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Occupational and Environmental Reproductive Hazards Education and Resources for Communities of Color

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Little research has been published on the occupational and environmental hazards affecting people of color. Even less is known about the hazards that affect women of color. Although women of color have always been aggressive participants in the work force, their labor activity has increased dramatically over the last decade. Current job placement patterns suggest that women of color are concentrated in the lowest-paying and most hazardous jobs. In this paper, we specifically focus on occupational and environmental reproductive health concerns. We write with the understanding that reproductive hazards can affect pregnant women, nonpregnant women, and men, as well as the health and development of young children. Emphasis is placed primarily on African American women, because information on Hispanic, Native American, and Asian women is very limited. We discuss the participation of women of color in the labor force, using the U.S. Department of Labor categories. We review specific occupational hazards associated with each category of work and briefly discuss environmental hazards, noting that communities of color are at a disproportionate risk of exposure. Finally, *we present the consensus report of the Community Education Working Group from the Woods Hole* Conference on Occupational and Environmental Reproductive Hazards.

Introduction

Since whites colonized the Americas, occupation has been a risk factor for people of color in the United States. In the 19th century, for example, large numbers of slaves suffered from diseases such as anthrax contracted from animals and nicotine poisoning from the tobacco plants with which they worked (*1*). In the 1930s, of 5000 blacks recruited to tunnel through a mountain in West Virginia, almost 500 died from silicosis. In the 1950s, blacks in the chromate industry were found to have 80 times the expected number of lung cancers. When blacks entered the textile industry in the 1960s and 1970s, they were concentrated in high-dust areas and were therefore at higher risk of developing byssinosis (*2*). In April 1991, the *Journal of the American Medical Association* reported a tuberculosis epidemic among migrant farm workers in North Carolina (*3*). Researchers found that 37% of Hispanics, 62% of African Americans, and 76% of Haitians had tuberculosis infections. Except for the ground-breaking work done by Davis and Rowland (*2*) and other sporadic reports, little research has been published on occupational hazards and their affect on people of color. One researcher recently reported that of 116 occupational cancer epidemiology studies, only 14 had any reference to nonwhites (*4*). Even less is known about the occupational hazards faced by women of color (*5*).

This paper focuses on occupational and environmental health as it affects people of color, particularly women of color. We specifically focus on the occupational and environmental reproductive health concerns of women of color because there is a particular lack of attention to this subject. The paper's emphasis is primarily on African American women because information on Hispanic, Native American, and Asian women is very limited. We believe that if we address the concerns of those least served, the concerns of all will be served.

First, we discuss the participation of women of color in the labor force using the U.S. Department of Labor occupational categories. We review specific occupational reproductive hazards associated with each category of work. Next, we briefly discuss environmental exposure to

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hazardous substances, noting that communities of color are at disproportionate risk. Finally, we present the consensus report of the Working Group on Community Education from the Woods Hole Conference on Occupational and Environmental Reproductive Hazards. Throughout, we assume that reproductive hazards in the workplace and environment affect pregnant women, nonpregnant women, men, and the health and development of children after birth.

Segregation in the Labor Force

Workers have been differentially incorporated into the work force according to race, sex, and ethnic lines. Therefore, occupational health among people of color can be better understood within the context of oppressed workers in terms of race, gender, and ethnicity. People of color have historically had the lowest paid, lowest mobility, and most unpleasant jobs in the work force. During slavery, whether working in the fields or the big house, black women were subject to chemical, psychological, and physical hazards. Women were whipped by the master, the mistress, or the white children whom they had nursed. These women were sexually abused, forced to work on their hands and knees, to carry heavy loads, and to work long hours. Enslaved people also suffered from ailments caused by work in industrial sites, such as the iron ore pits (*1*). No doubt all these factors had an effect on the reproductive health of black families. For example, during cotton boom years, there was an increase in infertility and miscarriages among black women (*6*). Today, black women still have dangerous jobs with low wages. Other women of color have joined their ranks.

