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Occupational Safety and Health

Lead Agency: Centers for Disease Control and Prevention

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Goal

Promote the health and safety of people at work through prevention and early intervention.

Overview

The toll of workplace injuries and illnesses is significant. Every 5 seconds a worker is injured in the United States.^{1,2} Every 10 seconds a worker is temporarily or permanently disabled.^{1,2} Each day, an average of 137 persons die from work-related diseases,^{3,4} and an additional 17 die from injuries on the job.⁵ Although youth (adolescents aged 17 years and under) represent only 2 percent of the total workforce, each year 74,000 require treatment in hospital emergency departments for work-related injuries, and 70 die of those injuries.⁶ In 1996, an estimated 11,000 workers were disabled each day due to work-related injuries.⁷ In 1996, the National Safety Council estimated that on-the-job injuries alone cost society \$121 billion, representing the sum of lost wages, lost productivity, administrative expenses, health care, and other costs. The 1992 combined U.S. economic burden for occupational illnesses and injuries was an estimated \$171 billion.⁸

Work-related injuries and illnesses include any injuries or illnesses incurred by persons engaged in work-related activities while on or off the worksite. This includes injuries and illnesses that occur during apprenticeships and vocational training, while working in family businesses, and even while volunteering as fire-fighters or emergency medical services (EMS) providers.

Issues

The Nation is poised to make significant improvements in the quality of life for all working people in the United States. The National Occupational Research Agenda (NORA), developed by the National Institute for Occupational Safety and Health (NIOSH) in partnership with more than 500 outside organizations and individuals, was released in April 1996 as a framework to guide occupational safety and health research into the 21st century. NORA partners include representatives from labor, industry, academia, State governments, and national professional organizations. The NORA process resulted in a consensus on the top 21 research priorities for occupational safety and health (see table).⁹

One of the 21 specific priority areas identified by the NORA process is intervention effectiveness research, a type of research aimed at finding out which prevention strategies effectively protect worker safety and health. This research will evaluate the impact of occupational prevention interventions, programs, and policies on safety and health outcomes across a broad spectrum of industries. Al-

though measurable improvements in worker safety and health have been achieved, only a few interventions have been evaluated systematically.

Category	NORA Priority Research Areas
Disease and Injury	Allergic and Irritant Dermatitis Asthma and Chronic Obstructive Pulmonary Disease Fertility and Pregnancy Abnormalities Hearing Loss Infectious Diseases Low Back Disorders Musculoskeletal Disorders of the Upper Extremities Traumatic Injuries
Work Environment and Workforce	Emerging Technologies Indoor Environment Mixed Exposures Organization of Work Special Populations at Risk
Research Tools and Approaches	Cancer Research Methods Control Technology and Personal Protective Equipment Exposure Assessment Methods Health Services Research Intervention Effectiveness Research Risk Assessment Methods Social and Economic Consequences of Workplace Illness and Injury Surveillance Research Methods

Source: NIOSH. *National Occupational Research Agenda*. Pub. No. 96-115. Cincinnati, OH: NIOSH, 1996.

Managers of public and private sector occupational safety and health programs face increasing demands to document program cost-effectiveness and impact on worker health. The lack of evidence about intervention effectiveness stymies the introduction of new programs and threatens the continuation of ongoing programs. Corporate safety and health programs, regulatory requirements and voluntary consensus standards, workers' compensation policies and loss-control programs, engineering controls, and educational campaigns are among the types of interventions that need to be developed, implemented, and evaluated. In addition to promoting worker safety and health, intervention programs can lead to increased productivity and save on long-term operating costs.

Because national data systems will not be available in the first half of the decade for tracking progress, five subjects of interest are not addressed in this focus area's objectives. These topics represent a research and data collection agenda for the coming decade and are related to a variety of activities. The first topic covers improvement in national workplace injury and illness surveillance by increasing the number of States that code work-relatedness of injuries and illnesses in a variety of data systems, including cancer registries, trauma registries, risk factor surveys, and health facility data (for example, hospital emergency department visits, clinic visits, hospital discharge records). The second addresses the reduction of

