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# Piloting a Personal Protection Equipment Distribution Program Among Chicago Day Laborers

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**Background** *Occupational injury rates among day laborers have been estimated to be as high as 31%, where lack of personal protective equipment (PPE) use is repeatedly noted as a contributor to occupational injuries.*
**Methods** *We distributed duffel bags containing nine pieces of PPE and provided training on their use to Chicago day laborers during six distribution sessions over two summers. Participants were contacted 4–8 weeks post-distribution and queried on PPE use.*
**Results** *Of 117 participants who received the equipment, 42 completed the follow-up survey. Workers performed construction, demolition, and painting type tasks and most often used gloves, safety glasses, and respirators. Hardhats, coveralls, and earplugs were the least used.*
**Conclusions** *The PPE we provided was used during 94% of the jobs, and every one of the nine items was used. Hearing protection was underused. This project showed that providing PPE, along with training on its use, may increase PPE use among Chicago day laborers, likely preventing occupational injuries.* Am. J. Ind. Med. 55: 159–166, 2012. © *2011 Wiley Periodicals, Inc.*

***KEY WORDS: day laborers; personal protective equipment; PPE training; occupational injuries; Latino workers***

## BACKGROUND

Latinos have higher fatal occupational injury rates than any other racial/ethnic group in the U.S. [BLS, 2007]. According to the U.S. Bureau Labor of Statistics (BLS), the proportion of occupational fatalities has been increasing in the Latino population [NCLR, 2009]. Occupational injuries are likely to be high even though, due to underreporting, the BLS reports lower rates relative to other population groups [NCLR, 2009]. Injuries and illnesses in Latino workers are undercounted in the US because of filters to reporting on the part of employers and the reluctance to report on the part of workers themselves due to fear of losing pay, adherence to traditional Latino values of not questioning authority figures, fear of exploitation due to documentation status, low English fluency [Harrington et al., 2008; Menzel and Gutierrez, 2009], and the lack of health care resources for this population [Azaroff et al., 2002].

In 2005, there were an estimated 2.6 million Latino construction workers in the U.S. [Menzel and Gutierrez, 2009]. A study that collected data from the Medical Expenditure Panel Survey between the years of 1996–2002 (n = 1833) found that Hispanic construction workers were 53% more likely to experience a work-related injury than whites [Dong et al., 2007].

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Day labor workers who actively search for employment in an informal market such as on the street corner or in big box store parking lots are often undocumented, Spanish-speaking, young men. As many as 92% of day laborers are hired by homeowners or construction contractors [Valenzuela et al., 2006; Buchanan et al., 2008] to assist in roofing, painting, installing drywall, residential construction, and other miscellaneous work [Walter et al., 2004; Buchanan et al., 2005; Seixas et al., 2008], at times without appropriate training and safety equipment [Buchanan et al., 2005]. Injury rates among this population are difficult to determine but studies have estimated rates of 20% [Valenzuela et al., 2006], 25% [Ochsner et al., 2008], and 31% [Lowry et al., 2009]. Studies have shown that day laborers do not have personal protective equipment (PPE) available to them and do not receive health and safety training [Buchanan et al., 2005, 2008; Ochsner et al., 2008; Seixas et al., 2008]. The lack of PPE may contribute to the risk of occupational injury among day laborers.

The aim of this pilot study was to initiate and evaluate a PPE distribution and training program as a means to reduce occupational injuries among day laborers. In conjunction with the Latino Union Worker Center (WC) of Chicago we provided day laborers with PPE and training on correct usage. We then assessed barriers hindering regular PPE use and determined the effectiveness of our PPE distribution and training program.

## METHODS

The Latino Union Worker Center is a community organization that provides programs in immigrant worker rights, popular education which encompasses workplace abuse, workplace health and safety, training and technical assistance, and policy action. Latino Union staff stand with workers on the street corner/parking lot hiring sites, assisting with the negotiation of pay with potential employers and offering information about the Latino Union organization and educational activities. Latino Union also supports a store-front location that provides a safe location where employers can go to hire day laborer workers. The WC staff performed the initial outreach to the day laborers regarding the PPE distribution project. They informed workers about the upcoming distributions, providing them with a flyer that included the date, time, and location of the distribution sessions. Word of mouth was also used to inform participants. Everyone waiting for work at the hiring sites where the WC provides a presence and who was over the age of 18, was targeted.

