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Latino and Immigrant Workers:

An Interdisciplinary Annotated Bibliography

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Latino and Immigrant Workers: An Interdisciplinary Annotated Bibliography

Ahonen, E. Q., et al. (2013). "Evaluating goals in worker health protection using a participatory design and an evaluation checklist." New Solut 23(4): 537-560.

Spanish-speaking immigrant workers in construction are considered hard to reach and at high risk for work-related injury and fatality. This evaluation study describes the use of participatory methods and an evaluation checklist to consider a health and safety (H&S) training program for these workers. A previously developed training manual and model were disseminated to eight worker centers (WCs) through participatory research collaboration. It incorporated H&S training for workers while strengthening the role of WCs as sources for leadership development and worker empowerment. Design, delivery, reaction, application, and extension were assessed through individual interviews with participants, trained trainers, and center staff and through observation of training sessions and partner debriefs; pre- and post-training tests assessed participant learning. Results indicate moderate learning and application by participants and strong evidence for structural gains in and among WCs. We conclude that such partnerships and models are valuable tools for collaborating with hard-to-reach workers.

Al-Bayati, A. J., et al. (2018). "Managing active cultural differences in U.S. construction workplaces: Perspectives from non-Hispanic workers." J Safety Res 66: 1-8.

INTRODUCTION: Current census reports indicate a growing shift toward workforce diversity in the U.S. construction industry, which is largely the result of increasing participation from the Hispanic community. The data also suggest that the Hispanic workforce suffers a higher rate of fatal injuries compared to their non-Hispanic counterparts. Therefore, there is a dire need to develop and utilize new management tools and strategies to accommodate the differences in language and culture of this incoming labor force. METHOD: The absence of these tools and strategies poses several challenges including cost overrun, schedule delay, and more importantly, higher workplace injury rates. This study aims to provide a better understanding of the contribution of cultural diversity as a factor that may influence the overall site safety. RESULTS: As a result, this study provides further evidence that indicate that the current findings regarding the influence of active cultural differences are reliable, valid, and needs attention. Furthermore, the study provides sub-analysis results of cultural values among Hispanic workers, which suggest that workers from Mexico are less likely to speak up on safety issues when compared to other Hispanic workers. Therefore, this study has both practical and theoretical implications for managing workforce diversity and related safety performance in the U.S. construction industry. The results of the study can be used by employers and managers to adopt responsive strategies and tools to reduce the likelihood of fatal and nonfatal injuries among Hispanic workers.

Al-Bayati, A. J., et al. (2017). "Reducing fatality rates of the Hispanic workforce in the U.S. Construction industry: Challenges and strategies." Journal of Construction Engineering and Management 143(3).

Recent government statistics have revealed a high rate of fatalities among Hispanic workers in the U.S. construction industry. This study investigates the root causes of this issue as well as the existing attempts to manage these causes effectively. Cultural barriers are one of the root causes that have not been fully explored. This detailed investigation expands into an exploration of cultural barriers and differences, variables that are directly attributable to

construction site safety. A survey instrument was designed to evaluate the existence and influence of these differences at U.S. construction sites, and data were collected from construction supervisors across the United States. The results of the survey strongly suggest the existence of two differences: high power distance and collectivism cultural dimensions. Based on the survey results and feedback from construction supervisors, recommendations for best practices in workforce development that guides construction professionals and researchers are suggested. © 2016 American Society of Civil Engineers.

Al-Bayati, A. J. and D. D. York (2018). "Fatal injuries among Hispanic workers in the U.S. construction industry: Findings from FACE investigation reports." J Safety Res 67: 117-123.

INTRODUCTION: Identifying and understanding the characteristics of workplace accidents can provide vital information required to clarify their causes and prevent similar accidents from happening in the future. The Hispanic workforce represents a significant segment of the U.S. construction labor force that is projected to continue increasing in population. The government statistical data show higher rates of fatalities among Hispanic workers when compared to other ethnic groups. METHOD: This study aims to provide details about the trends of fatal injuries among Hispanic workers. The study examined 92 government investigation reports to reveal the general trends, then an examination of fatal fall injuries within the study sample was conducted since falling is the predominant cause of fatal injuries. RESULTS: The findings suggest differences in accident characteristics between Hispanic workers and all workers, which could indicate a need for different interventions to improve the overall site safety. The study also revealed the dire need to propose revised investigation procedures that would help identify the root causes of accidents, which in turn leads to better recommendations and interventions.

Alsamadani, R., et al. (2013). "Relationships among language proficiency, communication patterns, and safety performance in small work crews in the United States." Journal of Construction Engineering and Management 139(9): 1125-1134.

The construction industry employs approximately 6% of all U.S. workers but accounts for over 16% of all occupational fatalities. Recent statistics indicate that over 40% of all U.S. construction laborers cannot speak English proficiently. To ensure strong safety performance, it is vital to include every individual in a construction crew in safety-related communications, regardless of language proficiency. Considering that most safety communication is delivered in English, it is not surprising that Spanish-speaking construction workers are fatally injured at a disproportionate rate. To conduct the first exploration of the characteristics of strong, multilingual safety networks in the Denver Metropolitan region of the United States, a multilingual research team conducted interviews with the members of 14 construction crews. Demographic attribute data for each individual (e.g., language proficiency, years of experience, position in the company) and network data were collected to analyze the safety communication network for each crew. The units of analysis included the individual actors in the network and the networks as a whole. The exploratory results contribute to the body of knowledge by revealing that unilingual work crews have safety performance that is 51% better than multilingual work crews ($p=0.10$), bilingual workers play a more central role than unilingual workers when more than one language is spoken ($p<0.001$), workers less than 35 years of age have a higher degree of centrality than do workers who are older than 35 years old ($p=0.11$), and managers play an important role in the exchange and diffusion of safety knowledge

regardless of language proficiency ($p<0.001$). Most importantly, social-network analysis metrics show that these language-boundary spanners often form the core of a network that connects disparate groups of individuals. By contrast, crews with relatively weak safety performance tend to have clear and disparate subnetworks distinguished by language and high turnover rates. Such characteristics are of concern because individual actors are not able to effectively warn one another of uncontrolled hazardous exposures or work in transition. © 2013 American Society of Civil Engineers.

Arcury, T. A., et al. (2012). "Work safety climate and safety practices among immigrant Latino residential construction workers." Am J Ind Med 55(8): 736-745.

Background: Latino residential construction workers experience high rates of occupational fatality and injury. Work safety climate is an especially important consideration for improving the safety of these immigrant workers. This analysis describes work safety climate among Latino residential construction workers, delineates differences in work safety climate by personal and employment characteristics, and determines associations of work safety climate with specific work safety behaviors. Methods: Data are from a cross-sectional survey of 119 Latino residential framers, roofers, and general construction workers in western North Carolina; 90 of these participants also provided longitudinal daily diary data for up to 21 days using an Interactive Voice Response (IVR) system. Measures included the Perceived Safety Climate Scale, and daily reports of five individual and five collective safety practices. Results: Work safety climate was mixed among workers, with roofers (19.9) having lower levels than framers (24.3) or general construction workers (24.3). Days reported for several individual (glove-related risks, not doing something known to be unsafe) and collective safety practices (attended daily safety meeting, not needing to use damaged equipment, not seeing coworker create an unsafe situation) were positively associated with work safety climate. Conclusions: Work safety climate predicts subsequent safety behaviors among Latino residential construction workers, with differences by trade being particularly important. Interventions are needed to improve safety training for employers as well as workers. Further research should expand the number of workers and trades involved in analyses of work safety climate. © 2012 Wiley Periodicals, Inc.

Arcury, T. A., et al. (2014). "Occupational safety beliefs among Latino residential roofing workers." Am J Ind Med 57(6): 718-725.

Background: This analysis describes beliefs about work safety and personal protective equipment (PPE) among Latino roofing workers, it delineates their perceptions of work environment characteristics that affect work safety and PPE use, and it describes how they experience work injuries and the consequences of these injuries. Methods: In-depth interviews were completed with 10 current and former Latino residential roofers. Interview transcripts were subjected to systematic qualitative analysis. Results: Participants' valued productivity over safety, and this had a negative influence on their safety behavior and reduced their PPE use. They understood that roofing was hazardous. They limited use of PPE when they felt it reduced productivity and when it was uncomfortable. Work environment characteristics that affected safety included company size, the physical demands of the job, lack of training, the need for work, general life stress, and distractions at work. An injury had to result in lost work time to be considered significant. Access to health care is limited by employers not providing Workers' compensation. Discussion: Future research is needed to substantiate these descriptive results

and to delineate factors that are associated with safety behavior and use of PPE. Interventions, based on a lay health educator model, are needed to improve safety in this population. Safety regulations need to be evaluated and their enforcement needs to be improved. © 2013 Wiley Periodicals, Inc.

Arcury, T. A., et al. (2015). "Work safety climate, personal protection use, and injuries among Latino residential roofers." Am J Ind Med 58(1): 69-76.

Background: This analysis describes work safety climate, personal protective equipment (PPE) use, and injuries among Latino residential roofers, and examines the associations of work safety climate with PPE use and injuries. Methods: Eighty-nine North Carolina residential roofers completed a baseline interview and daily logs about perceptions and use of PPE, occurrence of injuries in last 12 months, and work safety climate. Results: The mean work safety climate score was 26.5 (SD=5.6). In the baseline interview, participants reported that the majority of employers provided PPE and that they used it most or all of the time; daily log data indicated that PPE was used for half or fewer of hours worked. 39.9% reported any injury in the last 12 months. Work safety climate was significantly correlated with the provision and use of most types of PPE, and was inversely associated with injury. Conclusions: Supervisors promoting safety may increase the PPE use and decrease injuries. © 2014 Wiley Periodicals, Inc.

Asfar, T., et al. (2021). "Implementing a Novel Workplace Smoking Cessation Intervention Targeting Hispanic/Latino Construction Workers: A Pilot Cluster Randomized Trial." Health Educ Behav 48(6): 795-804.

BACKGROUND: U.S. Hispanic/Latino construction workers constitute a large and historically underserved group in terms of smoking cessation services. Using formative research, we developed a worksite smoking cessation intervention tailored to the life/work circumstances of these workers. AIMS: This study aims to examine the feasibility, acceptability, and potential efficacy of the developed intervention "Enhanced Care" (EC; one group behavioral counseling session provided around the food truck + fax referral to tobacco quitline [QL] + 8-week nicotine replacement treatment [NRT]) compared with "Standard Care" (SC; fax referral to tobacco QL + 8-week NRT) in a pilot, two-arm, cluster randomized controlled trial. METHOD: In collaboration with construction site safety managers, a sample of 17 construction sites (EC: nine sites/65 smokers; SC: eight sites/69 smokers) was enrolled. Participants received two follow-ups at 3 and 6 months after enrollment. Feasibility outcomes were enrollment rate, adherence to treatment, and 6-month retention rates. The primary efficacy outcome was 6 months prolonged abstinence verified by expired carbon monoxide <10 ppm. RESULTS: Enrollment rate was high (85.9%). Six-month follow-up rates were acceptable (EC = 76.9%, SC = 66.6%). Adherence to treatment was better in the EC group (received worksite intervention: EC = 93.8%, SC = 88.4%; contacted by QL: EC = 49.2%, SC = 40.6%). Abstinence rates were 27.7% for the EC and 20.3% for the SC (p = .315). DISCUSSION: The developed intervention was feasible and acceptable, and it substantially improved abstinence among Hispanic/Latino workers. The involvement of safety managers was essential to the implementation of the intervention. Training safety managers to deliver the intervention has great potential to implement a sustainable smoking cessation service in the construction sector.

Asfar, T., et al. (2018). "A cluster randomized pilot trial of a tailored worksite smoking cessation intervention targeting Hispanic/Latino construction workers: Intervention development and research design." Contemp Clin Trials 67: 47-55.

Construction workers have the highest smoking rate among all occupations (39%). Hispanic/Latino workers constitute a large and increasing group in the US construction industry (over 2.6 million; 23% of all workers). These minority workers have lower cessation rates compared to other groups due to their limited access to cessation services, and lack of smoking cessation interventions adapted to their culture and work/life circumstances. Formative research was conducted to create an intervention targeting Hispanic/Latino construction workers. This paper describes the intervention development and the design, methods, and data analysis plans for an ongoing cluster pilot two-arm randomized controlled trial comparing an Enhanced Care worksite cessation program to Standard Care. Fourteen construction sites will be randomized to either Enhanced Care or Standard Care and 126 participants (63/arm) will be recruited. In both arms, recruitment and intervention delivery occur around "food trucks" that regularly visit the construction sites. Participants at Enhanced Care sites will receive the developed intervention consisting of a single face-to-face group counseling session, 2 phone calls, and a fax referral to Florida tobacco quitline (QL). Participants at Standard Care sites will receive a fax referral to the QL. Both groups will receive eight weeks of nicotine replacement treatment and two follow-up assessments at three and six months. Feasibility outcomes are estimated recruitment yield, barriers to delivering the intervention onsite, and rates of adherence/compliance to the intervention, follow-ups, and QL enrollment. Efficacy outcomes are point-prevalence and prolonged abstinence rates at six month follow-up confirmed by saliva cotinine <15 ng/ml.

Asfar, T., et al. (2019). "Integrating Worksite Smoking Cessation Services Into the Construction Sector: Opportunities and Challenges." Health Educ Behav 46(6): 1024-1034.

Background. Smoking prevalence among Hispanic/Latino construction workers in the United States is very high (31%). Aims. To investigate tobacco use profiles in these minority workers and explore their management's views about implementing sustainable worksite smoking cessation services. Methods. Analysis of baseline data from a smoking cessation trial among Hispanic/Latino construction workers (n = 134; adult men >/=18 years), and semistructured, 45-minute interviews with 24 key personnel at six construction companies in south Florida were conducted. Interviews were recorded, transcribed, and analyzed thematically. Results. Overall, 43.3% of workers were Cuban, and 81.3% had low acculturation level. Nicotine dependence levels were "high" in 61.8% of workers. Half of the workers had a successful quit attempt but only 9.9% received advice from a physician to quit smoking, 16.7% used medication to quit, and 79.2% did not receive assistance. Participants in the interviews stated that nothing was provided to help smokers quit smoking and considered distributing self-help materials with free medications as the most appropriate service. Challenges to integrating the service were time restriction and cost. Recommendations for implementing the service were local/state government mandate. Discussion. Tailoring tobacco treatment to Hispanic/Latino construction workers' job circumstances and culture is essential to support their cessation efforts. Integrating worksite tobacco treatment services into other available health promotion programs (e.g., safety) and enforcing smoke-free legislation in the construction sector can facilitate its adoption. Conclusion. Involving key stakeholders and mandating the service by the State and local government are necessary to integrate sustainable worksite smoking cessation services in the construction sector.

Azaroff, L. S., et al. (2006). "Protecting workers and residents from wood floor-finishing hazards." New Solut 16(2): 119-138.

