Proceedings of the 2007 State-of-the-Art Conference Pre-conference Workshop:

Protecting the Health of Health Care Workers: A Global Perspective

October 25, 2007, Vancouver, Canada





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Executive Summary

Fundamental elements for the provision, organization, and establishment of occupational health and safety (OHS) services for health care workers in rural/remote areas and developing countries include adequate resources, a strong safety culture, recognition of occupational health professionals, collaborative practice, and capability for communication and local risk analysis. First, however, assessment of existing OHS services is required. Adaptable needs assessment tools designed for use by local health care workers should allow progression from analysis to action. Essential elements of these tools include utility, recognition of the surrounding political, health care, and physical environments, and clear definition of the roles and responsibilities of users to act upon findings and implement solutions.

Securing adequate financial, physical, and human resources for occupational health and safety requires critical analysis of topics such as health care culture, political motivation, health care worker migration, and national and international financing. It is necessary to reshape attitudes towards valuing the health of health care workers. This includes acknowledging occupational health professional accreditation and educating health care students about OHS. It is also crucial to create awareness of workers' health among health care managers and administrators and to develop their knowledge and capability to support OHS. Resources such as the Pan American Health Organization's (PAHO) document "Workers' Health and Safety in the Health Sector: A Manual for Managers and Administrators" are valuable assets. Suggestions for collaborative practice include the formation and use of local OHS committees that involve decision makers, administrators, and health care workers. Communication strategies involve the free flow of information between policy makers, educators, employers, research laboratories, and health care workers. Mobile occupational health clinics and portable libraries are two examples of innovative methods of communication and information dissemination. Risk analyses allow occupational health practitioners to target local services to the most needed areas. Point prevalence surveys and workplace audit tools are effective methods to collect this data in remote and resource poor settings.

Priorities for prevention of blood-borne and air-borne disease transmission include education and comprehensive protocols and guidelines. Adequate, up-to-date, and ongoing OHS education and training for health care workers is essential. Protocols and guidelines should direct practice and uphold internationally endorsed standards while being responsive to local realities and needs. Protocol and guideline development and implementation must also involve the multiple stakeholder groups such as infection control, public health, funders, administrators, and health care workers. Immunizations and adequate access to post exposure management are vital for secondary prevention. Information such as prevalence and incidence rates of diseases endemic to the local area, transmission patterns and trends, and population projections are necessary to make informed decisions about vaccination priorities. Adequate institutional support for post exposure prophylaxis and follow-up consultations is also vital to ensure the quality of appropriate care following work-related injuries.

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Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
BOHS	Basic Occupational Health and Safety
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
ILO	International Labour Organization
OHS	Occupational Health and Safety
NIOSH	National Institute for Occupational Safety and Health
PAHO	Pan American Health Organization
PICNet	Provincial Infection Control Network of British Columbia
PEP	Post Exposure Prophylaxis
OSHA	Occupational Safety and Health Administration
RRA	Rural and Remote Areas
SARS	Severe Acute Respiratory Syndrome
SEN	Safety Engineered Needle
TB	Tuberculosis
UBC	University of British Columbia
WHO	World Health Organization
WHR	World Health Report

Workshop Overview

This synthesis report stems from a one-day pre-conference workshop, "Occupational Health Services for Health Care Workers in Rural/Remote Areas and Developing Countries." The workshop was part of the International Commission on Occupational Health (ICOH) Conference on Health Care Worker Health / 2007 State-of-the-Art Conference (SOTAC) held from 26 to 28 October 2007 in Vancouver, Canada. For this conference, ICOH and the American College of Occupational and Environmental Medicine (ACOEM) joined together to share research and understanding on protecting the health of health care workers.

The workshop was framed around the growing need to identify practical and sustainable ways of providing occupational health services for health care workers in rural/remote areas (RRAs) and developing countries. Working in four different groups according to their chosen area of interest, participants used case studies, a problem prioritization exercise, and dialogue to address three major themes:

1- The organization, provision, and establishment of occupational health services
2- Preventing occupational transmission of blood-borne and air-borne infectious diseases
3- Providing immunization and post exposure prophylaxis

Participants were asked to explain how workplace situations in their regions or countries compared to two case studies. They identified shared problems or realities and chose which commonalities they wanted to address. Finally, the groups discussed innovative ways to address the priority problems and suggested possible strategies for providing occupational health services while recognizing and moving towards meeting international guidelines. A copy of the workshop agenda can be found in Appendix A.

While this publication documents the workshop discourse, its larger purpose is to move beyond a record of proceedings. Participants have continued to develop and expand the ideas discussed on the workshop day. Participants and other contributors wrote the focus boxes located throughout the document to share examples of practical and sustainable ways of providing occupational health services for health care workers in demanding and diverse settings. Their goal was to enable occupational health professionals to share knowledge, expand understanding, and enhance occupational health services for health care workers around the world.

In total, over forty participants representing countries such as Romania, South Africa, Egypt, Democratic Republic of the Congo, Nigeria, Japan, China, Vietnam, Belgium, Finland, Colombia, Brazil, Canada, and the USA came together for this unique endeavour. We hope that this document will both share the exciting and innovative work being done in occupational health and spur continued discussion, development, and commitment to the health and safety of health care workers in rural, remote, and developing areas.

Introduction

Health care workers (HCWs) are fundamental to health. Health care workers are considered to be "all people primarily engaged in actions with the primary intent of enhancing health" (World Health Report, 2006, p.xvi). For the purposes of this paper we consider health care workers to be those people, including physicians, nurses, and allied health professionals, working within health care systems, either in the community, in hospitals, or in clinics. This can include community workers, unpaid workers, and students. Occupational health professionals are health care workers who have undergone special training in occupational health and safety and whose primary tasks concern workplace safety, hygiene, health, and environment (ICOH, 2002). The four traditional occupational health (OH) professions are occupational medicine, occupational hygiene, occupational safety, and ergonomics. Other professionals, including nurses, toxicologists, epidemiologists, human resource staff, quality experts, managers, lawyers, and health economists may also be considered OH professionals if their work focuses on workers' health. According to ICOH, "The expression 'OH professionals' is meant to include all those who, in a professional capacity, carry out occupational safety and health tasks, provide occupational health services or are involved in OH practice" (2002).

Not only do health care workers provide health care services and sustain health systems, they also influence health outcomes for individuals and populations. It is well recognized that adequate numbers of skilled health care workers are needed to achieve national and global health goals and that the number and quality of health care workers is positively associated with increased health care services and better health outcomes. For example, immunization coverage, primary care provision, and infant, child and maternal survival rates all improve with increasing numbers of health care workers (WHR, 2006). Reducing the number or density of health care workers may result in poorer health outcomes such as decreased child nutrition or increased cardiovascular disease (WHR, 2006). There is global acknowledgment that attaining the Millennium Development Goals for health by 2015 depends largely on the availability and skills of health care workers (Tawfik & Kinoti, 2006). In recognition of their crucial importance, in 2006 the World Health Organization (WHO) labeled health care workers as "the most valuable resource for health" and declared 2006 to 2015 "The Decade of Human Resources for Health."

Health Care Worker Shortages

Despite their essential importance, many countries and regions do not have adequate numbers of health care workers. According to the WHO, fifty-seven countries around the world are presently experiencing critical shortages of health care personnel. Although there are approximately 59.2 million full-time paid health care workers worldwide, 4.3 million more are needed to meet the minimum threshold of 2.5 health care professionals per 1000 population (WHR, 2006). In addition, the distribution of health care workers worldwide does not reflect the burden of disease experienced by different regions. While the African Region carries more than 24% of the global burden of disease, it has only 3% of health care workers. Conversely, the

Region of the Americas has 37% of the world's health care workers but only 10% of the global burden of disease (WHR, 2006). Furthermore, almost all countries suffer from an internal maldistribution of health care workers, characterized by urban concentration and rural deficits (WHR, 2006). The chronic, and often critical, shortages of physicians, nurses, and other health care workers in rural areas are well recognized. While less than 55% of the world's population lives in urban areas, over 75% of doctors, 60% of nurses and 58% of other health workers work in metropolitan settings. Moreover, maldistribution of health care workers is not confined to developing countries. In Canada, while 21.1% of the population lives in rural areas, only 9.4% of all physicians work in these settings (Pong & Pitblado, 2005). In the United States, rural counties experience the greatest health care worker shortages (LaSala, 2000). Overall, rural and remote communities and developing countries experience the greatest absolute shortages and distribution imbalances of health care workers, resulting in challenges to the health of both undersupplied communities and overburdened health care workers.

A full discussion of the causes behind the crisis in health human resources is beyond the scope of this paper; however, workshop participants recognized that multiple economic, political, social and environmental factors contribute to the problem. According to Tawfik and Kinoti (2006):

> In fragile health systems, as is the case in most resource-constrained countries, the human resource crisis is the result of many macroeconomic and governance factors …. The solutions to this crisis must therefore include addressing the broader macroeconomic factors as well as the more proximate factors that influence human resource-related functions of the health system.

Internal migration of health care workers from rural to urban communities, international recruitment of workers from developing to developed countries, changing population demographics, shifts in disease burdens, and emerging epidemics all impact the required number and mix of health care professionals. Internationally-driven financing and health care reform policies have reduced the number of training opportunities and slashed the number of employed professionals, while technological advances and changing consumer expectations call for greater numbers of specially trained and highly qualified staff. Furthermore, precarious work conditions and frequent and repetitive exposures to occupational hazards lead existing health care workers to seek work in more supportive and safe environments. The following discussion focuses on the occupational health care conditions that contribute to the attrition of health human resources around the world.

Occupational Hazards

There is international recognition that health care workforce attrition caused by occupational hazards is unnecessarily high and demands priority attention (WHR, 2006). For instance, nearly 90% of nurses surveyed by the American Nursing Association indicated that health and safety concerns influenced the likelihood that they would continue to practice (2001). In Africa and Asia, the growing threat of illness or death related to occupationally acquired disease is increasingly a reason health care workers leave their jobs (WHR, 2006).

Although most workplace hazards can be mitigated or prevented, health care workers still have amongst the highest rates of occupation related injuries and illnesses of all workers. According to the Canadian Institute for Health Information, in 2000 Canadian health care workers were 150% more likely than other workers to miss work due to illness or injury (2002). In the United States, the number of health care workers injured at work is increasing while injuries in two of the most dangerous industries, agriculture and construction, are decreasing (National Institute for Occupational Safety and Health, 2007). It is readily apparent that in order to address the shortage of health human resources around the world, the health and safety of these workers must be made a priority.

Health care workers face many types of occupational hazards including exposure to infectious diseases, back and repetitive strain injuries, latex allergies, violence from patients and families, and stress. Biological hazards are among the major risks to the health of health care workers. Infectious pathogens exist throughout all health care settings and include exposure to air-borne and blood-borne diseases. Due to the high risk of exposure to a vast range of infectious diseases in health care workplaces, organizers chose to focus workshop discussions on the occupational transmission of blood-borne and air-borne diseases.

Without adequate resources for health and safety, health care workers are very vulnerable to exposure and potential infection from biological agents. For instance, each year at least three million health workers worldwide are exposed to blood-borne pathogens due to needle stick injuries (Prüss-Üstün, Rapiti, & Hutin, 2007). Two million of these health care workers are exposed to hepatitis B, 900 000 to hepatitis C, and 170 000 to HIV (WHR, 2006). These injuries result in over 40% of all hepatitis B and C infections and 2.5 % of HIV infections among health care workers (Prüss-Üstün, Rapiti, & Hutin, 2007). Increasing numbers of health care workers are also exposed to air-borne diseases such as tuberculosis (TB), influenza, and Severe Acute Respiratory Syndrome (SARS). The 2003 SARS outbreak particularly illustrates how failure to use appropriate workplace precautions affects health care workers. Over one fifth of global SARS cases were in health care workers; in Canada, health care workers represented 51% of cases (Yassi et al., 2004). The SARS event highlighted the need to not only provide the proper equipment to health care workers, but also to provide training and information on the identification, assessment, management, and control of occupational risks.

The workshop case studies focused on two of the above named infectious diseases: HIV/AIDS and tuberculosis. According to the WHO, HIV/AIDS adds an increased burden to already fragile health systems contending with inadequate infrastructure, resources, and workers. For example, among female nurses in two hospitals in Zambia, deaths skyrocketed from 2 per 1000 in 1980 to 26.7 per 1000 in 1991. In Botswana, an estimated 17% of the health workforce died due to AIDS between 1999 and 2005 (WHR, 2006). While it is difficult to discern workplace from community exposure in these examples, workplace risk certainly increases with higher disease prevalence in the population. Obviously, in addition to finding a solution to the shortage

of health care workers, practical strategies and effective policies are needed to ensure the occupational health and safety of existing staff. In the case of HIV/AIDS, occupational exposure to infectious body fluids can be significantly decreased by effective primary prevention and universal precaution programs such as safety needles and sharps disposal technology.

The resurgence of TB and the increase in multi-drug resistant TB has also become a serious occupational hazard for health care workers worldwide (Harries, Maher, & Nunn, 1997). High TB rates in developing countries make the risk of disease for health care workers in these locations especially significant. More than 90% of the world's TB cases are found in hospitals in developing countries and 54% of health care workers in these countries are estimated to carry latent TB (Joshi, Reingold, Menzies, & Pai, 2006). In fact, the rate of active TB disease is higher among health care workers from developing countries than in the general population. Many of these cases are believed to be a direct result of occupational exposure (Joshi, Reingold, Menzies, & Pai, 2006).

Recent global health threats, growing research evidence, and international media attention have increasingly focused awareness on the health of health care workers. Through both field and research experience, organizers of this workshop recognized that, in particular, the health of health care workers in rural/remote areas (RRAs) and developing countries is under serious strain due to factors including spiralling pandemics of infectious diseases such as HIV/AIDS and TB, inadequate infrastructure and resources for health, and an overall lack of support for occupational health practice (Sago-Moses, et al. 2001; Spiegel & Yassi, 2005). The convergence of the significant crisis in health human resources with growing occupational health threats and the tenuous safety of health care workers in under-resourced areas led to the generation of this workshop's focus on RRAs and developing countries.