This research received expedited approval from the University of Illinois at Chicago's Institutional Review Board, protocol number 2008-0305, and all participants provided written consent.

We organized distribution sessions at multiple centers: at the WC before their weekly Saturday meetings, at a community park where the WC organizes soccer games for the workers, at a church hall, and in a parking lot near one of the street corner hiring sites. At a given distribution site, the project was explained as the workers waited for the start of the distribution. Those who chose to participate were provided with verbal and written informed consent and then were registered for the study. The registration form included a picture of each of the nine PPE items to be distributed (hardhat, N-95 respirator, goggles, safety sunglasses, disposable overalls, work gloves, kneepads, steel insoles, and earplugs). The types of PPE purchased for this project were chosen based on an informal survey conducted by visiting the hiring sites and asking workers what they most needed and by consulting with the WC staff. All PPE were ''one size fits all'' except for the steel insoles, of which a variety of sizes was purchased.

Participants were divided into small groups of four or five and directed to one of four demonstration tables. At each table, participants received a short presentation and demonstration on how to appropriately wear two or three different pieces of PPE. At the end of each presentation, participants received a training card with brief information on why, when, and how the particular PPE should be used, its limitations, how long the PPE would last, signs of deterioration, and how to care for it. The training cards were developed from the OSHA Tool Box training card, OSHA tailgate training, and online sources, along with the guidance of staff from the WC who encouraged us to make the cards as brief as possible. The training was performed by faculty and student volunteers from the University of Illinois at Chicago's Environmental and Occupational Health Sciences Division, who took part in a training session and mock run-through prior to the distribution. After the workers received the training on a particular piece of PPE, they received a sticker next to the picture of that piece of equipment on their registration sheet. After participants had received all the training at a given station, they rotated to the next table and repeated the process. When participants had completed all the stations, they turned in their fully stamped registration form in return for a duffel bag containing the PPE. When training for the N95 dust mask was given, participants were informed about the OSHA voluntary respirator standard and were given a copy of Section 1910.134: *(Mandatory) Information for Employees using Respirators When not Required under the Standard* (in Spanish).

Four to eight weeks after each PPE distribution session we attempted to contact participants by telephone to complete a survey about their PPE use. We also visited the hiring sites and the community park during soccer games to conduct follow-up interviews. The aim of the

survey was to collect the following information: three jobs performed in the past 4–8 weeks and the tasks relating to those jobs; whether or not PPE was used during these tasks; and the reasons for nonuse. In addition, workers were surveyed about which PPE was used the most and least often along with any problems with the PPE.

## Data Analysis

The data analysis of this study is descriptive. Descriptive statistics were calculated for all participants by age, hiring site, and whether a follow-up was provided. In some of our analyses the day laborers who waited for work at the Worker Center (hiring site 1) were compared to workers from the street corner hiring sites (hiring site 2–5), labeled as ''other hiring sites'' since their demographic characteristics and work opportunities may be different than the workers who seek work at the street corner sites (hiring site 2–5).

## RESULTS

There were six distribution sessions over the summers of 2008 and 2009. Three distributions occurred at a community park, and one each at the WC, a street corner, and a church. One hundred seventeen day laborers participated in the PPE distribution and training sessions and received a duffel bag of PPE. Eight participants were excluded from the data analysis; five who were found to have participated in two different PPE distributions, two who walked away with their registration sheet thus no contact information was provided, and one who was Polish-speaking for whom we were unable to find an interpreter to administer the follow-up survey (the interpreter had been available at the distribution session).

Forty-two day laborers (38.5%) were reached via telephone phone or at the individual hiring sites and completed a follow-up survey. Day laborer demographics and occupational characteristics for all 109 day laborers and the 42 interviewees are shown in Table I. All the participants were male. The follow-up interviewees had a median age of 40 years versus 38 years for the entire day laborers group (mean age of 41 years, 39.6 years, respectively). Among the follow-up group, 36% identified themselves as Mexican, 19% Hondurans, 12% Ecuadorians, and 9.5% Peruvian. Hiring site 1 had an older workforce: 75% of the follow-up interviewees were over the age of 40, whereas the mean age of interviewees from the street corner hiring sites (sites 2–5) was 39.5. The distribution of follow-up rate by hiring site indicates that we were most successful contacting workers from hiring site 1 (55%). The follow-up rates increased as age of participant increased; we were able to contact 54% of participants over 50 years old.

