WHO

Workers' Health Programme

and

Collaborating Centres

in Occupational Health

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30 December 1994
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Preface

The Network of the WHO Collaborating Centres in Occupational Health was created in June 1990 when the National Institutes of Occupational Health convened a meeting in Helsinki. The First Meeting of the Network member institutes was held in Moscow in September 1992. In that connection it was decided to organize the Second Meeting in Beijing in October 1994.

The Planning Group first elected by the Helsinki Meeting, and then new Planning Groups elected by the Moscow and Beijing Meetings, has had as its task to stimulate new ideas for the development of occupational health in the Member Countries, and to catalyse the division of work between the participating institutes in order to avoid costly duplication of work and to fully utilize the resources available. One of the early decisions of the Planning Group was to establish a Directory of the Collaborating Centres.

The aim of this publication is to keep the Collaborating Centres in Occupational Health informed of the activities of both the WHO Workers’ Health Programme and of the other Centres, but also to serve as a compact package of information to be offered for decision-makers at the national level. Following the practice adopted in the Moscow Meeting also the Summary Report of the Beijing Meeting is attached to the Directory. It contains information about the topical issues and activities of both the WHO Workers’ Health Programme and the Network.

*The Declaration on Occupational Health for All* and its background document *the Global Strategy on Occupational Health for All* were both approved by the Second Meeting of the WHO Collaborating Centres in Occupational Health in Beijing. They provide extensive guidance for the development of occupational health at both international, national and local levels. Both documents have been published separately, and are available from the WHO Office of Occupational Health in Geneva.

It is our hope that this booklet will provide practical information to the Collaborating Centres and will also stimulate the institutions to closer collaboration on a bilateral or multilateral basis, aiming at improved Occupational Health for All. It is also a concrete demonstration of the interest of the Collaborating Centres to give their positive contribution to the WHO Workers’ Health Programme.

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1. WHO Workers’ Health Programme

Programme priorities and activities

The WHO Workers’ Health Programme (WHP) is one of the components of the international health work of WHO, with the following overall objective adopted by the World Health Assembly (WHA):

"The control of occupational health risks and the protection and promotion of the health of the working population as well as humanization of work".

The specific objectives of the Workers’ Health Programme have been formulated as follows:

- To promote national workers’ health programmes, including legislation, infrastructure and institutional development, training and education, applied research, and advisory services, as well as monitoring and evaluation, aiming at full coverage of people at work.

- To stimulate and support the continuous development and/or adaptation of appropriate technologies and approaches for the implementation of national workers’ health programmes, with priority given to workers at high risk and vulnerable groups.
To meet these objectives, the WHO Workers' Health Programme, with its limited resources, assists countries in the development of occupational health programmes within the framework of public health services, applying the WHO concept of the primary health care approach.

The Programme responds to the occurrence of a worldwide epidemic of occupational work-related diseases resulting from exposure to hazardous agents and factors (physical, chemical, biological, ergonomic and psychosocial) in the work environment and occupational injuries. The occurrence of occupational diseases on a global basis is much underestimated due to poor notification and reporting systems. The magnitude of the problem is greater than is usually believed. Thus, according to the best available estimates, 68–157 million new cases of occupational illnesses are attributed to hazardous exposures or physical strain, 100 million workers are injured and 200,000 die each year from occupational accidents. It is estimated that the work-related illnesses may cause economic losses, which amount to 10–20% of the gross national product.

From epidemiological surveys carried out in many countries, it is known that workers still suffer from severe, acute and chronic occupational illnesses affecting their health and working capacities, such as

1) pneumoconiosis and other occupational respiratory diseases
2) occupational musculoskeletal disorders
3) occupational cancer
4) injuries, amputations, fractures, etc.
5) cardiovascular diseases
6) reproductive disorders
7) neurotoxic and other illnesses caused by chemical agents
8) noise-induced hearing loss
9) occupational skin diseases
10) psychological and psychosomatic disorders.

Infections and parasitic diseases related to work are a public health problem, particularly among agricultural workers in developing countries.

In spite of this severe negative effect of work-related illnesses on the health status of the global population, 20–90% of workers, depending on the country, have no access to occupational health services. The need for such services is particularly acute in the developing countries, which constitute the majority (142 countries) and countries in transition (22 countries).

The Programme formulates the policy and provides technical guidance on occupational health at the national level, as well as for different branches of industry, agriculture, construction and mining; for specific occupational groups such as seafarers and other transport workers; for vulnerable groups (women, children and young
workers, aging workers, migrant workers and workers with limited abilities, etc.). It also assists in the training of occupational health personnel in order to meet national needs.

The Programme keeps under review occupational health guides and standards, prevention and control of occupational hazards, health screening and surveillance, as well as biological monitoring of workers exposed to occupational hazards.

The Programme priority areas at the global level are as follows:

- Policy and strategy formulation
- Occupational health services development
- Technical cooperation with the development of national technical capabilities in:
  - the prevention and control of occupational hazards
  - work environment monitoring
  - health surveillance and biological monitoring
  - diagnostic criteria, reporting and notification of occupational diseases,
  - building national statistics in occupational health
  - health promotion at the workplace.
- Human resources development, research and information exchange
- Information support.

Regional programmes

Each of the six WHO Regional Offices has a regional programme on workers' health aiming at the promotion of national programmes on occupational health with full coverage of the working population by adequate occupational health services. The regional programmes put emphasis on community-based occupational health services and the primary health care approach, with special attention to underserved working populations such as those in agriculture, small-scale enterprises, informal sector, and vulnerable groups. Technical cooperation and training are important components of regional programmes.

WHO policy bases

The Constitution of WHO has recognized the improvement of working conditions as an important factor of health protection and health promotion. Therefore the Programme on Workers' Health was established at the very beginning of WHO.

The Primary Health Care Conference in Alma Ata in 1978 recommended, inter alia:

"that as part of total coverage of populations through primary health care, high priority be given to the special needs of women, children, working populations at high risk, and the underprivileged segments of society, and that the neces-
sary activities be maintained, reaching out into all homes and working places
to identify those at highest risk, to provide continuing care to them and to elim-
ninate factors contributing to ill-health".

In 1987, the 40th World Health Assembly requested the Director-General to promote
the implementation of the workers' health programme, as part of the national health
system based on primary health care, in close collaboration with other relevant pro-
grammes, nongovernmental organizations and all United Nations agencies
(WHA40.28).

The Eleventh Session of the Joint ILO/WHO Committee on Occupational Health
(1992) endorsed WHO's Programme on Workers' Health and identified priority
fields of action, as follows:

1) To develop a mechanism for occupational health practice
2) To obtain a strong political support for occupational health
3) To develop and strengthen infrastructures for implementing national occupa-
tional health programmes
4) To establish and strengthen technical & advisory services and applied research.

These priority fields are along the lines of broader policy documents encompassing
the health of the working population. Among them, the Agenda 21, UNCED, and
WHO Commission on Health and Environment should be mentioned.

**Ongoing and planned activities of the WHO/WHP covering the biennium 1994–1995**

The WHO/WHP promotes national and international activities in occupational
health. However, under limited human and financial resources, the Programme has to
select areas of activities financed by the provision available from regular budget
funds and from extra budgetary funds from the US National Institute for Occupa-
tional Safety and Health (NIOSH) for the projects described below under the title
'Cooperative Agreement with NIOSH'. In addition, funds have been made available
by the International Fiber Safety Group (IFSG) for the project on monitoring and
evaluation of airborne fibres at the workplace and by the European Union for the
same project, and for the project on biological monitoring of chemical exposure at the
workplace. Ongoing and planned activities are given below:

**Policy and strategy formulation, occupational health services development**
- In February 1994, the Planning Group of the WHO Collaborating Centres in
  Occupational Health has accepted the concept of strategy and recommended to
develop a 'Proposed WHO Global Strategy on Occupational Health for All'.
- The Second Meeting of the WHO Collaborating Centres in Occupational Health,
held in Beijing in October 1994, adopted the proposed Global Strategy, and
recommended to submit it to the consideration by the World Health Organization.

- The WHO Meeting on Reorientation of Occupational Health Services in Countries with Transitional Economies was held in Moscow in February 1994. The report with recommendations to countries has been distributed.
- The Proceedings of the WHO/ILO Inter-regional Task Group Meeting on Health Protection and Health Promotion in Small-scale Enterprises (Bangkok, 1993) has been published.
- The Joint ILO/WHO Committee on Occupational Health, April 1995, will discuss options and models for national policies, strategies and programmes, as well as functions of occupational health services.

**Technical cooperation with development of national capabilities**

- Guidelines on prevention and control of hazards in the work environment (in preparation)
- Internationally agreed method for evaluation of exposure to airborne particles and to airborne fibres (to be published in 1995)
- Health screening and surveillance of mineral dust exposed workers (to be published in 1995)
- Biological monitoring of chemical exposure in the workplace, Vol. 1 and Vol. 2 (to be published in 1995–96; Vol. 3 and Vol. 4 (pending availability of funds)
- Health protection in occupational exposure limits: Toxic chemicals (in preparation); electromagnetic fields (in preparation).

**Human resources development, research and information exchange**

- Sponsorship of participants at international courses on occupational health (by Regional Offices), participants and speakers at international symposia, conferences, development of training material. Research and information exchange has been promoted through international collaboration, sponsorship of international symposia, congresses and conferences on occupational hygiene, occupational medicine, industrial toxicology, ergonomics, etc. WHP was the co-organizer of two international symposia: New Epidemics in Occupational Health, Helsinki, May 1994; Occupational Exposure Limits to Electromagnetic Fields (0–300 GHz), Stockholm, September 1994. Two international symposia are planned to be co-sponsored which are in WHP’s priority areas: one on occupational health research and practical approaches in small-scale enterprises, organized by the Division of Occupational Health, Department of Health, Ministry of Public Health, Thailand (WHO Collaborating Centre in Occupational Health), August 1995, and the other on occupational health services: structure, functions and financing, organized by the Department of Community, Occupational and Family Medicine, National University of Singapore (WHO Collaborating Centre in Occupational Health), February 1996.

**Information support**

- An International Directory of Databases and Data Banks in Occupational Health was prepared and published in collaboration with the Scientific Committee on Occupational and Environmental Health of ICOH (1993). It is being amended and updated and the third version will be published in the next biennium.
Cooperative agreement with NIOSH

- The re-established NIOSH/WHO Cooperative Agreement on the Programme of Action on Workers' Health for three years beginning in October 1992 is commencing its last year. During the previous years, the following projects were carried out and finalized:

1) Prevention of occupational respiratory diseases
   a) Health screening and surveillance of mineral dust exposed workers
   b) Environmental monitoring of airborne particles
2) Biological monitoring of chemical exposure in the workplace (Vols. 1&2)
3) Health protection in small-scale enterprises
   a) WHO/ILO interregional task group on health protection and health promotion in small-scale enterprises
   b) guidelines for control technology of occupational hazards
4) Information support: International Directory of Databases and Data Banks in Occupational Health.

Projects agreed upon for the third year of the Cooperative Agreement

1) Occupational respiratory diseases – control and prevention (publication of the guideline)
2) Workshop on health surveillance of workers exposed to mineral dusts, Viet Nam
3) Prevention and control strategy – noise
4) Reproductive and developmental hazards for women at work
5) Strengthening of national human resources development planning and teacher training in occupational health (in collaboration with the Office of Global and Integrated Environmental Health).

Projects requiring financial support, as they were postponed due to lack of funds

- Biological monitoring of chemical exposure in the workplace: Vol 3. and Vol. 4
  Vol. 3 includes selected metals, solvents, pesticides and other chemicals. Vol. 4 is dedicated to the biological monitoring of exposure to genotoxic chemicals in the workplace.
- Health protection with the help of occupational exposure limits: toxic chemicals aiming at harmonization of criteria documents with definition of the minimum required information from which occupational exposure limits for chemicals in the occupational environment are derived.

Future action

The following developments are in preparation or under study:

- A proposal for a Global Strategy on Occupational Health for All, adopted at the Second Meeting of the WHO Collaborating Centres in Occupational Health, is
to be presented to the World Health Organization, with mechanisms for its implementation

- Strengthening of national capabilities in the field of occupational health, through intensifying technical cooperation with countries; harmonization of diagnostic criteria of occupational diseases, harmonization of control technology in occupational health
- Closer collaboration and joint action with other agencies (ILO, UNEP, UNIDO, UNDP, FAO, IAEA, the World Bank and the European Union, EU) in occupational health is envisaged.
- International collaborative action for the worldwide exchange of knowledge and information in the field of hazard prevention and control in the work environment, with the objective of promoting political will and developing or strengthening national capabilities will be developed.
- Guidelines for the assessment and control of exposure to heat, noise and reproductive and other hazards will be prepared.
- Training programmes for occupational health professionals are to be developed in the biennium 1996–1997.

Collaboration

The Office of Occupational Health, responsible for the WHO Programme on Workers’ Health collaborates with other WHO programmes concerned, specifically with the programmes on environmental health, chemical safety, health education, aging and health, and that on substance abuse, in particular. OCH also collaborates with ILO, UNEP, UNDP and other agencies or intergovernmental organizations, such as EU, OECD, as well as with nongovernmental organizations (NGOs), namely ICOH and its Scientific Committees, IAOH, IAAMRH, IEA, International Commission on Non-Ionizing Radiation protection (ICNIRP), which have official relations with WHO, and with many others such as the Asian Association on Occupational Health, African Association on Occupational Health, etc. Coordination of the WHO and ILO programmes on occupational health is reached through the official mechanism which is the Joint ILO/WHO Committees on Occupational Health and the Health of Seafarers. The principle of this cooperation is 'common goals and complementary strategies'.

Programming and planning in the WHO

Programme planning in WHO is based on the General Programme of Work. At present, the Eighth General Programme of Work covering the period 1990–95 is coming to an end and the Ninth General Programme of Work covering the period 1996–2001 on occupational health is in a position to make a significant contribution to all four policy orientations of WHO's Ninth General Programme of Work:

1) integrating health and human development in public policies
2) ensuring equitable access to health services
3) promoting and protecting health
4) preventing and controlling specific health problems.

Short-term planning is based on the biennial programme and budget (blue book), which is considered by the WHO Executive Board (Governing Body) in January every year, and discussed and approved by the World Health Assembly, in May every year.

Designation of Collaborating Centres

The designation of the WHO Collaborating Centres is based on the proposal by the Regional Offices or the Office of Occupational Health at WHO Headquarters, in consultation with the Regional Offices. The proposal should be based on the preliminary exploration with the institutions and national authorities concerned. The WHO programme officers in occupational health may advise on prospective centres, at both global and regional level.

The criteria used in the selection of institutions that may qualify for the designation as a WHO Collaborating Centre are as follows:

a) the scientific and technical standing of the institution concerned at the national and international levels

b) the place the institution occupies in the country’s health, scientific and educational structures

c) the quality of its scientific and technical leadership, and the number and qualifications of its staff

d) the institution’s prospective stability in terms of personnel, activity and funding

e) the working relationship which the institution has developed with other institutions in the country, as well as the inter-country, regional and global levels

f) the institution’s ability, capacity and readiness to contribute to WHO programme activities, whether in support of country programmes or by participating in international cooperative activities.

WHO Collaborating Centres are designated for an initial period of four years. The designation may be renewed for the same or shorter periods. Before the decision on redesignation is made, the activities of the Collaborating Centre in question will be evaluated.
In addition to the general criteria, the Planning Group has decided on the following more detailed criteria, concerning the designation of Collaborating Centres in Occupational Health:

**Qualitative criteria**  
- genuine interest and specific accomplishments of the institutions  
- scientific excellence at the international level  
- scope of the programme fitting well to the WHO Workers’ Health Programme  
- scope of activity of the institution may be either multi- or monodisciplinary  
- capacity to transmit the outputs to the national level  
- institutions with potential to adopt leadership in their sub-region

**Quantitative criteria**  
- resources as to expertise and equipment should be sufficient  
- financial support and support in kind

**Geographical aspects**  
- global geographical distribution of the Collaborating Centres in Occupational Health should be ensured.

