

Differences in Occupational Injuries, Illnesses, and Fatalities among Hispanic and Non-Hispanic Construction Workers

Paul M. Goodrum¹ and Jiukun Dai²

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. Unfortunately, this has occurred with costs in the health and safety of Hispanic construction workers. Using data from 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, this study examines relative differences in injuries, illnesses, and fatalities between Hispanic and non-Hispanic construction workers by occupation. The findings show that differences in injuries, illnesses, and fatalities exist between Hispanic and non-Hispanic construction workers, although not always unfavorably toward Hispanics, and the difference does vary by occupation. The implication of the increasing size of the Hispanic construction workforce with respect to construction safety and health training needs is discussed.

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Introduction

Over the past 2 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. Between 1994 and 2002, the number of Hispanic hourly construction workers in the United States increased significantly from 9.2 to 16.7% of the total hourly (paid) construction workforce (see Fig. 1).

It is noted that the percentage of the total hourly construction workforce being Hispanic did decline from 17.5 to 16.7% from 2001 to 2002. 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. 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.

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 those 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. 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

¹Assistant Professor, Dept. of Civil Engineering, 151C Raymond Building, Univ. of Kentucky, Lexington, KY 40506-0281 (corresponding author). Email: pgoodrum@engr.uky.edu

²Graduate Research Assistant, Dept. of Civil Engineering, Univ. of Kentucky, Lexington, KY 40506-0281.

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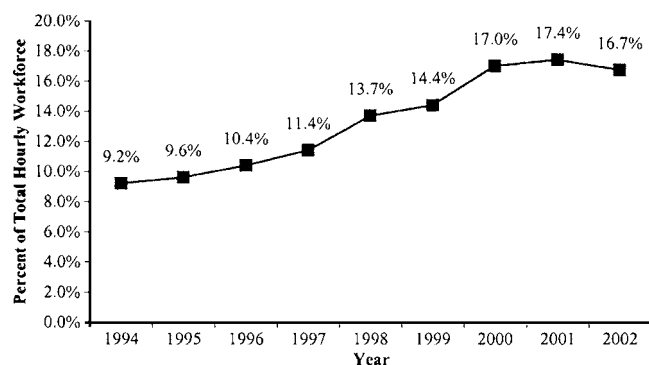


Fig. 1. Percentage of Hispanic construction workers by percentage of total hourly (paid) construction workers in United States, 1994–2002

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.

Common reasons to explain the disparity of accidents between Hispanic and non-Hispanic construction workers are differences in language, culture, and occupation. As shown by others, 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 recent study by Ruttenberg and Lazo (2004) involved in-depth interviews of 47 Spanish speaking construction workers. 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. Anecdotal evidence suggests there is a reluctance on behalf of many Hispanic construction workers to challenge authority on United States construction jobsites (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 key to successful training programs for Hispanic construction workers (Halcarz 2003).

It has been verified by many that the Hispanic construction workforce does experience a disproportionate number of fatalities and injuries compared to their non-Hispanic counterparts (Henshaw 2002; Hoover 2002; WISH 2002; BNA 2003; Moure-Eraso and Friedman-Jimenez 2003; Pittman 2003; and Richardson et al. 2003). In particular, Richardson et al. (2003) found that a relative risk of death from occupational injuries for Hispanic construction workers was 4.76 compared to 2.85 for White non-Hispanics and 3.77 for Black non-Hispanics. The researchers defined relative risk as the injury or fatality rate for a group divided the injury or

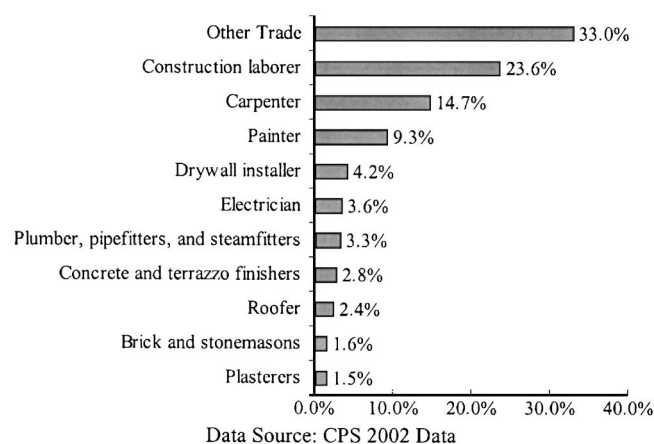


Fig. 2. Percentage of Hispanics in United States construction workforce by occupation

fatality rate for all workers. From 1997 to 1999, the construction occupations with the worse rate of fatalities per 100,000 workers were as follows (CPWR 2002):