The recent deaths of three hardwood floor finishers in the Boston area have highlighted the urgency of addressing hazards in this industry. Among other dangers to health and safety, fire is a constant threat in a work setting that combines highly flammable solvents, large quantities of airborne wood dust, electrical equipment, heat, and friction inside old homes. Immigrant workers, who perform a large proportion of this work, are at special risk. An Environmental Justice partnership of community-based organizations, community health centers, and environmental health researchers funded by the National Institute of Environmental Health Sciences (the "Dorchester Occupational Health Initiative") had been studying the occupational health of hardwood floor finishing when these workers died. This preparation enabled community, health, labor, business, and political leaders to mobilize a response and release recommendations within weeks of the second fatal fire. Their report, adapted below, contains important information for health and labor activists in all areas where wood flooring is common. Most notably, the use of less flammable (higher flash point) products can help reduce the risk of more fatal fires. For further information, please contact the Massachusetts Coalition for Occupational Safety and Health, masscosh.org.

Azaroff, L. S., et al. (2011). "Results of a community-university partnership to reduce deadly hazards in hardwood floor finishing." J Community Health 36(4): 658-668.

A community-university partnership used community-based participatory research (CBPR) to design, implement, and evaluate a multi-cultural public health campaign to eliminate flammable products and reduce use of products high in volatile organic compounds (VOCs) in hardwood floor finishing in Massachusetts. Leading participants were Vietnamese-American organizations and businesses. Following the public health campaign, a multi-lingual survey of self-reported experiences with fires, product use, exposure to outreach activities, and changes made, was conducted with floor finishers. One hundred nine floor finishers responded. Over 40% reported fires at their companies' jobs, mostly caused by lacquer sealers. Over one third had heard radio or TV shows about health and safety in floor finishing, and over half reported making changes as a result of outreach. Exposure to various outreach activities was associated with reducing use of flammable products, increasing use of low-VOC products, and greater knowledge about product flammability. However, most respondents still reported using flammable products. Outreach led by community partners reached large proportions of floor finishers, was associated with use of safer products, and adds to recent work on CBPR with immigrant workers. Continued use of flammable products supports the belief that an enforceable ban was ultimately necessary to eradicate them.

Borjan, M., et al. (2016). "Assessing barriers to the use of fall protection in small residential construction companies in New Jersey." New Solut 26(1): 40-54.

Three focus groups were conducted with residential construction workers from local New Jersey labor organizations to characterize barriers to fall protection use among residential construction contractors who work for companies with fewer than ten employees. Thirty-six residential construction workers volunteered to participate, the average age was thirty-nine years, and twenty-four (67%) were of Hispanic origin. Twelve (33%) of the participants reported having fallen from greater than 6 ft at work and twenty (56%) of the participants had

known someone who has fallen from greater than 6 ft. Sixteen (44%) had not been provided with fall protection equipment by their employer and eighteen (50%) reported their current employer had not provided workplace safety training. Factors that created barriers to use of fall protection equipment such as equipment availability, employee/employer relationships, cultural differences, and company size were identified. Results from this study confirm that falls remain a concern among residential construction workers in small companies.

Brender, J. D., et al. (2008). "Parental occupation, Hispanic ethnicity, and risk of selected congenital malformations in offspring." Ethn Dis 18(2): 218-224.

OBJECTIVES: Evidence suggests that parental occupation and Hispanic ethnicity may be risk factors for some birth defects. Because few studies have examined the effect of Hispanic ethnicity on occupational associations, we examined whether risk associated with certain occupations was heightened in Hispanics compared with non-Hispanic Whites. DESIGN: In this case-control study among Texas births occurring from 1996 through 2000, cases of neural tube defects, isolated oral clefts, and chromosomal anomalies were linked to their respective live birth certificates. A random sample of 4965 live births without documented congenital malformations served as the comparison group. Parental occupations were categorized into groups according to previously published associations. Logistic regression was used to obtain odds ratios (OR) and 95% confidence intervals (CI) for the selected congenital malformations in relation to parental occupations. RESULTS: Maternal occupations as cook or nurse were associated with oral clefts (OR 3.3, 95% CI .6-16.0) and neural tube defects (OR 3.1, 95% CI .5-13.1), respectively, among births to Hispanic mothers, but not with births to non-Hispanic White mothers. Hispanic fathers who were electricians were more likely to have offspring with chromosomal anomalies, especially trisomy 18 (OR 7.4, 95% CI 1.6-25.5), associations not seen among offspring of non-Hispanic White fathers. Risk estimates also differed by Hispanic ethnicity between oral clefts and paternal occupations of electronic equipment operator, farmworker, janitor, police officer, and printer. CONCLUSIONS: In this study, we found differences for risk of several congenital malformations by Hispanic ethnicity in relation to parental occupation. We recommend further study of these risks in other Hispanic populations.

Brown, S., et al. (2021). "Injury inequalities among U.S. construction workers." J Occup Environ Hyg 18(4-5): 159-168.

This study explores racial/ethnic inequalities in work-related injuries among U.S. construction workers. Data from the 2004-2017 National Health Interview Survey were used to estimate work-related injuries by race/ethnicity in construction. Disparities in demographic, socioeconomic, and injury status among construction workers were examined by race/ethnicity. Injury differences were also evaluated in multiple logistic regression analyses controlling for potential confounders. Compared to white, non-Hispanic workers, minority workers were more likely to have lower socioeconomic statuses (e.g., lower educational attainment, lack of health insurance coverage, and family income below the poverty level), which considerably increased the likelihood of work-related injuries. The odds of work-related injuries were 70% higher among racial/ethnic minorities than white, non-Hispanics in construction. Injuries were also more severe among minorities than white, non-Hispanic workers. Among workers with a work-related injury, nearly 85% of Hispanics reported missing at least one workday due to injury, 45.6% higher than the proportion of 57.9% for their white, non-Hispanic counterparts. After adjusting for major demographic and socioeconomic factors, the work-related injury difference

between race/ethnicity was no longer statistically significant. However, the odds of work-related injury remained significantly higher among workers who were younger (35-54 years vs. >/= 55 years: aOR = 2.2, 95% CI: 1.3-3.6); male (aOR = 5.3, 95% CI: 2.9-9.8); not college-educated (aOR = 1.5, 95% CI: 1.0-2.2); had a family income below the poverty threshold (aOR = 1.8, 95% CI: 1.2-2.8); or held a blue-collar occupation (aOR = 2.0, 95% CI: 1.2-3.4). These findings suggest that the injury differences between race/ethnicity were strongly associated with demographics and socioeconomic inequalities in these worker groups. The identified injury disparities should be reduced or eliminated, following the hierarchy of controls paradigm.

Brunette, M. J. (2004). "Construction safety research in the United States: targeting the Hispanic workforce." Inj Prev 10(4): 244-248.

While it is known that Hispanics have a continuous growing participation in the construction workforce and that their fatal and non-fatal occupational injuries are higher than any other ethnic group, very little construction safety and health research has been conducted in the United States. Research that focuses on safety and health of Hispanic workers employed in the construction industry might prove beneficial in reducing injuries and promoting safe and decent workplaces for all. The purpose of this article was twofold. First, to propose a research agenda where topics such as surveillance, intervention research on high risk occupations, intervention effectiveness evaluation, design and development of effective and appropriate safety training and educational materials, and the socioeconomic impact of injuries and illnesses, are investigated among the Hispanic construction workforce. Second, to present relevant aspects inherent to this particular population that need to be incorporated into the design and development stages of any safety and health research initiative. They include the occupational, social, economic, and cultural background of Hispanic workers; use of a participatory approach, proper selection and use of translation methods; and conducting collaborative research. Certain limitations and challenges related to the availability of resources for conducting safety and health research on Hispanic workers are further discussed.

Brunette, M. J. (2005). "Development of educational and training materials on safety and health: targeting Hispanic workers in the construction industry." Fam Community Health 28(3): 253-266.

The number of Hispanics in the construction work force continues to grow and their fatal and nonfatal occupational injuries are higher than those in any other ethnic group in the United States. Focusing on safety and health for this group may reduce injuries and promote safe workplaces. However, involving hard-to-reach workers is a difficult process because of language and cultural differences within ethnic groups. This article presents findings on effective design, development, and dissemination of safety and health educational materials targeted to Hispanic construction workers. How to utilize a linguistically and culturally sensitive approach is described. The author stresses the need for collaboration among researchers, unions, community development organizations, and advocacy groups in this effort.

Buchanan, S. N., et al. (2008). "Street corner hazard surveillance and health intervention among Chicago day laborers." Arch Environ Occup Health 63(1): 9-12.

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 mug/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.

Buchanan, S. N., et al. (2005). "Occupational health among Chicago day laborers: an exploratory study." Arch Environ Occup Health 60(5): 276-280.

The authors report on the results of an exploratory investigation of the occupational safety experience among day laborers at one street-corner hiring site in Chicago. The authors' goals were to pilot street-corner surveillance methods, including those that would facilitate access to the workers, and to obtain information on the day laborers' occupational safety experience, including the types of jobs and tasks performed, the hazardous conditions encountered, and the frequency of occupational injuries. The authors held interviews at one street corner in Chicago; 21 day laborers participated. All were male, and 90% were Latino. Construction jobs were common. Roofing and demolition were 2 of the most hazardous jobs. Of the respondents, 52% had been injured in the previous year. This exploratory study was a successful first step in occupational injury research among street-corner day laborers and suggests that these workers are frequently exposed to hazardous working conditions without safety training or equipment.

Burgel, B. J., et al. (2015). "Work-related health complaints and injuries, and health and safety perceptions of latino day laborers." Workplace Health and Safety 63(8): 350-361.

This study describes socio-demographic, health, and work factors as well as health and safety perceptions of day laborers who reported work-related health complaints and injuries. The researchers completed a secondary data analysis of 217 interviews conducted in 2009 with day laborers in a large city. The participants reported 83 health complaints or injuries (38%) that had occurred during the prior 12 months, with 57 of these complaints or injuries resulting in lost work time. Pain and soreness of the back were the most prevalent health complaints or injuries; 66% of participants did not report their injuries, 62% reported no health and safety training, 96% reported they needed personal protective equipment (PPE), and 63% were provided with PPE. Latino day laborers reported a high 12-month prevalence of work-related health complaints and injuries. Ongoing policy work is needed to encourage injury reporting by day laborers and the provision of health and safety training and PPE to this group of workers. Copyright © 2015 The Author(s).

Caban-Martinez, A. J., et al. (2010). "Self-reported joint and back pain among Hispanic construction workers: A pilot workplace musculoskeletal assessment." Journal of Musculoskeletal Research 13(2): 49-55.

Construction workers are frequently exposed to awkward work postures and physical demands that can lead to work-related musculoskeletal disorders. There has been limited development of assessment and outreach strategies targeting this highly mobile workforce in general and especially among Hispanic construction workers. We report the prevalence of joint pain from a convenience sample of Hispanic construction workers. A workplace musculoskeletal disorder assessment was undertaken coinciding with construction-site lunch

truck visits among 54 workers employed at two large South Florida construction sites. A 45-item questionnaire preloaded onto handheld devices was utilized to record field data. Forty-seven percent of Hispanic workers reported joint pain 30 days prior to interview date, of whom 87% indicated these joint problems interfered with work activities. Over 63% reported experiencing low back pain that lasted at least a whole day during the past 3 months. Right and left knees were the most frequently reported painful joints (both 34%). Musculoskeletal disorders as evident by joint pain, appears to be prevalent among Hispanic construction workers. Workplace ergonomic prevention strategies that reduce musculoskeletal disorders using innovative recruitment and engagement methods (such as during lunch truck construction-site visits) may improve opportunities to reduce joint pain and damage. © 2010 World Scientific Publishing Company.

Castaneda, D. E., et al. (2013). "Evaluating an Entertainment–Education Telenovela to Promote Workplace Safety." SAGE Open 3(3): 2158244013500284.

Centers for Disease, C. and Prevention (2008). "Work-related injury deaths among hispanics--United States, 1992-2006." MMWR Morb Mortal Wkly Rep 57(22): 597-600.

Hispanics are among the fastest-growing segments of the U.S. workforce. In 2006, an estimated 19.6 million workers in the United States were Hispanic, 56% of whom were foreign born. To characterize work-related injury deaths among Hispanic workers in the United States, CDC, the Bureau of Labor Statistics (BLS), and certain state agencies analyzed data from 1992-2006. This report summarizes the results of that analysis, which indicated that, during 1992-2006, a total of 11,303 Hispanic workers died from work-related injuries. The death rate for Hispanic workers decreased during this period; however, the rate was consistently higher than the rate for all U.S. workers, and the proportion of deaths among foreign-born Hispanic workers increased over time. During 2003-2006, 34% of Hispanic worker deaths occurred in the construction industry. Additional efforts are needed to reduce the risk for death among Hispanic workers because of projected increases in their employment, involvement in work with high risk for injury, susceptibility to miscommunication caused by language differences, and other potential risks associated with culture and economic status.

Chávez, S. and C. E. Altman (2017). "Gambling with life: Masculinity, risk, and danger in the lives of unauthorized migrant roofers." Am J Ind Med 60(6): 537-547.

Background: This paper examines the occupational experiences of unauthorized immigrants employed in one of the most dangerous occupations in the United States: roofing. Methods: We draw on 40 in-depth interviews with return migrants in Guanajuato, Mexico, to examine how the adoption of masculinity, dangerous working conditions, the labor market structure, and absence of legal status exacerbates injuries for unauthorized roofers. Findings: Undocumented men return to Mexico injured with chronic pain, health complications, and trauma. We find that men “do gender” that is adopt masculine beliefs, when they skirt safety practices, police each other's behaviors, withhold their emotions, experience heightened stress, and engage in poor health behaviors. It is a combination of dangerous working conditions, economic insecurity, and men seeking to fulfill their masculine roles that all combine to create unsafe working conditions and lead to injuries. © 2017 Wiley Periodicals, Inc.

Cigularov, K. P., et al. (2013). "Measurement equivalence of a safety climate measure among Hispanic and White Non-Hispanic construction workers." Safety science 54: 58-68.

Research continues to expose ethnic disparities in safety and health outcomes, making comparative studies of work-related factors that may explain these disparities increasingly important. Such studies raise issues about the cross-ethnic validity of the measures used to assess the factors of interest, such as safety climate. The current study is the first to examine the measurement equivalence of a multidimensional safety climate scale. A multi-group confirmatory factor analytic approach was used to assess the equivalence of the measure across White English-speaking, Hispanic English-speaking, and Hispanic Spanish-speaking construction workers. Results indicated that the same pattern of factors and equivalent factor loadings adequately represented the safety climate items across groups. However, other differences in item parameters were identified, including non-equivalence of some error variances and intercepts. This study highlights the importance of establishing measurement equivalence before proceeding with mean comparisons among groups. Future research should continue to investigate why differences in safety-related perceptions across ethnicities might exist.

Cruz, Y., et al. (2017). "Characterization of Foreign-Born vs. Native-Born Worker Fatalities in Kentucky, 2001-2014." J Immigr Minor Health.

Information on foreign-born worker (FBW) and native-born worker (NBW) fatal injuries is scarce. The Kentucky Fatality Assessment and Control Evaluation program analyzed 2001-2014 worker fatality data. The Kentucky FBW fatality rate was double the US FBW and NBW rates, and 50% higher than the Kentucky NBW fatality rate. FBW average age at death was 38 years; NBW age was 47 years. FBW deaths occurred in construction (26%) and services (22%) industries, and transportation [28% (54% due to semi truck crashes)] and construction [26%(48% due to roofing, scaffolding, and ladder-related falls)] occupations; in contrast, NBW deaths occurred in services (22%), and transportation (18%) industries, and transportation (25%) and management (20%) occupations, and were due to exposures to inanimate mechanical forces (38%), and transport accidents (30%). Enhanced FBW cultural competent interventions and policies are needed to prevent FBW occupational injuries, and improve FBW workplace safety and health.

