Medical Costs and Sources of Payment for Work-Related Injuries Among Hispanic Construction Workers

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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.* (J Occup Environ Med. *2007;49:1367–1375*)

The construction industry is one of the most dangerous industries, accounting for a disproportionate share of work-related injuries and illnesses in the United States. In 2005, construction industry employment was 8% of the total US workforce, but shared 22% (1243) of the nation's 5734 reported work-related deaths.[1] The construction industry's average rate of nonfatal injuries and illnesses with days away from work was more than 70% higher than that for all industries this year.[2] The rapidly increasing number of Hispanics employed in construction poses a serious challenge for construction safety and health. The number of Hispanics employed in construction almost quadrupled since the 1990s, and increased from 1.4 million in 2000 to 2.6 million in 2005 alone.[3] Work-related deaths among Hispanic construction workers rose along with the employment expansion from 108 in 1992 to 321 in 2005,[3] and fatality rates for Hispanic construction workers are consistently higher than non-Hispanic workers, especially for workers in high-risk occupations.[4] Although the death rates for Hispanic construction workers have declined in recent years, they are still higher than their white, non-Hispanic counterparts (12.4 vs 10.5 per 100,000 full-time workers in 2005 compared with 19.1 vs 10.6 per 100,000 full-time workers in 2000).[3]

Occupational injuries and illnesses are not only matters of safety and health, but also economics. The costs of work-related injuries consume

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substantial resources and prevent them from being allocated to other applications. According to a National Institute for Occupational Safety and Health-funded study published in 1997, work-related injuries and illnesses cost $171 billion (1992 dollars) annually.[5] Of the total benefit costs in workers' compensation, the medical share has risen rapidly in recent years.[6,7] Moreover, workers are not guaranteed full insurance coverage under workers' compensation for work-related disorders. A literature review by Dembe indicated that many injured workers have difficulty obtaining access to appropriate medical care because of the discouragement of employers and the behavior of workers' compensation insurance carriers that aggressively contest claims.[8] Rosenman et al estimated that only 25% of workers diagnosed with work-related musculoskeletal disorders filed for workers' compensation.[9] It was reported that, annually, workers' compensation paid roughly $8 billion to $23 billion less in medical costs than predicted from epidemiological studies based on incidence.[10]

Despite the rapid expansion of Hispanic employment in construction and a high risk at worksites faced by Hispanic construction workers, there has been little research on Hispanic construction workers.[11] Information on health services and medical costs for work-related injuries among this worker group has remained unknown. A significant limitation in previous studies has been reliance on data from workers' compensation, even though the definitions of occupational injuries and illnesses as well as the criteria for eligibility for workers' compensation, vary from state to state. Also, about one-fourth of the construction workforce is self-employed, most of whom are not covered by workers' compensation. In addition, workers' compensation data may not provide an indicator of Hispanic ethnicity.

To fill in this research gap, this study estimated medical costs of work-related injuries for Hispanic construction workers as well as the entire construction workforce, identified sources of payment for such costs, and assessed disparities between Hispanic and white, non-Hispanic construction workers. The hypothesis of this study is that Hispanic construction workers are less likely to receive workers' compensation and more likely to self-pay for the medical costs of work-related injuries than their white counterparts. Access to health insurance and other demographic and socioeconomic factors may partly explain these disparities.

Materials and Methods

This study analyzed 7 years of data from a large national population survey—the Medical Expenditure Panel Survey (MEPS) between 1996 and 2002. MEPS is conducted annually and cosponsored by the Agency for Health Care Research and Quality and the National Center for Health Statistics. It provides nationally representative estimates of health care use, insurance coverage, medical expenditures, and sources of payment for the US civilian noninstitutionalized population.[12] MEPS data have been used commonly in research for the general population, but have been rarely applied to occupational health services research.

MEPS has three major components: the household component, the insurance component, and the medical provider component. The household component is the core survey of MEPS, collecting data from a sample drawn from a nationally representative subsample of households that participated in the prior year's National Health Interview Survey. The household component provides data from individual households and their members, which is supplemented by data from their medical providers covered by the medical provider component. The insurance component collects data on employment-based health insurance from employers.