1. iron worker 84.9,
2. construction laborer 43.7,
3. roofer 29.2,
4. operating engineer 20.9,
5. electrical worker 16.3,
6. painter 8.1,
7. carpenter 7.7,
8. plumber 6.4, and
9. all construction 13.8.

As shown in Fig. 2, a number of these same occupations, particularly construction laborer, are also the most populated by Hispanic workers.

Differences in formal education between Hispanic and non-Hispanic construction workers is also a concern. According to 1998–2001 CPS data, Hispanic construction workers had 9.57 mean years of education compare to 12.07 for non-Hispanic construction workers (Goodrum 2004). Unfortunately, no data currently exist describing the differences of the quantity and quality of health and safety training offered to Hispanic and non-Hispanic construction workers. As for the ability of the Hispanic workers to understand the training they receive, it is presumed that a majority of the training received is 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.

The fact that a disproportionate number of Hispanic construction workers are being injured or killed on the job cannot be disputed. What remains uncertain is if this disparity exists when one controls for detailed occupations. As mentioned, one theory for the disparity is that Hispanic construction workers tend to work in more hazardous occupations compared to their non-

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

^aNote: Data source: BLS CPS, Supplemental Survey, February 2000.

Hispanic counterparts. This paper examines if Hispanic construction workers still experience more injuries, illnesses, and fatalities if the comparison is made among some of the more hazardous occupations in which Hispanics are commonly employed. According to the U.S. Bureau of Labor Statistics 2002 current population survey, the five most common construction occupations among Hispanics were: (1) carpenter, (2) construction laborer, (3) painter, (4) drywall installer, and (5) electrician. A better understanding of whether Hispanic construction workers suffer more occupational fatalities, injuries, and/or illnesses due to a disproportionate employment in more hazardous construction occupations versus non-Hispanic construction workers has direct implications on governmental and industry policy as to how to improve the health and safety of this growing workforce population.

Methodology

Data Sources

This study uses four data sources: the U.S. Bureau of Labor Statistics' (BLS) CPS, current employment survey (CES), survey of occupational injuries and illnesses (SOII), and census of fatal occupational injuries (CFOI). 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. The fourth data 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.

Incident Rates

Incident rates based on worker injury/illness and fatalities were used as a health and safety comparison between Hispanic and non-Hispanic workers. The injury/illness rate was calculated based on the number of nonfatal occupational injuries and illnesses involving days away from work as reported by the SOII in the following equation:

$$\text{injury and illness rate} = (N/EH) \times 200,000 \quad (1)$$

where EH =total hours worked by all full-time employees during the calendar year; N =number of injury and illnesses involving days away from work; and 200,000=base for 100 equivalent full-time workers (working 40 h/week, 50 weeks/year).

The SOII does collect data on the total hours worked by all employees in the sample, but that information is considered confidential and is not published by the BLS (Jones 2003). For the purpose of this study, the total hours worked for Hispanic and non-Hispanic workers were calculated based on the total number of workers by occupation and race as reported by the CES and the average hours worked per week by occupation and race as reported by the CPS.

The research also compared the fatality rate between Hispanic and non-Hispanic workers for different occupations. The fatality rate was calculated based on the number of occupational fatalities for Hispanic and non-Hispanic workers as reported by the CFOI in the following equation:

$$\text{fatality rate} = (N/EH) \times 200,000,000 \quad (2)$$

where EH =total hours worked by all employees during the calendar year; N =number of occupational fatalities; and 200,000,000=base for 100,000 equivalent full-time workers (working 40 h/week, 50 weeks/year).

