

Fatal Occupational Injury Rates in Southern and Non-Southern States, by Race and Hispanic Ethnicity

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The division of labor in the United States is structured by race and ethnicity. Black and immigrant workers historically have been hired disproportionately in labor-intensive jobs involving hazardous and unpleasant working conditions.^{1,2} In addition to individual acts of discrimination in hiring and work assignment, legal and economic structures have contributed to the racial and ethnic division of labor. Persistent segregation of residential neighborhoods and educational institutions, for example, influences labor market opportunities for minority and immigrant workers. This is particularly true in the southern United States, where state-sanctioned racial segregation persisted in some states until relatively recently and prejudice against minority and immigrant workers has impeded efforts to organize for improvements in working conditions.³

In recent years, the American South has experienced substantial declines in employment in traditional labor-intensive industries such as agriculture and furniture and textile manufacturing.^{4–6} Coincident with these declines has been a demographic shift in employment. Increasingly, manual labor (e.g., hand harvesting of row crops), once done primarily by Black workers, is being done by Hispanic workers.⁷ This pattern is occurring not only in declining industries but also in labor-intensive industries where employment has been increasing in the South, such as construction and landscaping.

We examined racial/ethnic differences in fatal occupational injury rates in the South and compared these observations to patterns in the rest of the United States. We began by examining fatal occupational injury rates by race/ethnicity in southern and non-southern states. Next, we examined variation over time in fatal injury rates to investigate whether there is evidence of an increase or decrease over time in disparities in fatal injury rates by race/ethnicity and region. Finally, we investigated whether racial/

Objectives. We investigated fatal occupational injury rates in the United States by race and Hispanic ethnicity during the period 1990–1996.

Methods. Fatalities were identified by means of the national traumatic occupational fatalities surveillance system. Fatal occupational injury rates were calculated by race/ethnicity and region using US-census-based workforce estimates.

Results. Non-Hispanic Black men in the South had the highest fatal occupational injury rate (8.5 per 100 000 worker-years), followed by Hispanic men in the South (7.9 per 100 000 worker-years). Fatal injury rates for Hispanic men increased over the study period, exceeding rates for non-Hispanic Black men in the latter years of observation.

Conclusions. These data suggest a change in the demographics of fatal occupational injuries in the United States. Hispanic men in the South appear to be emerging as the group with the nation's highest unintentional fatal occupational injury rate. (*Am J Public Health.* 2004;94:1756–1761)

ethnic differences in fatal injury rates within each region remained after adjusting for differences in the distribution of workers with respect to occupation and industry.

METHODS

The US National Institute for Occupational Safety and Health systematically compiles information on occupational injury deaths as part of the national traumatic occupational fatalities (NTOF) surveillance system. The NTOF database includes death certificate information from the 50 states, New York City, and the District of Columbia for all deaths of persons aged 16 years or older for whom an external cause of death (*International Classification of Diseases, Ninth Revision*⁸ codes E800–E999) was noted and for whom the certifier entered a positive response to the “Injury at work?” item.^{9,10} The analyses reported in this article include only unintentional injury deaths, which excludes deaths in the workplace from homicide, suicide, medical misadventure, non-work-related choking on food or other objects, and nonoccupational poisoning by therapeutic drugs or alcohol. All decedents included in these analyses were required to have complete

information on date of birth, date of death, gender, race, usual occupation and industry of employment, and place of residence.

A joint race/ethnicity variable was defined with 3 categories: Hispanic, Black, and non-Black. Any worker with an indication of Hispanic ethnicity, regardless of race, was included in the Hispanic category. We used the term *Hispanic*, rather than an alternative such as *Latino*, because the source data for these analyses were compiled using this terminology. Non-Hispanic workers of Black race made up the Black category. Non-Hispanic workers of other or unknown race made up the non-Black category, which is composed primarily of decedents of European descent (97%), with small percentages of decedents of Asian (2%), Pacific Islander (<1%), and Native American descent (<1%). Information describing the decedent's race and ethnic origin is collected by the person completing the demographic portion of the death certificate (typically the funeral director) from next of kin or other informants. The 1989 revision of the US standard certificate of death incorporated a significant change with the inclusion of a specific item on Hispanic ethnicity; a decedent is classified as Hispanic if the certifier enters a positive response to the “was

