



National Institute for Occupational Safety and Health

Tracking Occupational Injuries, Illnesses, and Hazards: *The NIOSH Surveillance Strategic Plan*

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“Mission -- Provide national and world leadership to prevent work-related illness, injury, and death by gathering information, conducting scientific research, and translating the knowledge gained into products and services.”



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health



Tracking Occupational Injuries, Illnesses, and Hazards:

The NIOSH Surveillance Strategic Plan

U.S. Department of Health and Human Services
Public Health Service
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

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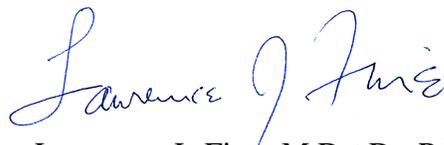
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Foreword

Tracking occupational injuries, illnesses, and hazards has been an integral part of the National Institute for Occupational Safety and Health (NIOSH) since its creation by the Occupational Safety and Health Act in 1970. In collaboration with its many partners, NIOSH has established surveillance programs to help describe the magnitude of occupational hazards, diseases, and injuries in the U.S. These surveillance activities have often documented the Nation's progress in reducing the burden of work-related diseases and injuries. They have also identified many old and new problems that require additional research and prevention efforts. Despite these accomplishments, occupational health surveillance in the U.S. remains fragmented, with substantial data gaps.

Given these deficiencies, the changes in the workplace over the past 30 years, and the competing demands for resources, NIOSH embarked on a process to assess current surveillance needs and to identify its goals for the next decade. The Surveillance Strategic Plan is the result of this effort.

I am grateful for the tremendous cooperation from our partners in developing this plan. I anticipate that it will serve not only as a guide for surveillance within NIOSH, but will provide a framework for occupational safety and health surveillance nationally. I look forward to continued collaboration with our many partners in government, the private sector, labor, academia, and non-governmental organizations in implementing this plan and making its vision and mission a reality.



Lawrence J. Fine, M.D., Dr..P.H.

Acting Director

National Institute for Occupational
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Abbreviations

ABLES	Adult Blood Lead Epidemiology and Surveillance
ASTHO	Association of State and Territorial Health Officials
BLS	Bureau of Labor Statistics
BRFSS	Behavioral Risk Factor Surveillance System
CDC	Centers for Disease Control and Prevention
CFOI	Census of Fatal Occupational Injuries
CPSC	Consumer Product Safety Commission
CSTE	Council of State and Territorial Epidemiologists
CWHSP	Coal Workers' Health Surveillance Program
CWP	Coal Workers' Pneumoconiosis
CWXSP	Coal Workers' X-ray Surveillance Program
DHHS	Department of Health and Human Services
EEOC	Equal Employment Opportunity Commission
EPA	Environmental Protection Agency
FACE	Fatality Assessment and Control Evaluation Program
FFHHS	Farm Family Health and Hazard Survey
ICD 10	International Classification of Diseases, 10 th Revision
MSHA	Mine Safety and Health Administration
NASH	National Surveillance System for Healthcare Workers
NAWS	National Agricultural Workers Survey
NCCI	National Council of Compensation Insurers
NCHS	National Center for Health Statistics
NCIPC	National Center for Injury Prevention and Control
NCID	National Center for Infectious Disease
NEISS	National Electronic Injury Surveillance System
NHIS	National Health Interview Survey
NIOSH	National Institute for Occupational Safety and Health
NOES	National Occupational Exposure Survey
NOHS	National Occupational Hazard Survey
NOHSM	National Occupational Health Survey of Mining
NOMS	National Occupational Mortality System
NORA	National Occupational Research Agenda
NSSPM	National Surveillance System for Pneumoconiosis Mortality
NTOF	National Traumatic Occupational Fatalities Surveillance System
OPHS	Office of Public Health and Science
OSHA	Occupational Safety and Health Administration
SCANS	Surveillance Cooperative Agreements between NIOSH and States
SDS	Supplementary Data System
SENSOR	Sentinel Event Notification System for Occupational Risks
SSA	Social Security Administration
TISF	Traumatic Injury Surveillance of Farmers

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National Institute for Occupational Safety and Health

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

Mission -- Provide National and world leadership to prevent work-related illnesses, injury, and death by gathering information, conducting scientific research, and translating the knowledge gained into products and services.

NIOSH Surveillance Strategic Goals

1. Advance the usefulness of surveillance information at the Federal level for prevention of occupational illnesses, injuries, and hazards.
2. Strengthen the capacity of State health departments and other State agencies to conduct occupational surveillance.
3. Strengthen surveillance of high-risk industries and occupations, and of populations at high risk, including special populations.
4. Promote effective occupational safety and health surveillance conducted by employers, unions, and other non-governmental organizations.
5. Increase research to improve occupational surveillance.

Background

Definition of Public Health Surveillance

Public health surveillance is the ongoing systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practices, closely integrated with the timely dissemination of these data to those who need to know. The final link in the surveillance chain is the application of these data to prevention and control. A surveillance system includes a functional capacity for data collection, analysis, and dissemination linked to public health programs.

To optimally develop comprehensive occupational safety and health surveillance, NIOSH needs to effectively partner and pool resources with States, other Federal agencies, and private organizations. Also, as the Nation’s surveillance program becomes more complex, there is an increased need for strategic planning to guide surveillance efforts within NIOSH and to foster coordination of activities among agencies and other organizations.

History of NIOSH Surveillance Activities

Over the past quarter century, NIOSH has played a key role in the surveillance of occupational hazards, diseases, and injuries, complementing the important surveillance activities carried out by many States, the National Center for Health Statistics (NCHS) and other Federal agencies, including the Bureau of Labor Statistics (BLS), the Occupational Safety and Health Administration (OSHA), and the Mine Safety and Health Administration (MSHA). NIOSH began developing a program of national occupational health surveillance activities in the early 1970s. These initial efforts involved hazard surveillance and health effects surveillance.

The initial hazard surveillance efforts included the National Occupational Hazard Survey (NOHS) of general industry, conducted in the early 1970s. NOHS used a representative sample of 5,000 establishments and identified more than 9,000 potential workplace hazards. NIOSH conducted a second survey of potential hazards in general industry — the National Occupational Exposure Survey (NOES) — in the early 1980s, and a similar survey of potential hazards in the mining industry — the National Occupational Health Survey of Mining (NOHSM)— in the late 1980s.

Competing priorities within the Institute, as well as cost considerations, have kept further surveys from being conducted on a regular basis. In recent years, NIOSH hazard surveillance efforts have also included dissemination of surveillance reports that incorporate results of OSHA and MSHA

NIOSH has been involved with collaborative surveillance activities since the 1970s.

inspection sampling. Important hazard data have also been generated as a result of investigation activities carried out under various NIOSH programs.

