Occupational health services
an overview
The World Health Organization is a specialized agency of the United Nations with primary responsibility for international health matters and public health. Through this Organization, which was created in 1948, the health professions of some 165 countries exchange their knowledge and experience with the aim of making possible the attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life.

The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health problems of the countries it serves. The European Region has 32 active member States, and is unique in that a large proportion of them are industrialized countries with highly advanced medical services. The European programme therefore differs from those of other regions in concentrating on the problems associated with industrial society. In its strategy for attaining the goal of "health for all by the year 2000" the Regional Office is arranging its activities in three main areas: promotion of lifestyles conducive to health; reduction of preventable conditions; and provision of care that is adequate, accessible and acceptable to all.

The Region is also characterized by the large number of languages spoken by its peoples and the resulting difficulties in disseminating information to all who may need it. The Regional Office publishes in four languages — English, French, German and Russian — and applications for rights of translation into other languages are most welcome.

\[a\] Albania, Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, Finland, France, German Democratic Republic, Federal Republic of Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Romania, San Marino, Spain, Sweden, Switzerland, Turkey, USSR, United Kingdom and Yugoslavia.
Occupational health services
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Occupational health services: an overview

(WHO regional publications. European series; No.26)

1. Occupational health services  2. Europe
I. Rantanen, Jorma        II. Title

ISBN 92 890 1117 3          WA 412
ISSN 0378-2255
Occupational health services
an overview

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During the Industrial Revolution in Europe, many reports decried the health risks at the workplace that gave rise to disease and accidents. As a result, many large industries — such as those concerned with mining, iron and steel, chemicals, textiles, metal manufacturing, and paper and pulp — organized health services for their workers. The main aims of these industrial health services were the prevention and medical treatment of occupational injuries and diseases. In some places, full medical care was provided for workers and their families.

During the late nineteenth and early twentieth centuries, legislation to protect workers against occupational injury and disease began sporadically to be introduced. The first regulations reduced working hours for women and children. In the 1920s and 1930s, legislation was broadened to cover accidents and poisoning at the workplace. Safety devices began to be built into machines, wet drilling and local exhaust ventilation were introduced to control dust in mines, and the inhalation of gases (such as carbon monoxide and nitrous oxides), metal fumes (such as lead oxide) and solvent vapours (such as benzene and trichloroethylene) was reduced.

After the Second World War, occupational health factors other than accidents and acute or chronic poisoning began to be studied, including heavy physical work, extreme thermal conditions, noise and psychosocial stress. The semi-automation of manufacturing in the 1960s and early 1970s focused concern on physically and psychologically monotonous work. In the 1970s, the emphasis shifted towards the adverse health effects of exposure to low levels of carcinogenic, mutagenic or teratogenic substances. In the 1980s, occupational health has centred largely on the biological and neuropsychological effects of chemicals and on problems caused by the rapid implementation of new technology such as computers, process automatics and video display units.

In line with industrial developments, occupational health services adjusted their goals to the changes in work, particularly those in the most industrialized countries. A concept of comprehensive occupational health emerged that dealt with all work-related factors and those related to lifestyle. The aims were now to promote the general health of workers (including their physical, mental and
social wellbeing), to protect workers against health impairment from occupational exposure to hazards, to adjust the work to the worker and to optimize working conditions. In the 1950s and 1970s, many European countries introduced legislation making occupational health services compulsory in workplaces. The coverage of the entire workforce in both industrial and nonindustrial enterprises became a goal. In some countries, the services were based on a collective agreement between employers’ and workers’ organizations. In a few countries, services remained voluntary and were left to local management and trade unions.

In addition, occupational health services were organized at large factories, and centres were established for groups of medium-size and small workplaces in the same geographical area. In some countries, special services were organized for industries with particular health and safety problems. In some countries, community health centres provided occupational health services for small workplaces in rural areas where the usual centres could not be established.

Many European countries have established occupational health institutes for research, field surveys and training. The oldest were set up in the 1910s, and the newest less than 20 years ago. These institutions train and educate occupational health staff; in many countries they also advise on the services.

Because the working population is the largest target group of general health policy and, in many ways, a key population in society at large, many countries have given high priority to occupational health services in their general health policies. As a result, these services have greatly expanded in European countries during recent decades. With this expansion has come a recognized need for close coordination with public health services.

As workers’ basic health and safety problems differ between European countries, so do priorities within occupational health services. In some countries, the services are essentially preventive, while in others full medical treatment is included. The practical solutions to workers’ health problems vary according to countries’ historical development, economic structure and organization of other related infrastructures, such as those for primary health care and occupational safety services.

In spite of these positive developments, occupational health services in the WHO European Region and its Member States are unevenly distributed. Such developments have been limited largely to the most industrialized countries of the Region and to the most developed areas of industry in these countries. Virtually all countries have difficulty organizing services for the self-employed, small industries, agriculture, and certain mobile sectors such as transportation and construction. The coverage of these insufficiently served sectors and the organization of relevant services for them are two of the most salient challenges in occupational health.

The present report provides an overview of occupational health services in the 32 Member States of the European Region, based on sources that include a survey carried out by the WHO Regional Office for Europe. The report also summarizes trends and future problems, and briefly discusses guidance from international organizations on the development of services.
A special note of appreciation is extended to Professor Sven Forssman, who was initially involved in the survey and prepared the draft report, and to Professor Jorma Rantanen, whose dedication was crucial in preparing this report.

The Regional Office welcomes comments and criticism from readers to assist in the further development of occupational health services.

J.E. Asvall
WHO Regional Director
for Europe
Introduction

In the European Region, the working population numbers about 350 million, or about 43% of the inhabitants. In 1982, the number of labour accidents in Europe was estimated at 10.6 million, of which 21 000 resulted in fatalities. If the regionwide risk of contracting an occupational disease is on average the same as in some European countries with reliable registration, there is a total of about 650 000 cases of occupational disease per year (1).