The MEPS respondents are asked to report current health conditions at every round of data collection. Interviewers record the respondent's verbatim response to each open-ended question, whereas the computer system generates a condition roster for every person in the household. After these condition questions, respondents are asked the reason for a medical provider visit. Respondents may frequently report several provider visits for the same condition. However, the condition appears only once on the person's condition roster. For certain types of information that a household respondent would have difficulties in reporting, the information is gathered directly from the respondent's employer, health care provider, and insurer.

MEPS data are released in individual level, event level, condition level, and job level files. All the files are linked by the survey identification for the data analysis of this study. SAS-Callable SUDAAN (Version 9)[13] was used for all data analyses. The descriptive statistics characterized the study population and described occupational injuries and associated medical expenditures and payments. A multiple linear regression model was established to control for major demographic and socioeconomic factors in analyzing the impact of Hispanic ethnicity on receiving workers' compensation payment. Age, educational attainment, insurance coverage, union status, size of establishments, and injury severity were analyzed as independent variables in describing workers' compensation payment. Gender was not included in the regression model because only a few female Hispanics were employed in construction.

Terms and Definitions

- *Construction worker* includes those who self-reported employment in the construction industry. From 1996 through 2002, the construction industry was coded as 3 in the MEPS data set corresponding to 15, 16, and 17 in the 1987 Standard Industry Classification system. (Starting with 2003 data, as

TABLE 1
Demographics of Construction Workers

Characteristics	All (n = 7025)[a] (%)	Hispanic (n = 1833) Percent	Hispanic (n = 1833) Lower 95% CI	Hispanic (n = 1833) Upper 95% CI	White, Non-Hispanic (n = 4533) Percent	White, Non-Hispanic (n = 4533) Lower 95% CI	White, Non-Hispanic (n = 4533) Upper 95% CI
Age*							
16–21	8.4	9.1	7.5	11.1	8.2	7.6	9.2
22–35	36.0	48.8	45.8	51.9	33.6	34.6	37.4
36–45	28.1	27.4	24.8	30.1	28.2	26.8	29.4
46–64	24.9	14.1	12.4	16.0	26.9	23.7	26.1
65+	2.7	0.5	0.3	1.0	3.1	2.2	3.2
Average age* (yr)	38.4	34.4	33.8	34.9	39.1	38.7	39.5
Median age* (yr)	36.0	32.5	31.9	34.0	38.2	37.4	39.0
Female worker*	9.5	3.8	2.8	5.0	10.6	9.7	11.6
Education*							
<9 grade	7.1	29.3	26.5	32.3	2.8	2.4	3.4
9–11 grade	19.1	25.7	23.2	28.4	17.8	16.5	19.2
12 grade	44.5	30.7	27.8	33.8	47.1	45.5	48.7
Some college	19.4	10.8	9.0	13.0	21.0	19.6	22.4
College and up	10.0	3.5	2.5	4.7	11.3	10.1	12.5
Total (Weighted number (M))	100.0 (10.6)		100.0 (1.56)			100.0 (8.1)	

Source: Medical Expenditure Panel Survey, 1996–2002.
*$P < 0.01$.
[a]Includes workers in other races and ethnicities (eg, black).
CI indicates confidence intervals.

other federal government data collection systems, MEPS adopted the 2002 North American Industry Classification System, in which the construction industry is coded as 23.)