Workers were asked to list three types of jobs performed in the previous 4–8 weeks. Figure 1 shows the distribution of reported jobs for which the day laborers were hired. Several jobs could be grouped under ''construction'' but we reported them separately since workers reported them as individual jobs and different types of PPE and occupational injuries can occur while performing them. The three most frequently reported jobs (workers reporting having performed the job) were construction (95.2%), demolition (59.5%), and painting (47.6%). Within each job reported, workers were asked to list tasks performed during that particular job (Table II).

Workers were then asked to list which PPE, received from us, they had used when performing those jobs (Table III). In construction, 43.2% of the day laborers reported using a respirator, 35.1% used gloves, 16.2% used a hard hat, and 13.5% used earplugs. For demolition, 63.6% reported using the respirator and 72.7% used gloves, 59% used a hard hat, and 13% used earplugs. All participants who did landscaping work used gloves and 66.7% used the kneepads. One worker used his hard hat while landscaping. Thirty-seven percent of the movers reported using a back belt, but they did not receive those from us.

Workers were then asked to list the most and least frequently used PPE. Gloves (60%), safety glasses (52%), and the respirator (52%) were reported as the most frequently used by over half of the workers. Ten percent of workers listed six or more items of PPE as the most used, that is, they did not choose one item as most used. The coveralls (33%), earplugs (31%), and hard hats (29%) were reported as the least used PPE. For items that were used the least frequently, we asked the workers why they use the PPE less frequently. The reason given most often was ''didn't need them'' (earplugs 27%, coveralls and hard hat 26%, insoles 14%). Coveralls and the gloves (10%), the respirator (5%), and earplugs (3%) were all reported to have either ripped or ''didn't last long.'' Two workers reported that the hard hat did not fit or was uncomfortable; two other workers said the hard hat would fall off and two different workers did not use them because they had not ''worked at heights.'' Six workers mentioned that the goggles fogged up, they could not see while wearing them, or they would sweat when using them. Three participants said they did not use their insoles because they did not fit and three others did not use them because they had their own boots. One worker reported that he could not hear when using the earplugs. Participants were asked to further describe any other problems with the PPE that was provided to them. Fifteen workers (43%) stated that there were no problems with any of the PPE they used.

Since in the past we had learned that workers did not take PPE to work because they did not have anything to

**TABLE I.** Day Laborer Demographics and Occupational Characteristics

| | Entire participants, n = 109 | | | Interviewed group, n = 42 | | |
|---|---|---|---|---|---|---|
| **Pre-follow-up** | **n** | **%** | **Follow-up** | **n** | **%** | **Follow-up rate** |
| Age distribution | | | | | | |
| 18–30 | 18 | 16.51 | | 5 | 11.9 | 27.8 |
| 31–40 | 40 | 36.7 | | 16 | 38.1 | 40.0 |
| 41–50 | 29 | 26.6 | | 14 | 33.3 | 48.3 |
| 51–65+ | 13 | 11.9 | | 7 | 16.7 | 53.8 |
| NR | 9 | 8.2 | | 0 | 0 | 0.0 |
| Age range | 18–77 | | | 21–62 | | |
| Median | 38 | | | 40 | | |
| Country of origin[a] | | | | | | |
| Mexico | — | — | | 15 | 35.7 | — |
| Honduras | — | — | | 8 | 19.0 | — |
| Ecuador | — | — | | 5 | 11.9 | — |
| Peru | — | — | | 4 | 9.5 | — |
| Colombia | — | — | | 2 | 4.8 | — |
| Guatemala | — | — | | 2 | 4.8 | — |
| Belize | — | — | | 1 | 2.4 | — |
| NR | — | — | | 5 | 11.9 | — |
| Hiring sites | | | | | | |
| 1 | 22 | 20.2 | | 12 | 28.6 | 54.5 |
| 2 | 32 | 29.4 | | 17 | 40.5 | 53.1 |
| 3 | 23 | 21.1 | | 3 | 7.1 | 13.0 |
| 4 | 25 | 22.9 | | 9 | 21.4 | 36.0 |
| 5 | 4 | 3.7 | | 1 | 2.4 | 25.0 |
| NR | 3 | 2.8 | | 0 | 0.0 | 0.0 |
| Distribution year | | | | | | |
| 2008 | 55 | 50.5 | | 11 | 26.2 | 20.0 |
| 2009 | 54 | 49.5 | | 31 | 73.8 | 57.4 |
| Overall follow-up rate | | | | | | 38.5 |