All women are defined by the sexual division of labor, earning less than white men; however, women of color have been historically assigned the most hazardous jobs with the least protections. For example, in the 1920s, in Durham, North Carolina, 36% of black women worked in tobacco sorting, cleaning, and stemming in racially-segregated locations for a wage of 11.9 cents/hr, while white women tobacco workers were given cleaner and somewhat less hazardous jobs inspecting and packing the tobacco at a wage of 29 cents/hr (*7*). Protective laws were implemented for white women in the early part of this century (*8*). Unfortunately, black women received no such protections.

Although women of color have always been aggressive participants in the work force, their labor activity has increased dramatically over the last decade, now approaching 58% (*9*). Hispanic women's participation reached 50% in 1986 (*10*). The increased activity of Chicanos, Puerto Ricans, Latinos, African Americans, and other ethnic groups in the labor force is projected to continue into the 21st century. As in the past, current job placement patterns indicate that people of color are still concentrated in the lowest-paying and the most dangerous jobs. And, since the number of black women in the labor force is greater than the number of black men, we can speculate that a large proportion of these women are concentrated in hazardous jobs and therefore merit particular attention. One study reports that black women are 91% more likely to face occupational health hazards than white women and that the risks increased by 20% between 1968 and 1986 (*11*).

Occupational Hazards for Women of Color

Occupational and environmental hazards among people of color are the least addressed in the current literature. When people of color are studied, there is a tendency to blame disparities of health status between whites and nonwhites on biological, cultural, and lifestyle characteristics. Perhaps, however, a significant component of health discrepancies are due to job placement patterns.

The Bureau of Labor Statistics classifies all jobs into six categories. We will look at the participation of women of color in each of these categories and discuss the hazards that they encounter in these occupations. We will argue that women of color are over-represented in the low-pay, high-hazard occupations and therefore warrant greater attention from occupational and environmental health and safety experts and advocates. The U.S. Census Bureau points out that certain jobs in each of the higher-paying categories are dwindling and that it is women of color who have been most affected by the elimination of these jobs (*9*). We speculate that these women are likely to take lower paying, higher-risk jobs.

Category 1 consists primarily of low-risk, high-paying jobs. People in this category are professors, lawyers, doctors, and corporate executive officers. Less than 2.5% of women of color fall into this category. When women of color are represented, they are likely to be elementary school teachers and registered nurses which are the low-wage occupations of this category. The number of women of color in these relatively low-risk occupations is already small and still declining. The Women's Bureau of the Department of Labor reported that, since 1986, 11,000 minority women working as secondary school teachers, librarians, archivists, and curators have lost their jobs (*9*). Many will end up in lower-paying, higher-risk jobs.

For this occupational group, the primary reproductive hazard of concern is the risk of infection during pregnancy. For example, human parvovirus B19 (the etiologic agent of fifths disease), is associated with fetal death when infection occurs during pregnancy (*12*). Other infections of concern to pregnant workers include cytomegalovirus, hepatitis B, rubella, varicella, and human immunodeficiency virus.

Category 2 includes sales and administrative support positions. Clerical work is largely performed by women. It is generally low paying and many women who work full-time in these positions still live below the poverty level. Women of color employed in this category are located on the lowest rung of the clerical ladder as typists, office clerks, cashiers, and filers. Racial discrimination is suggested in that women of color make up only 6% of all secretaries while 22% of all data entry workers are minority women (*13*). These jobs require little training, few skills, and offer little or no chance for advancement. Many

are part-time and provide no health benefits. Since 1986, there has also been a decline in the number of minority women employed in these occupations. According to the Bureau of Labor, the decline will continue throughout the 1990s (*9*). Most likely, these minority typists and office workers will enter even lower-paying, higher-risk jobs.

In addition to being low status, office work imposes numerous health hazards. One of the most prevalent is sexual harassment. Stress, often the result of sexual harassment, is also a significant health hazard. A National Institute for Occupational Safety and Health (NIOSH) study of occupational stress found that secretaries had the second-highest incidence of stress-related diseases (*14*).

