. 25, 1996

-Walk-In Registration: \$40.00 per person

Registration includes lunch, morning and afternoon refreshment breaks and all materials

Make checks payable to:

Commonwealth of Pennsylvania - PA DOH

We CANNOT accept Credit Cards, Purchase Orders or Vouchers.

Send registration form to:

Occupational Health Program  
PA Department of Health  
P.O. Box 90, Room 1023  
Harrisburg, PA 17108

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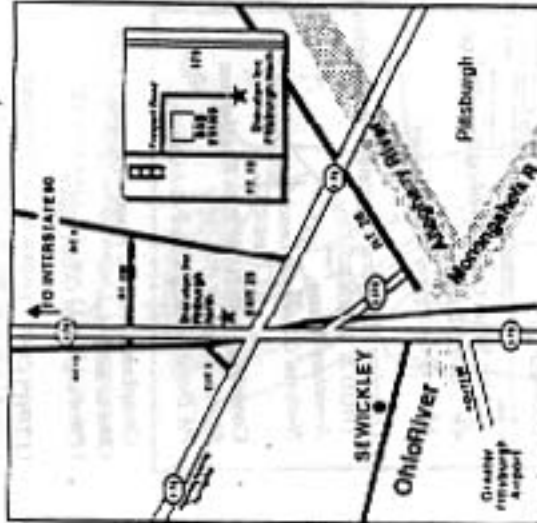


Tom Hodge  
Governor  
Daniel F. Hoffmann  
Acting Secretary  
Department of Health

SHERATON INN PITTSBURGH NORTH  
910 Sheraton Drive  
Mars, PA 16046  
(412) 776-6900

DIRECTIONS:

Located in the heart of Cranberry Township, The Sheraton Inn Pittsburgh North is located at the intersection of two major interstates, I-79 North and South at Exit 25 and the PA Turnpike at Exit 3. With the convenience of I-279, it is only 20 minutes from downtown Pittsburgh and 30 minutes from the Greater Pittsburgh International Airport.



Conference is partially funded by a grant from the National Institute for Occupational Safety and Health (NIOSH)

LEAD  
IN  
CONSTRUCTION



CONTRACTOR  
-COMPLIANCE ISSUES-  
In  
Pennsylvania

October 2, 1996

Sheraton Inn  
Pittsburgh North  
Mars, PA

Your really busy summer season is almost over, so here's a conference you can't afford to miss.

**WHAT YOU CAN'T AFFORD TO MISS**

- NEW PA state regulations
- NEW Title X and HUD information
- Ways to comply with federal and state regulations and still make a profit
- Information on the PA Adult Blood Lead Registry
- How to make sense out of medical surveillance and H.L.'s
- Legal issues that you can't ignore
- What non-compliance really costs

**WHO SHOULD ATTEND**

- Industrial painters
- General contractors & Sub-contractors
- Structural steel contractors
- Business Agents and other representatives of the trade
- Facility owners/managers
- Representatives of state and local governments
- Demolition contractors
- Training providers

**QUESTIONS ON ATTENDING?**

Call (717) 783-1158 and speak with Judith Goslin, PA Department of Health, Occupational Health Program



**Blood Lead Surveillance of Construction Workers, II**

**PROGRAM**

**MORNING:**  
Registration & Coffee - 8:30 a.m. - 9:00 a.m.

Welcome and Introduction

**KEYNOTE**  
*Dr. Thomas Merrill*  
University of Pittsburgh Medical Center

**PANEL:**  
Occupational Health Issues of Lead Exposure

**Medical Surveillance: OSHA Requirements & Beyond**  
*Allene Scott, M.D., University of Pittsburgh*

**The PA Adult Lead Registry**  
*Judith Goslin, PA Department of Health*

**Lead Exposure & Workers' Compensation**  
*Timothy Conway, Esq.*  
*Caroselli, Spagnoli & Boudier*

**Compliance with OSHA Recordkeeping Requirements**  
*Ed Seiker, Pittsburgh Area OSHA Office*

**LUNCH**

**AFTERNOON**

**KEYNOTE:**  
*Jack Beard, Esq.*  
*Airkpatrick & Lockhart*

**PANEL:**  
Regulatory Overview: What's Required?

**HUD and Title X**  
*Jonathan Wilson*  
National Center for Lead-Safe Housing

**NEW PA State Regulations**  
*E.A. Lawrence, PA Department of Labor & Industry*

**PROGRAM CONTINUED**

County Requirements  
*Lynell Popow*  
Allegheny County Department of Health

Waste Management  
*James Roof*  
PA Department of Environmental Protection

PA DOT Health & Safety Specifications for Lead Work  
*Ken Williams, PA Department of Transportation*

Closing & Adjourn - 3:45 p.m.

