Reducing Hazardous Cleaning Product Use: A Collaborative Effort

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SYNOPSIS

Workplace hazards affecting vulnerable populations of low-wage and immigrant workers present a special challenge to the practice of occupational health. Unions, Coalition for Occupational Safety and Health (COSH) groups, and other organizations have developed worker-led approaches to promoting safety. Public health practitioners can provide support for these efforts.

This article describes a successful multiyear project led by immigrant cleaning workers with their union, the Service Employees International Union (SEIU) Local 615, and with support from the Massachusetts COSH (MassCOSH) to address exposure to hazardous chemicals. After the union had identified key issues and built a strategy, the union and MassCOSH invited staff from the Massachusetts Department of Public Health's Occupational Health Surveillance Program (OHSP) to provide technical information about health effects and preventive measures. Results included eliminating the most hazardous chemicals, reducing the number of products used, banning mixing products, and improving safety training. OHSP's history of public health practice regarding cleaning products enabled staff to respond promptly. MassCOSH's staff expertise and commitment to immigrant workers allowed it to play a vital role.

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Vulnerable populations, including low-wage and immigrant workers, frequently work in the most hazardous environments and also have the fewest resources to address workplace dangers.[1,2] As global economic and political forces move large numbers of immigrant workers into at-risk jobs, labor unions, Coalition for Occupational Safety and Health (COSH) groups, and workers' centers have led creative efforts to combat occupational hazards. These methods involve workers as leaders in identifying priority hazards, health effects, and solutions, as well as building power to promote change.[3–5]

Public health practitioners and people with technical expertise can support these workers and their organizations by contributing to efforts to increase mutual support for labor and public health regarding issues that are important to everyone.[6] This article describes a successful occupational health campaign led by janitors and their union with a COSH group, Massachusetts Department of Public Health (MDPH), and academics contributing valuable skills and information.

OCCUPATIONAL HEALTH OF JANITORS

Janitorial work in the U.S. is characterized by low wages, few benefits, and limited opportunities.[7] Union density is low and some workers are employed "off the books."[8] Building cleaning has largely become the invisible work of newcomers to this country, both documented and undocumented.[9,10]

In comparison with other occupations, janitors suffer high rates of a number of occupational diseases.[11] Janitors can be at risk of contracting hepatitis B, hepatitis C, and human immunodeficiency virus from needlesticks and other sharps injuries;[12] potential cardiovascular and psychological diseases from discrimination and shift work;[13–17] violence-related injuries and stress due to isolation; strain and sprain injuries from awkward and repetitive motions;[18,19] dermatitis, rhinitis, and irritation or burns of the nose, throat, and eyes from acidic, caustic, or otherwise irritating chemicals; and asthma and allergies from sensitizing ingredients in cleaning products.[20,21] These risks can be exacerbated by mixing chemicals, which produces still more dangerous compounds.

Janitors are among the occupational groups reporting the highest rates of work-related asthma (WRA),[22–30] and cleaning products have been identified as the exposures most frequently associated with their symptoms.[31–41] Of 1,915 people with WRA identified in four states from 1993 to 1997, 12% reported an association between their symptoms and exposure to cleaning products.[38] Cleaning products were also the leading exposures reported by workers with reactive airway dysfunction syndrome (RADS).[42] A consensus statement recently released by the American College of Chest Physicians cited cleaning as a work exposure associated with occupational asthma, RADS, and work-exacerbated asthma.[43]

INTERVENTION PARTNERS

The Service Employees International Union (SEIU) has been working for two decades on the national Justice for Janitors campaign, seeking social and economic justice for 225,000 members in many cities.[44] While Justice for Janitors emphasizes secure full-time employment, adequate pay and benefits, and union representation, health and safety have also been a focus of several workplace campaigns, especially where employers are particularly resistant to positive change. SEIU Local 615, which represents 16,000 property service workers in Massachusetts, Rhode Island, and New Hampshire,[45] has collaborated with the Massachusetts COSH (MassCOSH) for several years to address work-related health problems reported by members.