The introduction of office automation has added to both the ergonomic and mental stress of clerical work and to concerns about the reproductive hazards of such work. In the early 1980s, concern about the reproductive health effects of using video display terminals (VDTs) grew in response to reported clusters of spontaneous abortions and birth defects among women working with VDTs. Although the most recent study indicates no increased risk of pregnancy loss associated with using VDTs (*15*), the association between work-related stress and pregnancy loss is still undetermined, as is the potential for other health effects from exposure to electromagnetic fields emanating from VDTs and other electrical devices.

Category 3 comprises the skilled trades. White women make up 2%, while black women and Hispanics account for 1%, of this occupational sector (*16*). When Hispanic and black women are employed in this category, they are more likely to be electrical and electronic equipment assemblers, dressmakers, butchers, or meat cutters. These occupations not only require finger and hand dexterity, reinforcing sexual stereotypes, but also are associated with significant health risks. Many skilled workers are subject to exposure to lead, garment dust, silicon, and numerous organic chemicals.

With the development of semiconductor physics in the 1950s, the electronics industry introduced a host of technological innovations and an array of new industrial chemicals. Although assembled in "clean" rooms, the production of semiconductor components does not necessarily guarantee a working environment free from chemical exposure. Organic solvents are used extensively throughout the industry and reproductive and developmental toxicologic data are available for only a few of these chemicals. Workplace epidemiologic studies suggest an association between exposure to multiple organic solvents and increased risk of miscarriage and birth defects (*17–27*). Some researchers found increased risks for fetal loss (*28*) and delivery of low birthweight infants (*29*) among electronics production workers. Unfortunately, most studies do not provide quantitative exposure data. Moreover, because workers tend to handle multiple solvents simultaneously, it is difficult to determine the effects of any one chemical or combination of chemicals.

The reproductive and developmental health effects of exposure to the ethylene glycol ethers, used in electronics photochemical processing, has been extensively studied in animals (*30*). Exposed male rats develop testicular atrophy, abnormal sperm production, and infertility. Exposure of female rodents during pregnancy results in fetal loss and birth defects. The National Institute for Occupational Safety and Health recommended in 1983 that the ethylene glycol ethers and their acetates be considered occupational reproductive hazards to both men and women (*31*). After nearly a decade, these chemicals are still not federally regulated by the Occupational Safety and Health Administration (OSHA) as reproductive and developmental toxicants.

One trend of particular significance to women of color (especially Spanish speakers who are highly represented as electronics assemblers), is that electrical and electronic assembly is one of the 12 fastest declining occupations in the United States (*32*). It is likely that these women will find work in other high-risk but lower paying positions.

Category 4 consists of the manual occupations such as operators, fabricators, and laborers. Women of color are likely to be employed in the manual occupations, working as laborers and operatives in the dry cleaning and garment industries. Methylene chloride, perchloroethylene, and formaldehyde are solvents used in these occupations. All are suspected of causing cancer. All are potential reproductive or developmental hazards. Methylene chloride is metabolized to carbon monoxide in the body, a well-known chemical asphyxiant. Perchloroethylene accumulates in fatty tissue and breast milk. In one case report, exposure through breast milk resulted in infant liver damage (*33*). Occupational studies from the Soviet Union report menstrual disorders among female workers exposed to formaldehyde. Formaldehyde is also a potential mutagen. Moreover, women in this occupational category may be concentrated in high-dust areas where they are at risk of developing byssinosis.

Since 1986, there has been a significant decline in operators who are women of color. There are now 30,000 fewer black women operators in the work force. This trend will continue through the 1990s (*9*). We can assume that the same decline affects Chicanos, Latinos, Puerto Rican, and Native American women. They too will probably move into higher-risk employment with lower wages.