decedent of Hispanic origin?" item.^{11,12} Almost all registration areas had implemented revised forms by the recommended date of January 1, 1989, with most state certificates closely following the model of the US standard certificate of death.^{11,12} The analyses reported in this article were conducted as part of a larger project examining fatal occupational injuries in the United States over the period 1980–1996.¹³ However, because a separate variable indicating Hispanic ethnicity was not recorded in the NTOF database before 1990, these analyses were restricted to the 7-year period 1990–1996. Information on Hispanic ethnicity was missing/unknown for a small percentage of decedents (<1%); these decedents were classified as non-Hispanic.

All eligible deaths in the NTOF system were tabulated by calendar year, gender, race/ethnicity, occupation, industry, and geographic region of the United States (South vs non-South). The South was defined for these analyses according to the conventional US census regions and includes Texas, Oklahoma, Louisiana, Arkansas, Mississippi, Alabama, Tennessee, Kentucky, Florida, Georgia, South Carolina, North Carolina, Virginia, West Virginia, District of Columbia, Maryland, and Delaware. We estimated the size of the workforce at risk using the 1980 and 1990 census data (the necessary data from the 2000 census were not available at the time this article was written). The workforce sizes for the years 1991–1996 were estimated by linear extrapolation.

Rates of fatal occupational injury were estimated for each year as the count of injury deaths divided by the estimated number of workers employed in that year, which approximates worker-years at risk. Poisson regression analyses, conducted with SAS PROC GENMOD, were used to estimate trends in fatal occupational injury rates over time, under the model $\lambda = e^{\beta_0 + \beta_1(\text{year} - 1990)}$, where the rate of fatal occupational injury, λ , is examined in relation to an indicator of calendar year, denoted *year*.^{14,15}

The value e^{β_0} describes the estimated fatal injury rate in 1990, and the value $[100(e^{\beta_1} - 1)]$ describes the estimated annual percentage change in fatal injury rate. Separate regression models were fit to estimate trends in fatal occupational injury rates for subgroups of workers defined by geographic region

TABLE 1—Crude Fatal Occupational Injury Rates by Race/Ethnicity, Gender, and Region: United States, 1990–1996

	Rate (No. Deaths) per 100 000 Worker-Years		
	Hispanic	Black	Non-Black
Men			
Southern states	7.9 (958)	8.5 (1762)	6.9 (8201)
Non-southern states	4.3 (1194)	4.0 (697)	5.1 (12 856)
Women			
Southern states	0.3 (25)	0.4 (84)	0.4 (352)
Non-southern states	0.2 (36)	0.2 (43)	0.3 (620)

(South vs non-South) and race/ethnicity. To evaluate whether differences in fatal injury rates by race/ethnicity and region owed to differences in employment structure between groups, we calculated a directly adjusted fatal injury rate using the occupation- and industry-specific number of non-Black workers in non-southern states in 1990 as the standard population. Occupation- and industry-specific fatal injury rates for each race/ethnicity- and region-specific group were weighted by this standard population, producing a rate estimate that is adjusted for employment structure differences by race/ethnicity and region.¹⁶ Analyses were conducted separately for men and women, although most of the presented results focus on men because they had more fatalities than women.

RESULTS

These analyses included 26 828 deaths from unintentional injury on the job. Table 1 presents fatality rates during this period for unintentional occupational injuries by gender, race/ethnicity, and geographic region (South vs non-South). Within each group defined by gender and race/ethnicity, fatal injury rates were higher for people working in the South than for people working in non-South. Among men in the South, Black workers had the highest fatal occupational injury rate (8.5 per 100 000 worker-years), non-Black workers had the lowest rate (6.9 per 100 000 worker-years), and Hispanic workers had a fatal injury rate intermediate between these groups (7.9 per 100 000 worker-years).

