National Conference on State-Based Occupational Health and Safety Activities

September 3-6, 1991
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Conference Abstracts

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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Conference Abstracts

In an effort to obtain a consistent style while maintaining content, we have retyped some of the abstracts submitted. Also, every effort has been made to include revisions submitted by authors before publication. Conference abstracts are listed in alphabetical order by presenter.

Reduction in Accidents Through Information and Education

Avis Acton, WC/DOE, Cheyene, WY

Attainment of the goal of accident prevention is of primary importance. The goal of the Department of Employment, Workers' Compensation Division to effect a noted reduction in work-related accidents through information dissemination and education are discussed. Data from the Annual Occupational Injuries and Illnesses Survey and the Workers' Compensation file are presented to exemplify the need for such actions.

National Goals for Occupational Lung Diseases: Focus on State-Specific Patterns

Rochelle Althouse, R. M. Castellan, CDC, NIOSH, Morgantown, WV

The eradication of silicosis, byssinosis, asbestosis, and coal workers' pneumoconiosis has been a broad national objective. The Public Health Service's "Year 2000 Objectives for the Nation" continues to note the importance of the prevention of these occupational lung diseases. Mortality surveillance is one method by which to both evaluate and focus efforts toward meeting these objectives. State-specific analyses can identify geographic patterns useful for encouraging preventive efforts at the state level.

The majority of analyses using death certificate data are based on rates tabulated from underlying cause of death only. For public health purposes of identifying occupational diseases, multiple cause of death listings are a more appropriate source of data. We used multiple cause of death data tapes, from the National Center for Health Statistics, to identify deaths occurring in U.S. residents with mention of coal workers' pneumoconiosis, silicosis, asbestosis, and byssinosis on the death certificate. Temporal trends and geographic distributions for each of these four lung diseases were developed for 1979-1987.

Differing trends and geographic patterns were evident for each of the four diseases. For 1979-1987 over 70% of deaths with mention of CWP occurred in only two states. Deaths with mention of byssinosis, although smaller in number, are clustered as well, with over 50% occurring in two states. Mentions of silicosis and asbestosis occurred in a more diffuse pattern. Six states accounted for 48% of deaths with mention of silicosis, and approximately 52% of deaths with mention of asbestosis were distributed in six states. Although the public health objectives calling for the control of these four occupational lung diseases are national in scope, it appears that focused efforts in specific states may be warranted to achieve the overall goals.

Investigation of a Sentinel Case of Asbestosis in a Paper Manufacturing Company

Henry A. Anderson, J. Schirmer, L. Hanrahan, D. Higgins, Wisconsin Division of Health, Madison, WI

In 1985 the Wisconsin Division of Health began an occupational disease surveillance program which included providing pneumoconiosis diagnosis consultation to clinicians by providing chest radiograph pneumoconiosis classification by a "B-Reader." In 1987, with the aid of the consultation program, a case of asbestosis was diagnosed in an electrician from a paper manufacturing plant. An earlier case in a painter/insulator from the same plant was identified in the consultation files. An industrial hygiene review of the facility assisted in identifying possible sources of asbestos exposure, all amenable to control. An unrecognized hazard was found in the paper drying machine hoods which contained asbestos for heat insulation. A common work practice was to use compressed air to clean paper dust out of the hood. A medical surveillance and asbestos control program was begun by the company. Fifty-one (18%) of 283 workers screened had abnormal radiographs. Pleural thickening was the most prevalent abnormality seen in 39 (76%) of the 51 abnormal films. The mesothelioma surveillance system was searched, identifying cases of mesothelioma with usual occupation and industry indicating paper manufacturing employment.

The Alaska Hazardous Painting Certification Law--Its History, Development and Effect on the Workplace

Richard R. Arab, Alaska OSH, Juneau, AK

Most government mandated worker certification programs such as those for electricians, plumbers and welders are meant to assure that the person performing the work is competent in doing so. In 1988, in Alaska, a new type of worker certification program was initiated. This is one that attempts to change the behavior of the person performing the job so that he or she performs the job in a safer manner. To a certain extent the training and certification programs for asbestos abatement workers that many states such as Alaska, and the Environmental Protection Agency require are geared towards such an objective. However, the main purpose is still to train a worker so that he knows how to do the job.

The State of Alaska has gone a step further in its hazardous painting certification program. This certification program is not meant to test the competency of the painter nor to assure that a person receiving this certification is a professional painter. Rather it is meant to require by law, that professional painters become informed about the dangers of working around hazardous materials and that they prove that they have received training and passed a test on how to safely handle the materials they are working with. Since the program started in 1988, over 1,000 professional painters in Alaska have taken the training and have been certified. This figure probably represents close to 90 percent of all the professional painters who work in the state.

Surveillance of Occupational Pesticide Poisoning in Oregon

Margot Barnett, L. R. Foster, J. E. Gordon, M. A. Heumann, Oregon Health Division, Portland, OR

The sentinel event surveillance model has been used to evaluate occupational pesticide poisoning in Oregon since November 1987. An overview of three years of case investigation data will be presented (169 case reports including 320 symptomatic occupationally-exposed individuals) in the context of the surveillance model. Pesticide poisoning represents a broad range of often ill-defined syndromes and symptomatology. In addition, health care may be given by a large population of primary care providers. There are two separate agencies in the state with jurisdiction over aspects of pesticide use and worker protection. Our experience in creating a network of educated health care providers as reporters of occupational pesticide poisonings, including the critical role of the Oregon Poison Center will be described. Mechanisms for coordination of investigation and intervention activities with overlapping agency jurisdiction have been implemented. Issues of confidentiality, and barriers to physician reporting and investigation of pesticide poisonings of farmworkers will also be discussed.

A Model Program for Lead Poisoning Prevention

Jim Bellows, L. Rudolph, California Occupational Health Program, California Department of Health Services, Berkeley, CA

Attention has been paid to an important link: surveillance must result in intervention. A high blood-lead report should lead to action in the workplace. Less effort has been devoted to establishing the complementary link: action in the workplace--monitoring--is needed for the surveillance system to work.

An innovative disease-control program was developed by completing the links between surveillance, voluntary action, and enforcement. The program is currently being implemented in a group of 151 employers in the Southern California radiator service industry, along with 111 companies with no employees.

An economically feasible path was developed for achieving compliance with the 12-year old OSHA lead regulations. This path was then "marketed," by working with opinion leaders and by repeated direct mailings. To facilitate some measures, the program stimulated development of badly-needed local resources. Frequent reminder letters were tailored to each companies' previous actions.

During November 1990-February 1991, 92% of the employers completed blood-lead testing (only 5% had done so before the program). Results will be presented of intensified follow-up on 48 companies with blood-lead levels above 40 ug/dl.

The Role of State Plans in the National OSHA Program

Barbara Bryant, OSHA, Washington, DC

The Occupational Safety and Health Act encourages states to participate in the administration and enforcement of state occupational safety and health laws, preempts states from enforcing occupational safety and health laws in issues for which Federal OSHA has promulgated standards, except through an approved state plan, and sets out minimum requirements for approval of such plans. There are currently 25 states with approved plans, two of which cover only the public sector. As plans have developed through the years, their roles have expanded, both within their own borders and within the context of the entire national program. Operational status agreements and final approvals have limited OSHA's enforcement roles within these states. States are given an early opportunity to participate in the development of standards and compliance policies, participate in OSHA's Integrated Management Information System and are invited to join with OSHA in analyzing performance data for monitoring purposes.

Analysis of Significant Exposures to Blood and Body Fluids of Emergency Medical Personnel in a Large Metropolitan Fire Department

Charlene Buckner, Lesliann Helmus, A. A. Migliozzi, Ohio Department of Health, Columbus, OH

Incident reports of exposures to body fluids for a large metropolitan emergency medical service will be analyzed and discussed. The reporting system covers 150 paramedics and 950 emergency medical technicians. The reports reflect a period of 45 months including July, 1987 through March, 1991.

A total of 94 incident reports were completed with approximately 25% representing a significant exposure as defined by the Centers for Disease Control. Analysis of these reports includes route of exposure, type of procedure at the time of exposure and the future of the call.

In August 1989, a comprehensive AIDS law became effective in Ohio. The law has language that allows health care workers to request testing of patients for HIV seropositivity when a significant exposure has occurred. The effect of this law will be considered in the data analysis.

Evaluation of Occupational Mortality Surveillance

Carol A. Burnett, C. Robinson, J. Salg, N. Lalich, CDC, NIOSH, Cincinnati, OH

Thirty-three states code the industry and occupation information from death certificates and many use the data as a component in their occupational health surveillance programs. The National Institute for Occupational Safety and Health has developed an occupational mortality surveillance system based on these data from selected states. We describe the surveillance system and an evaluation that focused on the use of occupational mortality data for identifying work-related disease. A review of the literature showed that occupational mortality data,

despite known limitations, have often been used successfully for development of hypotheses about work-related disease and for prioritization of epidemiologic research. We found good agreement between associations identified using the mortality data and those found in more rigorous studies using population-based cancer registries with interview data. We demonstrated a method to develop hypotheses of associations by comparing the results of occupational mortality analyses across countries. In addition to identifying work-related disease, states have used the data in union and industry educational programs, as a source of information for researchers, in reports on disease or occupation, and to identify worker educational needs.

Occupational Medical Services in the State: Markets, Medicine, Models

Martin G. Cherniack, Yale Occupational Medicine Program, New Haven, CT

The rationalization of occupational medicine services within the State of Connecticut has proceeded over the past three years from several different and independent sources. These include the development of academic clinics with a linked approach to surveillance data-base development, state initiated legislation covering workplace monitoring and medical surveillance, federal grants, particularly directed to the construction industry, and for profit out-patient services. Competitive and cost driven services, such as hospital provided case management of workers compensation and directed care may accelerate clinician reporting and reinforce secondary and tertiary occupational disease specialty clinics.

Overview of the National AIDS Reporting System

Carol A. Ciesielski, CDC, CID, Atlanta, GA

AIDS is reportable in all 50 states and U.S. Territories. Case reports, sent to CDC from state and local health departments, contain demographic, clinical, and risk factor information; they also state whether the patient has worked in a health care setting since 1978. Those who have are considered to be health care workers for surveillance purposes. Health care workers represent about 5% of the U.S. adult AIDS cases, and are similar in age, race and sex to AIDS cases who are not health care workers. All AIDS cases for whom a risk for HIV infection is not identified are followed up by health departments. CDC is working with state and local health departments to expand reporting of occupationally acquired HIV infection to include those HIV infected individuals who may have been infected through occupational exposures, but do not meet the AIDS case definition.

State Occupational Health Programs (NON-OSHA)

Molly Joel Coye, Johns Hopkins School of Hygiene and Public Health, Baltimore, MD

In the two decades since the creation of OSHA and NIOSH, state governments have assumed increasing responsibility and leadership in occupational safety and health. By 1990, 26 states had established State OSHA Plans. A growing number of states have also developed programs

that are not mandated under the OSH Act -- activities which complement and go beyond federal and state OSHA programs. These new state programs include the active surveillance of work-related injuries and illnesses, physician and laboratory reporting of lead and other occupational poisonings, developing additional standards and guidelines for occupational hazards, and establishing occupational medicine clinics. This presentation will describe the purpose, operating characteristics, results and resource requirements of the major types of state occupational health and safety programs now in existence.

Workplace Reproductive Health Hazards - A State Health Department's Response

Patricia Coyle, California Occupational Health Program, California Department of Health Services, Berkeley, CA

The recent Supreme Court ruling banning workplace fetal protection policies addresses employment discrimination, but does nothing to address the problem of work-related exposure to reproductive toxicants. We anticipate that in the wake of this decision, worker, employer, and health care provider demands for assistance in evaluating workplace hazards to pregnancy will increase. In this presentation we share our 10-year experience addressing this issue. The COHP Reproductive Health Hazards Project has four components: 1) direct consultation with pregnant workers and their health care providers; 2) development of educational materials for workers and health and safety personnel, and a training module for genetics counselors; 3) review of the availability of reproductive toxicity information and its use in standard-setting; and 4) participation in a university-sponsored committee exploring policy options for the state legislature. The successes and limitations of each of our efforts will be discussed, as well as how these approaches may be adapted for use in other states.

Iowa Statewide Surveillance of Acute Farm Injury

Russell W. Currier, S. Jones, Iowa Department of Public Health, Des Moines, IA

Acute injury remains a significant farm health problem in the U.S., rendering it one of the most hazardous occupations in the nation. During 1990, with resources from a CDC grant, the Iowa Department of Public Health established statewide surveillance for acute injuries requiring medical care resulting from farming activity.

CY 1990 data recorded 2,143 injuries from 98 of 99 counties. 83 of these injuries were fatal (40.8/100,000 farm population); children under 15 and farmers over 65 were disproportionately represented. Machinery related incidents (694) accounted for 32% of injuries and 45% of deaths. Animals caused 17% of injuries and three deaths; falls/slips resulted in 242 (11%) injuries and 4 fatalities. Of nonfatal injuries, 17% were hospitalized.

Tractor related deaths (n=29) were due to the following: Roll overs 16, run overs 6, tractor-vehicle collisions 3, and loss of control 4. Roll over protective structures may have prevented 15 of these deaths.

Persons injured were most commonly farmers (40%), farm family members (27%) and employees/service personnel/visitors (33%). Males outnumber females 7:1. Ages of injured ranged from 1 to 92. This compilation of data indicates potential interventions to reduce injury should focus on improved operation of machinery and screening very young/very old operators for competency.

