

IV. Sentinel Event Notification System for Occupational Risks (SENSOR): The Concept

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Introduction

As Langmuir¹ and Foege and colleagues² have discussed, the purpose of surveillance is not only to collect and analyze data but also to direct active prevention programs designed to control and, when possible, eliminate the occurrence of preventable disorders. In the past, several states have enacted specific laws and regulations requiring physicians, laboratories, and other health care providers to report selected occupational diseases.³ Although in a few states the development of targeted reporting systems has been linked with case follow-up and workplace intervention from the beginning,* in most instances, state programs for provider reporting of occupational conditions have not, unfortunately, been linked with response and intervention efforts.

Other shortcomings have also been identified that have limited the usefulness of provider-reporting systems.⁴ These include uncertainty among providers about characteristics of specific occupational disorders (i.e., lack of epidemiologic case definitions). In the reporting of communicable diseases, on the other hand, the development of case definitions has greatly facilitated the epidemiologic investigation of selected conditions.⁵ Another limitation of existing reporting systems for occupational disease is the lack of formal, defined networks of sentinel providers with specific responsibility for reporting selected conditions to state health agencies. Although the regulations in many states specify that any occupational disease should be reported, inadequate guidance has been provided to practitioners on how to carry out such reporting. Finally, the resources to receive, analyze, and direct responses to reported cases are minimal or lacking in most states.

Overview

To address these limitations, 10 states have initiated targeted provider-reporting systems, called collectively the Sentinel Event Notification System for Occupational Risks (SENSOR), to perform active surveillance of selected occupational conditions. These SENSOR systems build on the experience and capacity already present in state health and labor departments, which were, in part, previously developed with NIOSH support.

In its original concept, the SENSOR system consists of two organizational components (Figure 1). First, a network of sentinel providers (e.g., individual practitioners, laboratories, and/or clinics) is identified in each state system. This provider network recognizes and reports cases of the selected occupational disorders to the surveillance center. The center receives reports from and interacts with the providers,

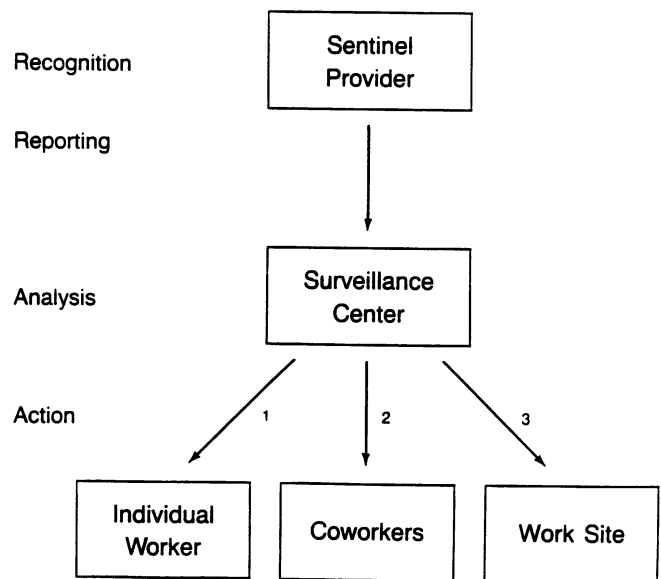


FIGURE 1—Organizational Components of SENSOR

analyzes the data, and directs intervention activities toward the individual cases, co-workers, and the worksites from which cases are reported. The center is also responsible for handling confidential medical data properly and for determining appropriate and effective intervention procedures. Besides fulfilling this pivotal role of coordinating responses to provider reports, the center may also provide technical consultation or more substantive action on a wide variety of occupational health issues (e.g., use of vital records and other existing data sources for monitoring trends of occupational disorders, disseminating information, etc.). In most states where the health and labor departments share responsibilities in occupational health and safety, the surveillance center is expected to facilitate interaction between complementary programs that may currently exist in relative isolation.

In most instances, this center is located in the state health department. The surveillance center is responsible for: maintaining targeted reporting activities (including case finding); following up reported cases (including case confirmation); screening for the disorder in other workers at the site; evaluating worksite factors potentially responsible for the disorder; issuing workplace-specific recommendations for hazard abatement; and developing and maintaining other appropriate and possible activities related to occupational illness and injury (e.g., trend analysis, education, technical consultation, information dissemination).

Recognition

To facilitate the recognition by sentinel providers of

NOTE: Author affiliations and addresses are listed on p. 7.

*Honchar PA, Martin J: Development of surveillance and intervention for lead-exposed workers in Texas: preliminary results (in preparation).

selected occupational conditions, NIOSH has limited the initial scope of the program and identified six conditions (silicosis, occupational asthma, pesticide poisoning, lead poisoning, carpal tunnel syndrome, and noise-induced hearing loss) that lend themselves with comparative ease to provider reporting. The criteria for selection of conditions are discussed in chapter V of this monograph. Depending on local evaluations of occupational risks, which vary from state to state, the surveillance centers can also propose other conditions for reporting.

