

Analysis of workplace injuries among Hispanic construction workers due to safety hazards

Rizwan U. Farooqui

Florida International University, Miami, Florida, USA, rfaro001@fiu.edu

Syed M. Ahmed

Florida International University, Miami, Florida, USA, ahmeds@fiu.edu

Farhan Saleem

Florida International University, Miami, Florida, USA, fsale001@fiu.edu

ABSTRACT

The U.S. Census Bureau estimates that one in four persons in the United States will be of Hispanic origin by 2050, up from one in eight in 2002. Driven by immigration, this dramatic growth in the Hispanic population will present unique challenges in the workplace. In construction, the increase in the Hispanic population has enabled the industry to meet its workforce demands. Construction has become the sector of the workforce with the highest percentage of Hispanic workers outside of agriculture [CPWR, 2002]. Unfortunately, this has occurred with costs in the health and safety of Hispanic construction workers. Data, collected from various sources including the U.S. Bureau of Labor Statistics' current population survey, current employment survey, survey of occupational injuries and illnesses, and census of fatal occupational injuries, shows that most workplace injuries take place among Hispanic workers because of their limited job prospects than U.S.-born workers to do things that are more dangerous because they are more afraid about losing their job if they refuse to do it. These workers might be more afraid to speak up about dangerous things on the job and they are more likely to be employed by unreliable contractors who are not practicing safety precautions. Based on the above preliminary data, this study examines the root causes of workplace injuries among Hispanic Construction workers and attempts to identify any additional information that might be helpful in reducing workplace injuries due to safety hazards.

Keywords: Occupational safety, Fatal and non-fatal Injuries, Hispanic workers, Construction industry.

1. INTRODUCTION

Over the past few decades, the U.S. construction workforce has experienced intense demographic changes. For instance, the past 30 years has seen the United States construction industry move from one that was predominantly unionized to one that is predominantly nonunion. Based on current population survey (CPS) data, 35.7% of all construction workers were union members in 1976. That number had fallen to approximately 20% in 2000. The most recent demographic shift in the United States construction workforce is the rapid increase in the Hispanic population. Construction has become the sector of the workforce with the highest percentage of Hispanic workers outside of agriculture [CPWR, 2002]. Between 1994 and 2004, the number of Hispanic hourly construction workers in the United States increased significantly from 9.2 to 15% of the total hourly (paid) construction workforce (see Figure 1).

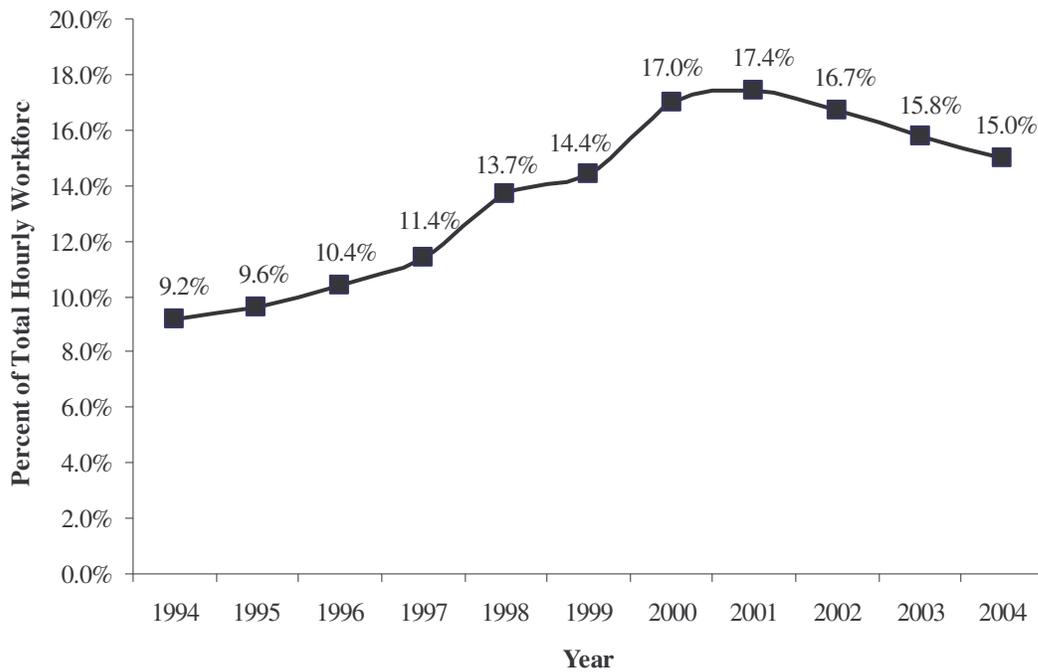


Figure 1: Percentage of Hispanic construction workers by percentage of total hourly (paid) construction workers in United States, 1994–2004

