

IMPROVING WORKERS' HEALTH ACROSS THE GLOBE

Advancing the Global Plan of Action for Workers' Health

*Examples From
Contributions of the
Global Network of WHO
Collaborating Centres
for Occupational Health*

National Institute for
Occupational Safety and Health
NIOSH

WHO Collaborating Centre
for Occupational Health



Finnish Institute of
Occupational Health

WHO Collaborating Centre
for Occupational Health



Cover Photo: Vietnam 2010

Photo by Suvi Lehtinen

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This booklet provides examples of the activities and achievements of the Global Network of WHO Collaborating Centres for Occupational Health. It also celebrates the 25th anniversary of the Global Network, which was formed in 1990.

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The Finnish Institute of Occupational Health (FIOH) is a research and specialist organization in the field of occupational health and safety. FIOH promotes occupational health and safety as part of good living nationally, regionally, and internationally. Visit the FIOH website at www.ttl.fi

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WHO http://www.who.int/occupational_health/network/ccarchives/en/

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FOREWORD

Since the Global Network formed in 1990, the World Health Organization (WHO) Collaborating Centres for Occupational Health have worked to improve safety and health for workers. The Global Network of WHO Collaborating Centres for Occupational Health has a broad, active membership, including 55 collaborating centers and three nongovernmental organizations. These groups are a substantial component of the world's leading ministerial, academic, and professional communities for occupational health. The International Labour Organization is a partner to the network.

The network has been guided by both the WHO 1996 Global Strategy on Occupational Health for All (WHA49.12) and the more recent 2007 Global Plan of Action on Workers' Health (WHA60.26).

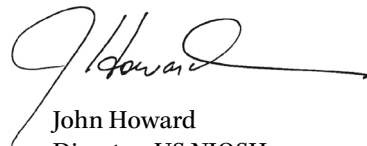
This booklet celebrates the first 25 years of the Global Network of WHO Collaborating Centres for Occupational Health. Trust among the actors is growing, offering an effective growth arena for the network activities. The global guidance provided by the WHO Occupational Health Programme, at both the headquarters as well as the regional offices, has benefited actions at the national level.

The pages that follow offer examples of what the centers and nongovernmental organizations can achieve by working together. The aim is to shed light on approaches and practices in the many fields of occupational health.

We hope readers learn from the examples and become inspired to develop occupational health activities in their own countries, for their own workforces. The goal is to ensure that all workers stay healthy and keep their ability to work throughout their working careers. For this to happen, working conditions and work environments must be improved, and all working people must be given access to occupational health services.

The global world of work has much room to improve, in many of the ways that these success stories illustrate.

Pleasant, empowering reading!



John Howard
Director, US NIOSH



Harri Vainio
Director General, FIOH



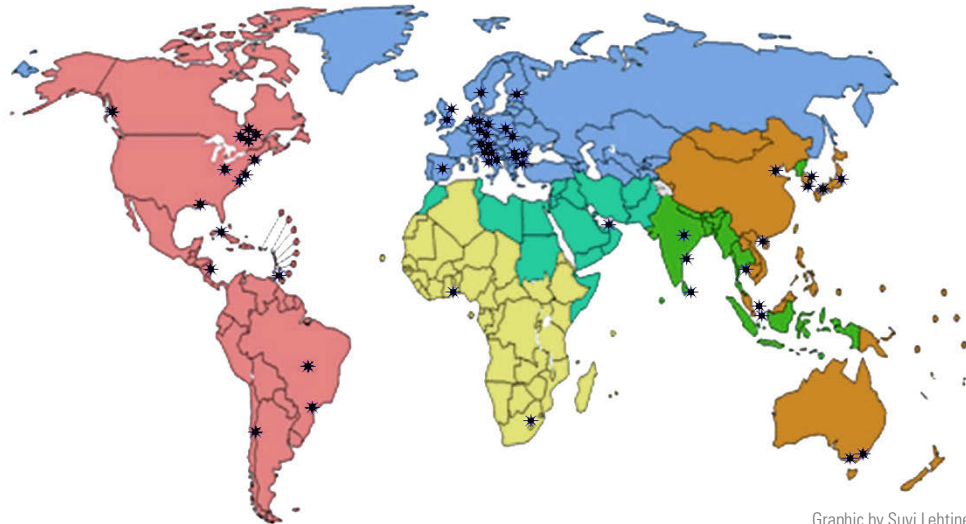
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THE NETWORK OF WHO COLLABORATING CENTRES FOR OCCUPATIONAL HEALTH



Graphic by Suvi Lehtinen

WHO Collaborating Centres for occupational health (2015) shown on a WHO map illustrating its six regions.

*The boundaries and names shown and the designations used on maps do not imply the expression of any opinion on the part of the World Health Organization concerning the legal status of any country, territory, city, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

INTRODUCTION

The World Health Organization (WHO) Collaborating Centers for Occupational Health have existed since the beginning of the 1970s. Since the Network of WHO Collaborating Centres for Occupational Health was established in 1990, the collaborating centers have worked together in a more systematic way. This booklet celebrates the 25th anniversary of the network. The mission of the network is to stimulate networking between the WHO Collaborating Centers and international partners to support WHO to implement its mandated tasks in the area of occupational health and safety.

The network has a broad and active membership that currently includes 55 collaborating centers,¹ with more that are in the process of being designated as collaborating centers. This is a large component of the world's leading ministerial, professional, and academic communities for occupational health. The global network also includes three nongovernmental organizations in formal affiliation with WHO: the International Commission on Occupational Health, the International Occupational Hygiene Association, and the International Ergonomics

Association. The WHO occupational health staff in Geneva and the Regional Advisors in Occupational Health constitute the Secretariat and provide leadership. The International Labour Organization is an active partner. The coordinated and direct interactions among the members of the global network greatly expand the global reach of the occupational

health programs at WHO headquarters and the six WHO regional offices.

The global network is unique in WHO, for its coherence, energy, and organization of contributions to a common workplan. Since being established in 1990, the global network has carried out projects within this shared workplan to globally advance workers' health and safety in priority areas agreed on by the WHO and global network directors.

This booklet provides examples of successful network projects beginning in 2009. More information on collaboration is available in two articles.²⁻³ Appendix 1 summarizes the priorities of the workplan. Appendix 2 lists collaborating centers, nongovernmental organizations and other institutions contributing to the workplan.



Photo by Jorma Rantanen.

Left: The "Declaration on Occupational Health for All" was signed on the Great Wall of China in October 1994. From left are Dr. Mikhail Mikheev, WHO/HQ; Professor Nikolai Izmerov, Institute of Occupational Health, Moscow; Dr. Richard Lemen, U.S. NIOSH; and Professor Jorma Rantanen, Finnish Institute of Occupational Health. Professor Fengsheng He signed the declaration in Beijing.

WORKPLAN OF THE WHO COLLABORATING CENTRES FOR OCCUPATIONAL HEALTH

The “Global Plan of Action for Workers’ Health”^{[URL1],4} was created to improve the health of all workers. The plan has these objectives:

1. To devise and implement policy instruments on workers’ health.
2. To protect and promote health at the workplace.
3. To improve the performance of and access to occupational health services.
4. To provide and communicate evidence for action and practice.
5. To incorporate workers’ health into other policies and projects.

BACKGROUND

The Global Plan of Action for Workers’ Health⁴ was endorsed in May 2007 as Resolution 60.26 by the 193 WHO member states at the 60th World Health Assembly. The Global Plan of Action is based on the earlier WHO Global Strategy on Occupational Health for All,⁵ prepared in 1994 by the collaborating center network directors. The global strategy was used to develop a proposal to the 1996 World Health Assembly, which was endorsed as WHA Resolution 49.12 of 1996.⁶

The 2007 Global Plan of Action for Workers’ Health provides a policy framework for renewed and intensive action to protect, promote and improve the health of all workers, with the goal of preventing occupational health risks and hazards. Its structure is the five objectives listed above. The resolution addresses all aspects of workers’ health, including primary prevention of occupational hazards, protecting and promoting health at work, and improving the response of health systems to workers’ health. It calls for traditional methods to assess and manage occupational risk in the workplace, which is a key area for action. It also calls for improving workers’ health by involving other public

health disciplines, such as chemical safety, environmental health, health systems, and disease prevention and control. It urges close collaboration with labor and other sectors, and all relevant stakeholders. Partners in many projects include the WHO occupational health staff in Geneva and in the six WHO Regional Offices, collaborating centers, institutions working toward designation as collaborating centers, nongovernmental organizations, country ministries, and international organizations of employers and workers.

The Network of WHO Collaborating Centres for Occupational Health helps WHO to provide assistance to countries. The network has been carrying out national, regional, and global projects to help countries implement their commitments to the Workers’ Health: Global Plan of Action. The first of two recent common workplans was the 2009–2012 workplan, which enabled WHO to report accomplishments to the World Health Assembly in 2013. This booklet reports on the activities and successes of the 2009–2012 workplan and the 2012–2017 Global Master Plan, which is currently underway.

Examples of successes are described in the following pages.

The collaborating center projects in both workplans are examples of successes and are organized into five groups, each focused on one of the five Objectives of the Global Plan of Action for Workers’ Health. The progress of projects was coordinated by volunteer managers from some of the collaborating centers, and by WHO staff in Geneva and in the Regional Offices.

LOOKING FORWARD

The collaborating centers, nongovernmental organizations, and WHO staff in headquarters and the Regional Offices are actively moving forward within the [Global Master Plan 2012–2017](#).^[URL2] Projects in this new plan continue to help WHO to produce products and assist countries meet their commitments in the WHO Global Plan of Action on Workers’ Health (2008–2017): Resolution 60.26.

A particular emphasis in both workplans has been to assist low resource countries and to share the practical tools, with new users implementing them and evaluating them.

POLICY INSTRUMENTS ON WORKERS' HEALTH

Objective 1:
To devise and
implement policy
instruments on
workers' health



Right: Ergonomics and work organization form an important part of occupational health and safety.

Photo by Suvi Lehtinen

The World Health Assembly Resolution 60.26, WHO Global Plan of Action on Workers' Health (2008–2017), encourages national policy frameworks and action plans that recommend the following essential components: enacting legislation; setting priorities for action; defining objectives, targets, and mechanisms for implementing them; elaborating on national profiles; allocating resources (human and financial) for monitoring, evaluating, updating, and reporting; and always ensuring accountability.

INTRODUCTION

WHO and the International Labour Organization strongly encourage countries to develop national standards and procedures to improve worker health. Key documents include International Labour Organization Convention No. 161 on Occupational Health Services, the WHO Global Strategy on Occupational Health for All (1996 WHA49.12 Resolution), and the Global Plan of Action on Workers' Health 2007 (WHA60.26). National actions have enabled countries to strengthen their responses to health issues and to maintain the ability to work.

Occupational health profiles are sets of quantitative and qualitative indicators that describe the status of occupational health at various levels. Profiles are useful tools for describing particular situations, setting baselines, and detecting early signals of problems related to workers' health. Profiles are valuable indicators of occupational health trends and serve—when repeated and updated—as functional monitors of the efficacy of occupational health programs and their implementation.

National profiles constitute one of the key focus areas of the International Labour

Organization's Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187). The framework also seeks to prevent occupational injuries, diseases, and fatalities by developing national systems and action plans, and consultation between ministries and stakeholders with representative organizations of employers and workers.

The projects included in Priority 1.1 contributed to the global evidence for action on workers' health. The outputs can be collated into a systematic collection and analysis of national policies, action plans, and profiles in workers' health for several countries, including Serbia, Chile, Australia, Vietnam, China, and Brazil. The ultimate goal was using these and other materials to help develop good practice and benchmarking tools for other national policy instruments. The project outputs are available in the [GeoLibrary](#),^[URL.3] an electronic repository of existing policy documents and related information materials developed by the University of Illinois at Chicago. This repository can be shared with countries that may not have national profiles and action plans, or may be in the process of

PRIORITY 1.1

Develop and update national profiles on workers' health and provide an evidence base for development, implementation, and evaluation of national action plans on workers' health.

establishing them. An additional resource is the International Labour Organization's [extensive microsite](#)^[URL.4] for national occupational safety and health policies and national profiles.

Emphasis on particular occupational health issues differs among countries and time periods. Currently, highly industrialized countries are focusing on aging workforces, migrant workers, work ability, work organization, workplace management, stress, and other psychosocial factors, ergonomics and musculoskeletal disorders, occupational health services for prevention, health promotion and healthy workplaces, and management of new technologies. In contrast, priorities of in-transition and developing countries include hazardous sectors (mining, agriculture, transportation, and construction), traditional hazards (physical, chemical, safety issues), workplace accidents and injuries, technology transfer, and vulnerable groups, such as child laborers and migrant workers.

Most countries collect occupational health data in various forms involving, for example,

work-related injuries, occupational diseases, absenteeism, and labor statistics. However, it is challenging to compare countries because of disparate legislation, criteria, and reporting mechanisms. Despite these limitations, publishing a basic set of occupational health indicators is important as a crude assessment of the status of occupational health in a country. This can inform intervention planning and decisions on policy and advocacy.

The audience for information about national policies is decision-makers within government authorities, social partners, training, education and information bodies, research institutions, and the general public. Future efforts will likely not only include developing and updating national profiles on workers' health, but also addressing another identified gap—building capacity to give technical assistance for member states in elaborating national policy instruments.

STRENGTHENING OF A HEALTH SYSTEM—SERBIAN NATIONAL STRATEGY ON OCCUPATIONAL HEALTH

The Serbian Institute of Occupational Health has worked to strengthen Serbia's capacities to develop and implement occupational health policy, legislation, and action plans. This has been done with the participation of social partners in order to maintain the number of occupational health service units and occupational health staff.