Role of occupational health services

The shift from expanding to intensive production, a consequence of new structures in world economics, is dynamically changing working life in Europe. This change involves an active adaptation to new divisions of work, growing economic integration within the Region and the rapid implementation of new technology. While industrialization is relatively recent in some countries in the Region, the post-industrial stage has begun in others. These developments have a profound impact on working conditions, on the types of industry and occupation in the Region, on the content of jobs and the organization of work, and on the nature, occurrence and seriousness of health hazards at the workplace.

During the past 15 years, economic constraints have slowed the development of health services. High cost-effectiveness is now demanded in each activity. The efficient use of available resources is increasingly important as occupational health services tackle a broadening range of problems. Such services must be able to solve the traditional problems of various industries and agriculture, as well as to meet the challenges posed by new information technology, highly reactive chemical substances and kinds of physical energy (such as laser beams and certain kinds of electromagnetic radiation). This range implies an expansion of scope, a need for greater competence and, inevitably, the adoption of a multidisciplinary approach to services. The services have accumulated much experience in the prevention of specific work-derived
hazards. This experience can help other health sectors to develop successful preventive programmes.

Profound social changes parallel the changes in the structure of industries and the content of jobs. Attitudes towards work are changing, new value systems are evolving, and interest in self-determination is growing among workers, particularly the young. In addition, economic integration and current trends in international trade substantially increase workers' mobility. This mobility will enable people to compare working conditions and the availability and quality of services in different countries. In addition, about 15 million migrants live in the WHO European Region. The awareness of current trends in occupational health is thus likely to increase within the Region, perhaps leading to demands to harmonize working conditions in different parts of it. Consequently, workers are increasingly eager to participate in decisions about the structure and organization of their work, as well as, for example, the quality and content of the occupational health services provided. All these trends are reflected in the new legislation on services in a number of countries and in agreements between employers and trade unions in various industries.

Today, occupational health services must be able to respond effectively to new problems and to reshape the type and, if necessary, the structure of services. The present report gives an overview of occupational health services in European countries in the mid-1980s and describes how such services develop according to the needs identified by the countries. It summarizes several of the most common features of the services in Europe and briefly analyses the similarities and differences between the countries surveyed. Detailed country analyses, based on Member States' replies to a questionnaire from the WHO Regional Office for Europe, provide the foundation for this review. 

Background of the survey

This report is based on a survey of 32 Member States by the WHO Regional Office for Europe that began in 1983 and was completed in 1985. The report is far from complete, owing to variations in both the administration of the services in countries and the format of replies. Information was collected from the countries' replies and from recent publications (2–8) describing occupational health services in 21 countries. Part of the information given in the country replies was updated on the basis of these publications. When data were contradictory, official replies or other official documents were used as the principal source of information. Nevertheless, considerable gaps in the information remain, making specific aspects of occupational health services in

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*a The country reports are presented in a separate volume, *Occupational health services: country reports*. Copies of this document can be obtained from the Occupational Health unit, WHO Regional Office for Europe, Scherfigsvej 8, DK-2100 Copenhagen Ø.
individual countries difficult to compare, particularly quantitatively. The survey clearly indicated the need to develop statistical and recording systems for these services in countries. Further, occupational health services in Europe are difficult to characterize as an entity because they vary remarkably widely between and within countries. The defects and weaknesses in this report can to a certain extent be eliminated in later editions, when the method of survey has been assessed on the basis of experience from this study.

The survey had a number of objectives:

- to obtain information on the general development of occupational health services in Europe;
- to identify the basic principles and legislation guiding this development;
- to analyse the objectives of the services;
- to identify new functions and activities for them;
- to describe their organizational patterns;
- to examine their coverage; and
- to analyse personnel and training programmes in occupational health.

In addition, an inventory of support institutions was undertaken and coordination with other health services was analysed. The survey also considered the main problems faced by occupational health services and trends in their development in Member States.

Several factors limited the interpretation and applicability of the survey. Because all the necessary data are not compiled in all countries, the survey is very general. In addition, a general problem in carrying out such a cross-sectional study is that the data quickly become outdated, owing to rapid developments in working life and, accordingly, occupational health services. A third problem was the absence of a reference or model occupational health service towards which all Member States should move.

Nevertheless, the survey shows interesting similarities and differences in the legislative basis, functions, activities, organizational patterns and human resources of occupational health services. A knowledge of these similarities and differences may help the reader to understand more easily the trends in the development of services in different parts of the Region and their characteristics in various countries. This report is by no means a scientific evaluation of occupational health services in Europe; it is merely a description based on information provided by countries. Nevertheless, it is the first regional survey of occupational health services.

In practice, occupational health services are multisectoral; they are formally linked to ministries responsible for health, labour, social security and sometimes environment. In addition, social partners have traditionally taken

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Social partners represent organizations of employers and workers and take part in collective bargaining (between government, employers and workers or between employers and workers only) or other decision-making on issues of working life.
part in decisions on developing legislation, on making collective agreements and on implementing occupational health services. The authorities with the principal responsibility for the development, administration and inspection of services vary between countries. Therefore, the bodies and interest groups involved in decision-making, implementation, and follow-up and evaluation are numerous and in principle heterogeneous. Occupational health services are traditionally and substantively multidisciplinary. They depend on the knowledge and skills of health experts, occupational health physicians and nurses, industrial hygienists, physiotherapists, psychologists and engineers. This characteristic separates occupational health services in many respects from general health services.