One of many COSH groups around the country, MassCOSH is a coalition of workers; unions; community groups; and health, safety, and environmental activists that organizes and advocates for safe jobs and healthy communities throughout eastern and central Massachusetts. For 30 years, MassCOSH has worked with the Massachusetts labor movement, recruiting a diverse multilingual staff to organize, advocate, lobby, and provide assistance to local unions, individuals, and groups.[46] MassCOSH has recently focused on immigrant, low-wage workers and their communities, involving workers and unions in changing the workplace. Active projects have included an Environmental Justice for Cleaning Workers Initiative. MassCOSH has also consistently recruited and relied on volunteer technical experts, including physicians, industrial hygienists, epidemiologists, and policy experts.[47]

Since 1993, the Occupational Health Surveillance Program (OHSP) of MDPH together with the Health Departments of California, Michigan, and New Jersey have received funding from the National Institute for Occupational Safety and Health to conduct surveillance of WRA, identifying industries, occupations, and exposures associated with WRA.[37] A focus on sentinel surveillance provided an opportunity to understand the importance of individual WRA cases and solicit their stories of exposure and disease. Cleaning products emerged as a significant WRA cause in all four states.[38] As a result, OHSP staff developed expertise on the health effects of exposure to cleaning products.

METHODS

Workplace assessment with janitors in a transportation center

Approximately 140 members of the SEIU Local 615 worked for a private contractor, cleaning a large passenger transportation center with 24-hour access. During the past several years, they had raised many issues of workplace hazards with their supervisors. When they couldn't get them corrected, the workers approached their union representatives with the issues. For example, broken wheels on cleaning carts required workers to use extra force to push them up ramps, into bathrooms, and around the facility. Discarded materials in bathrooms included broken glass, syringes, and unmarked liquids with potential physical, biological, and chemical hazards. Concern about cleanliness in public bathrooms promoted increased use of more concentrated disinfectants, especially during night shifts, which caused acute irritant symptoms. Understaffing resulted in job overload, extra tasks, speed-up, and fatigue.

Survey

In response to these concerns, SEIU Local 615 and MassCOSH developed a four-page Spanish-language survey in March 2005 to seek feedback about specific symptoms, hazards, and equipment, as well as provision of health and safety training. The survey provided check-off lists of health problems that respondents associated with chemical use, health problems they associated with overwork, and other workplace hazards (e.g., exposure to dust, body fluids, bacteria, sexual harassment, and violence). It included a drawing of a human figure and allowed respondents to pinpoint the location of pain attributed to their work. Respondents were also asked to indicate whether they had received training in eight different topics related to health and safety.

RESULTS

The union distributed the survey, and 49 janitors (35% of potential respondents) completed it, including morning, evening, and overnight staff from three wings of the transportation center. Twenty-one respondents wrote descriptive comments beyond the check-off items allowed on the survey.

Forty-six (94%) respondents reported chemical use. Thirty-eight (78%) respondents reported at least one symptom that they associated with chemical use, including headache, itchy skin, and eye irritation. Forty-five (92%) respondents described at least one symptom that they attributed to excessive workload, most commonly headache, depression, and lack of appetite. Thirty-five (71%) respondents marked at least one body part as painful, "falling asleep," or bothered due to their work (Table 1). Areas of the body most marked were the neck (n=16, 33%) and feet (n=14, 29%).

Other hazards most reported were exposure to dust, heavy work, body fluids, and general harassment (Table 2). Written comments responding to other concerns described bad treatment, ignoring seniority, understaffing, instability in the work, poor treatment of people active in the union, and "playing with their feelings." One respondent wrote, "Every day they give us more work, they harass us, and watch us as though we are prisoners."

Between 25 and 29 respondents (51% to 59%) reported having received no training on using chemicals or personal protective equipment, cleaning potentially infectious body fluids, finding or using material safety data sheets (MSDSs), or undertaking safety procedures for heavy equipment or emergency procedures. These are all elements required by the Occupational Safety and Health Administration's Hazard Communication and Bloodborne Pathogens standards.[48] Nineteen (39%) respondents reported no training on rules about sexual harassment.