It is noted that the percentage of the total hourly construction workforce being Hispanic did decline from 17.5% to 15% from 2001 to 2004. Although a worthy topic of additional research, this may be attributable to a drop in the recent overall drop in construction employment levels. According to employment estimates in construction by the United States Department of Commerce, 7,072,000 full and part-time employees worked in construction in 2001. That number declined to 6,986,000 in 2002, 6,913,000 in 2003 and 6,827,000 in 2004. It is possible that as construction firms downsized, Hispanic workers, who are often newly employed, were the first to be laid off as a result of the work slowdown. As shown in Table 1, an analysis of variance (ANOVA) analysis of hourly paid Hispanic and non-Hispanic construction workers indicates there is a statistical difference at the 90% confidence level in job tenure between these two groups. When asked how long they had been working continuously for their current employer during the CPS supplemental survey in 2000, surveyed Hispanic construction workers indicated an average of 6.6 years and non-Hispanic construction workers indicated an average of 8.2 years. At least from this limited sample of construction workers, non-Hispanic workers had worked on average 1.6 years more with their current employers than their Hispanic counterparts.

Table 1. Job Tenure of Hourly Paid Hispanic and Non-Hispanic Construction Workers

	Hispanic			Non-Hispanic			df	F value	Significance
	Mean	Standard deviation	N	Mean	Standard deviation	N			
Job tenure (years)	6.62	7.04	76	8.18	7.76	372	447	2.62	0.10

Note: Data source: BLS CPS, Supplemental Survey, February 2000.

While Hispanics are currently a minority in the overall United States construction workforce, Hispanics are already the majority in some states' construction workforce and may soon be the majority in others. According to 2001 CPS data, Hispanics were the majority in the overall construction workforce in Texas, New Mexico, and California by making up 69.4, 55.9, and 51.4% of the respective state's construction workforce.

Unfortunately, the increased employment of Hispanic workers in construction has not occurred without an expense to the health and safety of their population. Since 1994, Hispanic construction workers have had markedly higher fatal occupational injury rates than their non-Hispanic counterparts. In 2000 and 2001, while overall workplace fatalities were falling, deaths among Hispanic workers were rising – by 12% in 2000 and 10% in 2001. In 2002, the Assistant Secretary of Labor for Occupational Safety and Health, John Henshaw, highlighted the fact that Hispanic workers, in all industries, accounted for a disproportionate number of occupational fatalities of 13.8% compared with their proportion of employment of 10.7% (Henshaw, 2002). One reason offered for the disparity of accidents involving Hispanics was their heavy employment in construction compared to other industries. Unfortunately in construction, Hispanics also appear to experience a larger number of accidents compared to their level of employment. According to the United States Census between 1996 and 1999, there was a 40% increase in fatalities among Hispanic construction workers even though there was less than a 20% increase in their level of employment. In 2001, the rate of work-related deaths from construction injuries for Hispanics was 19.5 per 100,000 full-time workers – 62.5% higher than the rate of 12.0 for non-Hispanic construction workers. The 840 fatal work injuries recorded for Hispanic workers in 2002 accounted for the second highest annual total ever for that population, while, for the same time frame, among black non-Hispanic workers, a total of 491 fatalities were recorded, the lowest annual count ever for that population.

Consequent to above, this research attempts to look into the root causes of workplace injuries among Hispanic construction workers due to safety hazards with the aim to identify any additional information that might be helpful in reducing workplace injuries due to safety hazards.

2. OBJECTIVES

The aim of the research presented in this paper is to analyze the workplace injuries among Hispanic construction workers based on data collected from various sources, and to diagnose the root causes of higher rate of workplace injuries among Hispanic workers as compared to the Non-Hispanic workers associated with the U.S. construction industry. Consequently, the research reported in this paper has following major objectives:

1. To analyze the workplace injuries among Hispanic construction workers.
2. To determine the root causes of workplace injuries among Hispanic construction workers.
3. To propose recommendations for reducing the higher rate of workplace injuries in Hispanic construction workers.