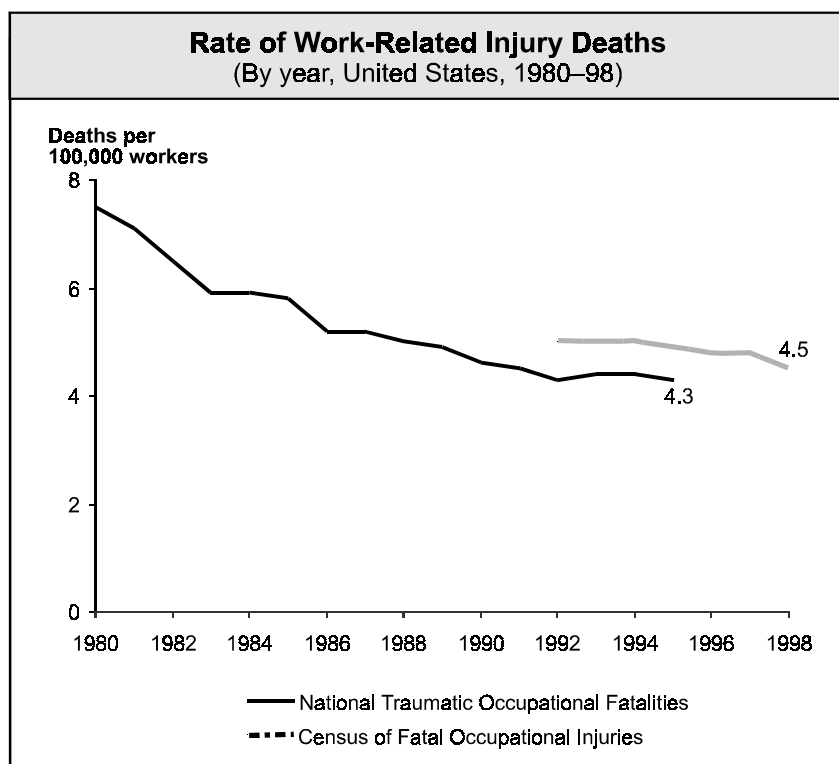
exposures that result in workers having blood lead concentrations of 10 µg/dL or greater of whole blood. The third involves increasing the proportion of health care facilities that appropriately protect workers by instituting effective prevention practices to reduce latex allergy (for example, low-protein, powder-free gloves; nonlatex gloves). The fourth is related to increasing the proportion of health care settings, correctional facilities, and homeless shelters that appropriately protect workers by implementing effective tuberculosis control programs (for example, administrative controls, work practice and engineering controls, employee training and skin testing, and where necessary personal respiratory protection). The fifth relates to increasing the proportion of agricultural tractors fitted with rollover protective structures.

Trends

A number of data systems and estimates exist to describe the nature and magnitude of occupational injuries and illnesses. These data systems have advantages as well as limitations. However, no national occupational chronic disease or death reporting system currently exists. Therefore, scientists, public health professionals, and policymakers must rely on estimates of the magnitude of occupational disease generated from a number of data sources and published epidemiologic (or population-based) studies. Although these compiled estimates generally are thought to underestimate the true extent of occupational disease, they are considered to provide the best available data. Such compilations indicate that an estimated 50,000 to 70,000 workers die each year from work-related diseases.

Data from the National Traumatic Occupational Fatalities Surveillance System (NTOF), based on death certificates from across the United States, demonstrate a general decrease in occupational death over the 16-year period from 1980 through 1995. The numbers and rates of fatal injuries from 1990 through 1995 remained relatively stable—at over 5,000 deaths per year and about 4.3 deaths per 100,000 workers. Motor vehicle-related fatalities at work, the leading cause of death for U.S. workers since 1980, accounted for 23 percent of deaths during the 16-year period. Workplace homicides became the second leading cause of death in 1990, surpassing machine-related deaths. Although the rankings of individual industry divisions have varied across the years, the largest number of traumatic occupational deaths consistently are found in construction, transportation and public utilities, and manufacturing. Industries with the highest traumatic occupational fatality rates per 100,000 workers are mining, agriculture, forestry and fishing, and construction.¹⁰

Rates of nonfatal injuries and illnesses have declined from a rate of 8.7 per 100 full-time workers in 1980 to 7.1 per 100 full-time workers in 1997.¹¹



Sources: DOL, BLS. Census of Fatal Occupational Injuries (CFOI), 1992–98. CDC, NIOSH. National Traumatic Occupational Fatalities Surveillance System (NTOF), 1980–95.

Disparities

Data systems that can routinely monitor disparities among population groups related to occupational injury and illness are not in place. NIOSH is working with partners and stakeholders in the occupational safety and health community to identify and address surveillance needs, including the need to track disparities.