Uses of Occupational Mortality Data in Massachusetts

Letitia K. Davis, Massachusetts Department of Public Health, Boston, MA

The Massachusetts Department of Public Health has been collecting and coding occupation and industry information on death certificates since 1982. These data have been used in a number of different ways to examine work-related illnesses and injuries within Massachusetts. Examples include: studies of traumatic occupational deaths, short and long latency respiratory diseases and cancer. The employment data on death certificates has also been used as an adjunct to employment information in the Massachusetts Cancer Registry and as an indicator of socio-economic status in the investigation of access to medical care. The collection of employment information on death certificates is a limited but important component of a comprehensive occupational health surveillance system. Alternatives for coding and analyzing these data will be discussed.

Occupational Health and Minority Workers

Letitia K. Davis, Massachusetts Department of Public Health, Boston, MA

Disparities of health status among ethnic and racial groups are a major public health concern in Massachusetts. Despite improvement of health status and life expectancy, people of color are disproportionately affected by adverse health outcomes. Black and hispanic residents bear the brunt of illnesses and deaths related to chronic disease, substance abuse, AIDS, poor perinatal outcomes and injuries. There is a growing body of evidence in the literature that people of color are also disproportionately exposed to occupational hazards. New evidence from Massachusetts will be reviewed and the importance of addressing racial and ethnic differences in the development of state-based occupational health programs will be discussed. Strategies range from collecting adequate race and ethnic information in public health data systems to the development of linguistically and culturally appropriate educational materials and programs for workers.

Survey of Occupational Health Clinics in Massachusetts: Staffing and Services

Robin Dewey, Massachusetts Department of Public Health, Boston, MA

As OSHA increasingly mandates medical surveillance programs, industry is turning more and more to free-standing medical clinics for employee health services. What services do these clinics typically provide? To what extent does clinic staff include specialists in occupational

medicine, industrial hygiene, and health education? What kinds of occupational diseases and injuries are seen most often? A survey of 50 occupational health clinics in Massachusetts was recently conducted to discover the answers to these and other questions. The prevalence of these clinics raises important policy issues concerning whether state health departments should have a role in accrediting these clinics and whether compliance with regulations requiring mandatory reporting of occupational diseases should be a criterion for accreditation. In addition, ethical and legal issues regarding patient confidentiality, return to work services, and whether the clinics see themselves as ultimately responsible to the patient or the employer are important points for consideration. Finally, the role occupational medicine physicians play in evaluating workplace hazards and educating patients and their employers will be explored.

State Occupational Mortality Data: Uses, Users, and Opportunities

Gwendolyn Doebbert, K. Riedmiller, California Department of Health Services, Sacramento, CA

Demand for information about workers' health has markedly increased in California, coinciding with growing public health concerns regarding health care cost containment and health risks associated with work site exposures. The occupational and industry (O/I) items from death records serve as an invaluable data resource. Data from the California Occupational Mortality Study (COMS) have been used to verify risks, and to allocate scarce resources for research, prevention, and intervention activities. Further, this study has provided information for public policy formation, and has been used to generate hypotheses regarding work-associated morbidity and mortality. This paper will present an overview of who needs state-level O/I data, and will review case examples of how these data are being used.

California's experience indicates that it is critical that state O/I data be integrated into the national vital records system. Emerging technologies, which offer new opportunities for cost effective implementation, will be reviewed.

Update on OSHA Ergonomics Activities

Raymond Donnelly, R. Stephens, OSHA, Washington, DC

Ergonomic concerns continue to increase and impact many state-based OSHA programs. The goal of this presentation is to provide the latest information regarding CTD's, back injuries, VDT's, meat packing programs, and other areas of concern. Compliance initiatives, guideline generation and rule making activity will also be addressed.

An Overview of the NIOSH State-Based Fatal Accident Circumstances and Epidemiology Project

John M. Dower, T. J. Pizatella, CDC, NIOSH, Morgantown, WV

In October 1989, NIOSH, through its Division of Safety Research (DSR), sponsored cooperative

agreements for conducting selected fatality investigations at the state level using the Fatal Accident Circumstances and Epidemiology (FACE) research methodology. Three states--Colorado, New Jersey, and Massachusetts--were provided funds to conduct FACE-type fatality investigations through state departments of Health and/or Labor. All state programs, although structured differently, have a surveillance component for identifying electrocution, fall and confined space-related fatalities, and an investigation component for conducting on-site investigations. The state-based FACE activities complement the in-house NIOSH FACE program, and share the goal of identifying factors that may increase the risk of work-related fatal injury. State-based FACE investigations provide states with the ability to target specific research and prevention efforts within their state. State intervention strategies should enable more effective fatality countermeasures to be developed and implemented by employers, employees, and state and federal regulatory agencies. State-based FACE program activities in fiscal year 1990 were committed to developing notification systems, recruiting and training personnel, evaluating intervention strategies, and conducting 38 FACE-type investigations. NIOSH DSR support activities, project start-up lessons and future program directions will be discussed. The ultimate goal of this project is to conduct FACE investigations of all work-related deaths at the state level.

Grassroots Worker Protection: The Case for State Occupational Safety and Health Programs

Douglas Earle, Michigan Department of Labor, Lansing, MI; N. Burkheimer, Department of Licensing and Regulation, Baltimore, MD

They conduct almost 70 percent of the Occupational Safety and Health Act enforcement inspections in the United States. They cite more violations, order more hazards abated, and they do it all with fewer personnel and for about half the tax dollars spent by their federal brothers and sisters at the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA).

"They" are the 25 states and territories which operate their own OSHA programs as provided for under Section 18 of the Occupational Safety and Health Act of 1970.

In the enforcement area, state programs conducted 113,582 inspections during the period of October 1, 1988 to September 30, 1989, compared to 54,557 by federal OSHA. Sixteen thousand of these inspections occurred at sites operated by state, county and city government employers. "State-plan" states cited employers for 386,723 violations of occupational safety and health regulations while federal OSHA identified fewer than half that number, citing only 184,620 violations. Of key importance is the fact that the USDOL program covers almost twice as many establishments as the state enforcement programs.

Occupational Health Service Planning and Delivery at a Large HMO

Adrianne Feldstein, Northwest Kaiser Permanente, Portland, OR

Northwest Kaiser Permanente serves 370,000 members in Northwest Oregon and Southwest

Washington who are enrolled through 4,000 employer groups, unions and trusts. The goal of the HMO is to preserved and improve the health of it's members and minimize functional impairment irregardless of the source of injury or illness. To this end Kaiser Permanente reorganized the delivery of Occupational Health Services into seven specialty clinics region-wide, including the sub-specialties of Occupational Health, Orthopedics, Physiatry, Neurology, Industrial Hygiene and Safety. Continuity of care is preserved through a unique medical record for each member. Planning for prevention is facilitated by a computerized database of employer characteristics and patient encounters. This paper will describe current service delivery as well as future plans such as increasing the management of care and integrating workers' compensation care with general health care.

Interagency Jurisdictional Issues

Regina M. Flahie, OSHA, Washington, DC

The Occupational Safety and Health Administration (OSHA) is the primary Federal agency with jurisdiction over the occupational safety and health of workers in the private sector. However, other Federal agencies exercise statutory authority over workplace safety and health. For example, the Department of Energy, Transportation and Defense, and the Environmental Protection Agency are among those agencies which assert jurisdiction over worker safety and health. In addition to these agencies, states have occupational safety and health statutes which vary from state-to-state. OSHA must work with these Federal and state agencies to assure comprehensive worker protection and avoid duplication of effort.

The NIOSH Farm Family Health and Hazard Surveillance Program

Todd M. Frazier, CDC, NIOSH, Cincinnati, OH

The National Institute for Occupational Safety and Health (NIOSH) is the Federal Agency mainly responsible for conducting research on the occupational safety and health of the U.S. work force. Farmers are an important part of this work force. The infrastructure of universities, County Extension Services, and State Health Departments is the focal point for NIOSH funding of a surveillance program that describes the health status of farm families and the hazards of farming. The results of these surveys will be a first step in the prevention of work related injury and disease. Six cooperative agreements awarded in September 1990 averaged $194,000 for the first year of a five year program. Survey designs differ with respect to commodity (grain, dairy, livestock, etc.), geography (statewide or selected counties), demography (all age/sex or selected groups), targeted diseases and injuries and selected physical, chemical or biological hazards. Each state's survey strategies reflects their specific priorities, perceptions of opportunity for research, and goals for disease and injury prevention.

Computer Assisted Coding of Industry and Occupation Literals from Death Certificates

Philip J. Freeman, Washington State Department of Health, Olympia, WA

Coding industry and occupation literals is a very labor- and time-intensive task when done manually. This data is very important in mortality studies to analyze the potential effects of occupational exposure and risks.

The State of Washington has developed a program to take the industry and occupation literals from death certificates and assign Bureau of the Census codes to them. Initially, the driving force was to reduce the time required to code the literals. The goal was to produce a reliable program that could be incorporated into our monthly certificate processing and could also be "exported" to applications in other, related automated systems.

This goal has been achieved to a large extent. The time required to code death certificates has dropped from almost two weeks per month to about 10 hours per month. The program completely codes about 75% of the certificates and half the entries on other certificates. Error rates on the automated part run under 3% at this point.

The user maintains the operating dictionaries that support the program and manually codes those entries that the computer cannot (or those entries rejected under the NIOSH validation program). The user also reviews the output from the coding run and catches the majority of the errors generated by the program.

Developing a Nurse-Based Occupational Health and Safety Infrastructure in Agricultural Communities

Eugene Freund, P. J. Seligman, C. H. Rubin, CDC, NIOSH, Cincinnati, OH

Nurses are essential components of the public health infrastructure, particularly in rural communities. This program, entitled "Occupational Health and Safety Surveillance through Health Departments and Nurses in Agricultural Communities," is an effort to extend public health nursing into the arena of agricultural health and safety. Through ten cooperative agreements averaging $235,000, the National Institute for Occupational Safety and Health is funding the placement of 31 nurses in agricultural communities. These nurses will conduct active surveillance for agriculture-related illness and injury in the states of California, Georgia, Iowa, Kentucky, Maine, Minnesota, New York, North Carolina, North Dakota, and Ohio, performing educational and other interventions as needed. Project nurses will also provide health care providers with educational materials and referrals to consultants in universities, state and federal government and Agricultural Extension services. This program provides an opportunity to assess the effectiveness of various methods of enhancing provider-based reporting and to identify the extent to which various agriculture related illnesses are amenable to case surveillance.

Emerging Trends - OSHA's Perspective

Frank Frodyma, OSHA, Washington, DC

The federal occupational safety and health program has traditionally been hampered by a lack of sufficient resources, and it is unlikely any additional resources will be available in the foreseeable future. In spite of inadequate resources, the agency is expanding its safety and health responsibilities from the more traditional areas, such as in construction and manufacturing, to newer responsibilities that include indoor air quality and smoking, bloodborne disease (such as AIDS), motor vehicle safety, and ergonomics. This expanded federal scope, as well as new federal authority to increase penalties, have significant implications for the regulated community.

State/Federal Programs to Promote Effective National Injury and Disease Surveillance

Eric Frumin, Amalgamated Clothing and Textile Workers Union, New York, NY

The availability of accurate publicly-administered data systems is fundamental to the effectiveness of occupational safety and health programs. Such systems are almost uniformly absent, as indicated by the 30-35% non-reporting of fatalities to both state and federal OSHA offices throughout the nation. The severe cost inflation in the workers compensation and health care systems is softening the traditional employer resistance to "recordkeeping burdens", as improved program management is increasingly viewed as essential to cost-containment. The absence of firm proposals by OSHA, BLS and state agencies for the wholesale redesign of injury/illness data systems -- rooted in ideological opposition to government activism -- is the single greatest obstacle to the development of useful new data systems. This gap is addressed in the AFL-CIO's program for OSHA Reform, which includes stringent workplace injury and illness data requirements and the mandatory establishment of a National Surveillance Program for occupational injuries and illnesses.

The Emory Agromedicine Training Project: A Statewide Initiative for Training, Service, and Research

Howard Frumkin, Emory School of Public Health, Atlanta, GA

Agriculture is one of the most hazardous sectors of the economy. Hazards include traumatic injury, pesticide exposure, zoonotic diseases, and UV exposure, compounded by lack of medical care access, poverty (especially for migrant workers), and other factors. The Emory Agromedicine Training Project is a collaborative effort including several groups in Georgia: the Agricultural Extension, the Farm Bureau, the three medical schools, the Migrant Health Program, the Departments of Human Resources and Agriculture, and others. Emory occupational medicine residents will rotate through an Agromedicine block, and will receive hands-on training by providing services and conducting research in rural Georgia. The program will be described in detail.

Utilizing State-Based Labor Organizations, Management Organizations and Higher Education to Achieve a Safe Workplace

Jeffrey B. Frymier, W. M. Maines, West Virginia University Institute for Safety and Health Training, Morgantown, WV

Opposing organizations coming together for a common goal is the catalyst for the formation of this state-based program. The WVU Institute for Safety and Health Training (ISHT) working together with organized labor and management has been able to create a program that meets a dire need within the state of WV. In the past, safety and health training programs have often been sponsored solely by one of the fore mentioned organizations. The needs of the sponsoring organization were often met but the needs of the target population were sometimes overlooked. With state and federal funding these organizations helped establish the base for a state wide safety and health training unit which could meet the diverse and pressing needs of industry within the state. In its initial year and a half of existence the (ISHT) has developed numerous safety and health programs and trained over 3,000 employees and employers. Topics have ranged from management level communication skills to hazardous waste worker training. Plant sizes have ranged from less than 40 to over 1,000. No matter the size of the company or the topic matter being discussed the goal is always to achieve a safer workplace through education, understanding and cooperation.

