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**Global Strategy on
Occupational Health for All**

The Way to Health at Work

Recommendation of the Second Meeting of the
WHO Collaborating Centres in Occupational Health
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Preface

The WHO policy has, since the foundation of the Organization, included elements for occupational health. Numerous key documents of WHO, the Constitution, Alma Ata Declaration, Health for All Strategy, the General Programmes of Work and several resolutions of the World Health Assembly have emphasized the need to protect and promote health and safety at work by preventing and controlling of hazards in the work environment and by promoting health and the work capacity of working people.

Facing the numerous problems of occupational health and safety and looking at the new developments and trends in the global working life, the two Meetings of the Network of WHO Collaborating Centres in Occupational Health, covering 52 research and expert institutions from 35 countries, have discussed the need for a new Global Strategy in Occupational Health. Such a Strategy should benchmark the priority actions for giving an effective response to the new occupational health needs in the rapidly changing working life and also address to the great differences in the working conditions and occupational health in countries at different stages of development.

The present document analyses the current situation and new needs of occupational health in different parts of the world, and proposes policy principles, 10 objectives and international and national actions for further improvement of occupational health.

The main emphasis is given to the preparation of new occupational health policies, development and strengthening of the necessary infrastructures, information systems and awareness of the needs and possibilities of occupational health activities, development of occupational health services for all working people, and building up the necessary support services and human resources needed for implementating the new Strategy. Much emphasis is given to collaboration within the WHO between the various International Organizations and Nongovernmental Organizations and between various disciplines relevant to occupational health. The necessity to develop collaboration and multidisciplinary approach, in occupational health practice at national and local levels is also considered.

The Second Meeting of the Network of Collaborating Centres in Occupational Health recommended that this Document be submitted for consideration by the WHO and it is proposed to be converted into the WHO Global Strategy on Occupational Health for All (The way to health at work).

It is the intention of the Network of the WHO Collaborating Centres in Occupational Health that this document stimulates discussions on needs and objectives for further development of occupational health and encourages policy and practical actions which are necessary to meet the challenges of occupational health in the modern working life.

Global Strategy¹ on Occupational Health for All

Executive summary

About 45% of the world's population and 58% of the population over 10 years of age belong to the global workforce. Their work sustains the economic and material basis of society which is critically dependent on their working capacity. Thus occupational health² and the well-being of working people are crucial prerequisites for productivity and are of utmost importance for overall socioeconomic and sustainable development.

It is the objective of this Strategy that by the year 2000 the countries where trends in occupational health and safety are already positive, should demonstrate a further improvement of occupational health and safety indicators, showing a reduction of the difference between the level of health and safety of low-risk and high-risk occupations and enterprises. In countries where the present trends are still negative, positive development is expected and the legal and other actions, including the development of necessary resources and infrastructures, should be taken to make such positive trends possible. All countries should show a progressive development of occupational health services with the ultimate objective of covering all workers with such services irrespective of the sector of economy, size of company, occupation, mode of employment, or nature of self-employment.

The workplace is a hazardous environment. Occupational health and safety² hazards are common in many economic sectors and affect large numbers of workers. Approximately 30–50% of workers report hazardous physical, chemical or biological exposures or overload of unreasonably heavy physical work or ergonomic factors that may be hazardous to health and to working capacity; an equal number of working people report psychological overload at work resulting in stress symptoms. Many individuals spend one-third of their adult life in such hazardous work environments. About 120 million occupational accidents with 200,000 fatalities are estimated to occur annually and some 68-157 million new cases of occupational disease may be caused by various exposures at work. In addition to unnecessary human suffering, the costs involved in these health haz-

ards have been estimated to amount up to several percent of some countries' gross national product (GNP).

The most important challenges for occupational health by the year 2000 and beyond will be: occupational health problems linked with new information technologies and automation, new chemical substances and physical energies, health hazards associated with new biotechnologies, transfer of hazardous technologies, aging of working populations, special problems of vulnerable and underserved groups (e.g. chronically ill and handicapped), including migrants and the unemployed, problems related to growing mobility of worker populations and occurrence of new occupational diseases of various origins.

In some regions and countries, only 5–10% of workers in developing countries and 20–50% of workers in industrialized countries (with a very few exceptions) have access to occupational health services in spite of an evident need virtually at each place of work. The need for occupational health services is particularly acute in the developing and newly industrialized countries (NICs). Furthermore, approximately eight out of 10 of the world's workers live in these countries. Such services, if organized appropriately and effectively for all workers, would contribute positively not only to workers' health, but also to overall socioeconomic development, productivity, environmental health and well-being of countries, communities, families and dependents. Also the control of unnecessary costs from sickness absenteeism and work disability, as well as costs of health care and social security can be effectively managed with the help of occupational health.

Rapid change of the modern working life is associated with increasing demands of learning new skills, need to adapt to new types of work, pressure of higher productivity and quality of work, time pressure and hectic jobs and with growing psychological workload and stress among the workforce. Such developments require higher priority to be given for psychological quality of work and the work environment, and more attention to psychosocial aspects of work.

Health at work and healthy work environments are among the most valuable assets of individuals, communities and countries. Occupational health is an important strategy not only to ensure the health of workers, but also to contribute positively to productivity, quality of products, work motivation, job satisfaction and thereby to the overall quality of life of individuals and society.

This proposed Global Strategy on Occupational Health for All¹ presents a short situation analysis by using available occupational health indicators, identifies the most evident needs for the development of occupational health and safety, in-

cluding the priority areas at both national and international levels, and proposes the priority actions for WHO's Workers' Health Programme.

On the basis of the global situation analysis, the analysis of expected future trends in working life, the documents of international organizations and professional bodies, the proposals made during the discussions of the Network of the WHO Collaborating Centres in Occupational Health and the Planning Group, ten priority objectives are proposed for the development of occupational health at international and national levels.

The 10 priority objectives proposed by the strategy are as follows:

- 1. Strengthening of international and national policies for health at work and developing the necessary policy tools**
- 2. Development of healthy work environment**
- 3. Development of healthy work practices and promotion of health at work**
- 4. Strengthening of occupational health services (OHS)**
- 5. Establishment of support services for occupational health**
- 6. Development of occupational health standards based on scientific risk assessment**
- 7. Development of human resources for occupational health**
- 8. Establishment of registration and data systems, development of information services for experts, effective transmission of data and raising of public awareness through public information**
- 9. Strengthening of research**
- 10. Development of collaboration in occupational health and with other activities and services**

Each objective has two different targets in view of the international and national actions that are needed to meet the strategy objectives.

The objectives emphasize the importance of primary prevention and encourage countries with guidance and support from WHO to establish national policies and programmes with the required infrastructures and resources for occupational health. In this development of national systems the role of the government is central. Further development of occupational health services is strongly emphasized. Mechanisms for setting standards or guidelines for control of various exposures at work and inspection to ensure compliance with such standards was also proposed. According to the principles of the ILO Convention No. 161 on Occupational Health Services, the primary responsibility for improvement of health and safety at work and for occupational health services at the workplace and within

the enterprise lies with the employer. Most countries implement occupational health and safety policies and practices at the national level through tripartite collaboration between government, employers and employees.

Principal actors responsible for occupational health and safety at the workplace level are the employers and workers who according to the internationally accepted principles should collaborate in carrying out activities for health and safety at work. They often need advice, assistance and services of occupational health and safety experts.

To implement such a strategy and to achieve the proposed objectives, higher priority should be given to occupational health in the WHO Programmes of Work and in budget plans. A follow-up system for the implementation of the strategy is also presented.

This Strategy document provides background for the Declaration on Occupational **Health** for All that was adopted by the Second Meeting of the WHO Collaborating Centres in Occupational Health on 13 October 1994 in Beijing.

¹The concept 'strategy' has several meanings and the term is often poorly defined. In this document the word *strategy* refers to employment of political, economic, psychological and intellectual **fora** to gather maximum support for the achievement of an adopted policy goal.

²In this document the term 'occupational health' (OH) includes the actions for occupational medicine, occupational hygiene, occupational psychology, safety, physiotherapy, ergonomics, rehabilitation, etc.

Global Strategy on Occupational Health for All

I Introduction: The right to health at work

The right to health and safety at work – a part of basic human rights

1. Most of the world's population (58%) spend one-third of their adult life at work contributing actively to the development and well-being of themselves, their families and of society. Work may have both a positive or an adverse effect on the health of the worker. In the most favourable circumstances work provides the income and material outputs for meeting the necessities of life and also has a positive impact on social, psychological and physical health and well-being. At the same time, a high level of occupational health and safety contributes to the achievement of material and economic objectives and provides high quality and performance in working life. In spite of this, conditions at work and in the work environment for many occupations and in many countries still involve a distinct and even severe hazard to health that reduces the well-being, working capacity and even the life span of working individuals.

Conditions of work and the work environment may have either a positive or hazardous impact on health and well-being. Ability to participate in the working life opens the individual possibilities to carry out economically independent life, develop his or her working skills and social contacts. One-third of adult life is spent at work where the economic and material values of society are generated. On the other hand, dangerous exposures and loads are often several times greater in the workplace than in any other environment with adverse consequences on health.

2. The officially registered working population constitutes 60–70% of the adult male and 30–60% of the adult female population of the world. When work at home and informal work are taken into consideration the percentage is even higher. In unfavourable cases the levels and intensities of hazardous exposures may be 10 or even 1000 times greater at work than elsewhere. Workers in the highest risk industries such as mining, forestry, construction and agriculture are often at an unreasonably high risk and one-fifth to one-third may suffer occupational injury or disease annually, leading in extreme cases to high prevalences of work disability and even to premature death. Less dramatic but well-defined occupational health

problems also prevail in service and office occupations where psychological stressors and ergonomic problems often increase the workload, cause job dissatisfaction and affect health and productivity.

On the other hand, a number of studies have provided convincing evidence of a positive association between health, well-being, well-organized work and a healthy work environment where safety and health are considered and where conditions conducive to one's professional and social development are provided.

It is universally accepted and confirmed in several documents by the United Nations, The WHO Global Strategy for Health for All by the Year 2000, the International Labour Organisation (ILO) and others that every citizen of the world has a right to healthy and safe work and to a work environment that enables him or her to live a socially and economically productive life. Virtually all countries are still far from this objective, as evidenced by the high numbers of occupational accidents and diseases. Thus a new global strategy for health at work is very relevant to WHO and other organizations interested in dealing with workers' health issues. In spite of the great differences in levels of safety and health at work and the type and occurrence of occupational health problems, also a national strategy is needed in each country.

Several sectors of society are involved in or have an impact on occupational health. Intersectoral and inter-agency collaboration is thus needed between various actors, such as employers, workers, governments and expert bodies at national level. At international level more collaboration in issues of occupational health is needed between WHO and other UN organizations such as International Labour Organisation (ILO), United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP), the World Bank and nongovernmental organizations such as International Commission on Occupational Health (ICOH) and International Occupational Hygiene Association (IOHA).

According to the principles of the United Nations, WHO and ILO, every citizen of the world has a right to healthy and safe work and to a work environment that enables him or her to live a socially and economically productive life.

II The workplace and sustainable development

Workakey 3.
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In the declaration of the Rio Summit, sustainable development is defined as a strategy to “meet the needs of the present world population without causing adverse effect on health and on the environment, and without depleting or endangering the global resource base, hence without compromising the ability of future generations to meet their needs”. The Declaration further stated: “Human beings are at the centre of concern for sustainable development. They are entitled to a healthy and productive life in harmony with nature”.

In terms of occupational health, the above principles mean the satisfaction of material needs through work and other production processes without causing danger to human health, the ecosystem, the resource base or the health of the community either in the short term or the long term. Occupational health is a basic element and constitutes a social and health dimension of the principle of sustainable development.

4. Occupational health is at the centre of sustainable development in the following ways:
 - a) The prevention of occupational accidents, injuries and diseases and the protection of workers against physical and psychological overload imply a parsimonious use of resources, minimizing the unnecessary loss of human and material resources.
 - b) The objective of healthy and safe work environments call for the use of safest, low-energy, low-emission, low-waste (green) technology and in many countries occupational health legislation requires the use of the best available production technology.
 - c) The occupational health approach has been shown to facilitate the undisturbed production that increases the quality of products, productivity and process management and thus helps to avoid unnecessary loss of energy and materials and to prevent unwanted impact on the environment.
 - d) Many environmental hazards and burdens are derived from occupational settings, e.g. industry, agricultural practices or transportation and services. Experts and others responsible for occupational health and safety are well informed of processes and agents that may be hazardous to the environment and often this information is available to them at a very early stage of the problem, thus enabling primary

prevention that is no longer possible once the hazardous elements are released into the general environment. The impact of occupational health on environmental protection in the case of problems derived from production systems is likely to be both effective and cost-effective. In many industrialized countries there are moves to make closer links between occupational health and environmental health approaches.

- e) Occupational health services aim to ensure the health, safety, working capacity and well-being of the working population. A healthy, productive and well-motivated workforce is the key agent for overall socioeconomic development. Moreover, high-quality and productive work can ensure healthy production of materials, goods and services, and the consideration and practical implementation of the principles of sustainable development.
- f) Most environmental health hazards that have later been found to affect the health of the general population were first detected in the work environment and/or in the working populations. Thus the occupational environment provides an early warning system for certain environmental health hazards just as it also provides effective models for preventive action.
- g) For more than half of adults the work environment is the most demanding environment in terms of physical, chemical, ergonomic or psychological stresses and physical workload. The requirement of the Rio Declaration on healthy and productive life is particularly relevant to the work environment and calls for occupational health action.
- h) The state of the general environment and the ecosystem has an impact on the health of workers either indirectly or directly in several occupations of agriculture, mining, fishery and manufacturing. Thus, there is a two-way relationship between occupational health and safety on the one hand and environmentally sound sustainable development on the other.
- i) Equally important for personal well-being and for socioeconomic development of communities and countries is an employment policy that ensures access to work for everyone and enables individuals to sustain themselves and their families by their own work. Highest possible employment is also a key factor in the safe, stable and sustainable social development of countries while high unemployment rates and other associated problems endanger such development.

- j) Particularly in developing countries the health and well-being of the family is critically dependent on the health and productivity of its working member, thus making several members of the community dependent on the health of the worker. In a situation where organized social protection is lacking, the loss of health, life or working capacity of such a key member of the family often means a severe crisis also for the rest of the family, affecting indirectly the well-being, health and economy of communities at large and of future generations.

