Work and Health

METHODS FOR RECRUITING WHITE, BLACK, AND HISPANIC WORKING-CLASS WOMEN AND MEN TO A STUDY OF PHYSICAL AND SOCIAL HAZARDS AT WORK: THE UNITED FOR HEALTH STUDY.

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Despite research on work and health having a long-standing concern about unjust exposures and inequitable burdens of disease, there are few studies that document the *joint* distribution and health effects of physical and psychosocial hazards (e.g., noise, dusts, fumes, and job strain) and social hazards (e.g., racial discrimination and gender harassment) encountered at work. Also, there is a paucity of data on how these exposures, singly and combined, are distributed in relation to sociodemographic characteristics including race/ethnicity, gender, socioeconomic position, and nativity. This article presents a conceptual model for redressing these knowledge gaps and describes recruitment strategies and the characteristics of study participants in the United for Health study. Working with labor unions, the authors recruited 14 (67%) of 21 worksites from manufacturing, meat processing, retail, and transportation, and 1,282 workers (72% response rate), of whom 62 percent were men, 36 percent were women, 39 percent were black, 23 percent were Hispanic, 25 percent were white, 31% earned less than a living wage, 40 percent were below the poverty level, and 23 percent had less than a high school education.

Research on social disparities in health has documented an excess burden of disease and premature mortality among the working class and populations of color (1, 2). Occupational health and safety studies have identified many exposures that

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contribute to this disease burden, including dusts, fumes, chemicals, musculoskeletal strain, noise, and job strain (3), yet only a few and mainly outdated studies have documented how such exposures are distributed by race/ethnicity, gender, and wage level (4, 5). Likewise, a growing literature is identifying the impact of a different set of exposures, referred to as "social hazards," that are also encountered at work, and encompass such phenomena as racial discrimination, sexual harassment, and fear of violence (1–3, 6–13). While all of these hazards occur in the workplace, often simultaneously or within a short time period, few studies have evaluated the occurrence of multiple exposures and their combined effect on health outcomes (14, 15) and how such exposures and health effects are distributed among workers. Indeed, much of the extant research on work and health examines physical and social hazards separately, and rarely in relation to race/ethnicity, gender, and wage level (1–3, 9–11). A more comprehensive understanding is needed of the ways in which physical and social hazards may jointly affect health outcomes and shape racial/ethnic, gender, and economic inequalities in health. Such an understanding could inform workplace and union policies to ameliorate inequalities and to minimize the hazards overall.

One difficulty in obtaining data on social disparities in the joint distribution of workplace hazards is gaining access to diverse working populations in which these exposures and their health consequences can be documented (16). It is often difficult to get worksite management to agree to participate in health studies, owing to managers' concerns about documenting a new problem that they will be expected to abate and/or that may have an adverse effect on their public image. In addition, managers may be concerned about loss of time and productivity by workers who participate in a study, and managers themselves often experience serious time and economic pressures. There is a dearth of literature on useful methods for enrolling working populations that are diverse in relation to race/ethnicity, gender, and wage level. To date, the research literature on worksite health promotion contains only a small number of reports on the processes and outcomes of efforts to recruit worksites into health promotion trials (17–19), and, to our knowledge, there are no such reports in the occupational safety and health literature, despite the centrality of this recruitment step in the research process. As a result, readers of worksite-based studies know little of how a study sample came to be, and researchers in the field miss opportunities to share with one another valuable lessons learned about recruitment strategies.

The objectives of this article are: (*a*) to describe methods and outcomes of our efforts to recruit worksites and individual workers to participate in the United for Health study, based in the greater Boston area (Massachusetts); (*b*) to present descriptive data on the sociodemographic characteristics of workers who participated in the study; and (*c*) to compare these characteristics to those of the overall population in the study catchment area, to gauge whether the recruitment strategy yielded a study population with racial/ethnic diversity at least equal to if not greater than that of the regional population. By discussing challenges and lessons

learned, we believe our experiences can aid other researchers who wish to conduct studies in similar populations and settings.