Cruz, Y., et al. (2018). "Characterization of Foreign-Born vs. Native-Born Worker Fatalities in Kentucky, 2001-2014." J Immigr Minor Health 20(2): 448-455.

Information on foreign-born worker (FBW) and native-born worker (NBW) fatal injuries is scarce. The Kentucky Fatality Assessment and Control Evaluation program analyzed 2001-2014 worker fatality data. The Kentucky FBW fatality rate was double the US FBW and NBW rates, and 50% higher than the Kentucky NBW fatality rate. FBW average age at death was 38 years; NBW age was 47 years. FBW deaths occurred in construction (26%) and services (22%) industries, and transportation [28% (54% due to semi truck crashes)] and construction [26%(48% due to roofing, scaffolding, and ladder-related falls)] occupations; in contrast, NBW deaths occurred in services (22%), and transportation (18%) industries, and transportation (25%) and management (20%) occupations, and were due to exposures to inanimate mechanical forces (38%), and transport accidents (30%). Enhanced FBW cultural competent interventions and policies are needed to prevent FBW occupational injuries, and improve FBW workplace safety and health.

Cummings, K. J., et al. (2022). "Disparities in COVID-19 fatalities among working Californians." PLoS ONE 17(3): e0266058.

BACKGROUND: Information on U.S. COVID-19 mortality rates by occupation is limited. We aimed to characterize 2020 COVID-19 fatalities among working Californians to inform preventive strategies. METHODS: We identified laboratory-confirmed COVID-19 fatalities with dates of death in 2020 by matching death certificates to the state's COVID-19 case registry. Working status for decedents aged 18-64 years was determined from state employment records, death certificates, and case registry data and classified as "confirmed working," "likely working," or "not working." We calculated age-adjusted overall and occupation-specific COVID-19 mortality rates using 2019 American Community Survey denominators. RESULTS: COVID-19 accounted for 8,050 (9.9%) of 81,468 fatalities among Californians 18-64 years old. Of these decedents, 2,486 (30.9%) were matched to state employment records and classified as "confirmed working." The remainder were classified as "likely working" (n = 4,121 [51.2%]) or "not working" (n = 1,443 [17.9%]) using death certificate and case registry data. Confirmed and likely working COVID-19 decedents were predominantly male (76.3%), Latino (68.7%), and foreign-born (59.6%), with high school or less education (67.9%); 7.8% were Black. The overall age-adjusted COVID-19 mortality rate was 30.0 per 100,000 workers (95% confidence interval [CI], 29.3-30.8). Workers in nine occupational groups had age-adjusted mortality rates higher than this overall rate, including those in farming (78.0; 95% CI, 68.7-88.2); material moving (77.8; 95% CI, 70.2-85.9); construction (62.4; 95% CI, 57.7-67.4); production (60.2; 95% CI, 55.7-65.0); and transportation (57.2; 95% CI, 52.2-62.5) occupations. While occupational differences in mortality were evident across demographic groups, mortality rates were three-fold higher for male compared with female workers and three- to seven-fold higher for Latino and Black workers compared with Asian and White workers. CONCLUSION: Californians in manual labor and in-person service occupations experienced disproportionate COVID-19 mortality, with the highest rates observed among male, Latino, and Black workers; these occupational group should be prioritized for prevention.

Cunningham, T. R., et al. (2018). "Differences in safety training among smaller and larger construction firms with non-native workers: Evidence of overlapping vulnerabilities." Saf Sci 103: 62-69.

Collaborative efforts between the National Institute for Occupational Safety and Health (NIOSH) and the American Society of Safety Engineers (ASSE) led to a report focusing on overlapping occupational vulnerabilities, specifically small construction businesses employing young, non-native workers. Following the report, an online survey was conducted by ASSE with construction business representatives focusing on training experiences of non-native workers. Results were grouped by business size (50 or fewer employees or more than 50 employees). Smaller businesses were less likely to employ a supervisor who speaks the same language as immigrant workers ($p < .001$). Non-native workers in small businesses received fewer hours of both initial safety training ($p = .005$) and monthly ongoing safety training ($p = .042$). Immigrant workers in smaller businesses were less likely to receive every type of safety training identified in the survey (including pre-work safety orientation [$p < .001$], job-specific training [$p < .001$], OSHA 10-hour training [$p = .001$], and federal/state required training [$p < .001$]). The results highlight some of the challenges a vulnerable worker population faces in a

small business, and can be used to better focus intervention efforts. Among businesses represented in this sample, there are deflcits in the amount, frequency, and format of workplace safety and health training provided to non-native workers in smaller construction businesses compared to those in larger businesses. The types of training conducted for non-native workers in small business were less likely to take into account the language and literacy issues faced by these workers. The findings suggest the need for a targeted approach in providing occupational safety and health training to non-native workers employed by smaller construction businesses.

de la Hoz, R. E., et al. (2008). "Health care and social issues of immigrant rescue and recovery workers at the World Trade Center site." J Occup Environ Med 50(12): 1329-1334.

This article reviews the experience of a unique occupational group of World Trade Center (WTC) workers: immigrant workers. This group is comprised largely of men, laborers, who are first-generation immigrants. The majority of these workers are from Latin America (predominantly from Ecuador and Colombia) or from Eastern Europe (predominantly from Poland). Our data shows that the disease profile observed in these workers was what we have previously reported for WTC working population as a whole. Recent reports have begun to document the disproportionate burden of occupational hazards, injuries, and illnesses experienced by immigrant workers in the United States. The WTC experience of immigrants exemplified this burden but, additionally, highlighted that this burden is exacerbated by limitations in access to appropriate health care, disability and compensation benefits, and vocational rehabilitation services. A clinical program that was designed to address the complex medical and psychosocial needs of these workers in a comprehensive manner was successfully established. Full justice for these workers depends on larger societal changes.

de la Hoz, R. E., et al. (2019). "Chest CT scan findings in World Trade Center workers." Arch Environ Occup Health 74(5): 263-270.

We examined the chest CT scans of 1,453 WTC responders using the International Classification of High-resolution CT for Occupational and Environmental Respiratory Diseases. Univariate and bivariate analyses of potential work-related pleural abnormalities were performed with pre-WTC and WTC-related occupational exposure data, spirometry, demographics and quantitative CT measurements. Logistic regression was used to evaluate occupational predictors of those abnormalities. Chest CT scans were performed first at a median of 6.8 years after 9/11/2001. Pleural abnormalities were the most frequent (21.1%) across all occupational groups In multivariable analyses, significant pre-WTC occupational asbestos exposure, and work as laborer/cleaner were predictive of pleural abnormalities, with prevalence being highest for the Polish subgroup (n = 237) of our population. Continued occupational lung disease surveillance is warranted in this cohort.

Dietz, N. A., et al. (2019). "Developing a Worksite-based Culturally Adapted Smoking Cessation Intervention for Male Hispanic/Latino Construction Workers." J Smok Cessat 14(2): 73-82.

INTRODUCTION: Over 2.6 million Hispanic/Latino construction workers (CWs) live in the US; 91% of South Florida CWs are Hispanic/Latino. CWs have higher smoking and lower cessation rates than other workers. Limited access to cessation services, worksite turnover, and lack of interventions tailored to culture/occupation hinder cessation. Partnering with worksite food trucks to deliver unique cessation interventions may improve these efforts.

AIMS: To explore a novel cessation approach, assess worker/worksite acceptability, and seek input into intervention development. METHODS: In 2016, we conducted five semi-structured focus groups with 37 daily smoking Hispanic/Latino CWs. Constant comparative analysis was used to examine a priori themes regarding smoking behaviors, cessation treatments, intervention delivery, cultural adaptation, and quit interest. RESULTS: CWs reported tremendous job stress. Most smoking occurred during the workday and most CWs did not use Nicotine Replacement Therapy with past quit attempts. Most CWs were open to a worksite face-to-face group cessation intervention before work (many underutilize breaks and feel pressure to keep working). CWs felt it unnecessary to tailor the intervention to Hispanics/Latinos indicating smokers are the same regardless of race/ethnicity. CONCLUSIONS: Findings demonstrate the need to consider work environments, job demands/stress, and worker preferences when developing accessible and acceptable cessation interventions.

Dong, X. and J. W. Platner (2004). "Occupational fatalities of Hispanic construction workers from 1992 to 2000." Am J Ind Med 45(1): 45-54.

BACKGROUND: Hispanic construction employment has dramatically increased, yet published data on occupational risk is lacking. METHODS: Data from the Census of Fatal Occupational Injuries (CFOI) and current population survey (CPS) were examined from 1992 to 2000. Fatality rate, relative risk (RR), and risk index were calculated using CFOI fatality data and CPS data on hours worked, adjusted to full-time-equivalents (FTE). Data between 1996 and 2000 were combined to allow reliable comparisons of age and occupational groups. RR and 95% confidence intervals were calculated. RESULTS: In 2000, Hispanics constituted less than 16% of the construction workforce yet suffered 23.5% of fatal injuries. RRs were: helpers, construction trades, 2.31 (95% CI: 1.41-3.80); roofers 1.77 (95% CI: 1.38-2.28); carpenters 1.39 (95% CI: 1.08-1.79); and construction laborers 1.31 (95% CI: 1.17-1.46). CONCLUSIONS: Hispanic construction workers consistently faced higher RRs, for every year from 1992 to 2000 and for every age group. In 2000, Hispanic construction workers were nearly twice (1.84, 95% CI: 1.60-2.10) as likely to be killed by occupational injuries as their non-Hispanic counterparts.

Dong, X., et al. (2007). "Medical costs and sources of payment for work-related injuries among Hispanic construction workers." J Occup Environ Med 49(12): 1367-1375.

OBJECTIVE: To assess medical costs of occupational injuries and sources of payment among Hispanic and non-Hispanic construction workers. METHODS: More than 7000 construction workers, including 1833 Hispanic workers were examined using the Medical Expenditure Panel Survey, 1996 to 2002. Univariate and multivariate analyses were conducted using SUDAAN. RESULTS: Annually, work-related injuries in construction cost $1.36 billion (2002 dollars), with 46% paid by workers' compensation. Compared with non-Hispanic workers, Hispanic workers were 53% more likely to have medical conditions resulting from work-related injuries, but 48% less likely to receive payment for medical costs from workers' compensation ($P < 0.05$). CONCLUSIONS: This study suggests an urgent need to reform the current workers' compensation system to reduce the burden shifted to injured workers and society. Such reforms should include easier access and more assistance for Hispanic and other immigrant workers.

Dong, X. S., et al. (2022). "Psychological distress and suicidal ideation among male construction workers in the United States." Am J Ind Med 65(5): 396-408.

BACKGROUND: Male workers in the US construction industry have a higher suicide rate than other workers in the nation. However, related research on this population remains sparse. This study evaluated psychological distress and suicidal ideation in these workers, and possible underlying factors. METHODS: Data from the National Survey of Drug Use and Health from 2008 to 2014 were analyzed. Stratified and multiple logistic regression analyses were conducted to examine factors associated with psychological distress and suicidal ideation among male construction workers aged >/=18 years (n = 12,034). RESULTS: Nearly one-third (29.6%) of male construction workers in the United States experienced psychological distress (23.8% graded as moderate, 5.8% as severe), and 2.5% reported suicidal ideation in the past year. Higher odds of serious psychological distress and suicidal ideation were found among workers who were younger, worked part-time, missed workdays due to injury or illness, or were in poor health. Illicit opioid use (odds ratio [OR] = 1.87, 95% confidence interval [CI]: 1.22-2.89) and alcohol dependence or abuse (OR = 2.64, 95% CI: 1.74-3.99) significantly escalated the odds of suicidal ideation. The odds of suicidal ideation among workers with serious psychological distress were 33 times higher than those having no or minor psychological distress (OR = 32.91, 95% CI: 19.82-54.65) when other factors were constant. CONCLUSIONS: Occupational and nonoccupational factors were associated with constructionworkers' psychological distress and suicidal ideation. Both illicit opioid use and alcohol dependence or abuse were risk factors, and psychological distress was a strong predictor for suicidal ideation. To improve workers' mental health, it is necessary to integrate workplace injury prevention with illicit opioid-use reduction programs and suicide prevention.

Dong, X. S., et al. (2020). "Prescription opioid use and associated factors among US construction workers." Am J Ind Med 63(10): 868-877.

BACKGROUND: Construction workers are among the segments of the US population that were hit hardest by the opioid prescription and overdose deaths in the past decades. Factors that underlie opioid use in construction workers have been compartmentalized and isolated in existing studies of opioid use and opioid overdose, but they ignore the overall context of their use. This study examines prescription opioid use and its association with a variety of occupational and nonoccupational factors in construction workers in the United States. METHODS: Data from the 2011-2017 Medical Expenditure Panel Survey (n = 7994) were analyzed. The prevalence of prescribed opioid use and the association with occupational and nonoccupational characteristics among construction workers were examined in four multiple logistic regression models. RESULTS: The odds of prescription opioid use for workers with occupational injuries was more than triple that of their noninjured counterparts when demographics and occupational factors were controlled (odds ratio = 3.38, 95% confidence interval: 2.38-4.81). Odds of prescription opioid use were higher in older construction workers, workers who were white, non-Hispanic, working part-time, and in poorer health, while Hispanic workers and those without health insurance were much less likely to report prescription opioid use. CONCLUSIONS: Prescription opioid use among construction workers encompasses both occupational and nonoccupational factors. As an insight into opioid use among construction workers becomes clearer, effectively responding to the opioid crisis remains a challenge.

Dong, X. S., et al. (2022). "Pain and Prescription Opioid Use Among US Construction Workers: Findings From the 2011–2018 Medical Expenditure Panel Survey." Am J Public Health 112(S1): S77-S87.

Objectives. To examine prescription opioid and nonopioid analgesic use among US construction workers and their associations with pain conditions and sociodemographic factors. Methods. We analyzed data for about 9000 (weighted 11.5 million per year) construction workers who responded to the Medical Expenditure Panel Survey from 2011 to 2018. We applied both descriptive statistics and multiple logistic regression procedures in the analyses. Results. An estimated 1.2 million (10.0%) of construction workers used prescription opioid analgesics annually. The adjusted odds of prescription opioid use were significantly higher for workers suffering from work-related injuries (adjusted odds ratio [AOR] = 3.82; 95% confidence interval [CI] = 2.72, 5.37), non–work-related injuries (AOR = 3.37; 95% CI = 2.54, 4.46), and musculoskeletal disorders (AOR = 2.31; 95% CI = 1.80, 2.95) after we controlled for potential confounders. Adjusted odds of prescription opioid use were also higher among workers with poorer physical health (AOR = 1.95; 95% CI = 1.42, 2.69) or mental health disorders (AOR = 1.95; 95% CI = 1.41, 2.68). Conclusions. Work- and non–work-related injuries and musculoskeletal disorders significantly increased prescription opioid use among construction workers. To prevent opioid use disorders, multipronged strategies should be approached. (Am J Public Health. 2022;112(S1):S77-S87. https://doi.org/10.2105/AJPH.2021.306510).

Dong, X. S., et al. (2013). "Fatal falls from roofs among US construction workers." J Safety Res 44: 17-24.