Occupational health is a basic element and constitutes a social and health dimension of the principle of sustainable development. Occupational health practices constitute a set of key activities for such development.

III Situation analysis for health at work and development of the global working life

Trends of global economies

5. The ultimate result of the work input of the global workforce is a total global gross domestic product (GDP) of USD 21.6 trillion per year (USD 9 160 per worker). This GDP provides the economic and material resources by which all other activities, including health and social services, training and education, research and cultural services, are sustained. In addition to these material and tangible values human **labour** is also behind most intangible assets of society such as level of education and general knowledge.

In 1990, about 6.3% of global GDP was produced by agriculture, 36.3% by industry and 57.4% by services. The shares of different sectors varied widely, however, so that the respective proportions were 3.6%, 36.9% and 59.5% in the most industrialized countries and 48.4%, 15.5% and 36.1% in the least developed countries. In the industrialized world a major part of both the workforce and the GDP is bound to services, in developing countries the greatest part of the workforce is employed in agriculture. Due to variations in the productivity of different sectors and different countries, the average GNP per capita varies by a factor of 12 between the countries with the highest income and those with the lowest. This has a major impact on the workload and standard of living of workers in different parts of

the world. In recent years industry has been re-emphasized as the sector that produces the means to support other sectors such as services. Industrial productivity is often several times higher than productivity in agriculture.

The world is still economically very diverse. In spite of distinct progress made by the economies of many developing countries, the difference between the least developed and the wealthiest countries of the world did not reduce but actually widened during the 1980s. There are many signs that this development will continue during the 1990s.

In spite of positive socioeconomic trends in some developing countries, the future development of international economies speaks for further diversification in different parts of the world and on different areas of economic activity. Along with such development, working conditions and occupational health and safety standards are at risk of becoming polarized.

Future pattern of work and development

6. International economic and trade organizations predict further diversification of various economic sectors in different parts of the world in future. This will also have an impact on occupational structures and occupational health. The main recognized trends are growing internationalization, economic integration within the regions, such as North America, Europe and South-East Asia and growing competition between the regions. Slowing economic growth is expected in the industrialized world, while 3.4–5% average annual growth is expected in the rapidly industrializing developing countries particularly in South-East Asia and China (8% growth in 1993). Also foreseen are increase of productivity of agriculture in developing countries, increase in the role of industry in the lower and upper middle-income countries, and decrease of the employment impact of industries and agriculture to the favour of the service sector in industrialized countries. However, among the least developed countries a clear regression is seen. The same is true in countries at war. Highly unstable and turbulent changes have been experienced in the recent past and are still likely to be seen in the economies of the countries of Eastern Europe, with distinct consequences on health and safety at work.

Great differences in the working conditions

7. There is a wide variation in economic structures, occupational structures conditions of work, quality of the work environment, and health status of workers in different regions of the world, different countries and different sectors of economies. There are also special occupational settings and types of enterprises, economic activities and undertakings in which work

and workplace deviate substantially from the norm. Small-scale industrial and service enterprises often have few resources, heavy workloads and multiple tasks for one worker. Work takes place in an environment that does not always meet required standards. Family members of the workers and entrepreneurs, including children, pregnant women and elderly people, share the work in small-scale enterprises, home industries, small farms in all countries and cottage industries particularly in developing countries. In such situations most workplace exposures also affect family members and, since most of the time is spent in the combined home and work environment, the period of exposure also tends to be longer than the average. It has been estimated that two-thirds of the workers of the world still work in conditions that do not meet the minimum standards set by ILO.

Because of the high prevalence of manual and heavy physical work combined with lack of coverage of general health and social protection, developing countries and the NICs have several needs if they are to develop occupational health services. These needs include the strengthening of infrastructures, training of human resources, establishment of systems for registration of occupational injuries and diseases, establishment of institutes of occupational health, and establishment and updating of legislation and standards, as well as inspection of compliance with regulations. Due consideration should also be given to general health needs and to improvement of the health of the environment in these countries.

Due to the major changes in social and economic systems in the heavily industrialized Countries of Central and Eastern Europe (CCEE), the infrastructures for occupational health have weakened during the past few years. This is a consequence of splitting the large industrial concerns with well-established in-plant services into smaller independent enterprises that are not always able to maintain the services. The need of the CCEE countries for technical assistance, consultations and training in reorganization of occupational health and safety activities has been recognized. There is also a need to strengthen preventive general health services for the working population.

New developments
at the
workplace

8. Advances in science and technology will lead to new developments in production systems. New information technologies, automation, further mechanization, new materials, growing production and use of chemicals, implementation of biotechnology on an industrial scale, low-impact processes, low-energy production and low-waste and recycling industrial strategies will have a great impact on production systems and the work environment in all parts of the economy, particularly in industrialized

countries. This process of rapid change in production structures, often called the second industrial revolution, has a profound impact on conditions of work and on occupational health as well. Ensuring health and safety of workers as well as environmental health is key to the continued development of healthy new technologies.

The second industrial revolution which results from wide implementation of new information technologies and automation, biotechnologies, new production methods and materials and the development of low-impact, low-energy and low-waste industry generally has a positive impact on occupational health and safety, particularly in industrialized countries. Some new problems of workers' health have, however, been identified. In addition, new patterns of employment and new types of work organization are seen. Ensuring health and safety in such changes is a key factor in determining their sustainability.

New developments and change in the work-force

9. Such developments have already led to major changes in global and national economies and in technologies, as well as to rapid developments in manufacturing methods, working practices, organization of work, occupational structures, job demands, job contents and occupational health and safety, and the trend will continue. While the majority (60–70%) of employees in the OECD countries had blue-collar jobs in the 1970s, by the 1990s, about 60–70% were employed in typical higher- or lower-level white-collar jobs (work in office environments). The overall impact of such developments on occupational health is likely to be positive, and exposure to many of the traditional physical, chemical, biological and mechanical hazards will be effectively prevented or controlled. At the same time, new job demands, the increased needs for processing and analyzing information, and several controlroom-like activities may increase the psychological problems of work such as mental stress. The new job content, new working methods and new equipment also place a high demand on the learning capacity of workers.

The implementation of new technologies, new demands for productivity and quality, and the need to support innovation and work motivation will lead to new types of work organization, new forms of employment, (including self-employment and subcontracting), new arrangements for hours of work, new management systems and possibilities for self-steering and participation. Due adjustment of occupational health and safety activities to these new developments is expected and there is a need to ensure workers' health in such new conditions. Such changes will make it necessary to introduce, train and educate each working individual in occu-

pational health, thus enabling him or her to contribute positively to the health of the workers and the workplace.

Technology transfer, concerns and controls

10. Technology transfer is one of the major factors behind the economic development in both the industrialized and developing countries. Such transfer may occur in several different forms; in production carried out by multinational enterprises, as a national activity carried out by foreign investors or as an import of foreign technology. If performed according to the best principles proposed by the ILO and other international bodies, such transfer can have a highly positive impact on both productivity and occupational health and safety. There are numerous examples, however, of the transfer of hazardous and obsolete technologies from industrialized countries to developing countries, to the NIC and to Eastern European countries in transition. Numerous international guidelines and conventions have been prepared by international organizations to prevent such hazardous transfer, but they are not yet effectively implemented everywhere. In particular, the transfer of unshielded dangerous machinery and hazardous chemicals and substances has been reported to have caused an increase in occupational diseases and accidents among workers in the recipient countries. Several dramatic examples show the impact of the transfer of hazardous processes and waste to developing countries. The principle of the ILO Recommendations on Multinational Enterprises, the London Guidelines on Export of Banned Chemicals and UNEP's Basle Convention on Prevention of Transboundary Transportation of Hazardous Waste stipulate that nothing that is unacceptable in the exporting country should be transferred to the importer, no matter what the legislation of the recipient country states about such a practice.

The technology transfer may have positive or negative impact on health of the workers and on health of the environment. Nothing that is unacceptable in the exporting country should be transferred to the importer, no matter what the legislation of the recipient country states about such practice.

Social pains of development

11. In many developing and NIC countries, social change is associated with a high rate of unemployment, active migration of rural people to urban areas, excessive urbanization with all its social problems and insufficient Government capacity to regulate urbanization and build up the required infrastructures for growing numbers of migrants. Workers seeking job opportunities in urban areas are often exposed to occupational and social hazards similar to those of workers in industrializing countries during the

first industrial revolution 100 years ago and with similar severe impact on health and living conditions.

Universal minimum standards are needed for health, safety and social protection of workers in all countries. In order to prevent social dumping and over-exploitation of workers who are not able to defend themselves, compliance with standards should be internationally controlled and should not be compromised for any reason.

Growing economic competition has led some countries to compete, not only in the quality and productivity of work, but also by minimizing the costs of labour by paying less than reasonable minimum wages. At the same time standards such as those for occupational health and safety may be set far below those accepted in ILO International Conventions. Breaches of human rights, exploitation of unprotected workers, use of child labour, and high risks of health and safety are the consequences of such policies. Such social dumping has been found to be a vicious circle that has a 'counterproductive impact on sustainable development. Inhumane working conditions should be prevented by adopting and implementing a universal minimum standard for health, safety and other conditions of work that cannot be compromised anywhere. International mechanisms for control of such standards should be generated. The social dimension should be included as an essential part of all international, national and local regulations and policies. Some countries require that development aid and loans, particularly for the establishment of industries and other economic activities, should be conditional on inclusion of appropriate occupational health and safety elements in such economic programmes.

Demographic trends and working conditions of the global workforce

- Global workforce
12. About 2 400 million (45%) of the total 5 400 million population of the world and 58% of the population aged 10 years or more comprise the world's workforce (Table 1). If informal work and work at home is taken into consideration the proportion of the working population is even higher. Some 1 800 million (75%) workers live and work in developing countries and about 600 million (25%) in the industrialized world. By the year 2000 almost 8 out of 10 workers will be in the developing world.

Table 1. Working populations in the world in 1990 and 2000

Region	1990	2000	Growth 1990-2000
Africa	230	302	31.3
Asia	1410	1646	16.7
Europe	380	400	5.3
South and Central America	158	199	25.9
North America	180	200	11.1
Total	2 358	2 747	16.5

Numerous demographic changes are foreseen in the working populations of both developing and industrialized countries. The absolute number of workers will increase with almost 500 million by the year 2000 and 90% of that growth will take place in developing countries. This implies the need to produce some 500 million new job opportunities for young people. In addition there is a need to employ the current 820 million unemployed or partly employed persons. Unemployment is likely to be a major problem during the remainder of the 1990s. In view of supporting an individual's management of life by his or her own action, every adult citizen of the world should be given an opportunity to sustain himself or herself and the dependents with his or her own work. The present high global rates of unemployment deviate strikingly from such an objective.

It is estimated that the global workforce will grow by 500 million by the year 2000 requiring that new job opportunities be created for young people. In addition, employment must be organized for over 800 million people who are currently unemployed. This implies that the total employment shortage will be about 1-1.3 billion jobs by the year 2000. Unemployment is likely to remain a major long-term problem with adverse effects on health, working capacity and economy.

- Unemployment, hazard to health
13. Increasing rates of unemployment are expected because of the increase in productivity as a result of technological development, new divisions of work, high population growth and economic recession in different regions. Most agricultural and manufacturing processes will become less labour-intensive, and services are not likely to absorb all the excess workforce no longer needed for primary and secondary production. Unemployment has been found to be associated with health hazards related to economic difficulties, major social problems, unfavourable lifestyles, risk behaviour and psychological problems as well as, in some instances, higher mortality. The vast majority of the new jobs are needed in developing countries. Governments should carry out policies which enable every citizen of the world to have employment that corresponds to his or her

capabilities and needs, and ensures reasonable income in healthy and safe working conditions. International economic organizations and the ILO have emphasized that the only way to respond effectively to such a vast employment challenge is the promotion of small-scale enterprises and **self-employment**.

**Aging work-
force**

14. Dynamic changes are seen in the age structures of the working **populations**. Workers aged 60 years or more comprise 5.4% and 5.0% of the **labour force** in industrialized and developing countries, respectively. Adding those aged 50-59 increases the number of older workers threefold. A gradual increase in the average age of workers will be seen during the **1990s**, particularly in the northern and Alpine areas of Europe. After the year 2000 more rapid aging of the workforce will take place also in many developing countries. In some industrialized countries the aging of the workforce and the simultaneous negative or zero growth of the population will lead to overrepresentation of the elderly and underrepresentation of the young.

**Growing
numbers of
handicapped
and chroni-
cally ill and
underserved
workers**

15. Due to growing average age of workforce and high accident rates in some countries the number of handicapped people will increase. According to the policies adopted internationally for handicapped persons the **individuals** with limitations in functional capacities have a right to participate in work provided their status of health permits it. Such individuals must be specially protected at work to avoid further loss of health and working capacity by adapting work and the work environment to their individual needs. Similarly appropriate services for rehabilitation and maintenance of their working capacity are needed. Much remains to be done to ensure equal opportunities for employment for underserved groups such as migrants, the handicapped, refugees and chronically ill workers.

The major demographic trends worldwide are the increasing average age of the workforce, growing work participation rates, growing participation of female workers, growing mobility, increasing literacy, and level of education of the workforce. There are special problems of vulnerable and underserved groups such as child workers and handicapped people whose special needs should be appropriately considered in occupational health programmes.

The growth of the older section of the workforce coupled with growing demands for better productivity will require measures to adjust working conditions to elderly workers, as well as resources to maintain and promote their health and working capacity.

Increasing female workforce

16. The average global **labour** participation rate in the formal workforce among the male workers is 73%, the respective figure for females being 43%. Female participation in the workforce varies widely from 60% in industrialized countries to about 10% in North Africa and Western Asia. The rate of female participation is expected to grow in the future. In 1985 women represented 36.5% of the worlds **labour** force. There is a growing need to develop equality at work between male and female workers as well as to ensure equal job opportunities for both genders.

Child labour – a declining but serious health problem

17. To a great extent, the occupational health needs of about 100 million child workers in the world remain still unrecognized and the physical, mental and social development of these young individuals are likely to be affected. Drop-out from schooling may result in illiteracy while hazardous exposures and heavy workload present long-term health hazards to child workers.