Occupational Hazard Evaluation Programs: NIOSH and the States

Steven K. Galson, R. Hartle, M. Singal, D. Sundin, CDC, NIOSH, Cincinnati, OH

The NIOSH Health Hazard Evaluation (HHE) Program, mandated by Section 20 (a) (6) of the OSHA Act, has completed more than 6,500 evaluations since its inauguration in 1970. HHE requests have ranged from 400 to 500 per year for the past 10 years, and vary significantly by region and state. Factors influencing the program have included the closing of seven NIOSH regional offices and variations in state hazard evaluation resources. This presentation will discuss trends in HHE requests in relation to these and other factors. The influence of hazard evaluation programs on prevention of occupational disease is unknown. State and federal efforts to follow-up and reevaluate known hazards will be reviewed. Models for improving state-federal cooperation in occupational hazard evaluation will be examined.

Workplace Compliance with the OSHA Lead Standard: Workers' Perspectives

Barbara Gerwel, N. Long, G. Sorock, New Jersey Department of Health, Trenton, NJ

The New Jersey Department of Health has a legal mandate to receive reports of elevated blood lead (PbB) or urine lead (PbU) from clinical laboratories in NJ. The total number of individuals reported between October 1987 and July 1990 was 3,103. Twenty one percent (645) of reported individuals had PbB levels of 40 ug/dl or greater and/or PbU of 100 ug/l or greater. This segment of the lead exposed population was targeted for telephone interview. Telephone numbers were identified from laboratory reports and from phone calls made to laboratories and

physician offices for 456 workers employed by 118 employers. The race/ethnicity distribution of interviewed workers were: 322 white, 83 black, 27 hispanic. Of 456 interviewed workers there were 432 males and 24 females. In the workers' opinions, their PbB or PbU levels were elevated because of 504 reasons categorized as: poor housekeeping at worksite (121), inadequate or no ventilation (118), unusual event (92), inadequate respirator (76), smoking or eating at worksite (53), no respirator available (44). Regarding access to medical surveillance for lead exposure at the worksite, 244 (54%) had pre-employment physical examinations and 234 (51%) had periodic physical examinations in the past year. Employers informed only 303 (66%) workers about their elevated PbB or PbU levels. These data suggest that workplace compliance with the OSHA Lead Standard is poor. We will discuss how a new arrangement with OSHA was established to follow-up companies which do not comply with the OSHA Lead Standard.

NIOSH Control Technology Support for Enhancing the Intervention Capacity of SENSOR States

James A. Gideon, CDC, NIOSH, Cincinnati, OH

The NIOSH Division of Physical Sciences and Engineering (DPSE) has an ongoing research effort to document, evaluate, and disseminate information for preventing occupational illness. There are several areas in which there can be an effective synergism between DPSE control technology activities and SENSOR intervention activities, including: 1) SENSOR states often identify high hazard small businesses that require the development of new control technologies, such as lead in radiator repair shops; DPSE can help develop appropriate control technology, which can in turn be applied and disseminated by the SENSOR states; 2) DPSE has developed a technique of real-time video hazard analysis that allows more accurate definition of an intervention approach, and has trained a number of SENSOR states in its use; 3) SENSOR states are conducting a number of followback intervention site visits; DPSE has worked with several of the states to enhance the capacity to do this; 4) DPSE is helping compile and share intervention-oriented publications that have been developed by the OSHA 7(c)1 consultation programs, and these also will be shared with the SENSOR states.

Occupational Blood Exposures Among Emergency First Responders and Health Care Workers

Jane E. Gordon, R. D. Leiker, M. Barnett, S. K. Modesitt, Oregon Health Division, Portland, OR

Health care providers are becoming increasingly aware and concerned about the transmission of bloodborne diseases such as HIV and Hepatitis B. Although the majority of providers work in traditional medical settings (hospitals and clinics), Oregon has nearly 10,000 emergency first responders (ambulance, fire and law enforcement) who respond to more than a quarter of a million EMS calls each year. A successful, multi-phase study was conducted in an effort to understand and quantify the occupational exposure experience of this comprehensive group of health care providers. The project addresses three questions: (1) Can Oregon's existing statewide anonymous HIV test reporting system be utilized to identify and document occupational blood exposures among health care providers, including emergency responders? (2) Do the occupational blood exposure policies and procedures of individual emergency

response employers effect the number of incidents identified by the HIV test reporting system? (3) How does the self-reported blood exposure experience of a random sample of emergency responders compare with blood exposures identified through the HIV test reporting system during the same period of time? Data describing the blood exposed workers, exposure type and circumstances, HIV and Hepatitis B status will be presented for the 1,254 exposure incidents that were identified. The work of a multi-disciplinary group that was formed to review study results and identify possible interventions will also be discussed.

The National Occupational Health Survey of Mining: North Carolina Results

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The National Occupational Health Survey of Mining (NOHSM) was designed by the National Institute for Occupational Safety and Health (NIOSH) to characterize all of the health-related agents to which U.S. miners are potentially exposed. The NOHSM was mandated by the 1977 Federal Mine Safety and Health Amendments Act. While the NOHSM was designed as a nationwide survey, some parties have expressed interest in obtaining results on a state-by-state basis. One such request came from North Carolina.

NIOSH surveyed 22 currently active mines in North Carolina which were grouped into 10 mineral commodities. The North Carolina mines which NIOSH surveyed employed a total of 884 workers. the inventories listed 2,763 items, with 374 of those being zero use items. Three of the 22 surveyed mines claimed some information as trade secret. This presentation will summarize North Carolina vs. National results concerning the previously listed topics for each commodity plus employee potential exposures to chemical substances; trade name products; physical agents (noise, segmental and whole body vibration, and heat); musculoskeletal overloads; and welding-related processes.

Potential Risk of Occupational Exposure to the Human Immunodeficiency Virus (HIV) and the Hepatitis B Virus (HBV) Among Correctional Workers

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With the exception of health-care workers, there is limited data available about the risk of occupational exposure to HIV and HBV among groups of workers whose jobs involve contact with infected persons. With funding from NIOSH, the Department of Health surveyed 2,215 employees of the New Jersey Department of Corrections via self-administered, anonymous questionnaires to determine if they experienced any episodes in their present jobs during which the transmission of bloodborne viruses could occur. The study population was divided into three groups: custody staff, civilian medical staff, and civilian non-medical staff. Responses were received from 24% of custody, 60% of medical, and 54% of civilian non-medical staff surveyed. Potential HIV/HBV exposure episodes were experienced by 62 (17%) of the 373 custody respondents, 83 (55%) of the 152 medical respondents, and 19 (9%) of the 208 civilian non-medical respondents. The low response rate of this survey makes any generalizing of the results

to the non-responding population questionable. Nevertheless, we conclude that correctional workers face the risks associated with exposure to blood and other infectious body fluids during the performance of their duties. The extent and frequency of potential HIV/HBV exposure episodes in the prison setting varies among the different categories of workers. The survey results indicate that medical workers have the highest potential for exposure, followed by custody supervisors, non-supervisory custody staff, and civilian non-medical staff.

The Cancer Registry as a Tool for Studying Female Occupational Cancers

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There are few published studies that evaluate the effect of occupational exposure on the risk of developing female specific cancers. These studies are important, especially because of the increasing number of women in the workforce. They are difficult to perform since few workplaces have sufficient numbers of females for separate analyses. By using existing mortality or cancer registry databases that contain occupational information, large numbers of similarly exposed women can be grouped for study. The New Jersey Cancer Registry was used to analyze the pattern of cancer incidence, in manufacturing industries, by sex and race. In this analysis there were several industries that showed a statistically significant excess of female specific cancers. These results were further investigated. The histology of the cancers and the more detailed 4-digit Standard Industrial and Standard Occupational Classification codes were used to further investigate associations between 2-digit SIC codes, breast cancer, uterine cancer and the subcategory, cancer of the cervix. No pattern of association was seen with the breast cancers investigated. Several patterns were seen when uterine cancer associations were investigated. Statistically significant associations ($p < 0.05$) for specific histologic tumor types were seen in the fabricated metal; stone, clay and glass; lumber and wood; and electrical equipment manufacturing industries.

Wisconsin's Surveillance of Occupational Back Injury through Workers' Compensation Reports

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Back injury is one of the most frequently occurring and serious forms of trauma which can happen in the work place. Workers Compensation (WC) data were analyzed to determine the scope of this problem in Wisconsin. Reports were selected from the WC case history file. Back injury risks were determined by age group and gender; industry-wide incidence rates and occupational odds ratios were calculated. For the years 1982-1988, over 123,000 back injuries were reported, accounting for over 25% of all compensation cases in Wisconsin. Cases increased from 15,000 in 1982 to over 21,000 in 1988. Males accounted for over 71% of the cases, while 56% of the reports were for workers aged 25-44. Work place back injuries have cost over 335 million dollars, while 1988 costs alone are projected to exceed $80 million dollars. High risk industries included motor freight and warehousing, primary metals, heavy construction, and health services. Occupations with elevated risk odds included freight handlers, shipping clerks, truck drivers, brick masons, nurses, and nursing aids.

Connecticut Public Sector Occupational Safety and Health Program

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Connecticut is the only state with a public sector only occupational safety and health program which has been certified by the USDOL-OSHA. Started in 1975, CONN-OSHA conducts enforcement and consultation activities in the public sector to assure a safe and healthy working environment for state and municipal employees.

Development/adoption of standards, enforcement policies, consultation, training and education activities of CONN-OSHA for the public sector will be presented.

Implementation of a Successful Physician-Based Reporting System for the Surveillance of Occupational Diseases

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With targeted mailings and a new ruling requiring occupational disease reporting by physicians, a successful occupational disease surveillance system was implemented in Ohio. While the reporting of occupational diseases has been required by state law for a number of years, there was little compliance to the requirement prior to the advent of SENSOR activities. Beginning in March 1989, physicians were systematically contacted regarding the reporting requirement. Initial communication was made with approximately 1,500 physicians who specialized in either occupational medicine, pulmonary medicine or radiology. The specialties were chosen because of the SENSOR project focus on silicosis and lead poisoning. Communication has continued with this group via a quarterly newsletter, "Occupational Health Issues in Ohio". Additionally in late 1990, physicians specializing in family practice as well as occupational health nurses were added to the mailings.

In the fall of 1990 the number of diseases required to be reported was increased to nine and the reporting form was streamlined to facilitate completion of the form. The result has been a steady increase in the physician reporting pool that now includes approximately 150 providers. During 1990, 1,471 cases were reported from those providers including cases from 66 of Ohio's 88 counties.

Emergency Medical Technician (EMT) Risk of Exposure to Body Fluids

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Purpose: To identify the risk of exposure to patient body fluids for Emergency Medical Technicians (EMTs) providing pre-hospital emergency care. Setting: The City of Milwaukee, WI, has a population of 605,000. Its EMS system comprises fire engines for on-scene treatment (EMT-Eng), ambulances for transport of non-critical patients (EMT-Amb), and paramedic units for critical care (EMT-PM). Methods: For a two-week period in the spring of 1990, all EMS

units in the city completed an "Encounter Form" after all emergency patient encounters recording availability of body fluids, procedures performed and any actual "exposure" to body fluids. An "exposure" was defined as any direct contact of a patient body fluid with an EMT's body, clothing, or protective garments. Results: During the two-week study period there were 2,805 patients with 4,014 total patient encounters (1.4 EMS units/patient). Study forms were submitted for 93% of all encounters. Blood was available for potential contact in 25% of patients. Other bloody fluids were available in an additional 1% and non-bloody fluids in 10% of patients. Of the 2,805 patients, 548 (20%) were the source of an exposure. There were 1,419 exposures to 1,161 EMTs. The percent of EMTs that were exposed while interacting with a patient was 10% for an EMT-Amb, 15% for an EMT-Eng, and 20% for an EMT-PM. The number of EMTs exposed per patient was 0.20 for an EMT-Amb, 0.45 for an EMT-Eng, and 0.66 for an EMT-PM. Seventy-four percent of exposures involved blood/bloody fluid. Hands were involved in 96% of exposures; in 94% of these cases the hand was gloved, but in 4% of the cases the glove was torn. Conclusions: EMTs are at significant potential risk for exposure to body fluids and attention to their protection is needed.

Wisconsin SENSOR Occupational Lead Exposure Surveillance

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In 1988, the Wisconsin Division of Health SENSOR program began surveillance on occupational lead exposures. Blood lead testing laboratories were contacted to explain reporting requirements: Wisconsin statutes require reporting when lead levels reach 25 micro grams per deciliter or above. A data base was written to obtain demographic information and to track multiple client contacts for proper handling of repeat lead monitoring reports. Since 1988, 4,676 reports on 1,562 clients have been logged into the database. Approximately 80% of the reports were between 25 and 39 micrograms per deciliter; 13% were between 40 and 49, while 7% of the reports were above 50. Only 5% of cases were female. The majority of reports have come from enameled iron manufacturing, storage battery manufacturing, and brass, bronze and copper foundries. To increase coverage of at-risk industries under - represented in the data base, radiator repair shops were targeted for intensive surveillance (walk through, air monitoring, free blood lead testing, lead standard compliance education). These radiator repair shop site visits were conducted in the city of Milwaukee.