3. METHODOLOGY

DATA SOURCES

This study uses six data sources: the U.S. Bureau of Labor Statistics' (BLS) survey of occupational injuries and illnesses (SOII), census of fatal occupational injuries (CFOI), current population survey (CPS), current employment survey (CES), Center to Protect Workers' Rights' (CPWR) construction chart book, and the National Institute for Occupational Safety and Health's (NIOSH) Hispanic fatality investigation reports. Data on the number of injuries and illnesses of both Hispanic and non-Hispanic construction workers in different occupations were obtained from the SOII. The SOII is an annual survey that collects data on nonfatal workplace injuries and illnesses from a random sample of 176,000 private industry establishments. The BLS applies weights to each observation in order to estimate the number of occupational injuries and illnesses occurring in the population. For each sampled injury and illness, the SOII collects data on an injured worker's age, gender, occupation, race, as well as the nature of the injury. While race is a data element in the SOII, it is not a required field. As a result, race/ethnicity is unreported for 28% of the cases from 1998 to 2001 (Richardson et al., 2003). In addition, the SOII is a survey instead of a census, and it is therefore subject to sampling error. The CFOI is also managed by the BLS and provides data on the number of fatal accidents of workers by occupation. The CFOI collects detailed data on all work related fatalities including employee work status (hourly wage or salaried worker), gender, occupation, age, and race. Like the SOII, race is not reported for a number of cases in the CFOI and is not self

declared, which may result in coding errors. Another data source used in the study is the CPS, which was used to supply data on hours worked by Hispanic and non-Hispanic construction craft workers as well as provide percentages on the level of employment of Hispanic and non-Hispanic craft workers for different occupations. The CPS is a monthly survey of approximately 50,000 households conducted by the U.S. Census Bureau for the U.S. Department of Labor. Each month, the CPS randomly selects 59,000 housing units (e.g. single family homes, townhouses, condominiums, apartment units, and mobile homes) for the sample, and approximately 50,000 are occupied and eligible for the survey. The other units are found ineligible, because they have been destroyed, vacant, converted to nonresidential use, or contain persons whose usual place of residence is elsewhere. Respondents are asked questions about the employment information and demographic characteristics of each member of the household over 14 years of age. Another source is the CES, which was used to supply data on employment levels of different construction occupations. The CES is a monthly survey of 160,000 businesses and government agencies that gathers data on employment numbers, hours, and employee earnings. The final two data sources are the Center to Protect Workers' Rights' (CPWR) Construction Chart Book and the National Institute for Occupational Safety and Health's (NIOSH) Hispanic fatality investigation reports.

DATA ANALYSIS

After careful examination of data collected from abovementioned sources, analysis has been made to find out the root causes and suggest remedial actions to cater workplace injuries among foreign and native born Hispanic construction workers. This is illustrated in the next section of this paper.

4. ANALYSIS RESULTS

In this section, analysis of various data collected from afore-mentioned sources in relation to involvement and workplace safety of Hispanic workers in the U.S. industry will be illustrated. For ease of interpretation and connectivity, these data have been divided into the following subsets:

1. Composition of Hispanic Population as a Percentage of U.S. Population (1980-2000)
2. Composition of Hispanic employees as a percentage of each industry (2000)
3. Hispanic employees as a percentage of construction and all industries (1980 – 2000)
4. Fatal occupational injuries and diseases by industries (2003)
5. State-wise percent of fatal workplace injuries involving Hispanics workers (1992–2004)
6. Fatal workplace injuries of native and foreign born Hispanic workers among all industries (1996–2004)
7. Fatal workplace injuries among Hispanic native and foreign born construction workers (1993–2002)

Above mentioned data subsets are illustrated in following sections.

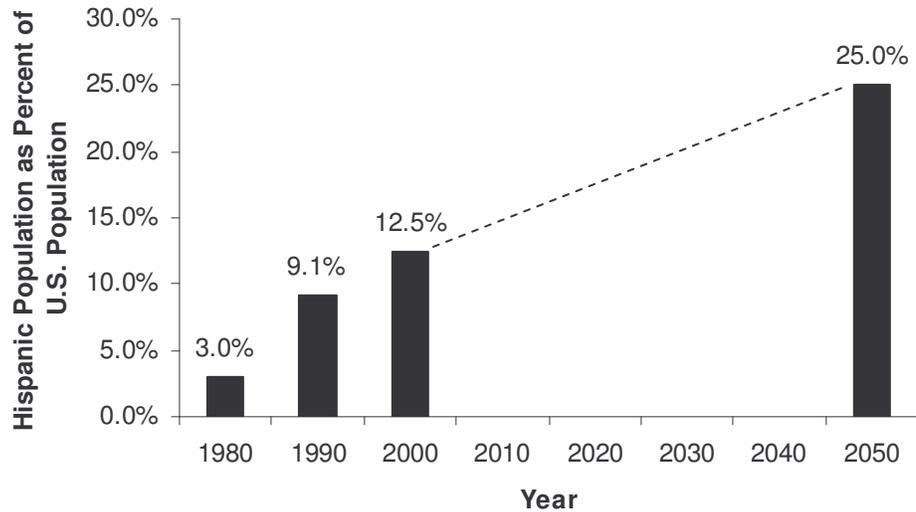
COMPOSITION OF HISPANIC POPULATION AS A PERCENTAGE OF U.S. POPULATION (1980–2000)

Immigration of Latin Americans to the United States has had a major impact on the makeup of the U.S. population over the past 25 years. Hispanics accounted for only 3 percent of the U.S. population in 1980. By 1990, that percentage had risen to 9.1 percent, and in 2000, Hispanics represented about 12.5 percent of the U.S. population, or about one in eight Americans (see Figure 2).