The number of the child workers between 10 and 14 years of age is difficult to estimate for individual countries. The numbers are declining in the industrialized countries although even there child **labour** is still used. About 5% of the workforce in developing countries are child workers, with up to 7.9% in Africa. Serious concern has recently been expressed about the unhealthy working conditions of child workers and about associated adverse effects on young people's health and physical, mental and psychosocial development.

The number of young workers (15-24 years) is declining or will show decelerating trends due to falling birth rates and longer training periods in virtually all countries (with exception of certain developing countries). The decrease in the number of young workers will become even steeper after the year 2000. In spite of this, particularly in developing countries, young people have the highest risk of unemployment that prevents them from learning work practices and in a relatively short time affects their chances of ever finding employment.

Labour migration

18. Internal and international migration of the **labour** force is expected to grow during the next decade for several reasons. Rural populations are migrating to urban areas, especially in developing countries to seek employment and a higher standard of living. The degree of urbanization is expected to grow from 71.5% in 1985 to 74.8% by the year 2000 in industrialized countries and from 3 1% to 4 1% in Africa. Such migration will cause several employment, health, housing and social problems in the urban and suburban areas of the developing world.

Economic inequalities, wars, unemployment, destruction of the environment, and hostile political pressures increase the rates of international migration and the number of refugees. This international migration is likely to increase problems for internal migrants by, for example, exacerbating the problems of housing and unemployment. Migration of young **labour** from developing countries to industrialized ones will be a particular problem between Africa and Europe and between the Central and North America. Examples of exploitation of powerless migrant and **refugee** workers and social dumping can be found in several industrialized countries.

Small-scale enterprises and self-employment

19. The most important provider of new job opportunities will be small-scale enterprises and self-employment. Several new employment patterns call for new approaches from occupational health programmes. In the absence of well developed organizations for occupational health and with a general shortage of resources, the development of health at work for persons in small-scale enterprises and for the self-employed will lie in the hands of the entrepreneurs who run those enterprises and the self-employed themselves. Several studies and practical experience show that these groups are not the most aware of the need for occupational health. Accordingly, the provision of training and information to both the entrepreneurs and the self-employed is an important step in the development of global occupational health. A number of studies by, for example, the ILO have shown that a proper occupational health programme can substantially improve not only the health of persons who work in small-scale enterprises but also the economic productivity and sustainability of the undertaking.

Informal sector

20. A major part of the workforce in developing countries and 5–10% of the workforce in industrialized countries are occupied in home industries, in small service units or as casual workers. This part of the workforce and its workplaces are difficult to define and even more difficult to cover with any kind of service or information. Occupational health hazards may, however, be highly prevalent and there may also be substantial **para-occupational** exposures among family members and neighbours. The informal sector, home industries and several new types of self-employment are expected to be important in improving the future employment situation in both developing and industrialized countries. There is a need to develop relevant occupational health services for such new enterprises and new groups of employees.

Level of education and literacy of the workforce

21. The illiteracy rate of the adult population in the world is at the moment 39%, i.e. about 960 million. As many as 95% of illiterates live in **developing** countries. The literacy rate is expected to grow worldwide to 72% by

the year 2000, though a decline is expected in Africa and in some of the least developed countries of Asia. Enrolment rates for secondary and tertiary (university) education are growing and the differences between the developing and industrialized countries will grow less. Middle-income countries in particular will increase their average levels of education, while sub-Saharan Africa and the least developed countries elsewhere will continue to suffer from a shortage of people with higher education. This in turn will create difficulties in supporting socioeconomic and technical development because the capacity to absorb modern working methods and technologies is critically dependent on the availability of well-trained experts. While the improving educational level is likely to further the development of occupational health and safety, the shortage of higher education will negatively affect the development of occupational health in the least developed countries.

Situation and trends in occupational health and safety

Exposures and hazards

22. The occupational health standards of workers and workplaces vary substantially according to economic structure, level of industrialization, developmental status, climatic conditions, and traditions in occupational health and safety. 20–50% of workers may be subject to hazardous exposures at work in industrialized countries and the rate may be even higher in the developing and newly industrialized countries. Mechanical factors and physical and chemical agents are the main problems in manufacturing industries, while pesticides, heavy physical work, organic dusts, biological factors and accidents are the occupational burdens of agricultural workers. A number of studies show that in the most unfavourable conditions 50–100% of the workers in some hazardous industries may be exposed to levels of chemical, physical or biological factors that exceed the occupational exposure limits applied in the industrialized countries.
23. Because of the numerous problems of health at work and among working people, the need for occupational health is evident in all countries (industrialized, newly industrialized or developing) including the least developed ones. The types of problems may, however, vary substantially ac-

Workplace hazards may be greater in developing and newly industrialized countries

Need of occupational health is universal

ording to the national and local needs and conditions, cultural influences, and other local factors.

Depending on the country, type of economic activity and enterprise, up to 30-40% of workers, and in some high-risk industries more than half of workers in some countries may be exposed to hazardous physical, chemical, biological or ergonomic factors that seriously exceed the exposure limits adopted for many industrialized countries. As a consequence, high proportions of workers may show adverse health effects from their workplace exposures.

Several recent surveys on psychological stress at work show increasing trends, particularly in industrialized countries. Such hazards have been shown to cause remarkable loss of health, well-being and working capacity and thus to affect the productivity, quality of working life, and economic status of individuals, companies and nations.

Traditional occupational diseases still a concern in industrialized countries

24. Even the industrialized countries – faced with an aging workforce, rapidly developing technologies, growing environmental concerns and extensive implementation of new information technologies – have to pay attention to the need to prevent occupational injuries, traditional occupational diseases caused by physical, chemical and biological factors, heavy physical work, and ergonomic problems. These problems apply increasingly, however, to smaller high-risk groups. For the majority of workers, the problems of the modern work environment⁴, such as psychological stress, new models of work organization, computerization of tasks and indoor air quality in office buildings are priority problems. The aging workforce also require the adaptation of the working methods and job demands to fit for the capacity and needs of the aging individual. The maintenance and promotion of the working capacity of elderly persons is also a priority concern in many industrialized countries.

Occupational morbidity is not recognized in many developing and rapidly industrializing countries

25. The rapidly industrializing countries still show industrial growth and often make use of technologies that are less advanced than those of industrialized countries. In such situations it may be difficult to manage all aspects of production such as, for example, health and safety at work and the health of the work environment as well as environmental health. Occupational accidents and traditional physical and ergonomic hazards and occupational diseases are an important problem and the need for further preventive and control measures is often poorly recognized. Notification and registration of such outcomes is often less developed and many of them remain unregistered. Mechanisms for prevention and control of occupa-

tional hazards are, however, less developed and many of the needs of workers' health are not met.

- In least developed countries a major part of the workforce is in agriculture
26. The least developed countries that still employ the major part (up to 80%) of the workforce in agriculture and other types of primary production face occupational health problems that are different from those experienced in the industrialized countries. Heavy physical work, often combined with heat stress, occupational accidents, pesticide poisonings, organic dusts and biological hazards will be the main causes of occupational morbidity. In the least developed countries these occupational factors are aggravated by numerous non-occupational factors such as parasitic and infectious diseases, poor hygiene and sanitation, poor nutrition, general poverty and illiteracy.
- Occupational health needs of working women
27. The special occupational health problems of working women are recognized in both the developing and industrialized countries. In the former, heavy physical work, the double work burden of job and family, less developed working methods and traditional social roles are the factors that increase the burden of female workers. In the industrialized countries, where women also have the double work burden, lower-paid manual jobs are often left to female workers. Also the design of machinery and work tools are often made according to male anthropometry although female workers use such equipments. Women may also face problems of occupational exposures that are hazardous to reproductive health. In many service occupations the female workers may be exposed to the threat of violence from clients or to sexual harassment from fellow workers. Some studies indicate a higher than average risk of unemployment among low-paid female workers which may also have negative social and health consequences on families. Equal job opportunities for women and men and equal payment for the same job are still rarely seen around the world.
- Occupational exposures occur in complex combinations
28. High numbers of physical, chemical and biological agents, as well as adverse ergonomic, physiological and psychosocial factors are found in today's work environment. Such agents and factors, individually or in several complex combinations, threaten workers' safety and health and reduce well-being and productivity. Some hazards have been well identified while some others, such as health effects of non-ionizing radiations and indoor air pollution, still need research and scientific risk assessment. Occupational health problems caused by new developments in working methods, production technology and work organization should be foreseen and assessed early enough to undertake effective preventive action. In the past few years new infectious epidemics have threatened the health of workers, particularly those in the health services. Also some old infectious **epidem-**

ics such as tuberculosis have re-emerged in many industrialized countries and continue to cause a health hazard to workers in health care.

Mechanical hazards and accident risk

29. Mechanical factors, unshielded machinery, unsafe structures at the workplace and dangerous tools are one of the most prevalent environmental hazards in both industrialized and developing countries and affect the health of a high proportion of the workforce. Hazards caused by traffic in many countries are starting to reach epidemic dimensions. For example, in Europe about 10 million occupational accidents, 25 000 fatalities and almost 150 000 fatal traffic accidents happen every year, a part of them being commuting accidents. There is a growing body of data showing that most accidents are preventable and that relatively simple measures in the work environment, working practices, safety systems and in behavioural and management practices are able to reduce accident rates even in high-risk industries by 50% or more in a relatively short period of time. On the other hand, ignorance of such precautions, particularly in sectors where production has grown rapidly, has led to increasing rates of occupational accidents. Accident prevention programmes are an important and technically feasible part of occupational health services; they are shown to have high cost-effectiveness and yield rapid results.

Major industrial hazards

30. Though less frequent, major industrial catastrophes may cause great health losses and the workers are often the first and most severely affected victims. In a large-scale catastrophe the social, environmental and economic loss is so great that it is almost impossible to calculate. Many industrial catastrophes originate from technical failure, but human factors and the factors related to occupational health and the work environment often play a role. A predictive and preventive approach at the workplace, including adequate training in emergency response, may substantially reduce the potential for such hazards and the competence and knowledge of occupational health services should be used for this purpose. By limiting the risk of major accidents at the workplace it is possible to avert their consequences on the community and the environment.

Physical factors in workplace

31. Workers may be exposed to several physical factors such as noise, vibration, ionizing and non-ionizing radiations and microclimatic conditions which are known to affect their health. Between 10% and 30% of the workforce in industrialized countries and up to 80% in developing and newly industrialized countries are exposed to such physical factors and in some high-risk sectors such as mining, manufacturing and construction all workers may be affected. Noise-induced hearing loss has been found to be one of the most prevalent occupational diseases in both developing and industrialized countries. Numerous preventive means are available, including design of low-noise technologies and work methods, noise re-

duction at the source, enclosures, isolation of noise source, protection of workers' hearing by personal protectors and, if other methods are not available, shortening of the exposure times. Similar preventive strategies have been developed for other physical factors, particularly for localized vibration and ionizing radiation.

Chemical factors 32.

About 100 000 different chemical products are in use in modern work environments and the number is growing constantly. Exposures are most prevalent in industries processing chemicals and metals, in the manufacture of several consumer goods (such as metal products and plastic boats), in the production of textiles and artificial fibres and in the construction industry. Chemicals are increasingly used in virtually all types of work, including non-industrial activities such as hospital and office work, cleaning, cosmetic and beauty services and numerous other services. The extent of exposure varies widely according to the industry, activity and the country. Fortunately only 1 500-2 000 chemicals are widely used, making assessment and management of risks easier, although not simple. Metal poisoning, solvent damage to the central nervous system and liver, pesticide poisoning, dermal and respiratory allergies, dermatoses, cancers and reproductive disorders are among the health effects of such exposures. In some countries more than half of the workers in certain high-risk industries may show clinical signs of occupational disease which also has an adverse effect on working capacity.

Biological agents 33.

Some 200 biological agents, viruses, bacteria, parasites, fungi, moulds and organic dusts have been found to occur in occupational exposures. In the industrialized countries around 15% of workers may be at risk of viral or bacterial infection, allergies and respiratory diseases. In many developing countries the number one exposure is to organic and biological agents. The Hepatitis B and Hepatitis C viruses and tuberculosis infections (particularly among health care workers), asthmas (among persons exposed to organic dust) and chronic parasitic diseases (particularly among agricultural and forestry workers) are the most common occupational diseases resulting from such exposures. The growing mobility of people from disease endemic areas to areas of low risk has increased the risk of disease, particularly to health care personnel. Immunizations can be used to control some hazards such as Hepatitis A and B, while for some others careful personal and occupational hygiene and use of personal protective devices or immunoglobulins (Hepatitis C) may be the main preventive strategy. A new occupational health problem affecting health service workers and certain other groups is the re-emergence of traditional epidemics of communicable diseases in, for example, Eastern Europe. The risk of occupational transmission of HIV to health care personnel has proved to be less probable than originally expected.

Reproduction health hazards at the workplace

34. Growing attention was paid in the 1980s to the risk from reproduction health hazards of work and workplace exposures. Some 200-300 chemicals known to be mutagenic or carcinogenic tend to have adverse effects on reproduction (including infertility in both sexes, spontaneous abortions, fetal death, teratogenesis, fetal cancer, fetotoxicity or retarded development of the fetus or the newborn). Numerous organic solvents and toxic metals are associated with adverse effects on reproduction health. Many biological agents, such as certain bacteria, viruses and zoonoses, as well as heavy physical work, are also associated with an increased risk of reproduction disorders. The reproduction hazards caused by ionizing radiation have been well established, while hazards from non-ionizing radiations are under intensive study. Both male and female workers may be affected by occupational hazards but particular concern is given to the protection of women of fertile age and during pregnancy. In addition to the conventional preventive actions of occupational health and hygiene services, special arrangements have been made in some countries to remove pregnant women from exposure that may be hazardous to the health of the mother or fetus. The modern occupational health approach considers the possibilities of primary prevention for protection of reproduction health of both genders in all stages of reproductive life of the worker.

Occupational carcinogens

35. About 300-350 different factors – chemical (e.g. benzene, chromium, nitrosamines, asbestos), physical (e.g. ultraviolet radiation, ionizing radiation) and biological (e.g. aflatoxins, tumor viruses) – have been identified as occupational carcinogens. The most common cancers resulting from occupational carcinogenic exposures are cancers of the lung, bladder, skin, mesothelium, liver, haematopoetic tissue, bone and soft connective tissue. Estimates for occupationally determined part of cancer morbidity out of the total cancer morbidity vary between 2% and 38%. Among certain occupational groups, such as asbestos sprayers, occupational cancer may be the leading factor in ill-health and mortality. Due to the special character of occupational cancer, the only effective strategy for its control is primary prevention that aims at total elimination of the exposure or at effective isolation of the worker from carcinogenic exposure.