The CES and CPS were again used to provide estimates of total hours worked.

Analysis of Injuries and Illnesses

One theory for the increased number of construction accidents involving Hispanic workers is their disproportionate employment in more hazardous occupations. To control for this effect, the study examined the injury and illness rate, based on Eq. (1), for each of the study's five detailed occupations. The comparison of the injury and illness rates are among Hispanics, non-Hispanic Whites, and non-Hispanic Blacks, which are race categories developed by the BLS. In the case of carpenters, laborers, painters, and electricians, Hispanics had a slightly lower rate than their White non-Hispanic counterparts while Black non-Hispanics had the lowest rate. In the case of drywall installers, Hispanics did have the highest injury and illness rate of all three groups in 2002 (Fig. 3).

Although the comparison of accident rates is useful, it only provides an examination of the frequency of injuries and illnesses. To examine if statistical differences exist, cross tabulations and chi squares were also performed. The number of injuries and illnesses for Hispanics and non-Hispanics by each occupation were again based on the estimates of the population from SOII. These total numbers of injuries and illnesses were compared to

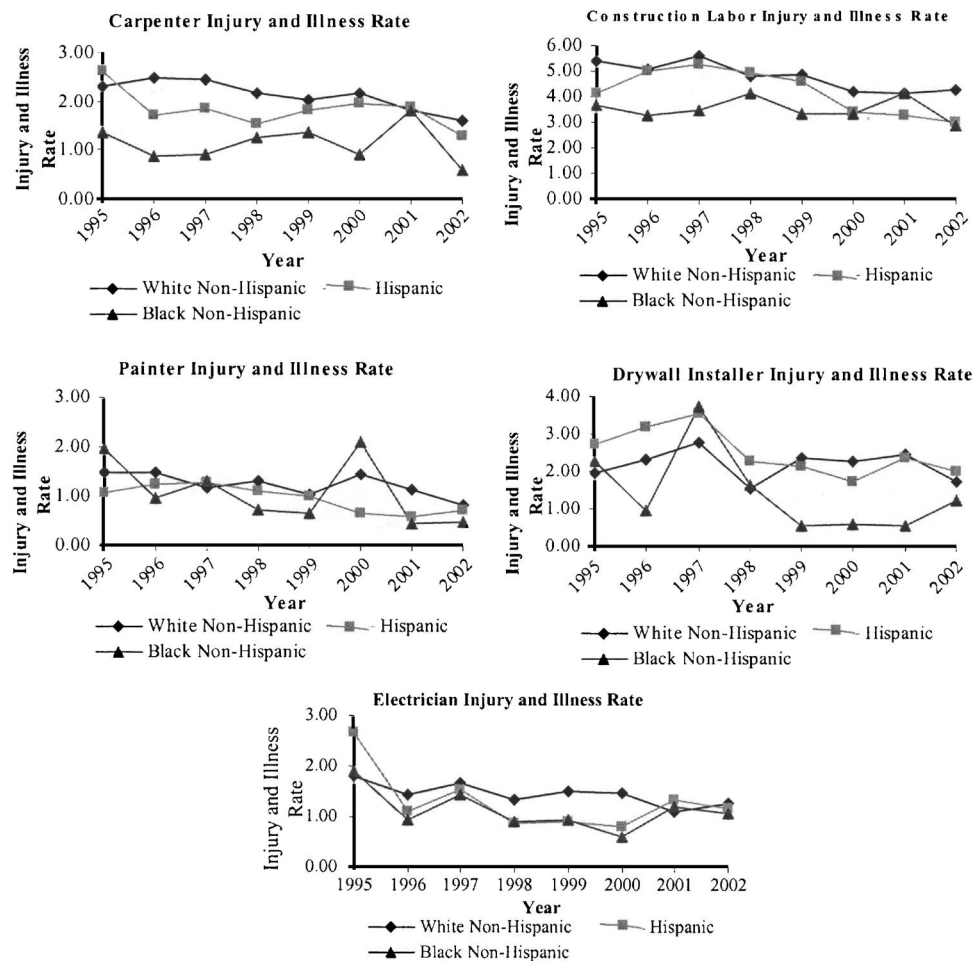


Fig. 3. Occupational injury and illness rate for Hispanic and non-Hispanic workers