This study examined trends and patterns of fatal falls from roofs in the U.S. construction industry over an 18-year period (1992–2009), with detailed analysis for 2003–2009. Roof fatalities accounted for one-third of fatal falls in construction in 1992–2009. A disproportionately high percentage (67%) of deaths from roof falls occurred in small construction establishments (1–10 employees). Roofers, ironworkers, workers employed with roofing contractors, or working at residential construction sites, had a higher risk of roof fatalities. A higher rate of roof fatalities was also found among younger (< 20 years) and older (> 44 years) workers, Hispanics, and immigrant workers.

Dong, X. S., et al. (2009). "Fatal falls among Hispanic construction workers." Accid Anal Prev 41(5): 1047-1052.

This study evaluated occupational deaths resulting from fall injuries among Hispanic construction workers using data from the Census of Fatal Occupational Injuries and the Current Population Survey. The demographics and characteristics of fatal falls among Hispanic workers were examined and compared with that of their white, non-Hispanic counterparts. The results show that fatal injuries among Hispanic construction workers were more likely to be caused by a fall than their white, non-Hispanic counterparts (OR=1.48, 95% CI: 1.05-2.10) after controlling for possible confounders. The rate of fatal falls for foreign-born Hispanic construction workers was 5.5 per 100,000 FTE, which is significantly higher than 4.1 per 100,000 FTE for Hispanic workers who were born in the U.S. (OR=1.36, 95% CI: 1.08-1.67). The disparities in fatal injuries from falls were found in age groups, job tenure, occupations, and types of construction projects. This study also found that about every two of three fatal falls in construction occurred in establishments with 10 or fewer employees. More prevention,

intervention, and training measures must be applied to Hispanic workers, especially those who are new immigrants. OSHA enforcements should target small construction establishments in order to lower overall fatality rates, costs, and unnecessary losses of life.

Dong, X. S., et al. (2011). "Injury underreporting among small establishments in the construction industry." Am J Ind Med 54(5): 339-349.

BACKGROUND: There is convincing evidence that occupational injury and illness rates, particularly those reported by employers in the BLS' Survey of Occupational Injuries and Illnesses (SOII), substantially underestimate the true magnitude of injury and illness in the construction industry. METHODS: Fifteen years of data from five large nationally representative data sources were analyzed, including SOII, CFOI, CBP, CPS, and MEPS. Regression trends and ratio analyses were conducted, and stratified by establishment size and Hispanic ethnicity. RESULTS: Small construction establishments were most likely to underreport injuries. The SOII data only captured 25% of severe injuries among Hispanic workers, and 60% among white workers in small construction establishments. CONCLUSIONS: Underreporting is pervasive in the construction industry for small establishments and Hispanic workers. Given that small establishments are predominant in the U.S. construction industry, they should be the focus of a larger effort to identify the true extent of construction-related injuries.

Dong, X. S., et al. (2010). "Work-related injuries among Hispanic construction workers-evidence from the medical expenditure panel survey." Am J Ind Med 53(6): 561-569.

BACKGROUND: Although a large number of Hispanic workers have entered the construction industry, few studies have estimated non-fatal work-related injuries for Hispanic construction workers at a national level. This study examines work-related injury conditions among Hispanic construction workers and assesses disparities between Hispanic and white, non-Hispanic workers. METHODS: Pooled data were analyzed from a large national population survey, the Medical Expenditure Panel Survey (MEPS), between 1996 and 2002. More than 7,000 construction workers were identified from the MEPS data including 1,833 Hispanic workers and 4,533 white, non-Hispanic workers. Univariate and multivariate analyses were conducted using SAS-callable SUDAAN. RESULTS: Hispanic workers differ from white, non-Hispanic workers in demographic and socioeconomic status. After controlling for major risk factors, Hispanic construction workers were more likely than their white, non-Hispanic counterparts to suffer non-fatal work-related injury conditions (OR = 1.28, 95% CI: 1.00-1.64). CONCLUSIONS: This study provides important evidence concerning Hispanic workers' safety on construction sites. Enhanced safety and health programs for Hispanic construction workers and improved occupational injury data systems are recommended.

Dong, X. S., et al. (2013). The impact of language barriers on healthcare utilization among Hispanic construction workers. Health disparities: epidemiology, racial/ethnic and socioeconomic risk factors and strategies for elimination. Las Vegas: NOVA Science: 161-176.

Dong, X. S., et al. (2014). "Fatal falls in the U.S. residential construction industry." Am J Ind Med 57(9): 992-1000.

Background: Falls from heights remain the most common cause of workplace fatalities among residential construction workers in the United States. Methods: This paper examines

patterns and trends of fall fatalities in U.S. residential construction between 2003 and 2010 by analyzing two large national datasets. Results: Almost half of the fatalities in residential construction were from falls. In the residential roofing industry, 80% of fatalities were from falls. In addition, about one-third of fatal falls in residential construction were among self-employed workers. Workers who were older than 55 years, were Hispanic foreign-born, or employed in small establishments (1-10 employees) also had higher proportions of fatal falls in residential construction compared to those in nonresidential construction. Conclusions: The findings suggest that fall safety within the residential construction industry lags behind commercial construction and industrial settings. Fall prevention in residential construction should be enhanced to better protect construction workers in this sector. Am. J. Ind. Med. 57:992-1000, 2014. © 2014 Wiley Periodicals, Inc.

Dong, X. S., et al. (2019). "Heat-related deaths among construction workers in the United States." Am J Ind Med 62(12): 1047-1057.

BACKGROUND: Heat is a severe hazard for construction workers and may be worsening with global warming. This study sought to explore heat-related deaths among U.S. construction workers and a possible association with climate change. METHODS: Heat-related deaths in the Census of Fatal Occupational Injuries from 1992 to 2016 were analyzed. Denominators estimated from the Current Population Survey were matched with demographic and occupational categories in rate calculations. Statistical tests were used to examine heat-related deaths in relation to time, geographic region, and temperature. RESULTS: Construction workers, comprising 6% of the total workforce, accounted for 36% (n = 285) of all occupational heat-related deaths from 1992 to 2016 in the U.S. Mean temperatures from June to August increased gradually over the study period. Increasing summer temperatures from 1997 to 2016 were associated with higher heat-related death rates (r = 0.649; 95% confidence interval: 0.290, 0.848). Compared to all construction workers (risk index = 1), statistically significant elevated risk of heat-related death was found among Hispanics (1.21), in particular workers born in Mexico (1.91). Occupations with a high risk index included cement masons (10.80), roofers (6.93), helpers (6.87), brick masons (3.33), construction laborers (1.93) and heating, air conditioning, and refrigeration mechanics (1.60). CONCLUSIONS: U.S. construction workers are at a high risk of heat-related death, and this risk has increased with climate change over time. Effective workplace interventions, enhanced surveillance, and improved regulations and enforcement should accompany broader efforts to combat global warming. The construction industry can help reduce global warming through increased implementation of green building principles.

Evia, C. (2010). "Localizing and designing computer-based safety training solutions for Hispanic construction workers." Journal of Construction Engineering and Management 137(6): 452-459.

Despite the construction industry's generally positive reaction to the use of information and communication technologies (ICTs) in many of its functions, some of the profession's key players reside in a digital divide and do not benefit from advances in technology. Hispanic construction workers, an at-risk population with high rates of workplace accidents, are affected by that divide because they rarely take advantage of available ICTs at work. One application of ICTs that can help Hispanic/Latino workers is computer-based training (CBT) for occupational safety. However, the design of CBT materials for Spanish-speaking workers needs to go beyond

basic localization of existing products in English. A radical localization approach that uses participatory design sessions with construction workers and their supervisors is proposed in this paper. This case study reports that Latino workers reacted positively and retained knowledge from CBT materials, including videos with elements of humor and without graphic representations of accidents, modeled after the genre of a television situation comedy.

Evia, C. and A. Patriarca (2012). "Beyond Compliance: Participatory Translation of Safety Communication for Latino Construction Workers." Journal of Business and Technical Communication 26(3): 340-367.

Developing effective workplace safety and risk communication materials for Latino construction workers poses a challenge for technical communicators. These workers are at a disadvantage because of culture and language differences on many job sites. Furthermore, low levels of literacy in any language and lack of proper training compound their job site communication problems. This article builds on cultural studies-based recommendations to develop discourse in workplace safety and risk that these workers can fully understand. The authors in this study used direct creative input from Latino construction workers in order to create safety and risk communication products that were evaluated as effective and culturally relevant for these workers and their peers. © The Author(s) 2012.

Fernandez-Esquer, M. E., et al. (2020). "Documenting and Understanding Workplace Injuries Among Latino Day Laborers." J Health Care Poor Underserved 31(2): 791-809.

BACKGROUND: Latino day laborers face substantial injuries at work. We present a comprehensive assessment of their injury experience and explore the predictors of selfreported injuries. METHODS: Worker and injury characteristics were collected from 331 day laborers using an innnovative injury assessment tool. The odds of injury were estimated using a logistic regression. RESULTS: Participants were foreign-born, Spanish monolingual, and employed in construction. Sixty-seven individuals reported 88 past-year injuries, mostly involving the upper or lower extremities. Injuries were caused by moving heavy objects, falling, or being struck an object. Of the documented injuries, 24% were not reported at work due to fear of being fired; 64.4% resulted in missed workdays, 54.0% in temporary incapacitation, and 34.5% in permanent incapacitation. Being married significantly reduced the odds of reporting an injury. DISCUSSION: Better documentation can inform the development of better policy protections that ameliorate injuries experienced by Latino day laborers at the workplace.

Fernández-Esquer, M. E., et al. (2015). "The influence of demographics and working conditions on self-reported injuries among Latino day laborers." International Journal of Occupational and Environmental Health 21(1): 5-13.

Background: The majority of day laborers in the USA are Latinos. They are engaged in high-risk occupations and suffer high occupational injury rates. Objectives: To describe on-the-job injuries reported by Latino day laborers, explore the extent that demographic and occupational factors predict injuries, and whether summative measures for total job types, job conditions, and personal protective equipment (PPE) predict injuries. Methods: A community survey was conducted with 327 participants at 15 corners in Houston, Texas. Hierarchical and multiple logistic regressions explored predictors of occupational injury odds in the last year. Results: Thirty-four percent of respondents reported an occupational injury in the previous year. Education, exposure to loud noises, cold temperatures, vibrating machinery, use of hard hats,

total number of job conditions, and total PPE significantly predicted injury odds. Conclusion: Risk for injury among day laborers is not only the product of a specific hazard, but also the result of their exposure to multiple occupational hazards. © W. S. Maney & Son Ltd 2015.

Fernandez-Esquer, M. E., et al. (2021). "Structural Racism and Immigrant Health: Exploring the Association Between Wage Theft, Mental Health, and Injury among Latino Day Laborers." Ethn Dis 31(Suppl 1): 345-356.

BACKGROUND: Although wage theft has been discussed primarily as a labor and human rights issue, it can be conceptualized as an issue of structural racism with important consequences for immigrant health. OBJECTIVES: The objectives of this study were to: 1) identify sociodemographic, employment, and stress-related characteristics that increase Latino day laborers' odds of experiencing wage theft; 2) assess the association between wage theft and serious work-related injury; 3) assess the association between wage theft and three indicators of mental health-depression, social isolation, and alcohol use-as a function of wage theft; and 4) assess serious work-related injury as a function of wage theft controlling for mental health. METHODS: Secondary data analyses were based on survey data collected from 331 Latino day laborers between November 2013 and July 2014. Regression analyses were conducted to test the relationships described above. RESULTS: Approximately 25% of participants reported experiencing wage theft and 20% reported serious work-related injury. Wage theft was associated with working in construction and was initially associated with work-related injury. Wage theft was not significantly associated with mental health indicators. The association between wage theft and injury became non-significant when controlling for the mental health variables. CONCLUSIONS: The hardship and stress associated with wage theft incidents may ultimately lead to more frequent injury. Although we expected an association of wage theft with mental health, we found vulnerability to physical health as indicated by injury incidents. Thus, our basic premise was partially supported: wage theft may act as a stressor that stems from conditions, in part, reflecting structural racism, making workers vulnerable to poorer health.

Forst, L., et al. (2013). "More than training: Community-based participatory research to reduce injuries among hispanic construction workers." Am J Ind Med 56(8): 827-837.

Background: Workplace mortality and severe injury are disproportionately distributed among foreign born and Hispanic construction workers. Worker Centers (WCs) provide services and advocacy for low-wage workers and a way for investigators to reach them. The goal of this project is to prevent occupational injuries by increasing awareness of hazards and self-efficacy among foreign born, Hispanic construction workers and by expanding the agenda of WCs to include occupational health and safety (H&S). Methods: Investigators partnered with eight WCs in seven cities to train worker leaders to deliver a modified OSHA 10-hr curriculum to their peers. Results: Thirty-two worker leaders trained 446 workers over 3 years. There was a demonstrated improvement in knowledge, hazard identification, self-efficacy, and sustainable H&S activities. Conclusions: This study provides evidence for successful implementation of a training intervention for low wage, low literacy Hispanic construction workers using a community-based participatory research approach. © 2013 Wiley Periodicals, Inc.

Friedman, L. S., et al. (2012). "Analysis of ethnic disparities in workers' compensation claims using data linkage." J Occup Environ Med 54(10): 1246-1252.

OBJECTIVE: The overall goal of this research project was to assess ethnic disparities in monetary compensation among construction workers injured on the job through the linkage of medical records and workers' compensation data. METHODS: Probabilistic linkage of medical records with workers' compensation claim data. RESULTS: In the final multivariable robust regression model, compensation was $5824 higher (P = 0.030; 95% confidence interval: 551 to 11,097) for white non-Hispanic workers than for other ethnic groups when controlling for injury severity, affected body region, type of injury, average weekly wage, weeks of temporary total disability, percent permanent partial disability, death, or attorney use. CONCLUSIONS: The analysis indicates that white non-Hispanic construction workers are awarded higher monetary settlements despite the observation that for specific injuries the mean temporary total disability and permanent partial disability were equivalent to or lower than those in Hispanic and black construction workers.

Gilkey, D. P., et al. (2007). "Low back pain in Hispanic residential carpenters." J Chiropr Med 6(1): 2-14.

OBJECTIVE: Low back pain (LBP) is a leading cause of lost work time and has been recognized as America's number one workplace safety challenge. Low back pain is occurring at epidemic proportions among construction workers, and minority populations have been underinvestigated for risk of back injury. This project investigated the multiple potential risk factors for occupational LBP among Hispanic residential carpenters. METHODS: This investigation evaluated 241 Hispanic residential framing carpenters. Data for this study were collected using a 91-question survey. End points of interest included point, annual, and lifetime prevalence of LBP. RESULTS: Nineteen percent of respondents reported they had an episode of LBP in their lifetime. CONCLUSIONS: Hispanic residential carpenters reported less than expected prevalence of LBP compared with non-Hispanic counterparts in the same trade and location. Job tasks and personal and workplace risk factors, including psychological and morphological characteristics, affect the prevalence of LBP among Hispanic framing carpenters.

Goodrum, P. M. and J. Dai (2005). "Differences in occupational injuries, illnesses, and fatalities among Hispanic and non-Hispanic construction workers." Journal of Construction Engineering and Management 131(9): 1021-1028.