Survey results were not intended for scientific review or to calculate attack rates, and the instrument did not undergo the rigorous design and review typical of survey research. Characteristics of nonrespondents were not known, so the representativeness of the sample could not be assessed. Also, the questionnaire included no questions specifically about respiratory

Table 1. Symptoms that survey respondents reported as associated with exposure to workplace chemicals or overwork, Boston, March 2005

Self-reported cause of symptom	*Symptom*	*Number (percent) responding "yes" to listed symptom (n=49)*
Associated with exposure to chemicals	Headache	23 (47)
	Itch	20 (41)
	Eye irritation	18 (37)
	Sore throat	15 (31)
	Rash	15 (31)
	Skin burns	15 (31)
Associated with overwork	Headache	34 (69)
	Depression	21 (43)
	Lack of appetite	20 (41)
	Fatigue	15 (31)
	Nausea	6 (12)
	Other symptoms	6 (12)
	Anxiety	5 (10)

Table 2. Workplace hazards identified by survey respondents in Boston, March 2005

Exposure listed on questionnaire	*Number (percent) responding "yes" to listed exposure (n=49)*
Excessive workload	27 (55)
Chemicals	23 (47)
Dust	17 (35)
Heavy work	17 (35)
Blood, saliva, other body fluids	16 (33)
General harassment	16 (33)
Germs, bacteria in the garbage	13 (27)
Contagious diseases	13 (27)
Very heavy equipment	13 (27)
Other	12 (25)
Violence	6 (12)
Equipment that doesn't work	5 (10)
Sexual harassment	3 (6)

symptoms, such as wheezing, shortness of breath, or asthma. Therefore, the results were not comparable to previous health-related findings about cleaning worker populations

Instead, the survey was designed to solicit worker input and uncover symptoms, concerns, and any related workplace exposures. In addition, the process itself represented a first step in the campaign to raise and address pressing health issues.

Participatory hazard assessment

The following summer, several workers reported increasingly severe symptoms (e.g., nosebleeds and gastrointestinal problems) to union staff, who requested information from the employer on the potential health effects of the cleaning products used. The employer provided a 7-inch-thick binder with dozens of MSDSs without specifying which products were being used or were likely to cause the symptoms reported.

One worker suggested a method for soliciting worker input about the products. A table in the breakroom in Area A was dedicated to information gathering. Workers and supervisors gathered every product used. Then, each container was numbered and placed on a piece of paper for note-taking. The workers then walked around and discussed each product's use and associated symptoms or health hazards, marking on each paper their symptoms and concerns. They also identified additional products that had caused problems. SEIU Local 615, with assistance from MassCOSH, repeated this process during each shift.

These activities revealed a number of underlying issues. Supervisors indicated that several of the products should not be in use and that it was a mistake that they were available. Workers identified products that they used directly from the bottle that were in fact concentrates requiring dilution. The worker who had apparently become the most sensitized to chemicals was now bothered by the most products and had the most severe reactions (e.g., nosebleeds) rather than just irritation. In discussing hazards and warning labels, it became clear that language and literacy issues reduced their effectiveness.

SEIU Local 615 then asked MassCOSH for technical assistance in reviewing all products regarding specific ingredients and products associated with the acute symptoms, and to ensure that long-term health effects were also considered. MassCOSH involved its health and safety expert volunteers and the OHSP. SEIU Local 615 collected the MSDSs, and MassCOSH divided them among a group that included a physician, an OHSP industrial hygienist, and an occupational health researcher.