Outside the South, fatal injury rates were highest for non-Black workers (5.1 per 100 000

worker-years), intermediate for Hispanic workers (4.3 per 100 000 worker-years), and lowest for Black workers (4.0 per 100 000 worker-years). Notably, Black men working in the South had a fatal occupational injury rate that was more than two times the rate for Black men working in the non-South.

Female workers had much lower fatal injury rates than male workers, with minimal evidence of difference in rates between race/ethnicity groups within each region. In the South, non-Hispanic women (Black and non-Black) had slightly higher fatal injury rates (0.4 per 100 000 worker-years) than Hispanic women; in other regions, non-Black female workers had a slightly higher fatal injury rate (0.3 per 100 000 worker-years) than other female workers.

Overall, unintentional fatal occupational injury rates in the United States declined 1.1% per year (95% confidence interval [CI] = -1.7, -0.5) during the period 1990–1996. However, estimates of the annual change in fatal injury rates differed markedly by race/ethnicity and region (Table 2). For southern workers, Hispanic men had the lowest estimated fatal injury rate in 1990 (as indicated by the model intercept) but were estimated to have a 5.2% increase in fatal injury rates per year. In contrast, fatal occupational injury rates tended to decline over the study period for non-Hispanic men (Black and non-Black) in the South (-1.6% per year and -1.3% per year, respectively). Similarly, among non-southern workers, Hispanic men had the lowest estimated fatal injury rate in 1990 (as indicated by the model intercept) but were estimated to have a 6.0% increase per year in fatal injury rates. In contrast, fatal injury rates

TABLE 2—Average Annual Change in Fatal Occupational Injury Rates in Men, by Region and Race/Ethnicity: United States, 1990–1996

	Estimated 1990 Fatality Rate ^a	Percentage Change in Rate per Year (95% Confidence Interval) ^b
Southern states		
Hispanic	6.7	5.2 (1.9, 8.6)
Non-Black	7.1	-1.3 (-2.4, -0.3)
Black	8.9	-1.6 (-3.9, -0.8)
Non-southern states		
Hispanic	3.5	6.0 (3.0, 9.1)
Non-Black	5.3	-1.5 (-2.3, -0.6)
Black	4.3	-3.1 (-6.6, 0.6)

^aThis value is estimated as $[e^{\hat{\beta}_0} \times 100\,000]$.

^bThis value is estimated as $[100(e^{\hat{\beta}_1} - 1)]$ with approximate 95% confidence intervals constructed as $\{100[\exp(\hat{\beta}_1 - 1.96SE_{\hat{\beta}_1}) - 1], 100[\exp(\hat{\beta}_1 + 1.96SE_{\hat{\beta}_1}) - 1]\}$ where $SE_{\hat{\beta}_1}$ denotes the standard error of the parameter estimate.

tended to decline over time for non-Hispanic men (Black and non-Black) in non-southern states (-3.1% per year and -1.5% per year, respectively). Given the relatively small numbers of deaths among female workers, estimates of trends in annual fatal injury rates by race/ethnicity and region for women were highly imprecise (results not shown).

Estimates of the average annual change in fatal injury rates may obscure nonlinear trends in rates. In the South, fatal injury rates for non-Black men declined gradually over the study period (Figure 1). From 1990 through 1992, rates for Black men and Hispanic men also declined, but after 1992 fatal occupa-

tional injury rates for Hispanic men in the South increased rapidly. Consequently, although in the first years of the study, Black men in the South were the racial/ethnic group with the highest fatal occupational injury rate, in the latter years of the study, rates for Hispanic men in the South exceeded rates for all non-Hispanic workers (Figure 1). Outside the southern region, non-Black men experienced a gradual decline in fatal injury rates over the study period. From 1990 through 1992, fatal injury rates for Black men and Hispanic men declined as well, but since then rates for Hispanic men in non-southern states have increased (Figure 1). As a result, fatal injury

rates for Hispanic men in non-southern states have risen to parity with rates for non-Black men and exceeded rates for Black men (Figure 1). Rates for female workers (not shown) were an order of magnitude lower than rates for men and were similar among groups defined by race/ethnicity and region.