METHODS

Study Design

Our study, United for Health, was designed to ascertain the joint distribution of physical and social hazards at work, in relation to race/ethnicity, gender, and wage level, and to quantify their contribution to social disparities in health. The conceptual model guiding our study is presented in Figure 1. We used a cross-sectional design and gathered data through several mechanisms: a self-administered survey, an interviewer-administered job history questionnaire, a physical examination to measure selected health indicators directly (e.g., blood pressure), and occupational hygiene worksite walk-through surveys.

Study Population: Recruitment Target

To address the study questions, we needed to recruit a population of working-class women and men that not only was diverse with regard to the sociodemographic characteristics specified in the conceptual model, but was also likely to be exposed to a variety of physical and social hazards at work. As a first step in recruiting such a population, we made a decision to gain access through labor unions, rather than start with a worksite-based strategy. We made this decision for several reasons. First, unions provide a reliable and trusted vehicle for recruiting workers to discuss the very personal health issues under study, separate from the purview of management (20). Second, by selecting unions that employ workers across many worksites, we would be able to access workers experiencing a range of physical and social hazards. Third, through unions, we (and they) could disseminate our findings. New insights gained through this research can be translated into policy through unions, which are empowered by national labor laws to negotiate with employers about working conditions, including exposure to physical hazards, and can also advocate for workplace policies and conditions that discourage or prohibit racial and gender discrimination and sexual harassment (21).

In choosing to study unionized workers, who represent just 13 percent of the U.S. workforce (22), we knowingly reduced the potential generalizability of our findings to the large sector of non-unionized workers. Counterbalancing this concern, however, was the need for internal validity, including an accurate assessment of relevant hazards based on workers' candid responses to survey questions. Unions afford a good vehicle for engaging workers in studies because, as the only organizations whose mission is to represent workers' interests, they can create a trusting environment that can translate into good response rates and valid survey responses. This was a particularly important set of challenges to overcome