Little is known about factors such as gender, genetic susceptibility, culture, and literacy that may increase the risk for occupational disease and injury. Occupational safety and health experts who worked to develop NORA agreed by consensus that many high-risk populations have been underserved by the occupational safety and health research community, resulting in important unanswered questions about the profile of hazards these workers face, the number of cases of work-related injuries and illnesses, the mechanisms of these injuries and illnesses, and the optimal approach to preventing them. As a result, special populations at risk is one of 21 NORA priority research areas that will examine the challenges faced by different groups in the increasingly diverse workforce.

Opportunities

The growing U.S. workforce, projected to be 147 million by the year 2005, also is changing. The population is increasingly diverse and more rapidly exposed to innovative work restructuring and new technologies. Evidence suggests that the

way work is organized may directly affect worker health. Work organization broadly addresses the health effects of conditions of employment. It also encompasses special characteristics related to the overall economy, including the demands for productivity; the increasing presence in the workforce of adolescents aged 16 to 17 years (2.1 percent increase projected each year from 1992 to 2005), women (47 percent of the workforce in 1997), racially and ethnically diverse workers, and older workers (the aging of baby boomers); and the ongoing evolution from an industrial to a service economy.

The NORA strategic plan will ensure that research addresses the new, emerging work environment of the 21st century. Research translation, education, and outreach will ensure that labor, industry, academia, and national professional organizations have current information on how best to design prevention programs to protect worker safety and health.

Interim Progress Toward Year 2000 Objectives

For work-related injury deaths and nonfatal injuries, progress has been made toward meeting Healthy People 2000 objectives, including meeting several subobjectives (for construction and mining). The objective for reducing cases of hepatitis B infection among occupationally exposed workers has been exceeded, but the related goal for immunizing workers for hepatitis B fell short of the 2000 target. For several objectives, the Nation appears to be moving in the wrong direction—a situation that can be attributed, in part, to several confounding factors, including improved surveillance, reporting changes, and improved diagnosis. Finally, a few Healthy People 2000 objectives cannot be tracked reliably for progress, and some objectives have low relative value for monitoring improved outcomes in worker safety and health (for instance, safety belt policies at work do not equate automatically with safety belt use). These objectives have been revised, replaced, or dropped from Healthy People 2010 objectives.

Note: Unless otherwise noted, data are from the Centers for Disease Control and Prevention, National Center for Health Statistics, *Healthy People 2000 Review, 1998–99*.

Healthy People 2010—Summary of Objectives

Occupational Safety and Health

Goal: Promote the health and safety of people at work through prevention and early intervention.

Number	Objective Short Title
20-1	Work-related injury deaths
20-2	Work-related injuries
20-3	Overexertion or repetitive motion
20-4	Pneumoconiosis deaths
20-5	Work-related homicides
20-6	Work-related assaults
20-7	Elevated blood lead levels from work exposure
20-8	Occupational skin diseases or disorders
20-9	Worksite stress reduction programs
20-10	Needlestick injuries
20-11	Work-related, noise-induced hearing loss

Healthy People 2010 Objectives

20-1. Reduce deaths from work-related injuries.

Target and baseline:

Objective	Reduction in Deaths From Work-Related Injuries	1998 Baseline	2010 Target
<i>Deaths per 100,000 Workers Aged 16 Years and Older</i>			
20-1a.	All industry	4.5	3.2
20-1b.	Mining	23.6	16.5
20-1c.	Construction	14.6	10.2
20-1d.	Transportation	11.8	8.3
20-1e.	Agriculture, forestry, and fishing	24.1	16.9

Target setting method: Better than the best for 20-1a; 30 percent improvement for 20-1b, 20-1c, 20-1d, and 20-1e. (Better than the best will be used when data are available.)

Data source: Census of Fatal Occupational Injuries (CFOI), DOL, BLS.

NOTE: THE TABLE BELOW MAY CONTINUE TO THE FOLLOWING PAGE.