- *Hispanic worker* refers to workers who self-reported that their origin is Mexican, Puerto Rican, Cuban, South or Central American, Chicano, or other Latin American, regardless of racial background and country of birth.
- *Class of worker* is categorized as self-employed (both incorporated and unincorporated) and wage-and-salary workers.
- *Work-related injury* is counted when a medical condition was due to an injury at work. If a respondent reported missing at least one full workday, a *time-loss injury* is counted.
- *Medical expenditures* include expenses on hospitals, physicians, other medical care providers, and pharmacies. Payments for over-the-counter drugs, alternative care services, or telephone contacts with medical providers are not included. The medical expenditures were adjusted using the 2002 consumer price index medical cost across the study period.
- *Sources of payment* include *out of pocket* (directly made by patients and their families), *private insurance* (such as insurance provided by employer or purchased by self), *public insurance* (Medicare, Medicaid, and other public health insurance programs), *workers' compensation* (state workers' compensation systems), and *other* (other Federal and state or local sources, other private sources, and various unclassified sources).

Results

From 1996 through 2002, 7025 respondents reported that they were employed in the construction industry, of which 1833 were of Hispanic origin, 4533 were white, non-Hispanic, and the rest were black or another race or ethnicity. Table 1 summarizes the characteristics of the study sample. Hispanics were more likely to be male, younger, and less educated than white, non-Hispanics. The χ^2 test shows that the differences between the two populations in gender, age, and educational attainment were statistically significant ($P < 0.01$).

Table 2 presents the employment characteristics of construction workers. Hispanic construction workers were concentrated in blue-collar occupations, such as construction laborers and transportation (eg, truck drivers), or operating occupations (eg, crane and tower operators, graders, and scraper operators). Hispanic workers were less likely to be self-employed and unionized than their white, non-Hispanic counterparts. Among wage-and-salary workers, only 10% (95% confidence interval = 8.4% to 12.6%) of Hispanic workers reported they were union members, which was almost half the percentage for white, non-Hispanic workers (19%, 95% confidence interval = 17.5% to 21.1%). Also, more than half of the construction workers were employed by small employers (<20 employees).

Approximately 17% of construction workers had a medical condition that resulted from either work or non–work-related injuries (Table 3). Nearly half of the injuries among Hispanics were work-related. Compared with white, non-Hispanic

TABLE 2
Characteristics of Construction Employment

Characteristics	All (n = 7025)[a] (%)	Hispanic (n = 1833) Percent	Hispanic Lower 95% CI	Hispanic Upper 95% CI	White, Non-Hispanic (n = 4533) Percent	White, Non-Hispanic Lower 95% CI	White, Non-Hispanic Upper 95% CI
Blue-collar worker*	75.7	91.0	89.1	92.6	72.8	71.3	74.3
Detailed occupation**[b]							
Professional	4.4	1.5	1.0	2.2	4.9	4.3	5.7
Manger	14.2	4.8	3.6	6.3	15.9	14.7	17.3
Clerical	4.2	2.2	1.5	3.3	4.6	3.9	5.3
Craftsmen	44.6	45.5	42.0	49.0	44.5	42.8	46.2
Operatives	1.5	1.9	1.1	3.1	1.5	1.1	1.9
Transport operatives	16.6	20.3	17.1	24.0	15.9	14.6	17.3
Services	2.0	2.2	1.5	3.2	2.0	1.6	2.5
Laborers	10.3	20.8	18.3	23.4	8.4	7.5	9.3
Self-employed*	26.4	15.4	13.1	18.1	28.5	27.0	30.0
Union member**	17.6	10.3	8.4	12.6	19.2	17.5	21.1
Establishment size**							
<20	51.3	54.0	50.1	57.9	50.8	48.7	52.9
20–49	17.2	18.0	15.4	20.8	17.0	15.6	18.6
50–99	11.8	9.0	7.2	11.2	12.4	11.1	13.8
≥100	19.7	19.0	16.3	22.0	19.8	18.2	21.5
Total (Weighted number (M))	100.0 (10.6)		100.0 (1.56)			100.0 (8.1)	

Source: Medical Expenditure Panel Survey, 1996–2002.
*$P < 0.05$; **$P < 0.01$.
[a]Includes workers in other races and ethnicities (eg, black).
[b]These are condensed occupational categories used by the MEPS, which were generated from the 1990 detailed Census occupational classifications, in which "operatives" (codes 703-799) include machine operators, fabricators, assemblers, and some hand-working occupations, such as welders and cutters; "transport operatives" (codes 803-859) include motor vehicle operators (eg, truck drivers) and material moving equipment operators, such as operating engineers.
CI indicates confidence intervals.

workers, Hispanic workers were 53% more likely to have a medical condition because of work-related injuries (9.8% vs 6.4%). When medical conditions were controlled for injury severity, the gap was even larger: 5.3% of Hispanics had a work-related injury resulting in one or more days away from work, 77% higher than that for white, non-Hispanics.