These analyses of fatal occupational injury rates do not account for differences in employment structure between race/ethnicity and regional groups. To investigate whether observed differences in fatal injury rates by race/ethnicity and region owed to differences in employment structure, we standardized rates to a referent population (the gender-specific employment distribution of non-Black workers in non-southern states, 1990).

After we adjusted for differences in employment structure, annual fatal occupational injury rates for non-Black male workers in the South were still higher than fatal injury rates for non-Black male workers in non-southern states (available from the authors at: <http://www.unc.edu/~davidr/trends>). Adjusted fatal injury rates for Black men in the South were slightly higher than fatal injury rates for non-Black men in the South in some, but not all, years. This suggests that the higher fatal injury rates observed for Black workers in the South compared with non-Black workers in the South (Table 1) is largely explained by differences in employment structure. However, adjusted rates for Black men in the South were consistently higher than rates for non-Black men outside the South, suggesting that fatal occupational injury rates do differ with race and region after adjustment for employment structure. Outside the South, Black men had lower fatal injury rates than non-Black men after adjustment for employment structure. Adjusted fatal occupational injury rates for Hispanic male workers in the South increased in the latter years of study, with rates for this group exceeding rates for all other race/ethnicity and regional groups in the latter years of the study. This relative elevation in fatal occupational injury rates, after adjustment for employment structure, suggests that Hispanic workers in the South had higher fatal injury rates than non-Hispanic workers in comparable occupations and industries. This was not the case outside the South. In non-southern