By 2050 or earlier, the Census Bureau projects that the Hispanic population will account for one out of every four Americans (see Figure 2).

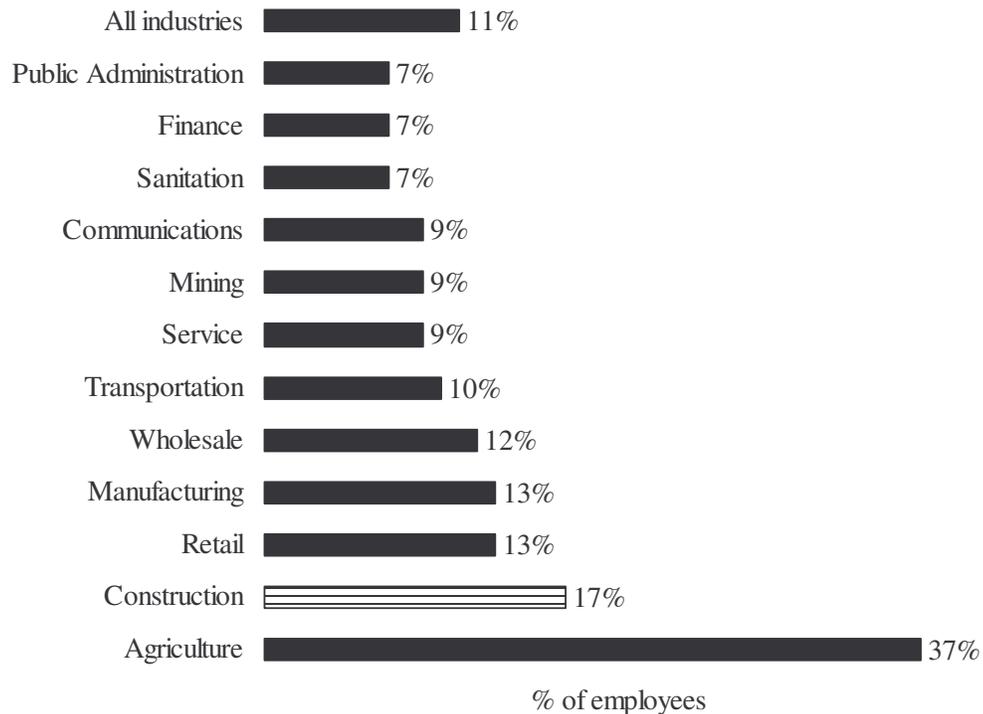
COMPOSITION OF HISPANIC EMPLOYEES AS A PERCENTAGE OF EACH INDUSTRY (2000)

Construction has become the sector of the workforce with the highest percentage of Hispanic workers outside of agriculture, accounting to 17% of Hispanic workers in 2000 (see Figure 3).



Data source: U.S. Census Bureau, Monthly Labor Review, October 2005

Figure 2: Composition of Hispanic Workers as Percentage of U.S. Population (1980–2000; projected 2050)

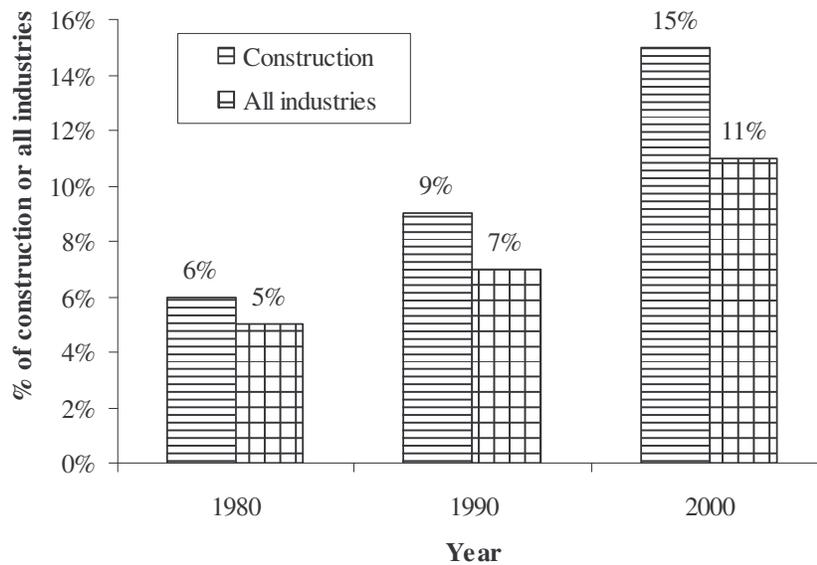


Data source: U.S. Census Bureau, 2000.