Based on the MEPS data, it is estimated that total medical costs for all construction industry workers was $1.364 billion (2002 dollars). Of this, Hispanic workers accounted for $290.6 million (21.3%) and white, non-Hispanic workers accounted for $914.1 million (67%) (Table 4). The rest was incurred by workers of other ethnicities. The average medical cost per injury was about $210 (12.4%) more for Hispanic construction workers than for white, non-Hispanic workers. Compared with white, non-Hispanic workers, in-

TABLE 3
Injury Related Conditions Per 100 Construction Workers

Injury	All (n = 7025)[a] (%)	Hispanic (n = 1833) Percent	Hispanic Lower 95% CI	Hispanic Upper 95% CI	White, Non-Hispanic (n = 4533) Percent	White, Non-Hispanic Lower 95% CI	White, Non-Hispanic Upper 95% CI
Conditions because of injury*	17.0	19.9	17.8	22.3	16.7	15.7	17.8
Conditions because of work-related injury*	6.8	9.8	8.3	11.7	6.4	5.9	7.1
Conditions with lost workday injury*	4.2	5.3	4.6	6.0	3.0	2.8	3.2

Source: Medical Expenditure Panel Survey, 1996–2002.
*$P < 0.05$.
[a]Includes workers in other races and ethnicities (eg, black).
CI indicates confidence intervals.

TABLE 4
Distribution of Medical Expenditures for Work-Related Injuries by Major Type of Services

Type of Services	All Construction[a] (%)	Hispanic (%)	White, Non-Hispanic (%)	Expenditures[b] (Sum, $ millions)
Outpatient*	15.7	9.6	16.9	214.2
Office-based	27.9	25.1	28.1	380.7
Emergency room*	9.5	11.5	7.8	129.6
Inpatient**	29.3	44.3	27.9	399.8
Dental	6.6	4.1	6.8	90.1
Prescribed medicine**	9.8	4.7	10.9	133.7
Expenditure per injured worker per yr ($)	1694.6 (100)	1896.6 (100)	1687.4 (100)	
Expenditures in construction ($ millions)		290.6 (21.3)	914.1 (67.1)	1364.4 (100)[c]

Source: Medical Expenditure Panel Survey, 1996–2002.
*$P < 0.05$; **$P < 0.01$.
[a]Includes workers in other races and ethnicities (eg, black).
[b]Weighted sum for all construction includes workers in other races and ethnicities (eg, black).
[c]Totals may not add to 100% because of rounding.

TABLE 5
Sources of Payment for Medical Costs of Work-Related Injuries

Source	All Construction[a] (%)	Hispanic (%)	White, Non-Hispanic (%)	Total Construction[b] (Sum, $ millions)
Out-of-pocket	8.7	23.0	5.9	118.7
Workers' compensation	46.2	26.8	49.5	630.4
Private insurance	31.8	45.7	29.9	433.9
Medicare	0.2	0.0	0.2	2.7
Medicaid	0.4	0.1	0.5	5.5
Other sources[c]	12.2	4.1	12.9	166.5
Total expenditure per injured worker per yr[d]	1694.6 (100)	1896.6 (100)	1687.4 (100)	
Total expenditures in construction ($ millions)		290.6 (21.3)	914.1 (67.1)	1364.4 (100%)[d]

Source: Medical Expenditure Panel Survey, 1996–2002.
[a]Average for per injured worker per year during the study period, includes workers in other races and ethnicities (eg, black).
[b]Weighted sum for all construction includes workers in other races and ethnicities (eg, black).
[c]Includes the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS), the Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA), Veterans Affairs (VA), other Federal and state or local public sources, and sources unknown.
[d]Totals may not add to 100% because of rounding.

jured Hispanic workers spent more on emergency room and inpatient services but less on outpatient, dental, and prescription services.