**Coordination and collaboration between the WHO/WHP and the Collaborating Centres**

**WHO Workers’ Health Programme**

The WHO/WHP is an extensive and comprehensive programme for the global development of occupational health for all who take part in the working life. With the financial and manpower resources available, the WHO/OCH Unit will be able to implement only part of the objectives and activities itself. Efforts are made to mitigate the financial limitations of the WHP, both by the Unit itself and by the Member Countries at the national level. Special attention should, however, be paid to ensuring that the sponsors/funding organizations do not have agendas contrary to the mission of occupational health.

**The Network of Collaborating Centres in Occupational Health**

The Network of the Collaborating Centres in Occupational Health can be seen as a powerful and practicable tool in implementing various activities of the WHO/WHP. The prerequisites for networking of the Collaborating Centres in the implementation of various activities within the WHO/WHP are among others

- effective and well-structured Programme which attracts Centres to implement it
- information about the WHO Workers' Health Programme objectives and ongoing projects
- information about other Collaborating Centres' (Network members) activities and programme plans
- competence and interest of the Collaborating Centres
- mutual interest in carrying out joint projects in certain topics in two or more Collaborating Centres
- traditions in international collaboration between the Centres
- funding.

The main advantage of networking is to gather the strengths of all Collaborating Centres and make the best possible combination available for the Programme and towards the goal Occupational Health For All.

The Planning Group is authorized to make decisions concerning the division of work between the Collaborating Centres, thus coordinating international activities of the collaborating centres. The inter-institutional collaboration between the network members has been dealt with in informal discussions between the individual institutes. The interest and priority areas of the individual Centres or groups of Collaborating Centres in implementing specific programme elements and the practical forms of their contributions can be seen in Chapter 3: Directory of the WHO Collaborating Centres in Occupational Health.

**Planning Group**

The Planning Group serves as an advisory body to the OCH Unit in deciding a comprehensive strategic plan for the Unit. The aim of seeking priorities in the preparation of the comprehensive strategic plan is to find activities, which would give the widest possible impact on workers' health, taking into consideration the limitations of resources in the WHO/OCH Unit. Thus, strict prioritization of the programme elements is needed. In evaluating the impact on workers' health of various activities, aspects such as number of exposed, levels of hazardous exposures, consequences of the measures taken on the basic rights of the workers, changes in the actual work environments, changes and trends in the workers' health status, and the cost of the project inputs in relation to outputs, are among the most essential criteria to be considered in the prioritization of programme elements. The strategy with the priority programmes will offer a basis for the Collaborating Centres to select the topics, targets and forms of their collaborative contributions.

Two priority activities for the WHO/OCH Unit have been identified already earlier:

a) training, at different levels, especially in developing countries, including the production of training and educational material, e.g. AV materials
b) preparation of guidelines in different aspects of occupational health practice.
Networking of the Collaborating Centres in Occupational Health

**INFORMATION ELEMENT**
- Reports on activities of the CCs
  - Meetings
  - Meeting Reports
- Information about international and national OH priorities
  - Global Strategy
  - Declaration on Occupational Health for all
  - Technical Reports
- Directory of the CCs in OH
  - WHP Newsletter
  - Training Courses
  - Guidelines
  - Electronic Bulletin Board
- Multilateral and bilateral Collaboration

**ORGANIZATIONAL FRAMEWORK**
- Meeting of the CCs in OH (every two years)
- Advice on priorities in OH
  - Planning Group (once a year)
  - WHO/OCH Unit WHP (permanent)
- Selection of programme priorities
- Division of work between the CCs
  - Solutions to practical OH problems

**SUBSTANCE CONTENT**
- OCCUPATIONAL HEALTH FOR ALL
  - elimination of risks
  - promotion of health

The overall framework of networking is shown in Figure 1.
Information between the WHO/WHP and the Collaborating Centres

For the effective promotion of occupational health and the WHP itself, dissemination of information among all involved (experts, authorities and other decision-makers in occupational health and safety, workers, employers, as well as the general public) about the Programme activities is needed. This can be carried out in two ways:

(a) disseminating information about the WHO Workers’ Health Programme objectives and activities,

(b) compiling, elaborating and disseminating scientific information about the most essential occupational health and safety problems.

WHO/WHP will convene study groups on selected priority problems to gather the existing knowledge and information available and to find out the gaps in our knowledge. These are published as WHO Technical Reports. They can be used both for training of occupational health and safety experts, and for informing national decision-makers about the occupational health and safety problems.

With the help of continuous communication of information between the WHO and the Collaborating Centres, the action plans and accomplished results of the Centres are available for the WHO/WHP, and the Programme may make full use of their published results, as well as of the joint publications of the Collaborating Centres.

The aim of this publication is to inform the Collaborating Centres of WHO/WHP objectives, priorities, and procedures, as well as of each others’ current and planned activities. In doing so, it is expected to improve the participating institutions’ possibilities to disseminate up-to-date information about the aims, results and benefits of occupational health activities within the framework of the WHO/WHP. In addition, this publication can be used also for informing all other relevant organizations and experts about the WHO Workers’ Health Programme objectives and activities.

The Directory of the WHO Collaborating Centres in Occupational Health, also available as a data base, will be updated biennially in connection with the Meeting of the Collaborating Centres.

The WHP Newsletter was decided to be established in the First Meeting of the Collaborating Centres in Occupational Health in 1992. It is being published three times a year by NIOSH, USA, and serves as a channel of up-to-date information on current activities of both the WHO/WHP and the Collaborating Centres. Another Newsletter on Maritime Occupational Health, also supported by WHO/WHP, plays the same role for those collaborating centres dealing with the health of seafarers. This news-
letter is published by the Institute of Maritime and Tropical Medicine, Gdynia, Poland.

The WHO Workers’ Health Programme and the Network of the Collaborating Centres in Occupational Health have been offered access to an electronic bulletin board which will facilitate the exchange of information between the network members. This possibility should be fully utilized to keep other members informed also about the successes of networking.

To monitor the WHO Collaborating Centres’ work and activities, in accordance with WHO rules, each centre is required to present its annual report in the form shown in Annex A, not later than January-February of the following year.

The geographical distribution of the Collaborating Centres is shown in Figure 2.

Figure 2. Geographical distribution of the WHO Collaborating Centres in Occupational Health
WHO Collaborating Centre

Annual report (Year)

1. Name of the Centre
2. Address
3. Head of the Centre
4. Terms of reference of the Centre

Place and date
Signature

For each point of this page and for each activity please use a separate sheet.

5. Work performed in relation to the terms of reference
   - name of activity
   - how the activity was implemented
   - possible publications and other outcomes
   - possible evaluation (e.g. evaluation of a course by the participants)
   - possible difficulties
   - possible recommendations for
     - further implementation of the activity
     - revision of the terms of reference
     - preparation of the terms of reference of the next designation period
     - related activities (e.g. follow-up and monitoring)

6. Collaboration between the Centre and WHO
   - visits by WHO staff to the Centre
   - visits by Centre staff to WHO
   - use of the Centre staff by WHO as temporary advisers or consultants
   - WHO financial support to the Centre through Contractual or Technical Services Agreement (including fellowships)
   - provision of Centre staff for courses sponsored or organized by WHO
   - any other collaboration
   - any difficulties encountered in the collaboration.

7. Collaboration with other WHO collaborating centres
   - name(s) of the other WHO collaborating centre(s) with which the Centre has collaborated
   - nature of the collaboration
   - outcome of the collaboration
   - suggestions for increased and improved collaboration with other WHO collaborating centres

8. Evaluation
   - evaluation (strengths and weaknesses) of the implementation of the activities included in the terms of reference
   - impact on the Centre’s activities of its designation as a WHO collaborating centre
   - impact of the activities undertaken by the Centre as a WHO collaborating centre on the national health development of the country.
2.

Examples of networking and practical collaboration

The Network of the Collaborating Centres in Occupational Health offers an excellent opportunity for effective utilization of existing knowledge and for creating synergism in the development of occupational health at the national level. Below are a few examples of this kind of practical collaboration with impact in the working life. Additional examples will be described in the next editions of this Directory.

*Australian-Chinese collaboration – Dr. Neill Stacey*

Exposure to solvents is widespread around the world. In the mid-1980s reports appeared linking solvent exposure of workers to increased levels of serum bile acids. This in turn was suggestive of liver injury. Studies were initiated in the toxicology laboratory of Dr. Neill Stacey in the National Institute of Occupational Health and Safety in Australia to examine the problem. A sensitive assay to detect individual serum bile acids was established on the premise that this would be more sensitive than existing protocols which determined total bile acid levels. Subsequent studies supported this assumption. Considerable work showed that chlorinated solvent exposures did increase serum bile acids in both workers and experimental animals. Mechanistic studies indicate that this is likely to be a reversible event that occurs by the solvent inhibiting hepatocellular transport of bile acids. There is no indication of long-term health sequelae associated with these changes in bile acids.

Meanwhile the problems of solvent exposure were being investigated by Professor Liang You-xin and his team in the People’s Republic of China. After Dr. Stacey and Professor Liang of the WHO Collaborating Centre for Occupational Health in Shanghai had met and discussed mutual problems of workers and research projects in their respective countries, they embarked on a collaborative research project to examine liver effects and serum bile acids in workers exposed to aromatic solvents.
in PR China. Atmospheric solvent concentrations were determined in the factories in PR China and samples were taken for bile acid analysis and sent to Sydney, Australia.

Currently the data are being processed so that the conclusions drawn are supported by the appropriate statistical analysis. Once this is complete we will know whether aromatic solvents cause shifts in serum bile acids and whether there are other simultaneous indications of liver injury at particular exposure levels. This will indicate whether the bile acids will provide a sensitive indicator of liver injury and/or exposure to aromatic solvents. The action required will depend on the associations drawn from the complete analysis of the data.

**Finnish-Singapore collaboration – Ms. Suvi Lehtinen and Professor J. Jeyaratnam**

The awareness and increasing knowledge of experts in occupational health and safety, as well as of decision-makers, politicians, employers, workers and the general public is vital for the development of occupational health and the improvement of working conditions. It is also one of the cornerstones of sustainable development of healthy and productive working life. In order to facilitate the work of occupational health and safety experts worldwide, the Finnish Institute of Occupational Health has participated, for several years, in the publishing of regional occupational health and safety newsletters in Africa, Asia and the Baltic Region. The African Newsletter on Occupational Health and Safety is distributed to 21 African English-speaking countries; also in Asia the number of participating countries is 21. These projects have been funded by the Finnish International Development Agency, FINNIDA.

The Newsletters offer a forum for new findings, exchanging good solutions and proposing various development ideas so that it is possible to learn from neighbours’ experiences. The publishing of newsletters at regular intervals ensures that experts are able to absorb the new data and ideas put forward in the newsletters. The articles and other submissions come from experts in their respective regions, thus speeding up the identification of similar problems in the various countries. Articles describing risk surveys that have been carried out in order to chart the intensity and severity of various occupational exposures are good material for the newsletters and provide information utilizable in many countries.

In addition to increasing awareness, the training of human resources in occupational health and safety is of utmost value. This activity can be expected to benefit the experts and their countries in the long-term perspective. In order to make it possible for occupational health and safety experts in developing countries to get relevant and appropriate further training, the Department of Community, Occupational Health and Family Medicine in the National University of Singapore and the Finnish
Institute of Occupational Health agreed to organize a joint short course (2-4 weeks) in occupational hygiene. Around 14-15 students are admitted to each course, and have found the course to be highly relevant to their practical needs. The course has been conducted on a regular basis for the last 5 years. Teaching staff for the course are from the Department of Community, Occupational Health and Family Medicine, National University of Singapore, the Finnish Institute of Occupational Health and other practitioners in Singapore. In the past students have been funded by WHO, ILO, ASEAN training awards from Singapore; industry and governments. Information regarding future short courses could be obtained from Dr. S.C. Foo, National University of Singapore, see contact information on page 45. The Singapore postgraduate programme for occupational health physicians has also been used by FINNIDA programme to train occupational health specialists from the East African countries. The postgraduate programme conducted by the School of Postgraduate Medical Studies, National University of Singapore leads to the Master of Medicine (MMed.) degree in Occupational Medicine. The academic course lasts for 1 year and the new intake is in July of each year. The course is targeted for physicians from the developing world wishing to specialize in Occupational Medicine. Further information could be obtained from Professor J. Jeyaratnam, contact information on page 45.

*Italian-Brazilian collaboration – Professor Renato Gilioli*

Some Italian examples of occupational health care delivery to developing countries are described below.

The activity of the WHO Collaborating Centres in Occupational Health in supporting developing or newly industrialized countries is deemed of paramount importance. In Italy, the WHO Collaborating Centre for Occupational Health at the Institute of Occupational Health of the University of Milan together with the Institute of Occupational Health of the University of Pavia gave scientific and technical support to the Italian Ministry of Foreign Affairs in a cooperative effort requested by the Ministry of Health of the State of Bahia in Brazil in 1988. The objectives were to:

- set up a reference centre for prevention, diagnosis and treatment of occupational diseases for local needs
- promote practical experience in the field of occupational health for postgraduate students
- educate and train local professionals devoted to teaching and training of health experts
- create an epidemiological registry for the collection and elaboration of data on occupational hazards and occupational accidents and their distribution among different activities

This project was motivated by the fact that in Latin America, and particularly in Brazil, it has been realized that the clinical pictures of developing countries are
changing rapidly from the typical ones connected with infections and malnutrition to diseases typical of more industrially advanced countries.

The State of Bahia represents quite well such a rapid transformation; the Camacary Petrochemical Complex, the second largest in Brazil, employs approximately 50000 workers, and in the metropolitan area of Salvador there were about 700000 workers in 1983.

This project was financially supported by the Italian Ministry of Foreign Affairs and was implemented by AISPO, the Italian Association for Solidarity among Peoples, a nongovernmental organization associated with the Sao Rafael Hospital in Salvador.

An important achievement of this cooperation was the establishment of CESAT, Center for the Protection of Workers' Health, in Salvador, as a joint venture between the Italian cooperation and the Ministry of Health of the State of Bahia. The initial financial support was given by the Italian Ministry. The project leader, three other health professionals and a number of experts for specific programmes were Italian.

Currently 25 health professionals, including the head of the project, a number of technicians, and clerks are Brazilian and work regularly in the Centre which is expanding its activities to the interior of the State of Bahia.

CESAT collaborated from the very beginning with the Sao Rafael Hospital, which was specifically equipped with the most sophisticated tools for toxicology, industrial hygiene and clinical activity.

A number of courses in different branches of occupational health for medical doctors and technicians were held with the cooperation of the Brazilian and Italian experts, mainly directed at updating professional knowledge.

The most significant outcome of this operation is that CESAT has become a permanent centre for workers' protection; its level of performance is still rising and the Centre is becoming self-sufficient. Scientific projects have been carried out at the Camacary Petrochemical Complex aimed at the detection of early impairment of neurobehavioural functions in workers exposed to a variety of organic solvents. The results are currently being published in Brazilian scientific journals.

A comprehensive review and analysis of the Italian cooperative initiatives in occupational medicine in Brazil will be presented at a specific symposium to be held in Sao Paulo in spring 1995 with a view to further develop the programmes.
3. Directory of the WHO Collaborating Centres in Occupational Health

1. National Occupational Health and Safety Commission
   Worksafe Australia
   Dr. Edward Emmett
   Chief Executive Officer
   Contact person: Dr. Neill Stacey
   Executive Director
   Research, Science and Statistics Division
   GPO Box 58
   Sydney NSW 2001
   Australia
   tel. Int.+612-565 9297
   fax: Int.+612-565 9300
   telex: 177 243

Tasks
The Research, Science and Statistics Division (RSSD) undertakes OHS research, training, provides advisory services and collates and disseminates national OHS statistics. Other functions of Worksafe Australia include setting national standards, working with industry to improve OHS performance and chemicals assessment for the nation. Worksafe Australia relates to our equivalent of the Ministries of Labour and Health and interacts with WHO and ILO.
Expertise  The personnel of the Division covers most aspects of OH & S except chemists and safety engineers (occupational health physicians, occupational health nurses, toxicologists, epidemiologists, occupational hygienists, ergonomists, psychologists, physiotherapists).