High numbers of allergenic and fibrogenic factors at work

36. There are estimated to be about 3 000 allergenic factors in our environment, most of them occurring as occupational exposures. Allergic dermatoses are one of the most prevalent occupational diseases and can lead to incapacity for work and to the need to move the worker to another occupation. The respiratory tract, followed by the skin surface, is the most important route for hazardous agents to enter the body. This makes occupational respiratory diseases the priority problem in any occupational health programme. Occupational asthmas are caused by exposure to several or-

ganic dusts, microorganisms, bacteria, fungi and moulds, several chemicals, both organic and inorganic. The growing tendency of the population to develop an allergic response, coupled with high numbers of allergenic exposures at work and better diagnostic methods, has led to a steady growth in the registered numbers of occupational asthma cases in several industrialized countries. Again the primary prevention approach is the most important preventive strategy.

In addition to respiratory allergens, the respiratory system may also be exposed to mineral dusts that cause fibrotic responses and are often associated with an elevated risk of cancer. Pneumoconioses have been found to occur in as many as half of workers most heavily exposed to silica, coal dust or to asbestos fibers.

Heavy physical workload and ergonomic problems

37. Between 10% and 30% of the workforce in industrialized countries and between 50% and 70% in developing countries may be exposed to a heavy physical workload or to unergonomic working conditions such as lifting and moving of heavy items or repetitive manual tasks. The occupations most heavily exposed to physical workload are miners, farmers, lumberjacks, fishermen, construction workers, storage workers and health care personnel (particularly those caring for the elderly). Repetitive tasks and static muscular load are found in many industrial and service occupations. Damage to the cardiorespiratory or musculoskeletal system and traumatic injuries may be the consequence of such an overload of hazardous factors. In many industrialized countries musculoskeletal disorders are the main cause of both short-term and permanent work disability causing economic losses that may amount to 5% of the GNP. Most of the factors behind such exposures can be eliminated or minimized through design of adequate machinery and tools, and through automation, mechanization, improvement of ergonomics, better organization of work and training in appropriate work practices. In particular, the growing numbers of elderly workers and the female workforce require constant vigilance from the occupational health services to prevent hazardous ergonomic conditions and physical overload.

Stress in the workplace

38. Up to half of all workers in industrialized countries judge their work to be "mentally heavy". Psychological stress caused by time pressure and hectic work has become more prevalent during the past decade. Other work factors that may have adverse psychological effects include heavy responsibility for human or economic concerns, monotonous work or that which requires constant concentration, shift-work, work under the threat of violence as, for example, police or prison work, and isolated work. Psychological stress and overload have been associated with sleep disturbances, burn-out syndromes and depression. There is also epidemiological evi-

dence of an elevated risk of cardiovascular disorders, particularly coronary heart disease and hypertension. Severe psychological conditions (psychotraumas) may be seen among the workers involved in serious catastrophes or major accidents where human lives are threatened or lost.

Shift-work
and
irregular
work
hours

39. In many industrial and service occupations, including health services, irregular working hours and frequent shift-work are associated with several physiological and psychosocial problems that affect the health of workers and require exceptional capacity for adaptation. In some countries up to 30% of industrial workers work shifts. Adaptation to unconventional diurnal rhythms varies widely between individuals. Aging reduces capacity for adaptation and starting to work in three shifts is not recommended for anyone over 45 years of age. Insufficient adaptation of the individual to shift-work may also have an impact on safety; several major industrial catastrophes in the past decades have started during night shift. The recent studies indicate surprisingly high rates of sleeping episodes e.g. among traffic workers in the night shift.

Work psy-
chology

40. Strategies to prevent adverse psychological factors are directed towards the elimination of psychological overload and stress by modification of the work environment, work organization and, if necessary, by changing managerial systems. Prevention and control includes organization of teamwork, training and education, introduction of stress management methods for individuals at risk and psychological support from foremen, fellow-workers and psychologically competent occupational health services. Occupational psychologists also recommend increasing workers' self-determination and self-regulation as preventive strategies. In case of threat of violence, measures for eliminating the likelihood of such hazards (e.g. working in pairs instead of working alone) and provision of adequate protective structures and equipment for cases of emergency will improve worker confidence.

Places of
work and
living may
be the
same

41. Many types of work, such as seafaring, transport, and supervision of prisons may require longer shifts or longer periods to be spent at the workplace than the regular eight hours per day. In extreme cases such periods at the worksite may be several months. In such special conditions, the place of living and place of work are the same, which creates specific environmental and psychosocial problems and needs.

Such workplaces may increase in number in the future since mining, forestry and oil exploitation activities, for example, are moving increasingly to remote areas. Offshore oil and gas drilling is constantly expanding and moving further from the shore. Underwater mining may become a major source of ores in future. Research is needed on hazards and their preven-

tion and on development of occupational health services for these new and special conditions.

Occupational health vs. general environment

42. A substantial number of hazardous exposures in the general environment and in the community environment are derived from industrial activities or from other occupational systems such as transport. Limiting the spread of such exposures from the workplace limits the numbers exposed and provides effective prevention and control with reasonable costs. The working population is exposed to the hazards both in the occupational environment and in the general and community environment. In assessment of the total exposure and health risks, all types of exposure should be considered. Occupational health experts have much valuable information that should be used more effectively for prevention of environmental hazards. In some countries formal arrangements have been made to strengthen collaboration between occupational health and environmental health and even to combine these approaches both functionally and organizationally. On the other hand, some occupational health units find it difficult to expand their activities into environmental health and prefer to limit themselves to issues of workers' health.

Social aspects of work

43. Several social aspects of work may raise health concerns, for example, the gender distribution and segregation of jobs and equality at the workplace, social relationships between the managers and employees, and social support from fellow-workers are aspects of work that may enrich or reduce social contacts. In many services and public jobs the social pressure from customers, clients or the public may cause additional psychological workload. Measures for improving social aspects of work are mainly those that promote the creation of open and positive contacts at the workplace, support the individual's role and identity at work and facilitate team-work.

Working conditions, type of work, vocational and professional status and geographical location of the workplace and employment also have a profound impact on the social status and social well-being of working people. Historically, occupational health programmes have been developed hand-in-hand with the improvement of social conditions for underserved and unprivileged occupations and groups of workers. In many countries, social policy and coverage of social protection is closely linked with employment, and occupational health issues may be understood as part of the social component of collective agreements. As the mobility of workers increases and high numbers of migrant workers are found in several coun-

tries their health, well-being and social support requires special attention in which occupational health experts have a role to play.

About 100 000 chemicals, some 50 physical factors, 200 biological factors and some 20 adverse ergonomic conditions, and an identical number of physical work loads associated with incalculable numbers and types of psychological and social problems have been identified as hazardous factors or conditions of work which usually occur in combinations and have several interactions. They contribute to the risk of occupational injuries, diseases and stress reactions, job dissatisfaction and absence of well-being. Most of such problems are in principle preventable and should be prevented in view of both interest of health and well-being, but also from the economy and productivity point of view.

Injuries, diseases and outcomes

The burden of occupational diseases and accidents 44. The ILO estimates that there are 120 million occupational accidental injuries and 200 000 occupational fatalities a year worldwide. This means the average risk of accidents is 42 per 1000 workers with the risk of fatality at 8.30/100 000. The European risk averages are 25/1000 for accidents and 6.25/100 000 for fatalities. Estimation of occupational disease rates is difficult because of the shortage of data and variation in the definition of an occupational disease in different countries. Extrapolation on the basis of incidence in the well-registered European countries (3–5/1000) gives a world annual incidence of 68-157 million cases of occupational diseases, of which about 30–40% may lead to chronic disease and about 10% to permanent work disability and, according to a crude estimate, about 0.5–1% to death. As indicated by WHO, in addition to formally registered occupational diseases high numbers of work-related diseases which are partially caused by occupational factors, aggravated by work or connected with lifestyles determined by work, occur among working populations. Globally, a major part of occupational diseases go undiagnosed and unreported.

120 million accidental injuries with 200 000 fatalities and 68-157 million cases of occupational disease are estimated to occur among the global workforce annually. In high-risk occupations one-fifth of the workers may annually contract an occupational accident or disease. Most of such morbidity is, in principle, preventable with the help of the modern occupational health approach. Many cases of occupational disease, however, go underdiagnosed and underreported and preventive actions are not undertaken.

The burden of infectious diseases, poor nutrition and hygiene in developing countries

45. In addition to occupational injuries and diseases, workers in developing countries suffer several maladies due to bacterial, viral and parasitic infections, malnutrition, poor hygiene and poor sanitation. Such conditions further reduce working capacity and aggravate the effects of occupational hazards. In some of the least developed countries the average manual worker in industry or agriculture may have several chronic infections. The average calorie supply of workers in the least developed countries is lower than what is needed to perform a full day of medium-heavy work (2400/kcal/d). The silicotic lung is more prone to contract tuberculosis, and lead exposure further aggravates anaemia caused by infections and malnutrition. Effects of many chemical exposures are aggravated by the poor nutritional status of the worker.

The ultimate objective of occupational health is a healthy and productive worker, free from both occupational and non-occupational diseases. Occupational health also aims at the social and economic well-being of working people and promotes healthy, safe and motivating work and work environments. To achieve such an objective requires continuous improvement of the conditions of work and a comprehensive and multidisciplinary approach. Also the general morbidity of working populations should be considered. Particularly in developing countries and in small-scale enterprises the adoption of the primary health care approach may be needed to attain such goals.

The ultimate objective of occupational health is a healthy, safe and satisfactory work environment and a healthy, active and productive worker, free from both occupational and non-occupational diseases and capable and motivated to carry out his or her daily job by experiencing job satisfaction and developing both as a worker and as an individual.

Low-risk and high-risk jobs and workers

46. The risk of occupational disease and accident vary substantially between different occupations. For example, in Finland there is a 30-fold difference in the occupational accident risk of low-risk and high-risk occupations and a 40-fold difference in the risk of occupational disease.

Even in conventional production procedures, certain jobs are more dangerous than others. At the same time, socioeconomic characteristics and lifestyle may substantially increase the risk caused by occupational hazards. Lifestyle factors, such as tobacco smoking among asbestos-exposed workers, may substantially elevate the risk of occupational cancer. Identification of high-risk occupations and occupational groups is of great importance for focusing prevention and control and for setting priorities. Many high-risk groups consist of people of poor socioeconomic status, illiterate, earning low pay and with poor social protection. For example, migrant workers have a higher risk of occupational accidents than do workers from the host country. Migrants are not able to defend their rights or reduce their risks on their own; improvement of their health situation requires extensive and long-term commitment from the employers, authorities and health professionals.

Varying standard of health of working populations

47. The health status of the working population varies greatly according to the general health situation of the country as well as the type of work and the standard of the work environment. Remarkable variation in the health of workers can be seen between the industrialized and developing countries. There are, however, also major differences in occupational health between countries with approximately the same level of socioeconomic development, demonstrating the importance of policy choices. Each country is, however, critically dependent on a healthy workforce and its capacity to produce raw materials, goods and services effectively. It has been shown that a high standard of occupational health and safety correlates positively with the GNP per capita in all groups of countries – developing, newly industrialized and industrialized. On the other hand, loss of working capacity may cause great economic losses. Thus, hazardous working conditions are counterproductive to economic and social development, while a healthy, motivated and productive workforce in an optimal workplace is one of a country's most valuable social and economic assets. A growing body of data show that the impact of occupational health is positive not only at the level of national economy, but also at the level of economy of an individual enterprise.

A high standard of occupational health and safety correlates positively with high GNP per capita. The countries investing most in occupational health and safety show the highest productivity and strongest economy, while the countries with the lowest investment have the lowest productivity and the weakest economies. Thus, active input in occupational health and safety is associated with positive development of the economy, while low investment in occupational health and safety is disadvantage in the economic competition.

Low priority still for occupational health services in health policies

48. Despite being important for national economies, the working population has seldom obtained a priority position on the health policy agenda – either internationally or in many countries with great occupational health problems. This is so in spite of the fact that substantial economic losses are caused by health and safety hazards at work and by reduction or loss of working capacity. Such loss may amount to 10–20% of GNP in some countries. The low priority given to occupational health is all the more surprising in view of the fact that most occupational health hazards are preventable. The World Bank recently estimated that up to two thirds of occupationally determined loss of disability-adjusted life years (DALYs) can be prevented. Furthermore, besides minimizing health and economic loss by prevention and control of health hazards at work, occupational health can also improve productivity, contribute positively to the quality of products, and improve job satisfaction and work motivation. It has also been seen in developing countries where the coverage of social protection is low that the well-being of the whole family is critically dependent on the health and productivity of the working member.

Poor occupational health and reduced working capacity of workers may cause economic loss up to 10–20% of GNP. According to the World Bank estimate, two thirds of occupationally determined loss of disability-adjusted life years (DALYs) could be prevented by occupational health and safety programmes.

Emerging problems

Occupational health needs + priorities vary according to national, regional + developmental situations 4 9 . Individual occupational health problems exist in many countries at different stages of development, but their prevalence, distribution, intensity and consequences vary substantially. Accordingly, the occupational health needs and priorities of countries vary widely according to their stage of socioeconomic development, economic structure, level of technology, geography and climatic conditions, demography of the working population, and the degree of development of occupational health and safety policies and infrastructures. Different problems, therefore, are new in different countries and enterprises. For example, in the rapidly industrializing countries the growing numbers of accidents may constitute a new problem while post-industrialized countries have shown declining accident rates for years.

The changing pattern of occupational health needs in industrialized nations 50. The industrialized countries are moving to the so-called post-industrialized stage characterized by a low proportion of employment in agriculture (2.5–5%), no more than one-third in industry and the rest in services. As occupations change, work requires more mental ability, independence and a high standard of competence and skill. Traditional occupational injuries and diseases will still occur, but they will affect comparatively small **high-risk** groups. Psychological problems at work, including symptoms of stress, will be the most common occupational health problem in the industrialized countries in the latter part of the 1990s. Certain new psychosocial problems have been recognized, such as stress from threat of violence among female service workers who work alone and stress caused by social workers' incapacity to help clients.