Overall, for all construction workers, less than half of total medical expenses for work-related injuries were paid by workers' compensation (Table 5). For injured Hispanic construction workers, only 27% of medical costs were paid by workers' compensation, much less than 50% paid for white, non-Hispanics. The rest was paid by workers and their families or by other public or private sources. The disparity in coverage between Hispanics and white, non-Hispanics was similar for all types of employment and wage-and-salary workers (Fig. 1).

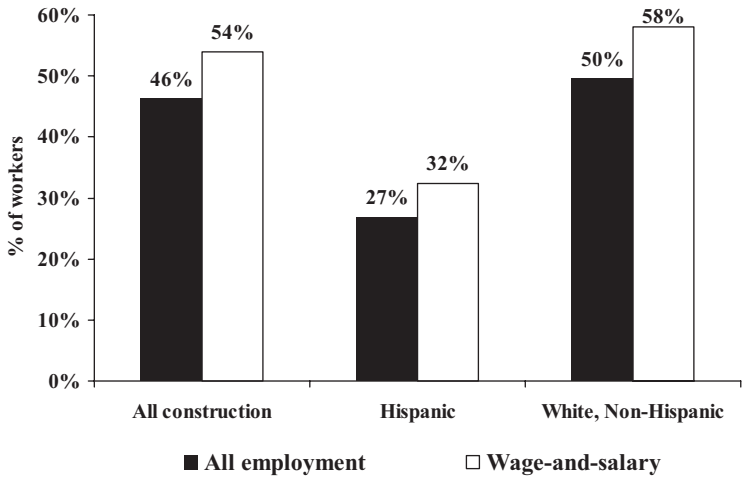

Fig. 1. Workers' compensation payment for medical costs of work-related injuries.

TABLE 6
t Test Results for Medical Costs Paid by Workers' Compensation

	Time-Loss Injury		Injury Without Time-Loss		Average	
	Mean	95% CI (Lower, Upper)	Mean	95% CI (Lower, Upper)	Mean	95% CI (Lower, Upper)
Hispanic	532.7	293.6, 770.5	295.2	43.0, 547.4	508.3	334.9, 680.5
White, Non-Hispanic	948.9	558.3, 1339.6	577.5	321.1, 834.0	835.3	604.6, 1065.2
Difference	−416.2*	−871.2, 38.8	−282.3	−647.3, 82.7	−327.0*	−614.7, −39.8
Total[a]	844.7	508.9, 1180.5	542.6	316.3, 768.8	782.9	548.1, 951.3

Source: Medical Expenditure Panel Survey, 1996–2002.
*$P < 0.05$.
[a]Excludes workers in other races and ethnicities (eg, black).
CI indicates confidence intervals.

The *t* test shows a significant difference in medical payment from workers' compensation for time-loss injuries and overall injuries between Hispanics and white, non-Hispanics ($P < 0.05$, Table 6). However, the difference was not significant for work-related injuries without time-loss between these two populations.

The difference in workers' compensation between Hispanics and white, non-Hispanics exists (significant at $a = 0.10$) after controlling for major demographic and employment factors (Table 7). Self-employed workers were much less likely to receive workers' compen-

TABLE 7
Results of Multiple Regressions[a]