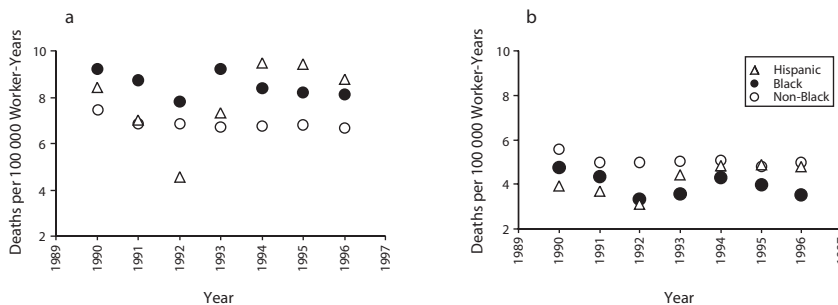
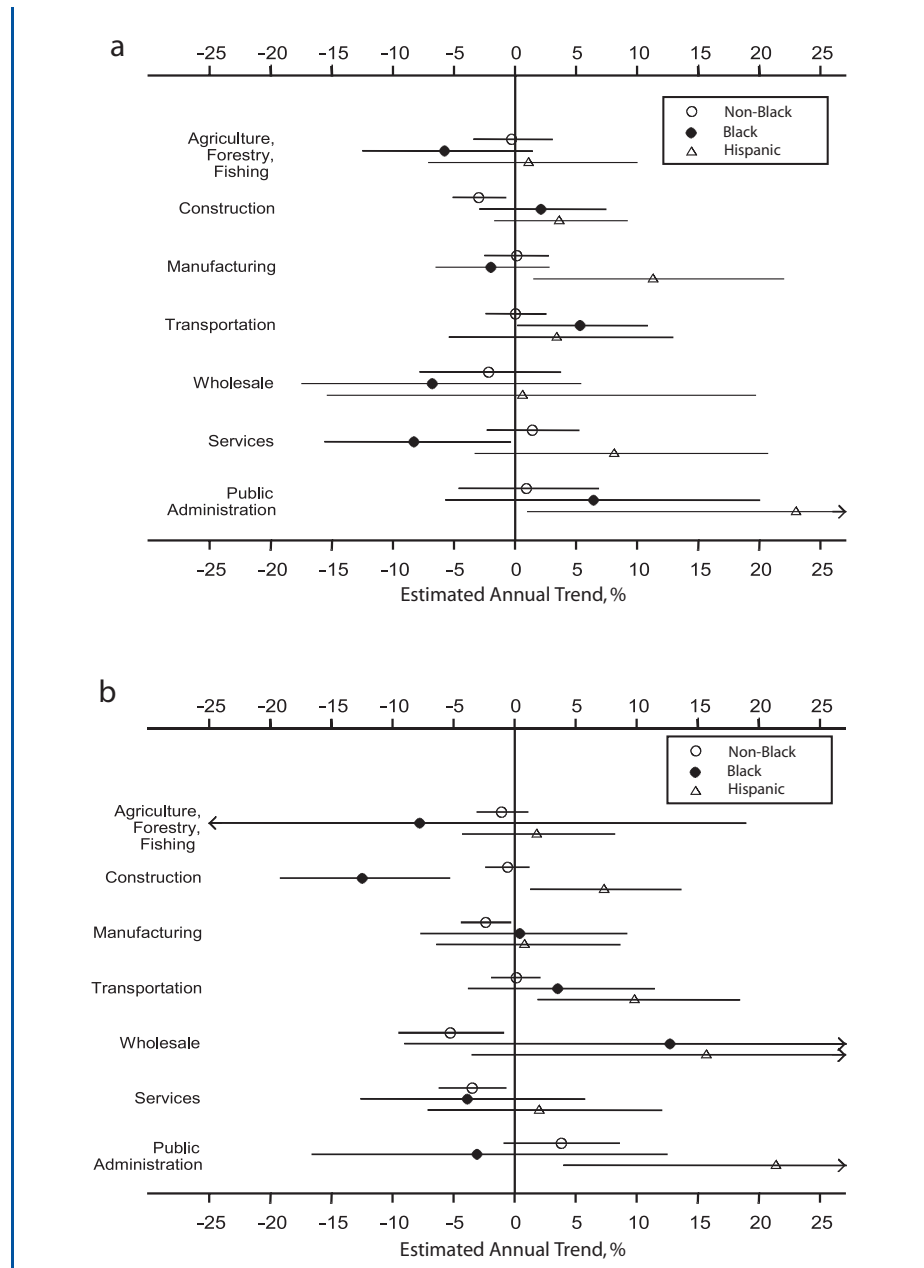


FIGURE 1—Fatal occupational injury rates among men in the United States, by race/ethnicity and year, (a) in Southern states and (b) in non-Southern states.

states, Hispanic male workers tended to have lower fatal injury rates than non-Black and Black men after adjustment for employment structure.

Examination of industry-specific trends, although less precise than overall trends, helps describe the direction of trends within major industrial categories. Because of the small number of deaths for some groups when we stratified by race, region, and industry, we focused on trends in major industrial categories in which at least 1 death occurred in each year for each race/ethnicity in each region. Among Hispanic men, trends in fatal injury rates were positive, indicating fatal injury rates that increased with time, for workers employed in every major industry group in southern and non-southern states (Figure 2). Significant positive trends for Hispanic men were observed in manufacturing and public administration in the South and in construction, transportation, and public administration in non-southern states. Significant negative trends for non-Black men, indicating decreasing fatal injury rates over time, were observed for those employed in construction in the South and for those employed in manufacturing, service, and wholesale industries in non-southern states. Positive trends were observed for Black men employed in construction, transportation, and public administration industries in the South and for Black men employed in manufacturing, transportation, and wholesale industries in non-southern states.

We also examined occupation-specific trends in fatal occupational injury rates (available from the authors at: <http://www.unc.edu/~davidr/trends>). Among Hispanic men, trends in fatal injury rates were positive for laborers and those employed in farming/forestry/fishing, crafts, transportation, and service occupations in both the South and the non-South. Trends were also positive among Hispanic men for machine operator occupations in the non-South. Trends were significantly positive for Hispanic men employed in service, transportation, and laborer occupations in the non-South, and craft and laborer occupations in the South. Among non-Black men, negative trends in fatal injury rates were observed for most occupations—with the exception of ma-



Note. Results are shown for occupations in which at least 1 death occurred in each year among each race/ethnicity in each region. Error bars indicate 95% confidence intervals.