[a]Country of origin was included in the follow-up survey only.

carry it in, we wondered whether providing duffel bags would help. Eighty-nine percent of workers reported that they took their duffel bags of PPE to work. However, the majority of workers who were interviewed while waiting for work did not have their duffel bags with them.

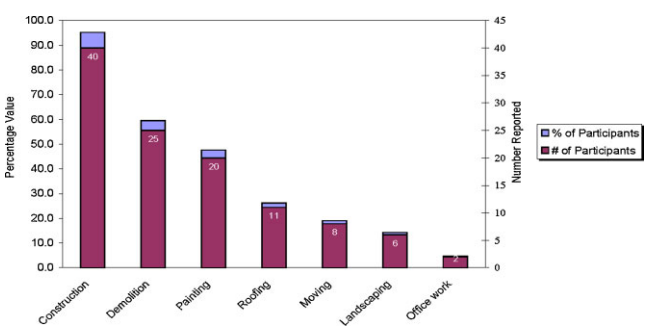


**FIGURE 1.** Types of jobs performed in the previous month.

Participants were encouraged at the conclusion of the survey to give comments on their overall experience with the PPE distribution, noted in Table IV. Most workers were grateful and appreciative; some expressed their opinion on types of PPE that could be provided in the future, and others requested more information on the PPE provided.

## DISCUSSION

Getting employees in conventional job settings to utilize PPE is difficult to achieve even though companies typically supply PPE, provide training, and enforces its use. It is even more challenging for the day laborer population; they are usually left to use their own PPE when they perceive it is needed and they do not receive training on its use. In our study, 1,053 pieces of PPE were successfully distributed to 112 day laborers, along with training.

**TABLE II.** List of Jobs With Most Frequent Task(s) Performed

| Job title with listed tasks | n | % |
|---|---|---|
| Construction | 38[a,b] | 95.2 |
| Carpentry (framing, carpet, drywall, plastering) | 16 | 42.1 |
| Cement/brick work (finishing, cleaning, priming) | 7 | 18.4 |
| Sandblast/tuck-point | 4 | 10.5 |
| Electrical/plumbing | 4 | 10.5 |
| Other cleaning task | 4 | 10.5 |
| Carrying material (cement, garbage, other) | 3 | 7.9 |
| Machinery | 2 | 5.3 |
| No task description given | 6 | 15.8 |
| Demolition | 22 | 59.5 |
| Tearing down walls | 16 | 72.7 |
| Removal of ceiling/insulation/floor | 8 | 36.4 |
| Cleaning | 2 | 9.1 |
| Plaster/wood work | 1 | 4.5 |
| No task description given | 12 | 54.5 |
| Painting | 19 | 47.6 |
| Scraping old paint, applying primer, painting | 10 | 52.6 |
| Painting (no paint removal) | 5 | 26.3 |
| Bending over, continuous arm movement | 1 | 5.3 |
| No task description given | 4 | 21.1 |
| Roofing | 11 | 26.2 |
| Adding/removing roof | 6 | 54.5 |
| Carrying materials (picking up garbage, other materials) | 1 | 9.1 |
| No task description given | 5 | 45.5 |
| Moving task | 8 | 19.0 |
| Lifting/moving boxes/furniture | 6 | 75.0 |
| No task description given | 2 | 25.0 |
| Landscaping/task | 6 | 14.3 |
| Gravel work (moving, laying paving stone, gravel) | 2 | 33.3 |
| Cutting (shrubs, grass, other) | 2 | 33.3 |
| Planting (trees, shrubs) | 2 | 33.3 |
| No task description given | 3 | 50.0 |
| Office work | 2 | 4.8 |
| Office work | 1 | 50.0 |
| No task description given | 1 | 50.0 |

[a]Did not get data from all workers.
[b]Workers listed multiple tasks.