The involvement of a number of sectors and disciplines in occupational health services makes even a survey a complex task: drawing a complete picture of a system requires thorough consultation with all concerned bodies. Thus, depending on the interest groups interviewed, opinions on the strengths, weaknesses and problems of the services, and aspirations for them may vary widely even within a country. This variation may influence the assessment of the overall status of the services.

Most Member States cover occupational health services in their legislation. Clearly, the services are a priority in government policy, but their implementation may vary greatly. Keen interest in occupational health services was demonstrated by the fact that all 32 Member States responded to the survey by sending all available data to the WHO Regional Office for Europe. Further support came from a survey of the International Labour Office (ILO). In 1983 and 1984, ILO surveyed its member countries on the structure and content of an international convention on occupational health services; 76 countries replied, including 21 in Europe. Most favoured such a convention (9–11). At the International Labour Conference in 1985, more than 90% of votes favoured a convention, which indicates strong support for occupational health services in Europe, as well as worldwide. Further, in discussions on the WHO regional targets for health for all (12), Member States gave high priority to reducing preventable ill health in the working environment, which implicitly means the development of occupational health services.
Legislative basis

Occupational health services may be either mandatory or voluntary. In 26 of the 32 countries of the Region, they are statutory: legislation requires the organization of services for employees. In Ireland, Luxembourg, Malta, San Marino, Switzerland and the United Kingdom, the organization of services is voluntary. Even these countries, however, have legal provisions on the health examination of workers exposed to specific hazards, such as asbestos and benzene, and of vulnerable workers, such as women.

Occupational health services may be covered by specific legislation or included in general health or occupational safety and health legislation. In 12 countries, the services are covered in legislation on labour, occupational safety and health, the work environment or other related issues. In 10 countries, services are organized on the basis of health legislation. Other countries have provisions in both labour and health legislation, or specific acts covering occupational health services. In general, eastern European countries include stipulations for occupational health services in their labour codes and health legislation. In contrast, many of the western European countries have organized their services on the basis of labour legislation alone.

Besides legislation, collective or other agreements give social partners varying powers to regulate the development and activities of occupational health services. This pattern is particularly important in Finland, the Federal Republic of Germany, Israel, Norway and Sweden.

The structure of legal provisions varies widely. At one end of the spectrum is a relatively detailed legislative structure, complemented by lower-level regulations detailing both the substance and operation of occupational health services (as is the case in France and the Federal Republic of Germany). At the other end is what is called frame legislation, giving only the basic principles of the services. An alternative model gives general obligations in legislation on occupational health and safety; specific and detailed provisions are made in lower-level regulations by the control authorities (as is the case in Denmark, the German Democratic Republic and Hungary). The most recent legislation (in Finland, Italy and Sweden) indicates a trend towards the relatively general frame legislation, leaving the implementation to individual undertakings and
interest groups or to local authorities, guided by instructions or guidelines issued by the competent authorities.

Further, the identity of the sector of government responsible for occupational health services has some impact on the activities undertaken. Services developed under the leadership of ministries of health have adopted a comprehensive approach that deals with, in addition to specific occupational health problems, the overall health of the workers, including work-related diseases, lifestyle factors and health promotion. Services controlled by ministries of labour deal with more specifically work-related problems.

The regional trend in legislation on occupational health services during the past 10 years has been the expansion of services from traditional manufacturing, to cover all workers in all industries (large or small), service occupations and the public sector, as well as the self-employed (including agricultural workers).
Official agencies for administration and implementation

A country's legislation and traditions determine the agencies responsible for the administration of its occupational health services, and thus the status and functions of these agencies. In Sweden, government authorities promote the services, while employers and trade unions implement them. The authorities in France and the German Democratic Republic give detailed instructions on implementation; those in the Federal Republic of Germany and the United Kingdom make occupational health inspections and provide advisory services. Employers' associations in the Federal Republic of Germany also have these functions.

In countries whose occupational health services are covered by labour legislation (such as Belgium, Denmark, France, the Federal Republic of Germany, Portugal, Spain and Sweden), the control authority is the labour ministry or the body supervising occupational safety and health activities. In countries whose services are covered by health legislation (such as Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary and Italy), the responsible authority is the health ministry. In Finland, Iceland and Norway, the labour and health administrations share responsibilities. The labour authorities control employers' compliance with the legislation, and the health authorities supervise occupational health personnel and control the medical aspects of the activity. The labour authorities consult health authorities on occupational health issues in Sweden. Regardless of the identity of the supervisory body, most countries have a special unit for the administration of the services, with personnel qualified in occupational health.

Occupational health services are multisectoral, involving ministries of health, labour, industry and agriculture, and interest groups such as employers and workers. For this reason the responsible agencies in some countries (Denmark, Finland, Italy, the Netherlands, Sweden and the United Kingdom) have organized bodies to advise on the services. These groups comprise representatives of the authorities involved (particularly those responsible for labour, health and social security), the employers and trade unions, and experts in various fields. The advisory body in Finland includes representatives of the associations of occupational health physicians and nurses (who do the practical
work) and of the municipalities (which are largely responsible for providing services).

The organizational and administrative duties of the control authorities at the national or provincial level vary greatly. In the eastern European countries, Belgium, France, the Federal Republic of Germany and the United Kingdom, strong national authorities within the ministries of labour or health supervise occupational health services; workplace organizations or local communities do this job in Italy, Sweden and Yugoslavia.

The responsibility for implementing occupational health services in localities and undertakings also varies between countries. Although the legislation usually gives this duty to the employer, the model of implementation varies both between and within countries.

In Finland, the Netherlands, Norway and Sweden, for example, joint occupational health and safety committees or similar organs in large undertakings have a substantial role in decisions on implementation. In Sweden, such committees appoint occupational health personnel.

