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# Street Corner Hazard Surveillance and Health Intervention Among Chicago Day Laborers

Susan N. Buchanan MD, MPH [a] , Anne Evens MS, MPH [b] , Cile Buckley MPH [c] & Lee Friedman PhD [a]

[a] Division of Environmental and Occupational Health Sciences, University of Illinois at Chicago School of Public Health

[b] Chicago Department of Public Health's Lead Poisoning Prevention Program

[c] Division of Occupational Medicine, John Stroger Hospital of Cook County, IL

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# Street Corner Hazard Surveillance and Health Intervention Among Chicago Day Laborers

Susan N. Buchanan, MD, MPH; Anne Evens, MS, MPH; Cile Buckley, MPH; Lee Friedman, PhD



**ABSTRACT.** Day laborers in Chicago are often hired for hazardous jobs and have little access to basic health care. In this study, the researchers offered tetanus vaccinations and blood lead tests to workers waiting on street corners, who then completed a survey on hazardous job tasks ($N = 92$). All participants were male, 97% were foreign-born, and 93% had performed demolition and rehabilitation, window removal and installation, or paint removal in the previous month. Most were not current with tetanus immunization. The geometric mean blood lead level was 3.8 μg/dL. Nonparametric statistical analysis showed a significant association ($p < .05$) between blood lead level and country of origin. The results demonstrate the feasibility of hazard surveillance and health intervention at street corner hiring sites.

**KEYWORDS:** day labor, lead, surveillance

Day labor in Chicago, as in other cities in the United States, is a growing economic phenomenon. Workers who wait on street corners or in parking lots to be picked up by contractors are often immigrants with few job skills and are sending money to families back home. Results from the National Day Labor Survey,[1] conducted in the summer of 2005, revealed that on any given day in the United States, approximately 117,600 workers either were seeking day labor or had been hired as day laborers. Homeowners or construction contractors hired 92% of these workers; 1 in 5 had suffered a work-related injury in the previous year.[1] In our previous work with Latino day laborers at one street corner hiring site in Chicago,[2] we found that they frequently worked under hazardous conditions with no training in occupational safety or use of personal protective equipment (PPE). We found that work injuries were common and access to medical care was inadequate.[2]

To counteract the difficult, often abusive work environments in which many day laborers operate, worker centers have emerged in many metropolitan areas. *Worker centers* are generally defined as community-based institutions that engage in service, advocacy, and organization to support low-wage workers.[3] Some centers offer an area in which workers can gather while they wait for work. Others have meeting spaces for workshops and classes on labor rights and regulations, computer literacy, or English. One such center in Chicago is located in a storefront near a street-corner hiring site. Founded in 2004, one of its main goals is to provide workers with an alternative gathering area, as low wages and wage theft are a constant concern at the competitive street-corner hiring site. In addition to providing a sheltered and safe space where workers can wait to be hired, the worker center regularly sends staff to visit various street-corner hiring sites to interact with workers and provide support, such as encouraging them to negotiate for a fair wage, making referrals to legal advice for incidents of hiring discrimination or nonpayment of wages, and informing them of support services available at the workers' center.

Day laborers are commonly hired to perform small subcontracting home repair and home demolition. Ninety percent of Chicago-area housing stock was built before 1978, and more than 17% of children tested in 1999–2000 had blood lead levels greater than 10 μg/dL.[4] In addition, researchers with the Chicago Department of Health Lead

***Susan N. Buchanan*** *and* ***Lee Friedman*** *are with the Division of Environmental and Occupational Health Sciences at the University of Illinois at Chicago School of Public Health.* ***Anne Evens*** *is with the Chicago Department of Public Health's Lead Poisoning Prevention Program.* ***Cile Buckley*** *is with the Division of Occupational Medicine at the John Stroger Hospital of Cook County, IL.*

Poisoning Prevention Program found that the average level of lead dustfall in 47 samples from 11 demolition areas in private homes in Chicago was 227.8 μg Pb/$m^2$/hr—5 times the US Occupational Safety and Health Administration standard (AP Mucha, unpublished data). Therefore, day laborers who perform demolition and construction jobs are likely at risk for exposure to lead-containing dust.