Two projects have been financed by the Ministry of Health since 2008: (1) developing criteria for the Registry of Occupational Injuries and its ongoing pilot testing, and (2) developing criteria for the Registry of Occupational Diseases. For this purpose, the European Commission prepared "Information Notices on Occupational Diseases: a Guide to Diagnosis." The publication was translated into Serbian and sent to the Ministry of Health in 2014.

From 2009 through 2012, the Serbian Institute of Occupational Health prepared three methods for assessing risk. This was accompanied by 15 workshops for occupational health professionals.

The National Committee for Occupational Health, along with the Serbian Institute of Occupational Health, prepared a new version of the "Occupational Health Strategy of the Republic of Serbia 2014–2017," accompanied by the "Action Plan 2014–2017." Both documents were translated into English and downloaded to the Institute's [website](#).^[URL5]

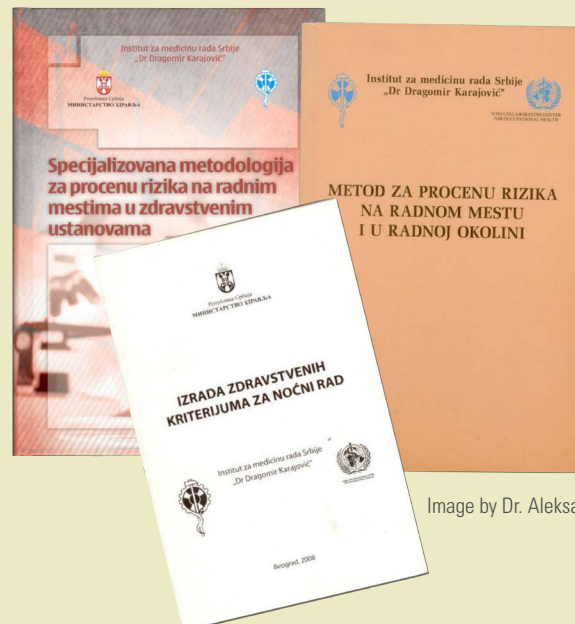


Image by Dr. Aleksandar Milovanovic

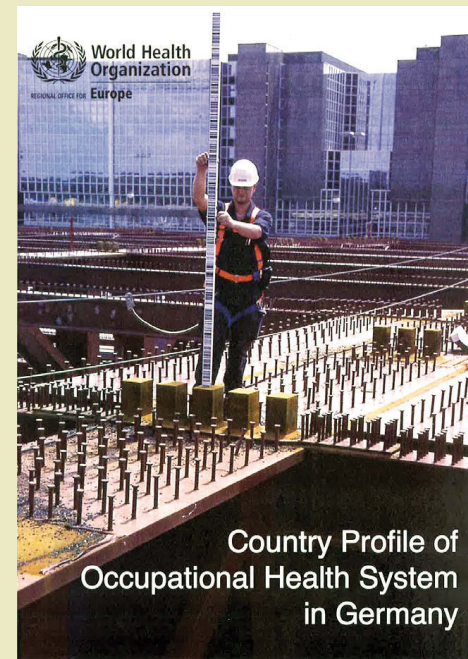
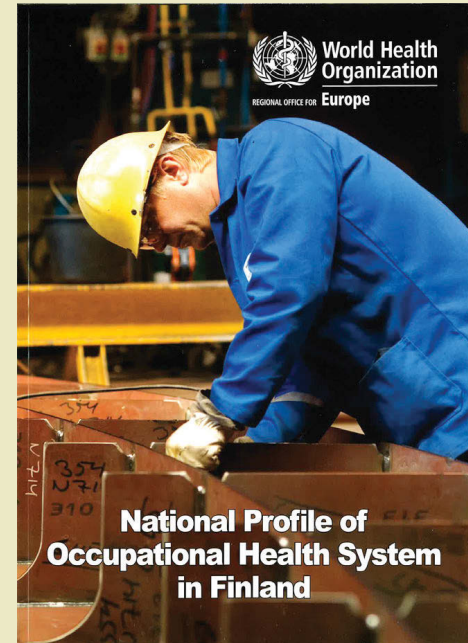
OCCUPATIONAL HEALTH SYSTEM PROFILES— FINLAND AND GERMANY

WHO and the International Labour Organization provide guidance for countries regarding national profiles. As the International Labour Organization prepared Convention No. 187, it provided in 2004 an outline and asked Finland to prepare its occupational safety and health [national profile](#).^[URL6] The purpose was to collect the information as a model and use the process as a guide for other countries preparing their own national occupational safety and health profiles.

Later, in 2009, the WHO Regional Office for Europe asked a few European countries to prepare national profiles describing the occupational health systems in their countries. Finland was one of the countries to create a [profile](#).^[URL6]

Germany also created a [national profile](#)^[URL7] within the WHO Regional Office for Europe program.

Preparing the national profiles offered an important lesson. When developing occupational health and safety, national-level dialogue among stakeholders plays a crucial role.



Previous page: Three methods to assess risk were prepared 2009–2012 by the Serbian Institute of Occupational Health. They are “Special Method for Risk Assessment at Workplaces in Health Institutions,” “Method for Risk Assessment at Workplaces and Work Environment,” and “Health Criteria for Night Shift.”

PRIORITY 1.2

Develop and disseminate evidence-based prevention tools, and raise awareness for the prevention of silica and other dust-related diseases.

SILICA

Silicosis is an incurable and irreversible chronic lung disease. It progresses, even after exposure has ceased. Silicosis is 100% preventable through technology currently available for controlling silica exposure, and sometimes even through adequate wetting procedures. By adequately implementing control measures and properly using equipment and protective gear, employers and workers could reduce exposures to levels considered to be safe.

INTRODUCTION

Priority 1.2 falls within the WHO Global Plan of Action's first objective—*To devise and implement policy instruments on workers' health*. The primary focus was to develop and disseminate evidence-based tools and to raise awareness on preventing silicosis and other dust-related diseases. The products include evaluating national programs, developing toolkits of effective interventions, and disseminating best practices for dust control, exposure assessment, and diagnosis of pneumoconiosis (the collective term for pulmonary conditions that result from exposure to dust and fiber irritants).

Silicosis is a disabling and often fatal lung disease caused by inhaling dust that contains respirable crystalline silica particles. These particles can be found in concrete, masonry, sandstone, rock, paint, and other abrasives. Silica is a large component of sand, rock, and mineral ores. Cutting, breaking, crushing, drilling, grinding, or abrasive blasting of these materials produces a very fine and inhalable silica dust. Workers exposed at high concentrations and/or long exposure periods are at great risk of developing silicosis (or other

silica-related diseases). Workplaces where silica exposure can occur include mines, quarries, foundries, sandblasting operations, certain construction sites, glass manufacturers, ceramics operations, and stone-cutting companies. Over time, workers develop scar tissue in their lungs, which affects how the lungs function. Silicosis is one of the oldest known occupational diseases, having been identified in miners and potters for centuries. The disease has various stages and degrees of severity including chronic, accelerated, and acute forms. Inhaling respirable crystalline silica particles is also linked to lung cancer, bronchitis, and tuberculosis. The silicosis itself may also lead to other conditions, which include lung fibrosis and emphysema, as well as silico-tuberculosis, a fatal form of pulmonary tuberculosis.⁷

The International Labour Organization and WHO have formed a global campaign to eliminate silicosis and other silica-related diseases by 2030. The campaign has been substantially advanced by coordinating projects in differing regions. The Americas region (including the United States, Brazil,

Chile, and Colombia) coordinated with the Africa region (South Africa) and the Asian region (India and Vietnam). The International Labour Organization describes these activities and publishes national plans on its webpage.⁷ The tools and informative material developed by the individual projects are available in the electronic [GeoLibrary repository](#)^[URL3] for easy global access. These projects involving regional collaboration were carried out in five focus areas:

- Developing and augmenting partnerships with stakeholders.
- Building capacity in diagnosis, surveillance, and treatment.
- Using best laboratory practices for silica.
- Using strategies and tools that are control-focused.
- Increasing technical knowledge and capacity in occupational hygiene.



EFFORTS MADE TOWARDS ELIMINATING SILICOSIS

Brazil

The National Program for the Elimination of Silicosis in Brazil began in 2002. Fundacentro and partners in the Ministries of Labor and Employment, Health Social Security, the Department of Justice, Pan American Health Organization, and International Labour Organization/Brazil continue to implement policies, legislation, training, guidance, and research tailored for various economic sectors. These sectors include mining and mineral processing, ceramics and glass, metallurgy, and construction. Fundacentro has helped the collaborating centers work on silica controls.

The National Program for the Elimination of Silicosis in Brazil has achieved many objectives. Brazil has banned sand as a blasting agent, dry finishing of ornamental stones, and dry rock perforation in mining. The Ministry of Labor and Employment issued rules for training and practice of X-ray interpretations by the International Labour Organization. Additionally, a [website^{\[URL8\]}](#) about the National Program for the Elimination of Silicosis in Brazil was created, hazard control manuals for ornamental stone works and the ceramics industry were published and disseminated, and guidance documents for the control of silica in mineral processing, construction, and the ceramic and glass industry were prepared. Since 2002, 420 physicians were trained in the International Labour Organization's International Classification of Radiographs of Pneumoconioses. This helps physicians improve secondary prevention of silicosis by recognizing early stages of the disease. For the foreseeable future, Brazil's main challenge is likely to remain the problem of silica exposure and silicosis in small enterprises and informal jobs.

Top left: A stonecraft worker cuts crystal stone in the city of Corinto, State of Minas Gerais, Brazil.

Bottom left: Crystal stone handicraft is finished by a stonecraft worker in the city of Corinto, State of Minas Gerais, Brazil.

Photos by Eng. Lênio Sérgio Amaral, Fundacentro, Brazil

EFFORTS MADE TOWARDS ELIMINATING SILICOSIS

Chile

Chile passed its [National Plan to Eliminate Silicosis^{\[URL9\]}](#) in 2009. The Chilean Institute of Public Health led the preparation for this achievement, with help from partners in Chile and with technical assistance of the U.S. National Institute for Occupational Safety and Health (NIOSH), Fundacentro, WHO, International Labour Organization, and the Pan American Health Organization. An accredited laboratory for silica analysis was established at the Institute of Public Health of Chile, which now serves as a

regional resource for analyses and training for South America. Another notable success has been developing simple guidance, “The Qualitative Evaluation of the Risk of Exposure to Silica,” for assessing and controlling silica exposures. This [simple system^{\[URL10\]}](#) for prioritizing risks was developed for four high-risk industries: aggregate crushing, ceramics, tile making, and dental laboratories.

Below: A mining engineer takes dust measurements at a Chilean rock quarrying company participating in the effort to control hazardous exposure to silica in the Americas Initiative to Eliminate Silicosis, supporting the WHO/ILO Global Program for the Elimination of Silicosis.



PRIORITY 1.3

Develop and disseminate evidence-based prevention tools and raise awareness for eliminating asbestos-related diseases

All forms of asbestos are classified as human carcinogens, and exposure increases the risk of asbestosis, lung cancer, mesothelioma, other cancers, and various non-malignant lung and pleural disorders. The global consensus is clear that the most effective way to eliminate asbestos-related diseases is to completely discontinue the use of asbestos, but national processes require a gradual transition. Smokers who are also exposed to asbestos have a greatly increased risk of developing lung cancer. Asbestos-related diseases can take 20 to 50 years to develop after exposures to asbestos.

INTRODUCTION

Priority 1.3 addresses the first objective of the WHO Global Plan of Action—*To devise and implement policy instruments on workers' health*. The focus is to develop and disseminate evidence-based prevention tools and raise awareness for eliminating asbestos-related diseases. Collaborating center projects include estimates of the burden of asbestos-related diseases, review of good practices for using asbestos substitutes, prevention of asbestos exposure, and health surveillance of exposed workers.

ASBESTOS

Asbestos is the name given to a group of minerals that occur naturally in the environment as bundles of fibers that can be separated into thin, durable threads. These fibers resist heat, fire, and chemicals, and they do not conduct electricity. For these reasons, asbestos has been widely used for centuries in many industries. Examples of materials that contain asbestos are roofing supplies, floor coverings, ceiling tiles, fire and noise-proofing insulations, asbestos cement products, automotive brake and clutch parts, heat-resistant fabrics, and

insulations for boiler, heating, and refrigeration systems.⁸

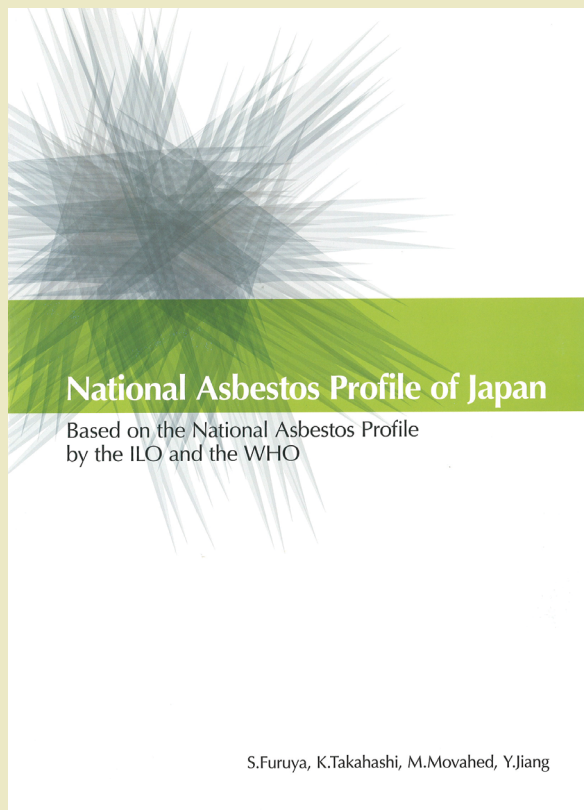
Asbestos exposure can occur when materials containing asbestos are handled. Fibers can be released into the air, and workers can inhale them when materials that contain asbestos are manufactured or used. Airborne exposure can occur when materials that contain asbestos are disturbed during maintenance, repair, abatement, and demolition of buildings and industrial facilities.