Initial health surveillance efforts involved the analysis of data primarily from the National Center for Health Statistics (NCHS) National Health Interview Survey (NHIS), the Social Security Administration (SSA) disability award files, and the NCHS Vital Statistics Death Certificate Data files. Data were also analyzed from the NIOSH-administered Coal Workers' X-Ray Surveillance Program (CWXSP), a national program that has involved over 300,000 examinations of active underground coal miners since 1970.

In the early 1980s, NIOSH collaborated with NCHS and State vital statistics departments to develop the National Occupational Mortality System (NOMS), which enables the use of the national mortality statistics program for periodic surveillance of cause-specific mortality by decedents' usual industry and occupation. In the late 1980s, NIOSH established the National Surveillance System of Pneumoconiosis Mortality (NSSPM), providing annually updated information on all deaths in the United States with pneumoconiosis listed as a cause of death. In the 1990s, NIOSH began the periodic publication of the *Work-Related Lung Disease Surveillance Report*, which presents data from the NSSPM and other sources.

Collaboration between NIOSH and States related to occupational safety and health surveillance began with the Surveillance Cooperative Agreements between NIOSH and States (SCANS), a program that increased State health department capacities in the area of occupational safety and health.

Initial injury surveillance efforts within NIOSH began in the early 1980s with analyses of data collected by other agencies [e.g., BLS workers' compensation-based Supplementary Data System (SDS)] and other collaborative efforts [e.g., interagency agreement between NIOSH and the Consumer Product Safety Commission (CPSC) to collect work-related injury data in the National Electronic Injury Surveillance System (NEISS)]. NIOSH also developed the National Traumatic Occupational Fatalities (NTOF) Surveillance System to fill a gap in basic information on fatal occupational injuries, providing information on all work-related deaths in the United States based on death certificates. In 1993, NIOSH published a major surveillance report summarizing NTOF system data titled *Fatal Injuries to Workers in the U.S., 1980-1989: A Decade of Surveillance*.

Examples of Current NIOSH Surveillance Activities

To help guide future surveillance of occupational injury deaths, NIOSH and BLS are currently collaborating on a comparative analysis of the NTOF system and a more recently developed, multi-source occupational injury mortality surveillance system maintained by BLS. Further, NIOSH has recently collaborated with the United States Department of Agriculture and the Department of Labor on new approaches to gather information on agricultural workers, a population under-represented in occupational injury surveillance systems. A recent example of targeted analyses has identified previously unrecognized high injury rates among youth less than 18 years of age who are working in agriculture.

To complement population-based occupational surveillance, NIOSH has developed programs to supplement surveillance data with information from in-depth, case-based investigations of selected diseases and injury deaths. The State-based Sentinel Event Notification System for Occupational Risks (SENSOR) Program is intended to carry out surveillance, investigation, and preventive intervention for specific occupational conditions, including work-related carpal tunnel syndrome, work-related asthma, and pesticide poisoning, among others. Operating in 13 States, SENSOR has recently been supplemented with funding from the Environmental Protection Agency for enhanced pesticide poisoning surveillance.

Current NIOSH State-based surveillance programs include SENSOR, FACE, and ABLES.

The Fatality Assessment and Control Evaluation (FACE) program has expanded from an internal program of fatality investigations to include cooperative agreements with 15 States. In addition to the SENSOR and FACE Programs, current major collaborative surveillance-related activities between NIOSH and States include the Adult Blood Lead Epidemiology and Surveillance (ABLES) Program, which has grown from 4 States in 1987 to 28 States in 1999.

The NIOSH Surveillance Strategic Planning Process

NIOSH established an overall Institute strategic plan for 1997 through 2002 that complements goals set by the Department of Health and Human Services (DHHS) and the Centers for Disease Control and Prevention (CDC). Representing the broad spectrum of the Institute’s work, the NIOSH Strategic Plan consists of four goals that focus on research, surveillance, prevention, and information dissemination and training. The NIOSH strategic goal for surveillance is to *‘Develop a system of surveillance for major occupational illnesses, injuries, exposures and health hazards.’* The 1999 objective for this goal was to *‘undertake a comprehensive surveillance planning process with NIOSH partners at the State and Federal levels to establish surveillance priorities.’* The intended purpose of this planning process was to ensure that NIOSH builds effectively on progress in occupational surveillance achieved to date and moves closer to achieving the Institute’s overall vision of “Delivering on the Nation’s promise: Safety and health at work for all people through research and prevention.”

The process for developing this NIOSH Surveillance Strategic Plan for occupational illnesses, injuries, and hazards began in 1998 with input from two groups: the NIOSH-States Work Group and the NIOSH Surveillance Coordination Group. Together, these groups represent public health leaders, surveillance specialists, and other public health professionals from within and outside of NIOSH.

The NIOSH-States Work Group performed the following:

- reviewed surveillance from the State’s perspective in order to identify what was needed to improve occupational surveillance;
- prepared a report including general recommendations and an appendix with condition-specific profiles describing surveillance rationale, objectives, and methods for each of 13 priority conditions identified by the Group.

The NIOSH Surveillance Coordination Group performed the following:

- reviewed surveillance activities and systems utilized within the Institute;
- conducted a needs assessment of surveillance in the areas of occupational illnesses, injuries, and hazards; and
- used these assessments to identify current gaps and set goals for developing more comprehensive surveillance systems in the next decade.

A total of 65 recommendations were generated by these two groups. After a critical review by NIOSH Senior Staff, the list was consolidated and narrowed to 20 draft objectives. To obtain additional input and comment on these draft objectives, several internal and public meetings were held during the summer of 1999. Representatives of States provided input at a meeting in Madison, Wisconsin, which was held in association with the national meeting of the Council of State and Territorial Epidemiologists (CSTE). A public meeting was held in Washington, D.C., and internal NIOSH meetings were held in Cincinnati, Ohio, and Pittsburgh, Pennsylvania.

Input was also obtained from the National Occupational Research Agenda (NORA) Surveillance Research Methods Team, Federal partners, including BLS, OSHA, and NCHS, and non-governmental

Over one year was committed to the development of this plan with input from over 400 health professionals.

organizations, including worker and employer representatives. Table 1 provides a summary of the NIOSH surveillance strategic planning process. Overall, approximately 400 health professionals contributed to the development of the NIOSH Surveillance Strategic Plan.

The NIOSH Surveillance Strategic Plan

The NIOSH Surveillance Strategic Plan is based on a long-range vision of a comprehensive occupational surveillance program involving a coordinated set of complementary surveillance systems. The plan seeks to achieve an appropriate balance between national and State-based activities, as well as an appropriate balance among health, injury, and hazard surveillance. Because no single Federal agency has an exclusive mandate to promote and conduct occupational health and safety surveillance, surveillance at all levels will benefit from increasing coordination and information exchange. Since new issues in occupational health will undoubtedly emerge in the next decade, the Surveillance Strategic Plan incorporates flexibility and the capacity to respond to them.