Training  Worksafe Australia organizes a series of professional development short courses aimed at OHS professionals and practitioners across Australia. In addition, 1-6 months courses which are also open to students from other countries, are organized: Intensive course in Occupational Medicine (12 weeks), and Course in Occupational Hygiene (13 weeks) for prospective occupational hygienists. Long-term training in association with major universities covers: Doctor of Philosophy; Master of Occupational Health and Safety (12 months full-time, treatise within 2 years); Diploma of Occupational Health and Safety (1 year full-time coursework).

Priority areas  Improved data describing the OHS situation in Australia to provide a foundation for industry-based prevention strategies
Descriptive surveys of exposure, effects, OHS awareness and attitudes in key industries
Integration of OHS into management systems
Increased awareness and cultural change needed to improve OHS
New technologies for biological monitoring and risk assessment
Evaluation techniques to support OHS activities
Enhanced partnerships with industry
OHS implications of forms of work organization and new technologies

Collaboration  Participation in relevant meetings; Provision of consultancy services; Collection and dissemination of information, as well as training of OH & S professionals in Asia-Pacific region; Establishment of regional OHS networking arrangements for government, employer and trade union organizations. In addition, some Institute staff members have extensive experience in developing countries.
2. **FUNDACENTRO**  
Sr Carlos Alberto de Azevedo  
Presidente  
Contact persons: Dr. Eduardo Algranti, Director of the  
Collaborating Centre  
Dr. Arline S.A. Arcuri  
Rua Capote Valente 710  
05409-002 Sao Paulo  
Brazil  
tel. Int.+55-11-8536588  
fax: Int.+55-11-8534027  
telex: 23497 FUJD

**Tasks**  
FUNDACENTRO carries out research, provides advisory services, organizes training and disseminates information in occupational health and safety.

**Expertise**  
The expertise of the Institute covers occupational health physicians, occupational health nurses, epidemiologists, occupational hygienists, ergonomists, safety engineers, psychologists, and experts in sociology and agriculture. The total number of the personnel is approximately 170.

**Training**  
The Centre organizes short-term training on several topics of occupational health and safety.

**Priority areas**  
Accidents at construction sites  
Pesticides  
Exposure to solvents, metals and dusts  
Epidemiology and statistics in occupational diseases  
Rotation of inspectors and experts

**Collaboration**  
Translations of books into Portuguese; Training; Control technology; X-ray reading

3. **National Center of Hygiene, Medical Ecology and Nutrition**  
Professor Emilia Ivanovich, Director  
Boulevard D. Nestorov 15  
Sofia 1431  
Bulgaria  
tel. Int.+3592-591011, 5812274  
fax: Int.+3592-598148  
telex: 22712 maprez bg
Tasks
The National Center of Hygiene is a multidisciplinary institution with four tasks: research, training, advisory services and information.

Expertise
The personnel of the Center covers occupational health physicians, toxicologists, epidemiologists, occupational hygienists, chemists, psychologists and work physiologists. The total number of experts is approximately 70.

Training
The Center organizes several short-term training courses annually. In addition, medium-term training courses are organized.

Priority areas
Occupational hygiene, chemical and physical factors
Physiology of work and ergonomics
Toxicology
Epidemiology of work-related diseases
Regulation and standard-setting

Collaboration
Collaborative research projects; Preparation of documents; Consultations; Organization of training courses; Exchange of information; Training of experts

4.
Canadian Centre for Occupational Health and Safety
J. Arthur St-Aubin, President and Chief Executive Officer
250 Main Street East
Hamilton ON L8N 1H6
tel: +1416-572-2981
fax: +1416-572-2206
e-mail: internet: abey@ccohs.ca

Tasks
CCOHS promotes a safe and healthy work environment by providing a comprehensive information service on occupational health and safety which includes information, training and customized services.

Expertise
CCOHS personnel covers all fields of occupational health and safety: occupational health, toxicology, epidemiology, occupational hygiene, ergonomics, chemistry, safety, information technology, and informatics. The total number of staff is 108.
Training  
CCOHS offers a short-term course on occupational health and safety for managers and supervisors (4 days). In addition, multimedia training programmes are developed to be implemented at the workplace and facilitate self-training.

Priority areas  
Provision of convenient access to OSH information in Canada and worldwide
Provision of computerized training programmes
Provision of customized services

Collaboration  
The three areas mentioned above, and networking through the use of CCOHS Electronic Bulletin Board.

5.  
**Occupational Health and Safety Commission (CSST)**
Mr. Yves Brisette
1199, rue de Bleury
Montreal, Quebec H3C 4E1
Canada
tel. Int.+1514-873-6364
fax: Int.+1514-864-9203

Tasks  
The CSST is not involved in research per se. It is a governmental organization that administers the Occupational Health and Safety Act and the Act related to Industrial Accidents and Occupational Diseases. The CSST has close collaboration with the Institut de Recherche en Santé et Sécurité du Travail.

Training  
Several short-term training courses are organized for workplace inspectors, rehabilitation officers, compensation officers, and financial officers.

6.  
**Asociacion Chilena de Seguridad (ACHS)**
Dr. H. Sandoval Orellana
Director Medico
Hospital del Trabajador
Vicuna Mackenna 200
Santiago
Chile
tel. Int.+562-2221525
fax: Int.+562-2223533, 6341706
7. Instituto de Salud Publica de Chile
Departamento de Salud Ocupacional y
Contaminación Ambiental
Dr. Jorge Sanchez Vega
Contact person: Sra Nella Marchetti Pareto
Avda Marathon No. 1000
Santiago de Chile
Chile
tel. Int. +56-239 1105 anexo 700-709
fax: Int. +56-2393600
telex: 48

Tasks
Instituto de Salud Publica de Chile is a multidisciplinary organization with four tasks: research, information, training, and advisory services.

Expertise
The personnel of the Institute covers occupational health physicians, occupational health nurses, occupational hygienists, chemist, and safety engineers. The total number of occupational health and safety professionals is, however, relatively small.

Training
The Institute organizes in addition to short-term national training courses, also a 6-month course on Risk Prevention (Curso de Experto en Prevención de Riesgos) and long-term training in collaboration with the Universidad de Chile (three academic semesters). These are also open for students from other countries.

Priority areas
Clinical and subclinical effects of metals, both occupational and non-occupational exposures
Establishing local health services
Development of techniques for evaluation of exposures

Collaboration
Research; control of exposures

8. Institute of Occupational Medicine
Chinese Academy of Preventive Medicine
Professor Changqi ZOU, Acting Director
29 Nan Wei Road
Beijing 100050
The People's Republic of China
tel. Int. +861-301 6891, + 861-301 5751
fax: Int.+861-301 4323
e-mail: ZOUQC%BEPC2@SLACVX.BITNET
The Institute of Occupational Medicine in Beijing is a multidisciplinary institute with four tasks and good personnel resources: research, information, training, and advisory services.

The personnel covers other areas of expertise except safety engineers and physiotherapists. The Institute has a wide network of collaborating institutions both in China and abroad. The total number of personnel is 230.

The institute carries out several training courses annually on various topics of occupational medicine, hygiene and toxicology.

Survey on occupational health in township and village-owned enterprises

Epidemiological investigation and etiological study on occupational cancers

Prevention and control of dust hazard

Studies on industrial toxicants, benzene, TNT, and pesticide poisoning

Studies on environmental and biological monitoring

Development and improvement of reporting network on occupational diseases

Research projects

Shanghai Medical University
School of Public Health
Professor GU Xue-qi, Director
Contact person: LIANG You-xin
138 Yi Xue Yuan Road
Shanghai 200032
People's Republic of China
tel. Int.+86-21-431 1900-214 (ext)
fax: Int.+86-21-433 0543
telex: 33325 smu cn

The Shanghai Medical University, School of Public Health is a multidisciplinary institute with four tasks.
Expertise

The number of occupational health and safety personnel is relatively small. Occupational physicians, occupational health nurses, toxicologists, epidemiologists, ergonomists, chemists are represented in the personnel.

Training

The Institute carries out training in occupational health. A one-year training programme on occupational health and occupational disease prevention, leading to a degree, has been carried out in years 1989–1991.

Priority areas

Integration of OHS with PHC in the rural area

Occupational dermatology

Neurobehavioural toxicology

Reproductive toxicology

Occupational cancer and its risk management

Collaboration

Accept fellows from developing countries to have continuous training in occupational health; Integration of occupational health and PHC with Center for PHC, Shanghai; Neurobehavioral toxicology with WHO and NIOSH; Editing series of teaching material on occupational health, industrial toxicology and/or health promotion at the workplace.

10.

Ministerio de Salud
División de Salud Ocupacional

Dra Julietta Rodriguez de Villamil
Subdirector (E) Environmental Risks Control
Calle 16 No 7-39
Bogota, D.E.
Republica de Colombia
tel. Int.+571-282 0047
fax: Int.+571-282 0003
telex: 45413

Tasks

División de Salud Ocupacional is a small unit of occupational health with the following expertise: engineering and occupational medicine.

Priority areas

Preparation of various materials on occupational health

Preparation of training modules and information material on occupational health.
11.

Institute of Occupational Health
Dra Miriam Martinez Valladares, Directora
Calzada de Bejucal, Arroyo Naranjo
Apartado 9064
Ciudad de la Habana
Cuba CP 10900
tel. Int. + 44 7820 and 44 7855
Telex: 512144 HIGEP-CU and 511149 MSP-CU
Fax: + Int. 53 33 3973
e-mail: meatra@cenia.cu

Tasks
The tasks of the Institute are research, training, occupational medical care, technical services, and standardization.

Expertise
The following experts are represented in the staff: occupational health physicians, occupational hygienists, toxicologists, psychologists, and epidemiologists.

Training
The Institute provides short-term training for national experts and for foreigners from Spanish-speaking countries. In addition, an International Master Course in Occupational Health is organized for professionals from Spanish-speaking countries.

Priority areas
Promotion, prevention, early diagnosis, treatment and rehabilitation of occupational diseases

Physical and mental capacity related to workers' health

Development of means for hygienic-sanitary control of occupational hazards

Occupational cancer

Standardization of the diagnosis of diseases of occupational origin

Collaboration
Research; Consultancies; Accepting of WHO fellows for training; Preparation of WHO documents
12. **National Institute of Public Health**  
**Centre of Industrial Hygiene and Occupational Diseases**  
Ass. Prof. Miroslav Cikrt, MD  
Srobarova 48  
100 42 Prague 10  
Czech Republic  
tel. Int. + 42-2-673 11 467  
fax: Int. + 42-2-673 11 236  
telex: 122 662  
e-mail: cikrt@csearn.bitnet

**Tasks**  
The Centre of Industrial Hygiene and Occupational Diseases is a multidisciplinary institution with four tasks: research, information, training, and advisory services.

**Expertise**  
Physiotherapists are not represented in the personnel. The other areas of expertise are well represented. The total number of staff is approx. 90.

**Training**  
The Institute organizes national training courses annually, no certificates.

**Priority areas**  
Toxicology  
Industrial hygiene, chemical and physical factors  
Occupational diseases, lung diseases, occupational neurology  
Psychology, physiology and ergonomics

**Collaboration**  
Preparation and revision of WHO documents;  
Cooperation in scheduled forms accepted during the First Meeting of Collaborating Centres in Moscow  
Active role in IPCS

13. **High Institute of Public Health**  
**Occupational Health Department**  
Prof. Dr. Ragaa El-Gazzar  
165, El-Horreya Avenue  
Hadarah Alexandria  
Egypt  
tel. Int. + 20-421 5575-6  
telex: 54467 univy un
### Tasks
The Occupational Health Department of the High Institute of Public Health is a multidisciplinary institution with three main tasks: research, training and advisory services. The information activities are less developed than the other three.

### Expertise
All the other occupational health and safety professionals are represented in the personnel except physiotherapists. The number of professionals is 25.

### Training
The Institute organizes one-week courses periodically for occupational physicians, chemists, biologists and safety engineers in industry. Special 1–6-month courses are designed on occupational health, biology and toxicology for students from developing countries. Long-term training is given at national and international levels: Diploma in public health majoring occupational health and industrial medicine (1 year), Diploma in public health majoring occupational hygiene (1 year), Master degree in the above two specialties (about 2 years), Doctor degree in the same specialties (4 years).

### Priority areas
- Research on reasonable permissible levels for different exposures in developing countries
- Occupational diseases
- Industrial toxicology
- Manual on different methodological approaches for biological monitoring
- Ergonomics, job strain and cardiovascular risk factors
- Mutagenicity

### Collaboration
- Exchange of information; Conferences; Preparing and editing documents; Training consultations

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14. **Finnish Institute of Occupational Health**  
Professor Jorma Rantanen, Director General  
Contact person: Ms. Suvi Lehtinen, Chief of Office  
Topeliuksenkatu 41 a A  
FIN-00250 Helsinki  
Finland  
tel. Int.+ 358-0-47 471  
fax: Int.+ 358-0-47 47 548 or 414 634  
e-mail: sleh@occuphealth.fi
Tasks

The Finnish Institute of Occupational Health is a multidisciplinary research institution with four main tasks: research, information, training, and advisory services.

Expertise

All the experts in occupational health and safety are represented in relatively high numbers. The total number of personnel is about 650.

Training

The Institute of Occupational Health organizes approx. 140 training courses annually for occupational health and safety experts in Finland. Also long-term specialization training of occupational health physicians, occupational medicine specialists, occupational health nurses, occupational hygienists, and occupational physiotherapists is carried out in Finnish. The training conducted in English is mostly short-term courses and symposia.

Priority areas

Development of occupational health services

Allergy and work

Prevention of musculoskeletal disorders

Prevention of noise hazards

Aging workers and maintenance of their work capacity

Healthy and productive work organization

Indoor air

Health effects of unemployment

Collaboration

Organization of joint meetings; Participation in consultations; Organization of training. WHO Workers’ Health Programme has been offered a distinct role in FIOH-FINNIDA-funded collaborative projects in developing countries.

15.

Institut National de Recherche et de Sécurité (INRS)
Mr. D. Moyen, Director
30, rue Olivier Noyer
F-75680 Paris Cedex 14
France
tel. Int. +33-1-40 44 30 00
tax: Int. +33-1-40 44 30 99
Tasks
The tasks of the INRS are research, training, information, and advisory services. The tasks of the INSERM consist of research activities.

Expertise
Toxicologists, epidemiologists, ergonomists, chemists, and psychologists are represented in the INRS staff. The total number of staff is approximately 600. Epidemiologists are represented in the staff of the INSERM. The total number of personnel is 17.

Training
The INRS organizes among others training courses for specialists in occupational risk prevention.

Priority areas
Prevention of occupational risks (INRS)
Evaluation of hazards at the workplace
Identification of unknown occupational risks
Interaction between individual characteristics and occupational risks
Efficiency of preventive actions
Computerized systems on occupational risks and health (INSERM)
Disability and work; musculoskeletal disorders
Occupational respiratory diseases
Psychosociological factors in occupational stress

Collaboration
Research; Analytical methods; Epidemiological studies; Exchange of researchers
17. **Association pour la Formation dans les Services Médicaux du Travail (AFOMETRA)**

Dr. Michel Blondet  
31, rue Médéric  
B.P. 156  
F-75821 Paris Cedex 17  
France  
tel. Int.+3314-4766 0230  
fax: Int.+3314-4267 9684

**Tasks**  
The tasks of the Institute include research, training and advisory services.

**Expertise**  
Occupational health physicians, toxicologists, epidemiologists, ergonomists, and psychologists are represented in the staff. The total number of staff is 23.