Participation in and the control of services are handled differently in small or medium-size undertakings. In Sweden, for example, smaller industries help to steer service activities with the assistance of regional joint committees. A single external unit may serve as many as 300 small undertakings, which do not have joint occupational health and safety committees. These units choose their own personnel. In eastern European countries such as the German Democratic Republic and Hungary, occupational health personnel are employed by the national health service, not the undertaking where they work. This approach is intended to ensure the independence of these personnel from employers and workers. In Italy, legal provisions specify that assessments of a person's fitness to work or of an illness due to occupational disease or accident must be carried out by a public institution independent of the employer. This principle is implemented by the delegation of occupational health services to local health centres.

The most interesting organizational developments in the past few years have taken place in Italy and Yugoslavia. In Italy, public health legislation passed in 1978 transferred the responsibility for occupational health services from the ministry responsible for labour to the local health authorities, which must not only provide services but inspect the conditions and environment at the workplace. This legislation has stimulated local governments to organize more than 400 occupational health centres, particularly in the most industrialized parts of the country. Yugoslavia has developed a new organizational model. The organization of all health services, including those for occupational health, is the responsibility of local communities. The consumers of services (industries and workers) and the providers of services (health institutions and health experts), with a minimum of involvement from higher level authorities, make their own decisions on implementing and developing health services. Funding is derived from local taxes.

Although the possible impact of administrative systems on the characteristics of occupational health services cannot be assessed from the survey, some general conclusions can be drawn. In general, the administration, control, and
development of services (as well as workers' participation in them) have been
effective in large undertakings, industrial and nonindustrial. Such undertakings
can establish in-plant units, usually staffed by multidisciplinary teams of full-
time experts. The interest of the undertakings, trade unions, management or
joint occupational health and safety committees provides the driving force for
service development.

In all European countries, as elsewhere, organizing services for small
industries, mobile workplaces, agriculture and the self-employed has been dif-
ficult. The problems arise because the undertakings to be served are less
organized and in a weaker economic position. There is little occupational
health activity, and the undertakings are numerous, suffer from widely different
problems, and have a low level of awareness of occupational health and safety.
In most countries, undertakings with fewer than 20 employees do not organize
occupational health and safety committees or have workers' safety representa-
tives. The lack of internal driving forces puts much more responsibility for the
development of services on external units and the responsible authorities. The
results of experiments in Finland, Italy, Norway, Sweden and Yugoslavia on
organizing occupational health services for small undertakings, construction
and the self-employed will be highly interesting for the whole Region.
Objectives

When occupational health services began 100 years ago, there was no internationally accepted definition of them or their objectives. The concepts developed from the practical needs arising from industrialization. After the Second World War, ILO and WHO made the first international attempts to define occupational health services. Because of the crucial role played by these two international organizations in the development of these services, their guidance at international and national level is described. Guidance from the Commission of the European Communities (CEC) is also included.

Guidance from WHO

Overall policy
The first WHO programme on occupational health was designed in 1950, just two years after the Organization was established (13). WHO joined with ILO to form the Joint ILO/WHO Committee on Industrial Hygiene. In the 1960s and most of the 1970s, the WHO occupational health strategy focused on scientific and technical aspects of occupational health services, such as the effects and control of toxic metals and vegetable dusts, the early diagnosis of occupational diseases, and training and education in occupational health.

During the past 10 years, the WHO occupational health strategy has been tightly connected to its global strategy for health for all (14). A new strategy for the further development of occupational health services was adopted in 1979, when World Health Assembly resolution WHA32.14 (15) on the proposed comprehensive workers' health programme referred to the most important goal of the Declaration of Alma-Ata (16): the need to organize primary health care services "as close as possible to where people live and work". The Declaration also states 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. Further, the primary health care approach is said to involve, in addition to the health sector, all related sectors, particularly agriculture, animal husbandry and
the food industry (16). Attaining the goal of health for all also requires the resources of industry and other economic sectors. In 1980, World Health Assembly resolution WHA33.31 (15) repeated the need for "a new perspective integrating occupational health in the primary health care of underserved working populations, particularly in the developing countries". In addition, the Assembly stressed that setting and implementing strategies for health for all required the promotion of occupational health services and the strengthening of institutional training and research.

The WHO Eighth General Programme of Work (17), covering 1990–1995, includes all these points and sets the following overall goal. By 1995, at least 70% of countries should have developed "occupational health programmes to meet the health needs of workers at their places of work or in nearby health facilities, based on appropriate technology and workers' participation". The occupational health needs of developing countries and underserved populations are priorities. The means for attaining these goals include: the collection of data at national level on workers' morbidity and working conditions, the identification of priority risks and hazards, the training and education of occupational health personnel, workers and employers, and the development of occupational health institutions.

The overall strategy of WHO clearly recognizes the value of occupational health services in putting health for all strategies into practice. The advantages of this approach — in carrying out preventive activities, reaching high-risk working populations and introducing the general principles of primary health care through health services provided at workplaces — are appreciated.

The WHO global strategy for health for all has paid much attention to the health needs of underserved working populations, such as those in agriculture and small industry, the self-employed and vulnerable groups such as children, women and the elderly. These groups frequently have health problems related to work. Occupational health services for them may be either nonexistent or poorly developed, particularly in the newly industrialized and developing countries, as well as in some areas of Europe. WHO has responded to the problems of these groups by developing occupational health services as a part of primary health care. This integration requires better coordination between occupational and national health service systems (as well as occupational safety and other labour services), and appropriate training for health personnel, employers and workers. The strategy also emphasizes the need to strengthen the preventive activities of services in all Member States.

Since 1979, the principles of health for all have been incorporated into medium-term programmes under the WHO workers' health programme. These programmes are currently implemented at global level as an integral part of the health for all strategy. WHO regional offices have created programmes to meet regional needs.