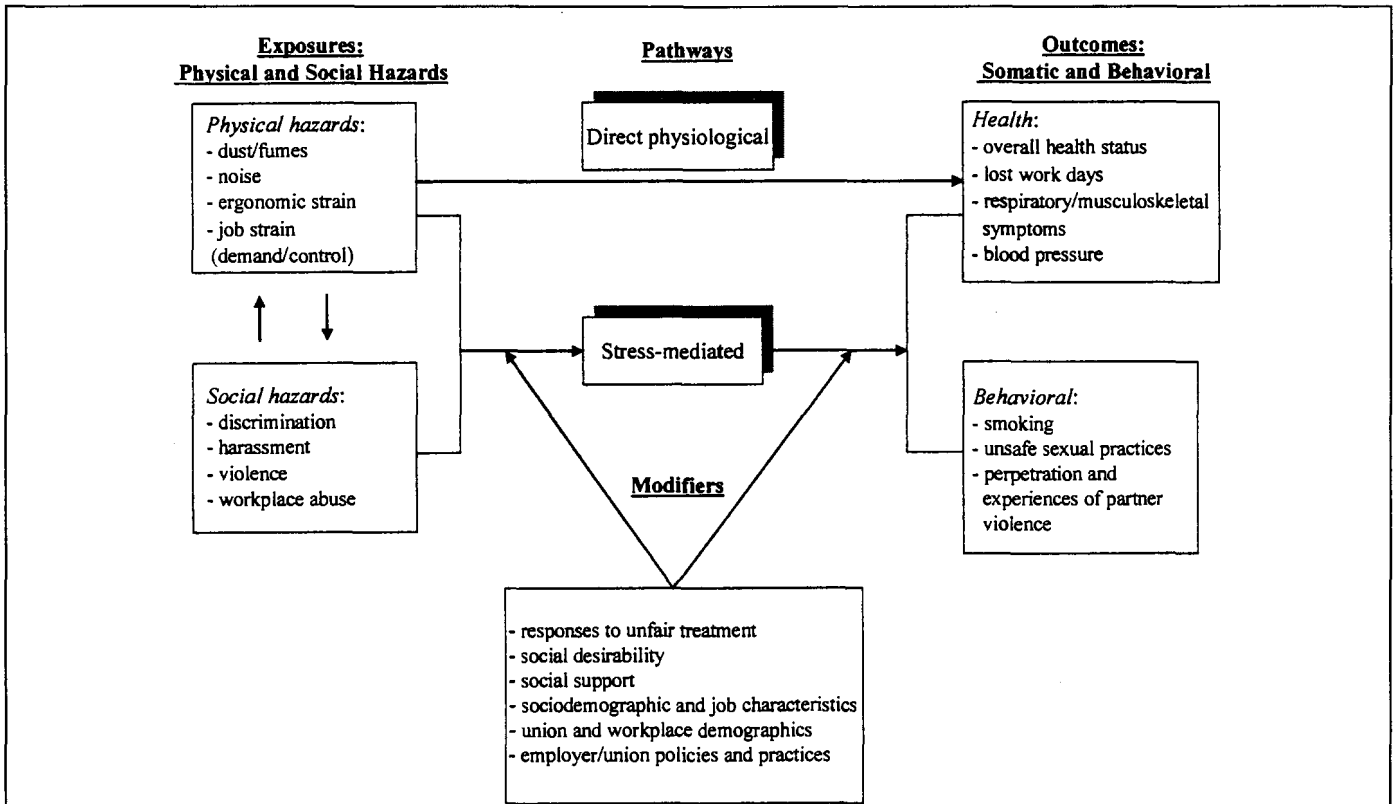

Figure 1. Conceptual model of the United for Health study.

in our study, given the sensitive and personal nature of several of our study variables (e.g., racial and gender discrimination, partner violence), coupled with the risks that workers face (e.g., of being fired) for identifying hazardous workplace conditions.

We attempted to recruit four unions, three of which agreed to participate in the study. They represented workers in a range of industries and occupations and had, according to their own estimates, racially and ethnically diverse memberships. The unions that participated valued the study's potential to gather information on members and their working conditions that could assist the unions in better serving their members' needs through collective bargaining and other means.

We held two focus groups with union members to explore strategies for optimizing study participation (e.g., babysitting services, travel expenses, financial compensation for time, and location of survey administration). Findings from the focus groups prompted us to alter our initial plans to conduct surveys at the union hall or even at the worksite before or after shifts. Members reported many time constraints, such as second jobs and child care responsibilities, that would limit their ability to participate if the study were not conducted at work and on work time. We revised our study methods accordingly; our union collaborators identified 21 worksites that would collectively yield our desired sample, and the study staff and union leaders worked together to recruit these worksites into the study, as described below. The study protocol was approved by the Dana-Farber Cancer Institute's Office for the Protection of Research Subjects.

Worksite Recruitment

Union leaders provided contact information for the appropriate management representative at each worksite. The study's principal investigator and the union president sent co-signed introductory letters and recruitment materials to each worksite management contact, and study staff followed up by telephone to assess willingness to participate in the study. If a worksite expressed interest, we conducted an in-person, on-site recruitment meeting to describe what would be required of participating worksites, including work release to complete the survey, physical examinations, and an industrial hygiene walk-through survey. We allotted $50 in financial compensation for completed surveys; this was either paid in full to workers in the form of a pre-paid grocery card, or divided between workers and management, in cases where management required us to reimburse them to release workers from their jobs to participate in the study.