Figure 3: Composition of Hispanic Employees as a Percent of each Industry (2000)

HISPANIC EMPLOYEES AS A PERCENTAGE OF CONSTRUCTION AND ALL INDUSTRIES (1980 – 2000)

Figure 4 illustrates the percentage composition of Hispanic employees in the construction industry as well as in all industries (in combination) for the period 1980-2000. Results clearly depict that the proportion of Hispanic workers in the construction industry has always remained higher as compared to their industry wide average for the same year, and this trend has continuously increased over the period 1980-2000 i.e. construction industry has attracted even higher proportions of Hispanic workers over the period of time.

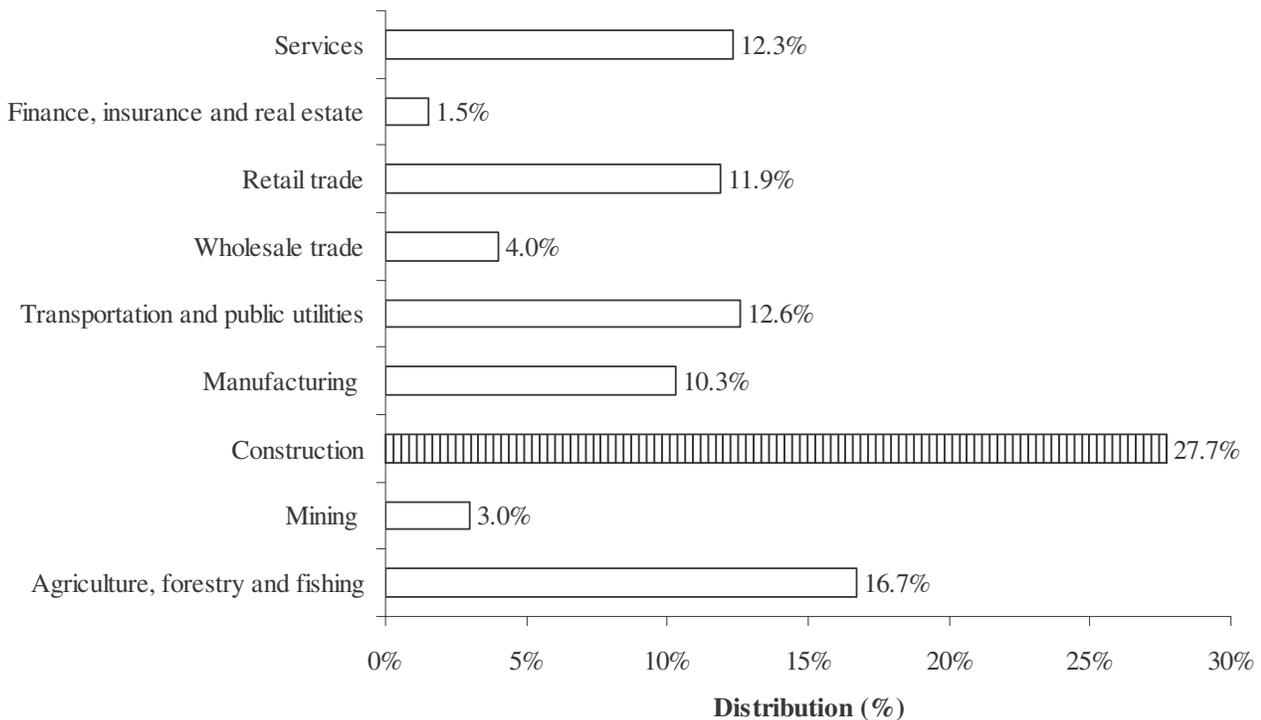


Data source: U.S. Census Bureau, 2000.

Figure 4: Hispanic employees as a percentage of construction or all industries (1980-2000)

FATAL OCCUPATIONAL INJURIES AND DISEASES BY INDUSTRIES (2003)

Construction has the highest percentage of fatal occupational injuries and diseases as evident from the data given in Figure 5.