**TABLE III.** Reported Used PPE During a Specific Job/Task

| | Job[a] | | | | | |
|---|---|---|---|---|---|---|
| | Construction (n = 37) | | Demolition (n = 22) | | Painting (n = 19) | |
| PPE | n | % | n | % | n | % |
| Goggles | 11 | 29.7 | 13 | 59.1 | 4 | 21.1 |
| Hard hat | 6 | 16.2 | 13 | 59.1 | 1 | 5.3 |
| Safety glasses | 10 | 27.0 | 9 | 40.9 | 3 | 15.8 |
| Earplugs | 5 | 13.5 | 3 | 13.6 | 0 | 0.0 |
| Coveralls | 0 | 0 | 6 | 27.3 | 6 | 31.6 |
| Insoles | 7 | 18.9 | 11 | 50.0 | 0 | 0.0 |
| Kneepads | 10 | 27.0 | 3 | 13.6 | 2 | 10.5 |
| Respirator | 16 | 43.2 | 14 | 63.6 | 10 | 52.6 |
| Gloves | 13 | 35.1 | 16 | 72.7 | 5 | 26.3 |
| No response | 3 | 8.1 | 0 | 0.0 | 4 | 21.1 |
| | Job | | | | | |
| | Roofing (n = 10) | | Moving (n = 8) | | Landscaping (n = 6) | |
| PPE | n | % | n | % | n | % |
| Goggles | 2 | 20.0 | 0 | 0.0 | 2 | 33.3 |
| Hard hat | 2 | 20.0 | 0 | 0.0 | 1 | 16.7 |
| Safety glasses | 5 | 50.0 | 1 | 12.5 | 3 | 50.0 |
| Earplugs | 0 | 0.0 | 0 | 0.0 | 1 | 16.7 |
| Coveralls | 0 | 0.0 | 0 | 0.0 | 1 | 16.7 |
| Insoles | 3 | 30.0 | 0 | 0.0 | 1 | 16.7 |
| Kneepads | 4 | 40.0 | 0 | 0.0 | 4 | 66.7 |
| Respirator | 2 | 20.0 | 0 | 0.0 | 1 | 16.7 |
| Gloves | 7 | 70.0 | 7 | 87.5 | 6 | 100.0 |
| No response | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |

[a]Not included: no PPE use was reported for office work.

Workers who participated in the follow-up interviews reported 261 uses of PPE for 115 different jobs, the PPE we provided was used during 94% of the jobs, and every one of the nine items was used. Of the nine pieces of PPE provided, the gloves, safety glasses, N-95 respirator, and hard hat were reported to be used for over 50% of the jobs.

In general, workers used the PPE for the appropriate jobs: they reported using the PPE items that are ''typically'' used during specific tasks. For example, 100% of workers who performed demolition work used some type of eye protection and over 50% reported using the respirator, insoles, and hard hat. When workers performed construction tasks, 57% used eye protection, but no other piece of equipment was used with as much frequency for construction. Greater detail on the specific job tasks was not included in the follow-up questionnaire and would have been informative. We are therefore unable to make conclusions about the efficacy of the PPE use with confidence.

Hearing protection was one of the least used PPE and the reason given most often was ''it was not needed.'' Also, from informal discussions with the workers we learned that some workers used earplugs to ''keep dust out'' of their ears. Since 95% of the follow-up participants had performed construction work and 76% described performing or assisting in demolition-type tasks, we are concerned that workers may not be aware of the necessity to

use hearing protection while working in noisy environments. A study conducted by Robertson et al. interviewing Latino construction workers on noise and hearing protection found a reason for not using hearing protection was workers were more preoccupied with immediate dangers such as falling than the possibility of losing their hearing in the future. Other reasons included misperceptions that hearing loss would not happen to them, PPE may not have been used in their countries of origin, and newly migrated workers may act ''tough,'' feel as if they are able to ''adapt'' to the noise [Robertson et al., 2007]. The noise levels at the working locations of the day laborers in our study are unknown; however 42% of workers reported performing carpentry type tasks during construction work and 72% tore down walls for demolition. These activities may have the potential for producing high noise levels. Clearly, more training on the appropriate use of hearing protection is needed in this population.

