

# New Directions at NIOSH



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**NIOSH**  
National Institute for  
Occupational Safety and Health

# Message from the NIOSH Director



*Dr. Linda Rosenstock, a well known scientist, professor, and practicing physician in occupational and internal medicine became Director of NIOSH in April, 1994.*

In April 1994, I became the Director of the National Institute for Occupational Safety and Health (NIOSH). At that time, NIOSH headquarters were relocated from Atlanta to Washington, D.C. The Washington office, located in the Hubert H. Humphrey Building on Capitol Hill, consists of a senior staff working on policy and legislation, health communications, and liaison activities with other agencies and groups. The headquarters move had both symbolic and practical implications. It was an important first step in achieving my highest goal, namely, increasing the visibility of occupational safety and health in general, and of NIOSH in particular.

Our new location gives us geographic proximity to important partners, including other agencies within the Department of Health and Human Services, such as the National Institutes of Health; federal agencies such as the Occupational Safety and Health Administration, the Mine Safety and Health Administration, the Environmental Protection Agency, and the Department of Energy; and trade and labor associations. It also places us close to decision-makers in occupational safety and health. I believe NIOSH is now better positioned to describe our resources and services and to inform people about the nature and extent of occupational safety and health problems and their causes and solutions.

As we work to improve access to NIOSH resources, we will also strive to increase their utility by providing recommendations, products, and services that are more timely, more understandable, and more practical. To promote prevention of workplace illnesses and injuries, we are disseminating our research and policy findings well beyond the scientific community to reach employers, workers, students, and others who can put our recommendations into practice. We are improving our programs that provide service and technical assistance to employers and employees and creating a research program that can address the changing workplace and workforce in the United States.

This document provides an overview of the work of NIOSH, explores the challenges we face, and outlines new research priorities. As we work toward prevention of workplace injury and disease, NIOSH looks forward to change and to continued interaction with workers and their representatives, employers, other federal and state agencies, and our professional colleagues.

# Workplace Injury and Disease

## A Mainstream Public Health Problem

In today's society, Americans are working more hours than ever before. The workplace environment profoundly affects health. Each of us, simply by going to work each day, may face hazards that threaten our health and safety. Risking one's life or health should never be considered merely part of the job.

In 1970, Congress passed the Occupational Safety and Health Act to ensure Americans the right to "safe and healthful working conditions," yet workplace hazards continue to inflict a tremendous toll in both human and economic costs.

In 1992, employers reported 3.3 million disabling work injuries and 370,000 cases of occupational illness. An average of 17 American workers die each day from injuries on the job. Moreover, even the most conservative estimates find that about 137 additional workers die each day from workplace diseases.

Medical payments under workers' compensation rose to almost \$17 billion in 1991. Considering that workers' compensation is received by only 60 percent of injured workers and does not cover most cases of chronic occupational illness, medical costs alone for these conditions may total between \$30 and \$40 billion.

Occupational injury and disease create needless human suffering, a tremendous burden upon health care resources, and an enormous drain on U.S. productivity (estimated to exceed \$100 billion annually). Yet, to date, this mainstream public health problem has escaped mainstream public attention. Workplace injuries and diseases are neither inevitable nor acceptable. The time has come to protect one of our most valuable resources: the American worker.



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## Fulfilling the Nation's Promise

The Occupational Safety and Health Act of 1970 committed this nation to ensuring safe and healthful working conditions for working men and women. The Mine Safety and Health Acts of 1969 and 1977 were enacted to provide the same protection for the Nation's miners.

The National Institute for Occupational Safety and Health (NIOSH) was created to conduct research and training and make recommendations for the prevention of work-related illnesses and injuries. NIOSH and its staff of about 900 are part of the Centers for Disease Control and Prevention (CDC) within the Department of Health and Human Services (DHHS). NIOSH headquarters are in Washington D.C., with offices in Atlanta, Georgia, and research divisions in Cincinnati, Ohio, and Morgantown, West Virginia.

One of the Institute's responsibilities is to make recommendations for standards to the Occupational Safety and Health Administration (OSHA) and the Mine Safety and Health Administration (MSHA), both in the Department of Labor. OSHA establishes and enforces workplace safety and health regulations in general industry, and MSHA fulfills these responsibilities in the mining industry.

The philosophy of NIOSH is articulated in the Institute's vision statement: Delivering on the Nation's Promise: Safety and Health at Work for All People...Through Research and Prevention

# Surveillance

Surveillance, the identification of hazardous working conditions and their health effects, is one of the most important factors in preventing workplace injury and disease. NIOSH works with a variety of public and private organizations to identify and track hazardous conditions through reporting on disease, injury, and worker exposures. These systems provide the data needed to target research and prevention activities and evaluate their impact. Surveillance plays a key role in defining major occupational safety and health problems and driving the efforts of NIOSH and others toward effective solutions.