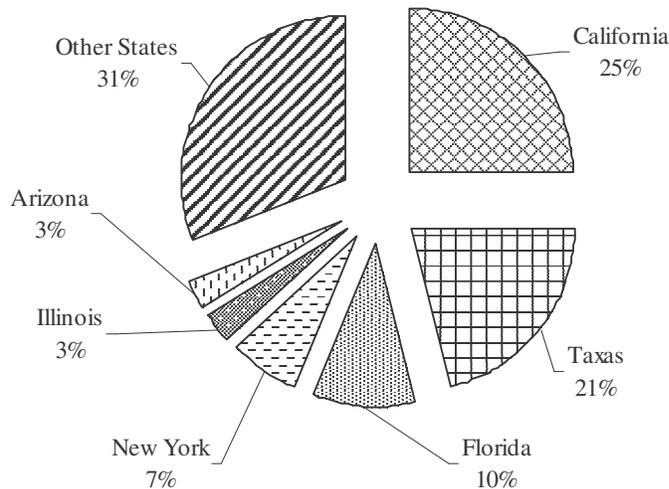
Data source: BLS, 2003

Figure 5: Fatal occupational injuries and diseases by industry

STATE-WISE PERCENT OF FATAL WORKPLACE INJURIES INVOLVING HISPANICS WORKERS (1992–2004)

Most of the fatal work injuries involving Hispanic workers from 1992 to 2004 that occurred in the U.S. were traditionally associated with large Hispanic populations – California, Texas, Florida, and New York (see Figure 6). However, Hispanic populations are growing in many States not traditionally known for large Hispanic populations. For example, the fastest growing Hispanic populations in the 1990s on a percentage basis were in North Carolina, Arkansas, Georgia, and Tennessee, according to the Census Bureau.

It is important to note that the type of fatal and nonfatal injury events among Hispanic workers varies from state to state based on the types of industries in those states. Therefore, interventions will need to focus more at a local level to be successful.



Data source: Census of Fatal Occupational Injuries, Monthly Labor Review October 2005.

Figure 6: State-wise percent of fatal workplace injuries involving Hispanics workers (1992–2004)

FATAL WORKPLACE INJURIES OF NATIVE AND FOREIGN BORN HISPANIC WORKERS AMONG ALL INDUSTRIES (1996–2004)

Disproportionate representation in higher-risk jobs has led to higher numbers and rates of fatal occupational injuries among Hispanic workers.

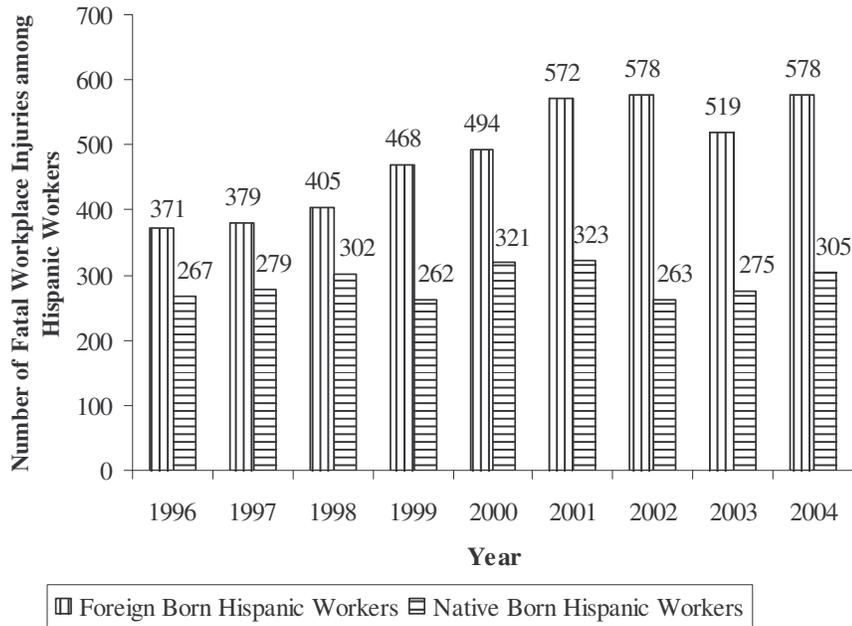
The number of fatal injuries to Hispanic workers rose from 533 in 1992, when the fatality census was first conducted, to a high value of 895 in 2001. At a time when fatalities were declining for workers in general, both the number and rate of fatal injuries of Hispanic workers were rising. While fatal injuries among Hispanic workers declined in 2002 and 2003, the number and rate were again higher in 2004 (see Figure 7).

Nearly two-thirds of the fatalities among Hispanic workers from 1996 to 2004 involved foreign-born workers (see Figure 7).

FATAL WORKPLACE INJURIES AMONG HISPANIC NATIVE AND FOREIGN BORN CONSTRUCTION WORKERS (1993–2002)

In 1992, when the fatality census was first conducted, fatally injured Hispanic workers accounted for about 1 in 10 private construction fatalities. In 2002, that fraction rose to about one in five. Overall, about a fourth of the fatal work injuries among Hispanic workers occurred in construction over this period (see Figure 8).