Evaluation of Potential Work-Related Exposure to Blood and HIV Among Denver Police Officers

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Colorado law explicitly authorizes state and local health departments to provide evaluation of public safety workers who have occupational exposure to blood and bodily fluids potentially infectious with HIV. The evaluation may consist of accessing medical and laboratory records of the source person or requiring HIV antibody testing of the source person. Since December 1989, the Colorado Department of Health has conducted active surveillance for exposures

among Denver Police Department officers. In the first 14 months, 125 incidents were reported among approximately 1,200 officers. The type of incident most frequently reported was exposure to saliva from biting or spitting; these were judged to have negligible risk of HIV transmission. In 30 incidents, there was significant exposure to blood; in 5 (17%) of these, the source person was determined to have HIV infection. No seroconversions in exposed police officers have been documented. The seropositivity rate of source persons involved in blood exposures is considerable higher than the overall rate and the rate among intravenous drug users who voluntarily seek HIV antibody testing at public counseling and testing sites in Denver.

Needlestick Injuries: The Continued Need for Prevention Strategies

Christine A. Hudson, L. S. Martin, C. A. Hudson, CDC, NIOSH, Atlanta, GA

Occupational transmission of HIV has been documented. HIV contaminated needles have been reported to pose the most serious risk. Literature reports and meeting abstracts were reviewed to further define factors associated with potential occupational transmission.

Most studies were respondent surveys rather than observational; the majority were directed to hospital workers. Study design and data collection varied. Needlestick injuries (NSI) reported as percent of workers in study injured ranged from 34-50%. Denominator figures were unavailable in many studies; NSI were reported as follows: 189/1000 healthcare workers (HCW), 107/1000 HCW, 22/24 exposures, 2134 exposures/7065 patient days, 1.06/nurse day, 200/year, decrease from 234 in 1987 to 201 in 1989. Reports of NSI due to recapping ranged from 10-70%; IV lines were often associated with NSI. Recapping continued even when compliance to other "universal precautions" recommendations was high. One report indicated that recapping injuries were reduced form 61% to 16% following an educational program. Where different occupations were surveyed, nurses predominated with the highest NSI rates. Three reports investigated whether the introduction of bedside boxes (BB) for sharps disposal had changed the NSI rate. The overall rate of NSI did not change, but disposal injuries decreased in some cases. It is difficult to evaluate the impact of BB since emphasis on reporting often results in increased worker compliance to injury reporting.

Accumulated data for percutaneous exposure to HIV infected blood still indicate that the risk of transmission is approximately 0.3% per exposure. There are several basic strategies for the prevention of occupational transmission of HIV: engineering controls, job design, personal protective, alteration of work practices, and training. Review of the current literature suggests that NSI have not been significantly reduced. The development and evaluation of engineering controls will be crucial to prevention of NSI.

Automated Coding of Occupation and Industry on Utah Death Certificates

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The development of the automated system for coding occupation and industry on Utah death certificates was initially supported by a NIOSH contract for state capacity building beginning in

1980. In subsequent years the coding of occupation and industry on Utah death certificates has been partially supported by funding from the National Center for Health Statistics.

The Utah occupation and industry automated dictionary was initially created by manually coding entries from 1979-1981 birth and death certificates. The 1980 census codes for occupations in industry were used as our standard. The certificate literal entries for the occupation and industry fields are keyed with truncation at 30 characters. Non-auto-coded items were manually coded and added to the dictionary. The dictionary is currently used to auto-code death records in our principal month. About 40 percent of monthly death records require manual coding.

The dictionary requires an exact match on two field, occupation and industry. If a match occurs, codes are inserted into the death record. Non-matches are listed for manual coding. After updating death records with new codes, the dictionary is updated and the original non-matched records are passed through the dictionary a second time to insure completeness of the dictionary and accuracy in updating the records. Approximately 300 new entries are added monthly.

The Statistical Analysis System (SAS) is a software package used by the Bureau of Vital Records. The automated occupation and industry dictionary is maintained as a SAS data set resident on magnetic tape. Monthly death edits are run using SAS software. The occupational dictionary invoked by the death edits produces an error correction list of just non-coded items for use by the occupation coding staff. Items not coded are flagged as error records and are also processed through regular edit procedures.

The dictionary update program checks for blank codes, impossible codes, and eliminates duplicate entries. The updated dictionary is then invoked in subsequent death edits. If everything works without error, no subsequent occupational coding is required in the monthly cycle. At the beginning of 1991 there are over 26,584 paired entries in the dictionary.

The National Traumatic Occupational Fatalities Surveillance System

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The National Traumatic Occupational Fatalities (NTOF) surveillance system is compiled from death certificate information for persons aged 16 years or older with an external (injury or poisoning) cause of death and a positive response to the injury at work item. Certificates are collected from the 50 states, New York City, and the District of Columbia. The NIOSH Division of Safety Research automates the certificates submitted by the states. Several narrative fields including industry, occupation, injury description, and underlying, immediate and contributory causes of death are maintained in the data file. Additionally, industry and occupation codes are assigned to the cases. The data provides the unique opportunity to describe occupational injury deaths by state, industry, occupation, cause of death, and by demographic characteristics. Narrative fields allow searches of the data for categories of variables not accessible through coded data sets. The NTOF data are useful for identifying problem areas, targeting intervention strategies and evaluating progress toward reducing traumatic fatalities in the workplace. State-based analyses of occupational injury deaths could be enhanced through the utilization of information in the NTOF data base which allows state comparisons of occupational mortality rates by employment and cause of death.

Use of SENSOR to Identify New Allergens

D. W. Johnson, M. E. Hart, K. D. Rosenman, MI-OSHA, Lansing, MI

The use of SENSOR fosters physician and industrial hygienist coordination to ensure follow-up of targeted conditions such as occupational asthma. We report the potential for occupational exposure to asthmogenic agents in the pickle and pepper processing industry. Potential asthmagens include essential oils, oleoresins, sodium bisulfite, tartrazine and capsaicin (8-methyl-N-vanillyl-6-noneamide). Sensitization is dependent on the potency, allergenic properties and duration of exposure. Identification of potential occupational asthmagens was determined by literature search and review of available manufacturing data. Work-relatedness of symptomatology was determined in four employees employed at four separate processing plants. The diagnosis of occupational asthma was made by four separate physicians utilizing a recommended medical screening protocol for workers exposed to occupational allergens.

Work-Related Psychological Disorders: A Review of Physical and Psychosocial Risk Factors Related to Iowa's Farm Population

Shirley K. Jones, R. W. Currier, Iowa Department of Public Health, Des Moines, IA

Literature on occupational stress/health identifies a wide range of working conditions, both physical and psychosocial, which pose a threat to psychological well-being. Iowa farmers face exposure to multiple physical and psychosocial hazards known to cause psychological disorders. There is no current surveillance system which would provide data on Iowa agricultural population affected, however, the incidence of suicide is higher in Iowa. The death rate due to acute injury in Iowa's agricultural population is higher than CDC estimates. (SPRAINS data, 1990) If one includes children and farm family members killed in agricultural related incidents the number rises by 30%. Alcoholism is high with low incidence of seeking treatment. This presentation will focus on psychosocial risk factors and physical factors which are known to affect mental health and relate them to the Iowa farm population. Since the farmer's workplace is also the place of residence, risk factors will be interrelated and unique barriers will exist in the design and application of interventions. Amenability to needed interventions will be discussed.

Assessment of Interventions for Children of Parents with Occupational Exposure to Lead

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Reports submitted to the Illinois Adult Blood Lead Registry have been matched with Illinois Childhood Lead Registry records to assess compliance with screening recommendations for lead-exposed workers' children and to determine whether further interventions are appropriate. To control for differences in the workers' and the children's last names, records are matched by household address. Compliance with childhood screening recommendations is measured as the number of workers with at least one child in the household screened, the number of workers

with all children in the household screened, and the total number of eligible children screened. Rates of compliance by residence, race, and sex of the worker have been calculated. Correlations between workers' blood lead levels and children's blood levels will also be assessed to determine whether intensive tracking efforts should be directed at certain children, based on the blood lead levels reported for workers living in their households.

Physician Reporting of Occupational Diseases: Why Doesn't It Work?

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Maryland has long had mandatory reporting regulations and the responsible state agencies (DHMH and MDE) have repeatedly acted to inform physicians of the regulations and to encourage reporting. A critical review shows the limitations of physician based reporting. An increase in physician reports of heavy metal poisonings is an artifact of a successful laboratory based reporting system; a disproportionate number of reports still come from a few physicians; physician reports frequently follow rather than stimulate OSHA activity. Poor participation has been attributed to lack of physician knowledge about occupational illness, and increased CME activities have been undertaken without effect. Interviews with reporting and on-reporting physicians suggest other reasons for non-participation: failure to involve physicians in the investigations, failure to provide feedback about results of investigations, failure to provide meaningful incentives for reporting.

Occupational Health Problems of the Developmentally Disabled Worker: Policy, Ethical and Training Issues Remain After Industrial Hygiene Surveys.

Raymond Kessel, University of Wisconsin, Madison, WI; T. Moen, Wisconsin Department of Health and Social Services, Madison, WI

The University of Wisconsin Statewide Genetics Network, (WSGN) a client advocacy group and a rehabilitation facility owner's group worked cooperatively with the 7C1 OSHA Consultation Program to address the occupational health and safety needs of both the developmentally disabled client and the facility owner/staff. Industrial hygiene surveys of over 50 facilities revealed many serious exposures in an industry classified by OSHA as low hazard. Questionnaires from WSGN revealed many serious exposures and injuries, with an average of 180 different "jobs" per year being brought into each facility. Training was provided to facility staff but additional outreach has been complicated by the move of many clients into supported employment. Many questions remain to be answered clearly for this group. What is a safe level of chemical exposure? How do you effectively train this client group? Can they use PPE effectively? How do you recognize exposure symptoms? How do you address chemical and prescription drug interactions. We continue to work cooperatively to address this issue.

Development of a Lead Exposure Prevention Program for Bridge Repair Workers

Susan Klitzman, M. Goldberg, C. Nunez, New York City Department of Health; D. Nagin, New York State Department of Health; P. Marino, Mt. Sinai Occupational Health Clinical Center, New York, NY

Lead exposure continues to be and important occupational health problem among workers involved in bridge demolition, repair and maintenance. An on-going collaborative effort of the New York City and New York State Departments of Health and the Mount Sinai Occupational Health Clinical Center indicates that concentrating resources from several organizations can be one way to deal with this well documented problem. After Mount Sinai notified NYCDOH of an elevated blood lead level in an ironworker employed at a local bridge undergoing a multi-year renovation, the NYC and NYSDOH and Mount Sinai developed, in close cooperation with the contractor and unions, a plan for medical surveillance and industrial hygiene assessment. The activities coordinated by the groups included biological screening, medical follow-up for workers with blood lead elevations, monitoring of airborne lead and determination of appropriate respiratory protection and hygiene facilities. The goals of the program were fourfold: protect the workers at the bridge from lead exposure; develop contractual language for lead-protection for bridge work; develop appropriate engineering and work staging controls to minimize lead exposure; assess the role of medical removal and alternate work assignments at the bridge.

Occupational Injury Surveillance, Epidemiology and Control Activities in Colorado

Karl A. Krafft, W. M. Marine, C. J. Garrett, Colorado Department of Health, Denver, CO

The Colorado Population-Based Occupational Injury Fatality and Surveillance system has tracked occupational deaths from 1982 to present using multiple reporting sources including the state vital records system and the state workers' compensation system. This basic methodology has been incorporated by the BLS as a national surveillance system - Census of Occupational Injury Fatalities. The Rural Occupational Injury Grant has sought risk factors to explain the five-fold rural/urban differences in occupational injury deaths in Colorado. Pre-event, event and post-event factors have been investigated. Surveillance has shifted from passive to active mode to enable case investigations of all non-transportation unintentional injury fatalities using the NIOSH Fatal Accident Circumstances and Epidemiology (FACE) protocol for fatalities not under OSHA jurisdiction. These active case investigations have augmented the surveillance system with more detailed information on injury circumstance, injury severity, trauma care and EMS response and employer characteristics.

Surveillance for Wyoming's Work-Related Morbidity and Mortality

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Available surveillance data for the period 1986-1990 are reviewed. Wyoming has a poor record for mortality as well as lost workdays per 100 workers, according to a NIOSH study covering a

six year period, 1980-85. Comparisons are made with this period. Data from Wyoming's 27 hospital emergency rooms are also reviewed, showing that some ten percent of the state's 160,000 annual ER visits are work-related. Wyoming ranked second worst in the nation. Though the work force is small, high rates reflect an ongoing problem. Several possible strategies are discussed to change this situation.

Developing Data to Evaluate Effectiveness of State Legislation, Regulation and Safety/Health Programs

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As state legislatures and agencies seek means to improve workplace safety and health, credible data that evaluates the effectiveness and efficiency of various approaches employed by states becomes more useful. This paper will outline various approaches currently used in the United States and discusses methods to build databases to yield information useful in evaluating state activities.

