

# Occupational and Environmental Health

## FROM THE BACK ROADS TO THE HIGHWAYS

by Barbara Sattler, DrPH, RN

Every day 17 workers lose their lives in the workplace. Every 5 seconds a worker is injured badly enough to require a hospital visit. These are the human costs of our "non-system" for addressing occupational safety and health. In 1992, \$115 billion were spent on workplace injuries and illnesses (Dear, 1994). It is virtually impossible to characterize the damage to communities in terms of human health and environmental damage caused by the array of environmental insults as a result of noncompliance with federal, state, and local regulations.

We are inadequately prepared to fulfill the spirit and letter of the laws created by Congress to protect our communities and workers from unhealthy and unsafe occupational and environmental conditions. The flaws in our preparation include: insufficiently trained and educated personnel, the absence of curriculum, training materials, and audit tools for occupational and environmental health and safety, and an information stream that resembles a system of back roads when we need information highways.

Since 1970, innumerable federal occupational and environmental health and safety regulations have been promulgated by the federal Occupational Safety and Health Administration (OSHA) and the U.S. Environmental Protection Agency (EPA). Many of these regulations are complex and require specialized skills and knowledge to adequately implement compliance activities. This article will address a number of issues relating to our overall pre-

paredness to comply with our current and future occupational and environmental health regulations.

Once a regulation is promulgated, which may be a decade long process, the only requirement of the federal government is to place the final standard in the *Federal Register*. Although Fortune 500 companies may have staff who regularly read the *Federal Register*, the vast majority of employers in America's workplaces do not have ready access to this document. The federal government does not have any systematic mechanism to identify affected parties or to send information to targeted audiences. Nor is there an associated mandate that training materials, audit and/or assessment guidance documents be developed once a standard is promulgated. There also is no minimum qualification for the personnel who are to be responsible for interpreting the often complex regulations and implementing compliance activities.

In the absence of a systematic approach for information dissemination, several ad hoc systems have developed. The results of a study done in Maryland in 1991 indicated that staff who are primarily responsible for occupational and environmental health and safety in small and medium sized plants received information about occupational and environmental health and safety from a wide array of sources (Snyder, 1991). An unfortunate but common mechanism by which many of these employers learn about regulations is when they receive a citation for a violation of a regulation. Other sources of information regarding regulations include trade associations; consultants; professional societies; and various government sources (including state government). Another source of information that has developed significantly in the last decade is the "loss control" staff from the insurance industry. More and more, the loss control staff are coaching employers to achieve compliance with occupational and environmental health and regulations as a requirement for continued insurance coverage.

### ABOUT THE AUTHOR:

Dr. Sattler is Director, Environmental Health Education Center, University of Maryland School of Medicine, Baltimore, MD.

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There is no quality assurance regarding the accuracy of information shared by non-governmental sources, nor is credentialing required or recommended for those consulting with employers about occupational or environmental health and safety. The U.S. Public Health Service is currently funding a project to categorize and define the many credentials awarded to environmental health professionals. In the category of hazardous waste and hazardous materials, over 75 different credentials are offered. The Bureau of Health Professionals of the Public Health Service is evaluating these credentials and attempting to assess the needs of the environmental health work force. Regional plans are being created for addressing the education and training needs of the projected environmental health work force. In the vast majority of workplaces (74%), the person responsible for occupational and environmental health and safety activities will not have had formal education preparing them for those responsibilities (U.S. Department of Health and Human Services, 1988).

This raises several concerns. What happens if employers are largely unprepared to make informed decisions regarding occupational health and safety compliance activities? We see a range of results, the most common of which is no response at all. As an example, a government study assessing private sector compliance with the 1983 Hazard Communication Standard (commonly known as the Right to Know) indicated that 58% are not in compliance with the Standard and that 30% of U.S. employers have never heard of the standard (Jeszeck, 1992).