the total population of each group as determined by CPS and CES data. One limitation with this method of analysis is that the total hours worked, which represents the exposure to risk of an injury and illness, is not considered. However, an analysis of CPS microdata indicates that only Hispanic and non-Hispanic painters and drywall installers had statistically significant differences in the mean weekly hours worked. The F -value measure was 3.80 (p value=0.051) among painters and 7.76 (p value=0.006) among drywall installers (see Table 2).

Hispanic painter and drywall installers worked on average 1.29 and 2.47 h more per week, respectively, than their non-

Hispanic counterparts. There was no substantial or statistical difference in the mean weekly hours worked for the study's other three occupations.

Table 3 displays the cross tabulations on injuries and illnesses occurring in 2002 for the study's five occupations. Each column shows the counts of workers who did and did not experience an injury or illness involving days away from work with the column percentages in parentheses.

As shown for each occupation, Hispanics have a comparable percentage of workers experiencing an occupation injury or illness compared to White and Black non-Hispanics, except among

Table 2. Mean Weekly Hours Worked for Hispanic and Non-Hispanic Construction Workers

Occupation	Hispanic			Non-Hispanic			df	F value	Significance	Difference (h)
	Mean	Standard deviation	N	Mean	Standard deviation	N				
Carpenter	38.06	10.16	588	38.59	10.66	3,735	4,322	1.29	0.256	-0.53
Construction laborer	37.14	8.92	752	37.48	12.37	2,205	2,956	0.47	0.491	-0.34
Painter	37.77	6.63	390	36.48	12.39	1,214	1,603	3.80	0.051	1.29
Drywall installer	39.71	10.20	192	37.24	9.84	368	559	7.76	0.006	2.47
Electrician	40.02	6.83	133	40.25	9.92	1,517	1,649	0.07	0.785	-0.23

Note: Data Source (CPS 2002).

Table 3. Injuries and Illnesses Involving Days Away from Work among Hispanic and Non-Hispanic Construction Occupations

		Race		
		Hispanic	White non-Hispanic	Black non-Hispanic
		Carpenter ^b		
Occupational injury or illness in 2002	Yes	4,075 (1.24%)	17,307 (1.55%)	512(0.58%)
	No	324,155 (98.76%)	1,101,801 (98.45%)	87,016 (99.42%)
	Total	328,230 (100%)	1,111,528(100%)	87,528 (100%)
	Difference to Hispanic		+0.30%	−0.66%
	Level of significance ^a		0.000	0.000
		Construction laborer ^c		
Occupational injury or illness in 2002	Yes	10,036 (2.77%)	23,118 (4.00%)	2,835 (2.68%)
	No	352,601 (97.23%)	555,141 (96.00%)	102,798 (97.32%)
	Total	362,637 (100%)	578,259 (100%)	105,633 (100%)
	Difference to Hispanic		+1.23%	−0.08%
	Level of significance ^a		0.000	0.140
		Painter ^d		
Occupational injury or illness in 2002	Yes	1,394 (0.69%)	2,780 (0.76%)	225 (0.45%)
	No	202,000 (99.31%)	365,422 (99.24%)	50,133 (99.55%)
	Total	203,394 (100%)	368,202 (100%)	50,358 (100%)
	Difference to Hispanic		+0.07%	−0.24%
	Level of significance ^a		0.003	0.000
		Drywall installer ^e		
Occupational injury or illness in 2002	Yes	1,508 (1.99%)	1,606 (1.59%)	72 (1.13%)
	No	74,414 (98.01%)	99,187 (98.41%)	6,286 (98.87%)
	Total	75,922 (100%)	100,793 (100%)	6,358 (100%)
	Difference to Hispanic		−0.39%	−0.85%
	Level of significance ^a		0.000	0.000
		Electrician ^f		
Occupational injury or illness in 2002	Yes	1,106 (1.17%)	8,811 (1.29%)	652 (1.07%)
	No	93,714 (98.83%)	675,617 (98.71%)	60,550 (98.93%)
	Total	94,820 (100%)	684,428 (100%)	61,202 (100%)
	Difference to Hispanic		+0.12%	−0.10%
	Level of significance ^a		0.001	0.062

^aThese values are the result of the application of the test of significance of the difference between two proportions. Data source: SOII (2002).

