

Observations from the CDC

Women and Work: Highlights of NIOSH Research

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THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH), a part of the Centers for Disease Control and Prevention (CDC), is the federal agency responsible for conducting research and making recommendations for the prevention of work-related disease and injury. NIOSH is mandated by Congress to "assure safe and healthful working conditions for working men *and women*" [emphasis added].

It is important to understand and appreciate the connection between human health and workplace hazards. Although often overlooked, the workplace can have a profound impact on a worker's health, ranging from cancer in factory workers to carpal tunnel syndrome in computer users. Although NIOSH research and prevention efforts protect all workers, the Institute recognizes that women often face unique risks such as chemical and physical exposures that affect pregnancy or the menstrual cycle or hazards encountered using equipment designed for male workers of larger stature. Today, women constitute nearly half of the American workforce, with 73% employed full-time¹ and more than 20% of those working part-time holding multiple jobs.² Most women work in clerical, service, professional specialty, executive/managerial, and sales jobs. The proportion of women in the workforce continues to grow. In 1964, 36.3% of women were employed, compared with 56% in 1996. Women are not only more likely to work outside the home today than in the past, but they also spend more time at work than did women in

earlier years. With more women working more and more hours, it is imperative to consider the workplace when examining a woman's overall health.

In addition to protecting working women, studying workers can improve the health of the general population. A study of the effects of cosmic radiation on female flight attendants may have implications for female frequent flyers, studies of harmful substances in the workplace may prevent their use in the general population, and research revealing that female workers using computer monitors are not at increased risk for miscarriages may alleviate the concern among all women.

Knowing that safety and health research on women has traditionally lagged behind research on their male counterparts, NIOSH has increased its efforts in recent years to address the research needs of women. Women's safety and health issues are well represented in the National Occupational Research Agenda, a framework created by NIOSH and more than 500 external partners to guide safety and health research into the next decade. A small sample of NIOSH research in areas of concern to women follows. The topics are varied and give a flavor of the sometimes daunting task of conducting research and prevention activities for the entire workforce.

In recent years, attention to breast cancer has increased. Even with the increased attention, the general public may be unaware of the potential workplace link. Breast cancer is the most frequently diagnosed nonskin cancer among

women in the United States. It is second only to lung cancer in cancer-related deaths.³ NIOSH has three major breast cancer studies under way to learn more about the role of workplace exposures in this complex disease. In one study, NIOSH is working to determine if ethylene oxide, a gas used to sterilize medical supplies, increases the risk of breast cancer. NIOSH is also studying women from capacitor manufacturing facilities to examine breast cancer incidence in women workers exposed to polychlorinated biphenyls (PCBs). NIOSH and the CDC's National Center for Environmental Health are collaborating on a study to determine if the high serum levels of individual organochlorine compounds (such as pesticides, dioxins, and PCBs) are risk factors for breast cancer. These studies will contribute to our understanding of the role these substances play in breast cancer risk.

Reproductive issues are of concern to many women. Three quarters of women of reproductive age are in the workforce and over half of U.S. children are born to working mothers.⁵ The reproductive health of women is of special concern because so little is known about how occupational hazards may affect the female reproductive system. In addition, occupational hazards that affect reproductive health can also increase a woman's risk of serious diseases, such as heart disease, cancer, and osteoporosis. NIOSH is developing an educational document, "The Effects of Workplace Hazards on Female Reproductive Health," as a resource for women concerned about reproductive hazards. This document provides a brief, easy-to-understand description of occupational hazards that might affect a woman's reproductive health, her ability to become pregnant, or the future health of her children.

To learn more about reproductive hazards in a specific workplace, NIOSH, in collaboration with the Federal Aviation Administration and the Department of Defense Women's Health Resource Program, is conducting studies of the reproductive health of female flight attendants. Air cabin exposures such as ionizing radiation, circadian rhythm alterations, cabin air pollutants, and physical and psychological demands may affect female flight attendants' reproduc-

tive health. This research will help determine if work as a flight attendant increases the risk of spontaneous abortion and other adverse reproductive outcomes, such as altered menstrual function, reduced fertility, and infant low birth weight.

In another reproductive study, NIOSH examined the effects of working with video display terminals (VDTs) and adverse pregnancy outcomes. NIOSH has determined that occupational VDT use by women does not increase their children's risk of reduced birth weight and preterm birth.⁶ The study also found no correlation between the intensive use of VDTs and miscarriages.⁷ These studies have greatly reduced the anxiety of employers and workers about the reproductive effects of working with VDTs.