New York State's Occupational Health Clinic Network

Matthew A. London, J. M. Melius, G. M. Casey, NYSDOH, Albany, NY

In 1987, following a report describing the burden of occupational disease in New York State (NYS) and a campaign by organized labor and health and safety activists, a publicly funded occupational health clinic network was started in NYS. Six clinics are located in the major population centers of the state and a seventh clinic specializes in agricultural medicine. With a mandate for disease prevention, each clinic includes industrial hygiene, epidemiology, and training as well as diagnostic services. Each clinic works closely with a community-based Advisory Board. Initially, the Clinic Network was funded from general tax revenues, though the funding source the last two years has been shifted to Workers' Compensation premiums. The first 5,000 patients seen by the Network include 28% construction, 44% manufacturing, and 28% white collar workers. Almost 15% of the patients have an occupational lung disease, most commonly asbestosis or asthma. Eight percent are diagnosed with noise-induced hearing loss, and more than 3% carpal tunnel syndrome. Though, in general, the clinics have grown and are fulfilling their mandate, certain problems exist, including: getting services to unorganized workers, reimbursement, and difficulty hiring occupational medicine-trained physicians. Future directions for the Network will be discussed.

Surveillance of Work-Related Carpal Tunnel Syndrome

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The California Occupational Health Program is working with the National Institute of Occupational Safety and Health to develop a model for occupational disease surveillance that

links case reporting to worksite-specific preventive interventions (SENSOR). The California model builds on a small, but strategic corps of county-based primary care providers who actively report cases of carpal tunnel syndrome (CTS). Cases, co-workers, and employers are interviewed to gather data to confirm cases and prioritize worksite follow-up. Selected worksites are visited to provide additional information for case confirmation and to recommend worksite-specific preventions. The model also builds on significant outreach to leading institutions in the medical, business, labor, and governmental sectors. In 1989-1990, sixteen health care facilities in Santa Clara County reported 223 cases of CTS. Of 185 work-related cases, 30 were reported by three occupational health clinics, 28 from two physical therapy clinics, 13 from a neurologist, 71 from two hand surgeons, five from two chiropractors, and eight from union health care providers and 30 other providers. The cases were largely female (78%) and white (62%), though Latinos (24%) were a significant minority. Cases represented 84 different occupational (SOC) titles and 73 different four-digit industrial classifications (SIC). Cases involving clerical workers using VDTs, retail grocery check-out clerks, food manufacturing workers, and pharmaceutical packaging workers presented as clusters which were followed-up with worksite investigations. Model worksite intervention programs are being developed and evaluated for their efficacy to reduce risk factors for CTS.

Strategies for Prevention of Work-Related Pesticide Illnesses

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The California Occupational Health Program is working with the National Institute of Occupational Safety and Health to develop a model for occupational disease surveillance that links case reporting to worksite-specific preventive interventions (SENSOR). The California model builds on a small, but strategic corps of county-based primary care providers who actively report cases of work-related pesticide illnesses. Index cases, co-workers, and employers are interviewed to gather data to confirm cases and prioritize worksite follow-up. The model also builds on significant outreach to leading institutions in the medical, business, labor, governmental sectors and pest control advisors. In 1989-1990, over 185 cases were reported by 10 medical facilities in Fresno County and a dozen worksites were visited. At the worksites of index cases, risk factors for illness included a lack of effective safety training and supervision, faulty engineering controls, ineffective use of personal protective equipment, lax or nonexistent decontamination and medical surveillance, and the over-reliance on toxic pesticide use. Worksite specific recommendations were made to correct deficient pesticide health and safety programs. In 1990, specialists in integrated pest management (IPM) accompanied COHP staff on several pilot field investigations. IPM is a pest management philosophy in which pesticides are used only after alternative non-chemical methods have been implemented. The substitution of less or nontoxic alternatives has the potential to reduce or eliminate worker exposures. Growers were receptive to worksite visits that combined traditional occupational health and safety evaluations with IPM consultation.

Spanish Language Outreach Campaign to Improve Work-Surveillance of Related Carpal Tunnel Syndrome

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The California Occupational Health Program with assistance from the National Institute for Occupational Safety and Health has adopted an intensive community outreach strategy in the development of a provider-based reporting and prevention system (SENSOR) for work-related carpal tunnel syndrome (CTS). This has included local and statewide outreach and education directed at the medical community, other government agencies, employers and trade associations, labor unions and other worker organizations and community groups.

Even with this attention to outreach, minority community members are often under-represented in traditional health surveillance systems. To study the relationship between targeted outreach to a "hard to reach" population of Spanish-speaking workers and their subsequent representation in our surveillance system, we have designed an outreach campaign to alert Spanish-speaking workers, who may be at high risk to CTS, to the potential risks in their jobs, early signs and symptoms of CTS, and how to get medical care for this condition. To accomplish this education and outreach, community based, local popular Spanish-language newspapers, and radio and television formats are being used to present our informational message. Selected health care facilities who are part of our SENSOR reporting network will participate in the outreach by being prepared to take calls from workers seeking more information, and to make appropriate referrals. An evaluation component will include a pre-/post-assessment of numbers of inquiries and referrals to the surveillance system.

Building Occupational Health Clinical Services through Collaborative State-Based Studies of Occupational Disease

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Between 1987 and 1990, comprehensive studies of occupational diseases and hazards associated economic costs, and proposed remedies were conducted in four Northeastern states: New York, New Jersey, Connecticut, and Pennsylvania. These studies resulted from close collaborations between academia, state and local Departments of Health and Labor, unions, corporate occupational health professionals, COSH groups, and others. Although the studies varied in detail, they were largely based on a single study paradigm, which was developed by the authors in New York State. Specific successes which have been achieved to date include funding by the New York State and Connecticut Legislatures of networks of occupational health clinical centers throughout the two states. The New York State Occupational Health Clinical Network, which is administered by the State Department of Health, currently consists of seven active centers and has a $3.5 million budget. The authors directed the two studies in New York and New Jersey and will discuss the process and outcome of these state-based initiatives.

Institutional Framework and Agency Cooperation Required to Ensure Implementation and Success of Statewide Active Medical Surveillance System

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We trace the design and development of a statewide lead-exposure surveillance system from its conceptual beginnings to its first year of implementation.

Necessary components included the development and application of specifications requiring worker health and safety programs within the bid contract specifications of the State Department of Transportation, active support and participation from the state's road construction industry and labor unions as well as cooperation from six Occupational Medicine Clinics across Connecticut.

The role played by the State Department of Health Services was pivotal. Not only does DOHS provide the center of the surveillance system, but the Department's study of lead toxicity among bridge workers and its continuing concern for limiting this health hazard was crucial to the success of the project.

Prevention of Work-Related Hospitalized Burns in Colorado

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The Colorado Department of Health (CDH) has developed a surveillance system designed to detect and prevent work-related hospitalized burns through funding from the National Institute for Occupational Safety and Health (NIOSH) Sentinel Event Notification System for Occupational Risk (SENSOR) program. The system allows CDH to link reports of burns with case followup and workplace intervention. Hospitals throughout the state report to the health department all burns that occur in Colorado and result in inpatient hospitalization. Between June 1989 and February 1991, 90 work-related hospitalized burns were reported to CDH. These reports were investigated through employee and employer interview, collection of relevant Worker's Compensation, OSHA, hospital, and other records, and worksite investigation of selected cases. The worksite investigation is authorized by regulation, and may be extended to other workplaces where similar exposure conditions exist. Primary, secondary, and basic causes of injury are determined. The results of the worksite investigation are summarized in a report that includes recommendations for remediation of identified problems. Case investigation reports are distributed to the employer, employee, union, trade association, and a number of safety organizations. Data from the hospitalized burn surveillance program are used to determine risk factors for burn injuries in the state.

A Cooperative Approach for Identification and Investigation of Occupational Fatalities in Colorado

Lyle McKenzie, J. McCammon, R. Hoffman, Colorado Department of Health, Denver, CO

The Colorado Department of Health (CDH) has developed a surveillance system for non-transportation, unintentional occupational fatalities. CDH identifies fatalities through a notification network including cooperative agreements with the federal Occupational Safety and Health Administration (OSHA), Mine Safety and Health Administration (MSHA), and Colorado Workers Compensation system, CDH review of state death certificates and voluntary reporting of cases by state and local law enforcement agencies and county coroners. Response time and effectiveness of each notification source is evaluated. This notification network enabled CDH to identify and investigate 68 work related fatalities during the period of April 1989 to December 1990. CDH investigates fatalities using the Fatal Accident Circumstances and Epidemiology (FACE) protocol developed by the National Institute for Occupational Safety and Health (NIOSH) Division of Safety Research (DSR). Primary, secondary and basic causes of each fatal injury are determined by CDH. Secondary causes are further separated into hazardous practices and hazardous conditions. This information is grouped by industry type to develop industry-specific profiles. Each profile illustrates the common characteristics of fatal injuries within an industry and provides a method to enhance awareness within that industry. Company size, geographic location and severity of the initial injury have been found to be critical factors in Colorado occupational fatalities. Case reports and profiles are distributed to employers, unions, trade associations, safety organizations, and other interested individuals. Complete copies of data and summary reports are transmitted to DSR, NIOSH.

Trends in Blood Lead Levels in the New York State Heavy Metals Registry - 1982 to 1990

James M. Melius, E. Back, R. Stone, M. Prince, New York State Department of Health, Albany, NY

For nearly ten years, the New York State Department of Health has operated a Heavy Metals Registry requiring medical laboratories, physicians, and health care facilities to report patients with elevated levels of heavy metals (lead, arsenic, mercury, and cadmium) in blood or urine testing. These data were used to evaluate the change in reported blood levels over time in major lead-using industries. Employment data from the New York State Department of Labor were utilized to estimate the number of people employed in these industries.

These data demonstrate a steady decrease from 1982 to 1990 in the rate of people with elevated lead levels in major lead-using industries subject to the OSHA general industry lead standard. No such decrease is evident in the construction industry which is not subject to this standard. Differing patterns of decrease in general industry may be explained by the phased requirements for compliance with the OSHA standard.

Occupational Surveillance in Washington State Using Vital Records

Samuel Milham, Jr., Washington State DOH, Olympia, WA

Twenty years experience with occupational mortality surveillance using death records and ten years experience in birth certificate analysis of parental occupations will be described. Methods and strategies for occupational coding and data analysis will be discussed. Topics to be covered include: computer coding of keyed occupational literals, multiple cause-of-death/occupational analyses and social class standardization of occupational mortality data.

An Ergonomic Research Program to Reduce Cashier CTDs in the Supermarket Industry

Charles I. Miller, Food Marketing Institute, Washington, DC

The advent of the large, full-service supermarket, the handling of far greater volumes of food, and the ever-increasing demands for efficiency and productivity, have necessitated the use of scanners that have imposed great demands on cashiers. The incidence of Cumulative Trauma Disorder (CTD) allegations, workers' compensation claims and OSHA citations are increasing at an alarming rate. This paper describes an organized ergonomic action plan in response to these problems plaguing the supermarket industry. It traces the FMI Ergonomics Task Force's progress from its inception as a handful of concerned, but determined, retailers looking for solutions...to an expanded, diversified group of retailers and suppliers of varied complementary backgrounds under the technical guidance of ergonomist, Dr. William Marras, of Ohio State University and the leadership of FMI. The various research phases and results to date, as well as the scope and objectives of the supermarket industry's comprehensive research program, will be presented. The evolution of a close-working relationship with state and federal OSHA administrations, and the subsequent dependency on the NIOSH surveillance group for a vital segment of the program, will also be discussed.

A Noncompliance Approach to Industrial Hygiene and Ergonomics Investigations

Elise Pechter Morse, J. Parker, DOH, DLI, West Newton, MA

The Massachusetts Division of Occupational Hygiene was established in 1934; it worked with employers in investigating silicosis and beryllium disease outbreaks. The early years were fraught with questions about the authority of a governmental agency to enter a private workplace and direct changes, and about the use of the information obtained.

Over the years the work has evolved and expanded in evaluating workplace hazards to health. DOH has persisted, even after many other state-based programs closed with the formation of OSHA. DOH operates with little contact with OSHA, doing similar and different work. Like OSHA we investigate private sector workplaces for chemical and ergonomic hazards. Unlike OSHA we investigate public workers' hazards, chemical exposures for which there are no PELs, and conditions for pregnant workers; we take requests from health care providers, neighbors, discharged employees and spouses; we recommend changes even when there are no "violations."

Without the ability to cite and fine, the Division relies mainly on three methods to encourage action to abate hazards: diagnosis, direction and deceit. This paper will describe the strengths and weaknesses of this noncompliance approach to occupational health (with examples).

State-Specific Respiratory Disease Mortality Surveillance of Agricultural Workers

Karl J. Musgrave, R. B. Althouse, R. M. Castellan, CDC, NIOSH, Morgantown, WV

Death certificates represent a largely untapped resource for occupational mortality surveillance. We used national multiple-cause-of-death data to generate leads as to potential occupational respiratory disease problems in 14 states with industry and occupation information for each of the years 1985-1988.

Previous studies have shown agricultural workers to be at increased risk of developing respiratory diseases. However, most mortality studies have considered only crude mortality using underlying cause of death and may therefore underestimate the public health importance of contributing causes of death. Furthermore, crude mortality data is a poor measure of premature mortality in the working age population.

We utilized multiple-cause-of-death data to estimate the years of working life lost (YWLL, ages 20-64) for agricultural workers in each of the 14 states. Standardized rates for YWLL were derived across 11 respiratory disease categories using the 1980 Census to obtain estimates of the "population at risk".

Occupational mortality surveillance based on death certificates is particularly useful where cohort studies may be difficult. This applies to occupational groups in agriculture where small non-unionized work units are commonplace. However, inaccuracies in death certificate occupation and industry statements and inability to control for confounding variables such as smoking suggest that results should be interpreted with care.