Earlier work with Chicago day laborers found that only 4 of 21 (19%) of interviewed day laborers had their own PPE [Buchanan et al., 2005]. Consequently, we assume that the majority of the day laborers in our study did not have their own PPE prior to the distribution sessions. Forst et al. [2006] found that while promoting protective eye wear use, simply handing out safety glasses increased their use up to 14% among Latino farm workers. Since we were unable to observe actual use on the job and we did not quantify before and after assessments of PPE use, we are unable to draw definitive conclusions about increase in usage. However, based on the previous data on PPE usage among day laborers gathered by us [Buchanan et al., 2005] as well the comments by our follow-up participants, it is likely that by providing PPE and training, this population's PPE use increased. Future efforts to increase PPE usage among this population might include quantification of reported before and after usage and comparison of different types of training methods, for example, peer-to-peer, interactive videos.

Possible explanations for non-use of PPE include that day laborers usually do not know what type of work they would be hired for and therefore may not have the appropriate PPE with them. Some workers mentioned not wanting to carry all items received in the distributions to the hiring sites and being afraid they would be stolen. One of the ways we evaluated the success of the project was by reporting whether workers had their bags of PPE with them at the time of the follow-up survey. Eighty-nine percent of workers reported taking their bags to work, but few of the workers who were interviewed while waiting for work had their duffel bags with them. The challenge remains to adequately document PPE usage on a daily basis. Observing workers at their jobs will likely continue to be impossible, but perhaps innovative methods such as workers reporting daily usage using electronic communications or taking photos at the work site could be utilized in future projects.

Our 39% follow-up rate was largely due to participants giving us phone numbers that were either invalid or not in service, and the inability to locate them through other means. Twenty-nine (26%) participants gave no contact number on their registration sheet or gave a non-working number. One participant was not contacted since we could not secure a Polish interpreter. Conducting the survey at the street corner hiring sites was not ideal. Workers were waiting for work and potentially missed work opportunities while speaking with us. Thus, some workers were distracted, rushed, or did not complete the survey. Since this population is highly mobile, we may have missed some workers because they no longer used the hiring sites or worker center to find work; one of the participants had moved to a different state between the distribution session and the follow-up survey. In comparison to our follow-up rate of 39%, a study examining a peer-led health and safety training program for day laborers performing construction reported a follow-up rate of 22%. Day laborers were contacted 2–6 months after receiving their training. Difficulties in acquiring follow-ups included high mobility, contact information changes, or that no contact information was provided for follow-up [Williams et al., 2010]. These same challenges are similar to ours and will likely continue to be a challenge in studies of this kind. Conducting follow-ups only among those who used the worker center might increase the follow-up rate. We found it easier to locate those participants and in addition, workers were at times available at the WC (hiring site 1) location to fill out a survey on their days off. Also, we did not use incentives for completing the follow-up survey. Our follow-up rate would probably have been higher if we had offered something in exchange for their time. In addition, consideration should be given to using focus groups for follow-up evaluation of the PPE use since we noticed that some workers seemed unwilling to give candid feedback, perhaps for fear of offending the research team.

Other limitations to this study include possible self-reporting bias. Workers were not observed at their worksites so the use of PPE and even job type and tasks could not be verified. Also, since this study did not follow a pre- and post-test design we cannot draw conclusions about increased PPE use with certainty. Previous research on day laborers does show, however, that workers in Chicago are primarily involved in construction, demolition, and moving type work as was seen in our study as well, and that workers overwhelmingly do not use PPE. Our study was also limited by the condition under which the workers were interviewed. When interviewed at the hiring site they were somewhat distracted and rushed due their vying for work. When interviewed on the phone they were often