Rural/Remote Areas and Developing Countries

It is difficult, if not impossible, to reach a single agreed-upon definition for the terms "rural and remote." Many countries and regions have their own definitions, depending on the particular local circumstances and conditions. In general, "rural" areas are considered to be sparsely populated places outside of towns and cities, while "remote" usually refers to a greater distance from a town or city. Rural areas often have a strong agricultural character, while remote areas may be characterized by particular activities such as mining, logging, petroleum, or gas exploitation. However, the scope of "rural" and "remote" is best understood not only in terms of geographical barriers, physical isolation, or distance, but also in the accessibility of physical, human, natural, or financial resources.

While rural and remote areas (RRAs) are not always under-resourced, many do experience particular challenges and significant lack of resources to a greater extent than their urban counterparts. Under-resourced areas may suffer from both a shortage of health care workers and a lack of OHS programs to promote the health of health care workers. Key determinants of lifestyle, economic activity, and health such as cultural,

climatic, and environmental conditions also differ from region to region, and can affect both living and working conditions. For example, social or armed conflicts in rural or remote settings, such as in parts of Colombia, Somalia, and Northern Uganda, can greatly impact a population's access to health and the willingness and/or ability of health care workers to live and work there effectively.

The above points are also true in the context of "developing" countries; another difficult-to-define term that generally refers to an under-developed or developing economy, a low national per-capita income, and a low rating on the United Nations Development Program (UNDP) Human Development Index. However, it is important not to lose sight of the relativity and ambiguity of this concept, and to recall that within so-called "developed" and "developing" countries (also referred to as low and middle income countries) there are often pockets of wealth and adequate resources existing alongside other pockets of relative poverty and lack of resources. Hence, when defining approaches to promoting occupational health and safety for health care workers in remote, rural, and developing countries, it is necessary to look specifically at the characteristics of the area, as each region may require the use of different approaches to address diverse physical, social, economic, and cultural conditions.

Section One: Organization and Provision of Occupational Health Services in Health Care

The objective of one working group was to explore the provision and organization of occupational health services for health care workers in RRAs and developing countries. It was clear to the group that OHS practices in many RRAs and developing countries are precarious, and that some of the conditions found in less developed areas may also persist in more developed countries such as Canada and the USA. Three areas of greatest concern in the organization and provision of occupational health services were identified:

1- lack of clear guidelines to assess the needs of OHS services in RRAs and developing countries;
2- Inadequate communication strategies and insufficient access to information;
3- Low status and lack of accreditation of OHS personnel.

This chapter synthesizes the discussions and elaborates upon suggested solutions.

Needs Assessments for Rural/Remote Areas and Developing Countries

Workshop participants agreed that there is not one standard way to identify the OHS needs of health care workers in RRAs and developing countries. Needs assessments are systematic evaluations of the current function and projected needs of a service or program and are useful to identify, address, and plan actions aimed to initiate, strengthen, or enforce basic occupational health services in health care settings. These evaluations often preclude changes to the design and function of services (see Focus Box One). While existing guidelines for the development and provision of basic occupational health services (BOHS), such as those promoted by the Pan American Health Organization (PAHO) and the Joint International Labour Organization (ILO)/WHO Committee on Occupational Health, constitute a good development pathway for OHS services, these ideas should be adapted to occupational health systems in RRAs and developing countries. It is necessary to define the essential elements of a needs assessment tool, perform an initial environmental scan of the workplace and surrounding area (region or country), and clearly determine roles and responsibilities for the implementation of the needs assessment and its recommendations. Specific assessment criteria fall under each of these three points:

A needs assessment tool for use in a RRA or developing country should:

- ☑ Focus on utility and avoid unnecessary duplication, adapt available resources, and utilize existing information. For example, turn existing general OHS guidelines into checklists and add evaluation scales;
- ☑ Be sensitive to both external and internal cultures such as the regional culture or norms within the health care setting;

- ☑ Be as simple and user friendly as possible; the assessment tool should not require OHS specialists to apply it. A checklist format can include all the elements that need to be addressed;
- ☑ Provide direction for the development of OHS services. The tool should move from assessment to recommendations and proposed action. It should give flexible guidance to users in a way that does not make them afraid to start developing OHS services.

An OHS needs assessment should include an initial environmental scan and should take account of:

- ☑ Health facilities and design, including adequacy of the structures;
- ☑ Presence and numbers of health care professionals including emergency services, medical and nursing services, paramedical services (dieticians, pharmacy, occupational therapy), and counseling services (psychiatrists, social workers, etc.);
- ☑ Sources and sustainability of funding;
- ☑ Local or regional examples of effective OHS programs;
- ☑ Geographical barriers and climatic conditions;
- ☑ Transportation systems, including access and function of road, air, and water transportation;
- ☑ Local conditions such as housing, schools, surrounding industries and economic activities, local infrastructure, presence of violence or wars etc;
- ☑ Internal and external culture, including the physical, financial, political, social, and cultural environment;
- ☑ Population distribution and demographics;
- ☑ Available communication and evaluation methods, including email, telephone, access to personnel for interviews, and distribution methods for surveys.

Prior to beginning the needs assessment, specifically determine who is responsible for:

- ☑ Implementation and leadership of the needs assessment, including carrying out the needs assessment and implementing recommendations;
- ☑ Employee health assessments (e.g. new employee health assessments, health care worker immunizations);
- ☑ Risk/hazard control (working conditions);
- ☑ Education and evaluation;
- ☑ Gathering required information, including personnel records, statistics, and policies, and current practices.

After the initial environmental scan, an assessment tool should explore both the health system in which the current OHS service is operating and the OHS services themselves. Specific assessment points include:

The existing health system:

- ☑ Primary health service model;
- ☑ National institutes or social security systems providing health services;
- ☑ Private systems providing health services;
- ☑ Professional OHS bodies overseeing education, licensing and accreditation;
- ☑ Professional medical, nursing and paramedical bodies overseeing education, licensing and accreditation;
- ☑ Local or regional methods of health care delivery (e.g. system of hospitals or outpost clinics).

The existing occupational health system:

- ☑ Percentage/proportion of health care workers that have access to OHS;
- ☑ Scope and capacity of existing OHS services, including facilities, medications, and equipment;
- ☑ Current internal OHS policies, procedures, and actual practices;
- ☑ Current compliance with external OHS regulations;
- ☑ Physical, financial, and human resources available for OHS;
- ☑ Occupational health education and training of HCWs and OHS staff;
- ☑ Working conditions, including number of staff working at one time, staff mix, availability of general supplies, equipment, medications, supervision and management;
- ☑ Workers' health, including occupational injuries, occupationally acquired disease, and general health;
- ☑ Risk communication methods;
- ☑ Preventive programs;
- ☑ First aid and emergency preparedness and procedures;
- ☑ Diagnoses, treatment and rehabilitation services available for occupational related diseases and injuries;
- ☑ General health care and public health preventive services available to health care workers;
- ☑ Patterns of collection, maintenance, and use of records and internal statistics;
- ☑ Evaluation and prioritization of current OHS activities;
- ☑ Type of health and safety hazards/risks and typical problems in the employment setting;
- ☑ Characteristics of the workforce, including skills mix and education levels;
- ☑ Internal and workplace processes, including inventory of chemical products and equipment used;
- ☑ Knowledge of employers and employees about OHS problems in the country/region;
- ☑ Plans and support for evaluating and changing current systems;
- ☑ Relationships with unions;
- ☑ Existence and function of health and safety committees.

Appropriate action to address the problems identified in the needs assessment is essential and follow-up and evaluation of the appropriateness, effectiveness, and outcomes of interventions should be undertaken. An example of the use of a needs assessment tool is below in Focus Box One.

Focus Box One: Using Needs Assessments in Ecuador

Marie-Claude Lavoie, Annalee Yassi, Maritza Tennassee, Ronaldo Fujii, Elizabeth Bryce, and Sydney Scharf

The Healthy Hospital Project in Ecuador was a joint international collaborative project between the Pan American Health Organization (PAHO), the Ecuadorian Ministry of Public Health (MOPH), the University of British Columbia, and the Provincial Infection Control Network of British Columbia. It aimed to strengthen Ecuador's capacity to promote healthier and safer hospitals by reducing the transmission of infectious diseases.

The project included several components, including 1) Identification of the primary infectious disease hazards and health risks in selected hospitals; 2) Delivery of training programs on occupational health and infection control to health care workers, union representatives, and hospital managers; and 3) Development and implementation of hospital based micro projects. An important focus of the project was to strengthen and/or implement occupational health and safety committees in each of the selected hospitals to ensure the sustainability and leadership in workers' health initiatives.

The needs assessment, the initial phase of the project, revealed several good occupational health and infection control practices in the selected hospitals, such as the establishment of a medical waste disposal program and the widespread dissemination of health promotion materials. Some identified challenges included the restricted resources and limited training available to enable workers to apply consistent infection control measures. The limited availability and accessibility of soap in the health care facilities was an important barrier in preventing the spread of diseases. Recapping of needles, a leading cause of needlestick injuries, was also a significant and common problem identified in the visited hospitals.

The second part of the needs assessment consisted of a survey of health care workers' knowledge of occupational health and infection control. The results highlighted a high percentage of under-reporting of exposure to blood and bodily fluids and limited training in occupational health and safety among HCWs. Those findings guided the design and content of a three-day training program. The results of the pre and post workshop questionnaire given to the participants indicated an increase in knowledge in the area of prevention of needlestick injuries, as well as knowledge of procedures around how to report an occupational injury. As well, the questionnaire results indicated an increased understanding of the importance of reporting for the prevention of future injuries and access to treatment.

The occupational health and safety committees (OHSC) were responsible for the implementation of further hospital based micro projects and delivered training sessions on occupational health and infection control to health care workers with the assistance of PAHO and the Ecuadorian MOPH. In total, over 230 health care workers received training on the prevention of needlestick injuries as well as on universal precaution principles. The committees played an important role in increasing the awareness among health care workers about the occupational risks present in the health care sector. They were also involved in advocating on behalf of the workers to hospital managers for the accessibility and availability of equipment and training to improve the safety of the hospital environment. In one hospital, the OHS committee met with the hospital manager to secure funding for the availability of soap throughout the hospital.

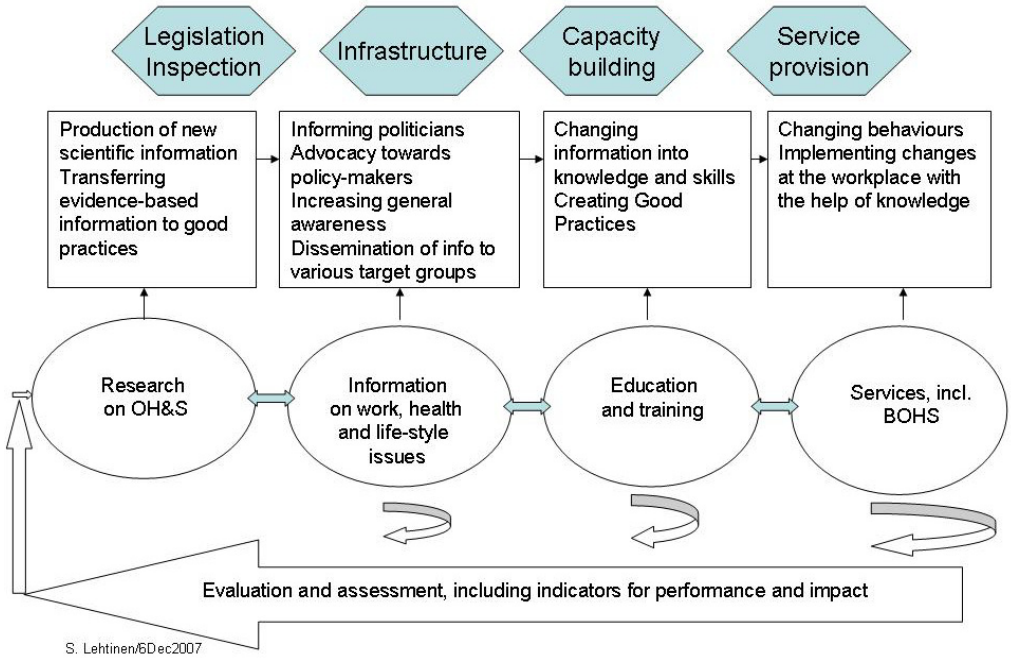
The knowledge and experience gained throughout the project, as well as the tools developed, will serve as basis for the implementation of other Occupational Health and Safety projects across the country.

The needs assessment tool used for this project is available at www.picnetbc.ca.

Communication Strategies and Information Activities

Much of the data and knowledge needed to inform occupational health and safety best practices in health care is already available. The problem is not necessarily the quantity or quality of information, but in its transformation into practice and use in workplaces. Authorities, research institutions, and policy makers need to produce user-friendly information that provides sufficient guidance for implementing change. The following figure shows the flow and role of information in occupational health and safety. Workplace practices are directly linked to the flow of information from research laboratories through policy makers, educational bodies, and employers. The capacity of service providers to implement change in workplace practice relies on having adequate resources, support, and infrastructure to translate evidence-based research information into usable guidelines. A continuous feedback of information from workers informs and drives further research, policy, and training priorities (Figure 1).

Figure 1: Information Activities in Occupational Health and Safety



Access to Occupational Health and Safety Information

Occupational health and safety is primarily the responsibility of the employer. According to the Occupational Safety and Health Administration (OSHA), employer commitment and employee participation are critical components of effective OHS programs (2008). It is of utmost importance that the employer provides HCWs the necessary information needed to work safely and that this information reaches all employees. Although autonomy should not supplant the obligation of the employer, HCWs can also obtain additional information independently. The basic channels for OHS information dissemination are similar to those used in other sectors. OHS professionals and HCWs may obtain information through their unions, health and safety

committees, specialized professional journals, professional groups, seminars, meetings, conferences, books, guidelines or manuals. Utilizing electronic materials, listening to the radio, watching television, searching for information from web portals, as well as establishing and developing information exchanges in local, regional, and international networks are common ways to gain information (Lehtinen, 2005). The challenge is to provide information in such a form that each workplace can utilize it for its own purposes in a cost-effective way.