Many women who work with computers are concerned about musculoskeletal disorders such as carpal tunnel syndrome. Musculoskeletal disorders are among the most prevalent medical problems in the United States, affecting 7% of the population. Work-related musculoskeletal disorders, specifically those involving the back, are among the most costly occupational problems.⁸ Women comprise a large proportion of the workforce in many occupations (e.g., nursing and machine operators) that have a high incidence of these disorders. More than 40% of working women reported some time spent engaged in repeated bending, twisting, or reaching activities at work.⁹ NIOSH has an intensive program of research on musculoskeletal disorders, with specific projects focused on occupations that employ large numbers of women.

A series of NIOSH and Internal Revenue Service (IRS) collaborative studies on work organization interventions for reducing discomfort in IRS data transcribers have shown the value of taking rest breaks when performing repetitive tasks. The studies show that providing rest breaks periodically throughout the work shift prevents overaccumulation of musculoskeletal, visual, and mental fatigue that would otherwise occur without the rest breaks.¹⁰ Positive effects on worker comfort were obtained while at the same time maintaining work performance. The study examined transcribers, a pri-

marily female occupation, but the results could apply to workers performing other computer jobs and perhaps also to workers performing other repetitive physical jobs.

In addition to working with keyboards and in data entry, many women have traditionally worked in the healthcare field. In previous laboratory research, NIOSH found that the biomechanical forces exerted by nursing staff during patient transfers are significantly reduced when using mechanical patient lifts and recommended manual patient transferring methods. NIOSH is currently examining the most appropriate way to implement these and other interventions. NIOSH researchers are evaluating whether a "best practices" program, which would implement these patient transfer methods, will be effective in reducing the incidence of back injury, injury-related costs, and subsequent disability in nursing homes (an industry that is 86% female).⁹

NIOSH research on latex allergy also has major implications for the healthcare industry. Reports on latex allergy have increased in recent years, especially among healthcare workers. About 8–12% of healthcare workers regularly exposed to latex are sensitized. Once sensitized, workers may go on to experience the effects of latex allergy, such as skin rash and inflammation, respiratory irritation, asthma, and (in rare cases) shock.¹¹ NIOSH recently distributed recommendations for preventing allergic reactions to natural rubber latex found in latex gloves. NIOSH also is conducting a study to investigate the prevalence of latex glove allergy and develop an intervention program for at-risk workers. A second study is investigating the immunologic changes, risk factors, and proteins associated with latex allergy. These studies are not limited to female workers, but many other women may benefit from the results, as the healthcare sector is a traditional setting for women workers. In 1996, 88.4% of nursing aides, orderlies, and attendants were women, and 93.3% of registered nurses were women.¹

Healthcare workers are also at risk for violence in the workplace. The largest number of nonfatal assaults in the workplace occurs in nursing homes (27%), followed by social services (13%) and hospitals (11%).¹¹ However, vi-

olence against women in the workplace is not limited to healthcare workers. Homicide is the leading cause of injury death for women in the workplace, accounting for 42% of all workplace deaths among female workers. The majority of female homicide victims were employed in the retail trade and service industries. Seventy-three percent to 85% of workplace homicides occur during a robbery or other crime.¹² CDC/NIOSH was one of the first federal agencies to examine the problem of violence in the workplace. NIOSH is evaluating environmental designs in convenience stores as deterrents to robbery to prevent work-related fatalities and injuries among convenience store workers. NIOSH is also exploring various sources of data on workplace victimization to improve the state of knowledge of this problem.

NIOSH is also concerned about women who work in nontraditional occupations, such as construction and related trades. In 1996, 128,000 women were reported as employed in the construction trades (2.5% of the construction workforce).¹ One NIOSH study examined the impact of a number of job stressors—including sexual harassment and gender-based discrimination—on the level of job satisfaction and psychological and physical health of female construction workers. Results from the study indicated that having both responsibility for others' safety and support from supervisors and male co-workers were related to greater job satisfaction. Increased reported psychological symptoms were found to be related to increased responsibility, skill underutilization, incidents of work-related sexual harassment or gender-based discrimination, and having to overcompensate at work.

Women work in a variety of occupations and industries that place them at risk from various hazards. NIOSH's research and prevention efforts are making workplaces safer for women and ensuring that they can remain a healthy and productive part of the workforce. For more information on any of the research mentioned here, other NIOSH studies relating to women workers, or other occupational and safety topics, call (800) 35-NIOSH [(800) 356-4674] or visit the NIOSH Home Page at <http://www.cdc.gov/niosh/homepage.html>.

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