

Commentary

Approaches to Sharing Occupational Safety and Health Information on a Global Scale

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Background *The global burden of occupational morbidity and mortality is staggering. Information sharing has been identified as a major way of reducing this burden. Past and current approaches to such sharing and application are worth examining in order to guide future efforts.*

Methods *Recent literature from international agencies and others was examined to identify examples of information sharing and to determine the status of such sharing and related issues. Literature was included from the areas of surveillance, priority setting, research, dissemination, and risk management.*

Results *Examples of global information sharing were identified and lessons were drawn from the issues attendant to them.*

Conclusions *Results indicate that a broad range of efforts actively promote the global distribution of occupational safety and health information. To advance global approaches to the sharing of occupational and safety and health information, it is critical to improve the opportunity and capacity to access information. Important objectives in achieving this goal are developing coherent and transparent information policies, conducting research on dissemination, adaptation, and utilization of information, and overcoming barriers to information and training. Am. J. Ind. Med. 41:210–216, 2002. Published 2002 Wiley-Liss, Inc.†*

KEY WORDS: *information; training; risk communication; international agencies; occupational safety and health*

INTRODUCTION

The workforce of the world is approximately 2.9 billion out of a total of 6.2 billion people, and they work in a range of situations from pre-industrial to high technology and information. The global burden of occupational injury and illness is staggering. In 1999 there were:

- 1.1 million worker deaths
- 250 million workers sustaining disabling injuries
- 160 million workers developing occupational diseases
- 12 million injuries among youth workers [Takala, 1999].

The economic losses from this burden are equivalent to 4% of the world's GNP [Takala, 1999].

Information sharing has been identified as a major way in reducing this burden [WHO, 1995]. The challenge is improving knowledge, increasing understanding, and applying information to specific problems. In many places, the occupational safety and health (OSH) problems are not new, but known solutions have not been applied. Where new problems exist, new information needs to be created and shared.

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Critical in developing approaches for sharing information is understanding the current and future nature of workplaces and workforces. The following are major characteristics of the international workforce:

- Increasingly more employed in service sectors
- Majority of new jobs in the “informal” sector
- Increasing number of migrant and immigrant workers
- Large number of child workers
- Increasing proportion of women
- Ageing workforce
- Large number of illiterate, semi-literate, and non-native language-speaking workers [Takala, 1999; Forastieri, 1999; ILO, 2001].

Each of these characteristics have implications for the type of information developed, the intended users, and the means of transmission. Understanding the information needs of target audiences and information users is important in effecting prevention.

Information sharing is a constitutive element of each of the five major components of OSH: surveillance, priority setting, research, dissemination, and risk management. All OSH activities at the company or country levels can be seen to fit into those components. Examples of global approaches to information sharing will be described for each component.

SURVEILLANCE

International surveillance of occupational diseases and injuries build strongly on the efforts of the International Labour Office (ILO), which was established in 1917. In 1994, the ILO established the Code of Practice on The Recording and Notification of Occupational Accidents and Diseases. The code recognized that there was a need for updating methods used for data collection and classification, and for the compilation and publication of statistics. Surveillance is not only the collection of statistics, but also the analysis and dissemination of information gained from them to influence subsequent actions.

The World Health Organization (WHO) in 1994 reported that of 191 member states, statistics on occupational diseases and injuries existed in 26 developed countries, and that few of the 143 developing countries had statistics. The use of the ICD-10 has been recommended by WHO as a unified means of classifying occupational diseases for surveillance purposes. But, still there is need for national investments in collecting surveillance data and for new monitoring strategies, which give more rapid responses than official statistics [ILO, 1999].

In addition to disease and injury surveillance, there have also been international efforts for hazard surveillance [Kauppinen and Toikkanen, 1999]. For example, as part of the Organization for Economic Cooperation and Development (OECD) Task Force on Assessment, an international

ad-hoc expert group on reporting exposure information has been established. The objective of this group is to develop flexible formats and guidance for the reporting of summary exposure information related to consumer, occupational, and environmental exposures.