Occupational health problems of NIC countries 5 1. The occupational health needs of the newly industrialized and rapidly industrializing countries relate to hazards such as occupational accidents, occupational diseases caused by mineral and organic dusts, chemicals, toxic metals and solvents, physical factors such as noise and vibration, and biological factors such as viruses and bacterial infections. Heavy physical workload and ergonomic problems also cause high numbers of strain injuries, musculoskeletal disorders and accidents. Traffic accidents in commuting to and from work are increasing. The prevention and control of such hazards has been successful in the industrialized countries and thus models for risk management are available. The problem is the low coverage of the occupational health and safety infrastructures and, in some instances, lack of political will, legislation, inspection, education, training, information and even awareness of the importance of occupational health and of its positive impact on socioeconomic development.

The new occupational health problems of industrialized countries tend to be associated with implementation of new technologies, new substances, psychosocial factors and the special needs of aging populations and vulnerable groups. The problems of newly industrialized countries stem from the more traditional occupational accidents and occupational diseases. In developing countries the problems of heavy physical work, pesticides and heat stress, as well as several vegetable and other organic dusts and biological hazards are of highest importance.

Growing 52.
occupational
health
needs of
developing
countries

The emerging occupational health needs of developing countries relate mainly to agriculture and other sectors of primary production. The role of the relatively small industrial manufacturing sector is vital to **socioeconomic** development. Pesticide poisonings, organic and mineral dusts, heavy physical work, heat stress, occupational accidents, industrial **chemical** and physical hazards, and ergonomic problems make up the list of priorities. Transfer of hazardous technologies and substances from industrialized countries is a problem that developing countries **cannot** solve by themselves. Effective elimination and control of such severe occupational health and safety hazards is hampered by onesidedly ambitious economic objectives, low coverage of legislation and inspection, non-existent or weak infrastructures for monitoring and services, and a universal shortage of expert manpower and institutions for occupational health. During the process of economic development, growing mechanization and **chemicalization** of agriculture and industry is expected, calling for preventive occupational health and safety actions.

Standards
of safety
vary according to
health
status +
vulnerability of
the exposed
population

53. Regulations and standards stipulating the minimum level of safety and health at work are important tools for improving working conditions since they apply to all workplaces and all employed persons. Traditionally all occupational health activities and standards have been designed according to the needs and capacities of an average healthy (male) worker of optimum working age (30-45 years). This group, though important, usually represents only about one-quarter of the total workforce. Other groups include older workers over 55 (about 20%), migrant workers (often a few per cent of the workforce), female workers (30-50% of the workforce) and in some countries child workers who may comprise a few per cent of the workforce. Up to 30% of the working population may have an **atopic** or otherwise vulnerable constitution and about 10-20% of the total **workforce** and up to 70% of older workers may have one or more chronic diseases that affect their working capacity or make them vulnerable at work. A few per cent of the workforce are permanently handicapped. Thus the

majority of the workforce deviate substantially from the 'average' and their number is growing. The special needs of vulnerable groups should always be considered in planning the work environment, working methods, workplace standards and occupational health services. The principle adopted by WHO and ILO is that each individual should be given the opportunity to participate actively in work without risk to his or her health; the principle also applies to vulnerable groups who may risk their health in conditions that may not be hazardous to the 'average' person. Such risk to the vulnerable may occur in conditions that meet the stipulated standards. Continuous vigilance is needed to monitor how conditions of work may affect vulnerable groups. Standards must reflect the need to protect such vulnerable groups and strong measures should be taken by every government to prevent discrimination against vulnerable persons in recruitment. Some governments have successfully provided specific economic incentives for employers who employ handicapped workers. The occupational health research and expert communities together with WHO Workers' Health Programme are expected to give a health-based foundation for appropriate risk assessment and standard-setting in occupational health also in view of protection the health of vulnerable groups.

According to the principles of the WHO and ILO, each individual, healthy, handicapped or chronically ill, should be given an opportunity to participate actively in work without risk to get harm to his or her health and working capacity. Such individuals should be effectively protected against discrimination at work by provision of appropriate legal and other protective measures.

Need for 54.
occupational
health
services
for small-
scale enter-
prises +
self-em-
ployed

It has already been argued that the future growth of employment will primarily be in small enterprises and self-employment. Such small-scale activities often have many advantages for occupational health and safety, but competence and awareness is not always sufficient for prevention and control of hazards in high-risk jobs. The health and economic loss caused by poor occupational health standards and a hazardous work environment may become unreasonably high for the small-scale enterprise, though this is not always clearly recognized. Providing sufficient awareness, knowledge, technology, practices and services for effective occupational health and safety programmes in small-scale enterprises is costly and technically difficult. New activities, new service provision models and new collaboration links need to be developed for this purpose. Collaboration between OHS organizations, industrial and trade associations, chambers of commerce, promotion and extension organizations, training institutions, and various professional bodies are experimented in many countries.

Need for specialized skills in occupational health services

55. Occupational health needs are becoming more specific and more complex. Such needs should be taken into consideration in designing training programmes for experts. In spite of positive developments in general health services, primary health care and specialized services, a special occupational health service with appropriate support systems, including clinical services for the diagnosis and treatment of occupational diseases, is still needed. Surveys of the occurrence of occupational diseases have clearly shown that the countries most advanced in preventive occupational health activity also record the highest numbers of occupational injuries and diseases. This finding may indicate that even higher numbers of cases occur in less developed countries but remain for the most part unrecognized and unregistered and consequently undiagnosed and untreated. Often low rates of diagnoses and reporting speak for inability of the health system to find occupational diseases and injuries.

Certain civil and military jobs are carried out in extreme environments, such as offshore oil and gas drillings, projects in remote areas and in unexplored areas or regions (tropics, space, and the ocean floor). Typical of such work is the narrow margin of safety and the high psychological, physical and social demands on workers. Knowledge, both theoretical and practical, should be systematically accumulated and documented on extreme working conditions and on human responses to such conditions. This knowledge should be evaluated and distributed to all who need it, including occupational health experts.

A 24-hour occupational health service may be needed for occupations where accommodation is on the worksite, as in offshore activities and seafaring. Availability of effective and competent occupational health services may be vitally important, not only for individual workers but also for the safety of the whole operation. Again, special models for provision of occupational health services for such activities are needed, and relevant special occupational health measures and expertise needs to be guaranteed.

- Problem of musculo-skeletal and psychological disorders
56. Work-related musculoskeletal disorders represent one of the major problems in occupational health for the 1990s and beyond. A similar large-scale need is to provide occupational health support in the prevention of psychological and psychosocial problems connected with work. In many countries such new needs call for reorientation of occupational health activities and may affect the structure, composition and training of occupational health service teams.

The occupational health approach highly cost-effective

57. In most countries occupational health is not a priority and it is not given sufficient resources to carry out the preventive, control or curative activities that are necessary. Thus, many well-known occupational exposures continue to cause a negative effect on workers' health, although prevention would have been both realistic and cost-effective. There is a bulk of convincing evidence that the occupational health approach is highly cost-effective in the prevention and control of occupational and work-related hazards and this approach should be given higher priority in national health and social policy.

Several new problems in occupational health are related to implementation of new technologies, the use of new chemicals and materials, application of new biotechnology, accidents in new production systems, new infections such as HIV, hepatitis C and other new viral and microbial diseases, the re-emergence of old epidemics such as tuberculosis, growing migration and mobility of people and workers and new types of organization of work. Numerous ergonomic problems and heavy physical workload are associated with musculoskeletal disorders, causing wide-scale loss of working capacity. The growing performance demands, time pressure and emotional workload in certain occupations (such as health care) are connected with stress symptoms and adverse health consequences.

Occupational health is a positive factor in the socio-economic development

58. The earliest possible prevention and control of preventable hazards would help minimize economic loss at national, company and individual levels and have a positive impact on the further development of work, health, productivity and quality. Occupational health is a positive factor in socio-economic development and in the development of the general well-being and quality of life of the population.

Occupational health services need to be updated

59. New types of employment and new occupational settings are being created as the result of certain types of part-time work, distant work, home work, family industries, work involving travelling and self-employment. The social protection systems, occupational health and safety services, and inspection and control systems may not cover these new workstyles or may cover them poorly. Workloads and hazards may, however, be dangerous not only for the worker but also for family members, neighbours and customers. New mechanisms for providing occupational health services for such work environments should be created and new strategies to

provide training, information and advice for such groups of workers remain to be developed.

Need for
continuous
monitoring

63. New technologies, substances and processes are being introduced to workplaces without previous experience of their potential health impact. Advance testing and assessment of hazards and risks is generally needed. Continuous monitoring of the possible occupational health effects of such new technologies should be exercised and care should be taken to introduce scientific criteria for planning of healthy and safe technologies and work environments. The capacity of occupational health experts to participate in the assessment of new technologies and in the provision of health criteria should be strengthened. For this, active research efforts are needed. Research for assessment and evaluation of various services and practical activities, including occupational health services, is also needed.

Preven-
tive
strategies
available

Preventive strategies aim at eliminating or reducing to acceptable levels the occurrence of hazardous agents and factors in the work environment, preferably at their source of generation/dissemination, secondly during their path of transmission, and lastly by protecting the worker. Specific measures include the selection of the least toxic materials, substitution of materials, substitution/modification of equipment and processes, correct operation and maintenance of processes and equipment, enclosures and closed systems, local exhausts and general ventilation, isolation of workers (e.g. by control rooms), good work practices and personal protective equipment (as a last resort). Information, training and education of workers and employers on hazards and their prevention (including on emergency response) should also be part of such strategies. In order to ensure the continued efficiency of preventive measures, environmental monitoring and health surveillance of workers, including biological monitoring whenever appropriate, should be carried out. The importance of anticipatory preventive action, by the selection of the safest and least polluting processes, equipment and materials, as well as the correct location and ergonomic design of workplaces, cannot be overemphasized.

IV A proposed Global Strategy on Occupational Health for All

Basis for the strategy

- WHO – a long tradition of occupational health work
62. The Constitution of WHO stipulates the fundamental right of all people to the highest attainable standard of health. In addition, article 2 of Chapter II of the Constitution specifies prevention of accidental injuries and the promotion of improvement of working conditions as functions of WHO. WHO has had a special programme for occupational health since 1950 and close coordination and collaboration has taken place with ILO. The Alma Ata Declaration emphasized the need to organize primary health care services (both preventive and curative) “as close as possible to where people live and work”. The Declaration emphasized that in the organization of such services, high priority should be given to the people most in need, including the working populations at high risk. In 1979 a new strategy for the further development of occupational health was launched when the World Health Assembly adopted Resolution WHA32.14 on the Comprehensive Workers’ Health Programme. In 1980, Resolution WHA33.31 encouraged countries to integrate occupational health and primary health care services to cover underserved populations, particularly in developing countries. In the same resolution a need for further development of occupational health services, training and research was emphasized.
63. Several WHO programmes and other initiatives have relevance to occupational health, the International Programme on Chemical Safety (IPCS) and its WHO element, the Programme on Chemical Safety (PCS) and the Programme for Promotion of Environmental Health (PEH), programmes on communicable diseases, non-communicable diseases and human resources development, and so on. The support of these programmes for the Workers’ Health Programme should be ensured.
- WHO General Programme of Work 1990-1995
64. The WHO VIII General Programme of Work for the Years 1990-1995 recognized the seriousness of the health problems of working populations, particularly the underserved in developing countries. So far little attention has been given to workers in agriculture, small-scale industries, construction and mining. The Programme of Work called for extension of primary health care to the underserved working populations, as well as providing guiding principles for supporting legislation for primary health care action in the workplace. But occupational health means far more than providing conventional primary health care to workers (and at the workplace). Occupational health is a preventive activity aiming at identification, assessment and control of hazardous factors at the workplace and generation of competent and effective actions to ensure a healthy work environment and

healthy workers. Such activity cannot be carried out with primary health care competence alone; specialized occupational health competence and knowledge of the real needs (e.g. knowledge on industrial and other chemicals, physical factors at work, ergonomics, safety, work psychology, occupational medicine) of the working life are needed.

The ambitious target of having at least 70% of countries develop occupational health programmes was set by the VIII General Programme of Work. To achieve this target, the WHO Workers' Health Programme in collaboration with ILO and countries called for identification and control of health hazards at work, identification of national priorities, evaluation of occupational health measures, provision of information to employers and workers, and efforts to meet the needs of high-risk groups, child workers, agricultural workers, mining and small-scale industry workers, and those working in construction and home industries. Training of both occupational health personnel and primary health care workers in issues of occupational health was also encouraged. In addition, a global data system for monitoring morbidity and mortality trends in major occupational and work-related diseases and injuries was also requested, standard guidelines were set up for data collection and reporting. Guiding principles and standards for occupational exposure limits were also anticipated. Much emphasis was given to the communication of information on occupational health between the Member States and to the development of the Network of Collaborating Centres in Occupational Health.

Most valuable information on health hazards of chemicals and on their risk assessment is produced by the IPCS in the form of Environmental Health Criteria, Health and Safety Guides and International Chemical Safety Cards. These outputs can be effectively used in occupational health programmes and should be distributed widely to occupational health experts.

The right to health and safety at work has been stipulated in the Constitution of WHO and ILO and is supported by a number of other United Nations documents. No country has so far been fully successful in achieving this objective for all workers. Thus occupational health infrastructures and programmes should be further developed in every country.

