

Exposure to Occupational Hazards among Hispanics, Blacks, and Non-Hispanic Whites in California

JAMES C. ROBINSON, PhD, MPH

Abstract: Relative risks of exposure to each of six types of occupational injuries and illnesses for Hispanic and Black workers compared to Whites who are not Hispanic were calculated using 1986 California data. Among males, Hispanics faced relative risks of exposure to all hazards adjusted for education and years of work experience of 1.33 (95% CI 1.22, 1.45), while Blacks faced relative risks of 1.17 (1.0, 1.37). Among females, adjusted relative risks were 1.19 (1.09, 1.29) for Hispanics and 1.31 (1.15, 1.50) for Blacks. (*Am J Public Health* 1989; 79:629-630.)

Introduction

Several studies have documented racial differences in exposure to occupational hazards, using national data on working conditions faced by Black and White workers.¹⁻⁴ These studies have been forced by the nature of the data they used to group Hispanics together with Whites who are not Hispanic. This approach not only conceals relative exposure differences between Hispanic and other Whites, it also may underestimate the difference in exposure levels between Blacks and Whites. The present study examined 1986 data on exposure to occupational injury and illness hazards for 5,737 workers in California, and calculated relative risks of exposure for Hispanics and Blacks, respectively, compared to Whites who are not Hispanic.

Methods

Information on work-related injuries and illnesses in California was obtained for 1986 from the mandatory reporting system of the state Workers' Compensation system. Under California law, employers must report to the state any work-related injury or illness that causes absence from work lasting one or more full days. These incidence reports are not directly influenced by whether or not the injuries and illnesses subsequently result in a compensation claim. The California Department of Industrial Relations tabulates these reports by occupation, industry, type of injury or illness, and a number of other criteria.⁵

Data were obtained for each of the five major types of injury and for acute illnesses as well as for total injuries and illnesses for each three digit Census occupation classifica-

tion. Frequencies were converted to rates per 1,000 workers per year using occupation-specific California employment data from the 1980 Census of Population,⁶ inflated by the 1980-86 rate of growth in total California employment.

The five major classifications of occupational injuries, which in 1986 accounted for 78.4 per cent of all reported injuries and illnesses, were: strains, sprains, dislocations, and hernias (43.3 per cent); cuts, lacerations, and punctures (13.4 per cent); fractures (10.0 per cent); crushing injuries, contusions, and bruises (8.0 per cent); and abrasions and scratches (3.7 per cent). Acute illnesses accounted for 7.5 per cent of all events.

Demographic data were obtained from the March 1986 Current Population Survey (CPS) of the US Department of Commerce's Bureau of the Census.⁷ The March 1986 survey contained data on 6,175 employed Californians, 5,737 of whom were employed in occupations for which injury and illness data were available. Of 2,649 female workers, 676 were Hispanics, 1,798 other Whites and 175 Blacks. Of 3,088 male workers, 968 were Hispanic, 1,966 other Whites and 154 Black.

Educational attainment as recorded by CPS was categorized as: not graduated from high school, high school graduates, less than four years of college, and four or more years of college. A potential work experience measure was constructed by subtracting years of education plus five from years of age.⁸ The square of this measure was also employed, in order to capture any nonlinear association between work experience and labor market rewards.

The occupational injury and illness rates were matched with the demographic data using three digit Census occupation codes. Each individual worker was thus ascribed the level of risk for each type of injury and for acute illness that was the average for his or her three digit occupation.

Injury rates were first transformed into logarithmic units and regressed on dichotomous variables indicating Hispanic and Black ethnicity, respectively, with other Whites who were not Hispanic composing the comparison category. Relative risks were calculated by taking the exponent of the coefficients on the ethnicity variables. Relative risks were adjusted by taking the exponent of the coefficients on the ethnicity variables in multivariate regressions that controlled for the four education and two work experience variables. The injury and illness rates were approximately lognormally distributed.

Results

Among men, Hispanics faced unadjusted relative risks for all injuries and illnesses combined of 2.21 (95% confidence interval = 2.04, 2.40), compared to other Whites; Blacks

Address reprint requests to James C. Robinson, PhD, MPH, Assistant Professor of Health Economics, Department of Social and Administrative Health Sciences, School of Public Health, University of California-Berkeley, Berkeley, CA 94720. This paper, submitted to the *Journal* August 9, 1988, was revised and accepted for publication December 12, 1988.