Category 5 is made up of farming, fishing, and logging jobs. Farm work not done by families is largely done by migrant farm workers. Most migrant workers are Spanish-speaking people of color, Haitians, or African Americans. Estimates for Spanish-speakers range from 50 to 90% and from 20 to 30% for African Americans (*34–36*). Many migrant workers are Filipinos, Vietnamese, Laotians, Haitians, Jamaicans, and Koreans. Most are concentrated in California, Florida, and Texas; however, they may work as far north as Massachusetts. Although the majority of migrant workers are men, the number of women farm workers increased from 15% to 22% between 1970 and 1980 (*10*). It is likely that this increase represents women of color. Farm workers are employed in labor-intensive agricultural work, primarily as fruit and vegetable laborers. They are exposed to a variety of pesticides. Many are teratogenic including benomyl, captan, chlorothalonil, maneb, and mancozeb (*34,37*).

Farm work is probably the lowest-paying and most dangerous job of all the occupational categories. Most farm workers are part-time or seasonal employees which denies them and their families the benefit of health insurance and retirement income. Migrant workers, in particular, labor under some of the most unhealthy conditions of any group of workers. Farm workers are not protected by existing laws that cover other workers: they are not covered by the National Labor Relations Act which enables workers to organize and negotiate collectively, nor are they covered by the Fair Labor Standards Act which sets minimum wages and prohibits child labor. Some states exclude migrant workers from workers compensation and unemployment insurance (*34*).

Category 6 includes service employment in health, business, and personal services. The services industry is one of the largest employers of women of color. The shift to a services economy from a manufacturing economy places more workers into low-wage and low-skill jobs. With this change has come a demand for female labor. Women of color fill this void and provide a pool of services workers as practical nurses, aides, cooks, food handlers, janitors, and housekeeping staff.

Historically, black women have been employed as personal servants in private households. Over the last two decades, a high percentage of poor Spanish-speaking and Asian women have joined black women as business, professional, and health services workers in institutional settings by janitoring and taking care of others. In these jobs, service workers are exposed to a variety of cleaning products, solvents, and ergonomic stressors as they bend, kneel, and lift heavy objects.

The shift to a services economy will generate 18 million new jobs by the 21st century. Most of these jobs will be at the low end of the pay scale (*9*). Since the labor force is expected to become increasingly female and minority by the year 2000, the majority of these new low-paying and hazardous service jobs are expected to be filled by Chicano, Latino, Native American, Puerto Rican, African American, and Asian women. Young single mothers who have difficulty finding jobs are likely to fill these positions.

Many of the new services jobs will be in the health care field which is already one of the largest employers of women of color. The majority work in hospitals as nurses' aides, cooks, janitors, and building cleaners. Table 1 shows hazards faced by women in the health services sector. They include exposures to chemicals, drugs, biological agents, and physical hazards which, among other effects, may reduce fertility, induce preterm labor, and increase perinatal morbidity and mortality.

Some may applaud the decrease in the number of high-risk jobs, such as electronics assemblers. However, the options available to women who lose these jobs are perhaps not good and the pay may be worse.

Table 1. Reproductive hazards to health care workers.

Exposure	Reproductive effects
Chemicals	
Waste anesthetic gases	Spontaneous abortion, birth defects
Ethylene oxide	Spontaneous abortion
Drugs	
Ribavirin	Birth defects (animals)
Cytotoxics	Infertility, birth defects (high doses)
	Fetal loss
Biological agents	
HIV	Neonatal morbidity and mortality
Cytomegalovirus	Birth defects
Hepatitis B	Neonatal morbidity and mortality
Human parvovirus B19	Fetal death
Varicella	Maternal complications, birth defects, spontaneous abortion
Rubella	Birth defects, neonatal morbidity and mortality
Physical agents	
Ionizing radiation	Infertility, birth defects (high doses)
	Childhood cancer
Strenuous work	Preterm delivery