FIGURE 2—Average annual trend in fatal occupational injury rates among men, by major industry group and race/ethnicity, 1990-1996, (a) in Southern states and (b) in non-Southern states.

chine operators—in the South and non-South and for transportation workers in the South. Among Black men, positive trends were observed for service occupations and laborers in the South, whereas trends were negative for other occupations.

DISCUSSION

It has been reported previously that fatal occupational injury rates for Black men in the United States are higher than fatal occupational injury rates for non-Black men.^{10,13} As

shown in Table 1, racial/ethnic differences in fatal injury rates vary markedly between southern and non-southern states. Outside the South, Black male workers had lower fatal injury rates than non-Black male workers. This difference suggests that racial and ethnic disparities in fatal occupational injury rates reported previously for the nation as a whole are largely a consequence of patterns observed among southern men. Racial/ethnic disparities in fatal injury rates at the national level are strongly influenced by patterns observed among southern men, owing to the high rate of fatal injury in the South and to the substantial size of the southern labor force. This is not to suggest that racial differences in jobs and hazards do not occur outside the South. However, it appears that working conditions in the South lead to racial patterns in fatal occupational injury rates that are quite different from those observed observed in non-southern states (when rates are examined in aggregate, as in Table 1).

Fatal occupational injury rates for Hispanic men were between rates for non-Hispanic Black and non-Black men (Table 1). One concern about potential bias in these estimates of fatal occupational injury rates by race/ethnicity and region is the possibility that Hispanics may be more likely to be undercounted than non-Hispanics in official census data. Undercounting of the number of Hispanics in the labor force would lead to positive bias in fatal occupational injury rate estimates for this group of workers (Table 1). Although this is a clear limitation of official census data, the Census of Population and Housing¹⁷ remains the most precise source for US population estimates by geographic region, gender, race, and ethnicity. Furthermore, for the purposes of the analyses reported in this article, we found that the Census of Population and Housing was preferable to smaller surveys (such as the Current Population Survey¹⁸) as a source for rate denominator information because of the imprecision of employment estimates derived from smaller surveys when data are cross-classified by gender, race/ethnicity, region, and major occupational and industry groups.

A major focus of these analyses was on trends in fatal injury rates over time. Fatal occupational injury rates in the United States have declined for several decades.^{13,19} How-

ever, we observed that the direction of trends in fatal injury rates differed for Hispanic and non-Hispanic men (Table 2). Although fatal occupational injury rates tended to decline over the study period for non-Black and Black men, rates did not decline for Hispanic male workers (Figure 1). These data suggest that Hispanic male workers in the South are emerging as the race/ethnicity group with the highest fatal injury rate. This signals an important shift in the demographics of fatal occupational injuries. Historically in the South, Black men have had the highest fatal injury rates on the job; this study suggests that Hispanic men may be increasingly taking on that role.

Undercounting of Hispanics by official census records does not per se lead to spurious trends in fatal injury rates over time; in order for a spurious positive trend in rates to occur, the degree of undercounting of Hispanics must increase over time. We estimated annual employment levels by linear extrapolation from decennial census data, an approach shown previously to be appropriate for fatal injury trend analyses.²⁰ Furthermore, observations from other investigations of trends in US fatal occupational injury rates among Hispanic men support our conclusions. Using information on fatality counts obtained from the Census of Fatal Occupational Injuries²¹ and annual rate denominator data derived from annual summaries of the monthly Current Population Survey, the Bureau of Labor Statistics has reported that fatal injury rates for non-Hispanic workers have declined over time, whereas rates for Hispanic workers have not. The Bureau of Labor Statistics has reported that fatal injury rates for Hispanic male workers in the United States have exceeded the fatal injury rates for non-Hispanic workers in recent years.^{22–25} In 2001, for example, Hispanic workers had a higher rate of fatal injury (6.0 per 100 000 worker-years) than non-Hispanic White workers (4.2 per 100 000 worker-years) and Black workers (3.8 per 100 000 worker-years).^{24,25} In order for undercounting of Hispanic workers to lead to positive bias in these reports of trends in fatal injury rates, one would have to postulate that Current Population Survey data have suffered progressively greater undercounting of Hispanic workers over time.