**Training**  

**Priority areas**  
Communication of information  
Prevention and ergonomics  
Mental health  
Epidemiology

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18. **Federal Institute for Occupational Health (BAfAM)**

Dr. Fritz Kochan, Director  
Contact person: Dr. Dieter Wolff  
Visiting address: Nöldnerstrasse 40/42  
D-1134 Berlin  
Postal address: Postfach 5  
D-10266 Berlin  
Germany  
tel. Int.+ 49-30-55138-0  
fax: Int.+ 49-30-55138170

**Tasks**  
The Federal Institute for Occupational Medicine under the direct jurisdiction of the Federal Ministry of Labour and Social Affairs is a multidisciplinary institution with three tasks: research, information and advisory services.
Expertise
The experts of occupational health represented in the staff of the institution are as follows: occupational health physicians, epidemiologists, mathematicians, chemists, psychologists, physicists, biologists, and sociologists. The total number of personnel is 160.

Training
The Institute organizes several seminars and conferences on occupational medicine.

Priority areas
Epidemiology and statistics, e.g. of work-related diseases and occupational diseases
Development of occupational health services
Musculoskeletal disorders
Effects of non-ionizing radiation

19.
Institut für Arbeitsphysiologie (IfADO)
Institute for Occupational Physiology at the University of Dortmund
Prof. Dr. Barbara Griefahn
Ardeystr. 67
D-44139 Dortmund
Germany
tel. Int.+ 49-231 1084-0 (extension 221 or 222)
fax: Int.+ 49-231 1084 400

Tasks
Institute for Occupational Physiology, Dortmund is a multidisciplinary institution with the tasks of research, advisory services, training and information.

Expertise
Occupational health physicians, toxicologists, ergonomists, chemists, safety engineers, psychologists, physicists and biologists are represented in the staff of the Institute. The total number of personnel is 170.

Training
The training organized by the Institute comprises short-term training courses.

Priority areas
Combined effects of climate, vibration and noise
Occupational diseases related to manual material handling
Cumulative Trauma Disorders
Mental and physical aspects of information overload
Individual disposition for occupational diseases

Collaboration
The Institute has expressed its specific interest for collaboration with the developing countries in Asia, Africa, and in Eastern Europe.

20. National Institute of Occupational Health
Professor György Ungváry
Nagyvárad tér 2
P.O. Box 22
H-1450 Budapest IX
Hungary
fax: Int.+361-215-6891
telex: 22 5109

Tasks
The National Institute of Occupational Health has the following tasks: research, education, training, information and advisory services, and preparation of legislation.

Expertise
Most of the occupational health and safety experts are represented in the staff. The total number of personnel is approximately 300.

Training
The Institute organizes several short-term (1–3 days) courses in occupational health every year. In addition, a 6-week national training course is organized annually for physicians wishing to specialize in occupational health.

Priority areas
Chemical safety
Research on delayed toxic effects and reproductive effects of chemicals
Risk assessment and risk management in occupational health
Prevention of damages caused by physical pathogenic factors
Research on the prevention and early diagnosis of occupational and work-related respiratory diseases
Dr. S.K. Kashyap
Meghani Nagar
Ahmedabad 380016
India
tel: Int.+91-79-865142/866842
fax: Int.+91-79-866630
telex: 81-121-6471 nioh in

Tasks
The Institute is devoted to the promotion and betterment of the total health of the working community and to the cause of providing safe and comfortable environment for work and living. The main activities of the Institute are research, education and training, and services.

Expertise
All central groups of experts in occupational health are represented in the staff. The total number of staff is approximately 310.

Training
The Institute organizes post-graduate training for medical doctors and environmental scientists leading to specialized or higher university qualifications, e.g. D.O.H (Diploma 4 Semester Course), M.D. (Degree Programme, 6 Semester Course) for medical graduates, and Ph.D. with thesis for both medical and environmental scientists.

In addition, the Institute organizes orientation short-term training of technical personnel in occupational health and toxicology, and health and safety education for workers and community.

Priority areas
Occupational health problems of agricultural populations, organized sectors of industry, and women and child workers.

Controlled exposure experiments and toxicological investigations on pesticides, metals and chemical carcinogens

Environmental pollution caused by agrochemicals and metals (lead, mercury, cadmium)

Development of safety norms for physical agents (heat, noise, illumination)
Models for delivery of occupational health care systems for workers through Primary Health Care Centres and Group Occupational Health Clinics

**Collaboration**

Participating Institute for International Programme on Chemical Safety (IPCS); Field studies; Development of Model Poison Information Centre for developing countries; Consultations; Organization of international meetings; Organization of training courses

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### 22. National Centre of Ergonomic, Occupational Health and Safety

Ministry of Manpower  
Mr. M. Soeripto, Chief  
Jalan Jen. A. Yani 69-70  
Comapa Putih  
Jakarta Pusat  
Indonesia  
tel. Int.+6221-413406, 412114  
fax: Int.+6221-7270153 or 513913

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### 23. Institute of Occupational Health

University of Milan, Istituti Clinici di Perfezionamento  
Professor Antonio Grieco, Director  
Contact person: Dr. Renato Gilioli  
via San Barnaba, 8  
I-20122 Milan  
Italy  
tel. Int.+ 39-2-5454091  
fax: Int.+ 39-2-5518 7172  
telex: 320484 unimi i  
e-mail: occupmed@imiuca.csi.unimi.it

**Tasks**
The Institute of Occupational Health at the University of Milan is a multidisciplinary institution with four tasks: research, information, training and advisory services.

**Expertise**
The other main groups of experts of occupational health and safety are represented in the personnel of the Institute except occupational health nurses and safety engineers.
Training
The Institute organizes both short courses and long-term national training programmes leading to a degree.

Priority areas
Occupational medicine
Ergonomics
Toxicology
Neurotoxicology
Epidemiology
Work safety

Collaboration
Preparation of documents; Co-sponsoring international symposia and conferences; The Institute has created two international centres: International Centre for Pesticide Safety and Regional Experimental Field Centre for the Prevention of Pesticide Hazards.

24.
National Institute of Industrial Health
Ministry of Labour
Dr. Shigezi Koshi, Director
21-1, Nagao 6-chome, Tama-ku
Kawasaki 214
Japan
tel. Int.+81-44-865 6111
fax: Int.+81-44-865 6116

Tasks
The Institute activities cover research and information.

Expertise
The main groups of experts of occupational health are represented in the staff except occupational health nurses and physiotherapists. The total number of staff is 59.

Training
The Institute does not organize any training courses.

Priority areas
Mental occupational health
Biological monitoring of chemical and physical causes of occupational diseases
Ergonomics
Occupational cancer
Technical improvements of the work environment

Collaboration
Exchange of information

25. Institute of Industrial Ecological Sciences
University of Occupational and Environmental Health (UOEH), Japan
Prof. Takesumi Yoshimura, Director
1-1 Iseigaoka Yahatanishi
Kitakyushu 807
Japan
tel. Int.+ 81-93-691-7403
fax: Int.+ 81-93-603 0158

Tasks
The Institute of Industrial Ecological Sciences is a multidisciplinary institution with three tasks: research, training and information.

Expertise
Occupational health physicians, toxicologists, epidemiologists, occupational hygienists, ergonomists, psychologists, physiologist and occupational health economist are represented in the staff.

Training
The Institute organizes several short- and medium-term courses and also participates in the programme of a 4-year doctorate course for Dr. of Medical Sciences.

Priority areas
Health policy and management
Ergonomics and work management
Occupational hygiene
Epidemiology
Health development and mental health
Toxicology and physiology
Environmental oncology
Occupational health economics

Collaboration
Collaborative research projects; Consultancies; Accepting of WHO fellows for short-term training
The Catholic Industrial Medical Center is a multidisciplinary institution with five tasks: research, information, training, especially long-term, clinical services and advisory services.

Safety engineers are not represented in the personnel. The number of other occupational health experts is relatively small.

The staff of the Center participates in the training courses of other organizers as lecturers. Five-semester postgraduate degree programmes to occupational physicians, occupational health nurses and occupational hygienists are offered in collaboration with the Catholic University Graduate School of Occupational Health.

Studies for early diagnosis and treatment of pneumoconiosis (animal and human)
Respiratory physiology of pneumoconiosis
Neurobehavioral toxicology
VDT work and workers’ health
Development of group OHS for small and very small industries
Toxicology of metals, e.g. Pb, Cd, etc.
Combined effects of occupational hazards
Air pollution in industrial complexes
Occupational epidemiology
Study of occupational health delivery system
Postgraduate education and training of occupational health personnel

Participation in meetings; Collaborative studies; Exchange of information; Training of occupational health personnel.
<table>
<thead>
<tr>
<th>Tasks</th>
<th>The Coronel Laboratory for Occupational and Environmental Health is a multidisciplinary institution with four tasks: research, information, training, and advisory services.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expertise</td>
<td>Occupational health physicians, toxicologists, occupational hygienists, chemists, psychologists, biologists, and health scientists are represented in the staff.</td>
</tr>
<tr>
<td>Training</td>
<td>Several short-term courses are arranged. In addition, Amsterdam School of Occupational Medicine arranges yearly a 4-year course for physicians. In addition, a Master’s Course on Occupational Health, Safety and Welfare is organized (84 days over a time span of 2 years).</td>
</tr>
</tbody>
</table>
| Priority areas| Biomarkers  
Biological monitoring  
Prevention of work-related diseases  
Occupational health services research  
Work rehabilitation |
| Collaboration | Aging and work; Exchange of information; Biomarkers in collaboration with e.g. the Nofer Institute in Poland and the Institute of Occupational Health in Dortmund and others; Training and education in collaboration with many other European institutes Leuven (Belgium), Birmingham (UK), Berlin (Germany), Rouen (France), and many others. |
TNO Centre for Occupational Safety and Health
Professor Frank D. Pot, Programme Director
Alfred A.f. Brouwers, Executive Office
Visiting address: Wassenaarseweg 56, Leiden
Postal address: P.O. Box 2215
2301 CE Leiden
The Netherlands
tel. Int.+31-71-18 17 00
fax: Int.+31-71-17 63 82

Tasks
The Centre coordinates the occupational safety, health and well-being activities of institutes belonging to the Netherlands Organization for Applied Scientific Research (TNO). Its major task is applied research. In addition to research and specific training courses, consultancy is gaining significance.

Expertise
The Centre and its participating institutes cover almost all medical, technical and social disciplines in the field of occupational safety, health and well-being. A total of 130 research staff and 50 technical staff members participate in the Centre’s programmes.

Training
Professional training of occupational physicians and occupational psychologists is organized. The Centre participates in university and private courses.

Priority areas
Posture and movement at work, musculoskeletal problems
Stress and well-being
Work organization and technology, including new production concepts
Exposure and risk assessment for disabled employees
Occupational health management of companies and occupational health services.

Collaboration
Research; Organization of symposia; Consultancy and information; Training and fellowships; Standardization, certification and legislation.
29. The Nofer's Institute of Occupational Medicine
Professor Janusz A. Indulski
8 Teresy Street
P.O. Box 199
90-950 Lodz
Poland
tel. Int.+ 48-42-55 25 05
fax: Int.+ 48-42-348 331 or 556 102

Tasks
The Nofer Institute of Occupational Medicine is a multidisciplinary institute with a scope of activity in research, information, training, and advisory services.

Expertise
A large number of occupational health and safety experts are in the staff. Safety engineers and physiotherapists are not represented, however. The total number of personnel is 520.

Training
The Institute organizes short-term training courses annually. Long-term specialty courses in occupational medicine (4 two-weeks courses) are also arranged.

Priority areas
Occupational health
Occupational carcinogenesis
Health care organization
Environmental health
Chemical safety and risk assessment

Collaboration
Collaboration with Helsinki Institute in the field of allergology, epidemiology and psychology of work. Interest in collaboration with other WHO Collaborating Centres has been expressed.

30. Instituto de Higiene e Medicina Social
Faculdade de Medicina de Coimbra
Professor Salvador Massano Cardoso
3049 Coimbra Codex
Portugal
tel. Int.+351-39-29 431
fax: Int.+ 351-39-20 484
<table>
<thead>
<tr>
<th>Tasks</th>
<th>Instituto de Higiene e Medicina Social is a training institution for undergraduate and postgraduate training.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expertise</td>
<td>Main fields of expertise are epidemiology and hygiene.</td>
</tr>
<tr>
<td>Training</td>
<td>Training curricula are organized for Master of Occupational Health and Master of Occupational Hygiene. In addition, Course on Occupational Medicine is carried out.</td>
</tr>
<tr>
<td>Priority areas</td>
<td>Methodological aspects of research in occupational health</td>
</tr>
<tr>
<td></td>
<td>Solvents</td>
</tr>
<tr>
<td></td>
<td>Stress at workplace and infectious diseases</td>
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<td></td>
<td>Work and cardiovascular diseases</td>
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<td></td>
<td>Work and musculoskeletal diseases</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Collaboration with the University of Louvain in the field of musculoskeletal diseases, and the Technical University of Denmark and other national institutions in the field of localized thermal comfort in hot environments.</td>
</tr>
</tbody>
</table>

**31. Institute of Occupational Health of the Russian Academy of Medical Sciences**

Professor Nikolai F. Izmerov, Director
31 Prospekt Budennogo
105272 Moscow
Russian Federation
tel. Int.+7095-365 02 09
fax: Int.+7095-366 05 83
cable: profigierna 105275 moscow

<table>
<thead>
<tr>
<th>Tasks</th>
<th>The Institute of Occupational Health in Moscow is a multidisciplinary Institute. It carries out research, disseminates information, organizes training, and provides advisory services.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expertise</td>
<td>All expert groups of occupational health and safety are represented in the staff. The total number of staff is approximately 630.</td>
</tr>
<tr>
<td>Training</td>
<td>Both short-term and medium-term courses are arranged. In addition, 3-year training for postgraduates and 2-year training for interns in the clinic is organized.</td>
</tr>
</tbody>
</table>
**Priority areas**

Industrial hygiene (dusts, vibration, noise, electromagnetic waves, industrial microclimate)

Work physiology and industrial ergonomics

Toxicology (accelerated methods of hygienic rating, long-term effects, studies on new chemical substances)

Occupational pathologies (treatment and prevention of occupational lung and skin diseases, vibration disease, allergies and musculoskeletal disorders, etc.)

Epidemiological studies in industrial hygiene

**Collaboration**

Preparation of various documents and technical reports; Organization of symposia and workshops; Training of specialists from other centres; Reporting system of occupational morbidity in Russia

32. **Department of Industrial Health**

**Ministry of Labour**

Dr. Timothy Wai-Hoong Phoon, Director

18 Havelock Road #05-01

Singapore 0105

tel. Int.+ 65-539 5109

fax: Int+ 65-539 5140

**Tasks**

The Department of Industrial Health in Singapore carries out the following tasks: research, information and advisory services. It also has regulatory and investigative activities.

**Expertise**

The occupational health experts represented in the staff are occupational health physicians, occupational health nurses, occupational hygienists, and industrial health inspectors. The number of staff is 34.

**Training**

Training is carried out in collaboration with other organizations, and the Department offers its experts as lecturers in the courses. Training in the form of organizing study visits up to one month to WHO, ILO etc. fellows is widely carried out.

**Priority areas**

Identification, assessment and control of occupational health hazards, including new hazards
Compiling local computer data bases on chemical trade names, worker exposure levels to various hazards, and results of medical surveillance tests

Implementation and supervision of in-plant occupational health programmes, e.g. hearing conservation programmes, hygiene monitoring programmes, first aid facilities, etc.

Study on occupational asthma

Medical surveillance programmes for workers exposed to various hazards

Collaboration

Exchange of information, surveys, guidelines, etc.

33.

Department of Community, Occupational Health and Family Medicine, Division of Occupational Medicine
National University of Singapore
Prof. J. Jayaratnam, Director
Lower Kent Ridge Road
Singapore 0511
tel. Int.+65-772 4290/9
fax: Int.+65-779 1489
telex: UNISPO RS 33943% VMID COFSEC
Bitnet: COFSEC@NUS 3090

Tasks
The activities of the Department include research, education and training, information and advisory services.

Expertise
Occupational health physicians, toxicologists, epidemiologists, occupational hygienists, ergonomists and biostatisticians are represented in the staff. The total number of staff is 37.

Training
The Department organizes international 2-weeks courses on industrial toxicology and hygiene. A 3-month national Designated Factory Doctors' Course has been arranged. In addition, an international long-term course (1 year) leading to the Degree of Master of Medicine in Occupational Health is organized.