New technologies have made information easily accessible throughout the world and have changed the learning environment of many working people (Rantanen & Lehtinen, 2000). In particular, the use of the internet has expanded rapidly during the past ten years and many organizations and individuals rely on web services for information dissemination. There are, however, large differences in access to electronic information between countries and regions. The online Digital Opportunity Index (available at www.itu.int/ITU-D/ict/doi/index.html) shows the availability of access to computers and the internet and may help in deciding if information is best conveyed electronically to potential users. Access to information in electronic form not only relies on the availability of infrastructure, but also requires the computer and information literacy of workers. Analysis of internet use of among HCWs and occupational health and safety professionals will help information providers select appropriate information channels. It is the responsibility of workplace managers to ensure that those who do not want to or who are not able to use the internet can still access information. In particular, HCWs who have been in the workforce for many years will need support to develop their information technology skills.

Innovative Practices in Information Dissemination

Mobile clinics

Countries such as Romania and Thailand have begun to use mobile occupational health clinics in order to reach remote and rural areas more easily (see Focus Box Two). This model could be easily applied to occupational health care for health care workers scattered in villages and remote communities. Mobile clinics could make use of whichever mode of transportation is most applicable to the area, including bikes, boats, motorcycles, or horses.

Billboard campaigns

Billboard campaigns can draw attention to occupational health and safety issues affecting HCWs in the community. Billboard campaigns are time-bound intensive information dissemination projects that aim at creating general awareness of a specific topic. Other types of campaigns on occupational health and safety could also be arranged, such as information campaigns at schools for pupils to become aware of the relationship between work and health, or in hospitals to introduce all HCWs to a pertinent topic.

TV, radio, and newspapers

TV, radio, and newspapers can reach large population groups simultaneously. Radio and TV programs are effective information channels in communities where these types of media are common. For example, many groups of people are accustomed to listening to regularly programmed shows such as dramas on the radio. These shows could be utilized for the dissemination of information related to working conditions for HCWs.

WHO Blue Trunk Libraries

The WHO has established mobile libraries that can be found in nearly 70 countries around the world (www.who.int/ghl/mobile_libraries/bluetrunk/en/index.html). The Blue Trunk Libraries' durable construction and relatively small size make them a versatile tool in disseminating information. They are designed primarily for local or district health centres where health materials are generally not easily accessible. Workable modes of distribution to peripheral health centres have been identified and informal networks have been set up through which the health information is circulated. Publications are chosen for specific target districts and occupational health and safety documents could be added to these libraries.

Fact sheets

One-page fact sheets can be prepared on specific OHS topics and distributed widely both to workplaces and to the media, so that they can further inform the general public about certain urgent topics in occupational health and safety. A detailed plan for the selection of the most urgent topics and the preparation of fact sheets would need to be coordinated on a national or regional level.

Text messages to mobile phones (emergencies)

If a target group has access to mobile phones, it would be possible to send mass messages via text messaging. This channel, if available, should be left for emergencies and would require ongoing coordination.

Army as a vehicle for information

Armies can be utilized as vehicles for information dissemination on OHS in areas under war conditions.

Health and Safety Committees and Unions

Health and safety committees and union representatives must play active roles in the dissemination of OHS information. These two groups are able to communicate information to HCWs through meetings, newsletters, education, and training sessions.

Workshop participants concluded that all existing information channels should be fully utilized and adapted to local conditions. In order to improve OHS information dissemination to HCWs, analyses of use, access to information channels, and current availability of OHS information are needed. Appropriate evaluation questions could be added to needs assessments. International bodies such as the WHO, ILO, and ICOH could

periodically review the status and development of health care information dissemination practices in various parts of the world and relate their findings to occupational health care.

Focus Box Two: Occupational Health Mobile Units in Romania

Lilian Rapas

Occupational health is in a process of dynamic change in Romania and it is important to acknowledge that there are real differences in occupational health and safety provision between rural areas and urban areas. Not all workers currently experience the same standards of occupational health and safety at their workplaces, and infrastructure for occupational health and safety is not equally developed in all regions.

Romania is a country with 21.67 million inhabitants, 54.9% in urban areas and 45.1% in rural areas, with a labour force of 9.95 million. Public OHS providers are organized as a network of local county units. OHS providers for the social sector focus on early ill-health retirement assessments and assessments of employees with disabilities. Some large companies have developed in-house OHS services. Private OHS providers cover about 40% of small and medium businesses and they act locally, regionally and even nationally. Their OHS professionals may be independent practitioners or may be from large corporate OHS providers and are concentrated in urban areas. Private OHS providers have one or more central units in cities consisting of multidisciplinary teams (occupational medicine physician, nurse, safety engineer, and other specialists). For rural and remote areas, some of the private OHS providers have developed mobile units that can be transported to the work sites in order to efficiently perform large numbers of physical exams in a short time. Services provided by mobile units include:

- visual acuity testing;
- audiometric testing;
- electrocardiograms;
- pulmonary function tests;
- radiology services;
- laboratory analyses.

These technical services are performed by a nurse and the results are assessed by an occupational medicine physician later in a central unit. The content of the service focuses on pre-placement medical examination, periodical workers' health surveillance, baseline physical examinations, health risk assessment, basic sanitary and hygiene levels, and vaccinations (influenza immunizations).

OHS providers from the local public health authorities have also developed field services divisions for the following:

- analytical industrial toxicology reports;
- gas and vapour identification;
- heavy metal analysis;
- other chemical and physical hazards.

We must underline that the service provision model may vary, depending on the local circumstances, needs, and costs.

Focus Box Three: Improving Conditions for the Human Talent in the Health Sector of Colombia

J Rodríguez Guzmán & AM Cabrera Videla

The provision of health services depends on the size, the skills and the commitment of the health care workforce. The lack of human resources in health sector has been a long-standing concern world-wide, especially in developing countries (WB, 2005). Health human resources are a challenge in many dimensions, including shortages, international migrations, low skills and/or inappropriate skills mix, low performance and motivation, and geographical imbalances. The geographical imbalance and distribution of health professionals has become a key issue given that the provision of cost-effective interventions could be improved through reallocating and strengthening health human resources. This is a challenge as attracting and retaining staff in rural facilities often relies on the personal preferences of health professionals. Often decisions are made based upon individual interests such as training opportunities, career development prospects, living conditions, workloads, colleagues and working conditions. Social issues such as family and security concerns are also involved.

Health human resource constraints are common in Colombia. In response, the Government, in collaboration with stakeholders in the health sector such as universities, institutions and professional associations, have carried out several activities:

1- An inventory of human resources for health was initiated in 1997. These resources have been identified and gathered into national databases categorized by professions, regions, and domains.
2- The creation of the Observatory for Human Talent in the Health sector aimed at generating, analyzing and disseminating the knowledge and information required for developing and implementing policies related to human resources for the heath sector. The central strategy of the Observatory is the integration of the Government with international health agencies (PAHO/WHO), educational institutions, research centers, health care providers and professional associations.
3- The establishment of multi-sectorial working groups under the National Service of Apprenticeship (*Servicio Nacional de Aprendizaje SENA*) for determining core competencies and skills for all disciplines involved in the health sector aiming to promote training and education programs for work and human development. The purpose is to fill the gaps for skilled and trained professionals according to the needs of the country.
4- In October 2007, Law 1164 was issued as a means to regulate issues on human talent in the health sector, creating an organizational structure to support, follow and balance the growth, distribution and effectiveness of the health care workforce within the country.

Particular interest has been given to Occupational Health (OH) human resources, given the broad variety of graduate programs in OH, and the multidisciplinary approach that prevails, despite the strong medical leadership in OH practice in Colombia. Derived from the National Human Resource Council for the Health Sector created by the Law 1164, a special council for development of OH workforce has also been created, with the aim of strengthening accreditation and positioning OH professionals.

As a consequence of these actions, it is expected that all health care and occupational health professionals will be accredited and certified by the delegated health authorities, likely under professional associations that have also been strengthened by these policies. All human resources should benefit by renewed opportunities to improve employment conditions together with fair salaries, career opportunities, and skilled health care worker development.

Sources:

1- World Bank Policy Research Working Paper 3686, August 2005: http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2005/08/19/000016406_20050819124104/Rendered/PDF/wps3686.pdf
2- Ministry of Social Protection of Colombia (2008) Human talent in Health: policies and regulations http://www.minproteccionsocial.gov.co/VBeContent/newsdetail.asp?id=107&idcompany=3&ItemMenu=2_256

Status and Accreditation of OHS Professionals

The status and accreditation of OHS professionals was the third priority for the provision and organization of occupational health services. OHS professionals are needed to identify, assess, and control hazards present in health care settings. However, the common disregard of occupational health care is clearly illustrated by the low status of OHS professionals. In many countries, the accreditation of OHS professionals is not recognized and professional organizations and associations struggle to make themselves visible and acknowledged (Rodríguez Guzmán, 2007). Testimonies gathered from the Survey on Ethics in OHS Practice in Latin America state that occupational health professionals are almost invisible to governmental and regulatory agencies. While Mexico has a National Accreditation Committee that determines, assesses, and certifies competencies in OHS practice (Pérez, 2008), Colombia has a structure nested within the health system that issues individual or corporate licenses to practice OHS or provide OHS services but that does not follow or evaluate the services provided. Some developing countries do not have OHS professional accreditation systems in place. The IILO's accreditation and certification processes and guidelines are currently being addressed, but the changes to the technical and regulatory process are extremely slow and considered too bureaucratic, (Vargas et al., 2001; SENA/MPS, 2004) diluting efforts and delaying solutions. As a consequence, in many jurisdictions occupational physicians are still perceived and paid as third class professionals. They are often part of human resource teams rather than medical staff, often have limited clinical profiles, are neglected by worker's compensation insurance and health care insurance, and dominated by health care administrators (Rodríguez Guzmán, 2007). The problem of recognition also extends to other professionals; in some areas, for example, OHS nurses are paid less than other nurses, reflecting the perception that their roles and responsibilities are less important (Moodley & Brachman, 2002; Sagoe-Moses et al., 2001).

While most countries have OHS associations, these organizations must continue to work to obtain acknowledgement, certification, and respect for OHS professionals. Credentials and accreditation for OHS professionals, including core competencies in the OHS field need to be standardized and solidified. According to workshop participants, this is an issue that could be brought to the attention of the WHO Collaborating Centres in Occupational Health. WHO Collaborating Centres are networks of institutions throughout the world that have expertise in a topic area. They represent a valuable resource and play a key role in capacity building (www.who.int/occupational_health/network/en/). With their support, tools should be implemented for:

1- Increasing awareness of workplace health problems;
2- Increasing public and institutional support for OHS for HCWs;
3- Launching public campaigns to increase the professional profile of OHS professionals;
4- Lobbying governments to issue public policies regarding OHS for HCWs; and
5- Supporting and strengthening the work of professional organizations.

Developing professional profiles and defining skills and competencies is a challenge, given the variety of tasks and the complexity of the processes for delivering occupational health services. A potentially effective way to address this problem is to focus on the type of activity that is required. For example, as the threat of worldwide transmission of infectious diseases has increased awareness of the need to protect HCWs, efforts have begun to define OHS infection control competencies. A recent successful example is the work of the Provincial Infection Control Network of BC (PICNet) (2007), which developed the "Framework for Staffing and Core Competencies Training Designed for Infection Control Programs" (available at www.picnetbc.ca). This framework encompasses the ILO guidelines for defining work competencies for OHS physicians and nurses including required professional qualifications, knowledge areas, skills, assessment abilities, attitudes, ethics and professionalism.

Professional Skills Mix and Numbers

Determining the correct mix of professional competencies and skills required for safe and effective OHS services is a challenge in the diverse health care settings found in RRAs and developing countries. An index or standard for the number and type of OHS professionals needed for services to health care workers does not exist. One option to fill this gap is to extrapolate from work done in related areas. While not specifically related to health care settings, the Joint ILO/WHO Guidelines for Basic Occupational Health Services suggest determining the type of occupational health professionals needed in commercial workplaces according to the level of service development, the enterprise size, and the level of formality (see Figure 2) (Rantanen, 2007). The minimum professional mix levels would include a field nurse and a safety officer or a physician and a nurse with some special courses or training in OHS. These guidelines also provide an experienced-based estimation of one physician and two nurses per 5000 workers, subject to the local conditions (Rantanen, 2007). The Pan American Health Organization's Manual for Managers and Administrators for Health and Safety of Workers in the Health Sector (2006) states that an OHS unit is best staffed with specialized professionals. If no OHS professionals are available, PAHO suggests those working there should undergo special training. It also remarks that an interdisciplinary team (occupational physician, occupational nurse, occupational hygienist, safety professionals, etc) constitutes the best practice.