Characteristics	β Coefficient	SE β	Lower 95% β	Upper 95% β	*t* Test	*P*
Intercept	955.0	290.8	384.4	1525.7	3.28	0.001[a]
Ethnicity						
Hispanic	−317.7	190.7	−691.9	56.6	−1.77	0.077
Non-Hispanic	0.0	0.0	0.0	0.0	—	—
Occupation						
Blue collar	−239.9	449.3	−1121.6	641.9	−0.53	0.594
White collar	0.0	0.0	0.0	0.0	—	—
Age						
16–21	−369.6	370.6	−1097.0	357.7	−1.00	0.319
22–35	97.0	301.4	−494.7	688.6	0.32	0.748
36–45	322.5	328.4	−322.1	967.0	0.98	0.326
>46	0.0	0.0	0.0	0.0	—	—
Establishment size						
<50	−305.8	360.8	−1014.0	402.3	−0.85	0.397
51–99*	−734.4	342.3	−1406.1	−62.6	−2.15	0.032
100 and up	0.0	0.0	0.0	0.0	—	—
Education						
>12 yr	−143.3	200.5	−536.7	250.2	−0.71	0.475
12 yr or up	0.0	0.0	0.0	0.0	—	—
Uninsured						
Yes	281.3	288.9	−285.6	848.2	0.97	0.330
No	0.0	0.0	0.0	0.0	—	—
Employment						
Self-employed**	−645.1	223.0	−1082.7	−207.5	−2.89	0.004
Wage-and-salary	0.0	0.0	0.0	0.0	—	—
Time-loss injury						
Yes	222.7	223.1	−215.2	660.5	1.00	0.319
No	0.0	0.0	0.0	0.0	—	—
Union						
Yes	365.9	459.3	−535.5	1267.2	0.80	0.426
No	0.0	0.0	0.0	0.0	—	—

Source: Medical Expenditure Panel Survey, 1996–2002.
*$P < 0.05$; **$P < 0.01$.
[a]Although the *P* value for the overall model indicates that this model was acceptable ($P < 0.01$), the multiple R^2 for the dependent variable was small ($r^2 = 0.1148$).

sation ($P < 0.01$) because they are generally not covered by the state workers' compensation systems. It seems that younger workers, blue-collar workers, workers without a high school diploma, and workers in small and medium establishments (<100 employees) were less likely to receive workers' compensation than their counterparts after controlling for other factors. However, the differences were not statistically significant except for establishments with 51 to 99 employees ($P < 0.05$). Union membership, injury severity, and uninsured status increased workers' compensation payments, but the effects were also not significant. One possible explanation is that small sample sizes in the subgroups could reduce the statistical significance. The r^2 of the overall model was relatively small ($r^2 = 0.11$), because many factors that might explain the residual variability, such as language and cultural barriers, state-to-state differences in eligibility or coverage, and employment environment, were beyond control in this study.

Discussion

This study assessed an important issue in occupational safety and health. Based on the data from MEPS, we estimated that the total medical costs for all work-related injuries (with and without time-loss) among construction workers in the United States was approximately $1.364 billion annually (2002 dollars). Of these costs, Hispanic construction workers accounted for $291 million, or 21.3% of the total.

There were sizable disparities between Hispanic and white, non-Hispanic construction workers in rate of work-related injuries, types of medical services used for treating work-related injuries, the medical costs per injured workers, and sources of payment for such services. Hispanic workers were more likely to have a medical condition caused by work-related injuries, but lag far behind their white counterparts in receiving workers' compensation. Average costs per injured Hispanic worker were 12.4% higher than those per white, non-Hispanic workers. Hispanic workers were more likely to seek treatment in emergency rooms and inpatient facilities, possibly indicating that their injuries were more severe on average and that they may delay access to medical care until it becomes urgent. These disparities may be partially explained by differences in demographics and socioeconomic status between the two population groups. Multiple indicators (type of employment, establishment size, education, occupation, and unionization) confound the disparities.

Workers' compensation medical coverage seems to serve all workers poorly, but especially Hispanic workers. The fact that, overall, workers' compensation only covered 46% of total costs means that workers, other insurance, and public sources are subsidizing workers' compensation medical coverage by at least $737 million per year. Much has been written about the "exorbitant" costs of workers' compensation insurance and the burden that it places on employers,[14–17] but there are few studies on the shifting of medical costs for work-related conditions onto other sources of payment.