As part of our ongoing interaction with Chicago worker centers, we designed this study in response to workers' concerns regarding workplace hazards and their interest in accessing basic health services. Our objectives of this study were to (1) pilot occupational injury surveillance and basic health interventions at the hiring sites and (2) assess blood lead levels in day laborers with potential occupational lead dust exposure. We offered both tetanus vaccinations and blood lead screening to workers at 3 hiring sites. We surveyed participants on participation in potentially hazardous activities, such as demolition and rehabilitation, window removal and installation, paint removal, and use of PPE.

## METHODS

We obtained human subjects protection approval from the University of Illinois at Chicago Institutional Review Board. We developed the study methods and interventions in collaboration with university-based clinical researchers, public health department lead control personnel, and worker center leaders.

We recruited day laborers from 3 locations: a street-corner hiring site, the parking lot of a home improvement store, and the worker center. Worker center staff members, who regularly visit the street-corner hiring sites, informed workers of the study several days before we arrived. As in our previous work,[2] day laborers were enthusiastic to participate and crowded around our table as soon as we set it up. We saw participants on a first come, first served basis and turned no one away.

We visited the hiring sites from 8 to 11 AM between July and September in 2005 and 2006. After being informed of the study's purpose, several declined to participate, usually because they did not want to have their blood drawn. However, they were still eligible to receive tetanus vaccination. Interested participants provided written informed consent. We then interviewed participants in English or Spanish about demographic characteristics, length of residence in the United States, whether they had performed demolition and rehabilitation jobs or window removal or installation in the previous month, and frequency of PPE use. We asked each worker for a contact phone number so we could contact them in case of elevated blood lead levels requiring medical follow-up. Trained phlebotomists from the Chicago Department of Public Health (CDPH) collected venous blood samples following standard CDPH quality-control and chain-of-custody protocols. A registered nurse offered and provided tetanus immunization to those who had not received it in the previous 5 years. At the same time, an industrial hygienist provided instruction on the risks of lead exposure, the potential routes of exposure (inhalation and ingestion), and safe practices to reduce lead exposure during demolition work. She also provided a handout regarding lead in demolition. We reported the blood lead level results to participants in a short letter that the worker center staff delivered to the workers at the hiring sites.

The Illinois Department of Public Health laboratory analyzed blood samples using the Perkin-Elmer Model 4100ZL atomic absorption spectrometer (PerkinElmer Inc, Waltham, MA) with Zeeman background correction under the supervision of the lab director. Lab workers analyzed 3 levels of quality controls at the beginning and end of each analytical run. Data analysis consisted of descriptive frequencies of demographics, job tasks, and PPE use. Blood lead levels were reported in micrograms per deciliter (μg/dL) of whole blood; level of detection was 1.0 μg/dL. We converted levels $<$ 1 μg/dL to 0.5 μg/dL. We calculated both arithmetic and geometric mean (GM) lead levels and used the Wilcoxon Rank Sum and Kruskal-Wallis tests to compare means among subgroups after the blood lead data was log transformed.

## RESULTS

Ninety-two day laborers completed the survey and had their blood drawn for lead testing. The nurse vaccinated 91 for tetanus. Forty-four (48%) waited for work at the street-corner hiring site, 27 (29%) at the home improvement store parking lot, and 21 (23%) at the worker center. A few workers were not interested in participating in the study but wanted to have tetanus vaccination, and we provided such. However, they are not counted as participants in the study.

Table 1 shows participants' demographic information. All participants were men, and the average age was 37 years ($SD$ = 9.6, range = 19–61 years). Eighty-nine participants were foreign born; 3 were born in the United States. For those originating outside the United States, the mean number of years of US residence was 6.7 years ($SD$ = 6.3, range of $<$ 1–30 years).

Regarding potential lead dust exposure in the workplace, 75 of the 92 workers (82%) had performed demolition or rehabilitation in the previous month, 54 (59%) had removed or installed windows in the previous month, and 70 (76%) had removed paint. Only 19 of the 92 (21%) had used PPE on a regular basis when performing those tasks.