Another option to determine the level of OHS service is to base estimates on general health personnel planning for rural/remote areas. However, human resource planning is not always straightforward. For example, in terms of providing the appropriate number of health professionals for standard health care services, the British Medical Association (2005) reported that remote areas experience particular difficulties, due in part to the challenge of providing service for small, sometimes fluctuating, populations. Variables that influence the number of health care professionals needed in a particular setting will also influence the number of required OHS professionals. Overall understanding and defined standards for occupational health human resource requirements in health care are still incomplete. Needs vary between situations, depending on the professional skills available, the demands of the population, the health care activities, the size of the workplace, the geographic locality, and specific local conditions. As a result of this discussion, the group

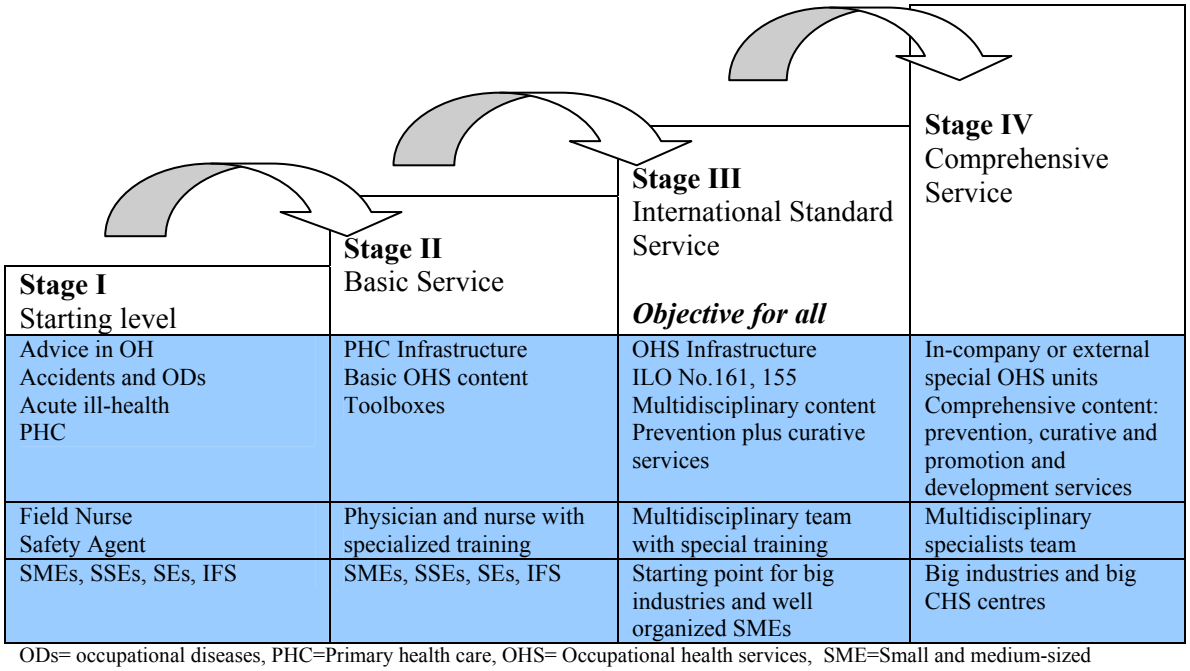
concluded that local or regional needs assessments could also be used to help determine the number and mix of occupational health workers required in particular settings.

Occupational Health Committees

Where occupational health services are not well developed or resourced, occupational health committees provide a way to draw attention to OHS issues and support OHS activities. In many parts of the world, these committees have facilitated workers' active participation in detecting OHS concerns, raising awareness of problems to management, finding solutions, and making decisions about programs and services. Occupational health committees should include HCWs and management representatives. In collaboration with OHS professionals, occupational health and safety committees can coordinate four important spheres of activities (PAHO, 2006):

1- monitoring the work environment;
2- employee health surveillance;
3- education and training;
4- occupational health services and programs (e.g. first aid, vaccinations).

Figure 2: Stepwise Development of OHS



ODs= occupational diseases, PHC=Primary health care, OHS= Occupational health services, SME=Small and medium-sized enterprises, SSE=Small-sized enterprises, SE=Self-employed, IFS=Informal sector

Source: Rantanem, J. (2007) Basic Occupational Health Services. Joint ILO/WHO Committee on Occupational Health. FIOH /ICOH.

It is possible to utilize the expertise of health care workers by asking one or two individuals to act as occupational health liaisons to these committees. This would identify at least one health care worker in each community or health care facility who is concerned with OHS. He or she could also pursue further training in OHS to support ongoing activities and service development.

To draw attention to the importance of good quality OHS for health care workers, workshop participants felt that the following discussion points may be useful to cite in dialogues with managers, administrators, HCWs and the general public:

1- Infectious diseases create situations that threaten the life and health of HCWs as well as patients, with transmission occurring in both directions. As a result, both groups need to be adequately protected. Diseases such as HIV/AIDS, HBV/HCV, TB, and SARS are recent examples of infectious diseases that have created concern within the public and health sector. International and national governmental organizations around the world have the obligation to turn their attention to protecting HCWs from infectious disease;

2- The threat of bioterrorism demonstrates the importance of protecting health care workers' health. Emergency preparedness and global response programs will only be effective if HCWs are available to provide them. Thus, first line of protection should be given to HCWs; strong OHS programs are needed to achieve this level of preparation and protection;

3- Time lost from work by HCWs who are injured on duty or become ill due to work exposures creates an additional burden to often already short-staffed health care workforces. Replacing sick or injured workers also costs money and pulls from potentially underfunded health care budgets. Workers' compensation costs derived from occupational diseases and death of HCWs have increased significantly, and in many countries have posed real threats to the economical stability of health care systems. Research studies on the burden of injuries and diseases in the health care workplace should be supported; with them, the economic and social benefits of OHS can be built. In the meantime, health care institution managers need to work hand-in-hand with workers' compensation boards. However, caution is needed to ensure that managing workers' compensation costs does not take priority over the prevention roles of OHS, as has happened in some jurisdictions.

Section Two: Establishing Occupational Health Programs

The second working group's discussion focused on issues related to establishing occupational health programs. While this list is not exhaustive, four areas were identified as fundamental to establishing comprehensive occupational health programs in rural/remote areas and developing countries:

1- Resources;
2- Safety Culture;
3- Collaborative Practice;
4- Risk Analysis and Awareness.

Throughout their discussion, the group referred to the two workshop case studies as points of reference and to provide examples for their recommendations. In the group's opinion, both case studies highlighted the general difficulties faced in establishing and providing effective occupational health care programs.

Case Study One: Air-Borne Diseases

Alan is a physician who has been practicing for many years in a rural hospital in Africa. Unlike many of his colleagues who have moved to bigger centres, he has stayed in the countryside because he loves the quiet setting and the people. His loyalty and love, however, are being severely tested by the new issue of drug-resistant TB, which is a growing problem in the population Alan serves. Because of this concern, Alan's wife, who is also a physician, is advising him to consider moving to a better resourced city hospital. Alan doesn't want to move but he is worried, and he knows as a health care worker, he is at risk of contracting TB. He can't remember if he was vaccinated with BCG when he was a child. He has never been skin-tested for TB as far as he remembers and the hospital does not have occupational health records. He doesn't feel well protected since there are no special masks (N95 respirators) available. He also knows that patients likely to have infectious TB should be isolated; however, his hospital does not have isolation rooms or even separate examination rooms. Although ventilation and air handling systems reduce the risk of infection; Alan's facility is old and does not have any special ventilation capacity. Recently he has become more concerned because he has been coughing for more than two weeks. The smear results of three recent sputum samples, fortunately, have been negative.

Case Study drawn from WHO materials available at: www.who.int/occupational_health/activities

Case Study Two: Blood-Borne Diseases

Karen Smart, RN, was working the weekend night shift when she a sustained a needle stick injury. Karen reached behind her to place a used needle in a sharps container and was stuck in the hand by another needle that was already in the container. The sharps container was on the injection trolley being shared with the patient in the next bed, who was in the hospital for pneumonia secondary to AIDS. It was unknown whether this patient had hepatitis B or C virus infection. Karen followed protocol and washed her wound immediately. The recommended regional policy for post exposure prophylaxis (PEP) states that the employer is required to ensure appropriate PEP is offered within 2 hours. In practice at this hospital, when a needle stick injury occurs on a weekend, the injured worker is told to return on Monday for evaluation when the occupational health office is open. Karen deferred when offered post exposure prophylaxis for HIV. She reasoned that because the needle had been exposed to air, there was a low risk of contracting any infectious virus. She knew that hepatitis B was most likely to be a problem, but she had had her full course of hepatitis B vaccinations. However, at her three month screening, Karen learned she had contracted HIV.

Case Study drawn from WHO materials available at: www.who.int/occupational_health/activities

Resources

Lack of resources can be one of the most disabling problems when instituting an occupational health program. As the case study on air-borne disease illustrates, there may be few or no physical resources available to protect health care workers. In the first case study, there was limited access to equipment such as masks (N95 respirators) to protect the physician from exposure to TB and there was no effective way to track patients because there was not a record keeping system. It was also difficult to protect general staff safety because the proper facilities, such as isolation rooms for TB patients, were not available. The second case study addressed a resource problem even though occupational health services were in place. Limited access to services when they are needed can be just as ineffective as not having the service at all. In the case of the nurse with the needle stick injury, inaccessible services meant the development of a potentially fatal disease; timely access to occupational health services may have prevented the occurrence of HIV infection.

The financial resources of health care organizations also affect the availability of OHS services. If funding bodies, whether national or local governments, do not allocate appropriate financial resources to occupational health, it is impossible to adequately address the prevention and treatment of occupational diseases and injuries. Likewise, private health care companies may spurn funding OHS services because they are not viewed as cost-effective for business. The culture of placing profit above the health and well-being of staff still prevails in many locations. This results in greater numbers of occupational illnesses and injuries to HCWs and greater strain on health care systems.

As discussed in the introduction, health human resources are very limited in many countries. Inadequate numbers of physicians, nurses, and other health care workers result in increased workloads that are difficult to manage and that threaten the quality of care. One such consequence is a reduced emphasis on health care worker safety. Less emphasis on safety ultimately leads to more accidents, exposures, and subsequent illnesses. This can lead back to a loss of competent providers and continuing human resources crises – a self-perpetuating cycle. In particular, workshop participants asserted that the "brain drain" movement of health care workers from developing to developed countries is a partial consequence of inadequate OHS programs and poor working conditions. As previously noted, many physicians and nurses leave their home countries to work elsewhere due to unsafe working conditions and overwork. For example, physicians and nurses in sub-Saharan Africa leave their home countries to work in such places as South Africa, while South African physicians and nurses leave to work in such places as Canada. Meanwhile, physicians and nurses in under-resourced rural or remote areas in countries such as Canada may move to better funded urban centers.

Safety Culture

In many parts of the world, OHS services are viewed as less important than patient care. In general, health care systems have focused primarily on clinical care for patients, and discourse about a workplace safety culture for HCWs is uncommon. Subsequently, employees may not view OHS as an important component of the workplace and health care management may lack awareness of HCW needs. This knowledge gap creates a burden for HCWs because their health and well-being may be taken for granted.

Yet a culture of safety should be of utmost importance for health care workers. HCWs often discuss prevention and quality care for those that are already ill or injured. Why should they treat themselves or their fellow workers with any less consideration? This altruistic culture has led some health professionals to have a false belief in being immune or invulnerable to work hazards. The *"super-being syndrome"* that many HCWs share as a consequence of their commitment to serve others seems to prevail in both developing and developed countries and in both public and private sectors. The cultural environment also affects how health care workers provide care and can affect OHS practices. For example, in parts of South Africa, it may be considered impolite to wear a mask, which can adversely influence the spread of TB. In Japan, it may be considered impolite to wear gloves during a visit as it may convey the message that a person is unclean.

One goal of occupational health and safety programs should be to change the culture and the mentality of HCWs, aiming to create responsible attitudes towards occupational injuries and diseases in the health care sector. Workshop participants concluded that HCWs themselves must take initiative to call for and create improved safety cultures in the workplace (see Focus Box Three). HCWs need to recognize the services they provide as valuable. Part of this value is the willingness to take care of themselves in order to take care of others. Health care workers can only give help if they are in the condition to do so, such as in the case of the well recognized adage to "put on one's own oxygen mask first before helping others" in an airplane. When they know the risks they are facing, health care workers can take the necessary steps to prevent or minimize

harm. In turn, they need to educate their patients. Social mores that affect health and safety need to be adjusted with sensitive education and practical alternatives. These changes need to be spurred by HCWs, confirmed and sustained by management, and involve community members, health care educators, government, unions, and policy makers. Creating awareness about hazards in health care settings and trying to avoid the creation of the "*super-being syndrome*" should also be incorporated within health care educational programs.

Focus Box Four: SARS in Canada

Bruce Gamage

The 2003 SARS (Severe Acute Respiratory Syndrome) outbreak had a profound impact on Infection Control (IC) and Occupational Health professionals working within acute care facilities in Canada. Prior to this event, IC practices were commonly implemented by staff as dictated by the policy within their facilities, but the failure to do so did not put their lives at undue risk during their day-to-day activities. After the SARS outbreak, hospital staff across the country became more motivated to request advice on appropriate use of personal protective equipment and isolation policies. Key issues that came to the forefront were the lack of negative pressure rooms in most acute care facilities and the fact that many staff were neither fit tested for N95s nor trained in their use. Lessons learned from this crisis were that health care workers' perception of personal risk is a strong motivator for increased compliance with IC policy but that an even stronger factor is the institution's focus on staff safety. If the resources are not in place to support their efforts to comply, compliance remains low as staff may perceive a decreased value in following procedures. A climate needs to be created within health care facilities in which workers feel supported by their administration and staff safety is a priority.

Collaborative Practice

Establishing effective occupational health services requires cohesion and collaboration between the different groups involved in the creation of policies and delivery of services (see Focus Boxes Four, Five and Six). Occupational health and safety is unique in that there are a number of diverse groups involved in providing services. Some groups, such as medicine and nursing, are specifically health oriented. Others, such as industrial hygienists are interested in the safety and functioning of a system. Local or national governments have an interest in both economic and health outcomes, and if an occupational safety and health agency exists, they are interested in the safety of their members amid the working environment. Local, national, or multinational companies may also have wide and varied interests in the health and safety of their workers. Unfortunately, programs and services are often fragmented because groups, agencies, or government ministries that have input into the direction and delivery of occupational health and safety programs may lack integration, communication, and consistency. Achieving the goals of one organization may influence the ability of another organization to do its job.