PRIORITY SETTING

If information is to be useful in setting priorities, then it needs to be directed to and used by decision-makers. Reducing the global burden of occupational injuries and illnesses should be considered as priority among all other types of global priorities, and then within the OSH field, priorities for research, application, and action need to be set [WHO, 1995]. Since its inception, WHO has recognized OSH as a goal, and in 1994 developed a Global Strategy on Occupational Health for All. Prior efforts served as the foundation to this strategy. For example, ILO Convention No. 155 adopted in 1981, requires ratifying states to formulate, implement, and periodically review, a coherent national OSH policy [ILO, 1981]. In 1976, the ILO Programme for Improvement of Working Conditions and Environment (PIACT) called for the preparation and revision of international labor standards, tripartite meetings between workers, employers, and government, action-oriented studies and research, and broad information dissemination.

Building on these efforts, WHO established 52 Collaborating Centres of Occupational Health that helped develop the Global Strategy on Occupational Health for All. Further, in keeping with the WHO Global Strategy on Occupational Health for All, WHO developed the Global Occupational Health Network (GOHNET) in 2000 [WHO, 2001a]. The objectives of GOHNET are to develop a global network to focus on prevention and practical solutions for reduction and control of occupational hazards; to provide mechanisms for partnerships; to improve dissemination; and to establish and strengthen local education and training on prevention of occupational health hazards. The basis for all these strategies is the widespread access to information about problems and solutions.

More recently, a series of international efforts to set priorities for research—the creation of new knowledge—has occurred. Many of these efforts followed the U.S. example of developing a National Occupational Research Agenda (NORA) [NIOSH, 1996]. NORA was the product of interaction by NIOSH with 500 stakeholders from industry, labor, government, and other sectors to identify 21 priority research areas. These priority areas then became the focus for allocation of resources and conduct of research.

RESEARCH

Research, while thought of as an information creating endeavor, is really built on a dissemination framework.

Scientists read the literature to learn the state of knowledge and help form hypotheses, and then after conducting research, publish their results for review and use by others. On a global basis, research planning is being conducted by partnership efforts between and within countries. Directories of research, such as the International Agency for Research on Cancer Directory of Ongoing Studies of Cancer [IARC, 1994] serve to foster partnerships, as do the general worldwide accessibility of the scientific literature.

International peer review of protocols also fosters research, as do the development and sharing of standards, such as the International Ethical Guidelines for Biomedical Research Involving Human Subjects [CIOMS, 1993] and the International Guidelines for Ethical Review of Epidemiological Studies [CIOMS, 1991] for the conduct of research. Research is also promoted and enhanced by the multitude of scientific meetings that have occurred in increasing numbers. The International Symposium on Occupational Exposure Databases and Their Applications for the Next Millennium held in London in 1999 provided extensive common ground for further research, particularly involving inhalation modeling [Tickner et al., 2001]. Other approaches, that have been tried, include development of a standard tool for analysis of occupational lung cancer in epidemiological studies in order to allow for comparable definitions of exposure or categorization of occupations [Ahrens and Merletti, 1998].

International collaboration in research and training is fostered by various countries particularly the United States, Canada, Australia, and European countries. In 1995, the United States organized the International Training and Research Program in Environmental and Occupational Health (ITREOH). The focus of the program is to understand, investigate, control, and prevent occupational and environmental health problems in developing countries and the United States. More than 234 scientific papers have been produced in this program [Breman and Bridbord, 1999].

A review of 38 OSH research projects in developing countries showed that donor-supported projects have a significant effect on strengthening research capacities of recipient scientists and research institutions [Rutherford and Forget, 1997]. The factors associated with positive impact included effective broad dissemination of research findings and involvement of multiple stakeholders in the project [Delclos et al., 1999].

DISSEMINATION

It is estimated that there are 35,000 OSH documents, fact sheets, and pamphlets published each year [Rantanen, 1999]. There are at least 155 scientific journals that publish OSH information and there are 6,000 databases and 3,000 CD-ROMS available internationally [Pantry, 1998]. Many

of these have been described in various publications [Takala, 1992, 1999; Abeyunga et al., 1998; Pantry et al., 1999; Herrick and Stewart, 2000]. The majority of all the health research is conducted in developed countries and less than 1% of authors who publish in well-recognized OSH journals are from developing countries [Jeryatnam, 1985]. Although most scientific journals have international audiences, there are ones that specifically address OSH from a global perspective. These include, for example, the International Journal of Occupational and Environmental Health and the International Archives of Occupational and Environmental Health. Recently the world's six largest medical journals announced that they will give medical schools and research institutes in developing countries, online access to their publications free of charge or at drastically reduced prices [Kmietowicz, 2001]. These six do not include OSH journals, but occasionally they publish OSH studies.