Figure 1 shows the distribution of blood lead levels. The arithmetic mean blood lead level was 5.0 μg/dL ($SD$ = 5.1 [nonnormal distribution], median = 4.0, range = $<$ 1–43 μg/dL). The GM was 3.8 μg/dL. Table 2 shows the GM blood levels for the various categorical subgroups (age, years in the United States, country of origin, sampling location, and PPE use) and the $p$ values for differences of

**Table 1.—Demographic and Job Task Information on Day Laborer Participants**

| Characteristic | *n* | % | *M* | *SD* | Range |
|---|---|---|---|---|---|
| Sex | | | | | |
| Male | 92 | | | | |
| Female | 0 | | | | |
| Age (y) | | | 36.7 | 9.6 | 19.0–61.6 |
| Years in United States | | | 6.7 | 6.3 | 0.1–30.0 |
| Country of origin | | | | | |
| Mexico | 54 | 59 | | | |
| Ecuador | 19 | 21 | | | |
| Guatemala | 12 | 13 | | | |
| United States | 3 | 3 | | | |
| Other[a] | 4 | 4 | | | |
| Hiring location | | | | | |
| Street corner | 44 | 48 | | | |
| Worker center | 21 | 23 | | | |
| Home improvement store parking lot | 27 | 29 | | | |
| Demolition work in past month | 75 | 82 | | | |
| Window removal in past month | 54 | 59 | | | |
| Paint removal in past month | 70 | 76 | | | |

*Note.* $N = 92$.
[a]Colombia ($n = 1$), El Salvador ($n = 1$), Nicaragua ($n = 1$), Peru ($n = 1$).

means within each subgroup. We found a significant association ($p < .05$) between blood lead level and country of origin, with the highest levels in workers from Mexico.

Two workers had blood lead levels greater than 20 μg/dL (ie, 21 μg/dL and 43 μg/dL). Worker center staff contacted them and referred them to the occupational medicine clinic at Stroger Cook County Hospital for follow-up.

**Table 2.—Mean Blood Lead Levels, by Subgroup of Day Laborer**

| Characteristic | Laborers ($N = 92$) *n* | % | Geometric mean (μg/dL) | Range | *p*[a] |
|---|---|---|---|---|---|
| Total | 92 | 100 | 3.8 | 0.5–43.0 | — |
| Age (y) | | | | | |
| 18–24 | 11 | 12 | 3.0 | 1.0–10.0 | — |
| 25–34 | 29 | 32 | 2.9 | 0.5–8.0 | — |
| 35–44 | 32 | 35 | 4.5 | 1.0–21.0 | — |
| ≥ 45 | 20 | 22 | 4.9 | 2.0–43.0 | .088 |
| Years in United States | | | | | |
| Born in United States | 3 | 3 | 5.5 | 3.0–8.0 | — |
| ≤ 3 | 31 | 34 | 4.4 | 0.5–43.0 | — |
| 4–9 | 39 | 42 | 3.3 | 0.5–10.0 | — |
| ≥ 10 | 19 | 21 | 3.8 | 1.0–14.0 | .399 |
| Country of origin | | | | | |
| Mexico | 54 | 59 | 4.5 | 1.0–43.0 | — |
| Ecuador | 19 | 21 | 2.7 | 0.5–8.0 | — |
| Guatemala | 12 | 13 | 2.9 | 0.5–8.0 | — |
| United States | 3 | 3 | 5.5 | 3.0–8.0 | — |
| Other[b] | 4 | 4 | 3.0 | 1.0–9.0 | .036 |
| Sampling location | | | | | |
| Street corner hiring site | 44 | 48 | 3.6 | 0.5–21.0 | — |
| Worker center hiring site | 21 | 23 | 3.8 | 1.0–14.0 | — |
| Home improvement store parking lot | 27 | 29 | 4.1 | 1.0–43.0 | .708 |
| Use of personal protective equipment | | | | | |
| No information | 5 | 5 | 2.7 | 1.0–6.0 | — |
| Never | 34 | 37 | 4.2 | 1.0–14.0 | — |
| Sometimes | 34 | 37 | 2.8 | 0.5–9.0 | — |
| Most of the time/ always | 19 | 21 | 5.8 | 2.0–43.0 | .007 |

[a]Kruskal-Wallis test used to evaluate nonparametric differences in mean blood lead levels.
[b]Colombia ($n = 1$), El Salvador ($n = 1$), Nicaragua ($n = 1$), Peru ($n = 1$).