A study of whether Hispanic construction workers experience more injuries, illnesses, and fatalities in some of the more hazardous occupations. The analyses addressed differences in injuries, illnesses, and fatalities among Hispanic and non-Hispanic carpenters, construction laborers, painters, drywall installers, and electricians, which are the most common Hispanic occupations and are also some of the more dangerous occupations in construction

Grzywacz, J. G., et al. (2013). "Feasibility of interactive voice response Methods in health behavior research with immigrant Latinos." American Journal of Health Behavior 37(2): 238-247.

Objectives: Determine the feasibility of using interactive voice response (IVR) for conducting daily diary research with immigrant Latinos. Methods: Baseline data containing demographic, health, and job-related characteristics were obtained from immigrant Latino construction workers (N=119). Participants also completed an IVR-based daily diary for 21 consecutive days. Results: Over one third (37%) of the sample adhered to the 21-day protocol;

a comparable percentage (38.7%) initiated but did not adhere to the protocol; and 24% never began the diary protocol. Adherence was generally not predicted by demographic, health, or job-related characteristics. Conclusions: IVR technology makes diary studies with Latino samples feasible.

Grzywacz, J. G., et al. (2012). "Occupational injury and work organization among immigrant Latino residential construction workers." Am J Ind Med 55(8): 698-706.

BACKGROUND: Rates of occupational injury among immigrant workers are widely believed to be underestimated. The goal of this study was to enhance understanding of the burden of occupational injury and the work organization factors underlying injury among immigrant Latino residential construction workers. METHODS: Prospective data were obtained from a community-based sample of Latino residential construction workers (N = 107) over a 3-month period. RESULTS: Twenty-eight participants were injured, resulting in an injury incidence rate of 55.0/100 FTE (95% CI = 41.4-71.6) during the 3-month observation period. The injury rate involving days away from work during the observation period was 3.9/100 FTE (CI = 0.2-7.2). Injuries were elevated among roofers relative to framers and general construction workers. Roofers had elevated exposure to a variety of deleterious work organization factors. CONCLUSIONS: Although imprecise given the small sample, our results suggest a threefold to fourfold underestimate of the injury burden to immigrant Latino construction workers. Work organization may contribute to elevated rates of non-fatal occupational injury, particularly among roofers.

Grzywacz, J. G., et al. (2012). "Employer provision of personal protective equipment to Latino workers in North Carolina residential construction." New Solut 22(2): 175-190.

Despite federal regulations requiring provision of personal protective equipment (PPE) without cost to workers in the United States, very little is known about whether immigrant Latino construction workers receive no-cost PPE from their employers, and the role that employer provision plays in regular use of PPE. This study used cross-sectional data from a community-based sample of 119 Latino construction workers in western North Carolina to document receipt of employer-provided PPE by construction workers, investigate sources of variation in the receipt of employer-paid PPE, and delineate associations of employer-paid PPE with workers' regular use of PPE. The results suggest that the residential construction subsector generally fails to provide workers with PPE at no cost, as is required by regulation. Analyses also suggest that recent immigrants are least likely to receive no-cost, employer-provided PPE, and that when employers do provide no-cost PPE, Latino construction workers are more likely to use it regularly.

Hallowell, M. R. and I. F. Yugar-Arias (2016). "Exploring fundamental causes of safety challenges faced by Hispanic construction workers in the US using photovoice." Safety science 82: 199-211.

The US construction industry has long been responsible for a high injury and fatality rate. Within this dangerous industry, Hispanic workers are 45% more likely to be injured or killed than their non-Hispanic counterparts. Previous researchers have examined reasons for these disproportionate injury rates but past literature is spurious, fragmented, and incomplete. To address these limitations an in-depth study was launched to explore the perceived challenges that impact the safety of Hispanic construction workers. The primary data collection method

was Photovoice, a photograph-based interview process that allows each participant to be the generator of their own data. The results of Photovoice interviews with 17 Hispanic workers in Colorado indicate that, compared with non-Hispanic workers, Hispanic workers perceive that they are: (1) susceptible to an internal pressure to complete work quickly and neglect safety based on their experiences in their home country; (2) assigned more dangerous tasks because of racism and discrimination; (3) more willing to accept dangerous work for fear of losing their jobs and ability to support extended family; (4) less likely to provide feedback to their supervisors and co-workers for fear of negative personal reactions; (5) more likely to be distracted by family issues while at work because of their strong and broad family ties; (6) more likely to ignore criticism because of machismo; (7) more likely to underreport injuries for fear of losing their jobs; and (8) less likely to ask for safety assistance when it is needed because of pride. © 2015 Elsevier Ltd.

Harrington, D., et al. (2009). "Conducting effective tailgate trainings." Health Promot Pract 10(3): 359-369.

The California Department of Health Services' Occupational Health Branch and others have identified the construction industry as being at high risk for injuries, illnesses, and fatalities. Effective tailgate trainings (brief job site safety meetings) can be a powerful tool to promote hazard awareness and safe work practices. The authors found that many contractors and supervisors conducted ineffective tailgate trainings. They developed the BuildSafe California Project to assist contractors to have more effective programs by holding 25 training-of-trainers sessions reaching 1,525 participants. The needs assessment, intervention, and evaluation results from the first 18 trainings are presented. Eighty-six percent of the participants found the program "very helpful." Participants used the materials and made improvements in the quality and frequency of trainings. Supervisors must be skilled at conducting tailgate trainings as part of their responsibilities. There is a serious need to provide more culturally appropriate safety training in a workforce increasingly made up of Latino workers.

Ibarra-Mejia, G., et al. (2021). "Differences in Workplace Risk Perception between Foreign-Born and First-Generation Mexican American Construction Workers." Int J Environ Res Public Health 18(11).

Risk perception is used to quantify risks in the industry and is influenced by different socio-demographic variables. This work aims to determine significant differences in the risk perception between Mexican American migrants and first-generation Mexican American construction workers. This study used a sample of 112 construction workers. A guided questionnaire was applied to collect socio-demographic information. For workplace risk behaviors, we used a 21-item questionnaire adapted from the previous instrument. Each question asked the participant's perception of the frequency with which they carried out risky activities during routine work activities and the severity of the possible injuries, using a five-level Likert scale. Then, an inferential analysis was carried out using analysis of variance (ANOVA). The main results highlight that time of residence in the United States had a significant influence ($p = 0.012$) on risk perception in the surveyed construction workers. On the other hand, the age and time they have been working for the organization did not significantly influence risk perception. Finally, risk perception can vary in construction workers according to different variables. It is essential to investigate the factors that influence it, to prevent risky behaviors that can lead to accidents.

Jaselskis, E., et al. (2008). "Successful multi-national workforce integration program to improve construction site performance." Safety science 46(4): 603-618.

Hispanics are a large and growing part of the United States workforce. Hispanic workers in the US construction industry comprise nearly 20% of the workforce and are projected to increase significantly over the next several decades. Construction companies in the United States will be challenged in melding Hispanic and American cultures on project job sites. Using an integration/differentiation/ambiguity framework of cultural analysis, this research focuses on the development of an introductory training program designed to fit the needs of the US construction industry. The purpose of the study is to identify aspects of construction which should either pursue cultural integration or preserve cultural differentiation as well as assess how much ambiguity can be anticipated in the cultural training programs. This is accomplished through a review of the literature as well as through a survey of contractor attitudes and needs related the use of Hispanic workers in their construction operations. This paper focuses on describing the research and development of various courses for improving communication between the American supervisor and the Hispanic laborer. Results from this study confirm that higher order industry values such as safety should be integrated across cultural groups, while specialized technical training can be effectively targeted to a specific cultural subgroup (differentiation). A certain degree of ambiguity in cultural identify and individualization of needs should be expected as boundaries between cultural subgroups blur over time

Jorgensen, E., et al. (2007). "An English/Spanish safety climate scale for construction workers." Am J Ind Med 50(6): 438-442.

BACKGROUND: Workers in the construction trades experience high rates of traumatic injury. An increasing number of workers in this industry speak only Spanish, including members of construction trade unions. This brief communication reports a dual language safety climate scale developed during a larger training intervention study. METHODS: Construction workers in two unions self-completed a previously validated 6-item safety climate scale modified for the construction trades. A seventh item was developed midway through the study and incorporated into the version completed by half of the respondents. For one union with a sizeable number of Spanish-speaking members, a dual-language (Spanish/English) version was administered. Follow-up telephone interviews conducted 3 months after the self-completed survey also included the safety climate scale. RESULTS: Cronbach's coefficient alpha was 0.85 for the 6-item scale and 0.85 for the 7-item scale. Similar coefficient alpha scores were found for the subgroup of Spanish-speakers on the 6- and 7-item scales. Spanish speakers with low education were less likely to respond to the scale when self-completing but not when it was administered by telephone in Spanish. CONCLUSION: This safety climate scale elicits consistent and reliable response from unionized construction workers when administered in English or in Spanish. Spanish literacy may be a consideration for the use of this scale among foreign-born Hispanic workers.

Lara, M., et al. (2021). "Pilot of a Community Health Worker Video Intervention for Immigrant Day Laborers at Occupational Health Risk." Front Public Health 9: 662439.

Significance: Immigrant day laborers suffer from disproportionate occupational health risks from hazardous reconstruction jobs after natural disasters. Methods: We conducted a randomized controlled trial of a short-video educational intervention to improve safety

knowledge and intent to engage in safety preventive behaviors among 98 Hispanic day laborers (49 randomized to video and 49 control). The short video featured a male promotor and a female promotora who narrated 3 stories of day laborers who were injured while doing construction work in post-Katrina New Orleans. The main outcome measures were changes in scores for day laborer-reported safety knowledge and safety behaviors derived from interviewer-delivered baseline and post-intervention surveys. Results: Video participants reported improvement in overall average safety knowledge score (mean score of 11.3 out of a max score of 12 or 94% when standardized to 0-100% scale), as compared to the control group (mean score of 8.6 or 72%) who were not offered the video ($p < 0.00001$). The intervention was highly successful in workers stating that they learned and were willing to change their safety preventive behaviors to reduce their occupational risk. The average safety behavior score was higher among those watching the video (17.2 out of a max of 22 or 78.1% when standardized on a scale 0-100%) as compared to control (14.5 or 65.9%) ($p = 0.0024$). Conclusion: A short video intervention can improve knowledge and intent to engage in preventive behaviors among Hispanic workers for which there is a dearth of construction safety preventive research.

Lin, K.-Y., et al. (2018). "Training of Low-Literacy and Low-English-Proficiency Hispanic Workers on Construction Fall Fatality." Journal of Management in Engineering 34(2): 05017009.

The construction industry has made extensive efforts to improve the safety of its labor force through various approaches, including training. However, many construction workers in the United States are recent immigrants who lack English proficiency and do not possess sufficient literacy levels in their own language for training comprehension. This reduces the effectiveness of traditional text-dominated translated training materials, which depend on both literacy and proficiency in a language. Thus, in this study, the authors used three-dimensional (3D) visualization to overcome the communication barriers that hinder effective safety training for low-literacy (LL) and low-English-proficiency (LEP) construction workers. This article summarizes the contributions of a study sponsored by the Occupational Safety and Health Administration (OSHA) Susan Harwood Training Grant Program; it describes the methodology to develop scenario-based 3D training materials on fall safety for LL and LEP workers and to validate the effectiveness of the materials. The results show that 3D training materials improve interaction between trainer and trainee during safety training, facilitate learning processes, and can overcome some of the communication barriers that hinder effective safety training.

Marin, L. S., et al. (2015). "Results of a community-based survey of construction safety climate for Hispanic workers." Int J Occup Environ Health 21(3): 223-231.

BACKGROUND: Hispanic construction workers experience high rates of occupational injury, likely influenced by individual, organizational, and social factors. OBJECTIVES: To characterize the safety climate of Hispanic construction workers using worker, contractor, and supervisor perceptions of the workplace. METHODS: We developed a 40-item interviewer-assisted survey with six safety climate dimensions and administered it in Spanish and English to construction workers, contractors, and supervisors. A safety climate model, comparing responses and assessing contributing factors was created based on survey responses. RESULTS: While contractors and construction supervisors' ($n = 128$) scores were higher, all respondents shared a negative perception of safety climate. Construction workers had statistically significantly lower safety climate scores compared to supervisors and contractors (30.6 vs

46.5%, P<0.05). Safety climate scores were not associated with English language ability or years lived in the United States. CONCLUSIONS: We found that Hispanic construction workers in this study experienced a poor safety climate. The Hispanic construction safety climate model we propose can serve as a framework to guide organizational safety interventions and evaluate safety climate improvements.

Marin, L. S. and C. Roelofs (2018). "Engaging Small Residential Construction Contractors in Community-Based Participatory Research to Promote Safety." Ann Work Expo Health 62(suppl_1): S72-S80.

Construction is a large employment sector with a high prevalence of small businesses. Despite the high injury rates reported for employees of small construction firms, these firms are under-represented in occupational safety research studies. Such studies are needed to understand barriers experienced by these firms and to examine ways to overcome them. However, challenges accessing and recruiting this hard-to-reach population are frequently reported. Traditional approaches of recruiting through unions or workers' compensation insurers may not be appropriate or effective for small construction businesses. Previous studies have demonstrated the value of academic collaborations with community-based organizations for recruiting participants from hard-to-reach populations for research studies. In accordance with the principles of Community-Based Participatory Research (CBPR), we formed a recruitment team comprised of staff from a local union, a community organization, and a community outreach team to recruit small construction contractors in Lawrence, MA. Media marketing strategies, participation in community events, exploring neighborhoods in search of ongoing residential projects, and partnership with vocational training institutions and building trade associations were some of the strategies implemented during this project. We recruited 118 contractors, supervisors, and foremen from more than 50 construction firms across the Greater Lawrence area to participate in an intervention project to reduce falls and silica exposure. The CBPR approach facilitated the development and implementation of recruitment strategies that resulted in the participation of a significant number of hard-to-reach small construction contractors.

Marín, L. S. and C. Roelofs (2017). "Promoting Construction Supervisors' Safety-Efficacy to Improve Safety Climate: Training Intervention Trial." Journal of Construction Engineering and Management 143(8): 04017037.

Hispanic workers may be more likely to experience a deficient safety climate on construction worksites and it may account for their disproportionate injury rates. As part of a large study, the authors developed and implemented a 5-h training program to improve construction supervisors' safety-efficacy, in order to enhance the safety climate on construction worksites. The training program covered fall prevention, silica exposure, leadership, communication, and safety planning. This study evaluated pretraining and posttraining changes and safety-efficacy six months posttraining. A total of 118 supervisors, contractors, and workers from more than 50 construction firms in Massachusetts attended the training. Statistically significant improvements were observed in participants' safety knowledge, skills, and attitudes. Six-months postintervention, 58% of supervisors, contractors, or both, perceived that the training contributed "a lot" to their ability to communicate effectively with Spanish-speaking workers, to take on a safety leadership role (52%), and to conduct effective training (62%). This study determined that when supervisors perceive that they have the knowledge, skills, and

confidence to make changes, they may better fulfill their role as a safety leader. Construction supervisor training courses might be revised to include leadership and effective communication topics. - See more at: http://ascelibrary.org/doi/full/10.1061/%28ASCE%29CO.1943-7862.0001330#sthash.bOwqmOhn.dpuf

McCauley, L. A. (2005). "Immigrant workers in the United States: recent trends, vulnerable populations, and challenges for occupational health." AAOHN J 53(7): 313-319.