Federal Surveillance Activities

Many Federal agencies engage in surveillance activities related to occupational fatalities, injuries, and illnesses. Although communication and collaboration among agencies has improved in recent years, there is a need for better coordination and collaboration of surveillance activities at the Federal level. The Surveillance Strategic Plan recognizes the importance of working with Federal partners to identify and fill data gaps, improve dissemination and use of surveillance information, expand public access to surveillance data, and encourage the inclusion of standardized coding of occupation and industry information in national data systems.

State-based Surveillance Activities

The Surveillance Strategic Plan recognizes that States have a vital role to play in the surveillance of occupational injuries, illnesses, and hazards. Under the Surveillance Strategic Plan, State-based surveillance systems and activities will provide a vital foundation for several Federal surveillance systems and will augment other Federal surveillance systems. In the long-range vision of an improved comprehensive nationwide occupational health surveillance program, all States will have the core capacity to conduct surveillance of occupational injuries, diseases, and hazards that will contribute to State and local prevention efforts, as well as to national data concerning magnitude, trend, and distribution. In addition, States will also have the capacity to conduct focused in-depth surveillance, follow-up investigations, and intervention for selected, targeted conditions (diseases, injuries, or hazards). Given inevitable resource constraints, it is not realistic to expect all States to conduct in-depth surveillance for all occupational conditions at the present time.

Private Sector Surveillance Activities

This Surveillance Strategic Plan recognizes that many day-to-day occupational health monitoring and surveillance activities are, and should be, conducted by employers, health care professionals and institutions, and unions. New technologies and changes in health care delivery offer new opportunities for surveillance activities. There is a tremendous amount of work outside of occupational health being done to develop health information/surveillance systems, and NIOSH recognized the importance of this work in designing its strategic plan. In fact, one goal in this Surveillance Strategic Plan is to identify those private sector individuals, institutions, groups, and organizations that are involved in successful surveillance programs, to learn from them, and to share their tools and effective prevention activities.

Surveillance of High-Risk Occupations

The Surveillance Strategic Plan seeks to continue to enhance a focus on high-risk industries and occupations, such as construction, agriculture, mining, and health care. In addition to maintaining surveillance of traditional concerns of continuing importance, the Plan seeks to increase surveillance relating to the use of protective technologies, as well as to work organization issues such as shift work.

Occupational Surveillance Research

Occupational safety and health surveillance presents a host of methodologic and other challenges. Research is needed to evaluate existing surveillance systems and approaches. New approaches must be developed to capture the experience of special populations and the growing number of workers who participate in non-traditional work arrangements, such as contingent, temporary, and contract workers, as well as part-time workers and multiple-job holders. The use of non-traditional data sources may be especially helpful for these surveillance efforts, but they are virtually unexplored. Recognizing these needs, the Surveillance Strategic Plan specifically includes a goal to enhance occupational safety and health surveillance research in the coming years.

Strengthening Partnership with Surveillance Programs

Finally, the goals of the Surveillance Strategic Plan cannot be achieved without strengthening NIOSH partnerships with other Federal, State, and non-governmental organizations. The goals also cannot be achieved fully without identifying additional resources to carry out such a plan. To accomplish the long-range vision of a nationwide occupational health surveillance system, NIOSH and its partners must formulate a concrete plan to marshal those resources. At the Federal level, available NIOSH surveillance funding and staffing need to be complemented by effective collaboration and pooling of resources with other Federal agencies. For State-based occupational surveillance programs, NIOSH needs not only to collaborate with States, but also to assist States in accruing funding at levels of support consistent with other public health arenas. NIOSH also needs to work closely with colleagues in non-governmental agencies and with those in other health disciplines to identify new, non-traditional sources of funding for occupational health surveillance. These additional efforts can help ensure that occupational safety and health surveillance can be fully integrated into an overall public health surveillance system. Through this comprehensive strategy, NIOSH and its partners can fully participate in widespread efforts to build a comprehensive, integrated, electronic public health surveillance system operational at the local, State and national levels.

NIOSH Surveillance Strategic Goal 1

Advance the usefulness of surveillance information at the Federal level for prevention of occupational illnesses, injuries, and hazards.

Need

While substantial improvements have been made in occupational health and safety surveillance activities over the last decade, surveillance information must be better integrated at the Federal level. Current surveillance activities are sometimes fragmented, with limited dissemination and significant surveillance gaps. To adequately address these gaps, we need to build more effective working relationships with Federal governmental partners to promote cooperation and create a unified approach to occupational surveillance.

Objectives:

Objective 1.1

Promote exchange of information and coordination of surveillance activities with Federal partners, including the identification of data gaps and the development of strategies to address these gaps.

Objective 1.2

Expand dissemination of surveillance information and access to data for public health action.

Objective 1.3

Expand the surveillance of hazards and prevention activities.

Objective 1.4

Encourage the inclusion in information systems of standardized codes and narrative information on work-relatedness, occupation, industry, and circumstances of injury or disease.

Objective 1.5

Increase the inclusion of data on socioeconomic consequences of occupational disease and injury into surveillance systems.

NIOSH Surveillance Strategic Goal 2

Strengthen the capacity of State health departments and other State agencies to conduct occupational surveillance.

Need

States have a critical role to play in a comprehensive nationwide surveillance system. State agencies, with access to unique and independent State-based health data systems, can provide essential information for nationwide occupational surveillance. State-based surveillance can target intervention efforts at the State and local level. Finally, there is a need to increase the capacity of States to carry out surveillance and related prevention activities.

Objectives:

Objective 2.1

Work with the Council of State and Territorial Epidemiologists (CSTE), the Association of State and Territorial Health Officials (ASTHO), and other organizations to strengthen State-based occupational surveillance activities.

Objective 2.2

Improve technical assistance to States for surveillance of selected occupational conditions or hazards.

Objective 2.3

Foster State-based surveillance programs of selected occupational conditions or hazards.

Objective 2.4

Pilot a program to review and implement a core set of State-based occupational surveillance activities that promote prevention at the State and local level.

NIOSH Surveillance Strategic Goal 3

Strengthen surveillance of high-risk industries and occupations, and of populations at high-risk, including special populations.