Possible explanations for why Hispanic ethnicity may be a determinant of fatal injuries include communication barriers on the job and during training; the assignment of more hazardous tasks to Hispanic workers rather than to non-Hispanic workers who ostensibly hold the same job; and failure by employers to invest in safety training, equipment, and protective gear for jobs done by Hispanic workers who may be short-term or illegal employees. Dong and Platner proposed similar explanations for their observation that Hispanic construction workers in the United States were at significantly greater risk of fatal occupational injury during the period 1992–2000 than their non-Hispanic counterparts.²⁶ Their study, which was based on Census of Fatal Occupational Injuries and Current Population Survey data, found that this pattern was consistent in each year of observation, with minimal variation over calendar time in fatal injury rates for either ethnic group.²⁶ In our study, although fatal occupational injury rates for Hispanic men tended to increase over time (Table 2), the trend in rates for Hispanic men and non-Hispanic Black men was non-linear (Figure 1). Changes over time in employment in high-risk industries, such as construction, could lead to non-linear trends in annual fatal injury rates. For example, new home construction in the United States, as measured by building permits, declined from the late 1980s through 1991 and increased rapidly afterward.²⁷ However, 2 observations argue against the conclusion that the temporal trend in fatal injury rates among Hispanic male workers is a consequence of changes in the proportion of Hispanic workers employed in high-risk industries such as construction. First, adjustment for employment structure had minimal influence on the pattern of fatal injury rates among Hispanic men. Second, trends in fatal injury rates for Hispanic men were positive for a wide range of industries (Figure 2). One alternative explanation is that a subgroup of Hispanic workers (i.e., seasonal or undocumented Hispanic workers) may be undercounted or may experience poorer working conditions and higher injury rates than long-term documented Hispanic workers. If the employment level for the former group of workers is sensi-

tive to economic trends, then industry-specific fatal injury rates for Hispanic workers may tend to vary over time in relation to demand for (and employment of) seasonal or undocumented Hispanic workers.

We observed that fatal injury rates for southern workers were higher than fatal injury rates for non-southern workers within each category of gender and race/ethnicity (Table 1). Adjustment for employment structure accounted for most of the difference in rates between non-Black and Black men in the South; however, after we accounted for employment structure, higher rates persisted for southern workers than for non-southern workers (and particularly for Hispanic workers in the South). This suggests the possibility that working conditions faced by southern workers are less safe than those faced by non-southern workers employed in comparable jobs. The observation that fatal occupational injury rates are higher in the South (and, more recently, highest among Hispanic workers in the South), even after adjustment for employment structure, suggests that targeting specific industries with high rates is not enough; within industries, significant racial/ethnic differences in rates must also be addressed. The findings indicate that greater injury prevention efforts need to be focused on the South (where rates are relatively high) and particularly on Hispanic workers in the South. ■

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Contributors

D.B. Richardson and D. Loomis contributed to all aspects of this study including conception and design, analysis and interpretation of the data, and drafting of this article. J. Bena and A.J. Bailer contributed to the

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Human Participant Protection

The institutional review board of the University of North Carolina at Chapel Hill approved this project.