Immigrant workers are a rapidly growing segment of the U.S. work force, and these increasing numbers have resulted in a different ethnic mix in the work force than in previous decades. Immigrant workers are not a homogenous group, but are over-represented in low-paying occupations. Their diversity and vulnerability present distinct challenges for occupational health nurses. High-risk occupations in which a large proportion of immigrant workers are hired include agriculture, sweatshops, day laborers, and construction. Initiatives needed to improve the working conditions of this vulnerable population include improved surveillance and research, culturally competent care providers, improved health care access, advocacy, and changes in immigration and health policy.

McCollister, K. E., et al. (2010). "Declining health insurance access among US Hispanic workers: not all jobs are created equal." Am J Ind Med 53(2): 163-170.

INTRODUCTION: Approximately 18% of the U.S. population are uninsured, a proportion that may continue to rise, particularly among Hispanics, as the cost of medical care increases faster than the growth in wages. METHODS: Health insurance trends were analyzed by race-ethnic category, and among Hispanic workers by occupation type and industrial sector, using data on employed respondents > or =18 years from 1997 to 2007 National Health Interview Survey (NHIS) (mean annual n = 17,392, representing 123 million US workers on average over this 11 year period). RESULTS: From 1997 to 2007, the relative decline in health insurance coverage for US workers was greatest among Hispanics (7.0%). Hispanic workers in the Construction and Services industries had the greatest overall decline in coverage (24.9% and 14.7%), as well as Hispanic blue collar workers (14.0%). CONCLUSION: Hispanic workers in general, and those employed in blue collar, construction, and services sectors in particular, are at greater risk for poor access to health care due to a lack of health insurance coverage.

McGlothlin, J., et al. (2009). "Ergonomics. Case study: safety training issues for Hispanic construction workers." J Occup Environ Hyg 6(9): D45-50.

Case study found that few of the Hispanic construction workers in the sample had formal safety training and many did not understand safety and health terms used in training.

Menendez, C. K. and S. A. Havea (2011). "Temporal patterns in work-related fatalities among foreign-born workers in the US, 1992-2007." J Immigr Minor Health 13(5): 954-962.

In the United States, approximately 20% of all workers who died on the job in 2007 were foreign-born. The objective of this study was to describe trends in occupational fatalities among foreign-born workers. An analysis of fatal injuries among foreign-born workers in the US occurring from 1992 through 2007 was conducted using the Bureau of Labor Statistics' Census of Fatal Occupational Injuries. Individual characteristics, employment characteristics, injury events and industry employment were summarized and evaluated for trends. Both the

number and proportion of foreign-born workers who died from a traumatic work-related injury increased substantially over the time period studied. The proportion who were men, aged 25-44 years, Hispanic, non self-employed, employed by business establishments with 10 or fewer employees, working at private residences and working in Construction and Services consistently increased throughout the time period. While some trends among foreign-born decedents are improving, others are worsening. More comprehensive research efforts are needed to address the occupational injury and safety issues among foreign-born workers, with a focus on Hispanics.

Menzel, N. N. and A. P. Gutierrez (2010). "Latino worker perceptions of construction risks." Am J Ind Med 53(2): 179-187.

BACKGROUND: Construction is a hazardous occupation, with Latino (Hispanic) workers at a greater risk for death than other ethnicities/races. Latinos accounted for over half of construction injuries involving days away from work in Nevada in 2006. METHODS: This study recruited 30 Latino construction workers from three Southern Nevada trade unions to participate in four focus groups conducted in Spanish to determine their perceived risks for injury. Audiotapes were transcribed into English transcripts, which were analyzed for themes. RESULTS: Themes included language/communication difficulties, traditional Latino values, construction trade skill level differences, and health literacy. Participants were unfamiliar with the workers' compensation system. CONCLUSIONS: Small contractors in particular should provide more effective safety training in Spanish and appropriate safety equipment. Unions should offer English language training using simulation and more information about workers' compensation rights. Occupational health providers should consider Latino beliefs and communication needs when assessing health status or providing care.

Menzel, N. N. and P. P. Shrestha (2012). "Social marketing to plan a fall prevention program for Latino construction workers." Am J Ind Med 55(8): 729-735.

BACKGROUND: Latino construction workers experience disparities in occupational death and injury rates. The Occupational Safety and Health Administration funded a fall prevention training program at the University of Nevada, Las Vegas in response to sharp increases in fall-related accidents from 2005 to 2007. The grant's purpose was to improve fall protection for construction workers, with a focus on Latinos. This study assessed the effectiveness of social marketing for increasing fall prevention behaviors. METHODS: A multi-disciplinary team used a social marketing approach to plan the program. We conducted same day class evaluations and follow-up interviews 8 weeks later. RESULTS: The classes met trainee needs as evidenced by class evaluations and increased safety behaviors. However, Spanish-speaking Latinos did not attend in the same proportion as their representation in the Las Vegas population. CONCLUSIONS: A social marketing approach to planning was helpful to customize the training to Latino worker needs. However, due to the limitations of behavior change strategies, future programs should target employers and their obligation to provide safer workplaces.

Meza, E., et al. (2022). "Worker Perspectives on COVID-19 Risks: A Qualitative Study of Latino Construction Workers in Oakland, California." Int J Environ Res Public Health 19(16).

Latino construction workers in the U.S. have faced a disproportionate risk for COVID-19 infection in the workplace. Prior studies have focused on quantifying workplace risk for

COVID-19 infection; few have captured workers' experiences and perspectives. This study describes COVID-19-related workplace risks from the perspectives of Latino construction workers. We conducted a qualitative study using semi-structured phone interviews with Latino construction workers from the Fruitvale District of Oakland, California. Twenty individuals were interviewed from December 2020 to March 2021. Nearly all participants (19/20) were Spanish-speaking men; mean age 42.6 years. The majority were low-income and over one-third did not have health insurance. Participants worked in varied construction-related jobs ranging from demolition to office work; additionally, four were day laborers, and three belonged to a labor union. We identified four major themes with public health policy and workplace safety implications: (1) Major concern about the risk of SARS-CoV-2 infection for family health and economic wellbeing; (2) Clarity about mask use and social distancing but not disclosure; (3) Variability in access to additional resources provided by employers; and (4) Uncertainty around structural support for SARS-CoV-2 quarantine/isolation. Our findings provide further evidence from workers' own perspectives of the major gaps experienced during the pandemic in workplace protections and resources.

Negi, N. J. (2013). "Battling Discrimination and Social Isolation: Psychological Distress Among Latino Day Laborers." American Journal of Community Psychology 51(1-2): 164-174.

Day labor is comprised of predominately male and recent Latino immigrants, mainly from Mexico and Central America who work in an unregulated and informal market. Three-quarters of the day labor force is undocumented and live under the federal poverty threshold as work is seasonal and highly contingent on the weather and the local economy. However, in spite of their exposure to significant health risks, little is known about the impact of Latino day laborers' (LDLs) work and life conditions on their mental health. This mixed methods study extends the literature by using the minority stress theoretical model to examine the relationship between discrimination and social isolation as well as participant identified protective factors such as religiosity and sending remittances with psychological distress. A quantitative survey with 150 LDLs was conducted and was followed by a qualitative member checking focus group to extend upon the quantitative results as well as the minority stress model with the lived experiences of these immigrant workers. Results reveal implications for prevention efforts with this hard-to-reach and marginalized population. © 2012 Society for Community Research and Action.

Nicholson, V. J., et al. (2008). "Disparities in work-related injuries associated with worker compensation coverage status." Am J Ind Med 51(6): 393-398.

BACKGROUND: This exploratory study addresses patterns of injury in an emerging population of contingent workers who are not covered by either worker's compensation (WC) or health insurance. The primary purpose is to improve the information base regarding the entire population of uninsured, injured workers. Because Latino workers are over-represented in the uninsured group, we include additional characterization of their patterns of injury. Recent studies have found that worker compensation claims and reports address a shrinking proportion of occupational injury and exposure, and about two-thirds of occupational injuries are not captured in the U.S. national surveillance system. METHODS: Following the NEISS methodology, a work-relatedness indicator was retrieved for emergency department (ED) visits to an academic health center in fiscal year 2005. RESULTS: Twenty percent of self-declared work-related injuries were not associated with self-reported WC coverage. Parametric and non-

parametric statistical analysis found several significant disparities in workers without WC. These disparities included a higher proportion of Latinos, workers under age 25, and construction workers. In the uninsured group, Latino workers had a higher proportion of moderate and severe injuries. Nearly all (92 percent) workers without WC also lacked health insurance. Injured low-income workers who lack access to both WC and employer-sponsored health insurance comprise an increasing percentage of the occupationally injured. Our exploratory study found this to be particularly true in high-risk populations. CONCLUSIONS: Work-relatedness indicators collected routinely in ED and outpatient settings should be incorporated into standard reporting systems to facilitate more accurate and comprehensive surveillance and better-targeted interventions.

Nissen, B., et al. (2008). "Immigrant construction workers and health and safety: The South Florida experience." Labor Studies Journal 33(1): 48-62.

Immigrants are a growing percentage of the U.S. construction labor force, so the safety of their working conditions deserves study. This article reports on research surveying 283 immigrant construction workers in south Florida about their safety training, use of personal protective equipment, and employer safety practices. Potential impacts of unionized status and documented legal status are tested through regression analysis. Results show only a minor positive relationship of unionization with more training and safer conditions and essentially no relationship between documented legal status and training or safe conditions. Reasons for the weak results are discussed, and further research questions are posed.

Ochsner, M., et al. (2008). "Immigrant Latino day laborers in New Jersey: baseline data from a participatory research project." New Solut 18(1): 57-76.

This study reflects the collaborative efforts of university-based researchers, New Labor, a non-profit, membership-based worker center, the Laborers' International Union of North America New Jersey Chapter (LIUNA), and the N.J. Laborers Health and Safety Fund to develop a greater understanding of the needs, experiences, attitudes, and practices of the Latino day-labor workforce in New Jersey. Survey and qualitative data presented in this study address several questions about which there is currently very little information. These results strongly suggest that a significant subgroup of day laborers are both aware of and concerned about the dangers they face, open to opportunities for Spanish language training, and despite challenges, ready to use what they learn about health and safety. As a reflection of the perceptions and reports of roughly 150 day laborers, this project provides further validation of the importance of stakeholder involvement in research and training among hard-to-reach worker populations.

Ochsner, M., et al. (2012). "Beyond the classroom: a case study of immigrant safety liaisons in residential construction." New Solut 22(3): 365-386.

Latino day laborers often work at dangerous construction sites with little power to change conditions. We describe the development, implementation, and early-stage results of a program to train immigrant day laborers as safety liaisons. These are construction workers prepared to recognize and respond to health and safety hazards. Based in Newark, NJ, the project involves collaboration between New Labor, a membership-based worker center, and university researchers and labor educators. Safety liaisons undergo training and receive ongoing support for their roles. Both qualitative and quantitative data are collected to monitor progress. Although lacking in formal authority, safety liaisons have prompted improvements at specific

sites, filed OSHA complaints, and developed a local worker council. Participatory training methods, opportunities for leadership outside the classroom, and participation in project planning have strengthened liaisons' effectiveness, leadership skills, and commitment. The safety liaison approach could be adapted by worker centers and their partner organizations.

O'Connor, T., et al. (2005). "Adequacy of health and safety training among young Latino construction workers." J Occup Environ Med 47(3): 272-277.

OBJECTIVES: This study aimed to assess the adequacy of safety training provided to young Latino immigrant construction workers. The study posited that, because of their youth and immigrant status, these workers would be less likely to receive adequate training. METHODS: We interviewed 50 youths aged < or =21 who had worked at least 10 days in construction in the previous year. The in-person interview included 140 questions covering a range of construction work and health and safety experiences. RESULTS: Participants reported performing a range of hazardous tasks, some while under the age of 18. Of these, 68% to 72% reported receiving some training, but median training time was only 1 hour. Only 24% reported receiving written training material. Those with less English ability received less training. CONCLUSIONS: Young Latino immigrants in this study received inadequate training given the hazardous work they performed. CLINICAL SIGNIFICANCE: Results of this research, especially the relatively low level of English communication skills among young Latino workers, point to the need for increased bilingual services not just in worker safety training programs, but also in medical clinics and emergency rooms that treat Latino workers.

Panikkar, B., et al. (2013). "Occupational health outcomes among self-identified immigrant workers living and working in Somerville, Massachusetts 2006-2009." J Immigr Minor Health 15(5): 882-889.

This study examines the burden of occupational health risks among a convenience sample of three immigrant worker populations (Brazilian, Haitian, and El Salvadoran) in Somerville, Massachusetts. In this community based research initiative (n = 346), logistic regression is used to analyze immigrant occupational health survey data collected from 2006 to 2009. In this study, injuries at work were significantly associated with lower English proficiency (OR = 1.8, 95 % CI 1.1-3.0), workers between the ages of 46 and 65 (OR = 2.7, 95 % CI 1.0-7.0), service workers (OR = 13.8, 95 % CI 1.8-105.2), production workers (OR = 10.8, 95 % CI 1.3-90.1), construction workers (OR: 21.7, 95 % CI 2.8-170.9) and immigrants with no health insurance (OR = 1.8, 95 % CI 1.0-3.1). Injuries were negatively associated with years in the US with more established immigrants in the US >15 years reporting more injuries at work. Older immigrants who have been in the US longer but are less proficient in English, and are still employed in low-wage occupations with no health insurance suffered more injuries than recent immigrants. Further validation of this result is required.

Panikkar, B., et al. (2014). "Characterizing the low wage immigrant workforce: a comparative analysis of the health disparities among selected occupations in Somerville, Massachusetts." Am J Ind Med 57(5): 516-526.

BACKGROUND: This study estimates job-related risks among common low wage occupations (cleaning, construction, food service, cashier/baggers, and factory workers) held by predominantly Haitian, El Salvadorian, and Brazilian immigrants living or working in Somerville, Massachusetts. METHODS: A community-based cross-sectional survey on

immigrant occupational health was conducted between 2006 and 2009 and logistic regression was used to assess the job-related risks among the most common low wage occupations. RESULTS: Construction workers reported significantly higher health risks, and lower access to occupational health services than the other occupations. Compared to cashier/baggers, the reference population in this study, cleaners reported significantly lower access to health and safety and work training and no knowledge of workers' compensation. Factory workers reported significantly lower work training compared to cashier/baggers. Food service workers reported the least access to doctors compared to the other occupations. CONCLUSION: We found significant variability in risks among different low wage immigrant occupations. The type of occupation independently contributed to varying levels of risks among these jobs. We believe our findings to be conservative and recommend additional inquiry aimed at assuring the representativeness of our findings.

PHILAPOSH (2014). "Using Social Media to Inform Latino Construction Workers about Fall Protection (CPWR Report)."

Pietrzak, R. H., et al. (2014). "Trajectories of PTSD risk and resilience in World Trade Center responders: An 8-year prospective cohort study." Psychol Med 44(1): 205-219.