Maine Occupational Health Surveillance Program

Ellen Naor, D. R. Lemieux, Maine Department of Human Services, Augusta, ME

This paper demonstrates the use of mortality data in a surveillance program for monitoring potential occupational health problems. Information on death certificates is used to profile causes of death among workers in the leather and pulp/paper industries, using proportionate mortality ratios (PMR's) and occupational sentinel health events.

In 1980, an estimated 20,000 persons were employed in the leather and leather products industry in Maine; over half operated shoe machines. Shoe machine operators have a potential exposure to a variety of hazardous chemical agents including arsenic, benzene and lead. Mortality profiles for 1984-1986 revealed significantly high PMRs for lung cancer, ischemic heart disease and suicide among male workers. Excess deaths from selected cancers, heart disease, and chronic obstructive pulmonary disease, were observed among females. Further analyses revealed five

sentinel deaths to shoe machine operators. Comparisons with data for 1981-1984 showed a generally consistent pattern.

Reports of chlorine leaks at a paper plant in 1988 triggered a review of the mortality experience of Maine pulp and paper workers. Mortality profiles showed significantly high PMRs for selected cancers, heart disease, and renal failure among ;male workers. A significantly high PMR for cancer of the lymphatic and hematopoietic tissue was observed among females. Further analysis revealed 11 sentinel deaths to pulp and paper workers.

Presentation of Occupational Injury and Illness Recordkeeping Issues

Stephen A. Newell, OSHA, Washington, DC

Concerns about the accuracy and utility of injury and illness data currently available have been raised by OMB, Congress, OSHA, NIOSH, BLS, The National Academy of Sciences, the General Accounting Office and representatives of business and labor. In addressing these concerns, OSHA believes that the existing regulations in 29 CFR 1904 should be clarified and revised through the rule making process and the revision of interpretive materials.

Our presentation will describe the recent transfer of the recordkeeping function from the Bureau of Labor Statistics to OSHA and examine some current recordkeeping issues, including a discussion of the proposed revision of the recordkeeping requirements.

Successful Follow-Back of Silicosis: Three Case Studies

Dennis M. O'Brien, T. C. Cooper, J. W. Sheehy, CDC, NIOSH, Cincinnati, OH, D. Valiante, P. Bost NJDOH, Trenton, NJ

The largest number of silicosis cases in New Jersey exist in the sand mining and processing, foundry, and pottery (sanitary were) industries. Early in 1988, an informal working agreement was established between the New Jersey Department of Health and the NIOSH Division of Engineering and Physical Sciences, to conduct a comprehensive study in one facility in each of these industries. Studies were performed to develop specific control recommendations for each facility and to provide training in survey techniques and in the application of engineering controls for state personnel. These studies found that about 50% of the pottery workers, 33% of the foundry workers, and none of the sand mine workers were overexposed to silica. Other exposure hazards were also identified. Material handling operations were found to be a major source of potential silica exposure in all three plants. Recommendations for exposure reduction included: substitution of non-silica materials where possible, improvements in existing ventilation, and automation of material handling tasks. Follow-up visits indicated good compliance with the recommendations. These case reports demonstrate the value of active surveillance in silicosis prevention and the value of state/federal cooperation.

Assessing Compliance with Blood Lead Monitoring Requirements through Expanded Collection of Laboratory Test Results

Tom O'Connor, M. Barnett, J. E. Gordon, Oregon Health Division, Portland, OR

Surveillance of elevated blood lead is plagued by uncertainty regarding completeness of reporting. The OSHA lead standard requires that employers take a number of active steps in order to identify the need for biological monitoring. As a result, health agencies conducting surveillance often do not know whether lack of reporting from a given company means and absence of elevated blood lead levels or a lack of compliance with environmental and/or biological monitoring requirements. From August 1, 1990, through March 1991, the Oregon Health Division received 85 reports of confirmed occupationally-related elevated blood leads. Reports were received from only a small percentage of Oregon companies in high lead-using industries. This included only 10 of an estimated 102 companies in three high-risk industries (brass, bronze, and copper foundries; battery manufacturing; and radiator repair). In order to obtain a more accurate picture of blood lead monitoring in the state, the Health Division initiated a study requiring that the two major laboratories in the state report results of all blood lead tests conducted for a period of six months. This paper reports the preliminary results of the study and discusses their ramifications regarding compliance with biological monitoring requirements and the effectiveness of surveillance in identifying elevated blood lead levels.

A Model State Occupational Health Program - New Jersey Department of Health

Kathleen O'Leary, New Jersey Department of Health, Trenton, NJ

The Occupational Health Program in the New Jersey Department of Health has experienced a significant increase in the scope of its activities, including regulatory responsibilities, surveillance initiatives and research efforts. The Program is involved in regulatory activities through the enforcement of the provisions of the New Jersey Public Employees Occupational Safety and Health Act and the provisions of the New Jersey Worker and Community Right to Know Act. In addition to the regulatory responsibilities, the Occupational Health Program has wide-ranging surveillance projects including: lead and other heavy metals; silicosis; asbestosis, chemical poisoning; and fatal injuries. The Program utilizes a variety of sources to collect surveillance data for these projects including: mandated laboratory reporting of elevated levels of heavy metals, and hospital and physician reporting of specified occupational diseases and poisonings. An integrated aspect of all projects in the Program is the development and distribution of educational materials and technical consultation. The activities of the Program are carried out by an interdisciplinary team of epidemiologists, industrial hygienists, physicians, health educators and other occupational health professionals. The efforts have been supported by state funds, special revenue funds and grants from NIOSH. A description of how the Program has identified priorities, developed projects, secured funds and recruited staff can serve as a model for other state health departments as they engage in a similar endeavor.

The Expansion of State Occupational Health Services through Liaison with Local Health Departments

Kathleen O'Leary, H. Fontus, R. Iglewicz, New Jersey Department of Health, Trenton, NJ

The Occupational Health Program in the New Jersey Department of Health has been involved in a unique effort to involve local/county health departments in expanding the occupational health services available at the local/county level. The Program: (1) promotes the establishment of and funds new occupational health programs in local/county health departments; (2) provides ongoing consultation and funds for existing programs in local/county health departments; and (3) supports the designation of occupational health as a core activity within the provisions of the Minimum Standards of Performance for Local Boards of Health. Furthermore, the Occupational Health Program staff have conducted orientation and training programs in occupational health and industrial hygiene for personnel in local/county health departments and have involved public health personnel (health officers, nurses, and sanitarians) in local/county health departments in occupational health investigations. As part of the core activities, the local/county health departments are participating in an innovative program to address occupational diseases and poisonings among New Jersey workers. Local health officials follow-up case reports by interviewing patients with occupational diseases and poisonings and, if warranted, conducting a workplace investigation. At a time when the priorities and emphasis of program activities in local health departments are changing, there is a unique opportunity to involve local health departments in preventive occupational health activities.

Occupational Health Clinics and Disease Surveillance

Milo Ozkan, Connecticut Department of Labor-OSHA, Wethersfield, CT

With the passage of State of Connecticut Public Act No. 90-226, the Department of Labor in cooperation with Department of Health Services and Workers' Compensation Commission have recently implemented a health and safety surveillance program. This program has established grants for occupational and auxiliary health clinics within the state. In addition to these grants, the Act provides funds for training and education, data collection/analysis, site evaluation and control of potential occupational diseases in the workplace.

The presentation will include the workings of the occupational/auxiliary health clinics and the cooperation of the three agencies to identify and control health concerns in the occupational setting.

Risk Assessment of HIV Transmission in the Health-Care Setting: Data from CDC Observational Studies in the Surgical, Obstetric, and Emergency Department Settings

Adelisa L. Panlilio, J. I. Tokars, R. Marcus, M. E. Chamberland, D. M. Bell, CDC, CID, Atlanta, GA

One factor influencing the rate of occupational transmission of a blood-borne pathogen to

health-care workers is the nature and frequency of occupational exposures to blood and certain other body fluids. CDC has conducted several observational studies to assess the nature and frequency of these exposures in health-care settings, including operating rooms, delivery areas, and emergency departments. Data from an observational study of 206 surgical procedures suggest that, of all operating room personnel, surgeons faced a significant risk of sustaining percutaneous, mucous membrane, or cutaneous contact with blood during operative procedures. Blood contact was recorded in 11.2% of 590 surgeon-procedures; percutaneous injuries, a subset of blood contacts, were observed in 1.2% of these surgeon-procedures. Risk of contact varied with specialty, length of time in the operating room, estimated patient blood loss, and emergency nature of the procedure. Another study of 1382 surgical procedures demonstrated that over half of percutaneous injuries sustained by surgeons were associated with holding tissues with their fingers during suturing. The first systematic observational study during deliveries recorded blood and amniotic fluid contacts during 202 vaginal and 28 cesarean deliveries. These deliveries involved 1388 obstetric person-procedures during which 151 blood and amniotic fluid contacts were sustained, including 145 skin contacts, two mucous membrane contacts, and four percutaneous injuries. Occupational groups with the highest rates of percutaneous injury were obstetricians and midwives. Observations in three inner city and three suburban emergency departments of blood contacts demonstrated that rates were highest during thoracotomy and fingerstick procedures and were significantly reduced by glove use. Many of the observed blood and amniotic fluid contacts in these studies were potentially preventable by adherence to universal precautions; additional protective measures or changes in technique might have prevented other contacts, especially the percutaneous injuries.

Minnesota Highway Maintenance Worker Cohort Mortality Study: Methods and Noncancer Mortality

David Parker, A. P. Bender, R. A. Johnson, W. K. Scharber, A. N. Williams, M. C. Marbury, Minnesota Department of Health, Minneapolis, MN; J. S. Mandel, University of Minnesota, Minneapolis, MN

In 1984, the Minnesota Department of Health (MDH) began a cohort mortality study of 4,849 workers to follow up concerns with the health and safety of highway maintenance workers (HMWs). A total of 1,530 deaths had occurred, resulting in a standardized mortality ratio (SMR) of 91 ($p<.01$) and an all cancer SMR of 84 ($p<.01$). There was a significant elevation in the SMR for chronic renal failure among long-term rural workers (SMR = 676, $p<.05$). The SMR was also elevated for transportation injuries. The latter SMR was highest among short-term urban workers (SMR = 280, $p<.01$). In addition, the SMR for transportation-related injury deaths tended in increase the later the decade of starting work. The SMRs were 137, 259, 502, and 2,145 for urban workers starting work in the decades 1945-1954, 1955-1964, 1965-1974, and 1975-1984, respectively. This study demonstrates the possible adverse health effects of highway maintenance work and the need to comprehensively evaluate injury mortality among selected occupational cohorts.

An Examination of Trends in Occupational Medicine Practices and Worker Access to Health Care

David H. Pedersen, CDC, NIOSH, Cincinnati, OH

NIOSH national surveys of the workplace conducted in 1972 and 1981 indicate considerable change in both the manner in which occupational medicine services are delivered to the workforce and in the traditional role of the occupational health physician. Trend analysis indicates that, as a whole, the workforce in the manufacturing sector is being provided with increasing access to medical care as a consequence of employment. There is a parallel trend to provide these services off-site, primarily through contractual sources. There also appears to be a tendency to eliminate the traditional on-site occupational medicine physician in favor of contractual sources of care. Since the NIOSH data indicates that on-site provision of physician services in both small and large industrial facilities appears to be more comprehensive and to be provided more frequently, there is some concern about the ultimate effect on the health of the workforce.

Lead-Based Paint Abatement: A State's Attempt at Regulatory Control

Lewis D. Pepper, Massachusetts Department of Public Health, Cambridge, MA; R. Rabin, Massachusetts Department of Labor and Industries, West Newton, MA

Lead-based paint, a major source of environmental lead, is a cause of childhood and adult occupational lead poisoning. The Massachusetts Department of Public Health Childhood Poisoning Prevention Law was modified to give the Department of Labor and Industries (DLI) authority to ensure the health and safety of deleaders. Approximately 60% of Massachusetts residences contain lead-based paint in the interior or exterior. Deleaders are not protected by the OSHA Lead Standard or Massachusetts regulations regarding lead exposure. The presentation will include a summary of the Massachusetts Lead Law and Deleading Regulations. Included will be a description of the DLI's unique enforcement program which requires both medical surveillance and training for deleaders. Common deleading techniques and required exposure controls will be presented. Typical exposure problem areas associated with deleading will be discussed. The program's medical surveillance component, which includes periodic blood lead testing, will be described and the results for the first year will be given.

Key Points for State Legislation for Occupational Disease Surveillance and Control

Dennis M. Perrotta, Texas Department of Health, Austin, TX

State governments interested in determining the impact and severity of occupational diseases in their jurisdictions may require specific enabling legislation to collect needed incidence data. State occupational health efforts must examine local issues of case recognition, reporting, collation and analyses, and make provisions for follow-up. Therefore, an overall approach, of which surveillance is but one part, should address issues of confidentiality, right-of-access to medical records, future changes to the list of reportable conditions, mandatory reporting, acting

upon clinically suspected cases, and right of worksite entry for follow-up and sampling. The Texas Occupational Disease Reporting Act is used as an example for these and other selected points. Supported by clear legal mandates, occupational disease surveillance efforts may significantly contribute to reducing the occupational disease burden.