- Limited resources an obstacle
65. Though major efforts have been invested by WHO, its Regional Offices and Collaborating Centres together with Member Countries, the ambitious targets of the VIII General Programme of Work are likely to be only partly achieved. There are several reasons for this, the most evident being the extremely limited resources available from WHO for the implementation of the Workers' Health Programme and the economic constraints in most Member States. Rapid structural changes in economies and changes in the political priorities are reported by several industrialized and developing countries. For example, the alleviation of problems related to severe unemployment in the Member States have consumed many of the resources that otherwise could have been used for development. All this has happened at a time when occupational health activities are needed even more than before, particularly in countries where transition of economic systems and development of employment has been turbulent.
- The UNCED, chemical safety and environmental health targets
66. The Agenda 21 of the United Nations Conference on Environment and Development (UNCED), as well as the recommendations of the WHO Commission on Health and Environment and the European Charter on Environment and Health contain several items that directly or indirectly concern occupational health. In addition to general aspects of chemical exposures, chemical safety and risk assessment, the documents also address specific issues such as surveillance of occupational exposures, the setting of exposure limits, the epidemiology of occupational diseases in terms of the dose-response relationship between exposure and outcome, the control of toxic exposures, the prevention of occupational accidents and injuries. These recommendations are expected to guide the relevant plans and programmes of WHO and ILO up to the year 2000 and beyond. Many of the targets for occupational health and safety, chemical safety and environmental health cannot be achieved without full participation of occupational health experts.
- High priority for occupational health and safety in the European Union
67. The European Union (EU) has paid much attention to occupational health and safety in its efforts to develop the so-called social dimension of working life. A comprehensive Framework Directive (No. 391/89) on the minimum requirements for health and safety at work has been approved and has been supplemented with some 16 special directives. The EU Fourth General Programme of Work for occupational health and safety has recently been passed and is currently being implemented.
- NAFTA
68. The North American Free Trade Association (NAFTA) of the USA, Canada and Mexico has initiated a programme for occupational health and is planning to improve the collection of information, the conduction of research, and the training and education of experts, workers and employers within the framework of the new Association.

Role of
NGOs:
ICOH,
IOHA

69. The International Commission on Occupational Health (ICOH) is a non-governmental expert body in the field of occupational health. It focuses primarily on research, training and information activities among the more than 2 000 experts in occupational health in about 80 countries. ICOH has also prepared an International Code of Ethics for Occupational Health Professionals. The International Occupational Hygiene Association (IOHA) with its 20 national associations carries out respective activities in the field of occupational hygiene.

Global
OH strat-
egy
needed

70. The proposed Global Strategy on Occupational Health for All is based on the WHO Constitution, the Health for All Strategy, previous policy objectives adopted by the World Health Assembly, UNCED Agenda 21, the call for leadership and collaboration from countries and several other organizations and especially on the scientifically documented special needs regarding health at work in all parts of the world, in all sectors of the economy and in all occupations. These needs have been further aggravated by the rapid changes in economies, technologies, health and demography and should be effectively met at all levels: international, national and workplace.

The proposed Global Strategy on Occupational Health for All is based on the WHO Constitution, Health for All Strategy, previous policy objectives adopted by the World Health Assembly, the UNCED Agenda 21, the call for leadership and collaboration from countries and several other organizations and especially on the scientifically documented needs regarding health at work in all parts of the world, in all sectors of the economy and in all occupations.

Principles of occupational health and safety

Defini-
tion of
occu-
pational
health

71. Several definitions of occupational health and safety and occupational health services have been produced by professional bodies, international organizations such as WHO and ILO and national bodies and authorities. If one summarizes those definitions, occupational health is considered to be multidisciplinary activity aiming at:

- protection and promotion of the health of workers by preventing and controlling occupational diseases and accidents and by eliminating occupational factors and conditions hazardous to health and safety at work
- development and promotion of healthy and safe work, work environments and work organizations

- enhancement of physical, mental and social well-being of workers and support for the development and maintenance of their working capacity, as well as professional and social development at work
- enablement of workers to conduct socially and economically productive lives and to contribute positively to sustainable development.

Thus occupational health has gradually developed from a **monodisciplinary** risk-oriented activity to a multidisciplinary and comprehensive approach that considers individual's physical, mental and social well-being, general health and personal development.

The most successful economies have demonstrated that workplaces designed according to good principles of occupational health, safety and ergonomics are also the most sustainable and productive. Furthermore, wide experience from countries show that a healthy economy, high quality of products or services and long-term productivity are difficult to achieve in poor working conditions with workers who are exposed to health and safety hazards. The available scientific knowledge and practical experiences of enterprises and countries which have achieved the best results in the development of occupational health indicate the value of several principles. These principles are common denominators in occupational settings that have shown the best results in health, safety, social relations and economic success. Enterprises with such occupational settings are also the most stable in times of crisis.

Strategy principles for occupational health & safety

72. The following principles are found in international instruments on occupational health and safety and in the legislations of the countries with the strongest occupational health and safety traditions: avoidance of hazards (primary prevention) and use of safe technology; government responsibility; authority and competence to regulate and control working conditions; optimization of working conditions; integration of production and health and safety activities; primary responsibility of the employer or entrepreneur for health and safety at the workplace; recognition of employees' own interest in health at work; cooperation and collaboration on an equal basis: participation, right to know and transparency; continuous follow-up and development of working conditions.

The key strategy principles of international and national occupational health and safety policies are:

- 1. avoidance of hazards (primary prevention)**
- 2. safe technology**
- 3. optimization of working conditions**
- 4. integration of production and health and safety activities**
- 5. government's responsibility, authority and competence in the development and control of working conditions**
- 6. primary responsibility of the employer and entrepreneur for health and safety at the workplace**
- 7. recognition of employees' own interest in occupational health and safety**
- 8. cooperation and collaboration on an equal basis by employers and workers**
- 9. right to participate in decisions concerning one's own work**
- 10. right to know and principle of transparency**
- 11. continuous follow-up and development of occupational health and safety.**

Implementation of such principles requires appropriate legal provisions, administrative enforcement and service systems for occupational safety and health and occupational health services.

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- 73.** For occupational health services, the following functional principles are recognized; prevention and promotion; adaptation and adjustment of working conditions to the worker; rehabilitation; curative services and acute response (first aid and emergency response).

By implementing such principles occupational health serves as a catalyst for change at the workplace towards the development of better management of production and better control of hazards at work.

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- 74.** Occupational health problems are not only problems for the worker, but above all they are problems of work and the work environment. The work environment varies greatly according to type of economic activity, occupation, company and size of workplace. Geographic and climatic conditions also have a great impact on the work environment, particularly in outdoor activities such as fishing, forestry and agriculture. However, due to differences between the work environments in different countries with otherwise similar socioeconomic and climatic conditions and between different companies with similar types of production, it has been concluded that a major part (varying according to the activity and the method of esti-

mate, 50–90%) of occupational health hazards are in principle preventable. Thus, there is much room for prevention in virtually all countries and particularly in countries with lower standards of occupational health and safety.

Safety and health at work: a realistic and achievable target 75.

Many industrialized countries with the strongest traditions in occupational health and safety can show constantly declining trends of occupational accidents and traditional occupational diseases as an impact of adopting the above principles.

Some national and international industries have adopted a strategy setting zero risk as an objective in the work environment. Though not totally achievable such a strategy has stimulated programmes and actions for planning and designing the work environment and working practices according to the best available technology and principles and carrying out production according to good practices, operation and maintenance. This has led to substantial reduction of hazardous exposures at work, elimination or decrease in occupational injuries and diseases, and saving of costs by reduction of disturbed production and costs of sickness. Such experiences demonstrate that a safe and healthy work environment can be planned, constructed, organized and maintained if the best occupational health and safety standards are applied. They also demonstrate that a healthy and safe work environment is a realistic and achievable objective, a positive investment rather than a burden for economy.

Occupational health problems are not only problems of individual workers' health, but they are also problems relating to the healthiness and safety of work and the work environment, the organization of work and the management philosophy of the enterprise and workplace.

Work organization and worker participation has a positive impact on health

76. The way that work is organized, the management style, and the extent to which the worker can determine or regulate his or her work and participate in decisions about it have been shown in several studies to make a positive impact on health, prevent overload at work, counteract stress and promote work motivation and productivity. In the midst of rapid change, the need to learn new jobs and new skills requires an environment which is conducive to learning and adaptation. Effective management of such changes requires further development of the principles of right to know, transparency, openness and participation. A number of studies have shown that organizing work in this way tends to be supportive of health and well-being, provides social contacts and gives opportunity for the development of personal abilities and skills. Such an approach also aims at adjustment

of the workload and other work requirements to match the personal needs and capacities of the individual worker. This latter objective is particularly important for enabling older individuals, handicapped persons, chronically ill individuals, pregnant workers and others with special needs or vulnerability to participate in work. Meeting such multiple criteria for a “good workplace” also meets the best occupational health standards. There is also recent evidence on better management of crises caused by economic difficulties of the companies, uncertainty of jobs, and threat of unemployment in organizations which have adopted new participatory and collaborative principles as a part of organization’s management culture.

A sound scientific basis and awareness are important

77. Successful prevention requires: a) information on the causal relationship between risk factor and health outcome, b) knowledge of the mechanism of action of hazardous factors and conditions, c) knowledge of how the causal relationship can be broken, d) resources, tools and mechanisms for the implementation of preventive measures, and e) political, managerial and target group support for the preventive programme. Many of these conditions are met in the modern occupational health approach and realistic opportunities for effective prevention do prevail provided point e) can be assured. Obtaining such support requires effective information and education of several actors and decision-makers and implies a need to raise awareness on the importance of occupational health. Knowledge of mechanisms of action and of the causal relationship between exposure and outcome call for extensive research efforts. One of the leading principles in the industrialized countries and international organizations, including WHO, is that all policy and practical actions should be founded on a “sound scientific basis.

Successful prevention requires scientific knowledge of the sources, mechanisms of generation, transmission and magnitude of problems together with technical knowledge and practical skills for the prevention and control. Thus multidisciplinary expert competence and practical technical competence should collaborate.

Empowerment of the community

78. In well-organized industrial settings, local activities in occupational health are initiated at plant level by managers, foremen or workers’ representatives. In many countries such activities are institutionalized in occupational health and safety committees. Various service systems, such as in-plant occupational health services, external occupational health units or

primary health care units, may provide expert services and advice in the development of occupational health and safety. This corresponds to the community approach in public health.

In the case of small and medium-sized enterprises, the self-employed and the agricultural sector, organized service systems are rare and other approaches should be adopted. The community-based approach may be relevant by providing training, information and expert advisory support to the local actors in the community. Two major experiments have been made in this field. One is the training intervention among the small and **medium-sized** enterprises in Asia, Africa and Finland by the ILO WISE approach, in which the owners of small industries are invited to learn better management by combining the objectives for productivity, quality and occupational health and safety. Interactive group learning methods have been used and found to be successful. For planning, implementation and follow-up of such activities, advice from external experts is needed. Another experimental approach, using primary health care units for initiating local activities for occupational health, has been tried in Thailand, Malaysia, Finland and Tanzania. Special training in occupational health is needed for the staff of primary health care units in order to make the programmes something more than just the provision of general health services for people at the workplace. In particular, interventions directed towards working methods and workplace exposures require special training that differs from the type of training that primary health care staff receive.

In the **informal** sector it may be very difficult to reach the workers, entrepreneurs and the self-employed. Such groups may be reached with the help of information and training, but usually the access should be organized in connection with other activities such as agricultural extension work, small enterprise promotion programmes, family health programmes and so on. In some limited areas, such as the prevention of poisoning and the provision of first aid training, voluntary organizations and NGOs may be able to help. Some trade unions have initiated projects on women's work and work conditions in the informal sector, for example as a part of the FINNIDA-supported development collaboration programmes in India and in the countries of South-East Asia. These programmes can be used as a vehicle for occupational health programmes as well.

The awareness of politicians, the authorities, employers, workers and the general public of occupational health and safety issues should be increased by using various ways to disseminate information. This creates a basis for strengthening political will to create the prerequisites for improvement of working conditions, and thereby workers' health. A system of participation

and positive incentives would further ensure the development of health at work in all societies.

Objectives and actions

T e n o b -
jectives
for special
action are
proposed

79. Goals and objectives of occupational health are based on the WHO **definition** of health as a “state of physical, mental and social well-being” that provides the individual with an opportunity to conduct a “socially and economically productive life”. Both the WHO Health-for-All strategy and the ILO Conventions on Occupational Safety and Health (No. 155) and on Occupational Health Services (No. 161) start from the principle that occupational health and safety services should be available and are the right of each individual taking part in work, irrespective of the sector of the economy, size of the company or type of assignment. This objective covers also the self-employed, agriculture, home industries and other workplaces in the so-called informal sector, as well as workers in cooperatives and the public sector. It aims, therefore, at occupational health for all working persons everywhere.

Not only the health problems directly related to work, but also the so-called work-related diseases, problems of general health and working capacity, and the potentially positive impact of occupational health on environmental health should be considered in setting objectives for occupational health.

80. To identify occupational health hazards, to provide appropriate advice on their control and prevention, to contribute to the development of healthy and safe workplaces and to follow up and take the necessary actions for the health of workers, a comprehensive and competent occupational health service is necessary. Such a service should be available at each workplace and accessible by each worker. For this purpose, many industrialized countries have developed a special, often legislation-based system for occupational health services (OHS). Comprehensive OHS are understood as front-line services, active at the workplace, containing preventive, curative and promotive elements and using, where appropriate, the primary health care approach. OHS constitute the health component of comprehensive occupational safety and health programmes aiming at progressive development of working conditions. In their most advanced forms, comprehensive OHS focus on workers and working populations, to the work environment and its hazardous factors, exposures and structures, and work organization. Such OHS contain preventive, control, curative, treatment, rehabilitation and promotion activities for the improvement of

working conditions, protection of health and for the maintenance and promotion of working capacity.

According to the WHO Health for All principles and ILO Conventions on Occupational Safety and Health (No. 155) and on Occupational Health Services (No. 161) every worker has the right of access to occupational health and safety services, irrespective of the sector of the economy, size of the company, or type of assignment and occupation.

Implementation
of objectives

81. In line with the new strategies of the United Nations organizations, particularly WHO, and strategies adopted in many of the Member States, and in view of the constraints on financial and human resources, a global strategy on occupational health for all should be implemented as far as possible in collaboration with other relevant bodies, programmes and actors. Strategic alliances, networking, division of labour and collaboration with other units of WHO, particularly PCS/IPCS and with other organizations, particularly ILO, are of utmost importance.

To make cost-effective use of available resources, careful coordination and collaborative links with other relevant programmes will be considered by following WHO's new integrated approach for programme implementation. Full use and participation of the Network of 52 Collaborating Centres in Occupational Health is foreseen.

The following 10 objectives requiring special action are proposed as a basis for the Global Strategy on Occupational Health for All. Some of the objectives have been included in previous WHO Programmes and particularly in the VIII General Programme of Work, but either the activity is still very relevant or previous objectives have so far not been met.