The 18 products reviewed contained approximately 50 ingredients listed on the MSDSs. Additional ingredients could have been present at less than 1%, and were therefore not listed on the MSDSs or considered in this analysis. The volunteers applied criteria promulgated by the Massachusetts Operational Services Division, Environmentally Preferable Products[49] and Green Seal Standard for Industrial and Institutional Cleaners (GS-37), and reviewed the hazards of the ingredients using various occupational health, environmental, and chemical references. Characteristics examined included carcinogenicity, reproductive toxicity, neurotoxicity, corrosivity to skin or eyes, respiratory and skin sensitization, combustibility, biodegradability, and aquatic toxicity.[50]

The experts considered the relative harm of immediate corrosive and irritating effects in comparison with the chemicals that had risks of long-term health effects. The capacity for dermal absorption, in addition to inhalation, increased the risk of bodily burden. They also considered the weight of evidence regarding carcinogenicity and reproductive harm, especially with regard to glycol ethers. Information about the cleaning effectiveness of each product was not provided or considered, although it might affect the muscular force required to achieve the same cleaning effect. They did note that the 18 products identified exceeded the number needed for cleaning operations.

Hazardous ingredients included alkyl phenol ethoxylates (estrogen-mimicking endocrine disruptors), 2-butoxyethanol (respiratory tract and eye irritant; causes headache, vomiting, and potential risks of long-term effects on blood, kidneys, and liver), diethylene

glycol monoethyl ether (eye and skin irritant; potential long-term effects on liver, kidney, blood, and central nervous system), sodium hydroxide (eye, skin, and respiratory system irritant), and quaternary ammonium compounds and monoethanolamine (sensitizers and irritants). Acidity and alkalinity contributed to the potential for eye, nose, throat, and skin irritation; one toilet bowl cleaner had a pH<1 (extremely acidic) and a floor cleaner had a pH=13 (extremely basic). A vandalism mark remover included volatile solvents (toluene and methyl ethyl ketone) that are known reproductive toxins.

Telephone conferences among MassCOSH staff and the volunteer experts prioritized the most hazardous products to present in a final table. The table consolidated information, including the name of the product and manufacturer, the use frequency and volume, the health effects of the listed ingredients, the National Fire Protection Association and Hazardous Materials Identification System health listings for the product, and any known safer alternative. The reviewers maintained records of all ingredients and health effects and, for simplicity, presented their conclusions based on the hazardous ingredients and concentrations. They selected four products deemed the most hazardous, and proposed that these be eliminated or replaced with safer alternatives. Several others were designated as "use with caution," including specific safety practices and equipment.

The union reviewed the technical information summarized by the experts, as well as the work practices in the transportation center. They uncovered practices that were putting workers at risk and could also pose a hazard to the public. These included the use of discontinued products, mixing of incompatible chemicals, and concentrates designed for automatic dispensing systems that were used without dilution.

Work environment improvements achieved

Armed with the information gathered, the union held several committee meetings with injured workers, union activists, and MassCOSH to make a plan to improve conditions. Most communication took place in Spanish. When needed, bilingual staff from MassCOSH and the union facilitated communication with MassCOSH technical volunteers.

Faced with organized workers supported with technical information, supervisors acknowledged the need to address several serious problems. SEIU Local 615 succeeded in winning agreement to these five priority changes:

1. Limit the total number of cleaning products that are used. Limit the availability of hazardous chemicals that must only be used in special circumstances.
2. Cleaning products should not be mixed, especially by night supervisors, but they can be diluted.
3. No changes can be made in products without notice to the workers.
4. A demonstration shelf with the correct products should be wired in place so that any product can be compared and verified by appearance of the container and liquid.
5. The operations that protect workers should be standardized so that health and safety training is focused on implementing clear work practices. Workers should be trained.

DISCUSSION

SEIU Local 615 achieved success in improving conditions for the 140 property services workers at this transportation center with assistance from MassCOSH and MDPH. Participatory, hands-on activities involving workers and supervisors revealed underlying problems. Action by the union informed by technical recommendations from the volunteer experts led to the needed changes. Improvements included cessation of inappropriate mixing of cleaning chemicals, elimination of several of the most hazardous products, standardizing operations, provision of demonstration containers to ensure use of the correct products, and better hazard communication.