Worker Injury Database System: A Key to Understanding Safety Problems

John C. Pine, Louisiana State University, Baton Rouge, LA

The Worker Injury Database System (WIDS) is an on-line public access database system composed of worker compensation claims. In a cooperative project between Louisiana State University (LSU) and the Louisiana Office of Worker Compensation (OWC), public and private employers may obtain information on the nature and frequency of employee injuries and illnesses. The database system includes state worker compensation records (claims) from 1985-1990 and formatted according to the Bureau of Labor Statistic's SDS (supplemental data system) guidelines. Employers may obtain access to the WIDS by a serial modem and obtain data to compare a facility to other similar industries in the state or compare occupations in a specific industry to other similar occupations. Comparisons are made by either predetermined reports or by a menu guided user friendly structured query. Employers are able to obtain comparative data so as to assess the short term and long term effectiveness of safety programs in a specific industry. WIDS is being expanded to include medical and indemnity payments for 1990. Accurate and timely information on worker injuries is critical in analyzing safety problems and the development of strategies to meet them.

Targeting of High-Hazard Industries by a State Labor Department

Richard Rabin, Massachusetts Department of Labor and Industries, West Newton, MA

The Massachusetts Department of Labor and Industries (DLI) has initiated a program to conduct workplace investigations of high health hazard industries. Historically, the Department's Division of Occupational Hygiene has investigated workplace hazards only in response to workers' complaints. As a result, many workplaces are never evaluated because workers do not speak English, do not know how to file a complaint or fear for their jobs.

The Department's project to target high hazard industries includes: (1) the identification of industries (by SIC code) in Massachusetts with elevated rates of illness and/or OSHA violations; (2) investigation of a random sample of small-to-mid-sized companies within those selected industries; (3) workplace investigations that include walk throughs, air sampling and/or observation of individual work processes; (4) a report with an evaluation and recommendations after each investigation, and (5) a summary report for each industry investigated, to be disseminated to companies, unions, and other interested parties. The project began in January 1991, and the presentation will provide results as of July 1991.

Let's Get the Lead Out: One State's Approach to Controlling Lead Hazards in Construction

John F. Rekus, Maryland Occupational Safety and Health, Baltimore, MD

Lead is perhaps the oldest known occupational health hazard dating from about the 4th century BC when Hippocrates first described its effects on miners. Its physical and chemical properties make it an excellent preservative coating and lead-based paints have been used for decades to protect structural steel from rusting. In the early 1980's MOSH industrial hygienists discovered that many construction workers who performed welding, oxyacetylene cutting or abrasive blasting on painted steel structures suffered from acute lead poisoning. Since the OSHA lead standard exempted the construction industry, MOSH developed its own standard regulating lead exposures in construction. This paper outlines the requirements of that standard and describes how employers were encouraged to comply with it through educational seminars and enforcement activities.

Occupational Exposures and Mortality Among U.S. Construction Workers 1984-86: Filling in the Gaps

Cynthia Robinson, H. Venable, F. Stern, C. Burnett, K. Sieber, J. Sestito, T. Frazier, M. Fingerhut, CDC, NIOSH, Cincinnati, OH

Construction is one of the largest industries in the United States and employs 7.5 million workers. There is evidence indicating that construction special trades workers may be experiencing a high proportion of work-related injuries, but not much is known about health. This has led to an effort to explore the health problems of construction workers. As a first step, we analyzed the 1984-1986 NIOSH occupational mortality surveillance data. This is occupation-coded death certificate data from 19 U.S. states that together with the National Center for Health Statistics and the National Cancer Institute have shared the added costs of coding occupation and industry on their death certificates. Results show that several site-specific cancers and other chronic disease PMRs were statistically significantly elevated for 61,682 white male construction workers. Men younger than age 65, who were probably still employed at death had significantly elevated PMRs for cancer, asbestos-related diseases, mental disorders, alcoholism, digestive diseases, falls, poisonings, industrial fatalities and homicides. Statistically significant elevated PMRs were observed for men in several construction trades. NIOSH environmental data sets indicated that there were many potentially hazardous exposures at construction worksites. The data suggested several hypotheses for future in-depth research as well as some new NIOSH surveillance Branch projects for construction workers.

Minimum Specifications for Occupational Health Surveillance - Workplace Followup of Occupational Disease Reports

Kenneth D. Rosenman, Michigan State University, Lansing, MI; F. Watt, Michigan Department of Public Health, Lansing, MI

It has been recommended that State Health Departments conduct surveillance for occupational

disease. In addition to monitoring trends, these reports, as with communicable disease, can be used to initiate public health investigations. Data will be presented on the workplace investigations of 300 patients with silicosis and 100 patients with asthma. The outcome of workplace investigations initiated by disease surveillance will be compared with investigations initiated by employee generated complaints.

Although it is not financially or legally feasible to include routine workplace followup as minimum activity at a State Health Department, it is important to show whether or not routine followup of an occupational disease report is useful. The data that will be presented on the efficacy of workplace investigations comes from OSHA inspections conducted by the Michigan Department of Public Health. Since referrals to OSHA are an important referral pattern used by State Health Departments, the results that will be presented are potentially generalizable to other states.

Tuberculosis: An Occupational Health Hazard in Prison Workers

Sarah Royce, California Occupational Health Program, California Department of Health Services, Berkeley, CA

Inmates in the California Department of Corrections have an adjusted TB incidence rate three times greater than that of the California population, due at least in part to intramural transmission. Two additional factors make TB a serious occupational health risk for prison workers: the HIV epidemic and multi-drug resistant TB.

A Cal/OSHA inspection of a state prison has helped focus public attention on CA's 100,000 inmates as a reservoir of TB for the community at large. COHP is providing medical/epidemiologic consultation to Cal/OSHA on the investigation of TB transmission to prison workers.

Minimizing the TB risk to workers requires controlling the epidemic in inmates. Therefore, COHP recommendations include TB skin testing of all inmates and employees who share air with inmates. Other proposed strategies are developing outreach plans and facility licensing/accreditation policies that address the occupational risk of TB, surveillance mechanisms to assess TB risk in other worksites, and an OSHA airborne infectious disease standard.

Targeting Health Promotion Using Occupationally Coded Mortality Data

Carol Hogfoss Rubin, C. A. Burnett, W. Halperin, P. Seligman, CDC, NIOSH, Cincinnati, OH

Twenty-three states have contributed to an occupationally coded mortality data set. We evaluated this data in terms of its utility in identifying groups of workers who are at greater risk of nonoccupational diseases and therefore may benefit from targeted prevention. 2.9 million occupationally coded death certificates collected between 1979 and 1987 were used to calculate Proportionate Mortality Ratios (PMRs) for a series of preventable diseases. Ten causes of

preventable death e.g., breast cancer, cervical cancer and ischemic heart disease, were analyzed and groups of workers with elevated PMRs described. Each disease exhibited a distinctive pattern of variation by occupational grouping. For example, there is an elevated risk of breast cancer among teachers (PMR=164), whereas this group exhibits a low risk of cervical cancer (PMR=76). We conclude that prevention of disease in the workplace must have occupationally induced illness as its primary focus but should also use occupation to target and reach populations that will benefit from disease prevention programs.

Closing the Loop: How Surveillance and Intervention Activities Complement Each Other in Occupational Disease Prevention and Control

Linda Rudolph, N. Maizlish, K. Dervin, California Occupational Health Program, CDHS, Berkeley, CA; J. Bellows, California Public Health Foundation, Berkeley, CA

This paper reviews California occupational disease surveillance programs (lead poisoning, pesticide illness, carpal tunnel syndrome), and discusses the interactions between surveillance and intervention activities. For example, a survey of lead-using employers indicated that only a tiny fraction of lead-exposed workers were receiving blood-lead monitoring. On-site evaluations in fifty lead-using companies in Los Angeles County verified wide variations among different industries with regard to lead poisoning prevention practices. A laboratory-based lead registry showed very few case reports from industries with low prevalences of blood-lead monitoring. A multi-faceted program designed to reduce lead poisoning in the radiator repair industry focused initially on efforts to ensure blood lead screening in radiator repair workers, to make this industry accessible to the existing surveillance system. Registry case reports for radiator workers increased about eight-fold in one-year period.

Parental Occupational Lead Exposure and Childhood Blood Lead Levels

Laurel C. Schulze, J. L. Pichette, J. D. Brender, Texas Department of Health, Austin, TX; C. M. Johnson, Southwest Texas State University, San Marcos, TX

Numerous studies have documented that children of lead workers are at increased risk of secondary exposure to lead. Blood lead levels as low as 10-15 micrograms per deciliter of whole blood have been associated with neurobehavioral deficits in young children and fetuses. Studies of lead workers and their children have found a large number of cases where the children have blood lead levels above 30 mcg/dl. This study examined whether there was a relationship between blood lead levels for workers and their children from the battery manufacturing and battery recycling industries in Texas. Data analysis was limited to 229 workers and household members who met the case definition of the study. Although no correlation was found between the worker's blood lead levels and that of their children, 30% of the children tested had blood lead levels 15 mcg/dl or greater. A statistically significant difference was noted when comparing children's mean blood lead levels by type of industry. Children, whose parents worked in battery recycling, had a mean lead level of 21.5 mcg/dl compared to mean lead levels of 9.9 and 12 mcg/dl among children whose parents who worked in battery manufacturing. A significant

decline was also noted in blood lead levels as age increased. Mean blood lead levels did not vary significantly according to other exposure opportunities.

Hazard Surveillance for the 1970's, 1980's, and the Future

Joseph A. Seta, D. Pedersen, M. Carroll, R. Young, A. Greife, CDC, NIOSH, Cincinnati, OH

NIOSH researchers have conducted two major nationwide surveys as part of a hazard surveillance program. The first survey, known as the National Occupational Hazard Survey (NOHS), was conducted in 1972-1974. The second survey, known as the National Occupational Exposure Survey (NOES), was conducted in 1981-1983. The Cooperative Exposure Survey (CES) is on the drawing board. The CES is a multiphase program to illicit voluntary cooperation from employees and to identify and inventory hazardous agents in their facility. Data are presented which describe and demonstrate the utility of the two national surveys and the CES from a state and local occupational health and safety perspective. Several hypotheses are generated that may have application for hazard surveillance in the future. The NOHS and the NOES could be valuable reference or base-line data sources, while the CES could serve as an early warning system or as a locator resource, or as a supplement to data gained from other sources. Several computer-generated maps are presented that identify geographic areas where trends in potential exposures to selected agents are most dramatic.

OSHA's Hazard Communication Standard: Prospects for Revisions and International Harmonization

Jennifer C. Silk, OSHA, Washington, DC

Workers exposed to chemicals are provided information about their hazards under OSHA's Hazard Communication Standard (HCS). The rule requires employers to establish hazard communication programs, including labels on containers, material safety data sheets (MSDS), and worker training. Although originally intended solely for workplace protection, standards addressing community right-to-know have extended the use of the chemical hazard information developed under the HCS to the public. The MSDS is thus expected to satisfy the needs of many different user groups, from exposed workers to physicians providing medical surveillance. OSHA has been evaluating its experiences in implementing the rule to determine if modifications would allow the information transmitted to be used more effectively. Public comment was solicited on these issues, and nearly 600 responses were received. Standardization of label and MSDS formats was of primary concern to commenters. In addition to OSHA's reconsideration of these issues, there are a number of ongoing international activities regarding transmittal of chemical hazard information. In particular, efforts are underway to attempt to harmonize various international approaches to classifying chemicals as to their hazards, and preparing appropriate labels and MSDSs. If successful, such harmonization would result in the use of the same label and MSDS worldwide.

Integrated Strategies to Control Work-Related Injuries and Illnesses in Washington State

Barbara Silverstein, J. Kaufman, Washington State Department of Labor and Industries, Olympia, WA

The Washington State Department of Labor and Industries (L&I) is in a unique position to use integrated prevention models to address occupational safety and health problems. The multi-disciplinary Safety and Health Assessment and Research Program (SHARP) uses the Industrial Insurance (II) division's databases to identify risk classes with high rates of claims for work-related illnesses and injuries, (e.g., carpal tunnel syndrome, back disorders, lead poisoning). SHARP conducts field studies to characterize disease and exposure in those risk classes, works with employers and employees to identify controls, and evaluates the effectiveness of interventions. This model builds on the enforcement duties of L&I's division of Industrial Safety & Health (WISHA, the state OSHA plan), which requires joint labor-management health & safety programs. L&I also sponsors outcome research in musculoskeletal disorders (e.g., lumbar fusions, carpal tunnel releases) in order to focus tertiary prevention resources effectively, and works with provider groups to reduce unnecessary procedures. Successful prevention models can be transferred to those in II and WISHA, and to employer and employee organizations for further implementation.

Establishment of a State-Based FACE Project in the New Jersey Department of Health

Emily Smith, G. Sorock, P. Bost, New Jersey Department of Health, Trenton, NJ

The Occupational Health Service in the New Jersey Department of Health (NJDOH) has established a Fatal Accident Circumstances and Epidemiology (FACE) project based on the NIOSH FACE protocol. The purpose of FACE is to conduct in-depth investigations of specific types of workplace fatalities and to make recommendations for their prevention. The FACE project was facilitated by our on-going fatal injury surveillance database which indicated the number and type of expected fatalities per month. Inter-agency cooperation between the NJDOH and federal OSHA was achieved after confidentiality issues were resolved. County-based medical examiners and OSHA Area Directors have reported cases to us. The NJDOH FACE investigators conduct joint on-site investigations with OSHA of the causes and contributing factors of fatal occupational falls and electrocutions. The methods and results of the first 15 investigations will be discussed. Two investigations will be described in detail. The future plans of our project include continuing investigation of workplace fatalities with possible expansion to confined space fatalities and wide dissemination of results of investigations to prevent the occurrence of similar injury events.