It is the objective in this Strategy that, by the year 2000, the countries where trends in occupational health and safety are already positive should demonstrate a further improvement of occupational health and safety indicators, showing a reduction of the difference between levels of health and safety of low-risk and high-risk occupations and enterprises. In countries where the present trends are negative, positive development is expected, and the legal and other actions, including the development of necessary resources and infrastructures, should be taken to make such positive trend possible. All countries should show a progressive development of occupational health services with the ultimate objective of covering all workers with such services irrespective of the sector of the economy, size of company, occupation, mode of employment, or nature of self-employment.

Collaborative framework within WHO 82. The development of occupational health and safety calls for full utilization of all the expertise and knowledge found in WHO. In planning new projects in occupational health, collaboration with and participation of other units within WHO is encouraged. Also vital is clearly-defined leadership in global occupational health. This should be demonstrated by giving a high priority to occupational health and by elevating the status of OCH within the Organization and within its regular budget.

Networking 83. As the resources for activities are scarce in every country, effective networking of the existing educational, research and information resources, programmes and institutions should be fully utilized. Such networking should aim to avoid duplication of work and waste of human and financial resources, to increase motivation and to improve quick and immediate transfer of knowledge. The Network of WHO Collaborating Centres in Occupational Health offers a good model and forum for development of this collaboration.

Ethics and continuity improvement 84. Many ethical problems are encountered in the practice of occupational health and in occupational health research. These should be tackled by tripartite review of the study protocols, avoidance of perceived compromises in results, and by following faithfully generally-accepted ethical guidelines and scientific methods in all work practices. The ethical code of ICOH for occupational health personnel is a valuable guideline which should be effectively distributed to all concerned.

Continuous improvement of quality is also closely related to the ethics of occupational health. WHO should take a leadership in introducing quality management systems for occupational health.

V Global Strategy Objectives and Actions for Occupational Health for All

85. Objective 1. Strengthening of International and National Policies for Health at Work and Development of Policy Tools

Description and justification. In spite of major efforts by international organizations, individual countries, enterprises, employers' and workers' unions and NGOs, many of the previous policy objectives on occupational health have not been met and are likely to remain unmet by the year 2000. Major traditional occupational health needs still prevail among the global workforce. In addition, due to the rapid changes in economic structures, technologies and demography, new occupational health needs have appeared and should be taken into consideration in policies. In spite of the evident needs, the majority of world's workforce is still not served by competent occupational health services. The priority of occupational health should be elevated on both national and international social agendas and appropriate resources should be provided for strengthening occupational health programmes at both levels.

Actions, international

- A strong occupational health element should be included in all policy programmes and plans of WHO, including the IX General Programme of Work. The necessary financial, personnel and organizational resources should be allocated for the implementation of this element.
- WHO should provide stimuli and support for Member States in the preparation of appropriate occupational health policies and programmes by transmitting information from international experience and from other countries. This is needed particularly in the developing and newly industrialized countries and in the economies in transition.

Actions, national

National policy and programmes for the further development of occupational health should be reviewed and prepared in collaboration with gov-

ement and social partners. Without prejudicing the primary responsibility of the employer for health and safety at work, government policy, legal actions and enforcement are needed to ensure minimum levels of health and safety in all sectors of the economy, including small-scale enterprises, the informal sector, agriculture and the self-employed. Occupational health programmes should be considered integral components of socio-economic development. Guidance given by the policy documents of WHO and ILO should be used when appropriate. A national programme for developing occupational health should include:

- updating of legislation and standards
- definition and, if needed, strengthening of the role of the competent authority
- emphasis on the primary responsibility of the employer for health and safety at work
- establishment of mechanisms for tripartite collaboration between government, employers and trade unions for implementation of national occupational health programmes
- education, training and information of experts, employers and workers
- development of occupational health services
- analytical and advisory services
- research
- development and, if needed, establishment of registration systems of occupational accidents, diseases and, if possible, exposures
- action to ensure collaboration between employers and workers at workplace and enterprise level.

The national occupational health system is realized at the level of the enterprise and at the local level in the form of OHS provided by occupational health teams in collaboration with employers and workers.

86. Objective 2. Developing the Healthy Work Environment

Description and justification. Occupational health problems are to a great extent derived from hazardous factors in the work environment. In most countries, hazardous exposures and factors that have adverse effects on the health of workers are still found in high numbers of workplaces. The achievement of targets for equity in health stipulated in the WHO Health-for-All strategy requires intensive actions for better work environments in virtually every country. Most hazardous conditions at work are in principle preventable and the primary prevention approach is the most cost-effective strategy for their elimination and control. Criteria and actions for the planning and design of healthy and safe work environments that are

conducive to physical, psychological and social well-being should be considered. With guidance and support from WHO, other international organizations and professional NGOs, countries should include in their national occupational health programmes a strong element for improvement of the physical and psychological work environment by using the primary prevention approach.

Actions, international

By using international scientific and expert support, together with support from other relevant programmes within WHO and outside, WHO should produce scientifically based guidelines for primary prevention of priority occupational hazards and should generate health-based criteria, standards and guidelines for the development of healthy work environments. Full use of the outputs of IPCS should be made. Collaboration between the WHO Workers' Health Programme and professional NGOs such as the International Commission on Occupational Health (ICOH) and International Occupational Hygiene Association (IOHA) and International Ergonomic Association (IEA) is recommended.

Actions, national

Every country should carry out national surveys representative of all workplaces and occupations and examine the occurrence, distribution and levels of occupational health and safety hazards and thus identify priority problems

- Within the framework of national occupational health policy and programme, strengthened national actions should be initiated with clear objectives for reduction and prevention of priority hazards at work, such as high-risk chemical and physical exposures and unreasonable physical workload or psychological workloads that lead to severe occupational accidents and diseases.

For the establishment and planning of new work environments, health-based criteria should be given to planners, designers and builders.

<p>87. Objective 3. Development of Healthy Work Practices and Promotion of Health at Work</p>
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Description and justification. Many occupational hazards can be effectively avoided and controlled through the adoption of appropriate working practices by the worker and through providing him or her with information, tools, work organization and work aids that enable the performing of

work tasks without risk to health. This requires knowledge of health hazards at work and how to avoid them. In some instances, personal protective devices may be needed. Introduction of healthy and safe work practices requires the development, validation and distribution of guidelines, codes of practice, effective education and counselling methods.

Workers' lifestyles may have specific or general impact on their occupational health and safety and working capacity. Health education on avoiding the combined effects of lifestyle factors and occupational exposures should be effectively provided. Health promotion that introduces healthy lifestyles and supports the maintenance of such lifestyles with appropriate information, counselling and educational measures should be undertaken and should preferably be included in OHS programme. This health promotion should be directed particularly to the maintenance of the working capacity of the worker.

Actions, international

The WHO Workers' Health Programme should provide health education, information and health promotion, as well as information and training materials and model programmes for

- strengthening working capacity and providing guidance in healthy and safe working practices
- providing guidelines for general health education, information and promotion campaigns that introduce healthy lifestyles among the working population.

Actions, national

The National Occupational Health Programme should encourage occupational health institutions and experts to include health promotion as an element of occupational health programmes in enterprises. The primary responsibility for this activity should lie with OHS and, where appropriate, collaboration with other bodies active in health promotion should be considered.

Health education for the adoption of healthy and safe working practices and for avoiding lifestyles hazardous to health and working capacity should be provided to workers as an integral element of OHS. Occupational health personnel should be given training and education in health promotion to enable them to carry out these activities as a part of their occupational health practice.

88. Objective 4. Strengthening of Occupational Health Services (OHS)

Description and justification. In many developing and newly industrialized countries no more than 5–10% of the working population, and in several industrialized countries less than 20-50%, have access to competent OHS in spite of the evident needs. Yet, the emerging problems of occupational health call for the development of OHS for all workers in all sectors of the economy and in all enterprises, as well as for the self-employed. Some industrialized countries have successfully achieved this objective in accordance with ILO Convention No. 161 on Occupational Health Services and have found the programme both feasible in terms of health and sustainable from the point of view of the economy.

Modern occupational health services draw from each relevant profession, discipline or science – be it biomedical or environmental – all the required elements and integrates them into a comprehensive multidisciplinary approach aimed at the protection and promotion of workers' health through actions related both to the work environment and to the workers themselves. Disciplines relevant for OHS include occupational medicine and nursing, occupational hygiene, work physiology and physiotherapy, ergonomics, safety and work psychology.

Actions, international

WHO will include in its Workers' Health Programme a special element for the development of OHS for all working people

Guidelines for both organization and implementation of such services will be provided by WHO in collaboration with other relevant bodies.

- Special emphasis will be given to the development of OHS for **small-scale** enterprises and the self-employed, including agricultural workers.

International financial, technical and information support will be allocated through WHO Regional Offices to facilitate development of OHS at national level.

- In this action, various service provision models, including the primary health care approach, will be used where available and appropriate.

Actions, national

- Each country should include in its national occupational health policy and programme an objective and actions for the gradual development

of OHS for all workers, starting from those at highest risk and those in underserved groups.

- The preventive approach should be given the highest priority. Countries are encouraged to provide the support services and other infrastructures needed for development of multidisciplinary OHS. Due consideration should be given to the needs of OHS for the self-employed, agricultural workers, persons employed in small-scale enterprises, migrant workers and those in the informal sector. In most instances such services can be provided by primary health care units specially trained in occupational health.

89. Objective 5. Establishment of Support Services for Occupational Health

Description and justification. Effective occupational health practice requires not only the front-line OHS at enterprise and local level, but also several expert services that individual companies or workplaces may not be afforded to sustain. Expert advisory and analytical services of occupational hygienists, ergonomists, psychologists, physiologists, safety engineers, and toxicologists, among others will be needed. Many countries have organized such services in institutes of occupational health but many others rely on services provided by universities, large industries or individual consultancies. However they are organized, these support services should be available for all practitioners in OHS. In all steps of occupational health practice the principles of total quality management and continuous quality improvement should be followed.

Actions, international

- WHO should give guidance and transmit experience and, if necessary, give advice to countries on why and how to organize the expert services for occupational health.
- International collaboration between experts providing these services should be encouraged to facilitate the development of their professional expertise.
- The need for research back-up for the development of expert services should be considered by WHO and other international organizations. Systems for developing and maintaining good scientific-technical quality in all services and methods employed in occupational health activities should be ensured by collaboration with WHO and the international professional bodies.

Actions, national

- Governments and authorities responsible for occupational health should ensure the availability of expert services for OHS by guaranteeing the availability of expert institutions with the necessary capacity and manpower.
- Development of expert services should be a part of the National Programme for Occupational Health.
- The potential shortage of such experts should be considered in the planning of the training curricula and programmes for occupational health.
- A national quality assurance and quality management element should be included in occupational health programmes and appropriate training should be provided to responsible personnel.

90. Objective 6. Development of Occupational Health Standards Based on Scientific Risk Assessment

Description and justification. To ensure minimum levels of health and safety at work, standards which define the safe levels of various exposures and other conditions of work are needed. The standards also serve as references for assessment of the results of monitoring and provide guidelines for planners. In the further development of standards the high variation in workers' sensitivity to occupational exposures should be considered. The fact that many individuals are not what is considered to be "average" should be taken into account. A relevant scientific basis for setting standards should be ensured through collaboration with research organizations.

Actions, international

- WHO should continue its efforts to produce principles and scientific bases for health-based standards concerning the major occupational exposures and other conditions of work, including chemical, physical, biological and ergonomic factors. Full use of the outputs of other programmes, such as IPCS and various professional NGOs should be made.
- Guidelines should be provided on principles for the development of psychosocial quality of work.
- Research needed for setting standards should be strengthened.

- As far as appropriate and possible, WHO should facilitate and encourage international collaboration and international harmonization of standards.

Actions, national

- By using guidance and support from international organizations and relevant professional and scientific communities, each country should adopt a basic set of standards to be used as criteria for the evaluation of the occupational health and safety aspects of various exposures, including chemical, physical, biological and ergonomic factors. Where formal standards are not feasible or appropriate, guidelines and codes of practices should be prepared (e.g. on psychological factors).
- Production of standards and limit values for occupational exposures should be included as an element in national occupational health programmes.
- Collaboration with bodies responsible for occupational health and safety with employers' and workers' organizations should be ensured when standards are being set.
- Countries should collaborate in the production of a scientific basis for standards.

91. Objective 7. Development of Human Resources for Occupational Health

Description and justification. Occupational health is a broad expert activity that utilizes the basic knowledge of several other disciplines, such as medicine, chemistry, physics, toxicology, physiology, psychology and safety technology. Competent occupational health activities require appropriate training in these fields.

Many of the industrialized countries have trained sufficient numbers of occupational medical experts to provide one physician per 2 000-3 000 workers and about one nurse per 1 000-2 000 workers (with a wide range of variation). Many European countries and those of North America, as well as Australia and Japan, have established specialist or diploma curricula for occupational health and some countries require specialization or diploma as a condition for the right to carry out occupational health practices. Special training in occupational health is available for nurses in most countries.

The training of specialists other than the medical experts for the multidisciplinary occupational health team is much less systematically organized in most countries. Special curricula for occupational hygiene are available in six European countries and in the United States and Canada. WHO has defined the profile of the occupational hygienist on the basis of defined areas of knowledge in an effort to promote international harmonization of training curricula. Training of physiotherapists specialized in occupational health is also available in some countries while the special training of occupational psychologists is rare. For many Western European countries, the training of safety engineers is well organized. There is a universal shortage of both expert resources and training in developing and newly industrialized countries in the South. This is due to three main reasons:

- a) lack of effective legislation and lack of requests from authorities and employers make the employment opportunities for such experts minimal
- b) in the absence of requests, the vocational training institutions and universities have not organized and developed curricula for the training of experts in occupational health
- c) in some instances, where training is available, it is oriented to clinical occupational medicine only which, though important, does not give a full response to the needs for expertise in a preventive workplace-oriented occupational health service.

Equally important is the awareness and knowledge of managers and foremen of the key principles of occupational health because they make decisions about several aspects of work that determine health and safety. The awareness, knowledge and skills of workers and the self-employed are key factors for appropriate safety and health behaviour and for adopting safe working practices. There is a universal need for training in the basic principles of occupational health and safety for workers who need such knowledge in their everyday work and employers who decide on the organization of work and other working conditions. In such guidance the need for a multidisciplinary approach should be specially addressed.

Actions, international

- WHO should include in its Workers' Health Programme a specific element on the training of various groups of experts in occupational health.
- In collaboration with scientific communities, other international bodies such as ILO, ICOH and IOHA, and by using support from the Network of WHO Collaborating Centres in Occupational Health and relevant professional associations, WHO should prepare appropriate

guidelines for training curricula for the key expert groups in occupational health.