The widespread dissemination of OSH information by paper has been amplified by electronic means [Agius and Bagnall, 1998]. The Internet, through the world wide web, now allows for the broadest dissemination ever. In addition to individual organization or country-based web sites are new partnership efforts. Bilateral efforts, such as the US–EU (<http://www.osha-slc.gov/us-eu/>) and Canada–EU (<http://www.eu-ccohs.org/>) joint web sites are significant steps in creating a network of interlinked web sites across the world—a global web portal for OSH. This global portal would allow rapid access to the world's information on OSH.

The foundation for global dissemination of information sharing has been the International Occupational Safety and Health Information Centre (CIS) established by ILO in 1959. CIS was mandated to collect and disseminate all relevant OSH information. It was assisted by 120 national and collaborating institutions around the world. CIS is the hub of international OSH information dissemination. Among the CIS products are on-line versions of the Encyclopedia of Occupational Safety and Health, International Hazard Datasheets on Occupations, CIS Chemical Databases and the bibliographic database (CIS DOC/CIS ILO).

Numerous products and compendia are available that combine databases. For example, OSH-ROM is a collection of bibliographic databases, such as CIS DOC, NIOSHTIC, HSELINE, MHDAS, RILOSH, and OEM (see www.hspublishing.com/hsworld for description). One potentially useful set of international databases are those that focus on solutions [Swuste and Hale, 1994; Swuste et al., 1995, 1997]. “Sharing Workplace Solutions” was the theme of a workshop of the Conference of the International Occupational Hygiene Association in 1992. This led to the Prevention and Control Exchange (PACE), which was the result of a WHO meeting in 1994. Another source of international information are the International Chemical Safety

Cards, developed under the auspices of the International Programme for Chemical Safety [Niemeier and Obadia, 2000]. The cards are simple, concise summaries of essential health and safety information on specific chemicals to use as basic information and training tools. There are approximately 1,300 cards in 25 languages.

Global dissemination of OSH information has been a focus of the World Congresses on Occupational Safety and Health, which are held every three years. The XV Congress in 1999 concluded that the number one challenge for the next decade is the transfer of what we know on safety and health and working conditions to practical actions. Additionally, the Congress cited the enormous need to train new experts and provide minimum training for employers and workers. Other recent specialty conferences and workshops have focused on information dissemination. The 3rd International Conference on Information Technologies in Occupational Safety and Health Information, Training, and Education sponsored by the International Social Security Association, the European Commission, and the ILO in Brussels in 1996 recommended the development of coherent and transparent information policies, open information networks, research on how to make prevention messages effective, and addressing the barriers to interactive multimedia in information and training.

The 4th International Conference on Occupational Safety, Health, and Environment Information in Dublin in 2000 focused on the e-OSHE World (electronic-occupational safety, health, and environment) and noted that 40% of the 130 countries in the CIS Network do not have access to computerized information. Also in 2000, the publication of the Proceedings of the Workshop on Research Dissemination, a part of the Swedish Work Life 2000 project, concluded that “One of the greatest problems in the OSH community is the lack of appropriate emphases on research involved in the dissemination, adaptation, and utilization of information . . . , and . . . there seems to be a severe mismatch between the optimistic assumptions made by senders about dissemination of research results, and what is available, assimilated, and needed for a potential user” [Lagerlöf, 2000].

Additionally, private organizations—such as industrial associations, trade unions, professional associations—also provide extensive OSH information that can be accessed globally [Takala, 1992]. Organizations such as the International Council of Chemical Associations provide information and guidelines for OSH, such as the Fundamental Features Criteria of International Responsible Care[®] Associations (<http://memberexchange.cmahq.com>).

RISK MANAGEMENT

Risk management can occur at the macro (geographic) and at the micro (corporate) levels. Elements of risk man-

agement include standard setting, enforcement, compliance, health and safety management programs, and training, among others.