**SPONSORS**

ABIA of Western Pennsylvania  
Occupational Safety & Health Administration, Region III Office  
Pennsylvania Department of Health  
Pennsylvania Department of Labor & Industry  
Pennsylvania Department of Transportation

**COMMITTEE**

*Don Adley* - KTAUSE Environmental  
*Rosky Desicfane* - Painters Local #6  
*Judith Goslin* - PA Department of Health  
*John Greta* - PA Department of Labor & Industry  
*Don Harbison* - A-State Contracting  
*James Karpinski* - Laborers' Training Center  
*Jolia Lange* - EnviroSAFE  
*E.A. Lawrence* - PA Department of Labor & Industry  
*James Pavlicek* - PA Department of Health  
*Ed Seiker* - OSHA, Pittsburgh Office  
*Ken Sachdev* - OSHA, Pittsburgh Office  
*Allene Scott*, M.D. - University of Pittsburgh

## Annex D. State Agency Contacts

### Alabama

J.P Lofgren, M.D., State Epidemiologist  
Division of Epidemiology  
Alabama Dept. of Public Health  
434 Monroe Street  
Montgomery, AL 36130-3017  
Phone: 334-613-5347  
Fax: 334-288-5021

### Alaska

Grace Egeland, Epidemiologist  
Alaska Dept. of Health  
Section of Epidemiolog  
3601 C. St., Suite 540  
Anchorage, AK 99524-0249  
Phone: 907-269-8000  
Fax: 907-561-6588

### Florida

Raul Quimbo, MBS  
Florida HRS/HSEE  
1317 Winewood Blvd  
Tallahassee, FL 32399-0700  
Phone: 904-488-3370  
Fax: 904-922-8473

### Idaho

Donna Julian, Program Coordinator  
Idaho Blood Lead Registr  
Idaho Dept. of Health and Welfare  
450 W. State St.  
Towers Building, 4th Fl.  
Boise, ID 83720-0036  
Phone: 208-334-6584  
Fax: 208-334-6581

### Indiana

Bill Letson or Dr. Greg Steel  
Indiana Department of Health  
Epidemiology Resource Center  
2 North Meridian St., 3rd Fl.  
Indianapolis, IN 46204  
Phone: 317-233-7207  
Fax: 317-233-7378

### Kentucky

Pat Beeler  
Cabinet for Health Services  
Department for Public Health, Division of  
Epidemiolog  
Surveillance and Investigations Branch  
275 East Main Street  
Frankfort, KY 40621-0001  
Phone: 502-564-3418  
Fax: 502-564-4553

### Mississippi

Pam Nutt  
Div. Of Child and Adolescent Health  
Mississippi Dept. of Health  
Box 1700  
Jackson, MS 39215-1700  
Phone: 601-960-7476  
Fax: 601-354-6087

### North Carolina

Bill Jones  
North Carolina Dept. of Environment,  
Health and Natural Resources  
Occupational and Environmental  
Epidemiology Section  
Dept. of Occupational Health Surveillance  
Box 27687  
Raleigh, NC 27611-7687  
Phone: 919-733-1145  
Fax: 919-733-9555

Oregon

Narda Tolentino, Program Manager  
Environmental, Occupational, and Injury  
Epidemiolog  
Oregon Health Division  
800 NE Oregon Street  
Suite 730  
Portland, OR 97232  
Phone: 503-731-4025  
Fax: 503-731-4082

Marilyn Scott, Industrial Hygienist  
Lead Program: Environmental,  
Occupational, and Injury Epidemiolog  
Oregon Health Division  
800 NE Oregon Street, Suite 730  
Portland, Oregon 97232  
Phone: 503-731-4025  
Fax: 503-731-4082

Pennsylvania

Judy Gostein, MS  
Industrial Hygienist  
Div. Environmental Health Assessment  
Pennsylvania Dept. of Health  
Box 90, Room 1020  
Harrisburg, PA 17108  
Phone: 717-787-1708  
Fax: 717-783-3794

South Carolina

Annette Gardner, Project Administrator  
Division of Health Hazard Evaluation  
Dept. of Health & Environmental Control  
2600 Bull St.  
Columbia, SC 29201  
Phone: 803-737-4173  
Fax: 803-737-4171

Tennessee

Marilyn Holmes, Coordinator  
Childhood Lead Poisoning Prevention  
Program  
State of Tennessee Dept. of Health,  
Maternal and Child Health Section  
426 Fifth Avenue North  
Cordell Hall Building, 5th Floor  
Nashville, TN 37247  
Phone: 615-532-7778  
Fax: 615-741-1063

West Virginia

Linnea Ohgren  
Div. Of Surveillance and Disease Control,  
West Virginia Bureau of Public Health  
Dept. Of Health and Human Resources  
1422 Washington St. E.  
Charleston, WV 25301  
Phone: 304-558-5358  
Fax: 304-558-6335

Dr. Nawal Lutfiyya  
Office of Maternal and Child Health  
Division of Research, Evaluation and  
Planning  
1411 Virginia St. E.  
Charleston, WV 25301  
Phone: 304-558-7996