Any occupation where workers handle materials containing asbestos is at risk for exposure. Unless proper controls and work practices are in place, asbestos can be released to the outdoor air, water, or soil where residents and workers alike can be exposed. Fibers can be carried on the clothing and skin of exposed workers into their respective communities and homes. Inhaling asbestos fibers is the exposure route of greatest concern, but asbestos can also be ingested.⁹

The projects were carried out by institutions in Japan, the Republic of Korea, Thailand, South Africa, United Kingdom, Germany, the Czech Republic, Italy, and Chile. The projects focused on three areas:

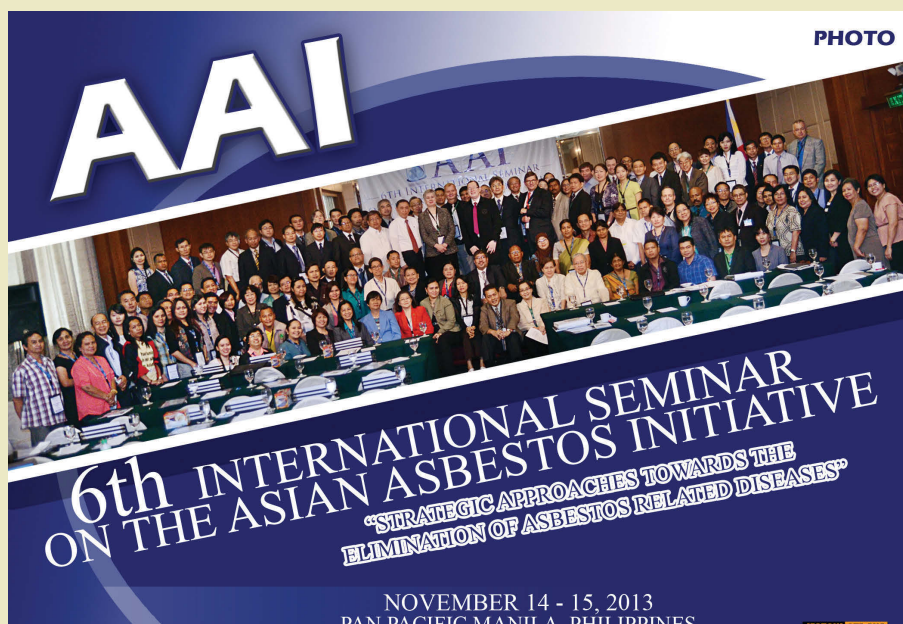
- Primary prevention—effective implementation of exposure prevention; developing technologies for abatement and substitution of asbestos
- Secondary prevention—developing surveillance and early detection of asbestos-related diseases
- Monitoring progress—compiling and reporting to the National Programs for the Elimination of Asbestos-related Diseases (an International Labour Organization/WHO initiative) with periodic review.

WHO is updating the global burden of disease attributable to asbestos and has developed a [website](#)^[URL11] with official documentation on eliminating asbestos-related diseases. WHO has also assisted the process in which the Rotterdam Convention Secretariat commissioned several of the WHO collaborating centers to develop a [toolkit](#)^[URL12] for eliminating asbestos-related diseases in Asia. The Asian Asbestos Initiative¹⁰ is a regional model based on accomplishments in Asia—a priority region in terms of needs—which can be translated and implemented in other regions.



ASIAN ASBESTOS INITIATIVE

The Asian Asbestos Initiative (AAI) is the international collaborative effort to prevent and eliminate asbestos-related diseases. It primarily focuses on achieving asbestos bans in Asian developing nations, and it aspires to be a model for the world. Since the initiative began in 2008, international seminars have been organized for 7 consecutive years in five Asian countries (twice in Japan and Korea, and once each in Thailand, Philippines and Indonesia). This work has taken place in close coordination with WHO, International Labour Organization, United Nations Environmental Programme, the International Agency for Research on Cancer, as well as the governments of the hosting countries. To foster cross-talk across various stakeholders, seminars achieved balanced representation of researchers, practitioners, government administrators and nongovernmental organizations. Regional meetings of the WHO collaborating centers have been held in conjunction with the international seminars, dubbed “AAI-1” through “AAI-7.” Along with the convening international seminars, experts have been dispatched and ad hoc study tours organized. The initiative not only stimulated the sharing of related national experiences, knowledge and technology—it has also spurred concerned parties to voluntarily collaborate outside the initiative’s framework. The Asian Asbestos Initiative is therefore directly and indirectly contributing to the impetus for countries to embark on the elimination of asbestos-related diseases through an asbestos ban.



Top left: The National Asbestos Profile of Japan publication.

Bottom left: The Sixth International Seminar on the Asian Asbestos Initiative 2013 group photo.

Globally, healthcare facilities employ more than 59 million workers, who are exposed to a complex array of health and safety hazards. Healthcare workers need to be protected from these workplace hazards as much as workers in the mining and construction sectors, which have long been considered at high risk. Because healthcare workers care for the sick and injured, comprehensive protection and health promotion for these workers ensures better care for the sick.

INTRODUCTION

Priority 1.4 addresses the first objective of the WHO Global Plan of Action—*To devise and implement policy instruments on workers' health*. The collaborating centers developed projects for evidence-based tools, informational materials, and training on national programs to comprehensively protect and promote health for healthcare workers, emphasizing bloodborne pathogens and hepatitis B immunization.

Every year, needlestick injuries cause 3 million exposures to bloodborne pathogens among the world's 35 million healthcare workers.

Healthcare workers are exposed in their workplaces to infections introduced by needlestick injuries at a rate of 39% for hepatitis B, 37% for hepatitis C, and 4% for HIV. Some regions experience broad variation in these rates.

Immunization can prevent up to 95% of hepatitis B virus infections, but fewer than 20% of healthcare workers in some regions of the world have received all three immunization doses required for immunity.¹¹

Successes come from collaboration in 23 countries in the six WHO Regions. Collaborators include WHO regional offices, the International Labour Organization, the United Nations Programme on HIV/AIDS, the International Commission on Occupational Health's Scientific Committee on Healthcare Workers, national ministries of health and labor, national organizations, and university professionals in occupational health.

Projects have focused on five areas:

- Biological hazards—bloodborne (such as HIV, hepatitis) and airborne (such as influenza, tuberculosis, or severe acute respiratory syndrome [SARS]).
- Musculoskeletal disorders and ergonomics
- Psychosocial hazards and work organization, along with workplace violence.
- Pharmaceutical and chemical risks.
- Comprehensive programs that include risk assessment and risk management tools and information.

Strategies have been developed to protect healthcare workers from potentially life-threatening bloodborne infections

that can result from sharps injuries, and to enhance patient care. This progress involved collaboration of NIOSH in the United States, WHO and its regional offices, governments and institutions in WHO member states, and WHO collaborating centers.

Efforts to protect healthcare workers from bloodborne pathogens led to developing a train-the-trainer program that has four components:

- A national planning meeting for ministerial and hospital leaders is held.
- A surveillance system for sharps injuries uses the EPINet¹² program.
- Campaigns focus on hepatitis B immunization of healthcare workers.
- A “Training for Development of Innovative Control Technologies Project” offers tools for evaluating sharps that have safety devices.

Participating nations include Vietnam, Tanzania, South Africa, Venezuela, Peru, Colombia, Brazil, Council for the Arab States of the Gulf (Kuwait, Saudi Arabia, United Arab Emirates, Bahrain, Oman, and Qatar), Egypt, Antigua, Barbados, Belize, British

PRIORITY 1.4

Conduct studies and develop evidence-based tools and information materials for the comprehensive protection and promotion of health for healthcare workers, emphasizing hepatitis B immunization.

Virgin Islands, Dominica, Grenada, St. Lucia, Suriname, Trinidad and Tobago, Croatia, The former Yugoslav Republic of Macedonia, Turkey, Bosnia-Herzegovina, Austria, Ghana, Russian Federation, and Serbia.

Major outcomes achieved globally in protecting workers include the following:

- Eight hands-on trainings.
- Six EPINet surveillance and five safety devices workshops.
- Five hundred “super-trainers” from 34 countries prepared to train health-care workers.

- About 20,000 trainers instructed by these 500 super-trainers to date.

Additionally, four regional occupational safety and health networks were established among healthcare workers in Latin America, Middle East, the Caribbean, and Southeast Europe. A [preventing needlestick injuries toolkit](#)^[URL13] has been translated into Spanish and is available on the WHO and Pan American Health Organization websites.¹³ EPINet was also translated by the collaborating center partnership into Spanish and Arabic. EPINet is available in many languages, and

[instructions](#)^[URL14] on how to use EPINet are provided.

A global shortage of health personnel has reached crisis level in many nations. Protecting the occupational health of health-care workers is crucial to maintaining an adequate workforce. The work of the collaborating centers has contributed substantially to promoting health and protecting health-care workers.



Photo by Dr. Maria Carmen Martinez

Above: Dr. Maria Carmen Martinez and Venezuela regional leaders attend the second national needlestick prevention conference in 2009.

PROTECTING HEALTHCARE WORKERS FROM NEEDLESTICK INJURIES

Venezuela

In 2007, WHO, the Pan American Health Organization, and NIOSH adapted and translated into Spanish a toolkit for preventing needlestick injuries. The project began in one state with four hospitals anchored within the Dr. Arnaldo Gabaldon Institute of Advanced Studies. Their data indicated that half of the healthcare workers surveyed had suffered at least one needlestick injury in 2006, most of which came from recapping needles after injection. More than 80% of the injuries were never reported. Roughly 35% of healthcare workers in the study were not immunized against hepatitis B. Armed with this knowledge, over the course of 6 years Dr. Maria del Carmen Martínez and her team from Institute of Advanced Studies used the WHO/NIOSH toolkit to greatly reduce occupational needlestick injuries in Venezuela through multiple initiatives:

Training: The Institute of Advanced Studies team conducted intensive training programs at 810 healthcare facilities across the country, educating about 37,400 healthcare workers on



Photo by Dr. María del Carmen Martínez

Above: Implementation of safety box usage in healthcare centers of the Venezuela Social Security Institute.

safety procedures for protecting themselves against blood-borne pathogen exposure. The Institute of Advanced Studies team built local capacity and facilitated program sustainability by teaching 3,920 healthcare workers to become “super-trainers,” who in turn trained 10,500 healthcare workers, and advised the healthcare facilities in their home regions. More than 10,000 copies of the free WHO/NIOSH CD-ROM containing the training program were distributed.

Academia: The Institute of Advanced Studies team incorporated the content of the needlestick prevention pilot program into the public health, occupational health, epidemiology, and nursing curricula in colleges and universities across Venezuela. Thus far, the program has reached about 5,200 graduate and undergraduate students. Sixteen research projects were conducted as part of the theses of master of public health (MPH) students.

Health and Safety Committees: The Institute of Advanced Studies team established 288 health and safety committees in hospitals in Venezuela charged with protecting the health and safety of healthcare workers in their facilities.

Immunization and Post-Exposure Prophylaxis: The Institute of Advanced Studies team immunized 80% of healthcare workers across all 23 of Venezuelan states against hepatitis B and created a mechanism for monitoring the exposures of employees in coordination with the National HIV/AIDS program.

In 2012, surveys indicated that needlestick injuries decreased 52% between 2007 and 2012 at the 810 healthcare and occupational health facilities in Venezuela that participated in the WHO/NIOSH pilot program. The project achieved success for many reasons, including favorable financial and logistical support from the Institute of Advanced Studies, strong government and nongovernment partnerships, the multidisciplinary approach that involved participants from many sectors of the healthcare and occupational health community, and especially the dedication of Dr. Martínez and her stewardship of the program.

HEALTH AT THE WORKPLACE

**Objective 2:
To protect and
promote health
at the workplace.**



Right: Going to work in the informal sector in Jaipur, India. Practical toolkits assist informal workers to understand and manage workplace risks.

Photo by Dr. Ivan Ivanov

PRIORITY 2.1

Practical toolkits for assessment and management of occupational health risks.

Over the past decades, practical risk management strategies or toolkits have been developed and implemented to prevent and manage occupational health risks. Toolkits include materials to help employers and workers, occupational safety and health experts, as well as those who are not experts, to identify common risk factors and deliver potential solutions or improvements. Common risk factors include chemical, physical, biological, and psychosocial risks, as well as work-related hazards for musculoskeletal injuries.

INTRODUCTION

Priority 2.1 addresses the second objective of the WHO Global Plan of Action—*To protect and promote health at the workplace*. A toolkit is a solutions-oriented strategy that uses practical tools to control a specific hazard and associated risk. Its content and format are based on the best available evidence, supplemented as needed by the practical experience and technical knowledge of experts in the field. The focus is on chemical, physical, biological, and psychosocial risks, as well as on work-related hazards for musculoskeletal injuries and disorders. The main products include training and developing technical assistance. This occurs through workshops; developing web-based tools for risk assessment and management; validating, disseminating, and providing operational analysis of toolkits; and developing web-available instructor-based training courses for risk management.