Global sharing of standards and recommendations is increasingly a necessity in a global economy. The efforts to harmonize occupational health standards was built in part on discussions of common criteria documents in the early 1990s [Zielhuis et al., 1991]. Additionally, the ILO fostered a globally harmonized system for classification and labeling of chemicals [ILO, 1991]. Prior to that, the international standards organization (ISO), established in 1947, was developing “universal” standards that in recent years with the ISO 9000 (for quality management) and the ISO 14000 (framework for environmental management) establish precedents for global workplace safety and health standards [International Standards Organization, 2001].

After successful introduction of these “systems” approaches to management developed by ISO, the ILO followed with the ILO/OSH 2001 Guidelines on OSH management systems. The ILO/OSH 2001 provides a unique international model compatible with other management systems, standards and guidelines [Machida and Baichoo, 2001]. Often joint efforts to develop recommended exposure limits can be an efficient approach on the part of participating countries. An international workshop on the Harmonization of Criteria Documents Used for the Establishment of Health-Based Occupational Exposure Limits was held in The Netherlands in 1989. The primary aim was to exchange information and experience regarding current procedures for standard setting and where possible to coordinate scientific activities in the area [Zielhuis et al., 1991]. In 1996, the U.S. Chemical Manufacturers Association (now the American Chemistry Council) published the analysis of processes for setting occupational exposure limits in 23 organizations in 15 countries [CMA, 1996]. In addition to global approaches, toward common standards have been approaches to develop consistent approaches to risk assessment. This has involved focus on the scientific principles used in risk assessment and on the policy/decision-making [IPCS, 1999].

Another approach leading to efficiency in developing recommendations is the development of bilateral agreements. Instead of numerous countries doing the same analysis on information on the same chemicals, it may be more efficient for partnerships to identify candidate chemicals and divide the workload. Thus, the US–Sweden, US–Nordic Expert Group, and US–Netherlands agreements on document collaboration have fostered joint or shared work on the basic interpretation of the information, yet allows each country to make its own recommendations.

Broader international collaboration has also occurred. The Concise International Chemical Assessment Documents (CICADs) are the products of various international efforts, as are IARC Monographs and IPCS Environmental

Health Criteria Documents. A future focus on efficient global partnering for recommended exposure limits is the World Occupational Exposure Values Conference planned for 2002. Critical in global approaches to standards and exposure limits is the need to allow individual countries to set their own limits. This can be accommodated by thinking of global limits as recommendations for minimum controls. Additionally, there could be concern that the efforts of countries with more rigorous standards could be diluted or weakened if global limits were sought. These areas need discussion.

Risk management is also fostered by international professional societies, such as the International Commission on Occupational Health (ICOH) and the International Occupational Hygiene Association (IOHA). International organizations, such as the Collegium Ramazzini and the Ramazzini Institute, are also forces for priority setting, research, dissemination, and risk management. In 1994, the International Programme on Chemical Safety (IPCS) initiated a project to harmonize approaches to the assessment of risk from exposure to chemicals. This effort included establishing an open and transparent process for risk assessment and the use of a general set of technical terms [IPCS, 1999].

The operative term in risk management is management. At the micro level, this is the responsibility of employers. Multinational corporations actively share information on health and safety within their components, but less so between companies. Access to, and utilization of, the world's literature and information on OSH encourages corporate decision makers to invest in prevention and control efforts. The basis for their actions on this will be cost-containment and governmental regulation.

Occupational health and safety has always been a major area of trade union activity in industrial and industrializing countries [Vogel, 1989]. National and international unions share health and safety information, which allows for inclusion in collective bargaining agreements. However, the rise of transnational corporations, the increased mobility of jobs and capital, and the transition from secure to contingent labor may be, as some believe, eroding trade union and legislative health and safety initiatives [O'Neill, 2000].

Training is a major component of management efforts to prevent and control OSH hazards. Global approaches to training are practiced by multinational corporations to varying degrees. The increasing demand for continuous learning and competence building includes OSH competencies. There are various efforts underway to develop core OSH curricula for new and young workers and occupational health professionals, such as physicians, nurses, occupational hygienists, and psychologists. Training of professionals worldwide has been the province of many organizations, notably including the members of the WHO