Workers Aged 16 Years and Older, 1998	Deaths From Work-Related Injuries				
	20-1a. All Industry	20-1b. Mining	20-1c. Construction	20-1d. Transportation	20-1e. Agriculture, Forestry, and Fishing
	Rate per 100,000				
TOTAL	4.5	23.6	14.6	11.8	24.1
Race and ethnicity					
American Indian or Alaska Native	DSU	DSU	DSU	DSU	DSU
Asian or Pacific Islander	DSU	DSU	DSU	DSU	DSU
Asian	DNC	DNC	DNC	DNC	DNC
Native Hawaiian and other Pacific Islander	DNC	DNC	DNC	DNC	DNC
Black or African American	3.9	DNA	DNA	DNA	DNA
White	4.5	DNA	DNA	DNA	DNA

Workers Aged 16 Years and Older, 1998	Deaths From Work-Related Injuries				
	20-1a. All Industry	20-1b. Mining	20-1c. Construction	20-1d. Transportation	20-1e. Agriculture, Forestry, and Fishing
	Rate per 100,000				
Hispanic or Latino	5.2	DNA	DNA	DNA	DNA
Not Hispanic or Latino	DNA	DNA	DNA	DNA	DNA
Black or African American	DNA	DNA	DNA	DNA	DNA
White	DNA	DNA	DNA	DNA	DNA
Gender					
Female	0.8	DNA	DNA	DNA	DNA
Male	7.7	DNA	DNA	DNA	DNA
Family income level					
Poor	DNC	DNC	DNC	DNC	DNC
Near poor	DNC	DNC	DNC	DNC	DNC
Middle/high income	DNC	DNC	DNC	DNC	DNC
Disability status					
Persons with disabilities	DNC	DNC	DNC	DNC	DNC
Persons without disabilities	DNC	DNC	DNC	DNC	DNC

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

NOTE: THE TABLE ABOVE MAY HAVE CONTINUED FROM THE PREVIOUS PAGE.

An average of 17 workers die from work-related injuries each day. These deaths are preventable. Public health efforts and resources can be targeted more effectively toward work-related injury prevention efforts, especially in those industries where the risk is greatest.

The NORA traumatic injury team has identified a number of research needs and priorities to address this issue. Specifically, the reduction of work-related injury deaths will require focused efforts to more fully identify and prioritize problems (injury surveillance), quantify and prioritize risk factors (analytic injury research), identify existing or develop new strategies to prevent occupational injuries (prevention and control), implement the most effective injury control measures (communication, dissemination, and technology transfer), and monitor the results of intervention efforts (evaluation). This approach will require the cooperation of many groups and agencies to provide the needed educational and outreach efforts, engineering controls, and enforcement of workplace safety regulations.

20-2. Reduce work-related injuries resulting in medical treatment, lost time from work, or restricted work activity.

Target and baseline:

Objective	Reduction in Work-Related Injuries Resulting in Medical Treatment, Lost Time From Work, or Restricted Activity	1998 Baseline (unless noted)	2010 Target
		<i>Injuries per 100 Full-Time Workers Aged 16 Years and Older</i>	
20-2a.	All industry	6.2	4.3
20-2b.	Construction	8.7	6.1
20-2c.	Health services	7.9 (1997)	5.5
20-2d.	Agriculture, forestry, and fishing	7.6	5.3
20-2e.	Transportation	7.9 (1997)	5.5
20-2f.	Mining	4.7	3.3
20-2g.	Manufacturing	8.5	6.0
20-2h.	Adolescent workers	4.8 (1997)	3.4

Target setting method: 30 percent improvement. (Better than the best will be used when data are available.)

Data sources: Annual Survey of Occupational Injuries and Illnesses, DOL, BLS; National Electronic Injury Surveillance System (NEISS), CPSC.

Data for population groups currently are not collected.

In 1997, nearly 6.1 million workers suffered injuries that resulted in either lost time from work, medical treatment, or restricted work activity. This is a rate of 6.6 cases per 100 full-time workers and clearly represents a public health and occupational safety and health problem of significant proportions. Prevention efforts must be heightened to reduce the tremendous burden of these injuries on individual workers as well as society.

20-3. Reduce the rate of injury and illness cases involving days away from work due to overexertion or repetitive motion.

Target: 338 injuries per 100,000 full-time workers.

Baseline: 675 injuries per 100,000 full-time workers due to overexertion or repetitive motion were reported in 1997.

Target setting method: 50 percent improvement. (Better than the best will be used when data are available.)

Data source: Annual Survey of Occupational Injuries and Illnesses, DOL, BLS.

Data for population groups currently are not collected.

For occupational injuries and illnesses resulting in days away from work, in 1997 approximately 507,500 cases (32 percent of all cases) involved overexertion or repetitive motion. Included within this total were 297,300 injuries due to overexertion in lifting (52 percent affected the back) and 75,200 injuries or illnesses due to repetitive motion, including typing or key entry, repetitive use of tools, and repetitive placing, grasping, or moving of objects other than tools.¹² The rates per 100,000 workers were 588 (overexertion) and 87 (repetitive motion), respectively.