Collaborative relationships may develop slowly and change is likely to occur slowly over time. Implementation of new policies or new ways of service delivery may occur more rapidly at the local or institution level; this points to the importance of collaboration at the level of the employer and employee. For example, in the second case scenario collaboration between the hospital occupational health department and the emergency room may have allowed the nurse to be seen immediately and receive available preventive care. Preventing an occupational disease such as TB in a rural underserved setting, such as in the first case study, presents a much greater collaborative challenge. As the case points out, there is a breakdown of multiple services such as occupational health records, supplies, and physical infrastructure. However, international agencies, such as the WHO, are often able to provide information to help address common challenges. Collaboration between local and international agencies may not eliminate problems entirely, but the help received through sharing available resources and knowledge may ease the burden.

Focus Box Five: Country Mutuals in Nicaragua

Julietta Rodríguez Guzmán

The Association of Countryside Workers (Asociación de Trabajadores del Campo - ATC) of Nicaragua was created in the 1970's from the union and organization of the Countryside Workers Committees (Comités de Trabajadores del Campo) who were struggling for their citizen rights and for improving their living and working conditions. In its almost 40 years of history, the ATC has led many actions to ensure the health care of countryside workers. Starting by adding themselves to the national, regional and zone health committees, they managed to solidify a body of more than 4,000 health promoters and 32,000 health squads for primary health care services until creating the countryside mutual.

The ATC has also created a network of OHS and environment educators and promoters. A baseline study on working and health conditions was done for the tobacco, coffee, and rice sectors in a joint effort with the National Autonomic University of Nicaragua. Here they started an inter-institutional collaboration project with the University for technology transfer, training, research, and exchange of institutional capacities. By 2005, in coordination with the Minister of Labour, ATC had achieved a 30% reduction in health hazards in the banana industry and 50% in the coffee, rice and tobacco sectors.

At the same time, they were able to strengthen multiple collective conventions and bipartite agreements with the support of unions, achieving important investments in health and environment. Over nine thousand rural workers were trained on several topics relevant to health and workplace environment, 41.76% of whom were women. This initiative helped to strengthen communication and advance workers' health and labour rights. The most significant achievement is the provision of medical care with a preventive approach to work hazards in rural settings.

There is no doubt that this initiative guarantees access to health care services based on community initiatives, reinforcing the spectrum of primary health care to more specialized levels of OHS services. It is therefore a very interesting and important contribution for delivering OHS services and practical solutions to HCWs in RRAs and developing countries.

Focus Box Six: Options for Working Together in Egypt

Emily Kamel

In Egypt, infection control policies in health care facilities vary widely according to the individual health premises' administration policy. One health care facility may adopt a stringent infection control policy while another may not have a sufficient infection control policy, depending on resources and on the commitment of the administration.

Formal occupational health services covering all health care workers in a geographical region are virtually non-existent. Education programs help to raise awareness among some groups of health care workers about blood-borne pathogens transmitted in health care settings, but full implementation of infection control policies and follow-up evaluations of health care workers as part of post exposure prophylaxis are still lacking. The Egyptian Medical Syndicate offers reduced-price hepatitis B Vaccinations to all physicians and their families. However, vaccination is not compulsory. Recently, the hepatitis B vaccination was included in the Compulsory Immunization Schedule for infants and children. As a result, future health care workers should be immune against HBV.

One possible strategy for providing occupational health services to health care workers in Egypt would be to collaborate with infection control units. Occupational health practitioners trained in delivering health services to working personnel could be recruited as members of infection control teams. In the absence of an infection control unit, an infection control policy could be adopted and an infection control team part or full-time as resources permit may be recruited from existing personnel who are interested in the issue. They should be acquainted with infection control guidelines in health care settings and among health care workers and should be able to adapt international guidelines to national and local settings without losing the essence of infection control.

Risk Analysis and Awareness

Based on the realities of limited financial, physical, and human resources, workshop participants identified that determining what the greatest risks are for a particular group of health care workers is a priority when establishing OHS services. Uncovering the risks specific to a country, region, or individual health care setting will allow decision makers to allocate scarce resources to the interventions that will have the greatest efficacy. Determining which procedures and settings produce the most injuries and exposures allows decision makers to target OHS activities to the most appropriate areas.

Risk assessment requires detailed data collection and epidemiological analysis. In reality, occupational health data collection initiatives in many countries, even wealthy countries such as Canada, lack attention and funding. In many countries, occupational health departments are virtually non-existent and data collection is a low priority. This becomes an ongoing challenge for evidence-based decision making. Furthermore, large surveillance systems, which may be better funded, have the potential to be insensitive to certain issues as aggregate information may hide specific situational data. Information systems need to be strengthened as they contain the tools to understand the situation. The need for enhanced occupational health services cannot be proven if there is no data. In the words of one participant, "If there is no data, there is no problem." For example, if only 10% of health research addresses health conditions that make up 90% of the global burden of

disease, and even less research is devoted to occupational health in developing countries, it is not surprising that occupational health care is such low priority in many health care settings

One simple and effective practice is to survey health care workers through a point prevalence survey. A point prevalence survey measures the existence of defined characteristics at a point in time, such as the number of HCWs who have ever had a needle stick injury. When the information in a point prevalence survey comes directly from the front line workers themselves, this method tends to be sensitive to local issues and risks. Although it is time-consuming, taking the time to interview front-line workers can offer a wealth of valuable information as well as innovative suggestions for possible solutions. Data collection can be facilitated by medical students or other health care trainees. Data results can be used for strategizing and planning when

Focus Box Seven: Cuba's National Biological Security Program

Raquel de los A. Junco Díaz and Vicente I. Prieto Díaz

The National Biological Security Program in Cuba works with Cuba's Public Health institutions, and reaches from the national level to institutions at the most primary levels of the health care system. This program unifies prevention and promotion of OHS services and seeks to significantly improve the work environment. It also aims to diminish morbidity/mortality associated with exposure to blood and body fluid, including those from needlestick injuries.

The work of the National Biological Security Program is implemented in the health institutions by the Biosecurity Committees. These committees include specialists of different medical disciplines who also consult with professionals at higher levels. One of the crucial aspects of the work of these committees is to assess occupational risks present for a specific worker as well as for a group of workers exposed to similar risks. In addition, this program created an occupational health information system, which includes information surrounding the exposure to blood, body fluids and sharps. The system includes information on the injured worker (occupation, specialty, years of experience, previous injuries, immunization record, etc.), the conditions under which the event occurred (type of accident, place where it occurred, materials involved, etc.), management of the injury, and access to post exposure prophylaxis (immediate and secondary actions).

Another program, the National Worker Health Program, establishes pre-employment requirements and files for HCWs, paying attention to immunization history and to the vaccinations needed in relation to the perceived labour risks. All HCWs are immunized against hepatitis B and Tetanus, leaving the other immunizations for workers in specific risk groups. Due to the fact that Cuba produces the vaccines against hepatitis B and tetanus domestically, and the Cuban health system guarantees immunization coverage for national health programs, there is satisfactory distribution and accessibility for both vaccines. Exposed workers are guaranteed to receive the three doses of hepatitis B vaccine. Each health institution is responsible for applying prophylactic methods post exposure. This system establishes immediate and secure action nationwide.

The National Biological Security Program confronts major challenges and emphasizes creating awareness amongst all health care workers, raising the level of knowledge amongst exposed workers, and adequate identifying risk factors. In addition, the program works to maintain rigorous control over exposures and aims to carry out effective post exposure prophylactic action to reduce occupational risks related to blood-borne pathogens. It also develops national standards for the management of occupational health in health institutions and maintains statistics.

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presenting to managers and administrators and lobbying for financial and overall support (see Focus Box Seven). Determining the most relevant risks will also allow managers and education coordinators to ensure that the most important issues are addressed in education and training. An excellent web-based workplace health surveillance system, designed specifically for the health care sector is the Occupational Health and Safety Information System (OHASIS), designed in Canada in collaboration with South Africa (see Focus Box Eight).

The use of a workplace audit system for facilities is another simple and effective practice. Checklists can be used by health care workers or health and safety committees to evaluate working conditions and assess whether risks are being addressed. Finally, health care workers around the globe should be encouraged to report all occupational incidents, regardless of the presence or adequacy of a surveillance system. Voicing concerns to supervisors and managers will increase awareness of the exposures faced by front-line workers on a daily basis and will provide guidance as to where to focus interventions. There must be willingness to reduce risks by senior personnel, whether management, government officials, or the executives of an involved company. It is truly in the best interests of leaders to understand the risks involved in health care and to minimize them. Their motivations may be different, such as profits or treatment costs, but the fundamental emphasis should be the same – to maintain a healthy and functioning health care work force.

There may be situations in many RRAs and developing countries where a risk analysis highlights problems for which the best solutions may not be feasible. For example, installing a ventilation system in a small community hospital or clinic may not be possible due to lack of funding or physical infrastructure. However, even in this situation an understanding of the risk may lead to a workable solution, such as isolating TB patients to one ward that has an open-air environment where there is greater exposure to ultraviolet light and natural ventilation. Increased awareness may be sufficient to prevent the exposure by influencing behaviour, such as how a nurse or physician handles used sharp instruments. The two case study scenarios give good insight into the importance of awareness. In both cases there is some understanding of the risk but the health care workers appear to have inadequate resources to manage the risk and little is done to intervene, prevent, or eliminate the exposures. In the case of the TB exposure this is mainly due to lack of resources, but further education may be a great benefit. The second case also highlights that awareness alone is insufficient to eliminate the risk of infection from a blood-borne pathogen exposure if there is a lack of adherence to safety measures and proper follow-up. The two cases should also bring attention to the fact that risks are not limited to the involved health care workers. Occupationally acquired diseases or injuries can also affect the family and acquaintances of a worker, the community, and other patients. For example, by having inadequate protection against TB the physician risks developing active TB and spreading it to other patients, members of the community, and his family members. The health care worker with active hepatitis C and HIV is at risk of spreading it to her sexual partners.

Focus Box Eight: Identification of Priority Action Areas in Hospitals in Japan

Koji Wada

Health care workers at hospitals with inpatient wards are at higher risk of exposure to a variety of occupational hazards as compared to clinics and long-term care facilities. We conducted a survey with the Delphi method to identify priority action areas in occupational health for health care workers at hospitals with inpatient wards in Japan.

A modified Delphi method was applied by mail survey twice. The Delphi method is a technique to form a consensus among the "experts." This process entails using a questionnaire; each participant is provided a questionnaire as the first survey. Then, as the second survey, each participant is provided another questionnaire with feedback and a summary of the results of the first survey. In this process, responses are summarized between rounds and communicated back to the participants. This allows for the possibility of obtaining a consensus without bringing panelists together physically.

Forty-three experts including physicians, nurses and managers participated in this study. The response rate was higher than 80% in both surveys. This study reached a consensus in terms of identifying fatigue, stress at work, and self-care as the priority action areas at hospitals with inpatient wards in Japan.

The action areas would be different in each hospital. However, this result could provide a benchmark for planning further occupational health strategies on occupational health for health care workers at hospitals with inpatients wards.

Source:

Wada K, Kudo Y, Nagai M, Yoshikawa T, Narai R, Oda S, Satoh T, Aizawa Y. Identification of priority action areas of occupational health for health care workers at hospitals with inpatient wards in Japan: a Delphi study. The Kitasato Medical Journal 2007;37:98-101

Focus Box Nine: OHASIS (Occupational Health and Safety Information System): An Innovative Web-Based Tool to Promote and Protect the Health and Safety of the Health Care Workforce

Lyndsay Dybka and Annalee Yassi

South Africa's health care workers face complicated demands with too few resources. Many well qualified health care professionals find higher paying positions overseas. In an effort to alleviate this drain on the health care workforce, an interdisciplinary South African-Canadian research team has developed and piloted the Occupational Health and Safety Information System (OHASIS), which will make the health of health care workers a priority.

OHASIS is a web-based system, designed specifically for occupational health in health care. It facilitates analysis of incidents, injuries, risk factors, and prevention/follow up measures. Some key features of the system are listed below:

- Comparability to identify best practices and areas needing assistance;
- Pooling of data to allow for better decision-making;
- High security and accessibility;
- Data encrypted and secured;
- High quality technology;
- Ability to link with other data systems;
- True internet application to allow data entry locally, regionally, and nationally.

OHASIS modules include incident / injury reporting, workplace assessment, workforce health, infection control, and a section dedicated to health and safety representatives. The system collects incident information based on South African regulations and requirements.

Items in the incident/injury reporting module include demographic information, incident description, injury type, activity, cause, contributory factors, and recommended controls. Reports are generated by rates as well as frequencies, and allows for bivariate and multivariate analyses. The workplace assessment module collects information on hazards and risk controls. Reports include the ability to print a full assessment, hazard summaries, and risk control summaries (filtered and sorted as desired). Risk control follow-up allows users to update the status of a risk control, as well as enter/update the due date. The due date control then triggers an automatic e-mail to the person responsible, if status is incomplete. The workforce health module allows data entry for individual health records, as well as bulk entry for training, immunization, and various testing procedures (e.g. screening, diagnostic testing, respirator fit testing). Workforce health data will be collected on health care worker profile, occupational history, health history (non-communicable diseases, communicable diseases, allergies, etc.), vaccinations, training received, fit testing for personal protective equipment, audiometry (if needed), history of workplace injuries or exposure incidents (pulled from incident module), HIV counseling and testing (whether or not HIV counseling and testing was accepted, date, counselor, risk factors, test result, CD4 count, symptoms, treatment), and TB status (including BCG history, exposures, risk factors, latent tuberculosis infection tests and results, prophylaxis, symptoms of active tuberculosis, chest x-ray, sputum culture, sensitivity, and treatment). Links to risks found for department and occupation are available and secure.

Given concerns identified in previous studies on information technology in low-middle income countries, understanding how to best introduce health information systems for decision making in these settings is crucially important to the world community. Improved working conditions enhance retention of health care workers. OHASIS will earn the trust of the workforce, ensuring that their rights are respected and their needs addressed while also facilitating clinical and organizational aspects of research.