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## Laboratory Research

NIOSH conducts research in the laboratory to evaluate potential hazards under controlled conditions, to develop technology and information needed for field research, and to develop and evaluate protective measures. Laboratory research allows the Institute to:

*Understand the causes and mechanisms of disease and disorders:* Much of what is known about the substances or conditions that cause work-related disease and the mechanisms by which they act has been learned through laboratory research. By examining in the laboratory the effects of toxicants and hazards on cellular biological, physical, and mental functions, NIOSH researchers develop information needed to design appropriate field studies and prevention measures.

*Develop technology for measuring and monitoring exposures:* To assess worker exposures, field researchers, industry, and regulatory agencies must be able to detect and measure hazardous environments. To meet this need, NIOSH develops, improves, and assesses methods and equipment for monitoring exposures workers receive through inhalation, ingestion, and skin absorption. Researchers also develop medical tests that can detect subtle biological changes indicating a worker's exposure to a hazard. These laboratory studies, which detect the early effects of exposure, improve the accuracy and utility of field studies and health surveillance efforts.

*Develop and evaluate control technology and personal protective equipment:* When a hazardous exposure or risk factor for injury or disease is identified, the next step is to develop and evaluate methods for reducing or eliminating that exposure or factor. NIOSH conducts and tests methods and equipment to control hazards. Where hazards cannot be sufficiently reduced, workers may require personal protective equipment such as chemical resistant clothing, hearing protectors, and respirators.



# Field Research

A great deal of NIOSH research is conducted by visiting workplaces throughout the United States. These field studies allow researchers to identify potential workplace hazards, determine the extent of worker exposure, measure risk for injury or disease, and demonstrate effective approaches to prevention.

*Health Hazard Evaluations* - NIOSH conducts hundreds of investigations each year at the request of workers, employers, and Federal and state agencies to evaluate health concerns at specific worksites. This program provides workers and employers with prevention recommendations, helps keep NIOSH informed about changes in working conditions and exposures, and assists the Institute in establishing research priorities.

For example, a series of health hazard evaluations helped NIOSH identify a high prevalence of musculoskeletal disorders among newspaper workers who use video display terminals. To reduce these injuries, NIOSH recommended rest breaks, changes in equipment and work organization, employee training, and eye tests.

*Exposure Assessment* - If research indicates that specific hazards may threaten workers' health, NIOSH designs studies to evaluate where, how, and to what degree exposure is occurring. This research enables NIOSH and others to determine the importance of specific hazards and to target prevention efforts accordingly.

*Epidemiologic Studies* - NIOSH researchers conduct large scale studies of worker populations to determine whether exposures to hazardous substances or conditions are causing injury or disease. These studies may span numerous worksites, occupations, and industries. Once the relation between exposure and health effects is determined, NIOSH recommends measures to prevent future injury and disease.





*Fatality Investigations* - To understand why workers continue to die on the job, NIOSH and State health departments collaborate to investigate worksites where fatalities have occurred through the Fatality Assessment and Control Evaluation (FACE) program. The FACE program investigates workplace deaths from electrocution, falls, machine-related incidents, and entry into confined spaces. From these investigations, NIOSH provides prevention recommendations to the employers and workers at the site and to workers at risk in similar industries.

*Intervention Studies* - When a hazard is known or suspected to cause disease or injury, NIOSH conducts research to evaluate the effectiveness of existing approaches in reducing or eliminating the risk to workers and to develop new approaches when needed. These prevention measures may involve a single technologic fix, such as substituting a safe chemical for a hazardous one, or a whole system of changes in technology, worksite policies, and training. A special emphasis of this program has been to assist small businesses, which usually do not have in-house safety and health professionals.

## Recommendations

NIOSH provides scientific information and recommendations that may be used by OSHA and MSHA in setting workplace standards. Additionally, the Institute works with others in government, industry, labor, professional associations, academia, and the media to communicate findings on workplace risks and promote prevention measures.

# Training



A major impediment to improving the prevention and treatment of work-related diseases and injuries is the lack of professionals trained in occupational health. Currently, there are only 1,500 physicians and 4,000 nurses certified in occupational health. That is one occupational medicine physician and fewer than three occupational health nurses to care for every 80,000 active workers and 20,000 retired or disabled workers. Additionally, primary care providers often fail to recognize workplace issues when diagnosing and treating patients. NIOSH, therefore, works to integrate occupational medicine into mainstream medical training. NIOSH training also supports the development of other occupational safety and health professionals essential to protecting workers' health, including industrial hygienists, safety specialists, and engineers.