Research evidence suggests an association between musculoskeletal disorders and certain work-related physical factors when levels of exposure are high, especially in combination with exposure to more than one physical factor (for example, repetitive lifting of heavy objects in extreme or awkward postures). More than 3 million persons are employed in the industries with the highest numbers of cases involving days away from work because of overexertion in lifting and repetitive motion.¹³ The number of workers affected can be reduced by continuing to focus national attention on prevention of this problem.

Strategies for reducing illness and injury due to overexertion or repetitive motion include increasing the number of States involved in control and evaluation activities and surveillance of musculoskeletal disorders; better support for State and community action to prevent and control musculoskeletal disorders; extending technical support and available engineering technology to industrial and service sectors to improve recognition and control of ergonomic hazards; establishing health care management strategies, as well as developing and validating standardized diagnostic criteria for early detection and treatment of musculoskeletal disorders for preventing impairment and disability; instituting ergonomic approaches at the design stage of work processes to factors that can lead to musculoskeletal problems; and increasing public awareness through media campaigns (for example, billboards and commercials) about the magnitude and severity of the problem, the need for early reporting, and early intervention to reduce disability as well as providing education about interventions.

20-4. Reduce pneumoconiosis deaths.

Target: 1,900 deaths.

Baseline: 2,928 pneumoconiosis deaths among persons aged 15 years and older occurred in 1997.

Target setting method: 10 percent fewer than the number of pneumoconiosis deaths projected for 2010 based on a 15-year trend (1982–97).

Data source: National Surveillance System for Pneumoconiosis Mortality (NSSPM), CDC, NIOSH.

Pneumoconiosis deaths are preventable through effective control of worker exposure to occupational dusts. The ultimate public health goal is to eliminate all pneumoconiosis among the Nation's current and former workers. Although progress toward this goal has been made in recent decades, the continuing occurrence of new cases of pneumoconiosis highlights the mistaken conclusion of many who have declared this a disease of the past. It will be important to maintain attention to and, as appropriate, enhance control of occupational exposures to hazardous dusts. Pneumoconiosis deaths will be measured by tracking death counts rather than age-adjusted deaths rates, emphasizing the preventability of each death.

An effective prevention strategy to reduce deaths from all types of pneumoconiosis will necessitate a broad range of approaches. Disease, disability, and hazard surveillance, both at the Federal and State levels, is required to monitor progress toward prevention and to identify new and persisting high-risk problem areas. Effective dissemination of pneumoconiosis surveillance and prevention information will raise awareness and motivate preventive actions for high-risk worker populations. Informational materials specifically designed to target regulators, employers, employees, industrial hygiene professionals, health care professionals, legislators, and the public also will contribute to elimination of pneumoconiosis.

20-5. Reduce deaths from work-related homicides.

Target: 0.4 deaths per 100,000 workers.

Baseline: 0.5 deaths per 100,000 workers aged 16 years and older were work-related homicides in 1998.

Target setting method: 20 percent improvement. (Better than the best will be used when data are available.)

Data source: Census of Fatal Occupational Injuries (CFOI), DOL, BLS.

Data for population groups are not collected routinely.

An average of 20 workers die each week as a result of workplace homicides in the United States. The jobs where employees are at risk of being murdered in the workplace share a number of common factors, including interacting with the public, handling exchanges of money, working alone or in small numbers, and working late night or early morning hours. Workplace factors can be modified to reduce or eliminate the effects of these risk factors. Workers, employers, and others can launch workplace violence prevention efforts as a part of all comprehensive workplace safety and health initiatives.

Reducing the number of workplace homicides will require improved surveillance and analytic epidemiologic research as well as effectiveness research to assess

engineering and other control strategies in various high-risk work settings. Additional education and outreach efforts also are necessary to inform workers, employers, occupational safety and health professionals, and others of the nature and magnitude of this problem and steps that can be taken to reduce the risk of workplace homicide.

20-6. Reduce work-related assaults.

Target: 0.60 assaults per 100 workers.

Baseline: 0.85 assaults per 100 workers aged 16 years and older were work-related during 1987–92.

Target setting method: 29 percent improvement. (Better than the best will be used when data are available.)

Data source: National Crime Victimization Survey, DOJ, BJS.

Data for racial and ethnic population groups currently are not analyzed. Data for other population groups currently are not collected.

Each year between 1992 and 1996, more than 2 million persons were victims of a violent crime while they were at work or on duty. (For additional information regarding improved surveillance, see objective 20-5.)