Environmental Hazards

In addition to concerns about disproportionately hazardous working conditions for people of color, we must also be concerned with hazardous environmental conditions in the communities where these people live. Increasing documentation shows that people of color and poor people are subjected to disproportionately large amounts of pollution, not only in their workplaces, but also in their communities. Three out of four federally designated hazardous waste sites are located in communities of color (*38*). The Center for Third World Organizing reported that two million tons of radioactive uranium tailings were dumped on Native American lands (*39*), while a U.S. Environmental Protection Agency (EPA) study found that people living within half a mile of uranium tailings were twice as likely to die of lung cancers as the rest of the population (*40*). The nation's largest hazardous waste landfill is in Emelle, Alabama, where the population is nearly 80% African American (*41*). Using National Health and Nutrition Survey data, Mushak and Crocetti (*42*) estimate that 3 to 4 million children are exposed to toxic levels of lead in the U.S. Most of these lead-poisoned children are African American and Latino (*43*). A federal study documented unhealthy living conditions of migrant farm workers in Colorado, most of whom are Chicano. The study found that drinking water in 21 out of 48 labor camps (44%) contained fecal bacteria (*44*).

Low-income communities of color are targeted for hazardous facilities siting more often than affluent white neighborhoods which have successfully advocated "not in my backyard" for siting of hazardous waste incinerators and other facilities. Although all poor people are subject to environmental discrimination, Bullard (*41*) demonstrates that race, not class, is the identifying feature of communities where toxic materials are processed or dumped. The public face of the environmental movement throughout the 1970s and 1980s has been dominated by white, middle-class people and their concerns. Therefore, the perception prevails that people of color are not interested in the environment. However, this is not so (*40,41,43*). Rather, people of color see environmental concerns as part of the total picture of social injustice in the United States. Moreover, in the last few years, communities of color have

incorporated environmental issues into civil rights perspectives. Ben Chavis, Executive Director of the Commission for Racial Justice, placed environmental concerns squarely on the civil rights agenda (*45*). In October 1991, the First National People of Color Environmental Leadership Summit met in Washington, DC. This summit marked the recognition of a long history of environmental assaults on people of color. The participants adopted 17 principles of environmental justice to guide the elimination of environmental racism.

Through these types of initiatives, people of color will play a stronger role, not only in addressing unfair siting practices, but also in lobbying for stricter controls and management of toxic materials.

Health Disparities of Women of Color

The health of women of color is worse than the health of white women (*46,47*). For example, the rate of hypertension in black women is 85% higher than in white women. The rate of diabetes is three times higher in black women than in white women and anemia rates are higher at all ages. Black women live 6 years fewer than white women. Lung cancer deaths in black women have sharply increased since the 1960s, and it is unclear that this increase is entirely due to cigarette smoking (*47*).

When mortality is classified by causes that are also pregnancy risk factors, the death rate among young black women in their mid–20s exceeds that of whites by more than 25% (*47*). Black women are at significantly increased risk of delivering preterm, low-birthweight infants. These discrepancies play an important role in the black/white infant mortality differential which is twice as high for blacks as for whites.

Less information is available on other women of color; however, tuberculosis carries a high risk of death for women of Mexican origin and Native American women. The infant mortality for Native Americans is nearly 60% above that for whites.

Health disparities might result from race and sex discrimination in hazardous employment. Stereotypic sexist patterns of employment place women in certain risky occupations because of their heightened "manual dexterity." Stereotypic racial patterns of employment place women of color in hazardous occupations because they are perceived to tolerate hot environments better or their skin is more resistant to the irritating nature of certain detergents and chemicals.

Occupational illness and injury in minority groups are underreported and underdiagnosed. Although blacks are more likely to suffer work-related injuries and disabilities, they are less likely than whites to report this information (*2*). Therefore, we can assume that, like black men, women of color often do not receive compensation for work-related injuries and diseases. For poor people and people of color, occupational hazards are not the only issue. For many poor people, employment must take precedence over occupational hazards. In addition, due to limits in education and access to information, they may not be fully aware of the dire health consequences of their jobs.

Community Education and Resources

Educators, environmental activists, and health professionals need to address the inequities that exist in work opportunities and in exposure to work and environmental hazards. For the most part, efforts to address these concerns have not been effective in reaching women of color. There are several reasons for this shortcoming. First, health care providers, often the first line of defense in recognizing, diagnosing, and treating work-related or environmental illnesses, receive little, if any, training in occupational and environmental health assessment or management. In addition, poor working women, many of whom are women of color, may not have access to health care and therefore do not benefit from education and health services that originate in the clinician's office.