Besides helping to identify conditions for reporting and follow-up, NIOSH is also completing a set of reporting guidelines for the selected conditions to help practitioners recognize possible cases, and a set of epidemiologic case definitions for the centers to use in counting and summarizing reported cases and in assessing the need for follow-up investigation. These guidelines and definitions will improve provider awareness and understanding of the selected occupational conditions and encourage uniform reporting among participating states. Ultimately, analyses of case reports will provide useful information about the characteristics of selected occupational conditions, their sequelae, and other important clinical and epidemiologic features.

Reporting

Providers usually report cases to state health departments by telephone or mail, using forms developed by the requesting agency. Recent advances in computer technology and telecommunication techniques now provide more efficient and rapid alternatives for transferring this information.⁶ NIOSH is facilitating a more interactive transmission of data from providers to surveillance centers by supporting the development of computer technology that allows electronic transmission of data for analysis and response.

The absence of immediate capabilities for electronic transmission of case reports is not, however, delaying or deterring the development of targeted reporting systems. The surveillance centers interact directly with sentinel providers in all current projects to encourage the recognition and reporting of occupational cases.

Analysis

Staff epidemiologists, statisticians, and other occupational health professionals in the surveillance centers analyze case reports from the provider network and determine whether further case follow-up and action are appropriate. In addition, they prepare summaries of reported cases and responses for distribution, especially to the sentinel providers who have reported the cases. In many states, the results of such analyses can be disseminated through publications directed at public health professionals, physicians, and other professionals. The results of such analyses can often be appropriately included in such CDC publications as the *Morbidity and Mortality Weekly Report (MMWR)*.

Although the data from SENSOR projects are primarily useful for case identification and follow-up, they are also valuable as supplements to other data sources currently used within the states to monitor trends in the occurrence of selected occupational disorders.⁷

Action

Active response and intervention are the heart of the SENSOR concept. Three activities can follow the receipt of a

confirmed case report. First, health officials contact the individual who sustained the disorder and offer an intervention to improve health or retard disease progression. (See chapter I in this monograph.) As SENSOR projects develop further, case-management guidelines will be provided to practitioners who report these cases. The second action is directed toward co-workers who are often at risk for developing similar occupational disorders because of common workplace exposures. The screening of co-workers is often appropriate to detect early, potentially reversible health disorders. Finally, in response to reports of individual cases, the surveillance center can coordinate and/or carry out interventions directed at specific causes in the workplace. In view of the current variability in state programs for controlling occupational safety and health hazards, local resources should be considered and used to determine the most appropriate mechanisms for directing such worksite action.

Conclusion

Mandates for provider-reporting systems have existed in several states for many years, but various shortcomings have prevented the potential of targeted surveillance and follow-up for occupational illness and injury from being realized. To achieve a more uniform, active approach to provider reporting, SENSOR was created as a cooperative, state-federal effort to develop local capability for recognizing, reporting, following up, and preventing six selected occupational disorders. NIOSH funded 10 SENSOR projects in late 1987 and early 1988 to demonstrate the feasibility of this approach. Ultimately, joint state-federal support will be essential for maintaining SENSOR activity within the states.

SENSOR should not be viewed as the sole approach for surveillance of occupational illness and injury. Other approaches for identifying cases of occupational illness or injury and for monitoring trends in the occurrence of these disorders will continue to function as components of the overall NIOSH plan for improving surveillance in occupational health and safety.⁷ The development of SENSOR is expected to be a significant milestone toward realizing a comprehensive surveillance system for occupational disease and injury in the United States.

Summary

Although many states have laws that require health providers to report cases of occupational illness and injury, most states do not maintain a comprehensive system that actively identifies and targets potential sources of case reports and then responds to such reports. NIOSH has

TABLE 1—SENSOR States and Target Conditions, 1988

State	Silicosis	Occupational Asthma	Pesticide Poisoning	Lead Poisoning	Carpal Tunnel Syndrome	Noise-Induced Hearing Loss
California			X		X	
Colorado		X				
Massachusetts		X			X	
Michigan	X	X				
New Jersey	X	X				
New York				X		
Ohio	X					
Oregon			X			
Texas			X	X		
Wisconsin		X			X	

developed a Sentinel Event Notification System for Occupational Risks (SENSOR) that uses targeted sources of sentinel providers to recognize and report selected occupational disorders to a state surveillance center.

SENSOR is a cooperative state-federal effort designed to develop local capability for preventing selected occupational disorders. To demonstrate the feasibility of this approach, NIOSH initially funded seven SENSOR projects in 1987 and three additional projects in early 1988 (Table 1).

Currently, these projects are in the preliminary stages of organization and start-up, with some having begun to receive case reports. As funds become available, NIOSH intends to gradually expand the scope of the program to include additional states over the next several years.

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