Collaborating Centres. Additionally, efforts of the NIOSH Educational Research Centers, the NIOSH Website, and NIEHS training and web site, as do web sites from other countries, have international draw and application. Broad training for workers, employers, and health professionals has been delivered by the ILO Training Centres, the Nordic Institute for Advanced Training in Occupational Health (NIVA), the Finnish Institute of Occupational Health, CIS, and ITREOH. The experience of Finnish programs is illustrative of how training programs can be structured to be sustainable. Three multi-year phases have been utilized. The initial phase focuses on infrastructure development primarily through information support and training of researchers. The second phase links the research program to national priorities; and the third phase involves networking through international data systems and linkages with researchers in other regions [Rantanen and Lehtinen, 1997]. The experience of the U.S. Southwest Center for Occupational and Environmental Health also illustrates the importance of supporting an infrastructure for broad information dissemination in the language of the intended audience. A good example is the peer-reviewed Spanish language journal, *Salud de los Trabajadores*, devoted to OSH for Latin America [Delclos et al., 1999].

The General Framework for Action by the Commission of the European Communities in the Field of Safety, Hygiene, and Health Protection at Work, 1994–2000, published in 1993 called for three fundamental requirements for an effective safety and health at work policy: (1) information and training must be targeted at workers at the appropriate levels; (2) safety and health education must be incorporated into the educational curriculum so that regard for safety and health becomes second nature; and (3) training of specialists in OSH is important. In many ways, the world of work is changing rapidly. The globalizing economies and introduction of new technologies increase demands on workers for continuous learning and competence building [WHO, 1999]. One effort to build OSH into core standards of competency is exemplified by the National Skill Standards effort in the United States. OSH knowledge is considered a core skill in standards design to help U.S. workers be globally competitive [Manufacturing Skills Standards Council, 2001].

Another management responsibility that could improve OSH on a global scale is exemplified by the efforts in European member states to change subcontracting (procurement) and marketing practices. In one study, 22 case examples from nine member states shows how OSH may be used as criteria for purchasing products and services from other companies, and as a marketing element promoting the sales of products and services [European Agency for Safety and Health at Work, 2000]. In the United States, the AIHA is currently considering a position document on contractor procurement.

DISCUSSION

Critical to advancing global approaches to OSH information sharing is the need for increased opportunity and capacity to access information. The “right” to know about risks or more broadly, to information, is not evenly practiced worldwide [Pantry, 2000]. WHO promotes the right to health at work for all. Information is a means to realization of that right. Despite broad membership by many countries, true access to information and distribution within countries is still a problem. As noted, many countries do not have computer access to CIS databases. Many workers do not have access to information due to language, literacy, and cultural barriers. Yet, increasingly in many countries, workers are required to shift from being passive information receivers to active subjects of health and safety having choices and responsibilities [Westerholm, 1999; Abeytunga, 2000].

The vast amount of information available worldwide is not always illuminating. There is often confusion about which information is the best, most useful, or even correct. Information overload occurs because of the magnitude and complexity of material. As P.K. Abeytunga of the Canadian Centre for Occupational Health and Safety (CCOHS) observed “Information is everywhere, but insight is hard to find” [Abeytunga, 2000].

In addition to information access, there is a need for the development of information through research. Research has been promoted by various countries and by WHO Collaborating Centres. There may also be a place for the formation of research centers of excellence in developing countries. These centers would be critical for long-term success in serving as regional resources for research and occupational and public health information.

There also could be value for the OSH communities to link with them global capacity building such as that in environmental health, HIV/AIDs, and emergency infectious diseases, which would help to build a solid global base for public health information dissemination and action [WHO, 1995]. Worker health is not yet understood as an integral part of public health, and that the workplace is an important arena for public health campaigns [Goldstein et al., 2001]. There is a need to influence decision makers in all countries to pay special attention to the importance of occupational safety and health at the enterprise and national economy levels [WHO, 2001b].

Sharing information on the global scale is a part of the process of globalization [Brown et al., 2001]. Opinions on globalization range from unconditional enthusiasm to concerns for mounting inequity, disenfranchisement for the poor, and environmental catastrophe [Campanale and Chong, 2001]. The health of workers is influenced by globalization both positively and negatively [Taqui, 1996]. Regardless of the political and economic structures that occur as part of globalization, there is an increasing demand

for sharing OSH information. To meet this demand, there is a need for a robust research strategy on OSH information to assess how it is used, transferred, and adopted [Lagerlöf, 2000]. There is a need to know about information provision as a prevention strategy, and how it can be enhanced on a global basis. By addressing these issues, the goal of OSH for all can be brought nearer.

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