Several years ago, the Public Health Service estimated that there were 715,000 people explicitly employed in the environmental health work force (U.S. Department of Health and Human Services, 1988). Of this group, only 11% had formal education in occupational/environmental health. Approximately 480,000 individuals were employed as operators or technicians who were not academically trained in programs leading at least to a baccalaureate degree. An adequately prepared occupational and environmental health work force is essential if we are to achieve the goals and objectives of recent legislative initiatives. Further, due to rapid advances in science and technology, the skills and knowledge of the existing work force urgently need to be upgraded.

**ROUTES OF SUCCESS—CURRICULUM AND CREDENTIALS**

There continues to be a need for a national intervention strategy to prepare the current and future envi-

ronmental health work force. In the 1960s, when the United States rose to the challenge of having an American take the first step on the moon, the American "academy" indeed responded, creating premier engineering programs across the country. This effort was supported by a national plan and the support of federal funding. A similar effort and funding program must now be launched to prepare the occupational and environmental health work force for the monumental task of protecting workers and community members from illnesses and injuries and to protect our environmental and non-renewable resources.

Such a national forum should include representatives from labor, industry, government, professional societies, and academia. The federal and state agencies responsible for the enactment of legislation concerning occupational and environmental health and safety must address the need to develop a competent work force.

The roles for various occupational and environmental health and safety specialists need to be clearly defined and meaningful credentialing systems established. This will require the development of basic or core curricula for each of the various specialties. At the same time, there must be cross training of occupational and environmental health professionals to encourage an interdisciplinary approach to problems. Finally, the disciplines of occupational and environmental health should be taught within a public health construct with emphasis on planning and prevention while also addressing remediation and clean up.

If an employer learns of the existence of a regulation or standard that will affect their workplace, some resources are available. If the regulation is promulgated by OSHA, a free consultation service exists in federal and state plan OSHA offices that can assist with interpreting the standard and in developing compliance plans. Many employers do not know about the consultation service and those who do know of its existence often choose not to use it. This may be caused by apprehension of working with a regulatory agency. Other sources of consultation include private sector consultants.

Making the decision to seek consultation (either public or private) requires an employer awareness level that is often absent. Therefore, policy questions that must be asked are: "how can we insure that all affected parties can be notified and educated in a systematic way about regulations that affect their industries and individual workplaces?; and what tools can be made available to employers and employees that will enable them to understand the health and/or safety issues and develop appropriate compliance programs?"

Under the reauthorized Clean Air Act, every state government is responsible for designating a small business ombudsman to assist small businesses in identifying qualified environmental auditors. This would appear to be an excellent start; however, there are no standardized criteria (or credentials) defining a "qualified" environmental auditor. Until we define the environmental health work force and establish standards of practice, employers will be at a loss for selecting the right person for the task at hand.

## PAVING THE WAY TO ACCESSIBLE, QUALITY INFORMATION

Addressing occupational and environmental health and safety issues requires a skilled and educated multidisciplinary team. However, training and educational institutions have not yet substantially integrated such issues into their existing curricula. For example, programs preparing health professionals, business people, and engineers should all incorporate courses on their respective roles regarding occupational and environmental health and safety.

In 1988, the Institute of Medicine, part of the National Academy of Science, convened a study group to evaluate the skills and knowledge of primary care physicians to address occupational and environmental health problems they saw in their practices (Institute of Medicine, 1988). The most important conclusion of this study was that primary care physicians were never formally trained in occupational and environmental health, and there was a tremendous need for the development of such curricula for medical schools. As a result of these findings, the National Institute for Environmental Health Science has awarded several grants to medical schools around the country to develop curricula and educational materials for medical students and residents.

In 1995, the Institute of Medicine completed a similar project involving nurses and published its finding in a report entitled *Nursing, health and the environment* (Institute of Medicine, 1995). Given that occupational health nurses outnumber physicians 6 to 1, the Institute's recommendations to increase nurses' awareness, education, training, and research regarding occupational and environmental health should be instituted by such agencies as the National Institute for Environmental Health Science and the National Institute for Occupational Safety and Health (NIOSH).