Need

Certain populations of workers are at especially high risk for occupational illness, injury, and hazard. Those employed in agriculture, construction, and mining still account for a large burden of occupational illness and injury. Health care workers, representing a growing industrial sector, have increasing rates of nonfatal injuries and illnesses, as well as increased hazardous exposures to such dangers as blood-borne pathogens, latex, and biomechanical stress. Other groups of workers are at increased risk because of age, gender, race, disability, or genetic susceptibility. The extent and nature of sector-specific job characteristics and particular risks experienced by these special populations and groups at higher risk must be understood in order to effectively target preventive efforts.

Objectives:

Objective 3.1

Enhance surveillance of occupational illnesses, injuries, and hazards in agriculture.

Objective 3.2

Enhance surveillance of occupational illnesses, injuries, and hazards in construction.

Objective 3.3

Enhance surveillance of occupational illnesses, injuries, and hazards in mining.

Objective 3.4

Enhance surveillance of occupational illnesses, injuries, and hazards in health care.

Objective 3.5

Assess the needs and explore the opportunities for surveillance in other occupational and demographic groups that are at high risk of occupational illness and injuries, such as special populations.

NIOSH Surveillance Strategic Goal 4

Promote effective occupational safety and health surveillance conducted by employers, unions, and other non-governmental organizations.

Need

Occupational surveillance activities often exist in the private sector apart from Federal and State surveillance programs. Innovative approaches to surveillance in the private sector need to be identified. Currently, we know occupational surveillance is being conducted by employers, unions, health professionals and institutions, and others using various methods to track illnesses, injuries, and hazards for the purpose of prevention and control activities. We need to foster increased communication, information sharing, and guidance to benefit the relationship between public and private sectors involved in occupational surveillance.

Objectives:

Objective 4.1

Identify best practices for occupational surveillance of illnesses, injuries, and hazards at the company, union, and/or industry level.

Objective 4.2

Develop and evaluate methods for occupational illness, injury, and hazard surveillance at the company, union, and/or industry level.

Objective 4.3

Support the development of surveillance tools for use by health care professionals and institutions.

NIOSH Surveillance Strategic Goal 5

Increase research to improve occupational surveillance.

Need

Research is needed to evaluate existing systems and approaches for conducting surveillance. The National Occupational Research Agenda (NORA) Surveillance Research Methods Team has begun efforts to increase the level of research to improve occupational surveillance. Numerous potential sources of occupational health and safety data exist but may have been neither fully evaluated nor utilized for surveillance purposes. The use of nontraditional data sources and linkages of data systems are virtually unexplored.

Objectives:

Objective 5.1

Conduct and support research to evaluate existing surveillance systems.

Objective 5.2

Support the development of new approaches for occupational surveillance, including surveillance of populations at high risk, and special populations.

Objective 5.3

Support follow-back investigations and focused surveys of groups at high risk, in order to supplement existing surveillance data.

Implementation Activities

The Surveillance Strategic Plan distinguishes between short-term high-priority activities to be completed by NIOSH within approximately two years and longer-term high-priority activities to be accomplished later, as resources permit. The implementation activities are a representative sample of the surveillance efforts that will continue or be undertaken in the next five years.

Objective 1.1 Implementation

Objective 1.1

Promote exchange of information and coordination of surveillance activities with Federal partners, including the identification of data gaps and the development of strategies to address these gaps.

Short Term:

- 1) Promote wide dissemination of the NIOSH Worker Health 2000 Chartbook of occupational surveillance information.
- 2) Meet annually with Federal surveillance partners (BLS, NCHS, OSHA, and MSHA) to coordinate surveillance activities, including planned analyses, dissemination, and special data collection efforts.
- 3) Collaborate with the CPSC, NCIPC, and other Federal agencies to expand the National Electronic Injury Surveillance System (NEISS) to capture all traumatic injuries.
- 4) Increase collaboration with the Environmental Protection Agency (EPA) regarding surveillance of pesticides and other hazards by renewing the Interagency Agreement and sharing aggregated pesticide-related illness and injury data.
- 5) Increase collaboration with MSHA regarding coal workers' pneumoconiosis surveillance by working with MSHA to increase participation of miners in federally administered health screening programs for miners and by exchanging data to evaluate the effect of any resulting increased participation.

Long Term:

- 1) Collaborate with NCHS and the PHS Office of Public Health and Science (OPHS) to ensure coordinated tracking of progress towards achievement of all Healthy People 2010 occupational safety and health objectives.
- 2) Integrate work-relatedness, occupation and industry, International Classification of Diseases (ICD) 10 activity codes, and relevant narrative information into electronic databases.

Objective 1.2 Implementation

Objective 1.2

Expand dissemination of surveillance information and access to data for public health action.

Short Term:

- 1) Improve public access to and utilization of NIOSH and other surveillance information by establishing a “Surveillance sub-site” on the NIOSH Web site (links to relevant sites, publications, current statistical data, etc.).
- 2) Assess the needs of external and internal surveillance information users as a basis for identifying unmet needs, evaluating the usefulness of NIOSH surveillance products, and developing surveillance information dissemination tools and strategies.
- 3) Initiate a centralized “clearing house” (a networked surveillance information reporting and retrieval system) for NIOSH, State, and other surveillance reports, alerts, and intelligence.
- 4) Develop partnerships with other agencies, trade groups, and industry and labor leaders to facilitate the dissemination and use of occupational safety and health surveillance data.

Long Term:

- 1) Improve access to NIOSH surveillance information by establishing new products, including Internet and Intranet-based surveillance information systems that encourage users to access and analyze NIOSH surveillance data.

Objective 1.3 Implementation

Objective 1.3

Expand the surveillance of hazards and prevention activities.

Short Term:

- 1) Define the specific aims and data components for a proposed ongoing national survey of occupational hazards and occupational safety and health activities.
- 2) Initiate hazard surveys targeted by industry, occupation, or hazard.

Long Term:

- 1) Conduct a comprehensive, nationally representative hazard survey.
- 2) Develop a national occupational exposure surveillance data base.

Objective 1.4 Implementation

Objective 1.4

Encourage the inclusion in information systems of standardized codes and narrative information on work-relatedness, occupation, industry, and circumstances of injury or disease.

Short Term:

- 1) Support the continued development of software to code occupation and industry narratives and encourage the use of the software in other systems [e.g., death certificate records, CDC National Program of Cancer Registries, Behavioral Risk Factor Surveillance System (BRFSS), NEISS].

Long Term:

- 1) Participate in standard-setting committees, such as the ANSI Z-16.2 committee that recommends standardized surveillance for occupational injuries and illnesses.
- 2) Work with health care organizations to encourage the regular use of ICD-10 activity codes for identifying the work-relatedness of injuries and illnesses.
- 3) Work with vital statistics offices, medical examiner and coroner organizations, and health care organizations to widely disseminate guidelines for determining and recording information on work-related injuries and illnesses.

Objective 1.5 Implementation

Objective 1.5

Increase the inclusion of data on socioeconomic consequences of occupational disease and injury into surveillance systems.