20-7. Reduce the number of persons who have elevated blood lead concentrations from work exposures.

Target: Zero persons per 1 million.

Baseline: 93 per million persons aged 16 to 64 years had blood lead concentrations of 25 µg/dL or greater in 1998 (25 States).

Target setting method: Total elimination.

Data source: Adult Blood Lead Epidemiology and Surveillance Program, CDC, NIOSH.

Data for population groups currently are not collected.

Twenty-five of the 27 States in NIOSH's Adult Blood Lead Epidemiology and Surveillance (ABLES) Program reported 10,501 adults (aged 16 to 64 years) with blood lead levels of 25 µg/dL or greater in 1998. Industries in which workers have been occupationally exposed to lead include battery manufacturing, nonferrous foundries, radiator repair shops, lead smelters, construction, demolition, and firing ranges. Workers in sheltered workshops (where mentally and physically challenged adults work) also are at risk for lead exposures. Lead taken home from the workplace also can harm children and spouses. Lead exposures can occur in avocations such as making pottery and stained glass, casting ammunition and fishing weights, and renovating and remodeling projects.

In the 1978 general industry standard, the Occupational Safety and Health Administration (OSHA) advised that the maximum acceptable blood lead level was 40 µg/dL and that males and females planning to have children should limit their exposure to maintain a blood lead level less than 30 µg/dL (29 CFR 1910.1025).¹⁴ Research studies on lead toxicity in humans indicate that compliance with the current OSHA lead standard should prevent the most severe symptoms of lead poisoning and some adverse reproductive effects in exposed workers. Nonetheless, the current OSHA standards fail to protect occupationally exposed males and females or their unborn children from all the adverse effects of lead, hence the 25 µg/dL cutoff in this objective.

The target can be achieved by continuing the efforts under way for the prevention of adult lead exposures, including interventions by States participating in NIOSH's ABLES Program, Council of State and Territorial Epidemiologists (CSTE) lead initiatives, OSHA's strategic initiative to reduce adult lead exposures, and voluntary industry initiatives such as those of the Lead Industries Association Incorporated and the Battery Council International.

20-8. Reduce occupational skin diseases or disorders among full-time workers.

Target: 47 new cases per 100,000.

Baseline: 67 new cases of occupational skin diseases or disorders per 100,000 full-time workers aged 16 years and older occurred in 1997.

Target setting method: 30 percent improvement. (Better than the best will be used when data are available.)

Data source: Annual Survey of Occupational Injuries and Illnesses, DOL, BLS.

Data for population groups currently are not collected.

In 1997, occupational skin diseases or disorders (OSDs) constituted 13.5 percent of all occupational illnesses reported to the Bureau of Labor Statistics (BLS), making OSDs the most common nontrauma-related occupational illness. Research on allergic and irritant dermatitis, the most common OSD, was identified as a NORA priority. In 1997, BLS data estimated a new case rate for OSDs of 67 per 100,000 workers, or 57,900 cases in the U.S. workforce. Because of survey limitations, the number of actual OSDs is estimated to be 10 to 50 times higher than the number reported by BLS.

The greatest number of cases of OSDs is seen in manufacturing, but the highest rate for diagnosis of new cases is seen in agriculture, forestry, and fishing. In the 1988 National Health Interview Survey (NHIS), the rate of new cases was 1.7 percent for occupational contact dermatitis (OCD) occurring in the preceding year. Projecting these results to the working population in the United States resulted in an estimate of 1.87 million persons with OCD. An analysis of workers' compensation claims reported an average annual claims rate for OSDs ranging from 12 to

108 per 100,000 employees. The total annual cost of OSDs is estimated to range from \$222 million to \$1 billion.

OSDs are preventable. Strategies for the prevention of OSDs include identifying allergens and irritants, substituting chemicals that are less irritating or allergenic, establishing engineering controls to reduce exposure, using personal protective equipment such as gloves and special clothing, using barrier creams, emphasizing personal and occupational hygiene, establishing educational programs to increase awareness in the workplace, and providing health screening. A combination of several interventions, which included providing advice on personal protective equipment and educating the workforce about skin care and exposures, have proved to be beneficial for workers. Primary and secondary prevention programs that include health promotion or public awareness campaigns and education or disease awareness programs can successfully be directed toward workers in high-risk industries.

20-9. Increase the proportion of worksites employing 50 or more persons that provide programs to prevent or reduce employee stress.