In 1991, a group of community health nurses was surveyed to determine the types of occupational and environmental health and safety problems their clients were experiencing and how well they felt they were prepared to address these problems. The results indicated that community health nurses are seeing occupationally and environmentally related problems, but find it difficult to navigate through the systems and resources necessary to seek solutions. A community health nurse who has not been adequately prepared in educational experience to ask the right questions may miss opportunities to prevent illnesses. For example, the Centers for Disease Control and Prevention (CDC) has developed a set of five simple questions that will assist a primary health care practitioner to determine whether a child may have an increased risk for lead poisoning (CDC, 1991). The absence of asking this simple set of questions may result in unevaluated, continued risk to the child and perhaps lead poisoning.

Years ago NIOSH had a program called Project Minerva, which supported the integration of occupational health and safety issues into business school curriculum. This program has been discontinued and most schools of business do not significantly incorporate occu-

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pational and environmental health and safety issues into their required courses. In a study evaluating the implementation of the Hazard Communication Standard in the manufacturing sector, the most important single variable predicting compliance with the standard was management "buy in" to health and safety (Sattler, 1990). Therefore, preparing current and future managers to understand the issues and their responsibilities will enhance their participation in the multidisciplinary team that is required to achieve the overall goals of protecting workers and the community from occupational and environmental health and safety problems. Similar concerns exist for engineering education, given that engineers are often in management positions and their work often impacts on occupational and environmental issues.

Early this year, the Institute of Medicine convened yet another committee to review the occupational and environmental health related databases of the National Library of Medicine (NLM). This committee is tasked with making recommendations to the NLM on how to make the databases accessible and useful to health care providers. Many federal agencies have made their documents available via Internet. The information stream is flowing, but we must create a context within which to make this information meaningful. We must insure that our basic education programs, community education programs, and continuing education courses support meaningful use of the information. The University of Maryland has created an Internet web server through which one can access a variety of web sites on occupational and environmental health and safety (the url is <http://ehc.umab.edu>).

The U.S. Army has been developing a prototype training program for "non-environmental" decision makers. The Department of Defense (DOD) has over 9,000 employees who are specifically tasked with environmental protection responsibilities such as compliance, restoration, prevention, and conservation. The Army has recognized that achieving environmental objectives requires all levels of management to understand the issues. In light of this, they have developed the Army Environmental Training Plan, which recognizes that "Army personnel often have a lack of environmental awareness and knowledge of how environmental programs apply within their own areas of responsibilities" (Brown, 1994). Their first and current task is to develop

## IN SUMMARY

### Occupational and Environmental Health From the Back Roads to the Highways.

Sattler, B.

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1. Our current occupational and environmental health work force is not adequately prepared to implement the regulatory requirements prescribed to maintain and improve public health.
2. In the majority of United States workplaces, the person responsible for occupational and environmental health is not formally trained.
3. Occupational and environmental health issues must be integrated into basic education programs for a wide variety of professionals such as business and engineering schools, as well as nursing and medical schools
4. Occupational and environmental health professionals must join with other public health advocates to develop and implement a strategy whereby the "value" of healthy communities and workplaces is understood and embraced at a societal level.

an extensive needs analysis. The overall goals of the Army Environmental Training Master Plan could provide a template for efforts in non-DOD sites. Their goals are:

- Institutionalize environmental training in units and schools.
- Increase environmental awareness at facilities.
- Provide short term environmental training support and products.
- Improve environmental professional career development.
- Fully coordinate existing training programs and add more courses and workshops.
- Expand environmental awareness research.
- Establish an environmental training support center.

These basic elements should be considered in any discussion about a national strategy for preparing the environmental health work force. A prepared environmental health work force in combination with informed employers, workers, and community members is essen-

tial to accomplishing the laudable goals established by Congress and the critical task of protecting workers, the community, and the environment.

In the past several years, there had been a trend to better incorporate training into the workplace. This was largely a function of the OSHA standards driven requirements for training. Striving to have trained employees is a laudable goal and an essential component in any comprehensive health and safety program. However, when offered, training is often inadequate. There is no credential or experience required by the person responsible for the training, which results in considerable variation in the quality of training.