Short Term:

- 1) Evaluate the inclusion of cost variables in existing NIOSH-supported surveillance systems.
- 2) Evaluate the utility of data from Federal and State workers' compensation systems, BLS, SSA, NCHS, the Census Bureau, the Equal Employment Opportunity Commission (EEOC), and National Council of Compensation Insurers (NCCI) or State rehabilitation programs to advance surveillance of occupationally related disability and impairment.

Long Term:

- 1) Report on costs of particular illnesses and injuries to workers, employers, and the public at large in NIOSH publications with the data available on the NIOSH website.

Objective 2.1 Implementation

Objective 2.1

Work with the Council of State and Territorial Epidemiologists (CSTE), the Association of State and Territorial Health Officials (ASTHO), and other organizations to strengthen State-based occupational surveillance activities.

Short Term:

- 1) Refine, disseminate, periodically review, and update the occupational surveillance profiles developed by the NIOSH-States Surveillance Planning Work Group for selected priority conditions/hazards.
- 2) Disseminate periodic pneumoconiosis mortality surveillance reports that include State-specific findings and allow for among-State comparisons.

Long Term:

- 1) Conduct, with States, periodic assessments of their training and technical assistance needs.
- 2) Conduct analyses of national data systems to produce surveillance reports that are useful for States by providing State-specific surveillance findings.

Objective 2.2 Implementation

Objective 2.2

Improve technical assistance to States for surveillance of selected occupational conditions or hazards.

Short Term:

- 1) Develop and support effective mechanisms for providing technical assistance to States for occupational health surveillance core capacity building, for on-going surveillance of selected priority conditions, and for rapid surveillance of emerging problems.

Long Term:

- 1) Provide States with technical assistance in support of State-based surveillance of all priority conditions on the list generated by the NIOSH-States Surveillance Planning Work Group.

Objective 2.3 Implementation

Objective 2.3

Foster State-based surveillance programs of selected occupational conditions or hazards.

Short Term:

- 1) Continue to support State-based surveillance for targeted conditions.
- 2) Collaborate with States to evaluate the goals of ABLES and SENSOR and to assess the number and characteristics of States needed to accomplish these goals.

Long Term:

- 1) Periodically evaluate the progress and impact of State-based surveillance of specific occupational conditions and hazards.

Objective 2.4 Implementation

Objective 2.4

Pilot a program to review and implement a core set of State-based occupational surveillance activities that promote prevention at the State and local level.

Short Term:

- 1) In collaboration with States, use the NIOSH-States Surveillance Planning Work Group Report to identify a set of core surveillance activities for implementation in selected States.

Long Term:

- 1) Evaluate the prevention impact of core surveillance in States and promote adoption of successful models of core surveillance by additional States.

Objective 3.1 Implementation

Objective 3.1

Enhance surveillance of occupational illnesses, injuries, and hazards in agriculture.

Short Term:

- 1) Analyze existing sources of data (such as NTOF, CFOI, FFHHS, NSSPM, TISF, NEISS, and the BLS Annual Survey) and disseminate findings to add to existing knowledge about the magnitude, circumstances, and trends in agricultural illness, injury, and hazards.

- 2) Pilot new data collection methods to provide data on childhood agricultural hazards and injuries, including collaborative efforts with the Departments of Labor and Agriculture.
- 3) Continue to collaborate with the Department of Labor to collect occupational illness and injury data in the National Agricultural Workers Survey (NAWS), and evaluate the utility of this survey to fill gaps in agricultural injury and illness surveillance.
- 4) Collaborate with the EPA and relevant State agencies to capture all acute occupational pesticide-related illnesses and injuries for the purpose of determining the magnitude and trend of this condition, for identifying new and emerging pesticide problems, and for adopting relevant interventions.

Long Term:

- 1) Promote collection of pesticide use and exposure data and explore using these data as a denominator for identifying pesticides with a high illness-to-use ratio.
- 2) Propose a system for routine and ongoing childhood agricultural injury surveillance as a component of the NIOSH Childhood Agricultural Injury Prevention Initiative.
- 3) Evaluate the need and opportunities to develop programs to reduce existing gaps in illness and injury surveillance associated with agriculture, and address under-reporting and under-representation in standard surveillance systems.

Objective 3.2 Implementation

Objective 3.2

Enhance surveillance of occupational illnesses, injuries, and hazards in construction.

Short Term:

- 1) Analyze existing sources of data (such as NTOF, CFOI, NEISS, NSSPM, and the BLS Annual Survey) and disseminate findings to add to existing knowledge about the magnitude, circumstances and trends in illness, injury, and hazards in the construction industry.
- 2) Conduct regional hazard and exposure surveys to describe the magnitude of exposures in the residential home construction industry.
- 3) Prepare and disseminate a report summarizing targeted surveys of silica hazards associated with highway and other construction operations.

Long Term:

- 1) Evaluate the need and opportunities to develop programs to reduce existing gaps in illness and injury surveillance associated with construction, and address under-reporting and under-representation in standard surveillance systems.

Objective 3.3 Implementation

Objective 3.3

Enhance surveillance of occupational illness, injuries, and hazards in mining.

Short Term:

- 1) Develop economic analyses to assess and facilitate the design of short-term in-depth surveillance of specific hazards in mining.
- 2) Periodically assess and report on CWXSP participation rates and Coal Workers' Pneumoconiosis (CWP) prevalence by mine and other factors using existing data from mine rosters and from MSHA.
- 3) Increase the use of MSHA illness and injury data narratives for describing patterns and trends.

Long Term:

- 1) Evaluate the coding and classification of illness and injury data from the MSHA 7001 log and collaborate with MSHA to improve the current data collection form.
- 2) Expand the CWXSP into a more comprehensive Coal Workers' Health Surveillance Program (CWHSP), to include non-pneumoconiotic airways disease, hearing loss, and other conditions, in addition to CWP.

Objective 3.4 Implementation

Objective 3.4

Enhance surveillance of occupational illness, injuries, and hazards in health care.

Short Term:

- 1) Assign a NIOSH occupational health and safety expert to work with National Center for Infectious Disease (NCID) to expand the surveillance capacity of the National Surveillance System for Healthcare Workers (NASH) system, to increase the scope of hazard, illness, and injury recording, and to facilitate the use of results gathered by other Federal agencies (BLS, OSHA).
- 2) Continue to support the evaluation of tools used for screening and surveillance of latex allergies among health care workers.
- 3) Develop partnerships with trade groups and industry and labor leaders to promote activities and facilitate dissemination and use of surveillance data.

Long Term:

- 1) Disseminate a surveillance report on occupational hazards, illnesses, and injuries in the health care industry.
- 2) Develop programs to reduce existing gaps in surveillance information and address under-reporting and under-representation.