During the past 10 years, the workers' health programme has focused on:

— prevention
— consideration of workers' total health
— collaboration and integration with primary health care
integration with other elements of the global strategy for health for all.

On the basis of these strategy decisions, the workers' health programme is to develop:

- workers' health programmes at the national level
- occupational health technology
- human resources in occupational health
- coordination and collaboration between occupational health services and other sectors.

At the regional level, the Eighth General Programme of Work \(17\) emphasizes the need to produce guidelines and principles to meet the particular needs of Member States. WHO will support the adaptation and use of appropriate technology for the prevention of occupational diseases and the improvement of the work environment. WHO will also foster intersectoral collaboration between health and labour ministries and other concerned sectors and promote the exchange of experience among the countries of its six regions.

**European programme for workers' health**

With its high industrialization, the European Region has somewhat different occupational health needs than regions consisting mainly of newly industrialized and developing countries. This difference is reflected even in the definition of the goals of occupational health services. In Europe in 1980, the WHO Working Group on Evaluation of Occupational Health and Industrial Hygiene Services \(18\) defined the ultimate goal of such services as:

promoting conditions at work that guarantee the highest degree of quality of working life by:

- protecting workers' health;
- enhancing their physical, mental and social wellbeing; and
- preventing ill health and accidents.

The Working Group added that, "to achieve this goal, medical, industrial hygiene, and related expertise is required".

This definition reflects the European trend towards prevention in the development of occupational health services by using a multidisciplinary approach. Occupational health is understood to be comprehensive; it includes specific actions for preventing and controlling occupational diseases and injuries, as well as elements for improving workers' general health.

In 1984, the thirty-fourth session of the Regional Committee for Europe adopted 38 targets for implementing the regional strategy for health for all \(12\). Many targets are closely related to occupational health \(19\), and two are central to occupational health activities: target 25 on the working environment and target 11 on accidents.

Target 25 \(12\) states that: "By 1995, people of the Region should be effectively protected against work-related health risks". It has four objectives \(20\):
— to support Member States in the development of comprehensive occupational health and industrial hygiene services, which also cover the needs of vulnerable and high-risk groups and are integrated with the overall health care system;

— to support Member States in improving the surveillance of workers' health and the reporting of occupational hazards;

— to develop measures for risk prevention and health promotion for workers; and

— to develop education and training programmes in occupational health.

Target 11 is concerned in part with occupational health, and has also been considered in the occupational health programme of the Regional Office. Target 11 states (12) that: "By the year 2000, deaths from accidents in the Region should be reduced by at least 25% through an intensified effort to reduce traffic, home and occupational accidents". This target, too, has objectives (20) relevant to occupational health services:

— to develop multidisciplinary and intersectoral policies on the prevention of accidents of all types (road, home, occupational and poisoning);

— to collect and disseminate comprehensive information support for accident control programmes;

— to improve information on behavioural, health and environmental factors affecting accident risk, especially with regard to high-risk and vulnerable groups, in order to develop primary and secondary safety measures;

— to adopt a comprehensive approach to education for safety; and

— to enhance national preparedness for health aspects of disasters and major accidents of all types in all Member States.

To achieve these objectives, numerous desired results have been defined and activities for producing them initiated.

Guidance from ILO

In 1950, the Joint ILO/WHO Committee on Industrial Hygiene issued the first international definition of occupational health (21):

Occupational health should aim at: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused
by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological equipment and, to summarise: the adaptation of work to man and of each man to his job.

Based on the discussions of the committee and the tripartite committee (representing governments, employers and workers) that met during the Forty-third Session of the International Labour Conference, ILO adopted Recommendation 112 on occupational health services in 1959 (22). An occupational health service was defined as:

... a service established in or near a place of employment for the purposes of —

(a) protecting the workers against any health hazard which may arise out of their work or the conditions in which it is carried on;

(b) contributing towards the workers' physical and mental adjustment, in particular by the adaptation of the work to the workers and their assignment to jobs for which they are suited; and

(c) contributing to the establishment and maintenance of the highest possible degree of physical and mental well-being of the workers.

In brief, this Recommendation considers occupational health services as those provided at or near the workplace. They are preventive in content and aim to adapt the work to the worker and to consider workers' overall health.

In 1985, ILO adopted a new international instrument, the Convention Concerning Occupational Health Services and its supplementary Recommendation 171 (23). The Convention uses the following definition:

(a) the term "occupational health services" means services entrusted with essentially preventive functions and responsible for advising the employer, the workers and their representatives in the undertaking on —

(i) the requirements for establishing and maintaining a safe and healthy working environment which will facilitate optimal physical and mental health in relation to work;

(ii) the adaptation of work to the capabilities of workers in the light of their state of physical and mental health.

The Convention also emphasizes the importance of a multidisciplinary approach and multisectoral collaboration.

This definition also stresses the preventive orientation of occupational health services, the enhancement of workers' physical and mental health through measures directed towards the work environment, and the adaptation of work to the worker. ILO member countries are to organize such services for all workers, starting with those at highest risk. A wide variety of essentially preventive activities aimed at the work environment, workers and the management of the workplace are included in the provisions concerning the functions of the services.
These functions comprise the following (23):

- the identification and assessment of risks from health hazards;
- surveillance of the working environment and workers’ health;
- advice on planning and organizing work, on programmes for improving working practices and facilities, on occupational health, safety, hygiene and ergonomics, and on individual and collective protective equipment;
- the promotion of the adaptation of work to the worker;
- the provision of information and training in occupational health;
- the organization of first aid; and
- the analysis of occupational accidents and diseases.

ILO Recommendation 171 (23) includes curative health care and the provision of general primary health care services as parts of occupational health services. This approach is particularly recommended in instances when the provision of such services by other sectors is neither feasible nor appropriate.