^bChi-square for the overall difference between columns, with d.f.=2, is 635.34, significance=0.000.

^cChi-square for the overall difference between columns, with d.f.=2, is 1217.73, significance=0.000.

^dChi-square for the overall difference between columns, with d.f.=2, is 61.99, significance=0.000.

^eChi-square for the overall difference between columns, with d.f.=2, is 53.32, significance=0.000.

^fChi-square for the overall difference between columns, with d.f.=2, is 29.45, significance=0.000.

drywall installers where Hispanics have the highest percentage. The difference in frequency of accidents is statistically significant for all five occupations.

One problem with the above analyses is the number of nonresponses in regards to the race of the construction workers experiencing an occupational injury or illness. In 2002, the numbers of nonreported races of injured or ill carpenters, construction laborers, painters, drywall installers, and electricians were 6,069, 5,437, 878, 911, and 3,743 respectively. For this study, cases where race was not reported were not included in the analyses. This approach uses the assumption that nonreported cases would follow the same pattern as reported in the observed data.

Analysis of Fatalities

To further examine the effects of occupation on the health and safety of Hispanic construction workers, the study examined the differences in fatality rates by race among the five trades. The fatality rates based on Eq. (2) are plotted for the five occupations in Fig. 4.

Examination of the 8 year fatality rates for Hispanics and non-Hispanics shows that some years Hispanics had higher fatality rates and other years they experienced either comparable or lower fatality rates. However based on the last year of the analysis, 2002, Hispanics did experience notably higher fatality rates among drywall installers and electricians, meanwhile, the