Target: 50 percent.

Baseline: 37 percent of worksites with 50 or more employees provided worksite stress reduction programs in 1992.

Target setting method: 35 percent improvement.

Data source: National Survey of Worksite Health Promotion Activities, OPHS, ODPHP.

Job stress has been identified as a significant risk factor for a number of health problems, including cardiovascular disease, musculoskeletal disorders, and workplace injuries. Research indicates that up to one-third of all workers report high levels of stress on the job. Worksite programs to reduce stress tend to adopt either stress management (for example, helping workers cope with current levels of stress) or primary prevention (for example, altering sources of stress through job redesign). Although many of these programs have been found to be effective in reducing levels of stress, additional knowledge is needed regarding which occupations are especially prone to the effects of stress, which aspects of organizational change in today's workplace pose the greatest risk of job stress, and what interventions are most useful to control these risks. The NORA Work Organization Team is committed to identifying factors that contribute to job stress and psychological strain as well as the prevention of these disorders. Definitive research is needed to clarify the relationship between psychosocial stressors associated with work organization and safety and health concerns, including job stress. Responsibility for implementing worksite programs lies with industry and industry associations, although worker representatives and labor groups should be involved in the design and implementation of worksite stress-reduction programs.

The baseline has been set using a 1992 survey that collected worksite data from the private sector and may not reflect accurately the practices of public sector organizations. The proportion of people who reported participating in stress management programs in the private and public sectors was 40 percent according to the 1994 NHIS data and may indicate that more worksite programs are offered in the public sector. NIOSH currently is planning data collection efforts to better understand stress prevention activities in both public and private workplace settings.

20-10. Reduce occupational needlestick injuries among health care workers.

Target: 420,000 annual needlestick exposures.

Baseline: 600,000 occupational needlestick exposures to blood occurred among health care workers in 1996.

Target setting method: 30 percent improvement. (Better than the best will be used when data are available.)

Data sources: National Surveillance System for Health Care Workers, CDC, NCID, NCHSTP, NIP, NIOSH.

Needlestick injuries are a serious concern for the approximately 8 million health care workers in the United States, because they pose the greatest risk of occupational transmission of bloodborne viruses, for example, human immunodeficiency virus (HIV), hepatitis B, and hepatitis C.¹⁵ Approximately 600,000 to 800,000 needlestick injuries occur annually, mostly among nursing staff; however, laboratory staff, physicians, housekeepers, and other health care workers also are injured.^{16,17} As of June 1999, a cumulative total of 55 documented cases and 136 possible cases of occupational transmission of HIV have occurred among health care workers.¹⁸ In 1995, an estimated 800 health care workers became infected with the hepatitis B virus (HBV).¹⁹ The number of health care workers who have acquired the hepatitis C virus (HCV) from an occupational exposure is unknown; however, approximately 2 to 4 percent of the 36,000 acute HCV infections in 1996 were thought to be in health care workers after an occupational exposure.^{20,21,22} Also, the emotional impact of a needlestick can be severe and long lasting, even when a serious disease is not transmitted.

Although the new cases of HCV infection decreased in the 1990s, 36,000 persons in the United States still are infected each year (1996), and approximately 3.9 million persons currently are infected with HCV.²³ Of these infected persons, an estimated 2 to 4 percent are health care workers occupationally exposed to blood due to needlestick injuries. HIV also can be transmitted in this fashion.

Many of these exposures are preventable with currently available technology. Two studies that evaluated safety devices, ongoing surveillance of occupational injuries, and consultation with experts in occupational safety and injury prevention indicate that at least a 30 percent reduction can be achieved with new technologies

and changes in technique. The use of engineering controls is an important priority in sharps injury prevention efforts. However, implementation of devices with safety features is only one component of a comprehensive program to achieve significant declines in sharps injuries. Such an approach includes modification of hazardous work practices, administrative changes to address needle hazards in the environment, safety education and awareness, and feedback on safety improvements.

20-11. (Developmental) Reduce new cases of work-related, noise-induced hearing loss.

Potential data source: Annual Survey of Occupational Injuries and Illnesses, DOL, BLS.

Related Objectives From Other Focus Areas

14. Immunization and Infectious Diseases

- 14-3. Hepatitis B in adults and high-risk populations
- 14-28. Hepatitis B vaccination among high-risk groups

27. Tobacco Use

- 27-12. Worksite smoking policies
- 27-13. Smoke-free indoor air laws

28. Vision and Hearing

- 28-8. Occupational eye injury
- 28-16. Hearing protection

Terminology

(A listing of abbreviations and acronyms used in this publication appears in Appendix H.)