Priority areas
Undergraduate and postgraduate education for physicians and occupational hygienists

Quality control services (laboratory)
Occupational hygiene reference laboratory
Research in occupational dermatitis, epidemiology, occupational cancers, solvents and heavy metals, ergonomics, and toxicology

Collaboration Consultations; Collaborative research; Conducting training courses; Participation in training and health programmes.

34. Occupational Health Centre of the Municipal Institute of Health of Barcelona
Dr. Salvador Moncada, Director
Placa Lesseps, 1
E-08023 Barcelona
Spain
tel. Int.+34-3-4150066
fax: Int.+34-3-2173197

Tasks The Occupational Health Centre (CSL) is a centre of the Municipal Institute of Health of Barcelona (IMS). IMS is responsible for the public health matters of the Barcelona region. The tasks of the Centre are research, information, training, and technical support to the health care system for the detection and prevention of occupational diseases. Main research lines are health information systems and health promotion. The CSL is designing new methods of epidemiological surveillance of occupational diseases and injuries in the Barcelona region. In health promotion, main interest is in the relationship between worker lifestyles and work organization and psychosocial factors.

Expertise The experts of the Centre represent occupational health and public health professionals. The total number of personnel is about 60. Epidemiologists and public health nurses are the major professional groups.

Training About 150 union leaders are trained every year. In addition, doctoral students of the Autonomous University of Barcelona and students at the Catalan School of Public Health receive theoretical and practical training.

Priority areas Occupational health information systems
- Primary care-based information systems
- Population-based occupational injuries registry
Psychosocial factors, lifestyles and health of workers

**Collaboration**  Working group on occupational health information systems.

### 35.
**Instituto Nacional de Seguridad e Higiene en el Trabajo**
Javier Gómez-Hortigüela Amillo, Director
Concepción Serrano Herrera, Directora
Torrelaguna, no 73
E-28027 Madrid
Spain
tel. Int.+ 34-1-403 7000
fax: Int.+ 34-1-403 0050

**Tasks**  Instituto Nacional de Seguridad e Higiene en el Trabajo is a multi-disciplinary institute with the scope of activity including research, information, training, and advisory services.

**Expertise**  Medical and technical experts are represented in the staff.

**Priority areas**  Dissemination of information
Personal protective devices

**Collaboration**  Exchange of information; Joint projects; Preparation of technical reports and training material

### 36.
**Institute of Occupational Health Sciences at the University of Lausanne**
Professor M. Guillemin
Rue du Bugnon 19
CH-1005 Lausanne
Switzerland
tel. Int.+ 41-21-313 2121 (medecine)
41-21-313 2131 (hygiene)
41-21-313 2144 (ergonomy)
fax: Int.+ 41-21-313 2120
email: mguillemin @ ulmed.unil.ch (internet system)
Tasks
Institute of Occupational Health Sciences at the University of Lausanne is a multidisciplinary unit with the four tasks: Education and training; Research; Services; Promotion of occupational health.

Expertise
See priority list

Training
Regular teaching at the University of Lausanne and at the University of Geneva

Comprehensive postgraduate training in occupational health in cooperation with the Federal Institute of Technology in Zurich

National short courses are organized, e.g. on ventilation.

Priority areas
Occupational hygiene and risk management

Mineral fibres, metals and solvents (exposure assessment)

Biological monitoring (development of new methods)

Occupational hygiene (new strategies)

Occupational medicine (early diagnosis of occupational diseases)

Ergonomy (ergopraxiology, visual testing)

Collaboration
Training and education in occupational hygiene is a specifically expressed area of collaboration; Harmonization of procedures and methods in occupational hygiene; Exchange of information; Training of individuals.

37.
Division of Occupational Health, Department of Health
Ministry of Public Health
Dr. Wilawan Juengprasert, Director
Trivanon Road
Nontaburi 11000
Thailand

tel. Int. +66-2-5918172-3, 5918189
fax: Int. +66-2-5918172

Tasks
Division of Occupational Health is a multidisciplinary unit with emphasis on research, training and information. Major tasks include

Surveillance of important occupational diseases
coordination of National Occupational Health Programmes

Development of appropriate technology and work models for occupational health programmes in a developing country

Development, strengthening and support of public health infrastructure to undertake effective occupational health service programmes


**Expertise**

The occupational health and safety experts represented in the staff are physicians, nurses, hygienists, environmentalist, chemists, toxicologists, biologists, ergonomist and psychologists. The total number of personnel is approx. 100.

**Training**

The Unit takes care of the manpower development of occupational health, disseminates information and trains government and private officials, students and others on occupational health.

**Priority areas**

Occupational health in small-scale industries and agriculture

Development of appropriate techniques for evaluation of exposures

Development of appropriate technology for early detection of occupational and work-related diseases

Development of a surveillance system for occupational diseases

Health service research and development

Imagination of working conditions and work environment through primary health care approach.

**Collaboration**

Exchange of information; Accepting of fellows from developing countries for short course training in occupational health; Participation in meetings; Undertaking joint projects related to occupational health in developing countries; Assistance in the organization of WHO Collaborating Centres’ meetings.
Institut de Santé et de Sécurité au Travail
Dr. Bennamar Raouf
Directeur Général
16, rue Ibn Tafergine
Tunis
Tunisia
tel. Int.+2161-788311
fax: Int.+216-794009

Institute for Occupational Health
Professor Yu.L. Kundiev, Academician, Director
Ul. Saksagansky, 75
252033 Kiev
Ukraine
tel. Int.+ 70-44-220 8030
fax: Int.+ 70-44-220 6677

Tasks
The Institute for Occupational Health in Kiev, the leading institute in occupational health in Ukraine, is a multidisciplinary institute with good human resources, and with four tasks:

1) hygienic, epidemiological, experimental and clinical studies
2) information support
3) training
4) advisory services.

Expertise
All experts in occupational health are represented in the staff in relatively high numbers. The total number of personnel is 300.

Training
Several training courses on health aspects of pesticide use are organized in collaboration with the IPCS and IRPTC. National courses are arranged as well on labour hygiene, occupational pathology, etc. The Institute organizes long-term national training programmes leading to a degree. A specialized council for defending a Candidate and Doctor of Sciences Thesis is located at the Institute.

Priority areas
Occupational epidemiology
Combined effects of occupational factors
Toxicology of heavy metals
Toxicology of pesticides, dermal toxicology
Psychophysiology of operators
Effects of organic dust
Occupational health in agriculture
Occupational health in electrowelding

Collaboration
Agricultural workers are the main target group. The Institute has a good network of collaborative organizations.

40. Institute of Occupational Health
University of Birmingham
Prof. J. M. Harrington
Edgbaston, Birmingham
England
tel. Int.+4421-414 6030
fax: Int.+4421-471 5208

Tasks
The tasks of the Institute include research, training and education, consultancy and advisory services.

Expertise
Occupational health physicians, occupational health nurses, toxicologists, epidemiologists, occupational hygienists and psychologists are represented on the staff. The total number of medical/scientific staff is 25, with 18 support staff. Areas of expertise and interest include occupational cancer, health of health-care workers, neurobehavioural effects of exposure to solvents and pesticides, sick building syndrome and respiratory effects of carbon black, foundry fume and man-made mineral fibres.

Training
The Institute organizes a 2-year day release course preparing physicians for the specialist examination in occupational medicine (leading to associateship of the Faculty of Occupational Medicine). There is also a full-time multidisciplinary Masters course in Occupational Health. This course combines formal teaching and project work and includes post-graduate students from different parts of the world. A wide range of short courses, workshops and seminars are also offered throughout the year. In addition, the Institute is involved in the training of factory inspectors, environmental health inspectors, ergonomists and toxicologists.
A new course preparing general practitioners and other physicians with an interest in occupational medicine began in 1994. This will prepare doctors for a national Diploma in Occupational Medicine.

Priority areas

The research interests of the Institute based on the multidisciplinary nature of the staff and key areas of expertise include multinational epidemiological studies, neurobehavioural toxicology, occupational carcinogenesis, occupational health problems of health care workers and retrospective exposure assessment in occupational hygiene. Current new areas under development include molecular epidemiology, particularly for chromium and PAHs and the development of neurobehavioural tests for neurotoxicants.

Collaboration

Provision of visiting lecturers and assessors for training programmes in occupational health organized by other centres, joint teaching activities with other WHO collaborating centres and multinational epidemiological studies. We also host visiting fellows students attached for varying periods for post-graduate experience in occupational health.

41.

Department of Psychology
Centre for Organizational Health and Development
Dr. Tom Cox
University of Nottingham
Nottingham NG7 2RD
United Kingdom
tel. Int.+44-602-515314/04
fax: Int. + 44-602-515325

42.

National Institute for Occupational Safety and Health (NIOSH)
Dr. Linda Rosenstock, Director
200 Independence Avenue, S.W.
HHH Building, Mailstop P06
Washington, D.C. 20201
USA
tel. Int.+202-401 6997
fax: Int.+202-205 2207
Internet: LZR6@ODDC1.EM,CDC.GOV

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Tasks
NIOSH is a multidisciplinary organization with the mission and mandate to develop and establish recommended occupational safety and health standards and to conduct research, training, technical assistance, and related activities to assure safe and healthful working conditions for every working person in the U.S.

Expertise
All major occupational health and safety professional disciplines are represented in the staff. The total number of personnel is presently approximately 950.

Training
NIOSH supports 14 major training facilities at universities that provide extensive training programmes leading to a degree in industrial hygiene, occupational health nursing, occupational medicine, and occupational safety. In addition, NIOSH provides training grants to 41 other university programmes.

Priority areas
Surveillance: The ability to identify the occurrence and emergence of work-related injury and disease is vital for prevention. While some targeted surveillance efforts address specific conditions, such as adult lead poisoning, occupational lung disease, and carpal tunnel syndrome, a national surveillance system for occupational disease and injury does not exist. To broaden current surveillance systems, it is necessary to 1) improve hazard surveillance by developing systems that identify hazardous work conditions, rather than cases of disease or injury; 2) evaluate new disease surveillance efforts to better fill the gaps in current reporting systems; 3) explore additional surveillance methods for nonfatal injury, including workplace violence; and 4) assess the economic burden of occupational conditions and potential economic benefits of their prevention.

Work Organization: Through surveillance and research, NIOSH and others have identified many physical and chemical hazards of work.
However, there is growing evidence that the way work is organized also affects the health and well-being of workers, both directly and in combination with other hazards. Investigations are needed on broad aspects of employment, including underemployment, overemployment, unemployment, shift-work, alternate work schedules, and job stress. Also encompassed in work organization are special risks that may result from the ongoing evolution to a service-oriented economy; to a workforce that is increasingly comprised of women, minorities and older workers; and to conditions of employment and demands for productivity increasingly pressured by global market forces.

Control Technology and Intervention Research: NIOSH seeks to prevent work-related diseases and injuries by designing, implementing, and evaluating measures to reduce occupational hazards at their source. If prevention measures are not currently available, new technologies need to be developed for controlling hazardous exposures. Such new technologies must be evaluated to determine that the prevention measures are feasible, even for smaller businesses. Intervention research, of which control technology is a part, examines the utility and impact of new and existing preventive measures in various workplaces. Assessments are needed of the effectiveness of regulations, educational efforts, government and private outreach programs, employer policies, worker training, and protective technology in preventing disease and injury.

Health Services Research: This area includes 1) assessing the adequacy of the supply of occupational safety and health professionals, including occupational physicians and nurses, industrial hygienists, safety specialists, and engineers; 2) evaluating the accessibility, availability, and delivery of occupational health services; the role of workers' compensation; and the integration of occupational health services and primary health care; 3) improving the quality of occupational health care, through clinical and preventive practice guidelines; 4) assessing the effectiveness of screening and treatment of selected occupational conditions, and 5) evaluating the economics of treating and preventing occupational injuries and illnesses.

**Collaboration**

Organization of meetings; Preparation of guidelines; Exchange of information and scientists
43. Johns Hopkins Center for Occupational and Environmental Health (COEH)
Department of Environmental Health Sciences
Johns Hopkins School of Hygiene and Public Health
Dr. John D. Groopman, PhD, Chairman, Department of Environmental Health Sciences
Contact person: Paul T. Strickland, PhD
615 North Wolfe Street
Room 7041
Baltimore, MD 21205
USA
tel. Int.+410-955-4130
fax: Int.+410-955-0617

Tasks
The Center is comprised of five various operational units: Division of Occupational Health; Occupational Health Clinic; Occupational Medicine Residency Program; Occupational Health Doctoral Program; Occupational Health Nursing Program.

Expertise
Altogether 32 experts work in the Center.

Priority areas
The main orientation is towards disease etiology and the design and implementation of preventive and intervention strategies for occupational and environmental disease and injury. Specific programmes relate to cancer, neurological disorders, musculoskeletal injuries and disorders, lead poisoning, Lyme disease, and risk assessment. Five priority areas for the next five years are

- Biomarkers of carcinogen exposure and risk
- Molecular epidemiology of occupational and environmental diseases
- Adverse effects of lead
- Repetitive motion disorders
- Biomonitoring, clinical intervention and risk assessment.

44. New York College of Osteopathic Medicine of New York Institute of Technology
Dr. Philip F. Fleisher
Old Westbury, New York 11568
USA
tel. Int.+ 516-626-6922
fax: Int.+ 516-626-9290
Tasks  The New York College of Osteopathic Medicine is a small unit with main emphasis on occupational physiology, ergonomics and occupational lung diseases. It has, though, activities going on in the four tasks: research, information, training and advisory services.

Expertise  The occupational health and safety experts represented in the staff with 1-2 experts are occupational health physicians, occupational health nurses, toxicologists, ergonomists, psychologists and physiotherapists.

Training  The Unit is concentrating on the development of training for Gulf States in occupational epidemiology, toxicology, and nursing education.

Priority areas  Strengthening of undergraduate programme
Development of residency or fellowship programmes in occupational medicine
Further development of the use of biomechanics and ergonomics

Collaboration  Exchange of faculty; Provision of speakers for programmes produced by other Centres.

45.  Southwest Center for Occupational and Environmental Health
University of Texas School of Public Health
Dr. George L. Delcos, Principal Investigator
Contact person: Sarah A. Felknor
P.O. Box 20186
Houston, Texas 77225
USA
tel. Int.+713-792 7456
fax: Int.+713-792 4407

Tasks  The Southwest Center for Occupational and Environmental Health is a multidisciplinary unit. Research, information, training, and advisory services belong to the scope of activity of the Unit.

Expertise  The Center has a full spectrum of occupational health and safety experts except for chemists.
Training
Several degree programmes (1–5 years) are carried out: Master in Public Health, Master of Science, Doctor in Public Health, Ph.D. and an accredited Residency in Occupational Medicine. Several short-term (1–3 days) training courses are carried out for occupational physicians, occupational health nurses and industrial hygienists.

Priority areas
Industrial hygiene measurements (exposure assessment)
Occupational respiratory diseases
Occupational hazards of health care workers
Ergonomic evaluations
Programme development, management and evaluation
Occupational and environmental epidemiology

Collaboration
Planning and implementing research agenda; Training of occupational health professionals; Programme planning and evaluation; Surveillance of occupational respiratory diseases; Occupational hazards of health care workers.

46. National Institute of Occupational and Environmental Health
Professor Le van Trung, Director
1B pho Yec Xanh
Hanoi
Vietnam
tel. Int.+ 2 63649
fax: Int.+84-42-12894

Tasks
The National Institute of Occupational and Environmental Health is a multidisciplinary institute with eight tasks. The number of personnel is approx. 70.

Expertise
Occupational health physicians, biologists, toxicologists, occupational hygienists, ergonomists, chemists, biochemists and psychophysiologists are represented in the staff.

Training
Short-term courses at the national level are carried out on various topics of occupational and environmental health.

Priority areas
Prevention and control of pesticides poisoning
Prevention and control of pneumoconioses and noise-induced hearing loss

Occupational environment and occupational diseases in small-scale industries

Psychophysiology of work

Ergonomics in technology transfer

Sanitation

Strengthening of occupational health network

**Collaboration**

Exchange of specialists and documents; Special interest has been expressed as to strengthening occupational health and safety collaboration in different countries.