Using risk management in occupational health and safety has a substantive history. National and international legislation clearly advocates risk management and national and international agencies

describe it in some detail in supporting guidance. For example, risk management is referred to in the European Community's Framework Directive 89/391/EEC,^[URL15] and the International Labour Organization Convention No. 187. Guidance is also found in official European, national, and international guidance on health and safety management, such as the International Labour Organization guidelines on occupational safety and health management systems.

Risk management in occupational health and safety is a systematic, evidence-based, problem-solving strategy. It starts with identifying hazards and assessing the risk they pose. This information is then used to suggest solutions to reduce risks at their source. Once the assessment is completed and solutions or controls implemented, the risk management actions are evaluated. Evaluation informs the whole process and should lead to a reassessment of the original issue, and to broader organizational learning, which leads to a continual cycle of improvement.

The projects were carried out by institutions in the United States, Republic of Korea, Portugal, China, Brazil, India, South Africa, the Netherlands, United Kingdom, Germany, Spain, Canada, Switzerland, Italy, Hong Kong SAR, Mexico and Australia. They focused on five areas:

- Chemical risks.
- Physical risks.
- Biological risks.
- Psychosocial risks.
- Work-related hazards for musculoskeletal injuries.

A key success from the projects focusing on chemical risks has been adapting materials to local situations, especially relating to control banding for chemicals. Successful initiatives included translating the publication “Control of Substances Hazardous to Health Essentials” into Chinese, as well as the adapting and translating the “International Chemical Control Toolkit” to implement control banding in the Republic of Korea and the “German Technical Cooperation Agency Chemical Management

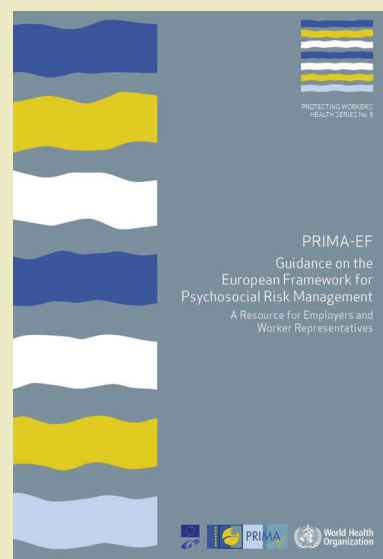
Guide” to use in India. Projects by the International Occupational Hygiene Association, as well as networks of stakeholders who interact via International Control Banding Workshops organized at International Occupational Hygiene Association meetings, have contributed to these successes. A German code of conduct for noise control in the music and entertainment sector was one of the projects focusing on physical risks.

Successes from the projects focusing on psychosocial risks include the [Psychosocial Risk Management Excellence Framework](#),^[URL16] which was developed through a strong Expert Consortium, including expert institutes from the United Kingdom, Germany, Italy, the Netherlands, Poland, and Finland, in addition to the international organizations. Other projects have developed practical toolkits for assessment of work stress, workplace violence, and bullying at work, including specific tools for key target groups, such as healthcare workers. A model of hazards affecting the risk of work-related musculoskeletal injuries and disorders—and procedures and tools to manage such risk—has been developed. Additional tools have been developed, for example, by the International Ergonomics Association. These include [Ergonomic Checkpoints in Agriculture](#).^[URL17]

EXCELLENCE FRAMEWORK FOR PSYCHOSOCIAL RISK MANAGEMENT (PRIMA-EF)

Europe

The Psychosocial Risk Management Excellence Framework (PRIMA-EF), developed by several European institutions, with input from international experts, was designed to accommodate all existing (major) psychosocial risk management approaches. The PRIMA framework has been built from a theoretical analysis of the risk management process, identifying its key elements in logic and philosophy, strategy and procedures, areas and types of measurement, and from a subsequent analysis of typical risk management approaches.¹⁴ A number of outputs may be found on the [PRIMA-EF website](#),^[URL18] including a book, a series of guidance sheets, a guide through WHO’s [Protecting Worker’s Health Series](#),^[URL19] and an inventory tool on best practice interventions from different European countries. This tool focuses on work-related stress, workplace violence, and harassment. An e-training course (PRIMAeT) focuses on psychosocial risk management. The PRIMA-EF materials are currently available in English, Italian, German, Dutch, Polish, Finnish, French, Portuguese, Spanish, and Chinese. PRIMA-EF is being adapted in Brazil and Japan.



Left: “Prima-EF Guidance on the European Framework for Psychosocial Risk Management: A Resource for Employers and Worker Representatives.”

PRIORITY 2.2

Healthy workplace programs and guidance to inform country frameworks.

GOOD PRACTICES

The work environment and life outside of work are important influences on the health of the global workforce. This makes it desirable to prevent and manage hazards at work, while also addressing “life risks.” A number of tools are available, but most focus on specific hazards, industries, or sectors. In earlier years no comprehensive international “blueprint” for good practice included both work risks and health promotion. The Global Plan of Action on Workers’ Health called for establishing mechanisms to help develop healthy workplaces, including consulting with workers and employers, and helping them participate.

INTRODUCTION

Priority 2.2 addresses the second objective of the WHO Global Plan of Action—*To protect and promote health at the workplace*. This priority includes reviewing the effectiveness of existing programs for healthy workplaces. This also focuses on tools for creating healthy workplaces, including a health-promoting culture and occupational health and safety principles. Implementing the global plan of action requires interventions at international, national, and workplace levels. Workplace interventions should be planned and delivered in an integrated way. They should also bring together health protection and health promotion. To achieve this, a first step was developing the [WHO Healthy Workplace Framework and Model](#).^[URL20]

A global framework for healthy workplaces was developed, based on the global plan of action on workers’ health. This framework launched in April 2010. Efforts followed in various countries to build upon suitable good practices worldwide that can be reproduced in different contexts.

A healthy workplace is considered to be “one in which workers and managers

collaborate to protect and promote the health, safety, and well-being of all workers, and the sustainability of the workplace.” This considers the following, based on identified needs, including:

- Health and safety concerns in the physical work environment.
- Health, safety, and well-being concerns in the psychosocial work environment, including work organization and workplace culture.
- Personal health resources in the workplace.
- Ways to participate in the community to improve the health of workers, their families, and other members of the community.

New in Healthy Workplace efforts was recognition that each individual worker faces risks at work and risks outside work, including in the home, community, and environment. Therefore, a comprehensive package of practical interventions at the workplace includes four areas:

- Increase awareness among the business community, workers, practitioners,

occupational health experts and policy makers, of the benefits of the comprehensive approach. This focuses on using a risk assessment and management model to reduce the health impact of hazardous, unsafe, and unhealthy working conditions.

- Develop global and specific guidance (a how-to guide) that covers the full cycle of assessing risk and managing workplace risks. The goal is to consistently improve workplace conditions that threaten workers’ health.
- Make comprehensive healthy workplace programs easier to use, and encourage the business community to take ownership of them.
- Establish a global partnership alliance to raise awareness, continue support, and ensure implementation.

Currently a healthy workplace network includes numerous members from nations around the world. Many of the experts agreed to develop practical programs and evaluate their success in contexts that are nation- and sector-specific. The contexts range from



Above: The healthy workplace initiative at the Saw Swee Hock School of Public Health, National University of Singapore, includes a jogging group, pictured here as they start their weekly Friday afternoon healthy activity.

specific work units, to small businesses, to large organizations, to nationwide.

Projects on healthy workplaces were carried out by institutions in Singapore, China, Japan, Germany, Italy, the United Kingdom, Republic of Korea, Australia, Spain, Canada, Costa Rica, the United States, Ghana, and Brazil. The healthy workplace initiative projects involved five components of a comprehensive healthy workplace program:

- Occupational health and safety hazards in the physical work environment.
- Work organization and cultural issues in the psychosocial work environment.
- Health promotion in the workplace.

- Private sector involvement in responsible business practices linked to employee health and safety issues.
- Comprehensive approach to a healthy workplace using continuous improvement and evaluation management systems.

The wide range of Healthy Workplace programs is illustrated by programs in Singapore and Brazil. The Healthy Workplace Program of the Saw Swee Hock School of Public Health in the National University of Singapore focuses on faculty and staff of the School. It includes a “Fitness Friday” that encourages staff and students to participate in various exercise interest groups on Fridays after

4 p.m. The launch of the exercise program is part of the school’s efforts to broaden the program to include the entire university. The Healthy Industry Program, led by the Social Service of Industry (SESI) in Brazil, seeks to improve the quality of life of industry workers in Brazil by promoting healthy workplaces and healthy lifestyles. Future initiatives will include reviewing the effectiveness of existing programs for healthy workplaces, developing training programs to help enterprises implement the healthy workplace framework, and using tools to create healthy workplace programs, including a health-promoting culture and occupational health and safety principles.

TOTAL WORKER HEALTH®

United States of America

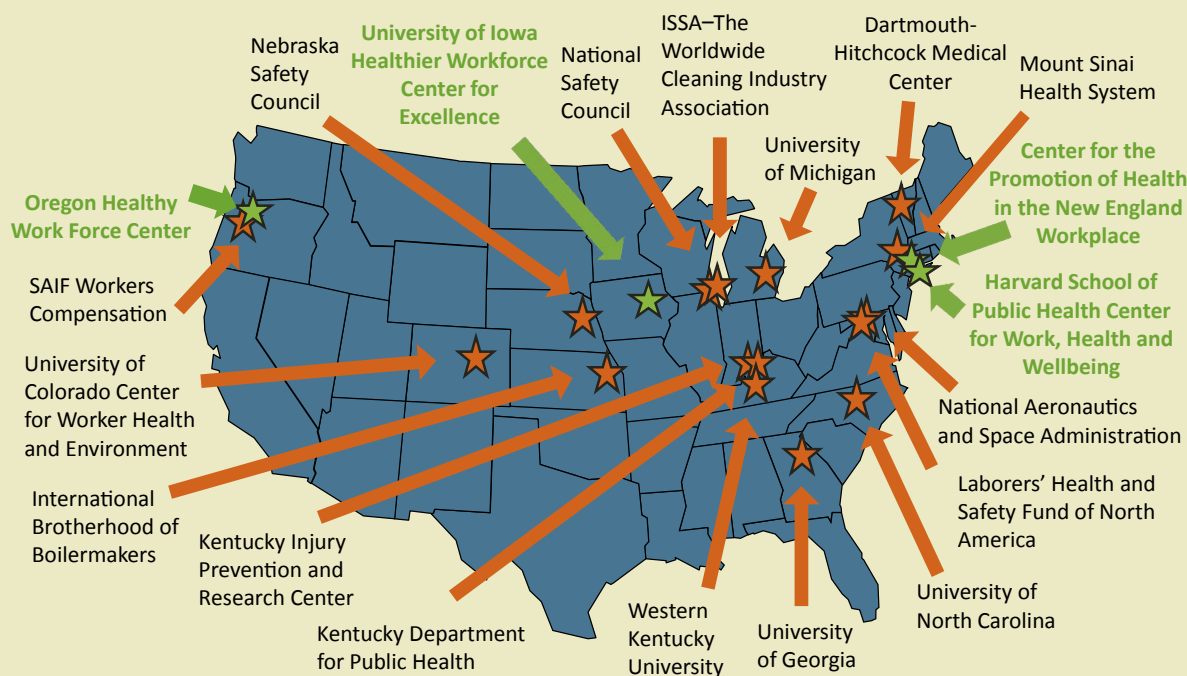
Total Worker Health® (TWH) is a research-to-practice effort of the U. S. National Institute for Occupational Safety and Health (NIOSH). At NIOSH, Total Worker Health is defined as policies, programs, and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being. The concept also addresses other workplace systems, including those relevant to the control of physical, biological, and psychosocial hazards and exposures; the organization of work; compensation and benefits; and work-life programs. Workplace policies that discriminate against or penalize workers based on their individual health conditions—or inadvertently create disincentives for improving health—are inconsistent with a Total Worker Health approach. Keeping workers safe is the foundation of the Total

Worker Health approach, and it underscores a holistic understanding of factors that influence worker well-being.

Partner and stakeholder input contribute to research priorities, conducting research, implementing interventions, and translating scientific knowledge. Partners include international organizations such as WHO and International Commission on Occupational Health, and domestic partnerships with NIOSH-funded extramural academic Centers of Excellence, volunteer Total Worker Health affiliates, and hundreds of occupational safety and health practitioners and researchers, workplace health and well-being professionals, labor partners, employers, and policymakers. The U.S. map below shows the geographical and organizational diversity of TWH partners.

Below: U.S. map shows key Total Worker Health partners.

NIOSH Centers of Excellence and TWH Affiliates



Graphic provided by Reid Anderegg

OCCUPATIONAL HEALTH SERVICES

**Objective 3:
To improve the
performance of
and access to
occupational
health services.**



Right: Occupational health services provide better work ability to all working people.

Photo by Suvi Lehtinen

About 45% of the world's population, and 58% of the population more than 10 years old, belong to the global workforce. Their work sustains the economic and material basis of society, which is critically dependent on their working capacity. Thus, the health, work ability, and well-being of the global workforce are crucial prerequisites for productivity, and they are of utmost importance for overall socio-economic and sustainable development.

WHO and the International Labour Organization strongly encourage countries to develop national standards and procedures to implement occupational health services. Key documents include the International Labour Organization's occupational safety and health and occupational health services standards. These include International Labour Organization Convention No. 161 on Occupational Health Services, the WHO Global Strategy on Occupational Health for All (1996 WHA49.12 Resolution), and the Global Plan of Action on Workers' Health 2007 (WHA60.26). National actions will strengthen their occupational health services to better respond to the needs of health and work ability of their working populations.