Guidance from CEC

In 1980, CEC issued a directive on the protection of workers from risks related to exposure to chemical, physical and biological agents at work (24). This directive contains general principles for the prevention of health hazards at work and provides, for example, for health examinations of people exposed to hazards at work and for adequate information on health risks at work. Other directives have already been passed or are under preparation that have or will have a direct impact on occupational health services. These directives cover such topics as exposure limit values for vinyl chloride monomer, lead and asbestos.

Objectives as principles

On the basis of guidance by the international organizations, the overall objectives of occupational health services are embodied in five principles, whose terminology is derived from that used to discuss health for all (25):

- protecting workers’ health against hazards at work (the protection and prevention principle);
- adapting work and the work environment to the capabilities of workers (the adaptation principle);
- enhancing the physical, mental and social wellbeing of workers (the health promotion principle);
— minimizing the consequences of occupational hazards, accidents and injuries, and occupational and work-related diseases (the cure and rehabilitation principle);

— providing general health care services for workers and their families, both curative and preventive, at the workplace or from nearby facilities (the general primary health care principle).

These principles are implemented in various ways in the practical activities undertaken in countries.

Countries' definitions of objectives
The Member States of the Region gave widely differing descriptions of the objectives of their occupational health services. Some gave relatively general answers, barely in accordance with the purpose of the questions, and some combined the replies to the questions on objectives and activities, thus defining the first through the second.

All countries, however, mentioned the prevention of occupational health hazards as the most important objective, and some countries' legislation includes the word protection. No country considered occupational health services to be merely corrective, that is, only treating the consequences of occupational hazards (although these are still considered to be important functions). Fifteen countries define the services as essentially preventive. There are limited or no therapeutic activities, except first aid, in Belgium, France, Luxembourg, Monaco and San Marino. Some countries have no specific legislation on occupational health services, and their regulations include only fragmentary provisions for health examinations for workers in hazardous jobs. Others (Bulgaria, Norway, Romania and Sweden) give priority to prevention but include the treatment of occupational diseases as a legitimate function. In Finland, prevention is a compulsory part of occupational health services, while the provision of general health care services is voluntary. In countries such as Hungary, Poland and the USSR, comprehensive preventive and curative health care for workers, including hospital services in some instances, is provided in connection with the occupational health services.

Most legislation does not define the standard of health and safety that should be maintained by occupational health services. A few countries, such as the Netherlands, apply the principle of using the best available technology for the protection of health and safety. There are similar goals in Iceland and Sweden, where the level aimed at is defined as satisfactory in view of the social and technical development of society. In Austria, the legislation requires the reduction of occupational hazards as far as possible. In the United Kingdom, two terms can be applied: all practicable means, and so far as is reasonably practicable. The first principle is interpreted to mean the level of protection made possible by current knowledge and feasibility. The second, less stringent principle is applied to less dangerous hazards and includes the consideration of the costs and benefits of occupational health and safety measures.

In spite of clear guidance from international organizations since the 1950s, few countries have considered the concept of adapting the work to the worker
in its most demanding sense. In Finland, for example, the legislation principally considers the adaptation of work to the capabilities and needs of disabled or chronically ill workers. In other countries, such as Belgium, the German Democratic Republic, Norway and Sweden, the principle is a general objective that includes all workers and covers active measures for adapting the work and the working environment to the physical, mental and social characteristics and capacities of the individual worker.

The health promotion principle is mentioned several times in country replies to the survey, with three different meanings. First, the promotion of health is considered to be an ultimate result of the successful prevention and control of specific occupational hazards in countries such as Israel, Spain and Turkey. Second, as in Italy, health promotion is understood to be an effect of comprehensive health services, which include occupational health services and general preventive and curative health care. Third, in Bulgaria and Iceland, health promotion is included in occupational health programmes with the meaning used by WHO. This covers a comprehensive set of goals for the biomedical, psychological and social aspects of workers' health and wellbeing and the use of all the available methods to promote workers' overall health, including occupational and leisure activities and the introduction of healthier lifestyles.

The principle of minimizing the consequences of occupational hazards relies on the early diagnosis of occupational diseases, first aid, curative action for occupational and work-related diseases and the rehabilitation of workers with occupational injuries. Because its implementation requires diagnostic facilities and at least a certain level of curative activity, the principle is most developed in countries with a comprehensive model of occupational health services, such as those in eastern and northern Europe.

A more detailed analysis of goals reveals several additional points of interest. A number of countries understand prevention within occupational health services to be principally an activity such as carrying out health examinations of workers prior to employment or during exposure to specific hazards. This approach is typical of services administered in detail by safety-oriented labour administrations. A number of countries, however, mentioned the reduction of sickness absenteeism and the promotion of workers' productivity as goals. The occupational health services administered by ministries of health, on the other hand, have a broader spectrum of objectives that includes preventive, curative and general health care activities, but surprisingly few aspects concerned with health promotion and mental health. The most comprehensive approach is likely to be found in systems in which services are jointly administered by health and labour authorities, and employers and workers participate in implementation.