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**47. Clinical Center of Serbia**

**Institute of Occupational and Radiological Health**

Prof. Dr. Aleksandar Vidakovic, Director

Contact person: Dr. Srmena Krstav, Head of the Dept. of International Relations

11000 Beograd, Deligradska 29

Yugoslavia

tel: Int.+381-11-685485

fax: Int.+381-11-643 675

**Tasks**

The Institute of Occupational and Radiological Health has four main tasks: research, training, dissemination of information, and advisory services.

**Expertise**

Most of the occupational health and safety experts are represented in the staff of the Institute. The total number of persons is 218.

**Training**

The Institute organizes short-term courses, both national and international. One-semester education in occupational health for medical students in the sixth year of studies is arranged. In addition, the Institute carries out specialization training in occupational health (3 years), Master of Science programmes (4 semesters) in occupational health, occupational and clinical toxicology, radiological health and assessment of work ability.
Training courses with a certificate in occupational health for GPs and graduated students are organized (2 semesters,) as well as specialization in occupational toxicology for chemists (3 years).

**Priority areas**

Toxic chemicals  
Work-related diseases  
Hazards in small-scale industries  
Improvement and integration of occupational medicine and occupational hygiene  
Occupational epidemiology

**Collaboration**

Organization of international training; Participation in the WHO-funded projects; Exchange of scientific information; Planning and conducting of epidemiological studies (occupational cancer, asbestos-related diseases, reproductive effects).

**Institutes in the process of being designated as Collaborating Centres in Occupational Health**

1. **National Institute of Occupational Health**  
   Professor Rolf Pedersen, Director  
   Contact person: Professor Tor Norseth  
   Visiting address Gydas vei 8, Oslo  
   Postal address: Postboks 8149  
   Dep 0033 Oslo 1  
   Norway  
   tel: Int.+47-22-4666850  
   fax: Int.+47-22-603276

**Tasks**

The Institute carries out research, provides advisory services, organizes training and disseminates information.

**Expertise**

The expertise covers epidemiology, occupational health, work physiology, chemistry and toxicology. A total of 116 persons work in the Institute.

**Training**

The Institute organizes short-term training courses for occupational health and safety personnel.
Priority areas
Development of service activity
Increasing dissemination of general occupational health information
Research in musculoskeletal disorders
Genetic susceptibility for cancer and other occupational diseases
Indoor air problems

Collaborating Centres in the Health of Seafarers

1. Institute of Maritime Medicine
   South Jutland University Centre
   Dr. Lars Brandt, Director
   Niels Bohrs Vej 9
   DK-6700 Esbjerg
   Denmark
   tel. Int.+45-79-141111
   fax: Int.+45-79-141199

Tasks
The Institute carries out research, provides training and education, advisory services and disseminates information. Main areas of research are epidemiology, occupational medicine, occupational safety, maritime and offshore medicine.

Expertise
Four medical doctors specialized in occupational medicine and epidemiology are included in the personnel of the Institute.

Training
Supplementary courses and advanced medical training are arranged. In addition, education of PhD students in cooperation with Danish universities is organized.

Collaboration
Research on injuries, diseases and working conditions of seafarers, fishermen and offshore workers; Preparation of scientific documents, practical guides and educational materials; Organization of training courses; Collecting of scientific and statistical data.
2. **Institute of Occupational Health**  
Prof. Dr. D. Szadkowski  
Adolph-Schöenfelder Str. 5  
22083 Hamburg Germany  
tel. Int.+4940-29188-2790  
fax: Int.+4940-29188-2785

**Tasks**  
The tasks of the Institute are research, training, information and advisory services.

**Expertise**  
Occupational health physicians, toxicologists, epidemiologists, ergonomists, and engineers are represented in the staff. The total number of staff is 34.

**Training**  
The Institute organizes short-term training courses for port health officers, navy doctors, and occupational safety specialists. In addition, an international 4-weeks course with final examination is organized on First Aid at Sea for ship officers.

**Priority areas**  
Training of ship officers in first aid  
Life saving appliances at sea  
Hygiene on board

**Collaboration**  
Training

3. **Institute of Maritime and Tropical Medicine**  
Dr. W. Renke, Director  
Professor S. Tomaszunas, Director of the WHO Interregional Collaborating Centre on Maritime Occupational Health  
Powstania Styczniowego 9 B  
81-519 Gdynia  
Poland  
tel: Int.+48-58-22 30 11  
fax: Int.+48-58-22 33 54  
telex: 054325 immit pl

**Tasks**  
The Institute of Maritime and Tropical Medicine is one of the medical research institutes of the Ministry of Health.
It has the following tasks: research in maritime occupational health, tropical medicine, travel medicine, diagnostic and curative services for maritime workers (clinic for 90 beds), training, collection and dissemination of information, and advisory services.

**Expertise**

The total number of personnel is 320, including 50 medical officers and 50 other workers with university degree. Several staff members have extensive experience of work in developing countries in WHO-coordinated health programmes.


**Training**

The Institute carries out short-term courses on maritime medicine and tropical medicine, and laboratory diagnosis. Specialization training for medical officers in maritime medicine is organized by the Institute. Health training for seafarers, and courses on occupational health are also organized.

**Priority areas**

- Epidemiology of diseases and injuries in seafarers, fishermen, dockers, shipyard workers, and divers
- Toxicity of materials used in shipbuilding and the construction industry
- Psychosocial aspects of work at sea
- Fitness for work of maritime workers
- Tropical health and epidemiology
- Health promotion of seafarers and travellers

**Collaboration**

- Harmonization of fitness standards for seafarers; Epidemiology of work-related diseases and injuries; Preparation of guidelines; Updating of the International Medical Guide for Ships; Participation in the Joint ILO/WHO Committee on the Health of the Seafarers, WHO Expert Advisory Panels, WHO meetings, international symposia on maritime health and conferences on International Travel Medicine; Collaborative projects with institutes in other countries.
Tasks
The Institute carries out research, provides advisory services, organizes training courses and disseminates information.

Expertise
The number of scientific personnel in the Institute is approximately 70.

Training
Several 10-days training courses are arranged on various topics of occupational health.

Priority areas
Development of preventive measures
Monitoring of transport workers' health
Development of environmental protection
Development of training
Organization of health care in transport

Collaboration
Research projects; Training; Collaboration in environmental issues
4. Second Meeting of the WHO Collaborating Centres in Occupational Health

Beijing, People’s Republic of China
11–14 October 1994

Summary Report

Opening of the Meeting

1.
Dr. N.P. Napalkov, Assistant Director-General of the World Health Organization (WHO), in his opening address wished all participants welcome to the Second Meeting of the WHO Collaborating Centres in Occupational Health. He reminded that the First Meeting of the Collaborating Centres was organized in Moscow, the Russian Federation in September 1992, and the present meeting was the continuation of the series of these biennial events. He expressed his appreciation that the Meeting convened in Beijing. Dr. Napalkov emphasized the role of the 52 WHO Collaborating Centres in Occupational Health in the overall development of health in the world. He continued by saying that the Global Strategy on Occupational Health which was on the Agenda of the Beijing Meeting can be expected to raise the priority of occupational health also on the agenda of WHO and of the Member Countries as well.
2.
Professor LI Shi Chuo of the Ministry of Public Health of the People’s Republic of China welcomed the participants to the Meeting and to Beijing. He mentioned that in spite of many improvements and developments in China, still many problems are faced in the field of occupational health and safety. In order to tackle these problems long-term efforts and good coordination of work are needed. International collaboration offers a good basis for this. As WHO has had good collaborative contacts with China for many years, this Meeting will offer a forum for the effective exchange of information and full utilization of the expertise of the Collaborating Centres.

3.
Professor Jorma Rantanen was elected the Chairperson of the Meeting, Professor HE Fengsheng as Vice-Chairperson and Ms. Suvi Lehtinen as Rapporteur. The list of participants is given in Annex 1 to this Report.

4.
Dr. Mikhail Mikheev, Chief Medical Officer, Office of Occupational Health, WHO, described the scope and purpose of the Meeting. He also expressed his thanks to the local organizers of the Meeting for all their efforts. The agenda is attached as Annex 2 to this Report.

**Occupational health in China**

5.
Professor SU Zhi gave an overview on the occupational health situation in China. Along with the socioeconomic reform which was started in 1979 China is moving from a centrally planned economy to a socialist market system. Such developments have opened new opportunities, but also indicated new needs for the development of occupational health.

He mentioned that several traditional occupational health and safety hazards, such as accidents and pneumoconioses show declining trends in view of both incidence and severity, but they still are highly prevalent and constitute a major public health problem. About 1/3 of workers on the average are exposed to conditions which do not comply with the existing standards. About 30% of the work force is covered by appropriate occupational health examinations. Special problems are met in the rapidly growing enterprises of foreign investors, in the small-scale industries and in the large state-owned industries which are undergoing reorganization and an economic crisis, thus dropping occupational health to a lower priority position.
The government has responded to such new challenges with a so-called Eight Character Strategy, including a) primary prevention by technical innovation, b) wet technology for cutting down dust exposures, c) enclosure of dust emission sources, d) improvement of ventilation, e) providing personal protection, f) strengthening of regulations and supervision, g) educating workers and increasing their participation and h) inspection of both the work environment and workers' health.

Such a strategy has been complemented with the reform of monitoring workplaces, occupational health services and workmen's compensation. Treatment and rehabilitation are also in the focus of development efforts.

Status of activities in WHO/OCH and within the Network

6.

Dr. Mikheev described the organization of work and the practical activities carried out within the WHO/OCH, the Planning Group as well as within the Network since the First Meeting of the Collaborating Centres in Occupational Health, held in Moscow in September 1992.

He continued with the presentation of topics discussed and decided upon in the Planning Group Meetings. The number of Collaborating Centres is now 52, and the Centres are located in the various Regions as follows:

<table>
<thead>
<tr>
<th>Region</th>
<th>Count</th>
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<tbody>
<tr>
<td>AFRO</td>
<td>-</td>
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<tr>
<td>AMRO</td>
<td>11</td>
</tr>
<tr>
<td>EMRO</td>
<td>2</td>
</tr>
<tr>
<td>EURO</td>
<td>27</td>
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<tr>
<td>SEARO</td>
<td>3</td>
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<tr>
<td>WPRO</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
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</table>

In addition to these, 4 institutions are in the process of being designated as WHO Collaborating Centres.

Altogether three Planning Group meetings have been held since the Moscow Meeting. The Planning Group has proposed the division of work among the Collaborating Centres, and the Collaborating Centres have reacted to the plan of action with various contributions.

The objectives and priorities set by the Planning Group are based on the 8th General Programme of Work. The activities carried out include:

Policy formulation in occupational health services development
- Health Protection and Health Promotion in Small-scale Enterprises, Bangkok, 1-3 November 1993
- Reorientation of Occupational Health Services in Countries in Transition, 8-10 February 1994, Moscow
- Global Strategy 'Occupational Health for All'

Development of national capabilities
- hazard prevention and control
- exposure assessment and work environment monitoring
- health surveillance and biological monitoring
- health protection with the help of occupational exposure limits
- health promotion

Human resources development
- HQ/Euro publication 'Occupational hygiene in Europe'
- WHO Guidelines on Training and Education in Occupational Health

Information support
- more than 10 international conferences and symposia have been co-sponsored by WHO/OCH
- International Directory of Databases and Databanks in Occupational Health
- Country profiles

Future actions

1. Global Strategy to be presented to consideration by WHO
2. Mechanism for implementation of the Global Strategy at the global and national levels is to be developed
3. Further development of national capabilities
4. Closer collaboration and joint actions with other UN agencies
5. Training programmes.

On the basis of Dr. Mikheev’s presentation, the following items and aspects were taken up in the discussion.

- The need for strong support of the WHO/HQ both in the budget frame and in policy-making was emphasized.
- Concerning the fluent flow of information a concern was raised whether the information reaches those countries and institutions which are not WHO Collaborating Centres in Occupational Health, but which clearly would benefit from the information and training materials produced by WHO. It was mentioned that the WHO channels for distributing the information materials and documents are being used. It was, however, recognized that this may not be sufficient. The need for an effective use of WHO publications was emphasized, and improvement of the publication distribution was recommended. The importance of two-way information flow was stressed for the further development of WHO activities. The feedback mechanism for the distribution and development of WHO publications was also deemed necessary. In creating a feedback system for WHO publications the Collaborating Centres can play a key role, appreciating the
appropriateness and the use of publications at the country level, and informing the Regional Offices as well as the WHO Headquarters on this issue. The Collaborating Centres could also take the role of a distributor of WHO documents through their own networks. The delegation of a task of a regional distributor to some Collaborating Centres was also proposed.

- The economic difficulties in various countries and in WHO were recognized.
- In order to be able to carry out practical actions, it was proposed that financial support be sought from different public agencies in order to facilitate the collaboration with e.g. developing countries.
- The uneven distribution of the Collaborating Centres in various Regions was also recognized and it seemed to call for an urgent correction. It was suggested that some centres be selected in developing countries which would be responsible for the dissemination of information in their regions (Singapore National University and Finnish Institute of Occupational Health offered to work for this purpose in Asia and in Africa).
- The language of the training and information material was found to be a problem. In addition to English-language documents, also other languages are needed, e.g. in South America material in Spanish is crucial. Good examples of translating WHO publications into other languages were mentioned, e.g. from Poland. The publications of WHO can be translated with the permission of the Publication Office of WHO.

In the discussions it was seen that the activities carried out by the WHO/OCH and the Network of the Collaborating Centres in Occupational Health were appreciated well by the participants of the Meeting. The systematic preparation of various publications was assessed valuable by all Collaborating Centres. The Group gave full support to the preparation of the Global Strategy on Occupational Health for All and encouraged the Office of Occupational Health to complete the work on the basis of discussions carried out in Beijing. It was seen necessary to strengthen the Office of Occupational Health in WHO Headquarters and to further encourage the collaboration and networking among the Collaborating Centres in order to give full support to the WHO Workers' Health Programme.

The assignments delegated to the Collaborating Centres

8.

The implementation of the actions based on the assignments by the Planning Group to various Collaborating Centres was reported to the Meeting as follows:

a) Development of global information on occupational diseases

Dr. Mikhail Mikheev informed that the ILO had taken the task of preparing a global system for an information data base on occupational diseases, with the aim to harmonize the systems in various countries and make the registries comparable.
Dr. Richard Lemen informed about the developments concerning the WHO Collaborating Centres' Newsletter. The Newsletter was established in order to disseminate information among the Collaborating Centres and to facilitate the information flow to policy-makers at the country level. The Newsletter was deemed useful. It was agreed that the mailing list of the Newsletter be updated to ensure that all the relevant persons receive it.

Ms. Suvi Lehtinen reported about the publishing of the Directory of the WHO Collaborating Centres. The First edition was published in January 1993 after the First Meeting of the Collaborating Centres. It is now being revised, including information about WHO activities in the field of occupational health, the report of the Beijing Meeting and the updated version of the Collaborating Centres' Directory. Also the main publications of WHO are considered to be included. The Second Edition is expected to be available by the shift of the year.

b) Guidelines for training

Professor Frank van Dijk described the preparation of the Guideline on Training in Occupational Health. He informed that in April 1994 the Coronel Laboratory organized the Fourth International Conference on Training and Education in Occupational Health which also compiled material for the preparation of the Guideline. A policy-oriented guideline for training in occupational health, analysing and emphasizing the need for special training in occupational health is needed. The Laboratory is preparing a draft guideline. The following items will be included: contents of the training for various groups of professionals, disciplines that should be covered by the training, minimum competences for occupational health physicians who are not fully trained in occupational health (general practitioners). Also the harmonization of educational curricula in various countries, as well as occupational epidemiology were touched upon. The project is expected to be finalized by spring 1996.

c) Workers' health in agriculture

Professor Yu. Kundiev reported on the activities carried out to implement the assignment in the field of workers' health in agriculture. The Ministry of Health of Ukraine has taken a positive approach, but because of the difficult economic situation no funding has been allocated. In spite of some difficulties it was decided to continue the planning of the international symposium. The dates were proposed to be May–June 1997. It was also recognized that close collaboration with FAO and ILO is needed. Professor Kundiev will continue the planning of the Symposium with an international planning group.
d) Occupational health in small-scale enterprises

Dr. Twisuk Punpeng reported on the implementation of the activities concerning the development of occupational health in small-scale enterprises. The Inter-regional WHO/ILO Task Group on Health Protection and Health Promotion in Small-scale Enterprises was organized on 1–3 November 1993 in Bangkok, Thailand. The report has been distributed to all collaborating centres. The Proceedings of the Meeting was expected to be available in two months.