Survey Recruitment and Administration

We recruited workers to the study between September 2003 and August 2004. Workers received an introductory letter about the study, and were then recruited and screened for eligibility at their worksites by study staff. Management in each

worksite provided the survey staff with a list of current employees. Union stewards helped to identify the workers on-site and direct them to the survey administration room. Eligibility criteria included an age of 25 to 64 years, being employed at least 2 months in the worksite, and ability to complete the survey in English or Spanish. We limited the study to workers aged 25 years and older to allow for an adequate latency period between work exposures and the health outcomes of interest. To recruit workers, we used a census in all but one case, in which we recruited a randomly selected fraction of workers.

The survey was administered on-site, typically during work hours, in a private room. It consisted of a 40 to 45 minute survey, administered by computer (in English or Spanish), followed by a 15 minute physical exam and interviewer-administered job history questionnaire. We used Audio-Computer Assisted Self-Interviewing (ACASI) both to improve the likelihood of obtaining sensitive information and to enable persons with low literacy to respond (23). With ACASI, questions shown on the screen are also heard over a headphone, via a digitally recorded audio component. Participants responded by pressing the indicated keys on a masked keyboard. The Spanish version of the survey was translated from English and then back-translated to ensure accuracy. One or more of the interview staff were bilingual in English and Spanish and were available to answer participants' questions. At the conclusion of the survey, staff gave participants a pamphlet on local organizations that provide information and services pertinent to topics covered in the survey.

Survey Measures

To assess the sociodemographic characteristics of participants, we obtained data on occupation, education, hourly wage, poverty level, occupational class, union membership status, race/ethnicity, nativity, and gender; language of survey administration was also documented. We determined *occupation* by asking respondents to indicate their job titles as part of the interviewer-administered job history questionnaire. Industry and job coding for each entry was performed using two standard coding schemes—the Standard Industrial Classification/Standard Occupational Classification (SIC/SOC; 24) and the North American Industry Classification System (NAICS; 25)—so that results on particular occupations could be compared with those in other studies using similar standard job codes. In this report we present occupations grouped into broad categories within industry. According to the NAICS coding scheme, the meat processing plant was classified as *meat and meat products (wholesale),* and the two lighting fixtures factories were classified as *lighting fixtures (manufacturing).* The occupations within these industries were grouped as *production—main,* for those jobs with duties related to the main production activities, such as machine operator or food mixer; and *production—support,* for those jobs with duties that supported the main production processes, such as quality control, inspection, or warehousing. Within the grocery

stores, *grocery store (retail),* jobs were grouped into *supervisor/skilled trade,* such as scheduler and meat wrapper, or *clerk.* All occupations in the *school bus service* industry had the same title, *bus driver.* Measures of socioeconomic position were assessed as follows: (*a*) *educational attainment,* in relation to credentials rather than years in school, because credentials can qualify individuals for certain jobs and income levels; (*b*) *hourly wage,* in relation to the estimated living wage for the Boston area, which was $10.54/hour in 2003 (26); (*c*) *occupational class,* as determined by whether respondents owned or ran a business or supervised others, a classification proposed by Wright (27; see also 28) and used in several U.S. health studies (29–32); and (*d*) *poverty level,* determined by annual household income in relation to need, according to the 2003 U.S. federal poverty guidelines and taking into account the respondents' family size and age composition (33–35). For race/ethnicity, participants could indicate they belonged to up to eight groups; all persons who indicated they were of Hispanic or Latino origin were included in the Hispanic group. Union membership status, nativity, and gender were also self-reported.

RESULTS

Worksite-Level Participation

Of the 21 worksites we attempted to recruit, 14 (67%) consented to participate. The participating worksites varied in size from 55 to 600 workers and represented a range of industries, including wholesale meat and meat production, retail grocery stores, lighting fixtures manufacturing, and school bus services. In recruiting worksites, we expected and encountered several obstacles and developed strategies to overcome them (Table 1). Reasons for worksites refusing to participate were: concerns about loss of productivity (n = 3), lack of approval at senior management levels (n = 2), concerns about the content of the survey (n = 2), lack of interest (n = 1), rapid turnover of senior management and inability to make a decision within the study timeframe (n = 1), and a company policy against surveying employees (n = 1). In recruiting worksites, we also discovered that among those who agreed to participate, many were motivated by the positive reputation of the Dana-Farber Cancer Institute and by a desire to support the institute's efforts, as was also the case with participating unions.