Currently, only 10–15% of global workers can access occupational health services.^{15, 16} This objective has a special demand to support working people in their everyday activities.

Priority 3.1 addresses the third objective of the WHO Global Plan of Action—*To improve the performance of and access to occupational*

health services—and it includes collaborating centers and nongovernmental organizations dedicated to improving this access.

INTRODUCTION

Preventing workplace injury and illness involves providing access to occupational health services and improving how they perform. This is accomplished through community, workplace, primary care, and expert resources. The global plan of action includes projects to address issues involving the delivery of occupational health services to prevent work-related injuries and illnesses, and to promote health and work ability of workers.

To prevent work-related injuries and illnesses, and improve coverage for all workers, collaborating center projects use essential interventions and Basic Occupational Health Services. The projects especially focus on covering workers employed in agriculture; small and medium-sized enterprises; the informal economy; and workers in precarious work environments, such as migrant and

PRIORITY 3.1

Develop working methods and provide technical assistance to countries for organization, delivery, and evaluation of basic occupational health services in the context of primary healthcare, with a focus on underserved populations and settings with constrained resources.

contractual workers. Successful projects have used simple techniques to improve workplaces, give health education, and do health surveillance at local and regional levels. In Thailand, the Ministry of Public Health developed a [successful program](#)^[URL21] to provide occupational health services at primary care units for workers in the informal economy.

Some Basic Occupational Health Services pilot projects established and strengthened occupational health and safety as a system. These projects began with a regional, community, or sector survey of working conditions. The survey data were used to create an occupational safety and health profile. A second step involved training of trainers on providing Basic Occupational Health Services. These trainers then gave instruction about providers of Basic Occupational Health Services. Basic Occupational Health Services have been provided for 1–3 years, and the results have been evaluated. Typically, the service package has utilized the [Basic Occupational Health Services guidelines](#).^[URL22] It has included

Right: Occupational health services can be developed in steps. This figure was developed by Professor Jorma Rantanen in collaboration with the International Commission on Occupational Health and the Finnish Institute of Occupational Health, according to ILO Convention 161. The arrows indicate that countries should strive for Stages III and IV when developing occupational health services to their working people as the steps are followed.

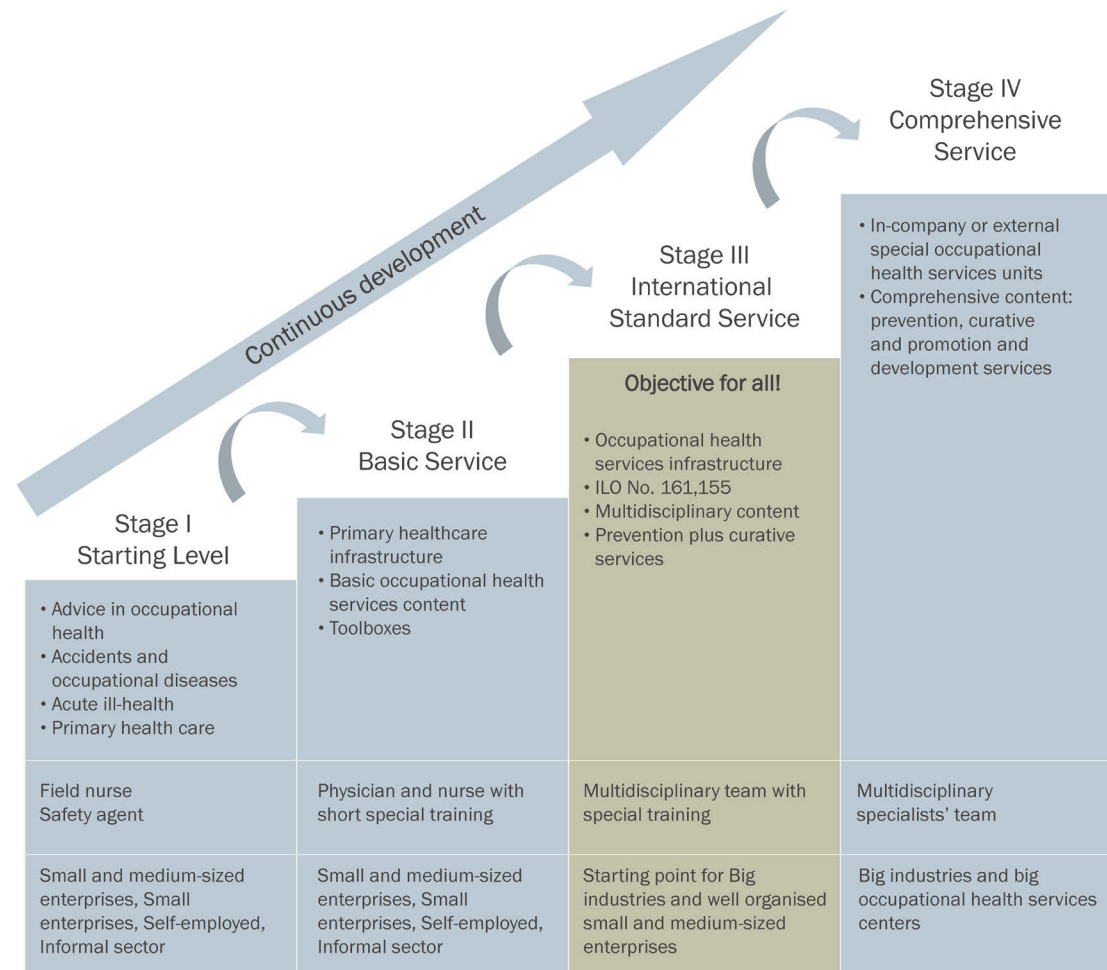


Figure by Dr. Jorma Rantanen

surveillance of the work environment and workers' health, risk assessment, initiatives and advice for management, preventive and control actions, support and advice in practical implementation measures. If needed, it has also included treatment or referrals for identified diseases, and first-aid services. Some projects promoted the work ability of workers.

Some projects enhanced delivery of services through programs in which a physician or a nurse at a healthcare or workplace setting was trained in occupational health and safety. In nations with shortages of human resources for health, a system or program might use community health workers. Projects reflect

the basic principles of occupational health, including risk assessment and prevention, health surveillance, adapting the work to the capacities of workers with medical conditions or partial work ability, and first aid.

Projects were also designed to study the type and level of external support (such as financial and service infrastructure) needed to develop Basic Occupational Health Services, and occupational health services in general. Research projects have evaluated the results of pilot programs that effectively established Basic Occupational Health Services, and occupational health services in general, and worked to achieve the global plan of action goal of developing content and

expanding coverage of occupational health services.

The examples that follow illustrate needs and successful interventions suitable for nations at all levels of development. Examples include practical research approaches used to establish programs, policies, and practices to implement occupational health services in the former Yugoslav Republic of Macedonia, Finland, India, China, and South Africa.

Basic Occupational Health Services Through Public Health Systems in India

Health sector workers are exposed to occupational hazards that seldom receive enough attention. The Occupational Health Research

Group of Sri Ramachandra University, Chennai, India, organized a framework for occupational risk management in Tamil Nadu, India. This led to the provision of Basic Occupational Health Services for public healthcare workers, enhancing the human-resource infrastructure to provide these services to other sectors.

A pilot exercise involved collaboration with the National Institute for Occupational Health–India, the Finnish Institute of Occupational Health, and Bureau of Occupational and Environmental Health–Thailand. The exercise involved identifying hazards and making qualitative exposure assessments in 44 health facilities across 267 work locations, which were representative of public health systems in Tamil Nadu. Training was designed for primary care physicians who provide Basic Occupational Health Services to local industry. The project helped healthcare providers assess and manage the occupational health risks in their own healthcare facilities, and subsequently it facilitated their service as

Basic Occupational Health Services providers. This new approach included workshops for more than 100 local health officers in two districts of the state of Tamil Nadu, and it demonstrated the usefulness of the Basic Occupational Health Services framework for creating a local program.

An expanded compendium of training resources was developed using job-hazard profiles for primary occupational sectors in individual districts. The Basic Occupational Health Services model was customized for the health sector in local conditions. The study results are catalyzing risk communication efforts with public health departments to understand the urgent need to intervene in incremental steps and create a positive feedback loop to manage the health of all workers, including those employed by the health departments. The pilot project showed two positive impacts. First, the Basic Occupational Health Services approach can be adjusted to the health sector at various levels. Second, the health sector units provided

with Basic Occupational Health Services intervention can be empowered to provide these basic services for workplaces of other sectors, small enterprises, the self-employed, and other under-served groups.¹⁸

The materials for assessing risks in health-care facilities, and the training materials are in the [GeoLibrary](#).^[URL.3] They can be used as training materials for other primary health-care workers. Lessons learned are also being used to develop a “Train-the-Trainers” guide for those who implement Basic Occupational Health Services in the areas covered by the South-East Asia Regional Office of WHO.

Developing Basic Occupational Health Services for Under-served Groups in FYR Macedonia

The Health Strategy of the Republic of Macedonia, 2020 has a priority of developing Basic Occupational Health Services, particularly for under-served workers. The Basic Occupational Health Services project for agricultural workers began with mobile clinic surveys of dusts and biological, chemical, physical, and ergonomic hazards among 200 workers in nine agricultural activities. The survey showed the prevalence of work-related symptoms: musculoskeletal (33.9%), respiratory (25.3%), gastro-intestinal (21.6%), back pain (57.3%), muscular pain (28.7%), fatigue (18.3%), and disturbed respiratory function (24.4%).

The process to develop Basic Occupational Health Services for the unemployed began with a key informant survey. A high risk of health problems was found among 76.7% of 5,000 unemployed workers. These health problems were accompanied by related poverty, insufficient financial support, stress, uncertainty, and marginalization. A total of 80% reported that occupational health services were unavailable. A high prevalence of symptoms was detected: cardiovascular (35.5%), respiratory (16.8%), nonspecific symptoms (31%), fatigue (24.5%), back pain (14.8%), psychological complaints (50.5%) and sleep disorders (32.5%). In a smaller sample (200 individuals), stress-related emotional



Above: The “Seoul Statement on Development of Occupational Health Services for All” was signed at the 31st International Congress on Occupational Health in 2015 by Dr. Young Soon Lee, president of the Korea Occupational Safety and Health Agency, and Dr. Kazutaka Kogi, president of the International Commission on Occupational Health.

disturbances were found in 63%, and psychosomatic symptoms in 38% of the sample population.

The survey results revealed the occupational health and work ability problems of the surveyed sectors, and they confirmed the need for occupational health services. The main focus areas of the surveys involved the feasibility of the Basic Occupational Health Services approach, and the practicalities of delivery, in terms of preventing occupational injuries and diseases and promoting work ability, particularly in under-served workers. Both projects recommended Basic Occupational Health Services to further develop occupational health services for the underserved groups.^{19, 20}

Basic Occupational Health Services in Finland's Municipal Primary Healthcare

Finland has a high coverage of occupational health services. The municipal primary healthcare units provide more than 30% of the total Finnish occupational health services coverage. Providing occupational health services for small enterprises and the self-employed still constitutes a challenge. A pilot

study surveyed the assessment by employees, employers, and occupational health professionals. Occupational hazards, and the feasibility and usefulness of Basic Occupational Health Services in workplace practices, were assessed. Eleven small enterprises in agriculture, services, and industries participated in the pilot. The occupational risks were generally assessed in similar ways among employees and employers. Seven types of occupational hazards were considered. About 60% of employees, and 62% of employers believed the risks were under control. More than 20% of respondents identified the need to develop ways to prevent accidents and manage psychological and physical factors. Employees were less satisfied than employers with the support from occupational health services for the controlling risks (36% versus 71% at least moderately satisfied). Both groups agreed that health examinations were performed adequately by Basic Occupational Health Services. However, more guidance was expected and required from occupational health services, which involved adjusting work practices and conditions to allow a

return to work. Both employers and occupational health services professionals considered Basic Occupational Health Services to be a useful method to evaluate occupational risks. This was because these services facilitated the assessment process in a systematic way, creating good and sustainable practices. Work environment hazards continue to be a major issue in occupational health of small enterprises. Even in a country with high coverage of occupational health services in general (90% in Finland), providing Basic Occupational Health Services appears to be a suitable method to standardize and develop risk assessment and health surveillance, and actions for prevention. Basic Occupational Health Services could be further developed for better guidance on returning to work and promoting work ability, particularly among aging workers.²¹

BASIC OCCUPATIONAL HEALTH SERVICES IN THE NATIONAL HEALTH STRATEGY

China

China has drawn up a National Health Strategy, an important objective to develop content and expand coverage of occupational health services from the current 10%. With the support of the WHO China Office, a 3-year pilot program (2006–2009) was launched to develop basic occupational health as a joint action of the Ministry of Health, State Administration of Work Safety Supervision, Ministry of Human Resources and Social Security, and All-China Federation of Trade Unions. The project focused on strengthening occupational health supervision, occupational health services, and the capacity of providing services in 19 counties across 10 provinces. Training was provided for more than 6,000 experts. Eighty-eight secondary level China Centers for Disease Control units were established, and expert and

supervisory staff were increased. The occupational health monitoring of working conditions and workers' health found that more than 600,000 workers were exposed to hazards. The health examinations for workers found a high number of new occupational diseases.