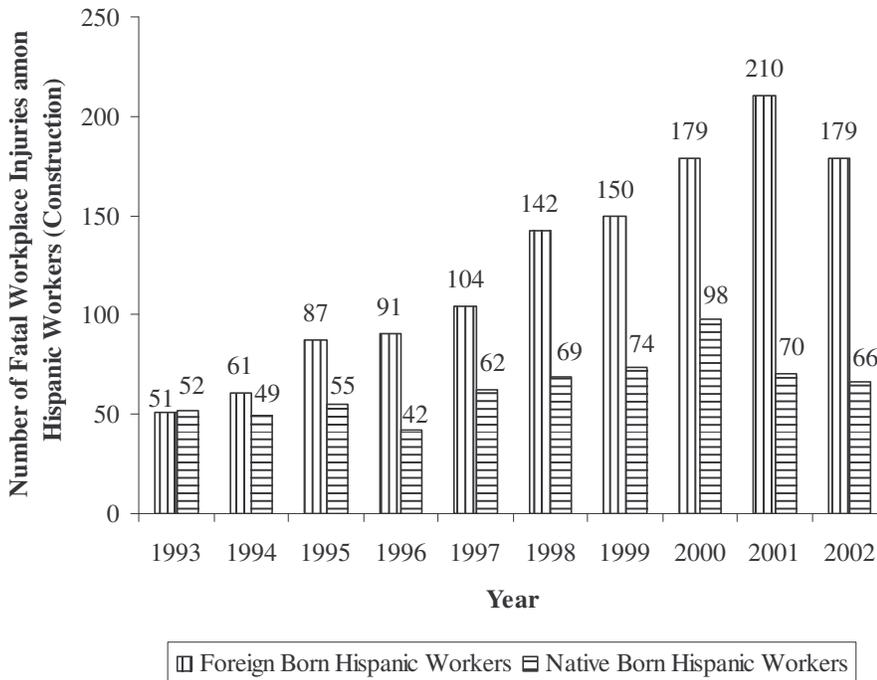
The number of fatal work injuries involving foreign-born Hispanic workers has risen substantially in construction and was about 3½ times higher in 2002 than it was in 1993 (see Figure 8).



Data source: Census of Fatal Occupational Injuries, Monthly Labor Review October 2005.

Figure 7: Fatal workplace injuries of native and foreign born Hispanic workers among all industries (1996–2004)

Note also that in 1993, foreign-born workers accounted for about half of the fatalities involving Hispanic construction workers. In 2002, foreign-born workers accounted for nearly three out of every four construction fatalities involving Hispanic workers (see Figure 8).



Data source: Census of Fatal Occupational Injuries, Monthly Labor Review October 2005.

Figure 8: Fatal workplace injuries of native and foreign born Hispanic workers in construction (1993–2002)

5. ROOT CAUSES

Common reasons that can be attributed to the disproportionate number of workplace injuries among Hispanic workers are as follows:

- Differences in language, culture, and occupation. The human aspects of the construction environment can have just as a significant impact on a worker's health and safety as the work itself (Hinze, 1981). Of paramount importance is the ability for many Hispanics to understand the language in which they receive their health and safety training. A majority of the study participants indicated that they did not understand a substantial amount of their health and safety training when the material was delivered to them in English. In 2001, 28.8% of Hispanic construction workers spoke only English according to CPS data, while the rest were bilingual or spoke only Spanish.
- There is reluctance on behalf of many Hispanic construction workers to challenge authority on United States construction jobsites (as also noted by Nash, 2004). For example, a Hispanic worker may not request personal protection equipment when needed out of fear of losing his or her job. In addition to overcoming language, addressing this reluctance during the health and safety training by verifying what they have been taught is the key to successful training programs for Hispanic construction workers (Halcarz, 2003).
- Hispanic workers, with their limited job prospects, are more likely than U.S. – born workers to do things that are more dangerous because they are more afraid about losing their job if they refuse to do it.
- Hispanic workers might be more afraid to speak up about dangerous things on the job.
- Hispanic workers are more likely to be employed by unreliable contractors who are not practicing safety precautions.
- Hispanic workers tend to be disproportionately represented in higher-risk, lower-wage jobs. Lower educational attainment, fewer job skills, and in some cases, lack of proficiency in the English language may contribute to this trend, especially among the foreign born. According to the Census Bureau, only about 11 percent of Hispanics in the United States have a college degree, as compared with nearly 30 percent of non-Hispanic whites.