To train these safety and health professionals, NIOSH funds educational resource centers (ERCs) and training projects at universities across the U.S. NIOSH also funds programs that introduce occupational safety and health into business, engineering, and vocational schools, as well as underserved geographic areas and minority colleges.



# Service

## **800 Number**

The NIOSH toll free number (1-800-356-4674) provides convenient public access to NIOSH and its information resources. Callers may request information about NIOSH activities or any aspect of occupational safety and health. Information on the following NIOSH services is available from the 800 number:

## **Health Hazard Evaluations**

Employers, employees, or their labor representatives who suspect a health hazard in their workplace can request a NIOSH health hazard evaluation to assess the problem and recommend prevention measures.

## **Publications and Information**

NIOSH publishes and distributes a wide range of publications covering the Institute's research and recommendations for providing safe and healthful working conditions. Additionally, the Institute works with numerous organizations and scientific and lay publications to disseminate occupational safety and health information. Internet users can reach the NIOSH publications office at [pubstaf@niosd11.em.cdc.gov](mailto:pubstaf@niosd11.em.cdc.gov).

The NIOSH Home Page on the World Wide Web provides information on NIOSH and its services. Users can reach the Home Page at <http://www.cdc.gov/niosh/homepage.html>.

## **Databases**

NIOSH maintains several widely used databases providing summary information on occupational safety and health research, including a bibliographic database of literature in the field (NIOSHTIC®) and the Registry of Toxic Effects of Chemical Substances (RTECS®).

## **Respirator Certification**

For millions of workers in environments where controls do not eliminate toxic exposures respirators are often used to prevent overexposure and the resulting disease and injury. To aid in the selection of appropriate respirators, NIOSH certifies models that meet established national standards. NIOSH is currently working to update and improve the current respirator certification standards.



# Research Initiatives

## Four New Priorities

To strengthen and expand the Institute's research programs, NIOSH leadership has chosen four critical areas for special emphasis. NIOSH will address these areas by shifting the focus of some of the Institute's in-house research and by supporting research at academic institutions and other national, state, and local organizations throughout the country.

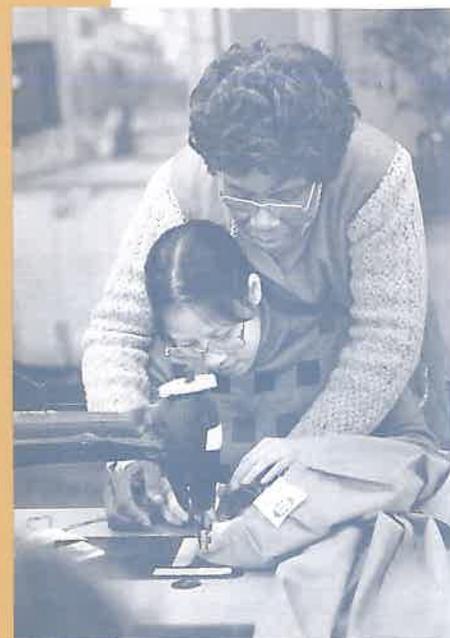
### Surveillance

The ability to identify the occurrence of work-related injury and disease is vital for prevention. While some targeted surveillance efforts address specific conditions, such as adult lead poisoning, occupational lung disease, and carpal tunnel syndrome, a national surveillance system for occupational disease and injury does not exist. The Institute will expand existing data collection efforts and link various data sources to provide more comprehensive and accurate information.

To broaden current surveillance efforts, NIOSH will: (1) improve hazard surveillance systems so employers, workers, and others can identify hazardous working conditions and respond with preventive efforts before disease or injury occur; (2) expand disease surveillance efforts to fill the major gaps in current reporting systems; (3) expand surveillance of nonfatal injury; and (4) begin to assess the economic burden of occupational conditions and economic benefits of their prevention.

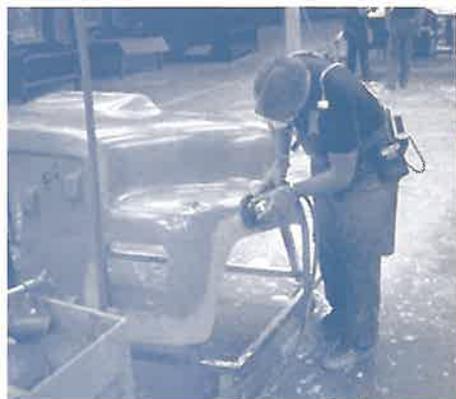
### Work Organization

Physical and chemical hazards of work have long been recognized by NIOSH and other researchers. There is growing evidence that how work is organized also affects the health and well-being of workers, both directly and in combination with other hazards. Work organization research addresses the health effects of broad aspects of employment, including unemployment, underemployment, overemployment, shift-work, and job stress. It encompasses special risks that may be related to the overall economy, such as the evolution from an industrial to a service economy and demands for productivity that are pressured by global market forces. It also looks at the implications of a workforce that is increasingly comprised of women, minorities and older workers. NIOSH will commit more resources to determine how such work organization issues affect the safety and health of workers.