While our collaboration with unions did generally increase the study's credibility among members, it often hindered negotiations with worksite management. At worksites that had poor relations with the union, our motives for the partnership were questioned. In some cases (five worksites belonging to a large grocery chain), at management's insistence, we dissociated the study from the union by removing union logos from the study's letter paper, so that management could "get the credit" (their words) for bringing the study to employees. The union agreed to

Table 1

Recruitment of worksites: obstacles and the strategies to overcome them

Obstacles
• Identifying and contacting the appropriate management "decision-maker" and needing to receive multiple levels of approval (executive board, vice president for human resources, legal office, etc.)
• Management concerns about productivity losses associated with giving workers time to participate in a study
• Management concerns about confidentiality for worksite
• Management concerns that survey would raise workers' expectations that problems identified by the survey would be corrected by management
Strategies
• Persisted in attempts to contact decision-makers and often enlisted the support of union leaders in identifying appropriate contacts
• Highlighted the benefits of participation to management (improved employee morale, reimbursement for work-release, monetary incentives for employees, offer of a free health fair for all employees, positive public relations)
• Explained that as part of protecting study participants' confidentiality, we would not share the survey or provide any individual responses or data, and that these same protections extended to the worksite

this because it thought the study benefited its membership, even if the union were not able to sponsor the study directly.

Individual-Level Participation

We had an average participant response rate of 72 percent (range 65%–87%) across all worksites. When survey staff could not locate individuals on the employee lists, they attempted to gather additional information from management on employees' whereabouts. In cases where survey staff were able to determine that an employee was on vacation, on medical leave, or working a schedule that would not permit participation in the survey (e.g., weekends only), we deemed these workers ineligible to participate. The remaining employees who could not be contacted were assumed to be eligible. For sites where the eligibility of employees we could not get in touch with could not be determined, we used the eligibility rate among those we did contact to estimate the proportion of those not contacted who could be assumed to be eligible.

Table 2 details lessons learned from our attempts to recruit individuals to the study. According to the survey staff, participants were receptive to the survey, including questions about potentially sensitive topics of racial discrimination,

Table 2

Recruitment of individuals: obstacles and the strategies to overcome them

Anticipated and actual obstacles • Outdated or inaccurate employee lists • Workers' fears about the physical exam and suspicion about research studies, lack of interest in participating, concerns about language requirements, and concerns about questions on "sensitive topics" (e.g., sexual harassment, racial discrimination, and violence)
Strategies • Checked employee lists with union stewards • Hired survey staff who represented the racial/ethnic and language composition of the intended study sample • Partnered with union to increase credibility, interest, and trust among members • Conducted survey during work-release • Provided monetary compensation for participating • Administered the survey with the ACASI method, with audio in English and Spanish

harassment, sexual behavior, and experiences of intimate-partner violence. Participants in the focus group to pretest the survey reported that the survey questions were "honest and sincere" and addressed important issues that are "all parts of life." A few survey respondents reported to survey staff that they were uncomfortable answering some questions, though they were able to do so because of the confidential manner in which data were obtained. In a few rare instances, survey staff noted that workers refused to participate in the study because they had heard from co-workers that the survey contained questions about "sex and violence."

Study Population Characteristics

The sociodemographic characteristics of the study sample are summarized in Table 3. The sample was predominantly male (62%), racially/ethnically diverse (39% black, non-Hispanic participants; 23% Hispanic participants), and included overall an even distribution of workers aged 25 to 44 years and 45 years and older. Compared with other racial/ethnic groups, a larger proportion of Hispanic workers (61%) were in the younger age category. There was considerable variation among racial/ethnic groups in employment patterns at the industry level: blacks were most likely to be employed in school bus service (66%), Hispanics in light fixtures manufacturing (20%), and whites in grocery stores (50%). Overall, most of the participants (59%) were in non-supervisory positions, but whites in the sample were more likely than other groups to be in supervisory positions (67%).