The International Symposium on Occupational Health Research and Practical Approaches in Small-scale Enterprises will be organized on 1–4 August 1995 in Thailand. The First Announcement of the Symposium was available at the Beijing Meeting.

e) Occupational health services

Professor Jerry Jeyaratnam gave a status report on the developments in the organization of the Symposium on Occupational Health Services: Structure, Functions and Financing, scheduled for 4–10 February 1996, to be held in Singapore. The preliminary Announcement was distributed to the Meeting participants.

f) Occupational health services of countries in transition

Professor Nikolai F. Izmerov described the activities concerning the reorientation of occupational health services in countries in transition. The High-level Meeting was organized on 8–10 February 1994 in Moscow with 30 participants from 14 countries. The Report of the Meeting has been finalized and distributed to all interested institutions. It is available from the WHO/OCH.

g) Aging

Professor Takesumi Yoshimura reported on the organization of an International Symposium on Productive Aging on 18–20 October 1994, in Kitakyushu Japan. Problems of occupational health and well-being of aging workers will be dealt with.

h) New epidemics in occupational health

Professor Jorma Rantanen reported on the organization of the International Symposium on New Epidemics in Occupational Health, 16–19 May 1994, which was attended by more than 180 participants from 36 countries and three international organizations (WHO, ILO, IARC). The Proceedings of the Symposium have been published and were distributed in the Beijing Meeting.
i) Women at work

Professor Janusz Indulski described the situation concerning the planning of a meeting on the special problems of women at work. The planning is well under way; even though the financial situation has to some extent made the planning difficult.

A Global Strategy on Occupational Health for All, and Collaboration

9.

A Global Strategy on Occupational Health for All

Professor Jorma Rantanen described the contents of the draft document on the Global Strategy on Occupational Health for All. He stressed that the working life is changing rapidly in all countries of the world, and thus it creates a common denominator for all countries in spite of the fact that they are in different phases of development. He described the following megatrends in the global development that have a direct or indirect effect on occupational health: manyfold differences in the prevalence of occupational diseases and accidents among the countries, but also within the countries among various occupations; increasing migration of workers; aging of the workforce; changes in job content from blue-collarism to white-collarism; importance of research in solving new occupational health and safety problems, need to carry out national situation analyses and surveys in order to find out the objective basis for priority setting for national occupational health and safety programmes; the crucial role of primary prevention in occupational health; economic appraisal in occupational health. All the trends described speak for the need for a multidisciplinary and comprehensive approach in occupational health and safety.

Dr. Mikhail Mikheev described the approval procedure of the proposal for the Global Strategy document within the WHO. It should first be presented to the Cabinet of the Director General, then handled according to the formal procedures of the World Health Organization.

Extensive general discussion and a thorough discussion about details was carried out by the Meeting, and numerous amendments and new proposals were presented. The ten items presented in the Executive Summary were identified and analysed. Among others, the following additional items were agreed to be included in the Global Strategy document: Definition of occupational health, environmental aspects, spe-
cial problems of the developing world, provision of occupational health services, better coordination both in WHO and among the United Nations Agencies.

The detailed items and comments mentioned in the discussion are attached as Annex 3 to this Report.

10.

Ethics in Occupational Health (reported by Professor Tor Norseth)

Dr. Richard Lemen presented the document on Ethics in Occupational Health. He referred in his presentation to an extensive literature search. He started out by defining morality and ethics and gave a short introduction to the several compromises in science. He then referred to the many problems encountered in the practice of occupational health and in occupational health research. Finally he suggested 5 different principles to be introduced in the ethical codes. These referred to the tripartite review of the protocol, avoidance of perceived compromises in results, review of study protocols, and ensuring that scientific methods are followed. Finally, all parties involved should be included in standard-setting procedure.

Principles and problems related to the use of biomarkers in monitoring exposure to and identification of early effects from hazardous factors were discussed. In addition, the confidentiality of personal health data and data acquisition in general should be included in the code of ethics. A suggested ethical standard will be rewritten and sent for review to all participants of the meeting.

11.

Networking

Ms. Suvi Lehtinen described the present situation in the networking among the Collaborating Centres. She mentioned that the crucial prerequisites for networking, i.e. strategy, information support, and organizational framework are now available. It remains to the Collaborating Centres to take initiatives to join either bilateral or multilateral collaborative networks. However, as feedback on successes as well as problems is needed in order to develop the effectiveness of networking, it was deemed necessary to organize the follow-up of various network activities. The CCOHS, Canada had already earlier offered the possibility for the Collaborating Centres to use the Information Bulletin Board for real-time exchange of information. Those Collaborating Centres which have the technical facilities were encouraged to utilize this possibility, also for recording the Network activities. Another forum for this kind of exchange of information is the WHO Newsletter. Also the need for various information materials, e.g. Directory of the WHO Collaborating Centres in Occupational Health as a hard copy was recognized.
The Network has now been well established and can carry out practical and productive activities on the basis of joint actions and division of work. The Network has helped in increasing the outputs of the WHO Workers' Health Programme. Further expansion and strengthening of the Network was encouraged.

Prevention of Occupational Respiratory Diseases

(reported by Dr. Gregory Wagner and Professor Tor Norseth)

13.

Occupational respiratory diseases were chosen by the Planning Groups as a scientific theme of the Second Meeting of the Collaborating Centres. The main argument for this choice was that the respiratory route is the main pathway for exposures from workroom air and the trends of occupationally related respiratory morbidity are inquieting in some areas. Three prominent presentations dealing with the prevention of respiratory diseases were given by Dr. Gregory Wagner of NIOSH, USA; Professor LI Yurei of the Institute of Preventive Medicine, Beijing, China; and Professor Tor Norseth of the Institute of Occupational Health, Norway. All presentations were followed by a very active discussion, and the need for both scientific and practical guidance in the prevention of various occupational respiratory diseases was recognized.

14.

Dr. Gregory Wagner from the US National Institute for Occupational Safety and Health discussed Trends in Prevention of Occupational Respiratory Morbidity. He noted, after reviewing available data from many countries around the world, that reliable health information particularly about morbidity is rarely available and, when available, is defined, recorded, and reported in ways that vary widely from jurisdiction to jurisdiction. He presented data from a number of developed and newly industrialized countries demonstrating that the control of traditional dust diseases in developed countries appears to have stabilized with a low but significant level of disease persisting. Trends in newly industrialized countries are more variable and not as encouraging. Overall, disease definitions and reporting systems show considerable variability so the data from country to country are not well comparable. In general, the numbers of people at risk for these diseases are uncertain.

In addition, Dr. Wagner made the following major points:

- Disease definitions are changing in recognition of the importance of the contribution of work to non-unique conditions. These latter are prime candidates for creative efforts at prevention.
- The well characterized diseases for which the scientific basis for prevention is well established and knowledge is widespread have been resistant to elimination.
In order to overcome the barriers to prevention, we will have to understand better the social, legal, economic, and behavioural, and political context which permits these preventable conditions to persist and to find the right levers that will promote prevention.

- **Non-specific conditions caused or exacerbated by work** can best be investigated and prevented with consideration of '24 hours of exposure' — i.e. the general, home and personal environment as well as the work environment. Nevertheless, recognition that these other environments may be contributing to disease and disability should not stop efforts to prevent the workplace attributable component of respiratory morbidity.

- **Hazard recognition and exposure control** — preferably through work process change, including substitution, but also with engineering controls with continual monitoring are critical elements of any prevention strategy. These should be supplemented by efforts at hazard and health surveillance.

- **International harmonization of methods for the recognition and control of diseases** is an important element in disease prevention. In the field of occupational respiratory morbidity prevention it is important to note the work of the WHO together with the ILO in promoting harmonization of approaches to screening and surveillance of workers exposed to mineral dusts as an example of this. The ILO approach to standardization of recognition of the pneumoconioses is another outstanding example of using a tool to promote widely concepts of good practice. The importance of harmonized approaches is ever increasing with regional and international economic activities with the EU, NAFTA, etc.

- **The work processes and the nature of work continually evolve.** This changing environment requires broad and comprehensive efforts to understand the interconnected systems leading to the development and persistence of disease in order to find the most effective and efficient means of prevention.

- **The pressures to forgo health and safety considerations in rapidly expanding and developing economies as well as in mature economies under increasing competitive pressures** should be directly combatted by health and safety professionals and the national centres responsible for prevention of occupational disease and injury.

Our cooperative efforts to understand the root causes of disease and to work together toward the prevention and even the elimination of diseases should provide mutual strength and support for each other as well as help improve the conditions of working people in our respective countries.

15.

Professor LI Yurei of the Institute of Occupational Medicine in Beijing discussed occupational respiratory diseases in China. He described a public information and worker education programme emphasizing eight techniques to improve worker health protection called the 'Eight Words Policy'. This policy and the educational campaign included encouraging workplace modification, improved worker personal protection, changed management practice, education, worker health surveillance, wet processes, enclosure, and ventilation in order to diminish risk of dust diseases of
the lungs. This approach was felt to have had a beneficial impact on working conditions.

Professor LI discussed in detail efforts in the identification and testing of drugs to treat those workers with silicosis. Because so many workers have developed silicosis, there is a commitment to attempting to ameliorate their condition or to arrest further development of the disease through drug therapy. These efforts have resulted in the identification of some potentially useful medications which are continuing to undergo trial and investigation.

Professor LI then reported on a major epidemiological investigation attempting to identify exposures resulting in increased lung cancer risk. This is an ongoing effort which has focused, in part, on arsenate and radon exposures. Surveillance activities have demonstrated a successful reduction in incidence rate of lung cancer in tin miners as dust exposure has diminished.

Professor LI reported that the combined public health efforts and efforts of the Ministry of Labour have resulted in some progress towards the control of occupational respiratory disease. Nevertheless, risks of pneumoconiosis and lung cancers are quite prevalent and require additional attention. This may be a particular problem in industries in the private sector not currently operating under normal health and safety inspection and regulation.

16.

Dr. Michel Lesage from the International Labour Office discussed the ILO activities in the prevention of occupational respiratory diseases. There has been gradually increasing interest in occupational safety and health at the ILO, particularly as it concerns the conditions for agricultural workers and workers in small enterprises. In addition, new and changing technologies have been a focus of attention. The ILO by its own process requires the participation of employers, employees, and governmental organizations. The ILO Conventions generally reflect the importance of active participation of both employers and workers.

ILO activities include standard setting as reflected in 175 conventions and 182 recommendations. Since 1919 seventy of these have focused on occupational safety and health and workers' health protection. The guiding policies for action include the 1981 Convention No. 155 and Recommendation No. 164 and the 1985 Convention No. 161 and Recommendation No. 171. The ILO tends to focus on cooperative approaches to problem solving rather than on rules.

In addition, the ILO has sponsored expert activity and information dissemination relevant to occupational disease prevention. Right now, the ILO Encyclopaedia of Occupational Health and Safety is undergoing a substantial revision with tripartite
involvement and worldwide participation. In addition, the ILO has been active in sponsoring the development of guidelines for screening and surveillance of mineral dust exposed workers and training in the use of the ILO system for recognizing the pneumoconioses.

17.

Professor Tor Norseth started his presentation by introducing the toxicological principles (dose, dose-effect and dose-response) for setting exposure limits. He stated that value judgements are always involved in limit setting, and that the concept of health-based values is unrealistic and misleading. At the end he gave some examples of biomedical data supporting the use of dose-effect and dose-response concepts for limit setting. Most participants agreed that all limits are based on value judgements, but some advocated that the concept of health-based values should still be kept. The discussion also brought up the responsibilities of the scientist for the public use of results, but the audience seemed to disagree on this question even though it was not discussed in any depth.

18.

Poster session (reported by Tor Norseth)

The poster session gave an excellent overview of the extensive activities of the WHO collaborating centres on research on the identification of risks and the prevention of occupational respiratory diseases. 28 institutes from 19 countries presented individually or jointly a total of 24 posters.

Most posters reported on the occurrence and the prevention of occupational respiratory diseases in different countries. The general impression is a decreasing rate of silicosis in industrialized countries, but this disease still constitutes a considerable problem in developing countries. Other respiratory diseases (alveolitis, asthma) seem to increase partly because of better diagnostics, but there also seems to be a real increase in morbidity. Some posters also discussed byssinosis and chronic obstructive lung diseases which seem to be preventable to a large extent. Asbestos and man made mineral fibres were discussed in several posters. Of specific interest was a poster discussing possible mechanisms of fibrosis and cancer caused by man made mineral fibres from the University of Occupational and Environmental Health in Japan. A poster from the Netherlands demonstrated an interesting network between several national institutes on various aspects of respiratory diseases. Also cancer risk in the dye industry (Poland) and cancer among seafarers (Denmark) were discussed. Several institutes presented in addition a most useful general overview of their activities.
19.

Round-Table Discussion 'Reduction of occupational respiratory diseases and elimination of silicosis - Is it technically achievable and feasible for Member States? (reported by Tor Norseth)

The round-table discussion commenced by stating that although the prevention of silicosis seems medically and technically feasible there is a question of achievability in some countries. Accordingly, even if the problem of silicosis is minor in some countries, it is of considerable size in others. The control of silicosis is not an easy task, and it depends on both effective hazard surveillance and on preventive practices. Education on all levels is important; the ILO X-ray classification was given as an example. Similar practices were recommended for other methods of diagnoses and surveillance (e.g. respiratory function test).

Sand blasting was mentioned as an important cause of silicosis which should be removed, but substitutes may also present a hazard. Respiratory protection programmes were advised as well as a better reporting system for the disease. Finally a general target level: no more silicosis by the year 2000/2005 in the world was suggested as a way to increase the attention paid to silicosis.

Conclusions and Recommendations of the Second Meeting

20.

Programme Activities

The numerous activities carried out by the WHO/OCH and the Collaborating Centres according to the assignments delegated by the Planning Group were described, evaluated in discussion and recorded. They were mostly implemented according to the plans, and the Centres have been motivated to implement further the collaborative tasks. However, in some cases the economic recession experienced in many countries was recognized as a limiting factor in the form of both lacking funds and shortage of human resources. In spite of such limitations, the Network is well established and seems to provide concrete support for the WHO Workers' Health Programme.

The activities within the framework of the Network of the WHO Collaborating Centres should be further strengthened and developed. This can be expected to be seen as improvements in workers' health worldwide, but will also lead to avoidance of duplication of work and thus will save both financial and human resources.
21.

A Global Strategy on Occupational Health for All

As clearly demonstrated by the proposed strategy document, there is a need for improvement of occupational health in all countries. Therefore, a Global Strategy was deemed valuable. It will simultaneously express the values that guide the practical implementation of occupational health activities both at the international as well as national levels. The draft Strategy includes the priorities for occupational health activities. The content and emphases in the draft Strategy were lively discussed among the Meeting participants. The draft Strategy was approved with proposed amendments and modifications by the Meeting of the Collaborating Centres for being presented to the consideration by the World Health Organization.

As soon as the preparation process has been completed, the draft Global Strategy should be submitted to WHO for further consideration. It should also be distributed to all Collaborating Centres in Occupational Health which could proceed with utilizing the Global Strategy and adapt it to their own national and local situations.

22.

Ethics

The various aspects of occupational ethics were presented and discussed. These referred among others to the tripartite review of the study protocol, avoidance of perceived compromises in research results, choice of the best scientific methods to be followed, and to the need to involve all parties in the standard setting procedure.