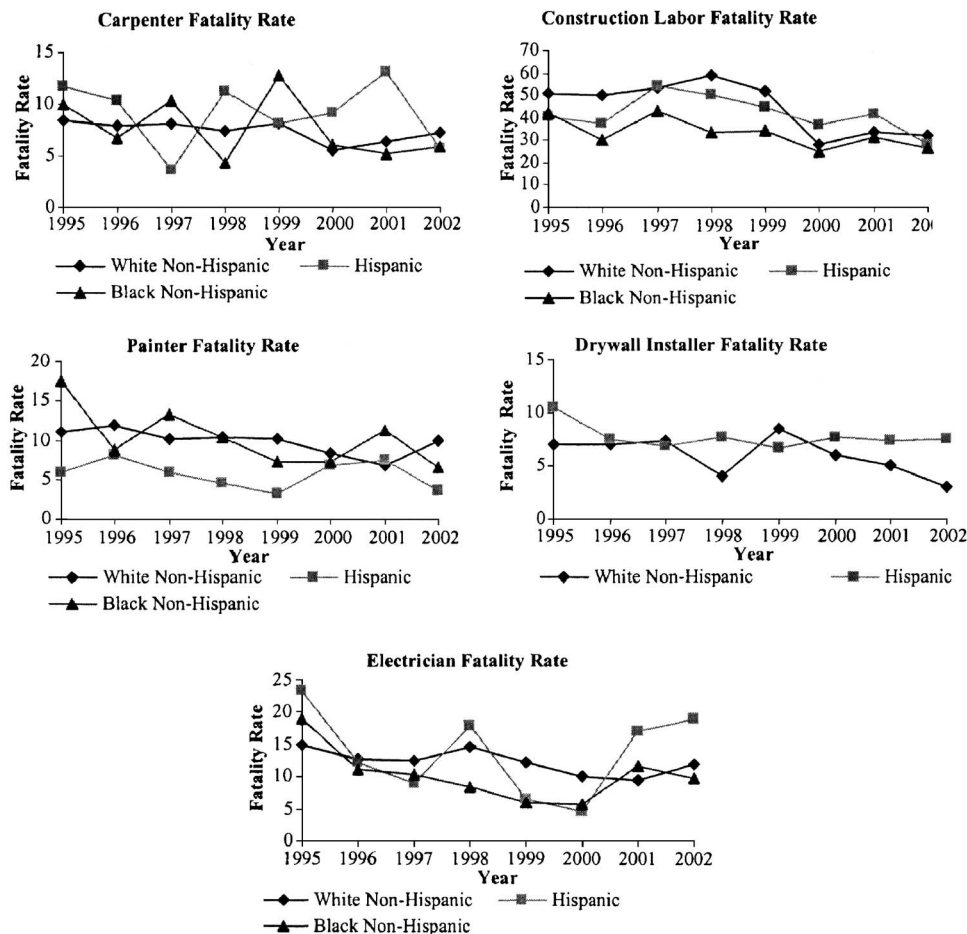


Fig. 4. Occupational fatality rate for Hispanic and non-Hispanic workers

fatality rate of Hispanic painters is lower than their non-Hispanic counterpart.

Again, cross tabulations and chi squares are used to examine if the differences are statistically significant (Table 4).

The differences in the frequency of fatalities as measured by the chi squares and significance test of the difference between proportions between Hispanic and non-Hispanic construction workers by occupation are mixed. Although Hispanic drywall installers and electricians experienced a greater frequency of fatalities in 2002, the differences by race of these occupations was not statistically significant according to the chi square analysis. On the other hand, Hispanic carpenters, laborers, and painters experienced less frequency of fatalities in 2002, but only the difference in fatalities among painters by race was statistically significant ($\chi^2=5.85$).

Conclusion

Clearly, there are too many construction workers, both Hispanic and non-Hispanic, being injured or killed on the job. The disproportionate number of injuries and fatalities among all Hispanics compared to all non-Hispanics is not being disputed by the writers nor is the seriousness of this situation being lessened. This paper explores one possible reason for this disparity: the disproportionate rate of Hispanic employment in the more hazardous construction occupations. In recent years, the increased number of injuries, illnesses, and fatalities experienced by Hispanic con-

struction workers has occurred at the same time that their employment levels have dramatically increased. The increase in injuries, illnesses, and fatalities has traditionally been attributed to the propensity of Hispanic workers to work in more hazardous construction occupations, differences in culture, and a lack of health and training being administered to or understood by this population. This study examined the effects of occupation by analyzing differences in injuries, illnesses, and fatalities among Hispanic and non-Hispanic carpenters, construction laborers, painters, drywall installers, and electricians which are the five most common Hispanic occupations and are also some of the more dangerous occupations in construction.

While other research has found that Hispanic workers in general suffer a disproportionate number of injuries, illnesses, and fatalities, this research found this to not always be the case. It should be noted that difference in analysis methods between this and other research may have contributed to this difference in outcome. First, this research focused on examining the differences among detailed occupations while others have focused on industry occupations (Henshaw 2002; BNA 2003, Moure-Eraso and Friedman-Jimenez 2003; and Richardson et al. 2003). Second, this research limited its statistical analysis of differences in injury, illness, and fatalities to just one year, 2002. Other research (Richardson et al. 2003) did examine aggregate data over a 3 year time period. The writers do note that this study did examine changes in injury, illness, and fatality rates that were compared over an 8 year period (Figs. 3 and 4), and this too indicated that Hispanic craft workers in the study's occupations did not always