Second, the community is a vital element in the lives of women of color and an important vehicle for organizing protest and action. Educators, health care providers, and social workers who do not use the resources of the minority community to communicate issues of health lose a valuable means of educating and empowering women of color. Third, because of differences in class, sex, or race, social workers, health care providers, and educators are often culturally insensitive when communicating with women of color, thereby hindering effective dialogue. Fourth, the discontinuous and often fragmented employment patterns of people of color hinder education and follow-up of workers.

A fifth factor responsible for poor outreach is the low level of unionization, especially in areas where minorities work. The services and agricultural industries, where a significant number of people of color are employed, have particularly low union participation. For example, in the services industry, only 6% of the workforce is unionized; in the agricultural sector, the figure is 1%. This factor makes outreach more difficult since unions are an important avenue for worker education, advocacy, and support. Unions also serve as watchdogs for workplace health and safety violations. In addition, many workers are undocumented, laboring in sweatshops, underground factories, and other exploitative work situations and do not receive the benefits of union protection.

Few programs are in place to provide specific services and support to people of color faced with reproductive hazards on their job or in their communities. Advocates increasingly recommend training primary care providers in occupational and environmental disease recognition and prevention (*35,48*). Primary care providers serving communities of color may be the most accessible source of information for minorities, particularly undocumented workers. In a recent lead-poisoning case in Massachusetts, a community health care provider was the first to identify a worker's illness and link it to occupational exposure (*49*). Intervention on the part of the provider subsequently led to discovery of other lead-poisoned workers, all of whom speak Spanish as their primary language. A number of state and local programs became involved. An OSHA investigation resulted in fines more than $200,000. At this time, the workers are organized and

moving toward establishing a union. Through patient education and direct intervention and advocacy, community health center staff can play an important role in detecting and preventing occupational and environmental disease, including reproductive disorders.

In an innovative educational project, the Labor Occupational Health Program (LOHP) developed an occupational health training program for health care providers at community health centers in California (*35*). Initially, community health center staff resisted, claiming that the majority of their clients were women and children who did not work. A survey of participants in the Women, Infants, and Children (WIC) Program, however, revealed that 43% of the women had recently worked, most during pregnancy. Jobs included commercial cleaning, laundry, and dry cleaning, all of which involve the use of toxic chemicals, including some reproductive hazards. The Occupational and Environmental Reproductive Hazards Center at the University of Massachusetts Medical Center initiated a similar education program. The program offers community health center staff in-service training, educational materials, and ongoing phone consultation and referral services to help them more effectively recognize and manage patients at potential reproductive risk from occupational or environmental exposures. Table 2 lists selected Massachusetts resources providing service to communities of color. Despite these types of initiatives, the needs of many workers and members of the community are not being met.

Table 2. Occupational and environmental reproductive hazards: selected Massachusetts resources providing service to communities of color.

The Pregnancy Environmental Hotline [(617) 787–4957] is one of the national Teratogen Information Services (TIS). Hotline staff provide information regarding known and potential reproductive risks from exposure to toxic chemicals to the public and to health care providers. The TIS is currently conducting a study to identify underserved populations. Outreach programs and funding strategies will be designed to reach these populations.

Immigrant Rights Advocacy Training and Education (IMTE) [(617) 266–0795] is an immigrant worker resource and advocacy center. The center offers educational materials describing immigrant rights in several languages. Staff have helped establish worker support committees in communities of color.

The Massachusetts Coalition of Occupational Safety and Health (MassCOSH) [(617) 524–6686] one the national Coalitions for Occupational Safety and Health, is an education and advocacy group for workers. Its Women's Committee develops multilingual educational materials, advocates for working women, and organizes for reproductive health rights in the workplace. The Latino Worker Health and Safety Project provides worker advocacy, training, and support.