© 1989 American Journal of Public Health 0090-0036/89\$1.50

TABLE 1—Relative Risks of Exposure for Male Workers, Adjusted for Levels of Education and Potential Work Experience

Injuries/Illness	Hispanics (95% CI)	Blacks (95% CI)
All Injuries and Illnesses	1.33 (1.22, 1.45)	1.17 (1.00, 1.37)
Sprains and Strains	1.33 (1.22, 1.45)	1.22 (1.04, 1.44)
Cuts and Punctures	1.42 (1.27, 1.57)	1.03 (0.85, 1.26)
Fractures	1.27 (1.16, 1.38)	1.05 (0.89, 1.23)
Crushing Injuries and Contusions	1.42 (1.29, 1.56)	1.24 (1.04, 1.48)
Abrasions	1.48 (1.32, 1.66)	1.03 (0.83, 1.28)
Acute Illness	1.25 (1.16, 1.34)	1.19 (1.04, 1.36)

faced relative risks of 1.41 (95% CI = 1.18, 1.69). Hispanic men had unadjusted relative risks greater than those of Blacks in each individual category of injury and illness. Hispanic women faced relative risks of exposure to all occupational hazards of 1.49 (95% CI = 1.38, 1.62), while Black women faced relative risks of 1.31 (95% CI = 1.14, 1.50).

Tables 1 and 2 present relative exposure risks for Hispanics and Blacks compared to other Whites who were not Hispanic after controlling for educational level and potential work experience. The size of the relative exposure risks are reduced, but substantial ethnic differences remain. Among Hispanic workers, the relative risk for all exposures declined from 2.21 to 1.33 for males and from 1.49 to 1.19 for females. The relative risk for all exposures declined from 1.41 to 1.17 for male Black workers, but for female Blacks were almost identical to their unadjusted relative risks.

Discussion

Hispanic and Black workers in California are exposed to higher risks of occupational injury and acute illness than are other White workers who are not Hispanic, even after controlling for years of education and potential work experience. These ethnic differences may be associated with differing job characteristics. Hazardous occupations have been found to offer fewer rewards and amenities in most dimensions than non-hazardous occupations, including fewer opportunities for worker control over the pace and content of the work process; fewer possibilities for on-the-job training and promotion⁹; higher rates of temporary and permanent layoffs¹⁰; and lower wages.^{9,11}

The limitations of these findings should be stressed. No data sources currently exist that include information on health and safety hazards in particular jobs and on the ethnic and socioeconomic characteristics of the workers employed

TABLE 2—Relative Risks of Exposure for Female Workers, Adjusted for Levels of Education and Potential Work Experience

Injuries/Illness	Hispanics (95% CI)	Blacks (95% CI)
All Injuries and Illnesses	1.19 (1.09, 1.29)	1.31 (1.15, 1.50)
Sprains and Strains	1.18 (1.08, 1.30)	1.40 (1.22, 1.62)
Cuts and Punctures	1.26 (1.13, 1.40)	1.12 (0.95, 1.33)
Fractures	1.11 (1.03, 1.19)	1.22 (1.08, 1.37)
Crushing Injuries and Contusions	1.24 (1.13, 1.36)	1.32 (1.14, 1.53)
Abrasions	1.30 (1.17, 1.44)	1.30 (1.11, 1.53)
Acute Illness	1.15 (1.07, 1.23)	1.30 (1.17, 1.45)

in them. This study combined three different data sets: injuries and illnesses from state Workers' Compensation records, employment data from the Census of Population, and demographic and socioeconomic data from a large survey of individuals. The limitations are especially serious with respect to occupational illnesses as distinct from injuries, since Workers' Compensation programs are mainly focused on acute illnesses rather than diseases with long latency periods. Efforts to improve the quality of data on occupational illness and injury for surveillance purposes should include ethnic and socioeconomic information wherever possible.

ACKNOWLEDGMENTS

This research was supported by a University of California Junior Faculty Fellowship. Computational assistance was provided by Kris Calvin.

REFERENCES

- Lucas R: The distribution of job characteristics. *Rev Econ Stat* 1974; 56: 530-540.
- Davis M, Roland A: Occupational Disease Among Black Workers: An Annotated Bibliography. Berkeley: University of California, Labor Occupational Health Program, 1980.
- Robinson JC: Racial inequality and the probability of occupation-related injury and illness. *Milbank Mem Fund Q* 1984; 62:567-590.
- Robinson JC: Trends in racial inequality and exposure to work-related hazards, 1968-86. *Milbank Mem Fund Q* 1987; 65(Suppl 2):404-420.
- California Department of Industrial Relations: California Work Injuries and Illnesses 1986. Sacramento: CDIR, July 1987.
- US Bureau of the Census: 1980 Census Detailed Population Estimates: California, Section 1. Series PC80-1-D6. Table 217. Washington, DC: The Bureau, 1980.
- US Department of Commerce, Bureau of the Census: Current Population Survey, March 1986, Technical Documentation. Washington, DC: The Bureau, 1986.
- Mincer J: The distribution of labor incomes: A survey. *J Econ Literature* 1970; 8:1-26.
- Robinson JC: Hazardous occupations within the job hierarchy. *Ind Relations* 1988; 27:241-250.
- Robinson JC: Job hazards and job security. *Health Polit Policy Law* 1986; 11:1-17.
- Robinson JC: Hazard pay in unsafe jobs: Theory, evidence, and policy implications. *Milbank Mem Fund Q* 1986; 64:650-677.