Background Longitudinal symptoms of post-traumatic stress disorder (PTSD) are often characterized by heterogeneous trajectories, which may have unique pre-, peri-and post-trauma risk and protective factors. To date, however, no study has evaluated the nature and determinants of predominant trajectories of PTSD symptoms in World Trade Center (WTC) responders. Method A total of 10835 WTC responders, including 4035 professional police responders and 6800 non-traditional responders (e.g. construction workers) who participated in the WTC Health Program (WTC-HP), were evaluated an average of 3, 6 and 8 years after the WTC attacks. Results Among police responders, longitudinal PTSD symptoms were best characterized by four classes, with the majority (77.8%) in a resistant/resilient trajectory and the remainder exhibiting chronic (5.3%), recovering (8.4%) or delayed-onset (8.5%) symptom trajectories. Among non-traditional responders, a six-class solution was optimal, with fewer responders in a resistant/resilient trajectory (58.0%) and the remainder exhibiting recovering (12.3%), severe chronic (9.5%), subsyndromal increasing (7.3%), delayed-onset (6.7%) and moderate chronic (6.2%) trajectories. Prior psychiatric history, Hispanic ethnicity, severity of WTC exposure and WTC-related medical conditions were most strongly associated with symptomatic trajectories of PTSD symptoms in both groups of responders, whereas greater education and family and work support while working at the WTC site were protective against several of these trajectories. Conclusions Trajectories of PTSD symptoms in WTC responders are heterogeneous and associated uniquely with pre-, peri-and post-trauma risk and protective factors. Police responders were more likely than non-traditional responders to exhibit a resistant/resilient trajectory. These results underscore the importance of prevention, screening and treatment efforts that target high-risk disaster responders, particularly those with prior psychiatric history, high levels of trauma exposure and work-related medical morbidities. © 2013 Cambridge University Press.

Puerto, C. L. d., et al. (2014). "Exploratory Study to Identify Perceptions of Safety and Risk among Residential Latino Construction Workers as Distinct from Commercial and Heavy Civil

Construction Workers." Journal of Construction Engineering and Management 140(2): 04013048.

Latino workers in residential construction currently suffer disproportionately high rates of injuries and fatalities compared to Latino workers in commercial and heavy civil construction. The aim of this study is to investigate possible differences in safety culture and risk perception among Latino construction workers across residential, commercial, and heavy civil construction sectors. Analysis was conducted using 218 survey responses from Latino construction workers collected in the Denver metro and northern Colorado areas. Results suggest that Latino workers in commercial and heavy civil construction share more similar perceptions of safety culture and risk than those in residential construction. Specifically, Latino workers in residential construction were more likely to agree with the statements that (1) work productivity and quality have a higher priority than safety and (2) safety rules and safety procedures are difficult to understand and that dangers present on construction sites cannot cause death. This study enhances the knowledge about the safety culture and risk perceptions of Latino construction workers in all three sectors. Study findings support the hypothesis that differences in safety culture perceptions among Latinos may contribute to differences in injury rates across the three sectors. Specifically, perceptions of a less-supportive safety culture may correlate to higher rates of miscommunication and incorrect assumptions that influence decision making, resulting in disproportionately higher rates of injuries and fatalities in residential construction compared to commercial and heavy civil construction. Such research findings are important because they provide a meaningful context and basis for effective construction worker safety interventions in the future.

Richey, M. M., et al. (2022). "Trends in fatal occupational injuries in Latino/a workers relative to other groups, North Carolina 2000-2017." Am J Ind Med 65(4): 242-247.

BACKGROUND: Latino/a workers may experience higher fatal occupational injury rates than non-Latino/a workers. In North Carolina, the Latino/a population more than doubled between 2000 and 2017. We examined fatal occupational injuries among Latino/a and non-Latino/a workers in North Carolina over this period. METHODS: Information on fatal occupational injuries was abstracted from records of the North Carolina Office of the Chief Medical Examiner and the death certificate records held by the North Carolina Office of Vital Records. Estimates of the working population were derived from the decennial census and American Community Survey. Estimates of annual rates of fatal occupational injury for the period January 1, 2000 to December 31, 2017 were derived for Latino/a workers and compared to Black and White workers not identified as Latino/a. RESULTS: Over the study period, 1,783 fatal occupational injuries were identified among non-Latino/a workers and 259 fatal occupational injuries among Latino/a workers in North Carolina. The majority of fatal occupational injuries among Latino/a workers occurred among males employed in construction and agriculture. While the fatal occupational injury rate among Latino/a workers declined over the study period, the rate among Latino/a workers was higher than among non-Latino/a White and Black workers; moreover, fatal occupational injury rates for Latino/a workers trended upwards during the most recent years of the study period. CONCLUSIONS: Latino/a workers in North Carolina have the highest fatal occupational injury rate of any race/ethnicity group.

Ringen, K., et al. (2018). "Construction Safety and Health in the USA: Lessons From a Decade of Turmoil." Ann Work Expo Health 62(suppl_1): S25-S33.

The construction industry is one of the largest and also most hazardous industries in the USA. It is affected more severely by the business cycle than most other industries. We examined industry trends during the last decade including the severe recession. During 2008 to 2010, as a result of the recession, 2.7 million workers and 20% of all employers left the industry. By 2010, the number and rate of traumatic fatalities had reached its lowest point ever, only to gradually increase again as the industry recovered from the recession. The risks of a fatality were disproportionate with employer size. The small employers (<20 employees), which account for 37.5% of employment, were responsible for 57% of all fatalities. These small employers are less likely to embrace essential safety culture practices and are slow to adopt new approaches to occupational safety and health. These employers-especially those which hire immigrant workers and self-employed workers-lag far behind in terms of adopting even essential elements of good safety cultures and management practices. Currently, there are no restrictions on going into business as a construction contractor or seeking employment as a construction worker. There is a great need to find ways to establish minimum qualifications for becoming a construction contractor and for becoming a construction worker. Some jurisdictions have established minimum occupational safety and health training. This is a good start, but qualifications must include greater emphasis on minimum skills requirements. State and local jurisdictions have good policy tools which could be deployed for this purpose but which have largely been neglected: licensing of both companies and workers could include skills qualifications; construction permits could include requirements for occupational safety and health; and greater use of criminal prosecution could be pursued where it is obvious that basic requirements for safety and health have been ignored.

Robertson, C., et al. (2007). "Noise and hearing protection: Latino construction workers' experiences." AAOHN J 55(4): 153-160.

This study explored Latino construction workers' experiences with occupational noise and hearing protection to provide qualitative data to be used in designing an intervention to prevent noise-induced hearing loss. An ecological framework provided the theoretical foundation for this study. Fifteen Latino construction workers participated in one of four focus groups exploring perceptions of exposure to noise on the job and barriers to and supports for wearing hearing protection. Support for an ecological framework was apparent in the environmental and personal factors revealed in the data: how it feels, personal responsibility, they make us wear it, we don't care about ears, it won't happen to me, being Latino, keeping our jobs, hearing protection is uncomfortable, and we can handle it. Researchers are applying results of this study in the development of a hearing conservation intervention for Latino construction workers to be evaluated in a randomized, controlled trial.

Roelofs, C., et al. (2011). "A qualitative investigation of Hispanic construction worker perspectives on factors impacting worksite safety and risk." Environ Health 10: 84.

BACKGROUND: Hispanic workers have higher rates of injury and death on construction worksites than workers of other ethnicities. Language barriers and cultural differences have been hypothesized as reasons behind the disparate rates. METHODS: We conducted two series of focus groups with union and non-union Hispanic construction workers to ask them about their perceptions of the causes for the unequal rates. Spanish transcripts were translated and coded in QSR NVivo software for common themes. RESULTS: Workers reported a difficult work environment characterized by supervisor pressure, competition for

jobs and intimidation with regard to raising safety concerns. Language barriers or cultural factors were not strongly represented as causative factors behind the rates. CONCLUSION: The results of this study have informed the development of an intervention trial that seeks to prevent falls and silica dust exposure by training contractors employing Hispanic construction workers in the elements of safety leadership, including building respect for their Hispanic workers and facilitating their participation in a safety program.

Sarel, L., et al. (2010). "Fatalities of hispanic workers: Safety initiatives taken by U.S. Construction companies to address linguistic and cultural issues." International Journal of Construction Education and Research 6(4): 271-284.

The U.S. Census Bureau's projection states that Hispanics form the largest minority group in the U.S. construction industry. A major challenge faced by American construction companies is the continually increasing number of fatalities among its Hispanic workers. According to the literature, illiteracy, the language barrier, and cultural differences are major causes of Hispanic worker fatalities. This study focuses on two out of these three aspects, i.e., language barriers and cultural differences. The study was undertaken to explore the reasons behind the lack of safety awareness of Hispanic workers, and to investigate the measures that construction companies take to deal with this problem. The literature review identified the main issues that need to be addressed by construction companies to ensure the safety of Hispanic workers. A survey was created, asking supervisors/directors of the top U.S. construction companies about their safety initiatives. As a result, it was found that construction companies address the problems of language and cultural barriers by implementing initiatives such as hands-on training, English as a Second Language courses, bilingual trainers, vocabulary cards, social gatherings, and common workshops. This study may help the construction industry identify areas requiring attention in order to improve the safety of its Hispanic employees. © Taylor & Francis Group, LLC.

Scott, J., et al. (2018). "Ensuring the Right to Rest: City Ordinances and Access to Rest Breaks for Workers in the Construction Industry." J Occup Environ Med 60(4): 331-336.

OBJECTIVE: The aim of this study was to evaluate the effectiveness of city Rest Break Ordinance (RBO) policies in expanding access to rest at work. METHODS: We use data from surveys of construction workers in Austin and Dallas, Texas, in 2009, 2012, and 2015 (n = 557) to calculate the odds of receiving a rest break in pre- versus post-RBO Austin and in post-RBO Austin versus pre-RBO Dallas, controlling for demographic and employment characteristics. RESULTS: Construction workers were 35% more likely to report receiving a rest break in Austin post-RBO and 16% less likely in Dallas without a RBO as compared to Austin with a RBO. CONCLUSION: The increased likelihood of receiving rest breaks at work in a RBO city suggests that, in the absence of enforceable national standards, city-level RBOs can be an important first step to effective prevention of heat-related illnesses (HRIs) and heat-related fatalities at work.

Seixas, N. S., et al. (2008). "Occupational health and safety experience of day laborers in Seattle, WA." Am J Ind Med 51(6): 399-406.

BACKGROUND: Day Labor is a growing part of the informal economy in the US, and in Seattle, and may entail a high risk of injury and illness at work. METHODS: We surveyed 180-day laborers, at two worker centers and an unregulated "Street" location concerning their

job-specific exposures and injury experience. RESULTS: Exposures to both health and safety hazards were common at all three sites. After controlling for type of work, immigrant workers were 1.5-2 times more likely than non-immigrant day laborers to report exposure to hazardous conditions. Among the 180 participants 34 reported injuries were classified as "recordable." We estimated an injury rate of 31 recordable injuries per 100 full time employees. The three hiring locations had differing job experiences and exposures. Those hired through worker centers had a lower risk of exposures, while the Street workers were more likely to refuse hazardous work. CONCLUSIONS: Day laborers are exposed to numerous hazards at work, resulting in high injury rates. Multiple approaches including community based organizations which may provide some employment stability and social support for protection at work are needed to reduce occupational injury and illness risk among these vulnerable populations.

Serdar, B., et al. (2012). "Biomarkers of exposure to polycyclic aromatic hydrocarbons (PAHs) and DNA damage: a cross-sectional pilot study among roofers in South Florida." BMJ Open 2(4).

OBJECTIVE: The main goal of this pilot study was to assess the technical and logistic feasibility of a future study. The research hypothesis is that occupational exposures to polycyclic aromatic hydrocarbons (PAHs) are associated with increased risk of DNA damage among roofers who work with hot asphalt. DESIGN: This is a cross-sectional pilot study. SETTING: The study included roofers from four different construction sites in Miami-Dade County, Florida. PARTICIPANTS: 19 roofers were recruited (six Hispanics and 13 African-Americans, all male), all of whom were eligible (no history of cancer and no history of chronic diseases of kidneys or liver). All participants provided pre-shift samples and 18 provided post-shift samples. Samples of one participant were excluded from the final analyses as they were considered unreliable. RESULTS: Levels of urinary PAH metabolites increased during 6 h of work. Linear regression models of post-shift metabolites included their pre-shift levels, post-shift urinary creatinine levels (for models of 1-OHPyr and 9-OHPhe), and skin burn due to contact with hot asphalt (for models of 1-OHPyr and 1-OHNap). Pre-shift levels of urinary 8-OHdG were not associated with any of the variables considered. For post-shift levels of 8-OHdG, however, post-shift 1-OHPyr (95% CI 0.091 to 0.788) and use of protective gloves (95% CI -1.57 to -0.61) during work explained 86.8% of its variation. Overall, highest levels of urinary PAH metabolites and of 8-OHdG were observed among workers who reported having skin burn and who did not use gloves during work. CONCLUSIONS: Urinary 1-OHPyr is a promising predictor of oxidative DNA damage among roofers. Work-related skin burn and use of protective gloves appear to influence PAH exposure and DNA damage levels in this group, suggesting the importance of dermal absorption.

Shrestha, P. P. and N. N. Menzel (2014). "Hispanic construction workers and assertiveness training." Work 49(3): 517-522.

BACKGROUND: Hispanic (Latino) construction workers experience disparities in occupational death and injury rates in the United States. The cultural value of respect for those in authority may hinder these workers from requesting safe working conditions from supervisors. OBJECTIVE: To evaluate whether Hispanic construction workers in Las Vegas, Nevada found assertiveness training more useful than non-Hispanic trainees and whether or not they practiced this behavior at work after the training. METHODS: An assertiveness training simulation was part of fall prevention classes offered to area construction workers. Eight weeks

after the training, participants were interviewed by telephone about class topics they found most useful and whether or not they had made any subsequent behavior changes at work. RESULTS: More than half of the 760 fall prevention trainees completed telephone interviews. A smaller proportion of Hispanic trainees found assertiveness training to be useful (11%) than non-Hispanics (28%) ($p \leqslant 0.001$). Only 2% of both groups identified practicing assertiveness at work. CONCLUSIONS: A large proportion of Hispanic trainees valued other knowledge more highly. They may weigh job security as more important than speaking up about safety issues, which might threaten their employment. Interventions to improve safety should focus instead on improving work safety climate and engineering controls.

Smith, D. J., et al. (2022). "Using Occupational Histories to Assess Heat Exposure in Undocumented Workers Receiving Emergent Renal Dialysis in Georgia." Workplace Health Saf 70(5): 251-258.

BACKGROUND: Immigrants often work in jobs that are known as dirty, demanding, and dangerous. Globally, the agricultural occupations have been associated with the emergence of chronic kidney disease of unknown etiology (CKDu) primarily in outdoor worker populations. The disease has also been reported in immigrants in the United States who work in agricultural occupations, but little research has been done outside of agricultural workers to determine whether immigrants who work other occupations are at risk for developing CKDu. METHODS: This study assessed the self-reported occupational histories of undocumented immigrants receiving frequent, emergent-only dialysis in Atlanta, GA. We assessed demographics, employment status, and work history, using the Grady Dialysis Questionnaire and the Occupational/Environmental Health History Form. RESULTS: Fifty undocumented immigrants receiving frequent, emergent-only hemodialysis were recruited for this study. The average age was 49.5 years (SD +/- 11.5), and the majority (52%) were female and originated from Mexico (66%). A majority (74%) reported having worked in the past 5 years and 28% reported currently working. A total of 68 unique jobs were reported. In decreasing order of frequency, our sample worked in occupations with documented renal toxicant exposures, such as applying pesticides in landscaping, heat exposure in agriculture, construction, landscaping, and dry cleaning, and lead paint fumes in construction. DISCUSSION: Occupational histories provide a greater understanding of the exposures and working conditions of those receiving frequent, emergent-only hemodialysis. This exploratory study suggests that further research is needed to investigate and assess whether renal toxicants are associated with occupations with high numbers of undocumented workers. APPLICATION TO PRACTICE: A detailed and thorough occupational history should be conducted from those receiving frequent, emergent-only hemodialysis. Developing continuing education for nursing and medical staff in dialysis centers on taking an occupational history, mandatory State reporting requirements, and hazard communication training for workers should be considered. Collaborations between occupational health professionals, public health authorities, employers, dialysis providers, and clinicians who see undocumented workers is required to understand and develop appropriate prevention measures for this population.