Table 3

Sociodemographic characteristics of survey respondents

Characteristic	Total (n = 1,282; 100%)		Black, non-Hispanic (n = 505; 39%)		Hispanic (n = 292; 23%)		White, non-Hispanic (n = 314; 25%)		All other small-size racial/ethnic groups (n = 171; 13%)	
	n	%	n	%	n	%	n	%	n	%
Gender:										
Male	791	62%	327	65%	164	56%	194	62%	106	62%
Female	456	36%	163	32%	120	41%	112	36%	61	36%
Missing	35	3%	15	3%	8	3%	8	3%	4	2%
Age, yrs:										
25–44	592	46%	209	41%	179	61%	120	38%	84	49%
45–64	610	48%	271	54%	95	33%	169	54%	75	44%
Out of range (<25 or >64)	37	3%	9	2%	3	1%	18	6%	7	4%
Missing	43	3%	16	3%	15	5%	7	2%	5	3%
Industrial/occupation:										
Meat and meat product (wholesale)										
Production—main	55	4%	2	1%	30	10%	13	4%	10	6%
Production—support	79	6%	6	1%	56	19%	9	3%	8	5%
Grocery store (retail)										
Supervisor/skilled	70	6%	22	4%	5	2%	33	11%	10	6%
Clerk	341	27%	123	24%	51	17%	123	39%	44	26%
Lighting fixtures (manufacturing)										
Production—main	130	10%	3	1%	52	18%	59	19%	16	9%
Production—support	30	2%	0	0%	6	2%	20	6%	4	2%
School bus service	485	38%	335	66%	28	10%	52	17%	70	41%
Missing	92	7%	14	3%	64	22%	5	1%	9	5%

Occupational class position:										
Own or run own business	69	5%	31	6%	15	5%	16	5%	7	4%
Self-employed/freelance	80	6%	23	5%	34	12%	67	21%	11	6%
Supervisory employee	287	22%	127	25%	46	16%	211	67%	47	28%
Non-supervisory employee	753	59%	299	59%	146	50%	12	4%	97	57%
Missing	93	7%	25	5%	51	17%	8	3%	9	5%
Hourly wage (% of living wage):										
$6.00–$10.54 (≤ 100%)	403	31%	122	24%	145	50%	86	27%	50	29%
$10.55–$13.16 (101%–124%)	167	13%	29	6%	48	16%	66	21%	24	14%
$13.17–$15.80 (125%–149%)	114	9%	35	7%	21	7%	39	12%	19	11%
≥ $15.81 (≥ 150%)	493	39%	289	57%	29	10%	112	36%	63	37%
Missing	105	8%	30	6%	49	17%	11	4%	15	9%
Poverty level (household):										
<100% poverty	495	39%	224	44%	137	47%	72	23%	62	36%
100%–199% poverty	283	22%	107	21%	53	18%	93	30%	30	17%
200%–299% poverty	143	11%	46	9%	25	8%	47	15%	25	15%
≥ 300% poverty	191	15%	70	14%	14	5%	80	25%	27	16%
Missing	170	13%	58	12%	63	22%	22	7%	27	16%

Table 3 (Cont'd.)