Psychological services in occupational health are still in their infancy. Legislation in a number of countries mentions psychological hazards as targets of activity, but the overall impression is that psychological programmes are not widely implemented in the Region.
The most authoritative list of the functions of occupational health services appears in the ILO Convention Concerning Occupational Health Services, supplemented by Recommendation 171 (23). The Convention gives the following functions:

(a) identification and assessment of the risks from health hazards in the workplace;

(b) surveillance of the factors in the working environment and working practices which may affect workers' health, including sanitary installations, canteens and housing where these facilities are provided by the employer;

(c) advice on planning and organisation of work, including the design of workplaces, on the choice, maintenance and condition of machinery and other equipment and on substances used in work;

(d) participation in the development of programmes for the improvement of working practices as well as testing and evaluation of health aspects of new equipment;

(e) advice on occupational health, safety and hygiene and on ergonomics and individual and collective protective equipment;

(f) surveillance of workers' health in relation to work;

(g) promoting the adaptation of work to the worker;

(h) contribution to measures of vocational rehabilitation;

(i) collaboration in providing information, training and education in the fields of occupational health and hygiene and ergonomics;

(j) organising of first aid and emergency treatment;

(k) participation in analysis of occupational accidents and occupational diseases.

These functions express the four principles distilled from the international guidance on the objectives of occupational health services. In addition, Recommendation 171 promotes the provision of curative and general health
care services where they are found to be appropriate. The Convention and the Recommendation provide a good reference for the comparison of occupational health service activities reported by countries.

The results of the WHO survey do not allow a detailed analysis of the functions of occupational health services in different countries. The constitution of the services differs from country to country and this affects their functions and content. Nevertheless, health examinations of various types dominate the activities of occupational health services.

In some countries, such as France and the Federal Republic of Germany, control authorities give detailed instructions on the average time that occupational health personnel must spend on specific activities such as plant visits and health examinations. In several other countries, the time limits for preventive or curative activities are stipulated in legislation or lower-level norms. The Norwegian and Swedish systems give local joint occupational health and safety committees the authority to decide the balance between activities. In Finland, the legislation lists the activities required, but they are carried out according to the identified needs of each workplace. This approach allows a relevant response to actual problems at the workplace. In some countries, such as Czechoslovakia, the German Democratic Republic and the Federal Republic of Germany, industries are classified according to work hazards and risks. The functions of and the balance between the activities of occupational health services are defined on the basis of the risk category of the undertaking concerned.

Because of long-standing legislation, the tradition of the occupational health service system and the way services are administered, the services in some countries are limited almost exclusively to health examinations of workers. Recent legislation in the Netherlands, on the other hand, stipulates 22 different tasks; they cover a wide spectrum of advisory and practical activities that are mainly preventive.

The scope of the activities required by legislation or based on national tradition can be classified in three categories:

— essentially preventive functions, mainly workplace visits and health examinations, and first aid (in Belgium, France, the Federal Republic of Germany, Luxembourg, Monaco, the Netherlands, San Marino and Switzerland);

— preventive functions, supplemented by selected curative and general health care services on a statutory or voluntary basis (in Austria, Finland, Italy, Norway and Sweden); and

— comprehensive workers’ health services, including both preventive and broad curative services (in Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Iceland, Italy, Poland, Romania, the USSR and Yugoslavia).

The category of service provided depends on not only the country but also its industries and geographical characteristics. In general, countries whose legislation stipulates strictly preventive occupational health services meet the
requirements of the ILO Convention, while those with a policy of comprehensive services meet the requirements of both the Convention and Recommendation 171.

Ten functions of well developed occupational health services

Irrespective of differences in the legal basis, organizational model, source of funding or general operating conditions of occupational health services, countries use similar methods for implementation. Countries vary mainly in the number of functions included. Well developed occupational health services were reported to have the following functions:

1. the surveillance of the work environment
2. initiatives and advice on the control of hazards at work
3. the surveillance of the health of employees
4. the follow-up of the health of vulnerable groups
5. the adaptation of work and the work environment to the worker
6. the organization of first aid and emergency response
7. health education and health promotion
8. the collection of information on workers' health
9. the provision of curative services for occupational diseases
10. the provision of general health care services.

Elements of functions 1–8 are found in about 17 countries. The importance of these functions, however, particularly that of functions 5, 7 and 9, may vary.

Surveillance of the work environment

The surveillance of the working environment, to identify and assess hazards and risks that may affect workers' health, involves the use of many methods, such as walk-through surveys, industrial hygiene measurements, ergonomic analysis and psychological and toxicological assessment. Countries such as Finland, the Federal Republic of Germany and the United Kingdom have issued specific guidelines for systematic surveillance. The conventional type of survey is the workplace visit of an occupational health team, during which potential hazards are identified and assessed, usually according to standardized guidance, a formula or a checklist.

Initiatives and advice on the control of hazards at work

Advising on and starting practical control measures for eliminating, managing or minimizing the hazards at work are the logical preventive steps after a hazardous condition has been identified and assessed, or when new industrial workplaces are planned and constructed. Although included in legislation in many countries, this function is comparatively weakly developed. Effective
implementation probably requires the participation of both workers and management. In countries such as Finland and the Netherlands, occupational health services have a statutory obligation to take part in the planning of industrial installations, the organization of work and the selection of machinery and tools.

**Surveillance of the health of employees**
The surveillance of employees' health has traditionally included health examinations, carried out before employment or assignment, periodically during exposure to specific health hazards, after a return from sickness or before placement in a new job. Special health examinations are conducted of workers with chronic diseases. Some health surveillance activities are usually not mandated by legislation, but may be carried out to protect workers' overall health. These include general health examinations of certain age groups (at five-year intervals, for example), examinations of working women (particularly those who are pregnant or have small children), young workers and retired people who were exposed to specific hazards during their working lives.

The battery of health examinations carried out differs considerably between countries. The most distinct variation is between occupational health services that are limited to preventive functions and health examinations strictly related to workplace exposure, and those that are comprehensive and include examinations related to workers' overall health.

**Follow-up of the health of vulnerable groups**
The follow-up and rehabilitation of the health of vulnerable groups, such as elderly workers and those with chronic diseases (including cardiovascular or locomotor system disorders and allergies), is a function of comprehensive occupational health services. The objective is to observe the potential effect of work on a disease or physiological condition, and to take early measures for reassignment or rehabilitation, and for preventing the further development of the health problem.