The Occupational and Environmental Reproductive Hazards Center [(508) 856–6162] serves as an educational and consultative resource for primary care providers and specialists who are managing patients with potential reproductive risks. The Center also provides direct assessment and management in complex cases. Care is provided to non-English speakers through an interpreter. Patient education materials have been developed including a multilingual poster with corresponding educational pamphlets.

The Massachusetts Toxics Network [(617) 731–1341] offers organizing support and resources to community residents concerned about their health and the health of their families due to contamination of the environment. The Citizens Clearinghouse for Hazardous Wastes [(703) 276-7070] provides information and services on a national level.

Toward an Agenda for Community Involvement

The Community Education Group at the conference brought together diverse educators, advocates, and organizers. This section presents the discussion and outcome of this working group. First, the group's general consensus on community education and outreach is summarized. Second, specific recommendations to other working groups are proposed. We believe that the discussion and recommendations go beyond the Woods Hole conference and will be of general interest to people of color and those individuals working in the area of occupational and environmental health.

The working group shared experiences, resources, and materials used in community-based occupational and environmental health education as they relate to underserved populations. We discussed strengths and weaknesses of community education initiatives and proposals for improving access to reproductive hazard education and services, particularly to people of color and undocumented workers. Several specific areas of need were identified. First, there is a need for a national clearinghouse of occupational and environmental health education materials: brochures, pamphlets, posters, videos, and other materials. A clearinghouse would help educators find useful materials and point out the lack of resources on certain topics. Materials should be available in several languages, especially in Spanish. A conference specifically addressing health and safety education would be useful to continue the working group's discussion and help initiate the clearinghouse project.

Second, we agreed that dissemination of information is important but insufficient. Therefore, education must be complemented with community organization. Communities can be organized around reproductive hazards and other health and safety problems. Identifying and training community representatives and leaders is a way to reach out and empower the community as a whole; therefore, we propose a "train the trainers" model for community education and organizing. Individuals in the community can learn and teach others to survey, document, and research their own health and safety concerns. In this way, we can educate the community so that it does not remain dependent on scientists and other outside experts to articulate community needs.

Third, to further encourage empowerment in communities of color, we need to support the development of a generation of young scientists, lawyers, educators, advocates, and health care providers who will serve their communities with an understanding of the community's history, fears, hopes, dynamics, and mechanisms. Students at all levels are potential allies and they can be tapped for participation in occupational and environmental community health activities.

Finally, to promote communication and understanding, we must develop a common language between community people and outside experts. We have to overcome the barrier of different languages used by the community and used by scientific researchers. Currently, a great deal of time is wasted on both sides due to misrepresentation, misconception, misunderstanding, and distrust.

Recommendations to Other Working Groups

Many people of color are suspicious of experts. This distrust comes from a long history of unfavorable experiences. For example, from 1932–1972, the U.S. Public Health Service conducted an experiment, known as the Tuskegee Experiment, on 400 uneducated syphilitic black men. Experts wanted to track the progress of untreated syphilis. The men were not informed that they had syphilis; they were told they had "bad blood" (*50*). A more recent violation of ethical research practice occurred in Maryland in 1984. Fifty-two thousand African American women were screened for sickle cell anemia. Over one-fourth of them were screened without their knowledge or consent. Therefore, they did not receive either the potential benefits of screening or education and counseling regarding sickle cell disease (*51*).

We ask experts in all sectors to be sensitive to our suspicions, to acknowledge our history, and to work with us in a collaborative and respectful way. We cannot work in isolation; we need the support of other key sectors involved in this work including researchers, clinicians, legal/policy experts, and labor and environmental advocates.

Our working group identified barriers to community education and empowerment and discussed collaborative projects to address these barriers. In addition to the challenges and strategies we adopted for ourselves, we proposed the following recommendations to the other conference participants and their peers.

Recommendations for Research

There has been relatively little research on occupational, environmental, and reproductive hazards affecting people of color, especially women. Therefore, we recommend that researchers document occupational hazards in the workplace and environmental exposures in communities of color. Research should include assessment, monitoring, and documentation of exposures and adverse effects to reproductive as well as other organ systems. More work needs to focus specifically on environmental exposure. This research should be carried out in addition to, not as a substitute for, studies on occupational exposure to hazards.