6. RECOMMENDATIONS

Based on the findings of the study, following are some recommendations for reducing the higher rate of workplace injuries in Hispanic construction workers:

- Certainly, additional health and safety training would benefit both Hispanic and non-Hispanic construction workers. However, traditional formal training techniques may have a limited effectiveness with the Hispanic construction workforce due to their level of education and their limited ability to understand English. Instead, mentoring newly employed Hispanic workers with experienced, well trained workers may be a particularly well suited training approach for this specific segment of the construction work force.
- Employers should ensure that pre-work safety meetings are conducted each day to discuss the work to be performed, identify the potential safety hazards, and implement safe work procedures to control the hazards. The use of the workers' primary language(s) and careful consideration of literacy levels will maximize worker comprehension of these subjects.
- Employers should train workers in hazard recognition and safe work practices for all tasks to which they are assigned or allowed to perform, including those pertaining to work requiring lockout/ tagout and work in a permit-required confined space. Again, the use of the workers' primary language(s) and careful consideration of literacy levels will maximize worker comprehension of these subjects.
- Employers should develop, implement and enforce a comprehensive safety and training program in language(s) and literacy level(s) of workers, which includes training in hazard recognition and the avoidance of unsafe conditions, including the identification of blind areas around construction vehicles.
- Employers should post warning signs in a language(s) that all workers can understand at entrances to each permit-required confined space, warning of immediate danger and safety requirements for entry.

- Employers should ensure that workers who are part of a multilingual workforce comprehend instructions in safe work procedures for the tasks to which they are assigned.
- Employers should ensure that safe work rules are adopted by all construction workers on site, irrespective of their origin, social and cultural bindings.
- Occupational Safety and Health Administration (OSHA) has developed the Compliance Assistance: Hispanic Employers and Workers web page to assist employers with a Spanish-speaking workforce in learning more about workplace rights and responsibilities, identifying Spanish-language outreach and training resources, and learning how to work cooperatively with OSHA. In addition, the Compliance Assistance: Hispanic Employers and Workers web page provides a list of OSHA's Hispanic/ English-as-a-second-language coordinators. These materials are available at the website address given below or can be obtained by contacting an area OSHA office. Information provided can be used by employers who are developing or improving safety and training programs for their Spanish speaking employees. The website address is: http://www.osha.gov/dcsp/compliance_assistance/index_hispanic.html
- Additional research examining the health and safety training actually received among Hispanic workers and the effectiveness of the training received would help confirm this. In particular, the writers suggest further studies examining differences among detailed occupations that also aggregate the data over multiple years for the statistical analysis. Aggregation of multiple year data will increase the sample size, which could uncover differences with greater statistical significance. Since the Hispanic construction population is the fastest growing population among the United States construction workforce, additional research in this area is warranted and needed to help develop and guide industry policy and training initiatives.

REFERENCES

- Center to Protect Workers Rights (CPWR). (2002). *The construction chart book: The U.S. construction industry and its workers*, Washington, D.C.
- Halcarz. (2003). "Safety training for diverse worker populations." *Occupational Hazards*, Penton Media, Inc., Cleveland, Ohio, 35–37.
- Henshaw, J. (2002). "Statement of John L. Henshaw, Assistant Secretary of Labor for Occupational Safety and Health, before the Subcommittee on Employment, Safety and Training Committee on Health, Education, Labor and Pensions, United States Senate." (http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=TESTIMONIES&p_id=286) (October 14, 2003).
- Hinze, J. (1981). "Human aspects of construction safety." *J. Constr. Div., Am. Soc. Civ. Eng.*, 107_1_, 61–72.
- Nash, J. (2004). "Construction safety: Best practices in training Hispanic workers." *Occupational hazards*, Penton Media, Inc., Cleveland, Ohio, 35–37.
- National Safety Council. (2002). *Hispanics at Risk: National Safety Council and Environmental Protection Agency Hold Second In a Series of Forums Exploring Health Safety Issues Among Hispanics*. (www.nsc.org/gov/hispanic.htm.)
- National Institute for Occupational Safety and Health (NIOSH). (2004), *Hispanic fatality investigation reports*.
- Richardson, S., Ruser, J., and Suarez, P. _2003_. "Hispanic workers in the United States: An analysis of employment distributions, fatal occupational injuries, and non-fatal occupational injuries and illnesses." *Safety is Seguridad: Proc., A Workshop Summary*, The National Academy of Sciences, Washington, D.C.
- U.S. Department of Labor, Bureau of Labor Statistics. (2001) *National Census of Fatal Occupational Injuries in 2000*.
- U.S. Department of Labor, Office of Public Affairs. (2002) *OSHA National News Release, (February 2002)*

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