The discussion on ethics in occupational health should be continued. On the basis of the comments and discussion of the Meeting, a discussion document on 'Ethics in Occupational Health' should be finalized.

23.

Networking among the Collaborating Centres

The present status of networking was reported. The crucial prerequisites for networking, i.e. strategy, information support, and organizational framework are available, and the Collaborating Centres are expected to fully utilize the possibility to join either the bilateral or multilateral collaborative networks. Information materials describing the activities of the Network, such as the Directory of the WHO Collaborating Centres in Occupational Health and the Newsletter, were welcomed.
The feedback system describing the activities carried out by the Network members should be developed in order to enable the further development of the Network. The Information Bulletin Board provided by the Canadian Centre for Occupational Safety and Health, as well as the Collaborating Centres' Newsletter should be effectively used for the exchange of information. The Directory of the WHO Collaborating Centres in Occupational Health should be further developed to be published and distributed both as a hard copy and in electronic form.

24.
Scientific Symposium on Prevention and Control of Respiratory Diseases

The high, and partly growing prevalence of occupational respiratory diseases was recognized to be a major occupational health problem in many countries. Therefore, preventive measures would be urgently needed. Prevention starts from recognition of risk and the workers at risk, and is followed by as immediate primary preventive measures as possible.

Obstacles in the prevention of respiratory diseases should be identified. Prevention is a long-term process, and the trends in many countries seem to be declining while increasing trends of some diseases in some countries are reported. Tripartite collaboration is important in the implementation of various preventive and control measures at the workplace level. The role of training is crucial, as well as the increasing of awareness of the management, workers and the public at large. Successes and good technical solutions should be demonstrated and information on such solutions should be distributed as widely as possible. Competent exposure monitoring is important. Health monitoring needs standardization and training of the experts. Therapy is still needed in countries with high numbers of clinical cases. Special attention should be paid to potential new risks of occupational and work-related respiratory diseases. Post-retirement follow-up should be organized to detect the delayed outcomes. Continuous quality improvement should be included in all hazard identification, diagnostic and preventive activities. The target for the reduction of occupational respiratory diseases by the year 2005 should be that no new cases of silicosis will be registered after the target date.

Closing of the Meeting

25.
The New Planning Group of the WHO Collaborating Centres in Occupational Health for the tenure 1994–1997 was elected. The members of the Planning Group are:
Dr. Richard A. Lemen, USA, Chairman
Professor HE Fengsheng, China
Professor Nikolai F. Izmerov, Russian Federation
Dr. J-M. Mur, France
Dr. Hernan Sandoval, Chile
Professor Takesumi Yoshimura, Japan

25.

The Third Meeting of the WHO Collaborating Centres in Occupational Health was decided to be organized in the Americas in the first quarter of 1997 at the kind invitation of Dr. Richard A. Lemen. The place and dates will be decided later.

Annexes

Annex 1 List of participants
Annex 2 Agenda
Annex 3 List of detailed comments to the Draft Global Strategy on Occupational Health for All
Annex 1

Second Meeting of the WHO Collaborating Centres in Occupational Health

11–14 October 1994
Beijing, People’s Republic of China

List of participants

Representatives of WHO Collaborating Centres

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Dr B. Perunicic, Institute of Occupational and Radiological Health, Clinical Centre, Deligradska 29, Belgrade, Yugoslavia

Dr T. Norseth, Director, National Institute of Occupational Health, P.O. Box 8149 Dep, N-0033 Oslo, Norway (invited as an expert)

Specialized Agencies and UN Offices

Dr C. Pinnagoda, Chief, and Dr M. Lesage, Medical Officer, Occupational Safety and Health Branch, ILO, Geneva
Ms Trine Lund-Jensen, Assistant Resident Representative, UNDP, Beijing

Nongovernmental Organizations (NGOs)

Prof. J. Jeyaratnam, Secretary-General, ICOH, c/o University of Singapore

Dr G.W. Gibbs, Safety Health Environment International Consultants Corporation, Box 27, Site 17, RR2, Winterburn, Alberta, Canada T0E 2NO, representative of International Commission on Occupational Health (ICOH)

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Dr N.P. Napalkov, Assistant Director-General, World Health Organization, Geneva, Switzerland

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Dr M.I. Mikheev, Chief Medical Officer, Office of Occupational Health, World Health Organization, Geneva, Switzerland (Secretary)

Ms Catherine Herren, Secretary, Office of Occupational Health, World Health Organization, Geneva, Switzerland

Dr B. Baranski, Acting Regional Adviser on Occupational Health, WHO Regional Office for Europe, Copenhagen, Denmark

Mr Young-Hak Yoo, Regional Adviser, Health of the Elderly, WHO Regional Office for the Western Pacific, Manila, The Philippines
Second Meeting of the WHO Collaborating Centres in Occupational Health

Beijing, People's Republic of China
11-14 October 1994

Final Programme

Tuesday, 11 October 1994

1. Opening Session

09:00 – 09:45 Opening of the meeting and opening remarks by Dr. N.P. Napalkov, Assistant Director-General, WHO

Opening addresses by the
Ministry of Public Health, China
Academy of Preventive Medicine, China

Election of Chairman, Vice-Chairman and Rapporteur
Adoption of the Agenda
Scope and purpose of the meeting

09:45 – 10:00 Tea/coffee break
10:00 – 10:20 Introduction of participants

10:20-10:30 Technical information

10:30 – 12:30 Occupational health in China: An overview
Dr. SU Zhi, Ministry of Public Health, Beijing

12:30 – 14:00 Lunch and Poster Session: Activities of the Occupational Health Centres in China

2. Programme Activities of the WHO Workers' Health Programme and its Collaborating Centres

Chair: Dr. R. Lemen, USA
Rapporteur: Ms. S. Lehtinen, Finland

14:00 – 15:00 Status report of the activities of the WHO Office of Occupational Health (30' + 30' discussion)
Dr. M.I. Mikheev, WHO, Geneva
15:00 – 15:30 Reports from institutions assigned for specific tasks within the WHO Workers’ Health Programme (9 items, 10' + 5')

15:30 – 15:50 Tea/coffee break

15:50 – 18:00 Reports from institutions assigned for specific tasks within the WHO Workers’ Health Programme (continued)

Wednesday, 12 October 1994

08:00-09:00 Paging of the posters of the Collaborating Centres. Poster room is opposite to the Meeting Room. The contributors are kindly asked to be at the vicinity of their poster during the Poster Session on Thursday, 13 October 1994, at 9:00-10:30.

3. **Global Strategy and Collaboration**

   Chair: Prof. J. Jeyaratnam, Republic of Singapore
   Rapporteur: Ms. S. Lehtinen, Finland

   09:00 – 09:30 WHO Global Strategy for Occupational Health and Declaration of the WHO Collaborating Centres’ meeting; Introduction
   Prof. J. Rantanen, Finland

   09:30-10:30 WHO Global Strategy; discussions and approval

   10:30 – 10:45 Tea/coffee break

   10:45-11:45 WHO Global Strategy; discussions and approval; nomination of a Declaration Group

   11:45-12:45 Ethics in Occupational Health; Discussions and approval
   Dr. R.A. Lemen, USA

   12:45 – 13:00 Networking among the Collaborating Centres; Updating of the rectory of the WHO Collaborating Centres in Occupational Health
   Ms. S. Lehtinen, Finland

   13:00 – 14:00 Lunch

4. **Prevention of Occupational Respiratory Diseases**

   Chair: Dr. HE Fengsheng, China
   Rapporteur: Dr. G. Wagner, USA

   14:00 – 14:30 Trends in prevention of occupational respiratory morbidity
   Dr. G. Wagner, USA
14:30 – 15:00  Occupational respiratory diseases in China
   Prof. LI Yuei, Institute of Occupational Medicine, CAPM, Beijing

15:00 – 15:10  Introduction to the ILO activities in prevention of occupational
   respiratory diseases
   Dr. M. Lesage, ILO

15:10 – 15:30  Discussion: Prevention and control of occupational respiratory
eases; strategies and techniques

15:30 – 16:00  Tea/coffee break

16:00 – 17:00  Continuation of discussions

Thursday, 13 October 1994

5.  Poster Session

   Chair: Dr. Twisuk Punpeng, Thailand
   Rapporteur: Dr. T. Norseth, Norway

09:00 – 10:30  Posters

10:30 – 11:00  Tea/coffee break

11:00 – 11:30  Prevention of occupational respiratory diseases by setting scient-
   ific principles for health-based occupational exposure limits
   Dr. T. Norseth, Norway

11:30 – 12:30  Discussions

12:30 – 14:00  Lunch

6.  Round-Table Discussion

   Chair: Prof. J. Rantanen, Finland
   Rapporteur: Dr. T. Norseth, Norway

14:00 – 15:30  Reduction of occupational respiratory diseases and elimination
   of silicosis – Is it technically achievable and feasible for WHO
   Member States?

   Panel members: Prof. LIANG You-xin, Prof. J. Indulski,
   Dr. T. Norseth, Prof. G. Wagner, Prof. ZOU Changqi
15:30 – 16:00 Tea/coffee break

16:00 – 16:30 Conclusions and recommendations on prevention of occupational respiratory diseases; areas of research and future action

7. Closing Session

16:30 – 16:40 Declaration on Occupational Health, introduced by Prof. HE sheng
16:40 – 17:20 Conclusions and Recommendations
17:20 – 17:30 Next Meeting of the WHO Collaborating Centres:
Date and place
17:30 – 17:45 Closing of the Meeting

Friday, 14 October 1994

09:00 – 13:00 Scientific visits

13:00 – 17:00 Meeting of the Planning Group
The detailed items and comments to the draft Global Strategy on Occupational Health for All mentioned in the discussion are presented below:

- In the discussion a very comprehensive content to the term 'occupational health' was accepted, including in addition to the health element, also safety aspects as well as the social dimension. In addition, it was decided to use the already accepted WHO terminology on health and related matters. The updating and further development of the terminology was left to the Joint ILO/WHO Committee on Occupational Health.
- Management aspects were decided to be included in the document.
- The readership of the document includes policy-makers, politicians, and the mass media in addition to occupational health experts. This would set certain requirements for the verbiage of the document.
- Uniformity of terminology within the document should be checked.
- Effects and connection of the occupational environment to the general environment should be mentioned.
- A comprehensive approach to workers' total health should be used.
- Maintenance of working capacity should be included in the document.
- Access to work should be included.
- The two-way relationship between work and health should be dealt with.
- Globalization of the economy may create a problem, and this should be dealt with in the document.
- Work should not be a risk to a worker's health. Work should sustain the working capacity of the worker. Work should be accessible to all people at working age.
- Workers with occupational diseases should be treated.
- A vision on the future status of occupational health is needed to guide and ensure the progress in occupational health.
- Collaboration and good coordination with other units in WHO should be emphasized.
- As many chronic effects appear only after retirement, the life-long follow-up and occupational health services should be ensured.
- The importance of primary prevention should be stressed.
- In addition to voluntary development actions and measures for improving the working conditions at the workplace level, also standards, their enforcement as well as inspection of the compliance of regulations, norms and standards, education of the parties involved and information of all concerned should be included.
- It was decided to add an introduction to the ten objectives described in the Executive Summary in order to make the Chapter more reader-friendly.
- No differentiation between the industrialized and developing world will be made, but in the texts of the document it will be taken into consideration that the countries are in different phases of development.
- The educational role of occupational health experts is crucial for the elevation of the priority position of occupational health on the policy agenda of the countries.
- The title of the document was changed to 'Occupational Health for All'. The date was left open which will imply the need for continuous improvement in the implementation of various occupational health strategies and programmes.

- Instead of using the term 'hypersensitive constitution' it was decided to use the phrase 'increased vulnerability' because of the great inter-personal variability in order not to cause misinterpretation of the intention to protect the health of the workers. For example, the existence of an occupational disease increases the vulnerability of the worker (occupational cancer).

- Concerning coordination and collaboration, it was recognized that the OCH should take a leading role e.g. in the further development of occupational health services making use of within-house and inter-agency resources. This would also help to solve the problem caused by limited resources available in WHO. Funding from outside sources should also be sought. Also the Network of the Collaborating Centres should be fully utilized.

- Taking into consideration the growing number of workers of the world in the developing countries, more emphasis should be paid in the document to the issues related to the transfer of technology and chemicals, as well as questions connected to the multinationals where also the Declaration on Multinationals approved by the ILO should be referred to. This issue will be taken to be one of the Objectives in the Executive Summary.

- The role of the Collaborating Centres in human resources development should be more clearly defined.

- Another overall objective was decided to be added: the importance of increasing the public awareness of occupational health.

- More emphasis should be put on the companies' responsibilities in the development of occupational health and improvement of working conditions. Here special attention should be paid to involvement as well as education and training of both managers and workers. The practical impact at the workplace level should be ensured by increasing awareness, through participation, by realizing the workers' right to know, and by following the transparency principle.

- Links between general health and workers' health should be stressed, and a specific mention of the problems and new needs of occupational health in the NIS countries should be included.

- Combined exposures to chemicals should be stressed.

- The roles and jurisdiction of the WHO and ILO were defined so that the ILO prepares the legal instruments for the Member Countries, using the tripartite principle and a strong legislative approach. WHO brings into the collaborative process the substantive content on occupational health making sure that the scientific basis for the actions is sound. Close collaboration is needed in order to avoid costly duplication of both human and financial resources.

- The Collaborating Centres should each organize the transfer of information and knowledge to other institutions in order to make it possible to learn from others' experience.

- The number of self-employed is increasing. Their special problems should be referred to in the document.

- Unorganized sectors, agriculture, small-scale enterprises could well be emphasized in the WHO efforts.
- It is important to develop the methodology and competence of occupational medicine to enable the physicians to make further positive contributions for the health of workers within the multidisciplinary framework of occupational health.

- It was recognized that the Global Strategy document gives each country a possibility to develop occupational health to meet the local needs and to adapt the actions to the local conditions, without compromising the objective of ensuring occupational health for all.
List of abbreviations used

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>CCOHS</td>
<td>Canadian Centre on Occupational Health and Safety</td>
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<td>EB</td>
<td>Executive Board of the WHO</td>
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<td>EU</td>
<td>European Union</td>
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<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<td>FINNIDA</td>
<td>Finnish International Development Agency</td>
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<tr>
<td>IAAMRH</td>
<td>International Association of Agricultural Medicine and Rural Health</td>
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<tr>
<td>IAEA</td>
<td>International Atomic Energy Agency</td>
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<td>IAOH</td>
<td>International Association of Occupational Hygiene</td>
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<td>IARC</td>
<td>International Agency for Research on Cancer</td>
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<tr>
<td>ICNIRP</td>
<td>International Commission on Non-Ionizing Radiation Protection</td>
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<td>ICOH</td>
<td>International Commission on Occupational Health</td>
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<td>IEA</td>
<td>International Ergonomics Association</td>
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<td>ILO</td>
<td>International Labour Organisation</td>
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<td>ILO</td>
<td>International Labour Office</td>
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<td>IPCS</td>
<td>International Programme on Chemical Safety</td>
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<td>IRPTC</td>
<td>International Register of Potentially Toxic Chemicals</td>
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<td>NAFTA</td>
<td>North American Free Trade Association</td>
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<td>NGO</td>
<td>Nongovernmental organizations</td>
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<td>NIOSH</td>
<td>The US National Institute for Occupational Safety and Health</td>
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<td>OCH</td>
<td>WHO, Office of Occupational Health</td>
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<tr>
<td>OECD</td>
<td>Organization for Economic Cooperation and Development</td>
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<td>OH &amp; S</td>
<td>Occupational health and safety</td>
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<td>OHS</td>
<td>Occupational health services</td>
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<td>PHC</td>
<td>Primary health care</td>
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<td>UNCED</td>
<td>United Nations Conference on Environment and Development</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<td>UNIDO</td>
<td>United Nations Industrial Development Organization</td>
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<td>WHA</td>
<td>World Health Assembly</td>
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<td>WHP</td>
<td>Workers’ Health Programme</td>
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