Use of New Jersey's Hospital Discharge Database for Surveillance of Nonfatal Work-Related Injuries

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Computerized population-based hospital discharge data in New Jersey offer new opportunities

for surveillance of serious work-related injuries. This database was evaluated for its potential in identifying selected injuries that occurred at work during 1985 or 1986. Hospital discharge data were compared with data collected by telephone interview of discharged patients. A total of 1,575 unique hospital discharge records included: Finger amputation (1,041), thumb amputation (209), crush injury of the lower limb (208), toxic effects of heavy metals (69) and eye burns (48). A total of 289 persons were located and consented to be interviewed. Sixty-one percent (175) said their injury was work-related. A comparison was made between self-reported injury at work and the presence of workers' compensation payer codes on the discharge database. The agreement beyond chance (Kappa) was 0.78 (95%CI=0.67,0.89). The sensitivity of this indicator of work-relatedness was 83%; specificity was 98%. These data suggest that workers compensation payment on the hospital discharge database may be a good to excellent proxy indicator of the work-relatedness of these injuries. Limitations include the 17% underestimate of work-related injuries using the workers' compensation payer codes.

WORKSAFE IOWA Occupational Medicine Associates Network - A University/Community-Based State-Wide Occupational Health Outreach Program

Nancy L. Sprince, J. A. Merchant, L. Albrecht, The University of Iowa, Iowa City, IA

The WORKSAFE IOWA Occupational Medicine Associates Network provides occupational health outreach services state-wide at the community level. This innovative university/community-based hospital model provides consultation in industrial hygiene and occupational medicine, education programs, and information services to occupational health programs at ten community-based hospitals in Iowa and bordering communities. Local occupational health programs provide a wide range of occupational health services to employers and workers. The Network is also utilized by members to share resources, ideas, and strategies. An electronic bulletin board links the hospitals with one another and the WORKSAFE IOWA staff and provides for an occupational health dialogue. Successes of this program include greater integration of occupational medicine and industrial hygiene at the local level, greater local visibility of occupational health issues, and greater availability to local programs of expertise and resources in occupational health education and information services. A grant from the W. K. Kellogg Foundation and affiliation fees from participating hospitals provide support.

Minimum Specifications for Occupational Health Surveillance: Surveillance Utilizing Hospital Discharge Records

Martha J. Stanbury, H. Fonius, New Jersey Department of Health, Trenton, NJ

In this report it is recommended that minimum specifications for state health department based occupational health surveillance include the utilization of hospital discharge data for trend monitoring and sentinel event surveillance. The inherently occupational diseases such as pneumoconioses and certain acute lung conditions are identifiable by IOD code. Although personal identifiers usually are not available, trend monitoring can be accomplished by eliminating repeat admissions through matching on demographic variables. Simple

extrapolations from these data can be used to make estimates of disease in the non-hospitalized population. When personal identifiers can be obtained, either voluntarily from hospitals or by implementing a hospital reporting regulation, these data are useful for index case identification and follow-up, using the SENSOR model of occupational disease surveillance. These and other applications of hospital discharge data for occupational health surveillance will be presented.

Development of Nationally Standardized Occupation and Industry Coding Software

Nancy Stout, CDC, NIOSH, Morgantown, WV; G. Doebbert, CDHS, Sacramento, CA

Surveillance of occupational injuries and diseases requires accurate categorization of occupations in industry (O/I) information to characterize work injuries and illnesses. Narrative O/I entries on vital records are often manually coded into standardized employment categories as part of state-based surveillance activities. Although some state and federal agencies have independently developed O/I coding software to meet their specific requirements, there is a need for a nationally standardized software that is accurate, efficient, and applicable to a broad range of users. Availability of such software to states would allow for cost effective O/I coding and provide data comparability by state. In a collaboration with NCHS, AVRHS, and CDHS, NIOSH sponsored a feasibility study and alternatives analysis for developing such software. The process and results of this study are presented and the next steps in the development of nationally standardized O/I coding software are discussed.

Innovations in Consultation and Training

Phyllis Straight, Oregon OSHA, Salem, OR

Burden by a growing Workman's Compensation costs, a labor management taskforce's endeavor to change the Compensation system, provided an unprecedented opportunity for Oregon OSHA to implement expanded consultative, training and technical resources services. With additional staff of 73 (some of which were enforcement) services were expanded and unique programming created.

In training and consultative sections specialist in agriculture, logging, construction, and ergonomics, were added to compliment a staff of general manufacturing, and industrial hygienist.

The success of our training core curriculum has been phenomenal. Specifics on workshops in Safety and Health Management; Recordkeeping; Hazard Communication; Safety Committees; Accident Investigation; Job Safety Analysis and Ergonomics for Supervisors will be discussed.

By creating a consultative services program funded with state money other innovations were able to be implemented. Including a "loaned" consultant program; a switch from the walk-around point out the hazard to safety and health planning assistance; and hazard identification classes for safety committee members.

The Technical Resources section approve innovative safety committee approaches (safety committees are mandatory for any employer having more than 11 employees at any time in the previous calendar year another innovation from the workers compensation reform bill). Highlights will be shared.

An Approach to Mercury Surveillance Intervention in a State Health Department

Eileen Senn Tarlau, M. V. Howarth, L. Bullock, R. Iglewicz, D. Singh, N. P. Singh, New Jersey Department of Health, Trenton, NJ

The New Jersey Department of Health recently initiated follow-up to laboratory reports of elevated mercury levels in blood and urine. In designing our approach to intervention, we first assessed existing efforts to control occupational mercury exposure. We will describe the results of our assessment in the following areas: 1) The prevalence of biological monitoring for mercury and the state of the art of sample collection, analysis and interpretation, 2) The regulatory environment including OSHA exposure limits, OSHA mercury control guidelines for employers, applicable OSHA regulations and the possibility of workplace referrals to OSHA, and 3) The availability of information on mercury controls such as respirators, gloves, spill clean-up procedures and materials, air monitoring equipment, and educational materials. We will outline our objectives and activities and explain how they complement existing efforts to control mercury exposure. We will present the results of symptom and exposure interviews of persons reported to the registry since 1988 and their correlation with blood and urine mercury levels. We will describe our procedures and aids for workplace evaluations including employer and employee interview forms, educational materials, report format and standard language for reports. Finally, we will describe our database for collecting and analyzing hazard surveillance information on workplaces using mercury and present preliminary findings on 40 workplaces.

NIOSH Information Services

Rodger L. Tatken, V. K. Morgan, CDC, NIOSH, Cincinnati, OH

As part of its information acquisition and dissemination activities, the National Institute for Occupational Safety and Health (NIOSH) operates a toll-free number (1-800-35-NIOSH) to improve the public's access to NIOSH and its information resources. This number is not an emergency response or medical hotline, but does make it convenient for all segments of the working and general public to request technical information, health hazard evaluation forms, and other information about NIOSH activities. Use of the service increased 269% during its first three years and is up another 63% during the first half of FY-91, now exceeding 1700 calls per month. Subjects most often asked about include specific chemicals (e.g., asbestos), video display terminals, indoor air quality, lifting, and personal protective equipment.

NIOSH also prints and distributes a variety of publications and maintains and makes publicly available two computerized databases of toxicity and occupational safety and health information. A description of these databases, RTECS® (Registry of Toxic Effects of Chemical Substances) and NIOSHTIC®, will be provided.

Occupational Fatality Surveillance in Massachusetts

Lynn Taylor, L. Davis, Massachusetts Department of Public Health, Boston, MA

A comprehensive traumatic occupational fatality system should accomplish two goals. It should: 1) rapidly identify individual traumatic occupational deaths so that prompt workplace investigations can be carried out; and 2) document overall patterns of traumatic occupational fatalities to both target and evaluate prevention efforts. The MA traumatic occupational fatality system is designed to accomplish both of these goals. It includes a 24-hour occupational fatality hotline, in-depth investigations of selected fatalities (conducted as part of the national Fatal Circumstances and Epidemiology (FACE) Project, and annual analysis and dissemination of traumatic occupational fatality data collected from multiple sources. Our experience with the hotline and in conducting FACE investigations will be described, and recent summary findings reviewed.

Poison Control Center Follow-up of Work-Related Chemical Poisonings

Allison Tepper, E. Senn Tarlau, New Jersey Department of Health, Trenton, NJ; T. Jennis, S. Marcus, New Jersey Poison Education and Information System, Newark, NJ

A prospective follow-up of work-related poisonings reported to a statewide poison control center (PCC) will be described. The project was designed to assess the feasibility of conducting case follow-up and the opportunity for initiating workplace-based prevention projects.

Of 897 reported cases reported from July 1989 through June 1990, 456 (51 percent) were interviewed. Lost time was reported by 35% of cases, with an average of 2.9 lost days. Thirty-nine percent of those interviewed reported co-workers with poisoning symptoms. In 28% of the episodes, more than five co-workers were affected. Chemical spills and splashes accounted for many cases; inhalation was the most common route of exposure (55%). Lack of protective equipment (36%) and poor ventilation (34%) were the most frequently cited contributing factors. Seventy-two percent of cases felt that their exposure was preventable. At the time of the interview, 49% of cases were still exposed to the poisoning agent, most on a daily basis.

This project shows that case follow-up is feasible, but inability to contact 49% of the cases limits use of the data for describing the extent and nature of the problem. The strength of this PCC-based surveillance system is its ability to identify serious and on-going workplace exposures that are preventable and, thus, amenable to workplace-based intervention by public health agencies.

Occupational Mortality Surveillance for Upstate New York

Gene Therriault, J. M. Melius, New York State Department of Health, Albany, NY

Since 1980, the New York State Department of Health has been coding occupational and industry information on all death certificates for New York State (exclusive of New York City). These data provide the basis for surveillance of mortality trends by occupation as well as for the

detection of possible associations between occupational exposures and specific causes of death.

Data from this analysis will be presented focusing on specific associations for occupational groups and possible new associations. The latter include fire fighters and brain and kidney cancer; service station workers and kidney cancer; and leather workers and leukemia.

Training of Safety Committee Members by State Government Sponsored Seminars

Clark E. Thomas, Arkansas Department of Labor, Little Rock, AR

Two state agencies, the Arkansas Workers' Compensation Commission and the Arkansas Department of Labor, teamed up in 1990 to offer a series of training seminars to reduce the common causes of accidents and injuries in industrial workplaces. Statistics were reviewed and employers interviewed to determine training needs. Local advisory boards of labor and management were used to help organize support for the programs.

Regional seminars were planned in strategic geographic areas and local businesses were invited. Conference registration fees were kept to a minimum and companies were encouraged to send hourly employees, supervisors and members of their in-plant safety committee. The information was provided in a basic format for people without much formal education in safety related matters. Door prizes were donated by area merchants and businesses. Over 1600 people attended the series of six conferences and attendees stated they received valuable safety-related information. The program is now beginning its second year.

Private Industry Compliance with New Jersey's Silicosis Surveillance Program

David J. Valiante, P. Bost, M. Stanbury, New Jersey Department of Health, Trenton, NJ

The New Jersey Department of Health (NJDOH) has maintained a register of silicosis cases using records, starting in 1979. To date 737 cases have been reported, of which 177 have been confirmed based on interview, medical records, and X-ray data. The NJDOH conducted 54 workplace inspections as the result of reports of silicosis. The inspection consisted of employer and employee interviews, a plant walkthrough and a report with recommendations aimed at preventing exposure to silica dust. Company compliance with these recommendations is strictly voluntary.

NJDOH evaluated company compliance with our recommendations through follow-up inspections at 15 companies. A total of 136 recommendations were issued to these companies during the original inspections between 1986 and 1990. We found that approximately half of the recommendations were fully or partly implemented. Compliance with NJDOH recommendations will be presented by industry type, by hazard category, and by recommendation type. The significance of these findings for silicosis surveillance using the SENSOR model will be discussed.

New Jersey's Worker Right to Know Program

Richard Willinger, New Jersey Department of Health, Trenton, NJ

New Jersey adopted the nation's strongest Worker and Community Right to Know law in 1983 and has been enforcing it in the public sector since that time. The law has several unique features. Hazardous substance inventories have been collected from over 10,000 public facilities. The inventory also includes information on the number of employees exposed to each substance. The Program has written more than 1,000 Hazardous Substance Fact Sheets. Similar to Material Safety Data Sheets, the fact sheets have a standardized format and are written to be understood by a non-technical person. They are being used nationally and internationally. The labeling required in New Jersey goes beyond the Hazard Communication Standard by requiring the exact chemical names and CAS numbers of the top five ingredients plus any additional hazardous substances in a product. Other aspects of the Program include education and outreach, working with all of New Jersey's counties, and performing inspections to enforce the law.

Testing a Census Approach to Compiling Data on Fatal Work Injuries

Janice Windau, BLS, Washington, DC; D. Goodrich, Texas Department of Health, Austin, TX

Although aware of general types of events that can lead to workplace deaths, researchers still search for a complete and accurate count of occupational fatalities. This report, appearing in a recent issue of the Monthly Labor Review, presents the results from a study that piloted a census approach to counting work-injury deaths in Texas. In conjunction with BLS, the state compiled fatal occupational injury information from death certificates and other sources. For single-source fatalities, the state attempted to verify work relationship through a followback to the employer or other knowledgeable person.

The study concluded that multiple sources are needed to compile complete and accurate data on occupational injury fatalities. Furthermore, a procedure must be developed to obtain additional information for fatalities identified by a single source or when work relationship cannot be determined. This followback must be timely to ensure adequate response. Data compiled during the study showed that motor vehicle accidents and homicides comprised the largest number of fatal workplace injuries in Texas. Fatal injuries were concentrated in the construction and transportation industries.

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