Because of past experiences, many people of color tend to distrust researchers who perform studies in their communities. Researchers must approach and work with community people in a respectful and collaborative manner. Study participants are not "guinea pigs" for an investigator's research, however worthwhile the researcher regards the proposed project. For example, a call for sperm donations to study fertility effects of workplace toxicants will be met with hostility unless the community has been involved in research planning. Successful researchers will collaborate with community representatives beginning with the initial conception, planning, and design of studies. People of color should be in senior positions of the research team, including the position of principal investigator.

Research inside and outside the laboratory must reflect the needs and health problems of the community. Trickle-down research is not the way to solve toxic health hazard problems; therefore, researchers should work with community representatives and advocates to identify study topics that are needed, useful, and that will result in clear benefits for the people being studied. Benefit to the community should be the primary goal and researchers should not abandon the community after the study is completed. Rather, research results should be accompanied by proposed positive solutions to community problems. Study results should be discussed with community representatives before publication and before press coverage.

Recommendations for Legislation and Labor Organizations

Since people of color are among the least-protected workers, legislation and labor advocacy can provide needed protection in the workplace and in the community. We support OSHA reform and the collaboration of policymakers and labor organizing groups in building a strong occupational health and safety movement. Stronger laws and regulations regarding workplace hazards should be designed to meet the needs of workers, not employers.

Health and safety issues are effective organizing tools to empower local people so that they can have safer workplaces, better housing, better health care, and union representation. Workers and the community must be involved early-on in the designing and implementation of environmental controls and standards, and involvement must be continuing and integral. This might involve establishing enforceable limits for some hazardous substances and substitutions for others. In addition, the concerns of unorganized and undocumented workers should be included in the legal/labor agenda, and coalitions should be built to address the broader issues of health and safety both inside and outside the workplace.

Recommendations for Medical Education

We invite medical educators to place health sciences students in communities of color to learn about community environmental and occupational health concerns. Continuing medical education courses could offer the same opportunity. Primary care providers should be targeted for this education and include not only physicians but also nurses, nurse practitioners, midwives, genetic counselors, health educators, physicians assistants, and others. The continued development of multicultural and multilingual services is a primary responsibility of the health care system, not an afterthought, and must involve trained profes-

sionals rather than people with other jobs and responsibilities who happen to be multicultural or multilingual. In addition to traditional medical and scientific resources, health care providers should respect and use local newspapers, newsletters, organizations, churches, and other community resources.

Recommendations for Toxics Use Reduction

We believe that toxics use reduction (TUR) is an effective means of addressing the problem of occupational and environmental reproductive hazards. Workers and members of the community, not just regulators, should be consulted regarding the need to target certain chemicals for TUR. Ongoing evaluation, monitoring, and enforcement must be a part of any TUR project. In-house TUR training in companies should specifically target and involve people of color. The TUR reduction initiatives are effective ways to address conditions in the community and, as such, they provide a potential organizing tool.

Conclusion

We have argued that people of color, especially women of color, are disproportionately exposed to health and reproductive hazards in the workplace and in their communities. Women of color are concentrated in the lower-paid job categories where they are also subject to more hazardous working conditions. The health status of women of color is worse than other population subgroups: for example, women of color have higher rates of hypertension, diabetes, cancer, and adverse pregnancy outcomes than their white counterparts. These discrepancies in health status may be partly due to disproportionate occupational and environmental hazards that people of color face. To combat these inequities, an integrated approach is needed combining improved access to health care and housing, medical and sociological research, legislation, standards-setting with labor organization, TUR, medical education, and community education and outreach. We have identified strategies for engaging communities of color in addressing and reducing occupational and environmental health hazards. In particular, we believe that without community organization and involvement, efforts to control and reduce occupational and environmental hazards, including those that affect reproductive health, will be ineffective and inequitable.

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