Acoustic trauma: Hearing loss that is caused by a one-time exposure to a very loud noise, such as a gun shot or blast overpressure. A portion of the hearing loss may be temporary, but a portion will be permanent.

Asbestosis: A type of occupational dust disease of the lung caused by microscopic asbestos fibers.

Blood lead level (BLL): The concentration of lead in a sample of blood. This concentration usually is expressed in micrograms per deciliter ($\mu\text{g}/\text{dL}$) or micro moles per liter ($\mu\text{mol}/\text{L}$). One $\mu\text{g}/\text{dL}$ is equal to $0.048 \mu\text{mol}/\text{L}$.

Byssinosis: A type of occupational dust disease of the lung most often caused by cotton dust.

Coal workers' pneumoconiosis: A type of occupational dust disease of the lung caused by coal mine dust.

Ergonomic hazards: Factors or exposures that may adversely affect health and are related to the interaction between persons and their total working environment, including the organization of work, tools, equipment, and the social and behavioral elements of the

workplace. These hazards also can apply to work performance capabilities and limitations of workers.

Hyperacusis: Abnormal sensitivity to everyday sound levels or noises, often sensitivity to higher pitched sounds, in the presence of essentially normal hearing and often accompanied by tinnitus. Hyperacusis often follows exposures to intense high-level sounds, such as overpressures from automobile air bag deployments or gun fire.

Musculoskeletal disorders: Conditions that involve the soft tissues of the body, including muscles, tendons, nerves, cartilage, and other supporting structures. The term usually refers to conditions of the large joints, including the neck, shoulder, elbow, hand and wrist, back, and knee.

National Occupational Research Agenda (NORA): A collaboration of the National Institute for Occupational Safety and Health (NIOSH) and its public and private partners to provide a framework to guide occupational safety and health research through the next decade.

Natural rubber latex allergy: An immediate hypersensitivity reaction to one or more natural rubber latex proteins that can result in a wide spectrum of signs and symptoms, including skin rashes; hives or wheals; flushing; itching; nasal, eye, or sinus problems; asthma; and, rarely, anaphylaxis (shock).

Noise-induced hearing loss: Hearing loss caused by repeated exposures to sounds at various loudness levels over an extended period of time. The resulting permanent hearing loss is the cumulation of many temporary hearing losses and is insidious, often unnoticed by the sufferer until listening and communication are impaired.

Occupational dusts: Dusts associated with industrial processes and other work activities.

Occupational skin disease or disorder (OSD): An abnormal skin condition caused by exposure to factors associated with employment. Examples include contact dermatitis, eczema, or rash caused by primary irritants and sensitizers or poisonous plants; oil acne; chrome ulcers; and chemical burns or inflammations.

Pneumoconiosis: A major category of lung disease caused by breathing in certain types of occupational dusts. The dust deposited in the lung can result in inflammation and scarring, with associated respiratory symptoms, reduced lung function, and disability. A number of types of dust (for example, asbestos, silica, or coal mine dust) are known to cause pneumoconiosis.

Repetitive motion injury: As reported to the Bureau of Labor Statistics (BLS), a disorder due to repetitive motion or musculoskeletal disorders of the upper extremity associated with workplace exposures to a combination of repetitive, forceful exertions and constrained or extreme postures. The term “repetitive motion injury” is no longer favored and has been replaced by “work-related musculoskeletal disorder” by the International Committee on Occupational Health (ICOH) Musculoskeletal Subcommittee. Back disorders are separately reported to the BLS as “disorders due to overexertion.”

Silicosis: A type of occupational dust disease of the lung caused by crystalline silica dust.

Work-related injury (fatal or nonfatal): Any injury incurred by a worker while on or off the worksite but engaged in work-related activities. Work-related injuries may be unintentional or intentional (that is, homicide and assault). The term includes apprenticeships, vocational training, working in a family business, and work as a volunteer firefighter or emergency medical services (EMS) provider. Injuries incurred during work-related travel are included; injuries incurred during routine commuting to or from work are not included.

Work-related musculoskeletal disorder: A condition involving the soft tissues of the body, including muscles, tendons, nerves, cartilage, and other supporting structures, that is caused by exposure to work-related factors. The term usually refers to conditions of the large joints, including the neck, shoulder, elbow, hand and wrist, back, and knee.

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