After evaluating the first pilots, the Chinese Ministry of Health decided in 2010 to expand the Basic Occupational Health Services projects to an additional 19 provinces and 46 counties. An Interministerial Coordination Committee was established to develop occupational health services in China. A special National Occupational Health Program for 2009–2015 was initiated, with goals to gradually expand the Basic Occupational Health Services approach to the whole country.²²

GLOBAL CONFERENCE “CONNECTING HEALTH AND LABOR”

In 2011, WHO and the Dutch TNO Work and Health collaborating center organized the global conference “Connecting Health and Labor” in The Hague.²³ The goal was to develop a strategy for scaling up workers’ health coverage through delivering essential interventions for prevention and control of occupational and work-related diseases and injuries in the context of integrated and people-centered primary healthcare. The conference brought together for the first time experts in occupational health and in general and family medicine.

In 2013, to share the message broadly, WHO and the South African National Institute of Occupational Health collaborating center organized a side event at the 66th World Health Assembly to raise awareness among the country delegates about the need to extend health coverage to informal sector workers.²⁴ In 2014, the World Organization of Family Doctors and the International Commission on Occupational Health issued a joint pledge to better integrate occupational health in the primary care setting.²⁵ Advancing integration of worker health and primary health care continues to be a priority of WHO and the global network.



ESSENTIAL INTERVENTIONS FOR WORKERS’ HEALTH IN PRIMARY CARE

WHO, together with several collaborating centers and partners (Bureau of Occupational and Environmental Diseases, Thailand; National Institute of Occupational Health, South Africa; International Center for Rural Health, Italy; U.S. National Institute for Occupational Safety and Health; El Bosque University, Colombia; and the Ministry of Health and Medical Education, Iran) carried out field studies to determine the range of interventions for workers’ health delivered at the primary care level and their costs. Studies and reviews of evidence were carried out by WHO collaborating centers and Coronel Institute in The Netherlands. The results of these studies allowed for developing definitions and costing inputs of a basic set of essential interventions for preventing and controlling occupational and work-related diseases. This set was included in the International OneHealth Costing Tool, a software tool designed to inform national strategic health planning in low- and middle-income countries.²⁶

This work also stimulated the inclusion of occupational health into the national health plan of Colombia, the strategy for re-engineering of primary healthcare in South Africa, and the universal health coverage scheme in Thailand. In 2014, WHO with the Ministry of Health and Medical Education and Semnan Medical University, organized an international consultation that reviewed the set of essential interventions for workers’ health and the indicators for measuring workers health coverage and developed a road map for scaling up workers’ health coverage in the WHO Eastern Mediterranean region.²⁷



Above: Field study in primary care facilities to include work related activities in Eastern Cape, South Africa

PRIORITY 3.2

Adapt and disseminate curricula, training materials, and training for international capacity building in occupational health.

Training materials, practice tools, and training delivery are needed to support occupational health services development, delivery, and evaluation. The goal is to disseminate model materials and courses, create a public domain inventory of training materials and practice tools, provide technical support to deliver courses and online training, support establishing national training programs in low- and medium-income nations, and introduce occupational health and safety into professional education programs.

INTRODUCTION

Priority 3.2 addresses the third objective of the WHO Global Plan of Action—*To improve the performance of and access to occupational health services*. It features projects that address education and training for building occupational health services personnel capacity. Education and training projects are designed to build capacity at basic, technical, and expert levels.

In developing nations, only 5–10% of workers have access to occupational health services. In many industrialized countries, only 20–50% of workers have access, with very few exceptions, in spite of an evident need at virtually every worksite. The need for occupational health services is particularly acute in the developing and newly industrialized nations. Furthermore, approximately eight out of 10 of the world's workers live in these countries.

Successful education and training projects trained community health workers in areas where there was limited access to healthcare providers. They also provided a minimal level of training for healthcare providers and established a network

of educators in occupational safety and health to support capacity building in education and training. Materials were made freely available through the electronic [GeoLibrary](#).^[URL3]

To enhance occupational safety and health systems, it is vital to educate and train public health officers, occupational safety and health inspectors, physicians, nurses, occupational hygienists, engineers, policy makers, plant managers, and union health and safety representatives. Some projects focused on creating local knowledge and supporting the implementation of prevention programs. They helped participants master knowledge and skills for a wide range of occupational health and safety problems across industries, in large and small enterprises. Educational and training projects offered systematic approaches to gather and interpret information and skills for making decisions, even with limited resources. Whether it is an injured worker, an ill workforce, an unanticipated chemical release, or a chronic, hazardous exposure, the ultimate objective of training is to have competent people who

can characterize and reduce or eliminate workplace hazards.

One example of a project in this area is implementing a training program to develop skills in risk assessment, control, communication, and prevention for more than 400 public sector workers from nine provinces in South Africa. The project partners from the National Institute for Occupational Health, South Africa, and the University of Illinois at Chicago adapted the [WHO Modules in Occupational Health](#).^[URL23] This has helped advance WHO's efforts to increase capacity to anticipate, recognize, prevent, and control workplace hazards. The modules in occupational health, hygiene, and safety are designed to educate those who are charged with the responsibility of protecting the health of workers. They include public health officers, physicians, nurses, engineers, policy-makers, labor inspectors, and worker health and safety advocates. The 32-hour course is case-based for a multidisciplinary audience and encompasses many disciplines—toxicology, epidemiology, occupational hygiene, and safety. It employs the methods of hazard/risk

NETWORM—NET-BASED TRAINING FOR WORK-RELATED MEDICINE

Germany

The international case-based e-learning project [NeTWoRM](#)^[URL29] was founded in 2003 by the WHO Collaborating Centre at the University Hospital of Munich (LMU), Germany.²⁴

NeTWoRM virtual patients introduce students and occupational safety and health professionals to an interactive learning environment, in which the user assumes the role of a healthcare professional. The user faces fictional and reality-based scenarios related to occupational safety and health, and based on a wide range of professions and workplaces. New case studies are added regularly. To date, NeTWoRM has generated about 90 unique virtual patients presented in nine different languages, with users in Europe, North and Latin America, India and South

Africa. Along with being translated, virtual patients are in a standardized way adapted to local culture and legislation. The virtual patients are updated on a regular basis, in line with the latest scientific standards. They are thoroughly reviewed by experts in the field, as well as through students' feedback.

Training materials for workers' health education

In collaboration with the University of Amsterdam, WHO, International Commission on Occupational Health, and other institutes, a [website](#)^[URL25] was created to present training materials related to workers' health, including Basic Occupational Health Services and primary healthcare. The materials are freely available for adaptation and further development.

identification, characterization, and evaluation and touches on issues related to policy and ethics.

Although the course was designed to be taught by two or three instructors for up to 25–30 students, an important and successful adaptation included creating a DVD of each of the 20–30 minute lectures. The DVD enabled one instructor to conduct the course for groups of up to 40 students. A “train-the-trainer” course was held for 90 participants in Johannesburg in September 2009, and 10 additional courses were offered for more than 400 participants as part of the national strategy for training “implementers” in government departments. The program complements the South African national strategy for increasing workplace health and safety in government agencies. The modules are considered a valuable resource in occupational safety and health training.



Photo by Dr. Leslie Nickels

Above: Public sector agency representatives presenting workplace risk assessment mapping in Kimberly, Western Cape, South Africa.

PROVIDING EVIDENCE FOR ACTION AND PRACTICE

**Objective 4:
To provide and
communicate
evidence for action
and practice.**

Right: A mining engineer walks a catwalk to retrieve a dust sampler at a rock crushing company in Chile, while participating in the collaborative project to control hazardous exposures to silica, a component of the WHO/ILO Global Programme for the Elimination of Silicosis.



Photo by Aaron Sussell

PRIORITY 4.1

Encourage practical research on emerging issues, including nanomaterials and climate change.

Research to identify and control hazards in the workplace takes place using surveillance schemes, reporting systems, and appropriate research agendas to fill knowledge gaps. Emerging issues include understanding and addressing hazards and solutions for workers dealing with nanomaterials and those affected by climate change, and communicating these findings to the global health and safety community.

Priority 4.1 addresses the fourth objective of the WHO Global Plan of Action—*To provide and communicate evidence for action and practice*. The projects under this priority address emerging issues brought about by nanotechnology, which is a global challenge to public health, and the implications of climate change on global health and safety.

INTRODUCTION

Nanotechnology projects are developed within several areas. They focus on improving occupational safety and health in nanotechnology industries. This is accomplished through research into identifying, mitigating, and communicating nanotechnology risks to low- and medium-income nations. Projects also assess whether safety measures for manufactured nanoparticles are adequate, and they develop guidelines for assessing the safety measures used to produce, use, and dispose of nanoparticles and products that contain nanoparticles. The projects also establish best practices globally for working with nanomaterials. This

includes recommendations on health effects, exposure limits, exposure monitoring, personal protective equipment, respiratory protection, and engineering controls. Additionally, a network of international experts in the field initiated a technical “observatory” (Nano-Comms) for disseminating information on nanoparticle health and safety issues. Other areas include recommending in vitro toxicological tests and developing a database for individuals who work with engineered nanomaterials. The database will document the type and nature of exposure, with a goal of creating a job exposure matrix and health surveillance protocols.

Nanotechnologies have seen continued development and globalization, and widespread use in industry and manufacturing processes. For this reason, a strong collaborative approach has been instrumental in the progress achieved so far. The 2009–2012 workplan included 12 nano projects led by 11 collaborating center partners. Many partners are already involved in collaborative

nano-focused research “clubs.” For example, the NanoImpactNet (European Network on the Health and Environmental Impact of Nanomaterials, of the Institute for Work and Health, Lausanne, Switzerland) has already passed the evaluation for the 7th European Framework Program. It has planned activities to address protection measures concerning the potential for unwanted exposures to nanoparticles. The key challenge with the work in these areas is to ensure that the findings are communicated appropriately to lower-income nations. These nations may have had to prioritize their own research to address more immediate topics, such as disease control, Basic Occupational Health Services, health surveillance, and training. This will be a focus in the workplan period, 2012–2017.

Collaborating centers carried out national projects on nanomaterials that contribute to the international sharing of toxicological knowledge, the sharing of guidance, and tools for managing exposures to nanoparticles. A group of experts from the collaborating

Right: Good risk management practices for nanomaterial manufacturing include exposure monitoring, local exhaust, and personal protective equipment (PPE).

centers and other institutions is working with WHO to develop “WHO Guidelines on Protecting Workers from Potential Risks of Manufactured Nanomaterials.” This document, and the collaborating center projects, will focus on creating a communication system useful for developing nations to recognize, assess, and manage risks if there is exposure to nanoparticles.

Climate change activities focusing on worker hazards are also a recent growth area among the collaborating center network members. As a result, this work will help to raise the profile of this topic and gain the support of government departments, industry, and academia. The projects within the current portfolio collate and summarize current evidence of the potential effects of climate change on workers’ health. This helps to inform future research on this emerging topic area, and it will help develop a clear understanding of the issues facing workers of both industrialized and developing countries.

The projects focused on the key issues emerging around climate change that contribute to the identification, collection, and summary of current evidence of the potential effects climate change has on workers’ health. They also identify knowledge gaps to help inform future research on this important emerging topic area. They seek to raise awareness of the emerging occupational safety and health issues associated with climate change among regional populations. A major focus is developing occupational safety and health



Photo by Dr. Chuck Geraci

regulations on managing heat as a hazard, and identifying and implementing climate change mitigation and adaptation measures for workers. Another major focus is assessing the handling and disposal of large-scale municipal waste in a sustainable manner, and applying existing models.

It is important to consider the occupational safety and health policy implications, as well as to understand the potential impact of climate change on workers’ health. Safe Work Australia is leading a project contributing to this topic. This research focuses on extreme weather events, such as exposure to heat and how it will impact workers, and it identifies the policy and regulatory implications for this emerging hazard. Additionally, the Canadian Institute for Research in Occupational Health and Safety (IRSST),

is exploring avenues of research related to the impact of climate change on occupational health and safety. In addition to expanding knowledge on climate change, this work informs future research priorities on the topic and develops further collaborations between global partners. A further strategic objective of this project aims to make the IRSST a national reference center with an interdisciplinary and multi-institutional research program on the impact of climate change on occupational health and safety.

The growing areas of nanotechnology research are a great success story. The increase in project submissions and the continued progress of existing projects suggest a greater awareness of the need to conduct research in these areas.

PRIORITY 4.2

Further develop the global research agenda for workers' health.

The global plan of action on workers' health calls for strengthening research on worker health, by framing special research agendas, giving it priority in national research programs and grant schemes, and fostering practical and participatory research.

The [Cochrane Collaboration](#)^[URL.26] illustrates a modern approach to ensuring the adequacy of past research on key occupational safety and health questions. It also helps prioritize questions that new research should address. The Cochrane Occupational Safety and Health Review Group investigates the best ways to protect workers against health risks and dangers that exist in the workplace. What reduces stress in healthcare? How can noise-induced hearing loss be prevented at work? How can falls from heights be prevented? What are the best ways to prevent explosions? These are the types of questions that are answered. The Cochrane review group collects all the available research on the effects of specific protective measures. The results of these studies

are combined in reports that are called systematic reviews. The systematic reviews have concluded that hearing protection does not reduce noise-induced hearing loss sufficiently, and also that cancer survivors benefit from measures aimed at preventing job loss. To date, 126 systematic reviews, or protocols of future reviews on topics relevant to occupational safety and health, are available in electronic format.

INTRODUCTION

Priority 4.2 addresses the fourth objective of the WHO global plan of action—*To provide and communicate evidence for action and practice*. The projects address a wide range of issues, including traditional and emerging occupational health and safety issues.