Table 4. Fatalities among Hispanic and Non-Hispanic Construction Occupations

		Race		
		Hispanic	White non-Hispanic	Black non-Hispanic
Carpenter ^b				
Occupational fatality in 2002	Yes	18 (0.005%)	78 (0.007%)	5 (0.006%)
	No	328,212 (99.995%)	1,119,108 (99.993%)	87,523 (99.994%)
	Total	328,230 (100%)	1,111,528 (100%)	87,528 (100%)
		Difference to Hispanic	+0.002%	+0.001%
		Level of significance ^a	0.327	0.936
Construction laborer ^c				
Occupational fatality in 2002	Yes	93 (0.026%)	171 (0.030%)	26 (0.025%)
	No	362,544 (99.974%)	578,088 (99.970%)	105,607 (99.975%)
	Total	362,637 (100%)	578,259 (100%)	105,633 (100%)
		Difference to Hispanic	+0.004%	-0.001%
		Level of significance ^a	0.261	0.851
Painter ^d				
Occupational fatality in 2002	Yes	7 (0.003%)	33 (0.009%)	3 (0.006%)
	No	203,387 (99.997%)	368,169 (99.991%)	50,355 (99.994%)
	Total	203,394 (100%)	368,202 (100%)	50,358 (100%)
		Difference to Hispanic	+0.006%	+0.003%
		Level of significance ^a	0.007	0.494
Drywall installer ^e				
Occupational fatality in 2002	Yes	6 (0.008%)	3 (0.003%)	— (—)
	No	75,916 (99.992%)	100,790 (99.997%)	— (—)
	Total	75,922 (100%)	100,793 (100%)	6,358 (100%)
		Difference to Hispanic	-0.005%	—
		Level of significance ^a	0.178	—
Electrician ^f				
Occupational injury or illness in 2002	Yes	18 (0.019%)	83 (0.012%)	6 (0.010%)
	No	94,802 (99.981%)	684,345 (99.988%)	61,196 (99.990%)
	Total	94,820 (100%)	684,428 (100%)	61,202 (100%)
		Difference to Hispanic	-0.007%	-0.009%
		Level of significance ^a	0.142	0.126

^aThese values are the result of the application of the test of significance of the difference between two proportions. Data source: CFOI (2002).

^bChi-square for the overall difference between columns, with d.f.=2, is 0.96, significance=0.619.

^cChi-square for the overall difference between columns, with d.f.=2, is 1.65, significance=0.439.

^dChi-square for the overall difference between columns, with d.f.=2, is 5.85, significance=0.054.

^eChi-square for the overall difference between columns, with d.f.=1, is 1.21, significance=0.271. The fatality number for Black non-Hispanics drywall installers was not reported by CPS.

^fChi-square for the overall difference between columns, with d.f.=2, is 3.52, significance=0.172.

experience higher rates compared to their non-Hispanic counterparts. Third, the writers used data from multiple governmental agencies, which have different sampling procedures and can introduce a bias in the findings. Fourth, this study used analysis methods that were influenced by sample size. As the study showed, analysis by injury, illness, and fatality rate may indicate differences between groups, but analysis methods such as chi square, which consider the size of the sample examined, can show the difference to still be statistically insignificant.

The study finds that differences exist among the number and frequency of occupational injuries, illnesses, and fatalities between Hispanic and non-Hispanic construction workers, although the difference did not always disfavor Hispanics. In regards to injuries and illnesses, the study actually finds that Hispanics have

comparable rates, and in certain cases lower rates, than their non-Hispanic carpenter, laborer, painter, drywall installer, and electrician counterparts. This confirms what others have found comparing injury rates among Hispanic and non-Hispanic workforce occupations (Richardson et al. 2003). While Hispanic and non-Hispanic carpenters and laborers have little to no difference in their 2002 fatality rates, Hispanic drywall installers and electricians had notably worse fatality rates, especially compared to their white non-Hispanic counterparts, although the difference was not statistically significant according to the chi-square analysis. The difference in fatality rates by race was most significant among painters, which showed that Hispanic painters had the lowest fatality rate among the three populations.

This paper finds that Hispanics did not always experience a

greater number of injuries and illnesses compared to their non-Hispanic counterparts when the effects of occupation are controlled. Only among dry wall installers in 2002 did Hispanics have a higher frequency of injuries and illnesses. This suggests that increases of injuries and illnesses among Hispanic construction workers can at least be partially attributed to the fact that Hispanics tend to work in some of the most hazardous occupations. Two of the top five Hispanic construction occupations, construction laborer and electrician, are in the top five most hazardous construction occupations. 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. 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 other 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.

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