Section Three: Primary Prevention for Blood-Borne and Air-Borne Pathogens

The objective of the third working group was to examine primary prevention strategies for blood-borne and air-borne pathogen transmission in health care settings. Health care workers in developing countries are at increased risk of infection with blood-borne and air-borne diseases in part because of the high prevalence of pathogens in these regions (Sageo-Moses et al., 2001). As a starting point for discussion, participants agreed that many accidental exposures to blood-borne and air-borne pathogens are preventable if health workers have and employ appropriate technology for sharps use and disposal, wear protective equipment such as gloves, masks, and eye protection, and have means to dispose of biomedical waste correctly. The group also determined that three key components must be in place as a basis for primary prevention strategies:

1- Baseline assessment;
2- Education and training;
3- Comprehensive policies and protocols.

The working group believed primary prevention measures based on these three elements would not only decrease the transmission of blood-borne and air-borne pathogens, but would also increase worker retention thereby addressing, in part, the current shortage of health care workers worldwide.

Baseline Assessment

Baseline assessment is not common practice in many regions because it is not seen as an immediate priority. However, the working group stressed that it is essential to document health histories, including vaccination records, for all new staff members. Health assessments should be completed at the time of hire, but should also be updated annually, post exposure, or more frequently if risk is elevated. The group felt that strong occupational health programs give workers a renewed sense of security in high-stress and high-risk workplaces. Monitoring the health of the worker and taking the time to examine their individual health history allows the health care worker to feel cared for in their workplace, which will ultimately lead to greater worker empowerment. Occupational health departments that actively encourage and support workers to stay healthy will help influence improved patient care and increased productivity.

Education and Training

Adequate, up-to-date, and ongoing education and training for all health care workers is a vital component of occupational health services (Yassi et al., 2007). However, because it is often not identified as a priority and may be deemed to be of little importance, workplace OHS education is often very limited or non-existent. Without adequate education, HCWs may underestimate the potential health impacts of occupational hazards such as needlestick and sharps injuries. This may also be due to the normalization process accompanying the

high number of injuries among HCWs in some areas. As previously indicated, education is a vital component to implementing a safety culture. The skills and knowledge attained through education are fundamental to ensuring that incidents and exposures are addressed with the sense of urgency and attention needed to ensure that workers, managers, and support staff initiate appropriate treatment and follow-up (see Focus Box Nine).

When planning formal educational initiatives, the current knowledge, attitudes, and practices of the health care workers in the specific institution should be evaluated and interpreted. It is common for health care workers to report high levels of knowledge and awareness of guidelines and procedures. When tested, however, knowledge scores may be lower than expected and reflect outdated policies and procedures. A workplace commitment to ongoing education is needed to ensure HCWs are able to maintain and build upon their knowledge base and to ensure the consistent implementation of occupational policies and procedures. However, even when HCWs are aware of and understand current policies and practice, compliance may be low. This is an issue that requires careful consideration. What factors are preventing health care workers from fully protecting themselves? The most realistic response to this question is an overall lack of resources. For example, staff may be aware of the fact that all sharps must be disposed of in a sharps disposal container as opposed to the regular waste container. However if inadequate funding prevents the supply of enough sharps disposal containers in each department, HCWs may be forced to walk to another area to properly dispose of the contaminated object. This is not realistic or feasible. Workplaces must support knowledge and education with the resources required to implement appropriate practice. Although many hospitals and clinics in the developing world may not have access to the services and supplies of the developed world, there are still simple ways to prevent or lower the risk of exposure to blood-borne and air-borne diseases. For example, in most countries there are ample supplies of puncture resistant plastic containers in the form of discarded water and beverage bottles and solutions such as the use of these containers for needles and sharps can significantly reduce exposure to blood-borne pathogens. The 2006 “Stop TB Strategy" addresses prevention of air-borne diseases in health care systems and suggests innovative solutions for use in poorly resourced areas (www.who.int/tb/strategy/en/index.html). Information tools such as the WHO toolkit, “Protecting Health Care Workers: Preventing Needlestick Injuries” give practical examples for safe handling and disposal of needles.

The question of who is responsible for overseeing educational programs is paramount in many workplaces. Education and training must actively include specific and integrated roles for the occupational health department, health and safety committee members, infection control practitioners, managers, and frontline workers. Involving all parties is essential to success and sustainability, as leadership by peer-nominated workers and local champions stresses relevance to every level of worker and encourages participation. Training and awareness campaigns need to reach all health care workers, as the objective is to establish a culture of prevention and a healthy workplace environment. The “Protecting Health Care Workers: Preventing Needlestick Injuries” toolkit mentioned above aims to fill this gap (available at

www.who.int/injection_safety/toolbox/en/). The toolkit is used to train health care workers on occupational transmission and prevention of blood-borne diseases. The training program also includes education sections for policy makers and hospital managers on occupational injuries and diseases. Involving national and local authorities is fundamental to increasing awareness of the need to invest in occupational health and safety services for health care workers. Likewise, all medical and health professional students should receive mandatory training in occupational health care. Currently, there is minimal education on occupational health in many medical and nursing schools. Using this window of opportunity for training will provide future HCWs with relevant information to protect their own health and safety, as well as improving their clinical skills.

To encourage participant engagement, training should focus on issues that have been identified as high priority by staff during risk assessment activities or through data analysis (Burke et al., 2006). Workers will be likely to attend sessions that are relevant to daily issues and concerns. For example, if results from a workplace audit indicate high incident rates of needlestick injuries occurring in one particular area of the hospital, it is crucial to ensure that the staff are aware of appropriate guidelines and protocols, and that their knowledge of proper procedures is current. Another way to provide educational opportunities is to give different HCWs the option to sit on occupational health and safety committees. These committees provide venues for discussions on disease prevention and occupational health care practices applicable to on-the-ground workers. While they may not be acquainted with the exact operations of an occupational health program, HCWs are able to see the health outcomes of poor OHS practices and should have valuable input into health and safety standards.

Education sessions should carefully consider cultural and contextual issues. Problem based learning provides realistic scenarios to the participants and enables them to apply newly attained information to situations to which they can relate. Dialogue and debate, behavioural modelling, and hands-on practice are more engaging than standard lecture formats and they reinforce and encourage retention of material presented in literature and pamphlets. It is crucial to collect feedback from participants at all lectures, workshops, and education sessions to evaluate the material and methods relevance and enjoyment. This will allow for future sessions to be tailored further to the specific group and topic. Prepared information packages on the potential risk for infection and appropriate post-injury treatment should also be available for workers. For example, in the second case study, Karen may have chosen to follow up on her consultation if she had access to information even after the occupational health office was closed. Occupational health forms and information packages should be adapted for different cultural and educational situations. For example, the low-literacy levels of some health care workers need to be taken into account.

Finally, it is also important to educate leaders to ensure that they will set an example to be followed by their staff. Including basic concepts of OHS in the training and orientation curricula of all management

professionals will lead to greater appreciation and support for OHS services. Because OHS services are not often seen as priorities for health care institutions, managers may not be aware of the problems HCWs are facing or of the benefits that OHS services provide. Resources such as the Pan American Health Organization's document "Workers' Health and Safety in the Health Sector: A Manual for Managers and Administrators" are valuable assets that can be used by decision makers to inform how OHS services could be organized and activated in their jurisdictions (available at www.bvsde.ops-oms.org/ssmanual/interface.htm). As previously noted, the manual is intended for managers, administrators, planners and anyone else involved in health care decision making. It offers basic concepts of occupational health and safety management and explains common hazards encountered in health care.

Involving unions as key players is also important to promote education and primary prevention activities. The participation of unions in education activities creates a greater sense of solidarity and support, while reinforcing the rights of all health care workers to a safe and supportive work environment. Unions also foster space for a collective voice for frontline workers to present to management and administration. The PAHO Manual for Managers and Administrators described above may also be used by labor unions.

Focus Box Ten: Building Capacity of Health Care Workers: A South African-Canadian Collaboration

Lyndsay Dybka and Annalee Yassi

A research collaboration began at a World Health Organization Collaborating Centre networking meeting in July of 2006, combining Canadian and South African expertise in improving occupational health within the health care sector. South African delegates from the National Institute for Occupational Health (NIOH) and the National Department of Health were particularly interested in building capacity of the health care workforce through education, training, and international collaboration.

The decision was made to pilot a comprehensive occupational health and safety programme in one public hospital, with the intention to roll out a national program at a later stage. Pelonomi Hospital in Bloemfontein, Free State was chosen because of the existence of strong managerial support, a well-developed occupational health department, a basic electronic occupational health information system, strong national, provincial, and academic support, an existing and functional health and safety committee, and eagerness and enthusiasm from all concerned parties.

An initial workshop was held in Johannesburg to gather input from national health and safety personnel. This was followed by a three-day workshop in Bloemfontein attended by almost 100 invited participants, including 16 occupational health professionals, most of the health and safety representatives elected by their co-workers at Pelonomi Hospital, union activists, clinicians and managers. The workshops introduced problem-based learning scenarios based on Canadian experience in occupational health and safety at home and worldwide, union training, and input from Canadian and South African occupational health and infection control experts. The scenarios addressed pertinent issues including needlestick injuries and stigma of HIV, back injury from heavy lifting, latex allergy from glove use, patient violence, and occupational exposure to tuberculosis. Participants were then divided into groups to conduct workplace assessments which examined the physical environment, specific occupational health practices and hazards, specific infection control practices, equipment and procedures, and ergonomics. A follow-up workshop was held in March 2008 for the health and safety representatives at Pelonomi Hospital. Questionnaires evaluating the workshops were completed by participants and feedback was positive, particularly in regards to the problem-based learning methods.

There is a strong interest within the health care workforce in South Africa to address the issues of health and safety even if the resources to put knowledge into practice are not readily available. Significant progress has been made at Pelonomi Hospital to promote and protect the health of the workforce. As illustrated by the successes at Pelonomi Hospital, improved working conditions along with increased education and training enhance retention of skilled health care workers.

Focus Box Eleven: Innovative Partnership Model for Preventing Occupational Blood-Borne Pathogen Infections Among Health Care Workers

María Sofía Lioce-Mata

In Latin America the percentage of infections among health care workers attributable to sharps injuries reaches about 80% for Hepatitis B, 53% for Hepatitis C, and 2.5% for Human Immunodeficiency Virus. In 2005, the World Health Organization (WHO), the Pan American Health Organization (PAHO), the U.S. National Institute for Occupational Safety and Health (NIOSH) and Latin-American partners developed a model project for the region. The WHO toolkit "Protecting Healthcare Workers: Preventing Needlestick Injuries" was culturally and linguistically adapted to Latin American audiences.

Venezuela agreed to conduct the pilot project. In 2007, international, national and state partners participated in national and train-the-trainer workshops. The partners agreed to have Aragua State as a model for the country. The key partners in Venezuela who have been working in the implementation of the needlestick project are:

1- Dr. Arnoldo Gabaldon with the Institute of Public Health Advanced Studies (IAES*),* the highest scientific institute of the Ministry of Health;
2- *CORPOSALU,* the autonomous health institute attached to the Governor of State;
3- Petróleos de Venezuela, S.A. (PDVSA), the Venezuelan state-owned petroleum company; and
4- The Venezuelan Institute of Social Security (IVSS)

The model aims at transferring expertise through a research institution. This conceptual approach involves strengthening research and surveillance capabilities within a research institution, which in turn trains and supports government officials and other professionals to implement preventive interventions, and ensures sustainability of the intervention. In one year, this project has been successfully expanded to four neighbouring states and continues its expansion. About 25 hospitals and three Networks of Outpatient Care have started to implement this project. Also, 750 students from national universities and health care professional institutions were trained with the toolkit.

Comprehensive Guidelines and Protocols

Creating comprehensive and integrated occupational health and safety guidelines and protocols requires the coordinated efforts of multiple groups such as national and local governments, occupational health professionals, employers, employees, and agencies such as unions. While national and international bodies often initiate and issue guidelines that are evidence-based, standardized, and applicable to as many populations and regions as possible, these directives should also be responsive to local realities and needs. Although all regions, including developing countries, should strive towards fully implementing internationally endorsed best practices, policies sensitive to regional realities may benefit from increased compliance because they reflect local issues. Some adaptation at the level of the facility is encouraged in order to ensure practices are appropriate and applicable to local surroundings. While striving towards international standards, decision makers should take care to engage with health care workers and employers to ensure the directives are culturally appropriate, practicable, and generally acceptable.

There are many guidelines and protocols on the primary prevention of blood-borne and air-borne infections. Encouraging best practice in primary prevention, even when a lack of resources may not allow for it, is

extremely important. The process of implementing these recommendations can be a gradual, ongoing process. Countries and regions are innovative and adaptive, and many do the best they can with what they have while still striving to uphold international guidelines (see Focus Box Ten). For example, safety engineered needles (SENs) are tremendously effective at reducing needlestick injuries, yet it is currently unrealistic for developing countries and remote/rural regions to purchase mass quantities of SENs. Although resources are strained, it is important to strive for best practice, which includes education and training in regards to SENs, particularly in regions where there is a high risk for exposure to blood-borne pathogens. Even in Canada, a country with a wealth of resources, SENs are still not used in all facilities.

According to the working group, low technology guidelines such as universal precautions - treating all patients as if they are potentially infected and using appropriate protection - are highly effective in settings where incident rates of infectious diseases are high and risks to HCWs are elevated. Some may argue that treating everyone as if they are infectious may result in patients feeling stigmatized, however the community must be educated to understand that these protocols and guidelines are applied equally to all members of the public to promote everyone's health and safety. Applying other precautions such as symptomatic isolation is also important. At first glance, isolating patients based on symptoms as opposed to diagnosis may seem costly, yet in reality, prevention efforts are particularly cost effective.

Once guidelines are produced, they need to be applied; unsustainable guidelines are futile. The responsibility for implementing guidelines and for monitoring the resulting practice rests with many different groups and concrete support from all parties is necessary. For example, local health care managers and administrators are usually responsible for implementing new practices. Staff must be made aware of new guidelines and procedures and must have the knowledge and capability to be able to put them into action. The resources to apply guidelines must also be available. Funding bodies must provide institutions with the resources to purchase any equipment and supplies indicated for use in the guidelines. In many RRAs and developing countries, lack of resources (human, financial, or physical) makes complying with new guidelines difficult or even impossible. For example, South Africa has nine provinces with appointed occupational health coordinators; however in most provinces the funding is inadequate for the coordinators to do their jobs. The two case studies also demonstrate how policy is often disregarded due to inadequate resources.