**TABLE IV.** Comments/Suggestions From Follow-Up Group

| |
|---|
| Gratitude/appreciation |
| Very good |
| Thank you for the equipment with the economy it is hard to get equipment. |
| Very grateful |
| Thank you! Very good, beneficial, provides initial protection |
| Everything was good, it helped a lot |
| Thank you, helped us a lot to avoid injury |
| Excellent, thanks |
| Even though has not used everything, everything is valuable. Is keeping everything stored away until needed. Knowing that they are being protected is important |
| Everything went well |
| What you gave us was perfect |
| PPE is important, the equipment helps |
| Very grateful, it's good what you are doing for us |
| Grateful, found it beneficial, would like back belts if possible |
| Worker needs more information on PPE |
| Very good, very useful |
| Everything is good, include back belt |
| Everything is needed |
| Recommendations/concerns |
| Need more information on the equipment: the benefits, how to use it |
| Would not mind a back belt |
| There was someone who got PPE twice and sold one of the equipment. |
| It's not fair for those who need it |
| Would like work boots, cloth overalls, waterproof boots |
| In regards to PPE use |
| It was difficult to know which jobs they would be doing so didn't always have PPE |
| Used sunglasses for landscaping, needs back belt |
| Didn't use hardhat much but it's very important to have for demo/construction |
| Mask helped when it was very dusty, gloves helped with trash |
| Didn't need hard hat all the time |
| Everything worked; they didn't last and were disposable |

using borrowed phones or were in noisy settings which probably decreased the quality of their responses, both in detail and veracity. Such challenges are common in the study of this transient work force, and this pilot study reports challenges that when taken into consideration will improve future efforts by researchers working with this population.

## CONCLUSION

There is little information in the literature on the frequency, efficacy of training, and the effectiveness of using PPE among day laborers. We found that a PPE distribution program can be used as an additional method to assist in preventing occupational injuries among this population. While the challenges were substantial: poor follow-up, brief interviews, and lack of direct observation of the worksites, we believe that our evaluation of this project contributes to the literature on injury reduction among day laborers. We demonstrated that the workers in our study were open and enthusiastic about receiving PPE and training on its use. Most of the workers reported using the PPE. The use of gloves, safety glasses, kneepads, and coveralls likely prevented injuries and probably did not lead to harmful exposures caused by incorrect or inappropriate use. There remains the concern, though, of whether workers used the appropriate PPE when needed. Specific concerns include their use of the respirators for paint fumes and hearing protection for the dust and not for noise reduction. Re-evaluation of the training on hearing protection and appropriate respirator use should be considered for future similar PPE distributions. Also, even though day laborers are known to perform roofing and have indicated their need for fall protection in the past [Buchanan et al., 2008] we did not provide fall protection equipment. The logistics of providing the correct equipment for different types of roofing jobs was impossible, but fall protection needs additional attention among this group. It is possible that by providing education on the other methods of PPE, day laborers become more aware of workplace safety and potential hazards, and become empowered either to ask for fall protection from their employers or to refuse jobs that present fall hazards.

One of the overall goals of the study was to develop a preliminary mechanism in which Chicago day laborers would have easy access to PPE, with the assistance of the worker center. The worker center sponsored by Latino Union has lockers which workers are encouraged to use while at work. Encouraging day laborers to use the worker center to seek work instead of at the street corner hiring sites might address the problem of workers not taking the correct PPE with them or fearing that it might be stolen; they could store the un-needed PPE in the locker once they were informed of the type of job they would be performing that day. In this project we provided the PPE free of charge. For future projects this should be re-assessed since we received a report that at least one worker sold the PPE he received. Charging a small fee for PPE may provide an incentive for workers not to resell purchased PPE and may encourage workers to use PPE only when needed, or discourage frivolous use when not necessary for the job. Revenue could be used to sustain a PPE distribution program or assist in other financial needs of a worker center.

For future distributions, the PPE equipment should be tested for durability before distribution. Workers in our project reported that the gloves and overall ripped easily and the gloves did not have enough grip capability to help workers grasp items (especially for movers). The goggles

and safety glasses fogged up and were uncomfortable when sweaty.

High occupational injury rates are a concern among day laborers. We developed a novel method for addressing this issue. We developed a preliminary method, which to our knowledge has not been reported previously, of distributing PPE to day laborers to prevent occupational injuries. The ultimate goal of projects such as these is to reduce occupational injuries among day laborers. Proving the efficacy of various types of safety interventions in reducing injury rates will continue to be daunting since this population is transient, continuously changing jobs, and has reasons to not report their injuries. Using qualitative methods and relying on worker centers for data collection and follow-up will improve the ability to assess the success of our efforts.

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