The Hazard Communication Standard is the most often cited standard, and lack of training is the most common specific violation within the Standard. The combination of downsized budgets, which often sacrifice training and other health and safety activities; the lack of significant countervailing advocacy for health and safety; and the current budgetary restrictions being applied to regulatory and compliance capability will inevitably result in a downward trend in training and other health and safety efforts. Further, the federal emphasis on "voluntary compliance" will require a well prepared occupational and environmental health and safety work force, which is not currently consistently evident.

Over the past 2 decades, the United States population has made a tremendous value and behavioral shift regarding some safety issues: i.e., most Americans now "buckle up" before driving; many American children wear helmets while riding bicycles. These behavioral shifts were partly the result of a massive public health campaign that placed a new "value" on safety. This same type of value shift must be seen in our workplaces and communities with regard to occupational and environmental health and safety. Current trends in policy indicate that certain populations are more disposable than others. For example, lead based paint policies often leave inner city and poor children unprotected from lead poisoning, and in some workplaces the value of production regularly supersedes the value of safety.

As a society, we need to learn to value the environmental healthiness of our communities and workplaces. This shift will require better information sharing and a public health campaign that includes articulate, well informed advocates. It is a time when multidisciplinary occupational and environmental health professionals will be essential to inform the community, to help initiate a shift in values and behaviors, and to help navigate us to healthier workplaces and communities.

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## COMMENTARY

The article "Occupational and Environmental Health: From the Back Roads to the Highways" clearly articulates some of the most prevalent problems in the area of occupational and environmental health. The historical approach identifies many of the unsuccessful attempts to develop an integrated system that advocates the health of the workplace and the environment. Three main themes are presented in the article: education, communication, and accountability.

The education of individuals involved in business, management, engineering, product development, and health must include information on workplace illnesses and injuries and impact on the individual worker, the industry, and the community. Curriculum models are needed that present information within the framework of public health. Education and training is essential for all levels of workers and management and should take place within an interdisciplinary framework.

It is not enough to have a variety of professionals together in a class or seminar; rather, these individuals must learn to model a truly interdisciplinary approach to occupational and environmental health. They must be able to interact in risk assessments, planning processes, implementation strategies, and evaluation methodologies. Sattler suggests a national credentialing process to establish criteria for each of the professional groups involved in occupational and environmental health and monitoring. Additionally, she recommends that all professional programs and curricula require content on occupational and environmental regulations, standards, and control measures.

One of the purposes of the National Institute for Occupational Safety and Health (NIOSH) Educational Resource Centers (ERCs) established in the 1970s is to implement such an educational model. These centers are required to provide interdisciplinary education to graduate students and continuing education programs to practicing professionals. Additionally, ERC faculty participate as consultants to educational and professional schools within the region in developing content modules in occupational health to be integrated into existing curriculum.

The second area addressed by Sattler is communication.

Once standards are enacted, years can elapse between enactment and implementation. Lack of an adequate communication system and common data base for occupational and environmental health professionals is a major obstacle to implementation, both in terms of dissemination of information and in implementation of control processes. In today's global society, means must be developed to transmit accurate information on research findings, changing technology, and standards to a multicultural and diverse population.

Finally, Sattler addresses quality assurance. Quality assurance has become a "theme of the times." Quality assurance, quality improvement, quality control, and reengineering are all projected as answers to problems in the business and educational environment. Sattler clearly defines the concept of quality assurance as the development of excellent curriculum models of interdisciplinary occupational and environmental education and practice, establishment of credentialing centers to monitor professional expertise, and establishment of challenging continuing education programs to address the impact of new processes and technologies on the health of the individual and the community.

These issues are of major concern. However, will the proposed interventions yield the desired results? NIOSH has attempted to address the education of health professionals through an interdisciplinary model of education and practice. Individuals prepared in such an environment do implement in their practice a quality occupational and environmental health program. Many of them also are certified by the appropriate professional accrediting agency. The problem arises when resources are so limited that only a few individuals can be prepared in this manner. To effectively implement the changes Sattler proposes, money, time, faculty, and preceptors must be committed to the programs. Without the opportunity to provide excellent educational opportunities and quality practice experiences to an increased number of business and health professionals these goals will not be met.

by Carol Love, PhD, MEd, RN  
Professor and Director  
Graduate Nursing Program  
Simmons College  
Boston, MA