Occupational health and safety guidelines and protocols should be based on the results of data analyses and risk assessments. National and international organizations such as the WHO, the ILO and the National Institute for Occupational Safety and Health (NIOSH) have documented the problems facing health care workers; this data can be invaluable in promoting useful policies. Statistics about injuries and diseases in regional health settings are also needed to establish that problems exist locally. Mechanisms to assure effectiveness are also essential, as policies that do not accomplish their purposes become hindrances to good occupational health care practice. Evaluation needs to be ongoing and must involve the feedback of health

care workers and the use of reliable data. To make this feasible, health care institutions in RRAs and developing countries can pursue international partnerships, such as with WHO Collaborating Centres. Connecting with international colleagues allows professionals to share successes and triumphs that may be adapted and implemented elsewhere. It is also important for researchers and HCWs in wealthy countries to realize that there is much to learn from the courageous and dedicated workforce in resource-limited regions.

Focus Box Twelve: Sharps Disposal in Guyana

Teófilo Monteiro and Ashok Sookdeo

Guyana has made significant progress in the standardization of the immediate disposal of sharps at medical facilities, as previously this was characterized as ad hoc and inefficient. This improvement is attributed to the training of staff at district hospitals, health centres and health posts across the country on the safe disposal of needles immediately after use. Proper kits for the storage and disposal of needles after use were also provided. This process is ongoing to ensure training and provision of sharps disposal equipment to all of the approximately four hundred facilities providing medical care in Guyana.

However, the situation related to final disposal of sharps is bleak and is one of the major challenges with regard to medical waste disposal in Guyana. Most of the sharp storage kits, including those of the main hospitals in Georgetown, are disposed at dump sites. Two of the district hospitals are equipped with incinerators, which burn sharps not only from their facility, but from nearby health centres and health posts. However, these incinerators are in urgent need of repair and do not function effectively. This inefficient final disposal of sharps may lead to injury and exposure to blood-borne pathogens by waste handlers at medical facilities, and people who collect refuse at dumpsites. Inappropriate medical waste disposal may also pollute the environment, directly affecting the community members.

To minimize the problems associated with the final disposal of sharps, the Pan American Health Organization in Guyana (PAHO-GUY) in collaboration with the Ministry of Health in Guyana is in the process of constructing De Montfort prototype incinerators at key small-medium health care facilities. These incinerators will also accommodate sharp disposals from nearby facilities. Training will be provided to medical waste handlers to ensure efficient operation of these incinerators.

When a HCW is exposed to an infectious disease, whether it is a blood-borne or air-borne pathogen, it is vital that there are clear protocols in place to deal with and report the incident. All staff members should be aware of the protocols and there should be a point person for each department that is contacted immediately when an incident occurs. At least one point person must be on call twenty-four hours a day so that staff members never hesitate to call for help. A twenty-four hour regional hotline is an innovative idea that may encourage HCWs who work alone to connect with resources to which they may not otherwise have access. The point person would be directly responsible for ensuring that the HCW receives appropriate and timely post exposure prophylaxis, in addition to emotional support and regular follow-ups. These incidents can be stressful, therefore careful monitoring of anxiety and coping strategies are important.

Section Four: Immunizations and Post Exposure Follow-up

Avoiding exposure is the primary way to prevent transmission of many infectious pathogens. However, other infection prevention strategies are also important components of the hierarchy of control. Immunization against preventable infectious diseases and adequate access to post exposure prophylaxis (PEP) after contact with infectious diseases are two important occupational health measures available to protect and promote the health of HCWs. The fourth working group worked together to discuss current realities related to immunizations and post exposure follow-up, identify common challenges, and share innovative practices in the context of RRAs and developing countries.

Immunization provides an effective barrier of defence against many infectious pathogens. A 2006 report on the burden of disease caused by needlestick injuries emphasized the need to rally our efforts towards designing and implementing comprehensive immunization programs for HCWs (Prüss-Üstün et al.). The WHO's 2008-2017 Global Plan of Action on Workers' Health also urges member countries to develop and implement immunization programs for health care workers. Guidelines from around the world recommend that health care workers should be up to date with their routine immunizations and vaccinated against hepatitis B, measles, mumps, rubella, varicella, tetanus, diphtheria, polio, and influenza. In some areas, BCG vaccine is recommended for HCWs who may have close contact with infectious tuberculosis patients, especially those with multi-drug resistant disease. HCWs working with immunocompromised patients, such as those with HIV/AIDS, are advised that it is particularly important to be tested and immunized for the above diseases, both for their own safety and for the safety of their patients. Some guidelines recommend immunizations for hepatitis A, Japanese encephalitis, cholera, meningococcal ACW135Y, tick-borne encephalitis, typhoid, and yellow fever for HCWs likely to be exposed to these diseases (Salisbury et al., 2006). After an exposure, post exposure management is an integral component of a complete program to prevent infection and is an important element of occupational health care for HCWs. World-wide, there are general guidelines for management and follow-up for some pathogens such as HIV and HBV, including recommended policies and procedures for accessing treatment, assessing infection risk, determining appropriate treatment, and organizing ongoing care.

Given the relevance of the threat of exposure to infectious diseases and the avoidable nature of some resulting infections, the working group affirmed that it is in the best interest of all parties - health care workers, hospital administrators, employers, policy-makers, and the population at large - to take active steps towards immunizing HCWs against vaccine preventable diseases and providing adequate treatment and follow-up after exposure occurs. Offering a comprehensive vaccination and PEP program includes considering the institutional, administrative, and personal factors influencing implementation and usage. The challenges of

creating immunization programs and the value of educating health care workers were at the forefront of the group's discussion on immunization, while the discussion of PEP programs centred on the examination of a case-study scenario.

Vaccinations

According to working group members, poor and under-enforced policies and guidelines represent one of the top challenges regarding immunization programs for health care workers. Lack of formal lines of responsibility for immunization programs was of particular concern for some participants. Compartmentalization of responsibility and unclear directives and accountability structures between and within institutions and governments often means that policies are not carried out. The working group also noted that hospital management and government officials often have to be convinced of the importance of vaccinations through data, facts, statistics, and media attention. Multiple levels of stakeholder involvement, including health care workers, hospital managers and administrators, public health, professional organizations, and governments are needed to ensure that immunization policies are implemented.

In fact, stakeholders at any level can help build or support vaccination policies. For example, in the absence of national guidelines on mandatory vaccinations for HCWs, institutions can act as leaders in promoting healthy workplace initiatives by creating local programs for staff. A health care institution may establish a more stringent policy for immunization than the national policy dictates. Professional or health and safety organizations can issue recommendations, monitor workplaces, provide training programs, and help develop guidelines. Health care workers themselves can raise awareness, influence change by choice of workplace, and work with other stakeholders to promote the implementation of vaccination programs through health and safety committees. The key is to find a champion to spearhead the cause, someone who has an interest and the ability to promote a vaccination program. Often this means using the resources available at hand, such as the use of an informal occupational health committee if a formal one is not feasible or providing local training to a health care worker if an occupational health professional is not available. Alternatively, if local hospitals or private health care providers are not providing adequate vaccination coverage, national governments can require employers to develop adequate policies and procedures and enforce the regulations through legislation, reporting structures, and monitoring.

Challenges facing immunization programs frequently begin even before a HCW is hired. Governments and health care institutions must determine what vaccines they wish to provide, whether the vaccine is available and how much of it is obtainable, and if the potential harm of the vaccine outweighs the benefits. Decision makers need data pertaining to prevalence and incidence rates of diseases endemic to the local area, transmission patterns and trends, and population projections in order to make informed decisions about vaccination priorities. These data may not be available or reliable in certain situations. Decisions regarding the scope of vaccination programs for health care workers often come down to the cost of the initiative, including both the time and expertise needed to organize and implement a vaccination program, as well as the

financial cost. Group members were quick to point out that coupled with the potential lack of data is the lack of resources that most governments and health care institutions in developing countries and RRAs face. Both physical and financial accessibility to vaccines is key to ensuring a workable vaccination program. While facilities may have vaccination policies in place, they may not be able to implement them because of a lack of resources. In reality, many health care institutions may not be able to meet national guidelines because of inadequate resources (see Focus Boxes Eleven and Twelve). One participant remarked that even countries with public health care systems committed to accessibility and universality such as Canada, do not always have adequate resources to implement legislated vaccination programs. For example, a common problem is the lack of staff to conduct baseline screening for newly hired HCWs.

An additional challenge includes ensuring appropriate organization and ongoing capacity of a program. For example, continued vaccination monitoring to ensure that HCWs receive the complete number of doses of a vaccine is essential. As one participant shared, this concern is especially relevant for the hepatitis B vaccine, as it requires three doses given at different times, which requires a vaccination program with advanced coordination and capacity.

Focus Box Thirteen: Meeting the Challenges of Immunization Costs

Elizabeth Donderewicz, Marie-Claude Lavoie, and Maritza Tennassee

The current costs of health care and medical supplies can seem insurmountable, particularly for countries and communities with limited resources. The Pan American Health Organization helps to reduce the price of vaccines for Latin American and Caribbean countries by managing a vaccine supply consortium. In essence, the prices of vital vaccines are reduced through bulk purchases for participating countries. The *PAHO Revolving Fund for Vaccine Purchase (RF)*[1] buys vaccines and immunization supplies, such as syringes and safety boxes, from the manufacturers on behalf of member countries.[2] Each year, PAHO distributes the list of vaccine prices available through the Revolving Fund and publishes it in the *Immunization Newsletter,* detailing the cost per dosage for almost 30 of the most commonly administered vaccines. The variance between vaccines purchased directly through the manufacturer in the United Sates and the Revolving Fund prices is considerable. The Center for Disease Control (CDC) reports that the private-sector cost per dose for the measles, mumps, and rubella (MMR) vaccine can be as high as 44.84 USD.[3] In contrast, the MMR vaccine offered by PAHO's Revolving Fund can cost as little as 1.40USD per dose. The former price is nearly 32 times the price offered through the Revolving Fund (the latter price). Similarly, some pharmaceutical companies offer the hepatitis B vaccine for 43.56 USD per dose,[4] while the Revolving Fund average price for the hepatitis B vaccine is 0.23 USD.[5] The reduced cost of the vaccine makes the prevention of the hepatitis B virus amongst health care workers a viable reality in communities with even the most limited financial resources.

Sources:
[1] Pan American Health Organization (PAHO). Immunization Newsletter. Volume XXIX, Number 1. February 2007. http://www.paho.org/English/AD/FCH/IM/sne2901.pdf p. 6
[2] PAHO charges a fee of 3% of the total cost, which is contributed to the capitalization of the Fund (*Andrus and de Quadros*, "Global Access to Vaccines: Deployment, Use, and Acceptance" p. 136)
[3] Center for Disease Control (CDC). "CDC Vaccine Price List." Updated 18 September 2007. http://www.cdc.gov/vaccines/programs/vfc/cdc-vac-price-list.htm. Costs vary by manufacturer. Quoted price is from Merck.
[4] Ibid.
[5] Pan American Health Organization (PAHO). Immunization Newsletter. Volume XXIX, Number 1. February 2007. http://www.paho.org/English/AD/FCH/IM/sne2901.pdf p. 6.

Focus Box Fourteen: Group Purchasing Organizations in the USA

Lawrence D. Budnick and Carolyn Ricks

In the United States, a number of academic medical centres and other systems for health care delivery have entered into Group Purchasing Organizations (GPOs). GPOs are a reflection of the economics of leverage in which health care organizations utilize the competitive bidding process to engage manufacturers to provide lower pricing for commodities that they use.

The GPO initiates discussions with the manufacturer on behalf of its members, thereby levelling the playing field for the smallest to the largest organization within its membership. The formation of agreements or contracts by the GPO with manufacturers means that pricing is tiered and remains constant contingent upon purchasing levels in any identified product segment. Most health care organizations enter into contractual agreements with GPOs to obtain economies of scale, standardization, best price and quality of product. The GPO is responsible for coordinating the competitive bid process in the interest of its members as well as to raise concerns with regard to product failure and/or comparative products and outcomes.

The return on investment for membership and/or affiliation in a GPO can be significant. For example, the University Hospital of the University of Medicine and Dentistry of New Jersey participates in a GPO to reduce expenses, gain best pricing and quality products, commodities and where applicable, contracted services. This collaborative relationship has allowed the University Hospital to realize significant monetary savings in products and services.

Participating in Immunization Programs

The importance of health care worker participation in immunization programs emerged frequently throughout the working group's discussion. The group asked two key questions: how can we encourage health care workers to be vaccinated and what are the influencing factors in a HCW's decision to be vaccinated? The group identified that there are a number of reasons why HCWs decline vaccines, such as fear of vaccine side effects, fear of needles, perceived insufficient time, inconvenience, perceived ineffectiveness of the vaccine, and/or limited knowledge about their risk of occupational exposure. Some health personnel may refuse to be vaccinated because of a pre-vaccination screening policy at their institution and their concerns about confidentiality. The group agreed that ongoing education for HCWs is needed to increase uptake of vaccines. Common misconceptions about immunizations can be addressed during immunization campaigns targeting HCWs. At the individual level, pre-employment occupational health consultation provides an opportunity to determine the immunization status of the future employee, and to ensure that he or she receives the recommended vaccines. This consultation also provides an opportunity to educate the HCW on vaccine preventable diseases, methods of prevention, the reporting system for work-related injuries, including needlestick injuries and protocol for PEP.