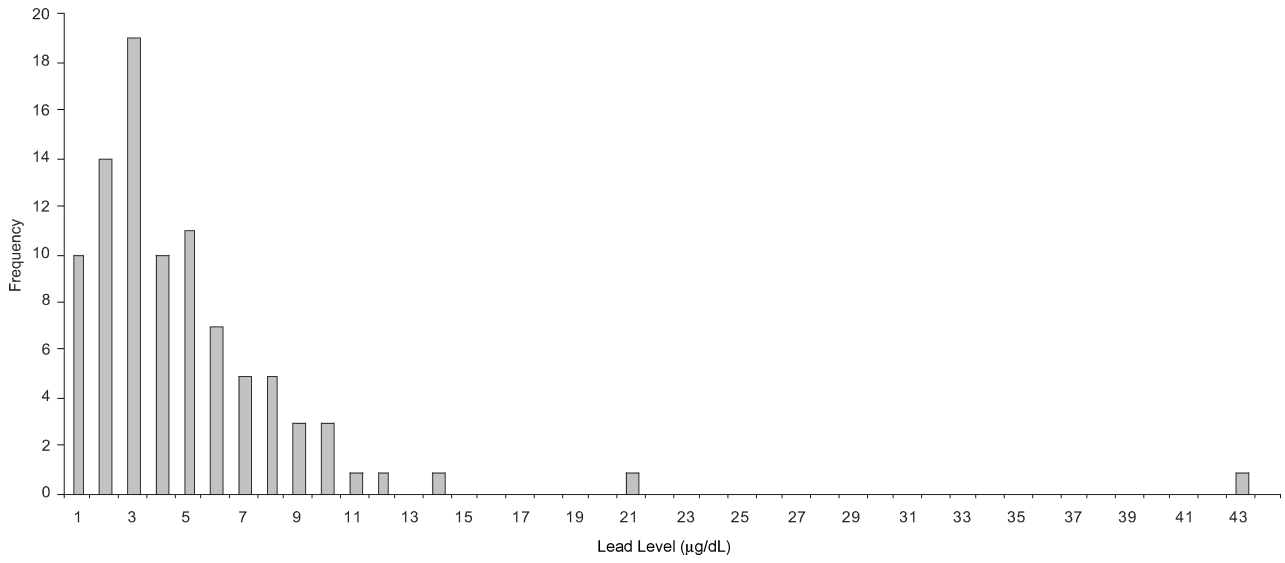


**Fig. 1. Distribution of blood lead levels in day laborer participants ($N = 92$).**

## COMMENT

From our previous work with street-corner day laborers in Chicago, we knew that workers were interested in tetanus vaccination. They also had described working in extremely dusty conditions while performing construction activities, without the use of PPE. We designed this exploratory investigation of hazard surveillance and preventive outreach among street-corner day laborers to address these 2 concerns. Workers enthusiastically agreed to receive the tetanus immunizations and screening for lead poisoning. At both outdoor hiring sites, a line of workers formed as soon as we arrived. A few declined to have their blood drawn, but all who approached us were interested in tetanus vaccination.

Regarding potential exposure to lead dust, the majority of workers had performed at least 1 hazardous job task in the previous month. Participants' GM blood lead level was 3.9 μg/dL, higher than that for both American adults (1.5 μg/dL) and Mexican American men (2.3 μg/dL)[5] but lower than blood lead levels found in US construction workers (ranging from 4.44–7.6 μg/dL in laborers[6,7] and 5.9 μg/dL in painters[6]).