Where individual countries are not able to carry out appropriate training programmes at national level WHO should establish through its Network of Collaborating Centres in Occupational Health and, when appropriate, through its special programmes such as EHG, GEENET and GET NET and particularly through its Regional Offices regional and subregional training programmes for training and education of experts in occupational health.

Countries with well-established training capacities in occupational health should be encouraged to provide expert advice and support in the organization of such training programmes subregionally or bilaterally.

Actions, national

- Each country should include in its National Programme on Occupational Health an element of training of sufficient numbers of experts to implement the National Programme and to ensure sufficient personnel resources for OHS.
- Governments should ensure that the necessary elements of occupational health will be included in the basic training curricula of all who may in the future deal with occupational health issues.
- Training in occupational health should also be given in connection with vocational training and in training programmes for workers, employers and managers.
- In all training the need for a multidisciplinary approach in occupational health should be taken into consideration, ensuring involvement of occupational medicine and nursing, occupational hygiene, ergonomics and work physiology, occupational safety and other relevant fields.

<p>92. Objective 8. Establishment of Registration and Data Systems, Development of Information Services for Experts, Effective Transmission of Data, and Raising of Public Awareness through Public Information</p>
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Description and justification. Analysis of reliable data and establishment of trends in occupational health as well as recognition of priorities at national and local levels are of utmost importance both for decision-making on policies and for occupational health practices.

There should be at least one well-developed focal point with sufficient library resources and modem data systems for the country. This focal point should be linked with international information and data networks. Progressive development of national networks is currently needed to provide technically feasible and cost-effective solutions.

Occupational health practice, training, research and communication are critically dependent on an effective supply of scientific and practical information and the availability of relevant databases. Such databases and information services are needed for each country and for each occupational health team, CD-ROM technology is able to provide relevant international data banks to individual experts at a reasonable cost. Several information networks also serve experts in specific fields such as toxicology, medicine, chemistry and technology. Access to information systems for experts in each country should be taken as an objective of the national occupational health programme. Information networks can also be developed on a subregional or regional basis.

Provision of CD-ROM information services to the key institutions in each Member State is a realistic objective and could be realized through, for example, the Network of the WHO Collaborating Centres in Occupational Health and, if appropriate, in collaboration with ILO International Safety and Health Information Centre (CIS), IPCS and the International Register of Potentially Toxic Chemicals (IRPTC). Multilateral and bilateral collaboration in transmission of information and sharing of experiences between countries and institutions will be further developed by the Network.

Much progress in the prevention of occupational health hazards has been made thanks to identification of adverse health effects by epidemiological research. It has usually taken a long time before sufficient numbers of cases have been noted and properly analyzed. Because of this, control actions have often been made *post hoc*, particularly in instances where the health outcome has been uncertain or unknown. New observations are occasionally made on occupational hazards, injuries and diseases that have not been reported before or that were not known to be work-related. Preventive actions are often delayed due to the uncertainty of the etiology of the problem. Collection of reports of new cases into an international data bank may help in planning and organizing multicentre studies or studies using pooled data. Such a data bank of interesting reports of new cases could be organized within the framework of the Network of WHO Collaborating Centres in Occupational Health.

Data on the demography of working populations, on economic activities and enterprises, on occupational diseases and accidents, and on the most important exposures and outcomes such as cancer are of vital importance for carrying out occupational health activities, for analyzing trends and setting priorities for prevention and control, and for carrying out **epidemiological** and other types of research. In most countries registers of data on occupational health and safety do not cover the whole working population and are not accurate enough for practical purposes. The development of occupational and environmental data registers for each country has been recommended recently by the Second European Conference on Health and Environment and by several working groups of WHO but further efforts should be made to meet the needs of occupational health.

Awareness of the needs and objectives of occupational health among the public at large, decision-makers, politicians, employers and workers is of utmost importance for getting the necessary political decisions taken and practical actions take. Several countries have established effective information activities for public information by using journals, other written information and electronic communication media.

Actions, international

- WHO should, in collaboration with CIS/ILO and other relevant bodies, prepare guidelines for registration of occupational diseases and accidents and, if appropriate and feasible, for collection of data on other important aspects of occupational health, including priority exposures. Development of national data systems should be supported by appropriate training.
- Establishment of international data banks on new observations of occupational hazards and outcomes should be undertaken by the Network of WHO Collaborating Centres in Occupational Health.
- WHO should collaborate with CIS/ILO, IPCS and IRPTC to provide Member States with appropriate CD-ROM information systems by using the Network of WHO Collaborating Centres in Occupational Health, CIS focal points and IRPTC focal points.

Actions. national

- Each country should review its data and registration systems of occupational diseases and accidents and, if necessary, by the year 2000 develop them to cover fully the basic occupational health and safety data by taking the guidance given by international organizations. The comparability of data should be ensured by collaboration between the countries through WHO or bilaterally.

- Each **country** should, through its WHO Collaborating Centre, link into the WHO data bank of new occupational hazards and outcomes.
- Each country is encouraged to join the WHO/ILO project for a CD-ROM data bank on occupational health and safety and distribute this data to its appropriate national networks. At least one focal point with such a data bank should be found in each country by the year 1997.
- A public information element should be included in the national **programme** for occupational health and information. Media should be effectively supplied with scientific information on occupational health and safety by national research institutions and professional bodies.

93. Objective 9. Strengthening of Research

Description and justification. Research is critical to the development of occupational health administration and planning, training and education, risk identification, assessment and practice. Much support is obtained from international research centres on occupational health. Because many occupational health problems **vary** according to national circumstances and practices, and in order to ensure the effective transfer of the results of international research and practice to the national level, each country needs national research programmes in occupational health. Most industrialized countries have delegated responsibility for such research to a national institute of occupational health or to a special department of occupational health in a university. The oldest institutes of occupational health were established in the industrialized countries 50-70 years ago, while most developing countries do not have such a centre although their needs may be even more evident than those of the industrialized countries. The main tasks of such a centre are the following:

- a) to provide the **necessary** critical mass of scientific and expert human resources that can offer expert support to national programmes and transfer international knowledge into the country
- b) to provide scientific and advisory support for policy-makers and decision-makers in the development of occupational health
- c) to support and guide the development of provincial, local and company programmes in occupational health
- d) to provide research, training, **information** and service support for all involved in the development of occupational health.

While well-established in many industrialized countries, also the **experiences** of such institutions in countries such as China, India and Thailand are highly positive.

Actions, international

WHO should encourage countries to establish and strengthen the national centre of excellence for occupational health, such as the Institute of Occupational Health or other body. The centre could further facilitate the development of other centres within the country thus leading gradually to a national network.

Where needed, WHO could transmit information and experience and provide expert assistance in the establishment of national centres.

- Each centre is encouraged to join the Network of WHO Collaborating Centres in Occupational Health.

By the year 2000 all the countries that have not yet established a national centre of occupational health should have such an institution in operation and able to participate in the Network of WHO Collaborating Centres in Occupational Health.

- WHO should with help of the Network of Collaborating Centres in Occupational Health stimulate and coordinate research which has global importance in occupational health such as provision of scientific basis for standard setting and assessment of occupational health risks.

Actions, national

Each government should establish or strengthen its national centre for occupational health and, if appropriate, the network of centres.

Each country should have at least one such centre functional by the year 2000.

- Such a centre should be given the responsibility of carrying out research, information, training, and if appropriate, advisory and analytical and measurement services in support of occupational health practices.
- The national research programme for surveying the occupational health and safety situation, for developing competence and methodology in occupational health and for responding to national occupational health problems should be a part of the national occupational health programme.

Effective international collaboration in research should be ensured by collaboration with the international scientific community, including the ICOH Scientific Committees and within the context of the Network of the WHO Collaborating Centres.

94. Objective 10. Development of Collaboration in Occupational Health and with Other Activities and Services

Description and justification. Successful implementation of the proposed Global Strategy requires close collaboration between WHO/OHC and several other organizations, such as ILO, ICOH and many NGOs. Collaboration within WHO is necessary with counterparts including IPCS, the programmes for communicable and non-communicable diseases, environment and health, and health promotion, and above all with the Regional Offices.

Occupational health activities have several links with other parallel activities, such as occupational safety, environmental health and environmental protection, primary health care and specialized hospital-based health care. In certain special situations, such as emergency response, occupational health activities are expected to collaborate intensively with several other services, such as rescue groups, fire services and police. In all such collaborative links the role of occupational health experts is to provide expert knowledge on potential hazards in the work environment and their effects on the health of those exposed to them. Occupational health experts often also have much experience of the practical prevention of hazards. Collaborative arrangements with neighbouring services may vary according to the country and local conditions, but such links should always be established and maintained for the benefit of all the collaborating partners.

In developing occupational health practices for special groups, such as farmers, the self-employed, small-scale industries and home industries, collaborative links may be needed with various extension organizations, industrial associations and several types of nongovernmental voluntary organization. Such links may facilitate the implementation of occupational health programmes among economic activities that are more informal and more difficult to reach than conventional well-organized industry and service enterprises,

Actions, international

- WHO should further develop its collaboration with ILO by providing health-related input to ILO work and specifically to the joint ILO/WHO Committee on Occupational Health and to CIS/ILO. Collaboration with the International Social Security Association (ISSA) is also relevant for occupational health and related social security issues.

WHO/OCH should develop and maintain its close working relations and practical collaboration with all relevant units of WHO, including PCS/IPCS and the Programme for Promotion of Environmental Health.

WHO/OCH should maintain and develop the Network of WHO Collaborating Centres in Occupational Health and should encourage new countries to join it. A part of tasks of WHO's Workers' Health Programme and selected actions of this Global Strategy may be assigned to individual Collaborating Centres or the Network.

Collaboration with UNCED activities, and particularly with CSD and UNEP, should be further developed.

Collaboration of WHO with international NGOs, employers' confederations, trade unions, businesses, industries, environmental groups and above all with international professional bodies such as ICOH, IEA and IOHA will be further developed and strengthened.

Actions. national

- Each country should establish a focal point for WHO occupational health programmes.
- Each country should establish a national body for ensuring multisectoral collaboration in occupational health and for encouraging all relevant bodies such as other health sectors, the Ministry of Labour, environmental health groups and relevant professional bodies to participate.
- Establishment of a national network of actors in occupational health is recommended and should be supported by the WHO Collaborating Centers with information, training, education and, if necessary, services. The WHO Collaborating Centres in Occupational Health have a central role in the development of occupational health and safety at both national and international levels.

Collaboration of occupational health bodies with representatives of the national scientific community and the training and education institutions such as universities should be encouraged.

Tripartite collaboration between government, employers and trade unions in implementation of occupational health activities should be ensured by the establishment of formal links with these bodies.

Collaboration with national NGOs and professional bodies is envisaged.

Collaboration should be encouraged with extension and promotion organizations and with industrial and trade associations.

VI Partners for the implementation of the Global Strategy

95. The implementation of the proposed Global Strategy needs a widespread collaborative network to translate policy objectives into practical action. WHO/OCH should prepare an action plan in close collaboration with WHO Regional Offices. The types of action should be chosen with consideration for cost-effectiveness and optimal impact.
96. Other international organizations relevant in the field of occupational health should be invited to contribute to implementation of the objectives of the Global Strategy. For this, systematic dissemination of information, using modern electronic media should be strengthened.

Further activation of the Network of WHO Collaborating Centres is a mechanism whereby the Collaborating Centres direct their activities to support the work of WHO/WHP. The Network of WHO Collaborating Centres has committed itself to providing support in technical and scientific activities of WHP. Effective and productive networking can best be built on collaboration that has been established on the basis of the genuine interest of institutions and experts. Conducting joint research projects, carrying out training activities, or making the network fully operable requires collaboration and good coordination. The Planning Group and WHO/WHP are therefore expected to take a strong leadership role in proposing programme priorities and facilitating agreement on the division of work between the Collaborating Centres.

VII Follow-up to the implementation of the Global Strategy

97. Effective follow-up to the Global Strategy is needed. In planning the future of the WHO Workers' Health Programme, the indicators for follow-up of the strategy implementation will be developed. The follow-up data will be examined not only by WHO governing bodies but also by the Planning Group of the Workers' Health Programme and the meeting of the WHO Collaborating Centres in Occupational Health.

Evaluation is understood to be an integrated part of the planning, programming and implementation of any activity, including occupational health. Guidelines for such evaluation have been published by WHO and others. This approach to evaluation was further developed in the 1980s and 1990s to include not only the *post hoc* assessment of efficacy and effectiveness of activities but also the *ex ante* assessment of all the quality parameters of occupational health activities. The adoption of quality man-

agement principles (such as continuous quality improvement, or CQI) in all activities concerning occupational health, including the Workers' Health Programme, will be encouraged within WHO and its Network of Collaborating Centres.

Special guidance and encouragement for the evaluation of national activities in occupational health will be produced for countries through the Network of WHO Collaborating Centres.

Abbreviations

CD-ROM	Compact Disk with Read Only Memory
CCEE	Countries of Central and Eastern Europe
CIS	International Occupational Safety and Health Information Centre
CSD	Committee for Sustainable Development
DALY	Disability adjusted life year
FAO	Food and Agricultural Organization of the United Nations
FINNIDA	Finnish International Development Agency
GDP	Gross domestic product
GEENET	WHO Global Environmental Epidemiology Network
GELNET	WHO Global Environmental Library Network
GETNET	WHO Global Environmental Technology Network
GNP	Gross national product
HFA	Health for All by the Year 2000
IAEA	International Atomic Energy Agency
IARC	International Agency for Research on Cancer of the World Health Organization
ICNIRP	International Commission on Non-ionizing Radiation Protection
ICOH	International Commission on Occupational Health
ILO	International Labour Organisation
IPCS	International Programme on Chemical Safety
IRPTC	International Registry for Potentially Toxic Chemicals
NGO	Nongovernmental organization
NIC	Newly industrialized countries
OECD	Organisation for Economic Cooperation and Development
OHS	Occupational health services
PCS	Programme on Chemical Safety
PEH	Programme for the Promotion of Environmental Health
PHC	Primary Health Care
SMEs	Small and Medium-sized Enterprises
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
WI-IA	World Health Assembly
WHO	World Health Organization
WISE	Work Improvements in Small Enterprises Programme, ILO