Objective 3.5 Implementation

Objective 3.5

Assess the needs and explore the opportunities for surveillance in other occupational and demographic groups that are at high risk of occupational illness and injuries, such as special populations.

Short Term:

- 1) Complete NIOSH's report on the magnitude of occupational diseases and injuries.
- 2) Analyze existing sources of data (such as NTOF, CFOI, TISF, NSSPM, NEISS, and the BLS Annual Survey) and disseminate findings to add to existing knowledge about the magnitude, circumstances, and trends in injuries among special populations at risk.

Long Term:

- 1) Augment existing surveillance systems to identify and follow-up the occupational problems associated with these traditionally under-served populations.

Objective 4.1 Implementation

Objective 4.1

Identify best practices for occupational surveillance of illnesses, injuries, and hazards at the company, union, and/or industry level.

Short Term:

- 1) Identify, facilitate, and encourage model surveillance programs and best practices within industries and occupations. Disseminate information concerning these programs and best practices identified.
- 2) Identify and report on current employer-based approaches used for medical screening and surveillance of occupational asthma among employees exposed to diisocyanates.

Long Term:

- 1) In collaboration with industry, trade, labor, clinical, academic, and professional organizations, evaluate and make recommendations for surveillance systems that can be used by companies, unions, and industries.

Objective 4.2 Implementation

Objective 4.2

Develop and evaluate methods for occupational illness, injury, and hazard surveillance at the company, union, and/or industry level.

Short Term:

- 1) Develop/evaluate screening and surveillance tools for employer-based occupational respiratory surveillance in high-risk occupational settings (e.g., occupational asthma among employees exposed to diisocyanates; chronic beryllium disease among beryllium workers; coal workers' pneumoconiosis and other dust-related conditions among coal miners; etc.).

Long Term:

- 1) Support the development of surveillance tools for small business and labor organizations.

Objective 4.3 Implementation

Objective 4.3

Support the development of surveillance tools for use by health care professionals and institutions.

Short Term:

- 1) Support the evaluation of tools used for screening and surveillance of latex allergies, blood-borne pathogens, and musculoskeletal disorders among health care workers.

Objective 5.1 Implementation

Objective 5.1

Conduct and support research to evaluate existing surveillance systems.

Short Term:

- 1) Expand extramural research that:
 - a) strengthens surveillance of high-risk industries and occupations, such as mining, and of populations at higher risk;
 - b) promotes a better understanding of the magnitude and scope of childhood agricultural injuries and illnesses;
 - c) develops methods for effective occupational safety and health surveillance conducted by employers, unions, and other non-governmental organizations; and
 - d) increases research methods development to improve occupational surveillance.

- 2) Expand extramural research in surveillance methods in order to reduce the under-recognition and under-reporting of workplace illness and injury. Findings from these projects are intended to advance scientific base of knowledge needed to monitor occupational safety and health hazards, injuries and illnesses.
- 3) Initiate research to assess participation bias (including barriers to participation) in the CWXSP.

Long Term:

- 1) Promote research that will facilitate the inclusion of NORA-identified special populations within appropriate surveillance systems.

Objective 5.2 Implementation

Objective 5.2

Support the development of new approaches for occupational surveillance, including surveillance of populations at high risk, including special populations.

Short Term:

- 1) Evaluate the potential surveillance use of data from the NIOSH Hazard Evaluations and Technical Assistance (HETA) program and make appropriate recommendations to effectively capture, analyze, and report on HETA investigation data.
- 2) Develop, validate, and promote standardized data collection instruments for assessing hazards.

Long Term:

- 1) Conduct intervention research to evaluate various ways to increase participation of miners in the CWXSP.

Objective 5.3 Implementation

Objective 5.3

Support follow-back investigations and focused surveys of groups at high risk, in order to supplement existing surveillance data.

Short Term:

- 1) Continue to support the Fatality and Assessment Control Evaluation (FACE) project to supplement surveillance data on selected types of fatalities with in-depth information that can be used to focus prevention recommendations.
- 2) Continue to conduct follow-back surveys of high risk groups or injury causes through the NEISS.
- 3) Through the HETA mechanism, conduct individual follow-back investigations of selected sentinel cases of various work-related diseases and provide workplace-specific recommendations for prevention.

Long Term:

- 1) Coordinate with BLS follow-back studies to be undertaken using cases identified in surveillance systems maintained by each agency (e.g., NIOSH National Electronic Surveillance System and BLS Annual Survey).

Glossary

(The terms listed in this section are provided to give the reader a clearer understanding of key terms in the text.)

Adult Blood Lead Epidemiology and Surveillance (ABLES): a surveillance system for identifying and preventing cases of elevated blood levels among workers in the U.S. Twenty-eight States participated in ABLES in 1999 by collecting lab-reported blood lead results and by targeting high risk industries and occupations, physicians, workers, and work-sites for outreach, intervention, and research.

Association of State and Territorial Health Officials (ASTHO): a non-profit Public Health Organization with representatives from State and Territorial health agencies. ASTHO works on national health policy and develops and implements State programs and policies. It is engaged in a wide range of legislative, scientific, educational, and programmatic issues and activities on behalf of public health.

Behavioral Risk Factor Surveillance System (BRFSS): a Centers for Disease Control and Prevention (CDC) coordinated, State-based, continuously conducted, telephone-administered health survey that monitors risk behaviors related to chronic diseases, injuries, and death. Questions focus on health behaviors related to several leading causes of death and disease, for example: using condoms to prevent the spread of AIDS, taking medication for high blood pressure, smoking or using tobacco, getting a mammogram, and not exercising on a regular basis.

Bureau of Labor Statistics (BLS): a statistical agency within the Department of Labor that collects, processes, analyzes, and disseminates essential statistical data in the broad field of labor economics and statistics. The BLS also serves as a statistical resource to the Department of Labor.

Case-based surveillance: the collection of personal identifiers for the purpose of follow-up studies or investigations. (See registry.)

Centers for Disease Control and Prevention (CDC): one of eight Federal public health agencies within the Department of Health and Human Services (DHHS). The CDC, and its 11 Centers, Institutes, and Offices, promotes health surveillance to monitor and prevent disease, injury, and disability. It maintains national health statistics, conducts research, and provides service towards illness and injury prevention.

Census of Fatal Occupational Injuries (CFOI): a national census of occupational injury fatalities, including self-employed workers, agricultural workers, and government employees. CFOI, developed and maintained by BLS, uses multiple sources of information, e.g. death certificates, OSHA reports, workers' compensation data, police reports, and newspaper clippings. CFOI is a Federal/State cooperative program in which costs are shared. States

provide data to BLS for inclusion in a national database and maintain their own State databases. Data are currently available for the years 1992-1998.