Characteristic	Total (n = 1,282; 100%)		Black, non-Hispanic (n = 505; 39%)		Hispanic (n = 292; 23%)		White, non-Hispanic (n = 314; 25%)		All other small-size racial/ethnic groups (n = 171; 13%)	
	n	%	n	%	n	%	n	%	n	%
Educational attainment:										
Less than 12th grade	296	23%	94	19%	103	35%	62	20%	37	22%
High school degree/GED	470	37%	207	41%	73	25%	134	42%	56	33%
Some college/vocational school	282	22%	128	25%	42	15%	71	23%	41	24%
≥ 4 years of college	118	9%	44	9%	19	6%	38	12%	17	10%
Missing	116	9%	32	6%	55	19%	9	3%	20	12%
Nativity:										
Born in U.S. or U.S. territory	607	47%	199	39%	69	23%	275	87%	64	38%
Foreign-born	616	48%	292	58%	192	66%	34	11%	98	57%
Missing	59	5%	14	3%	31	11%	5	2%	9	5%
Language of survey:										
English	1,060	83%	500	99%	83	28%	310	99%	167	98%
Spanish	222	17%	5	1%	209	72%	4	1%	4	2%
Union membership:										
Yes	1,151	90%	468	92%	224	77%	303	96%	156	91%
No	119	9%	34	7%	61	21%	9	3%	15	9%
Missing	12	1%	3	1%	7	2%	2	1%	0	0%

Nearly a third of the total sample, and 50 percent of Hispanics, were earning wages at or below Boston's living wage. A large proportion of the total sample was living in poverty (39%), with blacks (44%) and Hispanics (47%) more likely to be living in poverty than whites (23%). Educational attainment was low overall, with 60 percent of the sample earning a high school diploma/GED or less; more than a third of Hispanics did not complete the 12th grade. Immigrants to the United States constituted 48 percent of the sample, including 58 percent of blacks and 66 percent of Hispanics.

Comparison of Study Sample with General Population in the Same Geographic Area

To assess whether we had recruited a working population at least as racially/ethnically diverse as, if not more diverse than, the catchment area population, in Table 4 we compare the sociodemographic characteristics of our sample with those of the general population in the same geographic area, using data from the 2000 U.S. Census. Compared with the general population, our study sample had greater racial/ethnic diversity (8.4 and 3.8 times more likely to be black and Hispanic, respectively), was 4.5 times more likely to be living in poverty, 1.6 times more likely to have less than a high school education, and 4 times more likely to be foreign-born.

Unanticipated Problems

In conducting this study, we encountered a few unanticipated problems; an awareness of these issues may prove useful to other investigators attempting to reach similar working populations. First, data collection took longer than expected. We had allotted 6 months for data collection, but this extended to 12 months, generating additional study costs. The longer time was due, in part, to layoffs before and during the study period, such that there were fewer workers than expected in each worksite. We thus had to recruit additional worksites to reach our recruitment targets. Second, the survey length of 40 to 45 minutes raised concerns among managers at several worksites about productivity losses; a shorter survey might have alleviated this concern, but would have compromised our ability to obtain the data required to test the study hypotheses. Third, we found that worksites that were part of much larger corporations required more time and effort to recruit, because we had to obtain approval from several layers of management. Some of the larger corporations refused to be involved if they could not see the full survey, which we decided not to share with management under any circumstance. We offered only to share a list of broad topics included in the survey. We made this decision based on the concern that workers might in some way be punished for taking a survey that asked, for example, about instances of workplace abuse by managers.

Table 4

Comparison of study sample with the general population in the same geographic region, using Census 2000 data for Boston-Worcester-Lawrence Statistical Area

	Census		Study population[a]	
	n	%	n	%
Total population	5,819,101			
Gender:				
Male	2,816,601	48.4%	791	62%
Female	3,002,500	51.6%	456	36%
Race:				
Black, non-Hispanic	273,722	4.7%	505	39%
White, non-Hispanic	4,801,731	82.5%	314	25%
All other, non-Hispanic	386,546	6.6%	171	13%
Hispanic	357,102	6.1%	292	23%
Age, yrs:				
<25	1,912,448	32.9%	2	0
25–44	1,882,838	32.4%	592	46%
45–64	1,291,272	22.2%	610	48%
>65	732,543	12.6%	35	3%
Poverty level (household):	5,640,444			
≤ 100%	482,703	8.6%	495	39%
100%–199%	647,951	11.5%	283	22%
≥ 200%	4,509,790	80.0%	334	26%
Educational attainment at age 25+:	3,906,653			
< Less than 12th grade	560,062	14.3%	296	23%
High school degree/GED	1,045,701	26.8%	470	37%
Some college	957,236	24.5%	282	22%
≥ 4 yrs of college	1,343,654	34.4%	118	9%
Nativity:				
Born in U.S. or U.S. territory	5,098,041	87.6%	1,099	47%
Foreign-born	721,060	12.4%	183	48%