Sokas, R. K., et al. (2019). "Building a Sustainable Construction Workforce." Int J Environ Res Public Health 16(21).

The average U.S. construction worker is aged 42.6 years, and will not be eligible for full Social Security retirement benefits until age 67. Delayed retirement is largely driven by

economic need, but construction workers face considerable challenges in remaining on the job. This study explores trade-specific age trends within the construction industry, and the experiences of building trade unions with aging membership. A mixed-methods approach used trade-specific age statistics from the Current Population Survey and key informant interviews with labor leaders, in order to identify union experiences and interventions. Mean and median ages for all subgroups in construction increased from 2003 to 2017. Immigrant construction workers were significantly younger than workers who were born in the U.S. (41 vs. 43, $p < 0.001$). Union workers were older than non-union workers (42 vs. 39 in 2017, $p < 0.001$); the age differential between self-employed and wage-and-salary workers was wide (49 vs. 40, $p < 0.001$). Union leaders described barriers, such as age discrimination and the loss of previously available light tasks, as well as current and potential solutions through union contract language requiring the inclusion of older workers, or establishing limits for lifting. Other solutions included career pathways for training and safety, with their attendant limitations; mentoring/pairing opportunities with apprentices; and the potential opportunities and training needs for site management positions.

Sokas, R. K., et al. (2009). "An intervention effectiveness study of hazard awareness training in the construction building trades." Public Health Rep 124 Suppl 1: 160-168.

OBJECTIVE: We evaluated knowledge, attitudes, and self-reported work practices among apprentice and journeyman trainees in two construction trades at baseline and three months after participation in two training sessions as part of a 10-hour Occupational Safety and Health Administration hazard awareness training program. We developed preliminary assessment of prior and current training impact, accounting for demographics, trade, and construction site safety climate. METHODS: Participants were recruited prior to union-delivered safety training, self-completed a baseline survey prior to class, and completed a follow-up interviewer-administered telephone survey three months later. Discrimination (D) testing evaluated knowledge questions, paired t-tests examined differences in pre- and post-intervention knowledge, and attitude responses were tested with the Wilcoxon signed rank test. Linear regression analysis and logistic regression were used to assess the contribution of different categorical responses to specific sub-questions. RESULTS: Of 175 workers completing the baseline survey, 127 were born in the U.S. and 41 were born in Mexico; 40% of those who reported ethnicity were Hispanic. Follow-up surveys were completed by 92 (53%) respondents and documented significant increases in both fall safety and electrical safety knowledge. The most recent safety climate was associated with improvement in fall safety attitudes (slope = 0.49, $p < 0.005$) when adjusted by country of birth (slope = 0.51, $p < 0.001$). Workers born in Mexico had less formal education than U.S.-born workers and lower baseline knowledge scores, but more positive attitude scores at baseline and greater improvements in attitude at follow-up. CONCLUSION: Knowledge and attitude improvement following a one-hour safety class was measurable at three months in both U.S.-born and Mexican-born construction workers.

Sparer, E. H., et al. (2015). "Length of time spent working on a commercial construction site and the associations with worker characteristics." Am J Ind Med 58(9): 964-973.

Background: Construction workers move frequently from jobsite to jobsite, yet little is documented about length of stay on-site and associations with worker characteristics. Method: Using cross-sectional data, we investigated associations between worker characteristics

(including trade and musculoskeletal pain) and length of stay on-site (dichotomized as <1 month, n=554, and ≥1month, n=435). Results: Approximately, 56% of workers remained on the worksite for at least 1 month. Length of stay was significantly associated with workers' race/ethnicity, union status, title, trade, and musculoskeletal pain (P-values<0.05). Trades associated with longer length of stay included pipefitters and plumbers. Trades associated with shorter length of stay included operators and piledrivers. Workers with single-location pain had 2.21 times (95%CI: 1.52, 3.19) the odds of being short-term versus long-term, adjusting for trade, title, and race/ethnicity. Conclusion: The length of stay and associated characteristics provide important insight into how workers come and go on construction sites and the methodological challenges associated with traditional intervention evaluations. © 2015 Wiley Periodicals, Inc.

Stern, L. C. and T. A. Moore (2011). "Nail gun injury to the sacrum: case report and review of the literature." Spine (Phila Pa 1976) 36(26): E1778-1780.

STUDY DESIGN: Case report. OBJECTIVE: Review the literature that relates to nail gun injuries to the spine using a case report illustration. SUMMARY OF BACKGROUND DATA: Approximately 37,000 patients present to the US emergency departments annually with injuries inflicted from nail guns, 60% of which occur in the workplace. METHODS: A case report of a nail gun injury to the sacrum is presented and the pertinent literature is then reviewed. RESULTS: A 21-year-old male roofer presented to the emergency department after suffering an accidental, self-inflicted nail gun injury to the midline of his sacrum. The patient was neurologically intact and a computed tomography (CT) of the pelvis with rectal contrast noted the nail to be located midline within the spinal canal at the level of S3 without injury to the rectum. The patient was taken to the operating room for removal of the nail under general anesthesia and exploration of the wound, specifically looking for evidence of a dural tear, which was determined not to be present. The wound was closed primarily and the patient was given 24 hours of intravenous antibiotics followed by 2 weeks of oral antibiotics. At follow-up, the patient had returned to his roofing job full-time and there was no evidence of infection on examination or retained foreign bodies by radiograph. CONCLUSION: On the basis of our experience and a review of the literature, in terms of treating a nail gun injury to the sacrum we recommend the following: exploration in the operating room to investigate the possibility of a dural tear, thorough irrigation, and debridement, especially in the case of barbed nails, and consultation with general surgery to determine if there is any injury to intrapelvic contents before surgery. An infectious disease consultation postoperatively may also assist in proper selection and duration of antibiotic therapy.

Stiehl, E. and L. Forst (2018). "Safety Climate Among Nontraditional Workers in Construction: Arguing for a Focus on Construed External Safety Image." New Solut 28(1): 33-54.

Safety climate, employees' perceptions of work-related safety, (1) has been promoted as a leading indicator of workplace safety in construction. (2 , 3) While research has primarily examined internal organizational sources (e.g., manager attitudes, formal organizational policies) on these perceptions, external sources of information might be more relevant to construction workers in nontraditional jobs who work for a limited time and/or have limited interaction with other employees. This paper argues for the future development of a construed external safety image scale to measure employees' perceptions about how external groups view their organization's safety. (4) The construed external safety image would capture the external

sources that nontraditional workers use to assess safety climate and will allow public health researchers to identify and change dangerous workplaces while more effectively communicating information about safe workplaces to workers. The public health relevance of safety climate and construed external safety image for monitoring and communicating safety to nontraditional workers require examination.

Teran, S., et al. (2015). "Promoting adoption of fall prevention measures among Latino workers and residential contractors: Formative research findings." Am J Ind Med 58(8): 870-879.

Background: Falls from heights remain a concern in construction, particularly for foreign-born Latino construction workers employed by small residential contractors. The social ecological model provides a framework to assess the individual and contextual factors influencing the risk for falls. Methods: Five focus groups and thirteen in-depth interviews with workers, small residential contractors, and key informants were conducted in 2012 in San Francisco and Philadelphia. Data were analyzed with qualitative methods. Results: Economic conditions in residential construction, coupled with a lack of enforcement and vulnerabilities of the foreign-born workforce, are principal contributors to risk for falls. Small contractors perceive strong economic disincentives for implementation of fall protection and foreign-born Latino workers experience a variety of social, cultural and occupational pressures impeding its use. Conclusions: Increased adoption of fall protection cannot be accomplished solely by targeting Latino construction workers. Research is needed on incentives to influence contractor behavior and facilitate adoption of fall protection measures. Am. J. Ind. Med. 58:870-879, 2015. © 2015 Wiley Periodicals, Inc.

Tumpowsky, C. M., et al. (2000). "Elevated blood lead levels among adults in Massachusetts, 1991-1995." Public Health Rep 115(4): 364-369.

Objective. Lead poisoning, the oldest recognized occupational disease, remains a danger for children and adults. Data collected for 664 cases reported to the Massachusetts Occupational Lead Registry in 1991-1995 were summarized in a 1998 state report. Here, the authors present some of the key findings from that report for a wider audience. Methods. The authors summarize key findings of the 1998 state report. Findings. Construction workers, in particular licensed deleaders and house painters, accounted for almost 70% of occupational cases involving blood lead levels ≥ 40 micrograms of lead per deciliter (mcg/dl) of blood. Among 100 workers with the highest blood lead levels (≥ 60 mcg/dl), 29% were house painters. Hispanic workers were over-represented in the Registry. A small proportion of cases were non-occupational, typically associated with recreational use of firing ranges or do-it-yourself home renovations. Conclusion. Lead poisoning is a preventable disease, yet these data indicate that additional prevention efforts are warranted.

Welton, M., et al. (2018). "Ethnic Disparities of Perceived Safety Climate Among Construction Workers in Georgia, 2015." J Racial Ethn Health Disparities 5(3): 522-529.

BACKGROUND: Safety climate involves worker perception about the relative importance where they work and safety climate and has been shown to be a reliable predictor of safety-related outcomes. METHODS: The primary objective of this study is to investigate ethnic differences in perceived safety climate among construction workers. Surveys (n = 179) that included a 10-item safety climate scale were administered in Athens, Georgia (GA), at local construction sites and home improvement stores during June-August, 2015. RESULTS: The

majority of respondents were carpenters or roofers (39%), followed by laborers (22%), painters and dry wall workers (14%), other skilled trades (14%), and supervisors (11%); 32% were Hispanic. Hispanic ethnicity ($p < 0.0001$), drinking two or more alcoholic beverages per day ($p < 0.0001$), working for a company that does not provide health insurance ($p = 0.0022$), and working for a company with fewer than ten employees ($p < 0.0001$) were significantly associated with lower perceived safety climate scores. CONCLUSION: The lower perceived safety climate scores among Hispanic workers indicate that the perception of the importance of safety on the job site is lower among Hispanics construction workers than non-Hispanics construction workers.

Welton, M., et al. (2020). "Construction employment mortality among Mexican immigrants in the South Eastern United States, 2003-2013." International Journal of Migration, Health and Social Care 16(4): 349-358.

Purpose The purpose of this study was to investigate occupational and non-occupational mortality among Mexican immigrants in the South Eastern United States. The construction industry has the highest burden of occupational fatalities in the USA of all industries, and foreign-born Hispanic workers are disproportionately affected. Design/methodology/approach Data were obtained from 3,093 death certificates maintained by the Consulate General of Mexico in Atlanta, Georgia. Standardized mortality ratios (SMR) were used to compare occupational-related deaths among construction industry occupations, and logistic regression models were used to examine the relationship between manners of death not related to occupation and employment in the construction industry. Findings The proportion of Mexican immigrants who died from occupational injuries is higher among all construction workers (SMR = 1.31), roofers (SMR = 2.32) and carpenters (SMR = 2.25) than other workers. Among the population in this analysis suicide [adjusted odds ratio (aOR) = 0.63] and death from natural causes (aOR = 0.70) were inversely related to work in the construction industry. Research limitations/implications Interventions to reduce occupational fatalities among Mexican migrant construction workers should target roofers and carpenters. Future research should further investigate the industry’s association with suicide and natural death. Originality/value This is one of the first analyzes that investigated associations between construction industry employment and non-occupational fatalities among immigrants. The analysis provides evidence that a large portion of the Mexican immigrant population is used in the construction industry (38%) and face elevated risks for occupational fatalities and the results of this investigation should encourage greater surveillance of occupational illness and injury among foreign-born immigrants who work in construction, as well as other high-risk industries.

Williams, Q., Jr., et al. (2010). "The impact of a peer-led participatory health and safety training program for Latino day laborers in construction." J Safety Res 41(3): 253-261.

BACKGROUND: Immigrant Latino day laborers working in residential construction are at particularly high risk of fatal and non-fatal traumatic injury and benefit from targeted training. OBJECTIVE: To understand the impact of a participatory, peer-facilitated health and safety awareness training customized to the needs of Latino day laborers. METHODS: Baseline surveys exploring exposures, PPE use, attitudes, work practices and work-related injuries were collected from more than 300 New Jersey Latino day laborers in construction prior to their participation in a one day (minimum of six hour) Spanish language health and safety training class. The classes, led by trained worker trainers, engaged participants in a series of tasks

requiring teamwork and active problem solving focused on applying safe practices to situations they encounter at their worksites. Follow-up surveys were difficult to obtain among mobile day laborers, and were collected from 70 men (22% response rate) 2-6 months following training. Chi-square analysis was used to compare pre- and post-intervention PPE use, self protective actions, and self-reported injury rates. Focus groups and in-depth interviews addressing similar issues provided a context for discussing the survey findings. RESULTS: At baseline, the majority of day laborers who participated in this study reported great concern about the hazards of their work and were receptive to learning about health and safety despite limited influence over employers. Changes from baseline to follow-up revealed statistically significant differences in the use of certain types of PPE (hard hats, work boots with steel toes, safety harnesses, and visible safety vests), and in the frequency of self-protective work practices (e.g., trying to find out more about job hazards on your own). There was also a suggestive decrease in self-reported injuries (receiving an injury at work serious enough that you had to stop working for the rest of the day) post-training based on small numbers. Sixty-six percent of workers surveyed post-training reported sharing information from their safety workbook with friends and co-workers. Focus groups and interview results generally confirmed the quantitative findings. CONCLUSIONS: Participatory, peer led training tailored to the needs of construction day laborers may have a positive effect on Latino immigrant workers' attitudes, work practices, and self reported injury rates, but major changes would require employer engagement. IMPACT ON INDUSTRY: Health and safety researchers have identified reducing the number of traumatic injuries among the immigrant construction workforce as an increasingly important priority. This project provides one model for collaboration between university-based researchers, a union, and a community-based organization. The specific elements of this project-participatory curriculum customized to the needs of day laborers in residential construction, training day laborers to facilitate training classes, and involving peer leaders in outreach and research-could be adapted by other organizations. The findings of this study suggest that the Latino day laborers have a strong interest in and some ability to act on health and safety information. Widespread implementation of this type of training, especially if supported with cooperation from residential contractors, could lead to reduced rates of traumatic injury in the residential construction industry.

Wysong, K., et al. (2016). "Hypersensitivity Pneumonitis." Workplace Health and Safety 64(6): 284.

Chronic exposure to a broad array of antigens after workers inhale aerosolized organic dust particles from mold, animal dander, bird droppings, and chemicals, especially pesticides or herbicides, increases risk for hypersensitivity pneumonitis. Several demographic characteristics of immigrant workers in farming, poultry processing, construction, and landscaping increase this worker population's risk.

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