A key improvement was reducing the number of cleaning products on-site. The workplace assessment revealed the use of 18 cleaning products rather than the 11 actually needed to perform the work. In fact, it surprised supervisors who were not aware that certain products were still in use. SEIU Local 615 acknowledged the importance of a key lesson learned from the experience of MassCOSH: assessing the product need and reducing the number of products used to those actually required for cleaning (Personal communication, Tolle Graham, MassCOSH, March 2008). In addition, the authors observed that the process improved the consciousness and skills of the union staff and members regarding the products' occupational and environmental hazards.

Several factors were important in achieving these results. A strong union relied on the workers' knowledge of work operations and reported health effects of products, and the workers trusted their union representatives with their answers. In other situations, such as workplaces in which workers have limited English

proficiency and no union protection, workers may be so fearful that they would tolerate hazardous conditions and deteriorating health rather than lose their jobs.

The findings described in this article also highlight the importance of Spanish-speaking health and safety experts with labor experience in MassCOSH and MDPH. During the past decade, MassCOSH has prioritized recruiting staff and volunteers who not only speak the languages of Massachusetts immigrant workers, but who understand and communicate the life experiences, cultural perspectives, and economic realities of these populations. They have the unusual ability to engage workers in an open, trusting dialogue about sensitive topics, while sharing information in terms that are meaningful. They also share with the union an organizing approach to workplace safety and the commitment to build campaigns with workers over many years, often despite difficult physical and psychosocial conditions.

In this case, MassCOSH staff also provided a key link between the workers and technical consultants. These connections helped to establish trust between the labor and public health partners and identify both parties' information needs—steps that were also identified as crucial for success in another recent health collaboration between a labor union and public health professionals.[5]

An additional vital component consisted of the classic public health role MDPH played: translation of surveillance data into practical recommendations for immediate change.[51,52] Surveillance of work-related asthma had prompted the OHSP industrial hygienist to conduct extensive research on cleaning products, a frequently reported asthma trigger. She was able to combine the expertise she gained from the research with the workers' knowledge to quickly produce accessible information in support of workplace improvements. This intervention was informed by surveillance and promoted the translation of science to an occupational health intervention, in an example of ethical public health practice.[53,54] MDPH's commitment to address health disparities, and the involvement of OHSP in the surveillance and prevention of work-related injuries and illnesses among low-income, minority, and immigrant workers, also provided the framework, expertise, and capacity to work with partners in the community, and prioritize action on hazards affecting a vulnerable population.

This public health approach is especially important in the types of service sector environments in which traditional techniques (e.g., air sampling and cohort studies) are both unfeasible and unlikely to produce meaningful data. The resulting production of practical policy guidance has also been previously identified as contributing to the success of this type of collaboration.[6]

This case study builds on an emerging tradition of health professionals supporting worker-led struggles for safer work environments in the service industries (and building on a longer, complicated history of such collaboration in mining and manufacturing[55,56]). A recent hotel worker study led by the union UNITE HERE resulted in contractual decreases in workload due to demonstrated associations between overwork and musculoskeletal injuries.[57] Another recent collaboration between UNITE HERE and public health professionals identified exposures and health effects affecting hospitality workers that led to legislative and contractual initiatives to reduce exposure to workplace secondhand smoke and unhealthy levels of job demands.[6]

CONCLUSION

Following the example of union leader and visionary Tony Mazzocchi's work in the Oil Chemical and Atomic Workers Union and the wider labor movement, SEIU Local 615 mobilized scientists to "ventilate the issue."[58] Mazzocchi promoted the potential for scientists to learn about toxic substances from workers, and for workers to obtain answers from scientists. He knew that workers talking to each other allowed an affirmation of their observations and an assertion that it was their responsibility to define their needs, interests, and shared suffering, defining the scope and priorities of health and safety. The experts could then supplement with research, medical reports, and scientific studies contributing to the case.[58]

This case study will help further Mazzocchi's vision with information provided by experts that helped to support and validate workers' knowledge about the associations between exposures and their reported health outcomes. It also represents a success for a public health department's surveillance program in its efforts to provide information for prevention.

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