Right: Cochrane Collaboration Workshop in Hyderabad, India, 2015.

Photo by the Indian Association of Occupational Health



Photo by Lee Coursey, Flickr Creative Commons

AN INTERVENTION IN THE NUTMEG INDUSTRY

Grenada

The nutmeg industry was one of the most significant contributors toward the local economy in Grenada, until the country was devastated by Hurricane Ivan in 2004. A pilot project to revitalize the nutmeg industry, while increasing the health and safety of work, has been initiated by Grenada's St. George's University and partners. They have evaluated the processing plant hazards, and they built a solar dehydrator in the pilot plant to reduce the heat, dust, and mold of the traditional process. The project offered an occupational health and safety train-the-trainer course for the country's nutmeg workers, which included lectures and practical exercises at the nutmeg processing plant. The project also organized the planting of 2000 nutmeg trees on 40 acres of land-degraded area. In October 2011, after just one year, nutmeg trees had grown and established root systems, flora had increased, and there was an evident reduction in soil run-off. As a result of this collaboration, Grenada anticipates an increase in nutmeg production and an improvement in workers' health. The highlighted success story illustrates how research, in combination with practical interventions, can be carried out to address the widespread consequences of a devastating natural disaster, such as the hurricane in Grenada. This research has brought hope for economic resurgence in the region, and it has identified a practical intervention to manage heat stress in nutmeg industry workers, thus contributing to research efforts in climate change.



Photo by Dr. Muge Apkinar-Elci

Top Right: Occupational Safety and Health Train the Trainer Program for Grenada Nutmeg Workers

Left: Nutmegs

PRIORITY 4.3

Revision of the *International Statistical Classification of Diseases and Related Health Problems* to include occupational causes in the 11th edition.

The International Statistical Classification of Diseases and Related Health Problems, published by WHO, provides codes to classify diseases and a wide variety of signs, symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or disease. The classification is used worldwide for morbidity and mortality statistics, compensation systems, and automated decision support in medicine. Currently, work is underway to ensure that occupational health is included in the next revision of the classification (ICD-11).

INTRODUCTION

Priority 4.3 addresses the fourth objective of the WHO global plan of action—*To provide and communicate evidence for action and practice*.

This global plan of action objective includes revising the 11th edition of the *International Statistical Classification of Diseases and Related Health Problems* to include occupational causes of diseases. This important step will help identify and control hazards at work through a common surveillance and reporting system. This, in turn, can help promote appropriate research agendas to fill current knowledge gaps and communicate these findings to the global health and safety community.

Including occupational diseases within the next edition of the *International Statistical Classification of Diseases and Related Health Problems* has been a long-standing priority of WHO. However, initiating the process has not been without its challenges. Through the hard work of the WHO colleagues working alongside the international statistical classification task groups already involved with the revision process

of the existing chapters, the process to include occupation is well underway. This current effort is being coordinated between WHO and the Health and Safety Laboratory, United Kingdom, with input from a range of WHO collaborating center partners representing all regions. The collective group has provided definitions and diagnostic criteria based on reviews of published literature. The group is reviewing the proposed list of occupational diseases, with a view to completing content models for each disease. In 2012, WHO released for public comments the [draft of the 11th revision](#)^[URL27] of the classification. The beta-testing phase, open for public comment, will continue through 2017. After 2017, there will be a system in place for ongoing input to enable continuous upgrade of the system.

The opportunity to include occupational causes of disease in the latest classification version is of great significance. The document will aid reporting and data collection for occupational diseases and illnesses while helping with the diagnostic process, patient management, and exposure control.

Revision of the 11th Edition of the International Classification of Diseases

WHO is creating the 11th revision of the *International Classification of Diseases*. Developing these international health information standards works in accordance with WHO's constitution. The classification is one of the main, longstanding examples of how health information can assist populations and countries to manage their health statistics. The new edition will incorporate occupational causes of disease for the first time, which represents an important step in raising the profile of workplace health across the global community.

TARGETING HIGH-RISK INDUSTRIES AND VULNERABLE WORKER GROUPS

**Objective 5:
To incorporate
workers' health
into other policies
and projects.**



Right: Child doing agricultural work.

Photo by The Advocacy Project, Flickr Creative Commons

PRIORITY 5.3

Implement toolkits for the assessment and management of occupational safety and health hazards in high-risk industry sectors and for vulnerable worker groups.

The four most hazardous industry sectors, based on fatality rates, are agriculture, mining, transportation, and construction. Workers who are particularly vulnerable include young children (child labor); young people who are old enough to work but still immature and inexperienced; older workers; pregnant women; those working in contexts where either their gender or their ethnic status puts them at a disadvantage; migrant workers; those with personal disabilities; and those in precarious, disempowering forms of employment.

INTRODUCTION

Priority 5.3 addresses the fifth objective of the WHO Global Plan of Action—*To incorporate workers' health into non-health policies and projects*. This involves projects focusing on the occupational health needs of workers in hazardous industries, and the vulnerable worker populations. In both areas, WHO collaborating centers on all continents have contributed to this work.

HAZARDOUS INDUSTRY SECTORS

Projects address risks and interventions in the hazardous sectors of agriculture, mining, transportation, and construction. The Ministry of Manpower, Singapore, developed and piloted the [Construction Safety Audit Scoring System](#),^{[URL28], 30} an online audit tool providing an assessment of the quality of the safety and health management system at a construction worksite. The audit scoring system was adopted nationally in the construction industry in August 2011.

The National Institute for Occupational Safety and Health (NIOSH) in the United States has worked with international partners

to address risks to workers driving, working, or walking on roads. Best practices globally to protect workers in road environments are gathered in the Specialty Road Safety at Work library within the [Geolibary](#).^[URL3] Threats to the health of workers in maritime transport are assessed and interventions designed by the Hamburg Institute for Occupational and Maritime Medicine. Project topics include fumigant risks to workers unloading containers, and stress and illnesses among seafarers.

NIOSH and partners in Colombia worked to reduce occupational injuries, illnesses, and fatalities in Colombian mines through developing and implementing regulatory, training, and engineering interventions. The International Ergonomics Association and partners are assessing the health effects of underground mine workers. The Denmark Clinic of Occupational and Environmental Medicine and the German Maximilian University are working with partners in several countries to reduce mercury exposure due to artisanal gold mining.

The agriculture sector has received the greatest attention. This is a particularly important

sector, because 70% of the world's poor live in rural areas and are involved in agriculture as their main source of income.³¹ Overall, around 35% of the world's workforce is employed in agriculture,³² and agriculture sector workers include some of the most vulnerable, such as children, pregnant women, and the elderly.

One of the worst risks confronting agriculture workers is poisoning from pesticides. Developing countries use only 20% of the world's agrochemicals, yet they suffer 99% of deaths from pesticide poisoning.³² One of the most important causes is inadequate or nonexistent regulation of pesticides. Many of the pesticides marketed in developing countries fail to meet internationally accepted quality standards, and they are often inadequately labeled. They pose a serious threat to human health and the environment.

The pesticide problem in Africa is being tackled by the collaborating center at the University of Cape Town. An Internet-based discussion forum and list server has been established at the university, resulting in much more effective information sharing and collaborations among those responsible for regulating



Above: Focus group discussion with farmers sharing experiences about pesticides, health, and environment in Wakiso District, Uganda.

ENHANCING OCCUPATIONAL SAFETY AND HEALTH KNOWLEDGE AND SKILLS AMONG FARMERS

Uganda

Following a model established in Bolivia with the Plagbol Foundation, a project was launched in June 2010 in Uganda to reduce the harmful effects of pesticides. Taking part in this project was the Clinic of Occupational and Environmental Health at Odense University Hospital, Denmark, together with the nongovernmental organization Dialogos; the Danish Society of Occupational and Environmental Medicine; Danish Universities; and local partner Uganda National Association of Community and Occupational Health. Farmers were taught Integrated Pest Management, which eliminates or drastically reduces the use of the most

toxic pesticides by introducing more ecologically friendly alternatives. Additionally, Ugandan healthcare workers are being taught how to diagnose, treat, and prevent acute pesticide poisoning. A broader community education program, involving a range of civil society groups, is developing the community's capacity to ensure its own sustainable food production. These activities are being supported by online information and educational resources. The project activities are now in the second phase, which continues the training activities and includes support to create a Poison Control Center for Uganda in Kampala.

MERCURY-FREE “GRAVITY-BORAX” METHOD FOR SMALL-SCALE GOLD MINING

Philippines

The United Nations Environment Programme has developed a repository of effective methods to reduce or eliminate mercury exposures in small scale mining. One of these methods is substituting the use of mercury with an improved washout and borax application. The Odense Clinic of Occupational and Environmental Medicine is working with partners including the nongovernmental organization Dialogos, the Danish Society of Occupational and Environmental Medicine, Danish Universities, and local partner BAN Toxics in the Philippines. This method prevents mercury intoxications and pollution of the environment. The first results have shown that the mercury-free gold extraction method is less time-consuming and more effective than the traditional mercury method. However, additional technical skills are required in order to effectively use the method. The first phase succeeded in making one gold mining area mercury free, although mercury continues to be used in the other intervention area. The project has now expanded, and the initiative led by local nongovernmental organization BAN Toxics is currently supported by the Philippine government, and local miner federations, among others.



Photo by BAN Toxics

Above: The Philippine NGO BAN Toxics opens the first mercury-free mining facility in Mount Diwata in collaboration with the local government and the United Nations Industrial Development Organization.

pesticide use. In-person regional meetings of pesticide registrars have been held, along with bimonthly online pesticide discussion forums. The university has also developed a Postgraduate Diploma in Pesticide Risk Management, structured upon the Food and Agriculture Organization and WHO International Code of Conduct on the Distribution and Use of Pesticides. A wide range of newsletters, training materials and posters on pesticide safety have been produced and distributed.

The Milan International Centre for Rural Health and collaborators have developed a Global Rural Health Network to share approaches to address the complicated problems faced by agriculture and rural areas on all continents. Members of the network come from the WHO collaborating centers in Milan, Italy; Denmark; Colombia; South Africa; Croatia; Australia; and the FYR of Macedonia. In September 2010, the “Tirana Declaration on Rural Health” was adopted by delegates at the Third International Congress of Mediterranean and Balkan Countries in Albania. In Ecuador, national partners and the WHO collaborating center at the Clinica del Lavoro “Luigi Devoto,” Italy, have conducted studies of fungicide exposures. The goal of these studies is to reduce the health risks experienced by floriculture workers, both in greenhouses and open-field environments. Results will be used to promote improved workplace risk assessment and management.

One of the most effective ways of achieving greater future benefits for the occupational health of workers in high-risk sectors is to implement more widely some of the interventions that have already been demonstrated to be effective. The network is well equipped to meet this challenge, particularly as collaborating centers increasingly work together and share their expertise in addressing a specific kind of problem. Many excellent initiatives are underway, with outcomes targeting the needs of particular groups. These initiatives include

improvements to basic occupational health services, training programs, and various information and education resources that include a range of scientific publications.

Vulnerable workers

Priority 5.3 also seeks to coordinate projects addressing the needs of vulnerable worker groups. Tools and other resources addressing the needs of these groups are being organized by the University of LaTrobe, Australia. The projects targeting this population have been grouped into the following areas: (1) young workers (not including child labor), (2) child labor, (3) older workers, (4) migrant workers, (5) disadvantaged ethnic groups, (6) precariously employed workers, (7) female workers, (8) more general information and resources. It is anticipated that additional projects will be facilitated, planned, and recruited.

Young Workers and Child Labor

The global network was greatly appreciative to the May 2011 World Health Assembly for including guidance regarding young workers and child labor in the World Health Resolution 64.27 on “Child Injury Prevention.” The resolution^{[URL29] 33} includes reference to International Labour Organization Conventions No. 182 (“Worst Forms of Child Labor”) and No. 138 (“Minimum Age Requirement”) in the listing of conventions to remind the member states of their existing commitments. In the paragraph calling for plans of action, the wording includes a reminder to take actions to prevent child labor and to set requirements for legal adolescent employment. In the paragraph calling for awareness raising, there is a reminder to include employers and to address workplace hazards.



Photo by Kate Holt, Australian Aid Photolibrary, Flickr Creative Commons

Above: Olive Sabila Chemutai tends to her tomatoes on her homestead in Kapseror Village, Kapchorwa, Uganda.

APPENDIX 1

Summary of Priorities of the 2009–2012 Workplan.

Workplan of the Global Network of WHO Collaborating Centres for Occupational Health (2009–2012)

This Workplan represents the contributions of the Network of WHO Collaborating Centres for Occupational Health to implement the WHO Global Plan of Action on Workers' Health (2008–2017).⁴ [The Network](#)^[URL30] includes government, research, professional, and academic institutions from 37 countries, along with three nongovernmental organizations, with ILO as a partner. [The 2009–2012 Workplan](#)^[URL31] and its projects are organized according to the five objectives of the Global Plan of Action, and the projects refer to 15 priorities.

Global Plan of Action Objective 1: To devise and implement policy instruments on workers' health

Manager: Claudina Nogueira and Tanusha Singh, National Institute for Occupational Health, South Africa

Priority 1.1: Develop/update national profiles on workers' health and provide evidence base for development, implementation, and evaluation of national action plans on workers' health.

Outputs: Comparative analysis of national strategies and action plans, national profiles, and reports on lessons learned.

Support:

Collaborating Center: Jovanka Bislimovska, Institute of Occupational Health, FYR of Macedonia

WHO/HQ: Ivan Ivanov

Priority 1.2: Develop and disseminate evidence-based prevention tools and raise awareness for the prevention of silica- and other dust-related diseases.