Based on these data, the major financial burden of work-related injuries does not fall on workers' compensation, but rather on individual workers and their families and society. This is clearly a finding that should be taken into account when states consider workers' compensation reform.

The lack of coverage for Hispanic workers is especially alarming. Although this study did not examine whether the reduced workers' compensation was a failure of filing claims, previous studies indicated that workers may not view workers' compensation filing as "free" and may respond to some set of implicit or explicit costs associated with filing (eg, employee dissatisfaction, job security, opportunities for promotion etc.).[18–20] Hispanic workers, especially new immigrants, face language, legal, and cultural barriers to understanding and exercising their workplace rights. Those who are undocumented may be particularly fearful of retaliation because of their immigrant status and lack of work authorization.[19,20]

Another important factor affecting workers' compensation payment is the complex procedures to file a claim and restricted benefits for injured workers. Changes in workers' compensation systems over the past two decades have tightened fee schedules, limited physician choice, restricted eligibility, and lowered benefits.[21,22] As a result, pursuing a workers' compensation claim could require that a worker spend money and time on health care and legal consultations with uncertain prospects for reimbursement.

Based on the findings from this study, making the workers' compensation system more accessible to all construction workers, especially Hispanic and other immigrant workers, should be a priority. A number of administrative changes should be implemented such as providing health educators, bilingual interpreters, and booklets in Spanish on workers' compensation.

Hispanic workers are more likely to be employed by small employers and less likely to be union members than white, non-Hispanic workers are. Hirsch et al examined the effect of union membership on the receipt of workers' compensation benefits and found a positive relationship between unionization and the receipt of workers' compensation.[23] The authors interpreted this result and suggested that unionized workers are both better informed and better protected from employer retribution. If it is the objective of our society to treat workers fairly (and legally), our study suggested that we should meet it. There is a need for greater assis-

tance to injured workers, particularly for non-union immigrant workers.

Fundamental to the above approaches, improved workplace safety in the construction industry and all workplaces is the ultimate remedy to reduce workers' compensation costs while improving worker health. Therefore, developing more effective injury preventions is a longstanding challenge for the workers' compensation system and will benefit everyone. One important incentive for safety is supposed to come from experience rating in workers' compensation. However, the subsidization of workers' compensation reported in this study suggests that the economic incentive for safety in workers' compensation is being undermined.

Study Limitations and Future Studies

This study has several major limitations. Because the MEPS questionnaire uses the term "accident" in referring to an injury, work-related injuries caused by assault, violence, non-traumatic, and ill-defined injuries, are not counted as an injury. Medical complications of previous work-related injuries and injuries that have both work-related and non–work-related contributing causes also present challenges. In addition, construction workers who are currently unemployed or employed in another industry sector because of serious work-related injuries were not reported as "construction workers" and were not included in this study. Because of legal and immigration concerns, it is likely that workers living in the United States illegally are self-excluded from a household survey.[24,25] Also, seasonal and mobile workers may likely be excluded from a household survey,[26] such as construction workers who work for temporary agencies and on a contract employment basis. As a result, it is likely that work-related injuries in the construction industry were severely undercounted in this study. How the excluded workers differ from the workers observed by this study remains unknown.

Hispanics are from different nationalities and tend to live in certain regions that are equipped with various health care facilities and health benefits. However, because the subsample of Hispanic construction workers was relatively small, this study did not address state differentials in workers' compensation systems and national origin differences among immigrant Hispanics (eg, Mexicans, Dominicans, Cubans, Central or South Americans, etc.). In addition, misclassification associated with random recall bias may be also present in this study.

Further research may examine non-traumatic injuries and work-related diseases and geographic differences. Additional information could also be sought from a case study or a focus group of the MEPS respondents to ascertain worker experiences in interacting with the health care and workers' compensation systems, such as culturally-shaped attitudes and beliefs regarding work-related injuries, familiarity with workers' compensation systems in the United States, and so on. The results of qualitative studies would be complementary to this study in developing theoretical models to confirm or offer alternative explanations for the results discussed here.

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