Consumer Product Safety Commission (CPSC): a Federal regulatory agency that works to reduce the risk of injuries and deaths from consumer products through: developing voluntary standards with industry; issuing and enforcing mandatory standards; banning consumer products if no feasible standard would adequately protect the public; obtaining the recall of products or arranging for their repair; conducting research on potential product hazards; informing and educating consumers through the media, State, and local governments, private organizations, and by responding to consumer inquiries.

Coal Workers' X-ray Surveillance Program (CWXSP): an ongoing, congressionally-mandated program to provide periodic chest x-rays to working underground coal miners for the purpose of identifying early pneumoconiosis and facilitating transfer of affected workers to a job with lower dust levels. The program has been in effect since 1970.

Council of State and Territorial Epidemiologists (CSTE): an organization whose membership includes State and Territorial epidemiologists responsible for public health surveillance of diseases and conditions of public health significance. The surveillance of infectious diseases, chronic diseases and conditions, and occupational and environmental health concerns are priority areas for CSTE.

Data systems: Systems include trauma registries, hospital discharge data, emergency department records, private health insurer data systems, existing health or behavior surveys, etc.

Environmental Protection Agency (EPA): a Federal agency whose purpose is to enforce Federal laws protecting human health and the environment, and conduct environmental research that reduces risk to human health and adverse impacts on the environment. The EPA influences U.S. and global policies concerning environmental and natural resources, as they pertain to human health, economic growth, energy, transportation, agriculture, industry, and international trade.

Epidemiology: a discipline that studies the distribution and determinants of health-related conditions or events in populations.

Fatality Assessment and Control Evaluation (FACE): a NIOSH field investigation program with two arms: 1) a NIOSH/State cooperative program in which 15 States conduct State censuses of fatal occupational injuries and investigate specific types of these; and 2) a NIOSH intramural program that investigates specific types of fatalities at the request of 5 States or the Wage and Hour Division, US Department of Labor. Fatalities currently targeted by the FACE Program are machine-related events, deaths in street/highway construction work zones, and deaths to youth less than 18 years of age (excluding motor vehicle-related events and homicides).

Hazard: a source of risk that does not necessarily imply potential for occurrence. A hazard produces risk only if an exposure pathway exists and if exposures create the possibility of adverse consequences.

Healthy People 2010 (HP 2010): a Department of Health and Human Services initiative that provides benchmarks for the progress of the health of Americans for the next 10 years, with supporting objectives in disease prevention and health promotion.

International Classification of Diseases 10 (ICD 10): the 10th version of the International Statistical Classification of Diseases and Related Health Problems. It was formalized in 1893 as the Bertillon Classification or International List of Causes of Death. This revision contains the classification at the three- and four-character levels, the classification of the morphology of neoplasms, special tabulation lists for mortality and morbidity, definitions, and the nomenclature regulations.

Mine Safety and Health Administration (MSHA): a Federal agency that administers the provisions of the Federal Mine Safety and Health Act of 1977 (Mine Act) and enforces compliance with mandatory mining safety and health standards.

Morbidity: a term defined as either illness or disease. Morbidity rate is the number of illnesses or cases of disease in a population over a given period of time.

National Center for Health Statistics (NCHS): a Center within the CDC that is responsible for the collection, analyses, and dissemination of health statistics. NCHS has two major types of data systems: systems based on population data collected through personal interviews or examinations; systems based on individual records, with data collected from State and local vital and medical records.

National Center for Infectious Disease (NCID): a Center in the CDC whose mission is to prevent illness, disability, and death caused by infectious diseases in the United States and around the world. NCID accomplishes its mission by conducting surveillance, epidemic investigations, epidemiologic and laboratory research, training, and public education programs to develop, evaluate, and promote prevention and control strategies for infectious diseases.

National Center for Injury Prevention and Control (NCIPC): a Center in the CDC whose mission is to reduce morbidity, disability, mortality, and costs associated with non-occupational injuries.

National Electronic Injury Surveillance System (NEISS): a data system maintained by the Consumer Product Safety Commission (CPSC) to monitor consumer product-related injuries, representing a national sample of U.S. emergency departments. In an interagency agreement with NIOSH, NEISS also collects and codes data on all work-related injuries from emergency departments regardless of consumer product involvement.

National Health Interview Survey (NHIS): a cross-sectional household interview survey, administered by the National Center for Health Statistics (NCHS), which is a principal source of information on the health of the U.S. civilian population. NHIS data are used to monitor trends in illness, injury, and disability and to track progress toward achieving national health objectives.

National Health Interview Survey, 1988 Occupational Health Supplement: a survey that was administered in 1988 by the National Center for Health Statistics (NCHS) to approximately 43,000 households. This survey was developed to secure accurate statistical information on the amount, distribution, and effects of specific occupational illness and injury in the United States.

National Occupational Exposure Survey (NOES): an on-site nationwide survey conducted by NIOSH from 1981 to 1983 using a stratified probability sample of establishments in general industry. The primary objective of the survey was to provide national estimates of potential exposures to chemical, physical and biological agents. The survey also provided data on management's health and safety practices and policies. The NOES, and its predecessor NOHS, represent the most comprehensive source of data on the number of U.S. workers potentially exposed to specific hazards and the distribution of these hazards by industry and occupation.

National Occupational Hazard Survey (NOHS): an on-site nationwide survey conducted by NIOSH from 1972 to 1974 using a stratified probability sample of establishments in general industry. The primary objective of the survey was to provide national estimates of potential exposures to occupational health hazards by industry and occupational group. The survey also provided data on management's health and safety practices and policies. The NOHS, and its successor NOES, represent the most comprehensive source of data on the number of U. S. workers potentially exposed to specific hazards and the distribution of these hazards by industry and occupation.

National Occupational Health Survey of Mining (NOHSM): an on-site nationwide survey conducted by NIOSH from 1984 to 1989 using a stratified probability sample of mineral mines. The primary objective of the survey was to provide national estimates of potential exposures to occupational health hazards by mineral industry and occupational group. The survey also provided data on management's health and safety practices and policies. The NOHSM represents the most comprehensive source of data on the number of U.S. miners potentially exposed to specific hazards and the distribution of these hazards by mining industry and occupation.

National Occupational Mortality Surveillance System (NOMS): a mortality statistics database derived from public use vital statistics data disseminated by the National Center for Health Statistics. Since the early 1980s, NIOSH, NCHS, and the National Cancer Institute have supported State vital statistics programs' collection and coding of decedents' usual occupation and industry information. NOMS uses data from these cooperating States, and States which received cooperative agreements through early NIOSH State-based surveillance programs. Usual occupation and industry of the decedent are coded according to the Bureau of the Census classification system. Cause of death is coded according to the 9th Revision of the International Classification of Diseases.