Study limitations include that we did not take smoking histories or information regarding hobbies, eating from clay pots, or performing car maintenance, activities that might result in ingestion or inhalation of lead. The timing of the our visits may have been problematic in that most of the hiring had been completed for the day, and we may have missed workers who are routinely more successful in obtaining work. Although the results are overall reassuring, screening should continue and should take place earlier in the day. In addition, we were not able to measure levels of lead dust in the workplace. We also did not include information on lead hazards in the home and therefore could not evaluate the causal association between workplace exposure and blood lead level. Workers with elevated blood lead levels were referred to our occupational medicine clinic, where healthcare workers recorded a more detailed lead exposure history, including the possible exposures previously discussed (data not included). It is interesting that Mexican immigrants had statistically significant higher lead levels than did their Latin American counterparts (but lower than the mean for the 3 American-born workers); however, these levels were low, so urgent investigation is not warranted. Also notable is the statistically significant higher lead levels in workers reporting frequent PPE use. Perhaps those workers are exposed to dusty environments in which they wear inadequately protective masks. Because our study design did not allow for detailed analysis of this potential association, an investigation that includes detailed information on workplace exposure and type of PPE used is warranted.

Street-corner day labor is a growing economic phenomenon across the United States. Because of the hazardous jobs and lack of PPE use, workers likely suffer increased occupational disease and injury rates. This study adds to increasing evidence provided by day labor researchers in San Francisco,[8] Seattle (Noah Seixas, PhD, personal communication, March 9, 2007), Los Angeles,[9] and New Jersey[10] that performing occupational health surveillance and interventions at informal hiring sites and worker centers is a viable alternative to traditional occupational health and safety practices. Additional work to bring primary care screening, workplace safety and health training, and equipment demonstrations to the workers at their hiring sites is needed.

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For comments and further information, address correspondence to Dr Susan N. Buchanan, University of Illinois at Chicago, School of Public Health, 835 S. Wolcott, MC, Suite E-144, Chicago, IL 60612, USA.
E-mail: sbucha3@uic.edu

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### References

1. Valenzuela A, Theodore N, Melendez E, Gonzalez AL. *On the Corner: Day Labor in the United States*. Chicago, IL: University of Illinois–Chicago; 2006. http://www.uic.edu/cuppa/uicued/Publications/RECENT/onthecorner.pdf. Accessed March 24, 2006.
2. Buchanan S, Nickels L, Morello J. Occupational health among Chicago day laborers: an exploratory study. *Arch Env Occ Health*. 2005;60:276–280 (published 2006).
3. Fine J. *Worker Centers: Organizing Communities at the Edge of the Dream*. Ithaca, NY: Cornell University Press; 2005.
4. Lead Safe Chicago Working Group. *Lead Safe Chicago: A Plan to Eliminate Childhood Lead Poisoning in Chicago by 2010*. Chicago, IL: Chicago Department of Public Health and Loyola University; 2004. http://www.ci.chi.il.us/webportal/COCWebPortal/COC_EDITORIAL/LeadSafeChicagoPlan_1.pdf. Accessed January 8, 2008.
5. Centers for Disease Control and Prevention. Blood lead levels—United States, 1999–2002. *MMWR*. 2005;54:513–516.
6. Reynolds SJ, Seem R, Fourtes LJ, et al. Prevalence of elevated blood lead levels and exposure to lead in construction trades in Iowa and Illinois. *Am J Ind Med*. 1999;36:307–316.
7. Yassin A, Martonik J, Davidson F. Blood lead levels in US workers, 1988–1994. *J Occup Environ Med*. 2004;46:720–728.
8. Worby P. Organizing immigrant day laborers on the street: where program design meets city policies and neighborhood politics. Presented at: American Public Health Association 135th Annual Meeting; November 2007; Washington, DC.
9. Valenzuela A. *Working on the Margins: Immigrant Day Labor Characteristics and Prospects for Employment*. San Diego, CA: The Center for Comparative Immigration Studies, University of California, San Diego; 2000.
10. Marshall E, Ochsner M. Lessons from a peer-based participatory training program for Latino day laborers. Presented at: American Public Health Association 135th Annual Meeting; November 2007; Washington, DC.