Ideally, a HCW who declines a recommended vaccine should be offered a consultation with an occupational health professional. During this period, the occupational health professional can provide further information on the risk of contracting vaccine preventable diseases. The occupational health professional can listen to the reasons justifying a worker's decision and respond to his or her concerns. A valuable form of information to distribute to HCWs is the demographic pattern of infections pertinent to the region. The information will contribute to ensuring that a worker makes an informed decision. In addition, the cultural and psychological

aspects of a HCW must be taken into consideration. According to one participant, "it's not always just education of the workers but also finding a way of making it work in the specific culture."

Strategies to Improve Uptake of Vaccines

Strategies to improve uptake of vaccines include establishing pre-placement requirements in which HCWs have to be immune to certain diseases before they start working and mandatory immunization of medical and health professional students. Medical and other health professional students should receive pre-placement occupational health consultations to ensure that they are aware of the occupational risks in their future workplaces, as well as to ensure full immunization coverage. Vaccination programs in educational settings would provide a structured environment in which to provide vaccinations before health care workers disperse to different workplaces. Schools have resources such as students and instructors who can be used to deliver vaccinations. In addition, school-based vaccination programs would provide training opportunities for program management, vaccination administration, and immunization follow-up. Educational facilities could connect class lectures on communicable diseases and vaccines with a school based vaccination program.

Technologies such as tracking systems described in Focus Box Eight can be used to organize occupational health systems. For example, immunization records can be integrated into a computerized occupational health information system which contains the demographic and health information of HCWs. Occupational health information systems serve several purposes, including improving immunization coverage of workers and organizing necessary treatment and follow-up after work-related injuries. These systems can record relevant information on immunizations, including vaccines received, doses, dates, and any reported side effects. Information systems can improve treatment and follow-up by providing step-by-step flow sheets for treatment or automatic reminders for appointments. For example, the occupational health information system can send electronic reminders to the occupational health professional to ensure that HCWs are receiving their first, second, and third hepatitis B doses, as well as other appropriate vaccines.

Often the ideal system is modified to what can be practically done; electronic tracking, although potentially cost effective in terms of ongoing resources needed to manage the system, is not practical or applicable in all situations. According to participants, using individual immunization cards can contribute to the full immunization coverage of HCWs. In many countries, each individual has his or her own immunization card to record the dose and date of a vaccine. This method contributes in ensuring that the person is fully immunized, for example if they have had the three doses of vaccine against hepatitis B.

A significant number of HCWs work outside of formal health care institutions, including in private physician and dentist offices, small clinics, homes, and other rural locations. The working group agreed that special consideration needs to be given as to how to provide education, training, immunizations, surveillance and post exposure evaluation and treatments in a timely manner to these individuals.

Strategies to Increase Immunization Coverage:

- Providing free and on-site vaccination;
- Designing and implementing institutional guidelines for immunizing health care workers;
- Conducting pre-placement occupational health consultation to ensure satisfactory vaccination coverage;
- Maintaining a central and confidential information system of health care workers' vaccination status;
- Issuing automatic reminders for completion of the vaccine schedule;
- Providing ongoing education in the workplace regarding recommended vaccines for health care workers.

Post Exposure Prophylaxis

The working group's discussion of post exposure prophylaxis centered on the case scenario about transmission of blood-borne diseases. Participants were asked to discuss some of the complex issues surrounding post exposure prophylaxis in low-resource settings, share how they or others are currently addressing the issue, and then suggest possible recommendations for improving practice.

According to the working group, Karen's story (case study two) illustrates the challenges and unfortunate realities that many HCWs across the globe confront regarding access to occupational health services following an injury. The scenario also demonstrates the working conditions and environmental factors that further impact personal health and safety decisions. Implementing institutional policies and procedures, appropriate follow-up consultations and confidentiality,, and accessible and available care were identified by participants as the highest priority needs for PEP programs for health workers in low-resource settings.

Post Exposure Prophylaxis Policies and Procedures

Adequate institutional policies and procedures are critical to ensure access to appropriate care following work-related injuries, including needlestick and sharps injuries. Furthermore, HCWs, managers, and employers need to be knowledgeable about these policies in order to ensure they are implemented. Karen's story demonstrates the gap between institutional policies and implementation and is a scenario that is played out every day across the world. A PEP policy and procedure may exist on paper, but it may not be put into practice due to lack of staff, medical or financial resources, or institutional will. According to one group member, lack of workers' advocacy and rights in private institutions often results in inadequate or absent PEP resources for employees, even though the policy and procedure officially exists. In another participant's opinion, PEP protocols may be completely absent in some health care settings. HCWs may not be trained to assess for the need for PEP or to deliver the appropriate treatments. Furthermore, even if there is a written protocol, appropriate prophylactic medications may not be physically available.

Group members also noted that there is also often a segmented approach to post exposure prophylaxis that creates gaps in care. According to the working group, in order to provide the streamlined and cohesive care required after an injury, appropriate PEP has to start with management. Best-practice guidelines state that

there must be resources available to give medication, do the testing, and provide post exposure counselling within a specified period of time. Occupational health departments must coordinate with the emergency and laboratory departments to make certain that HCWs have access to clinical care following an injury, regardless of time or day of the week. For example, following the needlestick injury, Karen should have had immediate / rapid access to clinical care to manage the wound directly in the workplace. A PEP program needs to include established links so that information flows up the management line where action may be supported and mandated, and moves down the management line to extend to those who implement the program in a practical way.

Follow-up Consultations

Follow-up consultations are an important part of care management after needlestick injuries. Based on the post injury risk assessment evaluation, an injured worker may need to take post exposure drug therapy for prophylaxis against diseases such as HBV and HIV. In some cases, a worker may suffer negative side effects from these medications, which may become an incentive to discontinue treatment. Regular follow-up with an occupational health professional for support and guidance can help the worker cope successfully with any adverse effects of medications and maintain the treatment program. However, consultation following a needle stick injury may also create fear and anxiety due to the serological baseline testing. What happens if the worker tests positive for a pre-existing disease? What are the consequences in regards to his or her career, access to treatment, or compensation? All these factors play an important role in the decision of a health care worker to report and consult for an injury, and must be taken into consideration when planning and implementing a PEP program.

Confidentiality of the injured worker, as well as the source, is another critical factor to take into consideration when encouraging workers to report injuries. The workers may be afraid to report due to the stigma attached to needlestick injuries. In some situations, co-workers and managers may blame the worker for the injury instead of investigating the environmental and administrative factors surrounding the event. Stigmatization, fear, and denial around HIV/AIDS are still major problems around the world. One participant shared that lack of confidentiality in parts of Africa is a common problem; people will not get tested because testing is often not confidential and there is resulting stigma against the worker. If possible, one person should be in charge of tracking exposures and post exposure counselling to ensure privacy. In addition, there should be restricted access to information databases and occupational health records.

Finally, employees themselves need to be educated about post exposure evaluation. Along with learning about the availability of these services, HCWs need to be educated about the importance of obtaining these services in terms of their health and wellbeing. Increased knowledge will empower the employee to obtain services by eliminating lack of motivation, stigma, or ambivalence that may be present because of inadequate understanding. HCWs also need to know that these services are available at no cost to them and that their jobs are not at risk if they seek these services.

Accessibility and Availability

In order to create an environment that promotes reporting and follow-up, post exposure prophylaxis needs to be available and accessible. As previously noted, according to workshop participants post exposure consultation should be mandatory and available at the site of exposure 24 hours a day/seven days a week. In the absence of available post exposure prophylaxis, HCWs may decide not to report an injury, as there is no apparent incentive for reporting, such as treatment or even education. Access to post exposure treatment and consultation is just one facet of the larger picture. Occupational health professionals, emergency nurses, and physicians must be properly trained in risk exposure assessment, as well as appropriate post exposure treatment to inhibit development of disease. Supervisors and managers also play an important role in encouraging and supporting workers to access PEP. According to one participant, health care workers often state that their supervisors would not let them leave work to get treatment because their workplace was too busy or there was not additional staff coverage. Thus, even if PEP is physically available, lack of access because of workplace conditions can still prevent HCWs from receiving appropriate treatment. Management personnel must be educated about the importance of allowing employees to obtain services in a timely manner, supporting the employee to follow through with the completion of treatment and surveillance, and ensuring that the employee's medical record is confidential. Managers and administrators can also reinforce the importance of the ethical and professional responsibility of health care workers to be aware of their health status and to seek treatment for illnesses in order not to put patients at risk. Messages related to the importance of reporting, as well as the imperative need for confidentiality, must be communicated clearly and frequently to health personnel.

Many hospitals in RRAs or developing countries don't have post exposure consultation available and the worker must go elsewhere, placing the onus on the employee to find assistance. This is often a disincentive for them in terms of time and cost, particularly in rural areas. There are costs related to loss of income while away from work, as well as the costs of seeking help, particularly if the HCW must travel far distances or stay in another city while receiving treatment. In circumstances where continuous coverage is not possible, health care facilities should maximize PEP availability given the individual situation. For example, mobile occupational health units could provide "on call" coverage. Automatic reminders from a central information tracking system to inform people to come for follow-up care is one tactic to use if adequate occupational health staff are not available at each health care site.

Workshop participants felt that health care settings should be encouraged and supported to develop programs based on available resources and to maximize PEP availability within the working context. This may include identifying appropriate leaders in OHS from within existing HCW staff and encouraging professional role development. Other potential methods to address accessibility and availability of PEP include increasing awareness about its value, including its purpose and efficacy as well as the monetary value of staff retention and productivity. Management can also identify individual situations regarding workplace culture and use education and awareness to ensure PEP is accepted by HCWs as important and necessary. Creating standards for OHS practice within health care settings may encourage respect for occupational health and may result in increased interest in and awareness of the area.

Concluding Remarks

Workshop discourse revealed the crucial importance of occupational health care for health care workers in rural/remote areas and developing countries. Challenges in occupational health care cross the boundaries of countries, continents, and income levels; under-resourced rural areas in developed countries share many of the same needs as developing countries. In the absence of adequate recognition and resources (financial, human, or material), occupational health care programs and services need creative solutions. Drawing from their diversity of experience, workshop participants offered practical suggestions for supporting occupational health care for HCWs. From policy formation to program delivery, recommendations for and examples of innovations in occupational health practices include:

1- Systematically evaluate local occupational health systems to discover existing strengths and needs. Practical needs assessment tools such as the "Healthy Hospital" tool used in Ecuador should lead assessors from analysis to action;
2- Envisage new ways to use existing and emerging communication technology and strategies to disseminate occupational health information. Strategies can be on a large scale, such as the mobile OHS clinics in Romania, or can include smaller projects such as entering into partnership with a local radio show or creating OHS fact sheets for hospital use;
3- Draw local and national attention to the importance of OHS professionals. Seek and support national and regional regulations and policies that grant power to professional associations, recognize professional accreditation, and support fair compensation;
4- Draw local and national attention to the link between inadequate resources for occupational health care and the health human resource crisis;
5- Where occupational health services are not well developed or resourced, use OHS committees to draw attention to OHS issues. Utilize the expertise of health care workers by asking several to act as occupational health liaisons and providing them basic training;
6- Create and nurture a safety culture that values HCW health. Address misconceptions about HCW immunity to illness or injury, including the "*super-being syndrome"* in the workplace, health education facilities, and with the general public;
7- Support collaborative practice between health care professionals, hospital departments, local and international agencies, and governments, such as occurs with Cuba's National Biological Security Program. Create shared care plans for occupational health services;
8- Use risk analysis activities such as workplace audits or surveys to determine where best to target OHS activities and to heighten hazard awareness;

9- Support ongoing OHS education for HCWs. Use information gathered in needs assessments and risk analysis to target training. All health care students should receive mandatory training in occupational health and safety;

10- Use strategies such as the group purchasing organizations the USA or PAHO's vaccine and immunization supply consortiums to manage the costs of vaccines. Involve students and health care training institutions in vaccination programs;

11- Uphold international standards and recommended practices while using innovative practices. 24-hour post-exposure hotlines provide access to post-exposure counseling and coordination in remote settings. Plastic or glass beverage bottles provide sharps disposal alternatives in the absence of regulation waste containers.

Workshop participants intend this paper to act as a reference document for occupational health professionals who can benefit from grass-roots examples of practical and sustainable ways of providing occupational health services for health care workers in demanding and diverse settings. We hope that this document will both share the exciting and innovative work being done in occupational health around the world and spur continued discussion, development, and commitment to the health and safety of health care workers in rural, remote, and developing areas. With the full input and support of all parties, it is possible for many of the ideas generated in this workshop to be implemented. While never stopping efforts to obtain adequate resources to support globally recognized best practices in OHS, with creativity, knowledge, and dedication, improvement is possible even in limited resource settings.

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Appendix A: Workshop Agenda

Time	Activity	Presenter
8:15 to 8:30	Welcoming Session - Workshop objectives - Schedule	Annalee Yassi and Rachelle Rebman
8:30 to 8:40	Introduction of the participants	
8:40 to 9:00	Opening Session: Overview of state of occupational health services in health care around the world	Maritza Tennassee and Annalee Yassi
9:00 to 9:20	Opening Session: Overview of state of occupational health services in rural and remote areas	Lynn MacDonald
9:20 to 9:45	Overview of the workshop deliverables and rationale for format	Annalee Yassi
9:45 to 10:00	Coffee Break	
10:00 to 11:30	Case Scenarios - the current reality	Small groups
11:30 to 12:00	Presentation of group discussions	Representatives from each group
12:00 to 1:00	Lunch	
1:00 to 1:30	Using WHO/PAHO OHS resources Mini-Lab - Manual on Occupational Health and Safety - Prevention of needlestick injuries: toolkit	Marie-Claude Lavoie
1:30 to 2:30	OHS in rural/remote and developing countries – sharing solutions	Small groups
2:30 to 2:45	Coffee Break	
2:45 to 4:15	OHS in rural/remote and developing countries – sharing solutions Planning the publication and creating ongoing action plans	Small groups
4:15 to 4:30	Summary of action plans	Representatives from each group
4:30 to 5:00	Summary and Conclusion Evaluations	Maritza Tennassee and Annalee Yassi