National Occupational Research Agenda (NORA): in 1996, NIOSH developed a national research agenda with 21 areas of high priority research in collaboration with more than 500 individuals and organizations. The agenda is national in scope and is a living plan (<http://www.cdc.gov/niosh/norhmpg.html>). Surveillance research is one of the priority areas.

National Surveillance System for Pneumoconiosis Mortality (NSSPM): an annually updated pneumoconiosis surveillance system developed by NIOSH. The NSSPM includes information on all U.S. decedents with death certificate mention of pneumoconiosis since 1968. It is based on death certificate data files made available annually by the National Center for Health Statistics (NCHS). Records, currently available for each of more than 100,000 pneumoconiosis decedents, include information on demographic characteristics, year of death, underlying and contributing causes of death, and (since 1985 for deaths occurring in about half the States) usual industry and occupation.

National Traumatic Occupational Fatalities (NTOF) Surveillance System: a project that provides a nationwide surveillance system for occupational injury deaths. NTOF is based on death certificates as a sole source of case identification and has been estimated to include an average of 81 percent of all occupational injury deaths nationwide. NTOF data are currently available for the years 1980 through 1995. NTOF is the most comprehensive source of data on occupational injury fatalities prior to 1992.

Occupational Safety and Health Administration (OSHA): a Federal agency that administers the provisions of the Federal Occupational Safety and Health Act of 1970 (OSH Act) and enforces compliance with mandatory occupational safety and health standards.

Prevention effectiveness: a process to evaluate the effectiveness of prevention activities. These assessments use decision analyses, meta-analysis, economic analyses, and other methods to determine the effect of prevention programs on public health.

Registry: a system for collecting and maintaining in a structured record, information on specific persons from a defined population with specified health characteristics.

Risk: the probability that a disease, injury, condition, death or related occurrence may occur for a person or population.

Sentinel Event Notification Systems for Occupational Risks (SENSOR): a NIOSH cooperative agreement program with State health departments, or other State agencies in collaboration with State health departments, which develops generalizable condition-specific strategies for State-based surveillance of occupational diseases and injuries. Efforts have focused upon standardization of variables collected by the State programs, creation of software to facilitate adoption of the surveillance systems by additional States, comparison of SENSOR findings to other surveillance data sources, collaboration with CSTE on building infrastructure for State-based surveillance, further development of State-based hazard surveillance, and publication and dissemination of SENSOR reports. A key focus of the SENSOR program is to enhance the linkage between surveillance and intervention.

Social Security Administration (SSA), Office of Research, Evaluation and Statistics (ORES): provides ongoing statistical data and research analyses of the old-age, survivors, and disability insurance (OASDI) and Supplemental Security Income (SSI) programs.

Special population at risk: certain populations of workers are more likely to experience increased risks of diseases and injuries in the workplace as a result of biologic, social, and/or economic characteristics such as age, race, genetic susceptibility, language, literacy, culture, and low income. Examples of these workers are youth, elderly, people of color, migrant workers, etc.

Surveillance: the systematic, ongoing collection and/or acquisition of information for occupational diseases, injuries, and hazards; analysis and interpretation of surveillance data; dissemination of data or information derived from surveillance to appropriate audiences for prevention and control; and development of surveillance methodology. Those projects that do not meet any of the above criteria, but do support surveillance efforts are classified as programmatic support activities.

Surveillance data: this refers to the responses obtained for the variables or attributes in the surveillance system.

Surveillance information: this term is used interchangeably with surveillance data.

Survey of Occupational Injuries and Illnesses (SOII; a.k.a. Annual Survey): annual survey of a large sample of U.S. employers (approximately 250,000) maintained by BLS. The sample is drawn to provide national and State estimates for those States that participate in this Federal/State cooperative program (around 40). The annual survey excludes government workers, the self-employed, and employees of small farms. Employers report information from their injury and illness logs (for those employers not required to keep logs, record keeping forms are provided at the beginning of the study period).

Under-reporting: this term refers to the undercounting of cases or events of occupational exposure and/or diseases.

Under-representation: the result when certain populations (e.g., people of color, youth, elderly, disabled, etc.) have been either entirely excluded or disproportionately represented.

Table 1. Time Line of Surveillance Plan Activities

Date	Activity
September 1998 - April 1999	<ul style="list-style-type: none"> • Established the NIOSH-States Work Group. • The NIOSH-States Work Group held various meetings to identify 13 critical occupational priority areas, develop condition-specific profiles and recommendations, and provide a written report on the State perspective of occupational illnesses, injuries, and hazards surveillance for the next five years. • The NIOSH Surveillance Coordination Group (<i>SCG</i>) reviewed the current surveillance activities and systems used in the Institute. Conducted a needs assessment for occupational illness, injuries, and hazards surveillance with recommendations.
May 1999	<ul style="list-style-type: none"> • The NIOSH Executive Surveillance Committee began to review the work and recommendations submitted from the NIOSH-States Work Group and the NIOSH Surveillance Coordination Group.
June 1999	<ul style="list-style-type: none"> • The 65 recommendations submitted were reviewed by the NIOSH Leadership Team Subgroup for Surveillance Activities. (<i>June 17, 1999</i>) • The Subgroup focused the recommendations down to 20 objectives. • A public forum on the 20 objectives was conducted at the Annual CSTE/SENSOR/ABLES Conference in Madison, WI. (<i>June 27, 1999</i>)
July 1999	<ul style="list-style-type: none"> • A meeting was held with the external partners of the NORA Surveillance Research Team to obtain input on the objectives. (<i>July 8, 1999</i>) • An internal meeting was held in Pittsburgh, PA, with NIOSH staff to discuss the 20 objectives. Goals to encompass the objectives were written by the States and also reviewed. (<i>July 15, 1999</i>) • A public meeting was held in Washington, DC, with non-governmental representatives and a few State representatives to discuss the goals and 20 objectives. (<i>July 28, 1999</i>) • A meeting was held between NIOSH, BLS, and OSHA to discuss the goals and objectives. (<i>July 30, 1999</i>)
August 1999	<ul style="list-style-type: none"> • A meeting was held with NCHS, Division of Vital Statistics, and BLS to discuss the goals and objectives. (<i>August 4, 1999</i>) • A writing team was established to incorporate the comments, where applicable. Short- and long-term goals were written for each objective. (<i>August 16-17, 1999</i>) • The NIOSH Leadership Team Subgroup for Surveillance Activities, along with the Division Surveillance, representatives reviewed the document and provided input for the implementation activities.
March 2000	<ul style="list-style-type: none"> • The final development of implementation activities was completed. • Final document was submitted to the NIOSH Director.