[a]Percentages for study population may not equal 100% for all categories due to missing data, as shown in Table 3.

DISCUSSION

By collaborating with unions and using the methods described herein, we were able to gain access to worksites and workers that many might deem "hard to reach" and ask them questions about not only physical but also social hazards at work, many of which concerned topics that might be considered "sensitive" (e.g., sexual

harassment, racial discrimination, and violence). Our study sample included a large proportion of workers of color employed in a range of industries and occupations that pay low wages. By recruiting worksites that employed large numbers of blacks and Hispanics, and both men and women, we arrived at a study sample that will provide sufficient statistical power to assess the patterning of physical and social hazards by race/ethnicity and gender and across different occupations and wage levels. The survey tapped into a wide spectrum of workers' experiences, from workplace physical conditions, to social experiences such as racial discrimination and workplace abuse, to health status and health behaviors, and was well-received by workers.

To our knowledge, ours is the first study to describe potential pitfalls and practical strategies entailed in recruiting worksites and individual workers to a study of physical and social hazards at work, with the workforce specifically recruited so that the distribution of hazards could be quantified in relation to race/ethnicity, gender, wage level, and other sociodemographic characteristics. Although the research literature on worksite health promotion contains a small number of reports on the processes and outcomes of efforts to recruit worksites into health promotion trials (19), we could locate no such articles in the occupational health and safety literature. A limitation of our study stems from its sampling methods, in that we do not have a representative sample of worksites. Although we did encounter some obstacles, overall we were able to attain a high response rate (72%) from a study population based in a collection of worksites that comprise a broad cross-section of working-class occupations and a diverse workforce.

In applying for the research grant for this study and others involving unionized workers, we have had to respond to peer reviewers' concerns that unionized workers constitute a privileged group and are therefore not comparable to other workers. While it is true that unionized workers on average earn higher wages than their non-union counterparts (36), they could hardly be deemed a privileged population. In 2003, the average annual earnings in the United States for full-time union workers aged 25 years and older were $40,248 ($774 week × 52 weeks) (36), slightly under the U.S. median household income of $43,318 (37). Additionally, according to Bureau of Labor Statistics data for 2003 (38), the average hourly wage for blue-collar occupations (which corresponds to all but grocery store jobs in our study sample) was $17.84, or 1.7 times Boston's living wage for 2003. For service occupations, which include grocery store jobs, the average hourly wage was $13.64, or 1.3 times Boston's living wage. Even so, within our study population of union workers in Boston, fully 40 percent of the workers lived in households below the U.S. poverty line.

Analyses to be presented in future reports will redress significant gaps in the literature concerning the distribution of physical and social hazards (39), separately and together, according to race/ethnicity, gender, and other sociodemographic characteristics, and their relationships to health outcomes and behaviors. In so doing, we aim to contribute to a deeper understanding of how

working conditions affect health outcomes and shape social inequalities in health, and how these inequalities may be ameliorated by workplace and union policies and social buffers. In tandem with our efforts to inform the academic literature on social inequalities and working conditions, we are sharing our study results with our union collaborators and, together, receiving advice from an outside advisory group that includes experts in human rights, law, gender and racial discrimination, labor economics, and occupational safety and health policy and advocacy. Together, we will plan for ways to use these data to benefit the workers represented by the unions involved in our study and, more broadly, to consider ways of disseminating the findings to contribute to efforts to bring substantial improvements in work environments and workers' lives.

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