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### Intervention and Control Technology Research

Intervention research in the workplace examines the efficacy of preventive measures. In the past, when NIOSH has made recommendations for controlling occupational exposures, the Institute has not conducted routine follow-up to determine whether the recommended measures have been implemented and whether they have been effective. NIOSH will develop a broad program of intervention research to assess the effectiveness of policies, regulations, education and training efforts, government and private outreach programs, and new technology in preventing disease and injury.

Control technology research is a form of intervention research that seeks to prevent work-related diseases and injuries by designing, implementing, and evaluating measures to reduce occupational hazards at their source. If adequate controls are not currently available, Institute researchers work to develop new technologies for controlling hazardous exposures. NIOSH also works with employers, including smaller businesses, to ensure that prevention measures are feasible.

### Health Services Research

Health service research encompasses many aspects of health care including how health care is organized and paid for and the effectiveness of the prevention and treatment of diseases and injuries. Occupational health aspects of this important field are largely understudied. NIOSH will mount efforts to address the following areas:

(1) assessing the adequacy of the supply of occupational safety and health professionals, including physicians and nurses, industrial hygienists, safety specialists, and engineers; (2) evaluating the accessibility, availability, and delivery of occupational health services, the role of workers' compensation, and the integration of occupational health services and primary health care; (3) improving the quality of occupational health care through clinical and preventive practice guidelines; (4) assessing the effectiveness of screening and treatment of select occupational conditions; and (5) evaluating the economics of treating and preventing occupational injuries and illnesses.



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# Building Capacity



As NIOSH faces the challenges of protecting today's diverse workforce, the Institute will strengthen its capabilities when a new research facility in Morgantown, West Virginia, is completed in 1995. The 167,000 square foot building will provide state-of-the-art laboratory facilities and create over 300 new positions.

Researchers in the new Health Effects Laboratory Division (HELD) will conduct focused, applied, and preventive laboratory research, develop intervention programs, and design and implement effective methods for health communications. The Division will collaborate with researchers throughout NIOSH and in other public and private institutions to apply the latest scientific research to workplace health problems.

New research in Morgantown will expand and develop NIOSH capabilities with activities in the following areas:

## **Pathology and Physiology**

Researchers will develop highly sensitive, complex, and unique laboratory techniques to increase our understanding of occupational diseases and the ways in which they produce changes in human or cellular function. This research will develop pre-disease early warning systems and identify methods to prevent further damage to health.

## **Toxicology and Molecular Biology**

By developing methods to examine the toxic effects of workplace exposures, NIOSH researchers will more clearly define the relationship between hazardous substances and toxic responses. Research programs will focus on cell-to-cell communication, cellular interaction, genome insertions and activations, responses to production and release of cellular signals and mechanisms of control, blockage, and homeostasis of cellular systems.

## **Exposure Assessment**

Studies of health effects among workers are frequently limited by existing methods to characterize occupational exposures. Likewise, employers and workers cannot take preventive actions if they do not know that hazardous exposures are occurring. NIOSH researchers will develop new methods for measuring and monitoring exposure to hazardous workplace agents in order to advance our understanding of factors that cause occupational disease and improve our ability to prevent hazardous exposures. For example, researchers will develop and evaluate technology that can be worn by workers or placed strategically in the worksite to give immediate notification of exposures as they occur.

### **Engineering and Control Technology**

NIOSH researchers will expand the Institute's efforts to develop engineering solutions and protective equipment to prevent occupational diseases. Researchers will explore new techniques for worker protection, including the application of sensors and microprocessors in engineering controls and protective equipment.

### **Biostatistics**

Researchers in this area will have overall responsibility for providing statistical consultation on issues of study design and data analysis for the new laboratory division including development of new statistical methods as needed.

### **Health Communication Research**

Researchers in this branch will develop and evaluate methods, messages, and materials that communicate risks and necessary action to target audiences. These studies will enable the Institute to ensure that its communication efforts are relevant, appropriate, and ultimately contribute to the prevention of workplace injury and disease.

### **Expansion of Safety Research**

NIOSH will expand its ability to conduct research in safety engineering and human factors. NIOSH laboratory researchers will work to develop automatic sensor systems to safeguard against injuries, conduct biomechanical assessments of lifting and manual handling tasks, and develop and improve personal protective equipment, such as fall restraint devices.











**NIOSH**

Delivering on the Nation's promise:  
Safety and health at work for all people  
Through research and prevention

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