References

1. Taylor AK, Murray LR. Minority workers. In: Levy BA, Wegman DH, eds. *Occupational Health: Recognizing and Preventing Work-Related Disease and Injury*. Philadelphia, Pa: Lippincott Williams & Wilkins; 2000: 679–687.
2. Lloyd JW. Long-term mortality study of steelworkers. V: Respiratory cancer in coke plant workers. *J Occup Environ Med*. 1971;13(2):53–68.
3. Griffith BS. *The Crisis of American Labor: Operation Dixie and the Defeat of the CIO*. Philadelphia, Pa: Temple University Press; 1988.
4. Richardson D, Loomis D. Trends in fatal occupational injuries and industrial restructuring in North Carolina in the 1980s. *Am J Public Health*. 1997;87: 1041–1043.
5. Eckman A, Green J. *Dislocation and Workforce Equity; The South at Work in the 1990s*. Durham, NC: Institute for Southern Studies; 1997.
6. Mishel L, Bernstein J. *The State of Working America, 1994–1995*. Armonk, NY: ME Sharpe Inc; 1994.
7. Swanson LL. *Racial/Ethnic Minorities in Rural Areas: Progress and Stagnation*. Washington, DC: US Department of Agriculture, Economic Research Service; 1996.
8. *International Classification of Diseases, Ninth Revision*. Geneva, Switzerland: World Health Organization, 1980.
9. Stout N, Jenkins E, Pizatella T. Occupational injury mortality rates in the United States: changes from 1980 to 1989. *Am J Public Health*. 1996;86:73–77.
10. Marsh S, Layne L. *Fatal Injuries to Civilian Workers in the United States, 1980–1995*. Cincinnati, Ohio: Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health; 2001. Report 2001–129.
11. Tolson G, Barnes J, Gay G, Kowaleski J. The 1989 revision of the US standard certificates and reports. *Vital Health Stat 4*. 1991;28:1–34.
12. Rosenberg HM, Maurer JD, Sorlie PD, et al. Quality of death rates by race and Hispanic origin: a summary of current research, 1999. *Vital Health Stat 2*. 1999;128:1–13.
13. Loomis D, Bena JF, Bailer AJ. Diversity of trends in occupational injury mortality in the United States, 1980–96. *Inj Prev*. 2003;9(1):9–14.
14. Frome EL. The analysis of rates using Poisson regression models. *Biometrics*. 1983;39:665–674.
15. SAS, *Version 8.01* [computer program]. Cary, NC: SAS Institute; 1999.
16. Loomis D, Richardson D. Race and the risk of fatal injury at work. *Am J Public Health*. 1998;88: 40–44.
17. *Census of Population and Housing, 1990*. Washington DC: US Bureau of the Census; 1992.
18. Current Population Survey microdata files, *Employment and Earnings*. Washington DC: US Department of Labor, Bureau of Labor Statistics; 1990.
19. Bailer AJ, Stayner LT, Stout NA, Reed LD, Gilbert SJ. Trends in rates of occupational fatal injuries in the United States (1983–92). *Occup Environ Med*. 1998; 55:485–489.
20. Bena JF, Richardson D, Bailer AJ, Loomis D, Marshall S. Comparison of fatality rate denominator choices: population based methods. Paper presented at the Third National Occupational Injury Research Symposium (NOIRS); October, 2003; Pittsburgh, Pa.
21. *Census of Fatal Occupational Injuries, 1992–2001*. Washington DC: US Department of Labor, Bureau of Labor Statistics.
22. Toscano G, Windau J. The changing character of fatal work injuries. *Mon Labor Rev*. October 1994: 17–28.
23. Toscano G, Windau J. National Census of Fatal Occupational Injuries, 1995. *Compensation Working Conditions*. September 1996:34–45.
24. *National Census of Fatal Injuries in 2001*. Washington DC: Bureau of Labor Statistics US Department of Labor; 2002. Report USDL 02–541.
25. Walters F. Crunching the numbers: OSHA's data collection program is helping the agency focus its resources where the need is greatest. *JSHQ: Job Safety Health Q*. 2003;14(2):1–2.
26. Dong X, Platner JW. Occupational fatalities of Hispanic construction workers from 1992 to 2000. *Am J Ind Med*. 2004;45(1):45–54.
27. *New Residential Construction—History Tables: Housing Units Authorized by Building Permits*. Washington DC: Bureau of the Census; 2001.