Outputs: Evaluation of national programs, packages of essential interventions and good practices for dust control, exposure, and diagnostic criteria for pneumoconiosis.

Support:

Collaborating Center: Catherine Beaucham, Maria Lioce, and Faye Rice, NIOSH (United States)

Partner: Igor Fedotov, International Labour Organization

WHO/HQ: Ivan Ivanov

Priority 1.3: Develop and disseminate evidence-based tools and raise awareness for the elimination of asbestos-related diseases.

Outputs: Estimates of the burden of asbestos-related diseases, review of good practices for substitution of asbestos and prevention of exposure to asbestos, health surveillance of exposed workers.

Support:

Collaborating Center: Ken Takahashi, Institute of Industrial Ecological Sciences, Japan

Partner: Igor Fedotov, International Labour Organization

WHO/HQ: Ivan Ivanov

Priority 1.4: Conduct studies and develop evidence-based tools and information materials for the comprehensive protection and promotion of health for healthcare workers, emphasizing HBV immunization.

Outputs: Tools, guidance, assistance to countries for training, implementing and evaluating programs

Support:

Collaborating Center: Ahmed Goma and Maria Lioce, NIOSH (United States)

Partners: Julia Lear, International Labour Organization; Jorge Mancillas, Public Services International

WHO/HQ: Susan Wilburn; Pan American Health Organization: Marie-Claude Lavoie

Global Plan of Action Objective 2: To protect and promote health at the workplace.

Managers: Stavroula Leka and Aditya Jain, University of Nottingham, United Kingdom

Priority 2.1: Practical toolkits for assessment and management of occupational health risks.

Outputs: Tools, inventory, framework document, mapping of use and types of tools, evaluation, definition of common criteria of toolkits

Support:

Collaborating Center: David Zalk and Henri Heussen, International Occupational Hygiene Association, Wendy Macdonald, La Trobe University, Australia

WHO/HQ: Evelyn Kortum, Susan Wilburn

Priority 2.2: Healthy Workplace programs and guidance to inform country frameworks.

Outputs: Review of effectiveness of existing programs for healthy workplaces; tools for creating healthy workplaces including a health-promoting culture and occupational health and safety principles.

Support:

Collaborating Center: Patabendi Abeytunga, Canadian Center for Occupational Health and Safety, Canada; Fernando Coelho, Social Service of Industry, Brazil

Partner: Valentina Forastieri, International Labour Organization

WHO/HQ: Evelyn Kortum

WHO/Pan American Health Organization: Marie-Claude Lavoie

Priority 2.3: Develop toolkits for the assessment and management of global health threats (including HIV, tuberculosis, malaria, influenza) emphasizing vulnerable groups, in particular migrant workers.

Outputs: Tools, inventory, framework, mapping of use and types of tools, evaluation, and definition of toolkits.

Support:

Collaborating Center: Jadranka Mustajbegovic, Medical School University of Zagreb, Croatia

WHO/HQ: Susan Wilburn

Global Plan of Action Objective 3: To improve the performance of and access to occupational health services.

Managers: Kaj Husman and Timo Leino, Finnish Institute of Occupational Health; Leslie Nickels, NIOSH (United States)

Priority 3.1: Develop working methods, provide technical assistance to countries for organization, delivery and evaluation of Basic Occupational Health Services in the context of primary healthcare, with particular focus on underserved populations and settings with constrained resources.

Output: Good practices and demonstration projects for organization and delivery of occupational health services, evaluation of service delivery, international knowledge networks of service providers, website clearinghouse of information materials for occupational health practice

Support:

Collaborating Center: Frank VanDijk, Coronel Institute, the Netherlands

Nongovernmental Organization: Jorma Rantanen, International Commission on Occupational Health

Partner: Igor Fedotov, International Labour Organization

WHO/HQ: Ivan Ivanov

Priority 3.2: Adapt and disseminate curricula, training materials and training for international capacity building in occupational health.

Output: Model materials and courses for Basic Occupational Health Services, inventory, technical support for delivery of international courses and on-line training, national training programs in low- and medium-income countries, introduction of occupational health into professional education

Support:

Collaborating Center: Norbert Wagner, University of Illinois at Chicago, Linda Grainger, International Commission on

Occupational Health

WHO: Ivan Ivanov

EURO: Rokho Kim

Global Plan of Action Objective 4: To provide and communicate evidence for action and practice.

Managers: Jo Harris-Roberts and Ed Robinson, Health and Safety Laboratory, United Kingdom

Priority 4.1: Encourage practical research on emerging issues, including nanomaterials and climate change.

Output: Research reports and communication strategies with low- and medium-income countries on interventions to ensure workers' health

Support:

Collaborating Center: Nanomaterials, Rosemary Gibson, Health and Safety Laboratory, United Kingdom, and Vladimir Murashov, NIOSH (United States); climate change, Jo Harris-Roberts, Ed Robinson, Health and Safety Laboratory, United Kingdom

WHO/HQ: Ivan Ivanov

Priority 4.2: Further develop the global research agenda for workers' health.

Output: Research report matrix to identify relevant gaps in research

Support:

Collaborating Center: Jo Harris-Roberts, Ed Robinson, Health and Safety Laboratory, United Kingdom

WHO/HQ: Ivan Ivanov

Priority 4.3: Revision of the International Statistical Classification of Diseases and Related Health Problems to include occupational causes in the 11th edition.

Output: Occupational health and disease components added to ICD-11

Support:

Collaborating Center: Jo Harris-Roberts, Ed Robinson, Health and Safety Laboratory, United Kingdom

WHO: Ivan Ivanov

EURO: Rokho Kim

Global Plan of Action Objective 5: To incorporate workers' health into other policies and projects.

Manager: Wendy Macdonald, La Trobe University, Australia

Priority 5.1: Collate and conduct cost-benefit studies to clarify the economic benefits of workers' health.

Outputs: Published articles and information posted to WHO website

Support:

Collaborating Center: Jos Verbeek, Finnish Institute of Occupational Health, Finland; Diana Gagliardi, Institute for Prevention and Job Security, Italy

Priority 5.2: Develop specific and relevant recommendations to manage risks associated with the impacts of globalization on workers' health.

Output: Guidance for development banks, non-health sector entities to improve workers' health.

Support:

Collaborating Center: David Rees, National Institute of Occupational Health, South Africa

Priority 5.3: Implement toolkits for the assessment and management of OSH hazards in high risk industry sectors and for vulnerable worker groups.

Output: Tools, inventory, framework document, mapping of use and types of tools, evaluation

Support:

Collaborating Center: Hazardous sectors: Catherine Beaucham, NIOSH (United States)

Agriculture: Claudio Colosio, University of Milan, Italy

Transport: Lygia Budnik, CIOM, Hamburg

Vulnerable workers: Owen Evans and Jodi Oakman, La Trobe University, Australia

Partner: Young workers: Susan Gunn, IPEC International Labour Organization; Annie Rice SafeWork; International Labour Organization; Ruth Etzel, WHO

APPENDIX 2

The Network of WHO Collaborating Centres for Occupational Health, Institutes Working with WHO in Preparation for Designation, nongovernment organizations, and WHO/Network Leadership.

Fully Designated WHO Collaborating Centres in Occupational Health (2015)

MORE INFORMATION ABOUT THE CURRENT CENTERS IS AVAILABLE AT:

WHO COLLABORATING CENTRES GLOBAL DATABASE^[URL30]

AUSTRALIA

University of South Australia, Work & Stress Research Group, Canberra

La Trobe University, Centre for Ergonomics & Human Factors, Victoria

BENIN

Universite d'Abomey-Calavi, Cotonou

BRAZIL

Fundacentro, Ministry of Labour and Social Welfare, Sao Paulo

Social Service of Industry (SESI), Brasilia

BULGARIA

National Center of Public Health and Analysis, Sofia

CANADA

Canadian Centre for Occupational Health and Safety (CCOHS), Hamilton

Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST), Montreal

Centre Hospitalier Universitaire de Quebec, Sainte-Foy

University of Quebec in Montreal

University of British Columbia, Vancouver

CHILE

Institute of Public Health (ISP), Santiago

CHINA

Center for Disease Control and Prevention, Beijing

COSTA RICA

National University (IRET), Heredia

CROATIA

Andrija Štampar School of Public Health, Zagreb

CUBA

Institute of Occupational Medicine, Ministry of Public Health, Havana

CZECH REPUBLIC

National Institute of Public Health, Prague

FINLAND

Finnish Institute of Occupational Health, Helsinki

FORMER YUGOSLAV REPUBLIC OF MACEDONIA

Institute of Occupational Health, Skopje

GERMANY

Federal Institute of Occupational Safety and Health (BAuA),
Berlin

Dortmund Technical University, Dortmund

Ludwig Maximilian University, Munich

Institute for Occupational and Maritime Medicine, Hamburg

GRENADA

St. George's University School of Medicine, St. George

INDIA

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<http://www.ioha.net/>

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ABBREVIATIONS

ARDs: Asbestos-related diseases

ACMs: Asbestos-containing materials

BOHS: Basic Occupational Health Services

CCOHS: Canadian Center for Occupational Health and Safety

CDC: Centers for Disease Control and Prevention

ConSASS: Construction Safety Audit Scoring System

COSHH: Control of Substances Hazardous to Health

ECRES: Qualitative Evaluation of the Risk of Exposure to Silica

EURO: WHO Regional Office for Europe

FAO: Food and Agriculture Organization

FIOH: Finnish Institute of Occupational Health

FYR: Former Yugoslav Republic

GeoLibrary: Global Environmental and Occupational Health Library

GPA: Global Plan of Action

GTZ: German Technical Cooperation Agency

HSL: Health and Safety Laboratory, UK

IAES: Institute of Public Health Advanced Studies, Venezuela

ICD: International Statistical Classification of Diseases and Related Health Problems

ICOH: International Commission on Occupational Health

IEA: International Ergonomics Association

ILO: International Labour Organization

IOHA: International Occupational Hygiene Association

IPEC: International Programme to Eliminate Child Labour, ILO

IRSST: Institute for Research in Occupational Health and Safety, Montreal

ISP: Chilean Institute of Public Health

LMU: University of Munich, Germany

MoH: Ministry of Health

MOHRSS: Ministry of Human Resources and Social Security, China

NanoImpactNet: European Network on the Health and Environmental Impact of Nanomaterials

NeTWoRM: Net-based-Training for Work-Related Medicine

NGOs: Non-governmental organizations

NICs: Newly industrialized countries
NIHL: Noise induced hearing loss
NIOH: National Institute of Occupational Health, South Africa
NIOSH: National Institute for Occupational Safety and Health (United States)
NPEAD: National Programmes for the Elimination of Asbestos-Related Diseases
NPES-B: National Programme for the Elimination of Silicosis in Brazil
NSI: Needlestick injuries
PAHO: Pan American Health Organization
PHC: Primary healthcare unit
PRIMA-EF: Psychosocial Risk Management Excellence Framework
PRIMAeT: Psychosocial Risk Management e-Training Course
RCS: Respirable crystalline silica
SAICM: Strategic Approach to International Chemical Management
SARS: Severe acute respiratory syndrome
SAWSS: State Administration of Work Safety Supervision, China
SEARO: South-East Asia Regional Office of WHO
SESI: Social Service of Industry, Brazil
SME: Small and medium-sized workplace
SSE: Small enterprise
UCT: University of Cape Town, South Africa
UNACOH: Uganda National Association of Community and Occupational Health
UNAIDS: United Nations Programme on HIV/AIDS
UNEP: United Nations Environmental Programme
USDOL: U.S. Department of Labor
WHA: World Health Assembly
WHO: World Health Organization

LIST OF WEBSITES

- URL1.** http://www.who.int/occupational_health/publications/global_plan/en
- URL2.** http://www.who.int/occupational_health/network/OH_GMP_2012-2017.pdf?ua=1
- URL3.** <http://www.geolib.org>
- URL4.** <http://www.ilo.org/safework/countries/lang-en/index.htm>
- URL5.** <http://www.imrs.rs>; www.institutkarajovic.rs
- URL6.** http://www.ttl.fi/en/international/osh_in_finland/osh_profile/pages/default.aspx
- URL7.** <http://www.euro.who.int/en/health-topics/environment-and-health/occupational-health/publications/2012/country-profile-of-occupational-health-system-in-germany>
- URL8.** <http://www.fundacentro.gov.br/silica-e-silicose/pnes>
- URL9.** <http://www.ispch.cl/noticia/14593>
- URL10.** <http://www.juntoscontralasilicosis.cl/herramientas/>
- URL11.** http://www.who.int/occupational_health/topics/asbestos_documents/en/
- URL12.** <http://envepi.med.uoeh-u.ac.jp/toolkit/index.html>
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- URL16.** <http://www.prima-ef.org>
- URL17.** http://www.ilo.org/wcmsp5/groups/public/-ed_protect/--protrav/--safework/documents/instructionalmaterial/wcms_176923.pdf
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- URL22.** <http://www.ttl.fi/BOHS>
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- URL24.** www.networm-online.eu
- URL25.** <http://www.workershealtheducation.org>
- URL26.** <http://osh.cochrane.org/>
- URL27.** <http://www.who.int/classifications/icd/revision/en/>
- URL28.** <http://www.mom.gov.sg/workplace-safety-health/safety-health-management-systems/audits-review/Pages/implementation-review.aspx>
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- URL30.** http://apps.who.int/whocc/List.aspx?cc_subject=Occupational+health&
- URL31.** http://www.who.int/occupational_health/network/2009_2012_workplan/en/
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