**Adaptation of work and the work environment to the worker**
Adapting work and the work environment to the physical and mental capabilities of the worker is particularly necessary for workers in vulnerable groups and those with health problems. According to the most recent trends in occupational health services, however, this is expected to involve the consideration of the individual needs and capabilities of all workers, regardless of age, sex or state of health. Some countries, such as Sweden, have promoted this activity through specific programmes and with economic support from the government.

**Organization of first aid and emergency response**
The organization of first aid and emergency response is a traditional responsibility of occupational health services in all countries. It covers preparedness for accidents to and acute conditions in individual workers and the planning of the response to incidents affecting an entire undertaking, in collaboration with other respondents. Training in first aid is a universal duty,
even though occupational health personnel are not usually the first to respond. Nevertheless, they must ensure that all the personnel involved are well trained, that facilities for first aid are available and that the contacts necessary for preparedness have been made.

Health education and health promotion
Health education is organized to inform the worker and employer about hazards related to particular jobs, substances used in work and working practices. This activity is aimed at modifying the work environment or practices, to minimize possible health hazards and to suggest alternative measures to make work safer and healthier. Traditional forms of this activity include advice to workers on the selection and proper use of personal protection devices, such as gloves, and guidance for hygiene practices in jobs where, for example, toxic contamination may be spread by workers' hands.

Health education may also be general. It aims to introduce elements of a healthy lifestyle that may be important to workers in certain occupations. This includes advice to solvent workers to avoid alcohol and the distribution of antismoking information to asbestos workers. Sometimes occupational health services take part in the general health education campaigns organized by others, such as primary health care or voluntary health organizations. The campaigns may focus, for example, on smoking control and the promotion of healthy nutrition and physical activity.

Again, countries vary in the scope of health education. Education on specifically occupational hazards is given in countries with strictly preventive services, and both occupational and general health education in countries with comprehensive occupational health services.

Collection of information on workers' health
The most traditional form of this activity is the recording of occupational diseases and labour accidents found in most countries. In some countries, occupational health services keep statistics on sickness absenteeism, make formal reports on the surveillance of workplaces and record the results of health examinations and data on other aspects of surveillance of the working environment or relevant exposures (to carcinogens, for example). In some instances, occupational health personnel carry out epidemiological research on various aspects of the health of the worker of a specific undertaking.

Provision of curative services for occupational diseases
Even in countries whose occupational health services are strictly preventive (such as Belgium and France), occupational diseases may be diagnosed. In other countries, such as those in eastern Europe, preventive, diagnostic and full-scale therapeutic services for occupational diseases are provided. These may include:

- the full or partial diagnosis and treatment of certain occupational or work-related diseases (examples include the diagnosis of hearing loss or treatment of simple toxic eczema);
— the rehabilitation of workers, regardless of the cause of the disease;
— the referral of cases of occupational and work-related disease to other health services, on the basis of observations made in connection with other occupational health service activities (such as health examinations); and
— first aid and emergency response.

Provision of general health care services
General health care services may include both the prevention and treatment of non-occupational diseases and other relevant primary health care services, such as immunization and general health education. The level of service usually corresponds to that provided by a general practitioner, although full-scale medical services, with hospital units and appropriate outpatient services, may be organized for large industrial establishments. In eastern European countries, such hospital units are compulsory for undertakings employing 10 000 workers or more.

Conclusion
Taken together, functions 1–9 largely meet the requirements given in the WHO and ILO guidelines for the content and activities of occupational health services. Even this general survey, however, points out several weaknesses in the services. Initiatives to reduce hazardous exposures may be too few. The adaptation of work and the working environment to the worker is not widely implemented. Further, the psychological and psychosocial aspects of occupational health receive little attention in the country replies.
Organizational models

Organizational models for occupational health services vary between and within countries, according to national traditions, the organization of occupational health and safety and general health services, and the nature of the industrial or economic activity concerned. Six models are used in the Region: the big industry, group service, private health centre, community health centre, national health service and social security institution models.

Big industry model

The big industry model is typical of large units in the manufacturing and processing industries, but is also used in other large industries. Occupational health services are provided by in-plant units, usually staffed by a team of full-time experts. In the largest undertakings, such a team may be multidisciplinary. In addition to a physician and nurses, it may include a physiotherapist, an industrial hygienist, a safety engineer and a psychologist.

Some countries have legal provisions that require undertakings employing more than a given number of workers to organize such in-plant services (Table 1). For example, in Hungary, an undertaking employing at least 4000 people must appoint a physician; if it employs a minimum of 10,000 workers, an outpatient department is obligatory. In Portugal, even undertakings employing fewer than 200 people must provide in-plant services if high-risk occupations predominate. In Romania and the USSR, large industrial undertakings are requested to organize comprehensive medical service systems, including hospitals, clinics, outpatient departments and preventive services.

In France, on the other hand, the provision of in-plant occupational health services is obligatory for undertakings requiring at least 160 hours per month of physicians' working time. This need is calculated with a formula that takes account of the occupational health and safety hazards of the industry and occupation concerned. In practice, this minimum figure corresponds to the working schedule of a full-time physician.
Table 1. Size limits for undertakings required to organize individual in-plant occupational health services in eight European countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Minimum number of workers</th>
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<tbody>
<tr>
<td>Austria</td>
<td>750</td>
</tr>
<tr>
<td>Belgium</td>
<td>50</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1500–2000</td>
</tr>
<tr>
<td>Hungary</td>
<td>1200</td>
</tr>
<tr>
<td>Poland</td>
<td>500</td>
</tr>
<tr>
<td>Portugal</td>
<td>200</td>
</tr>
<tr>
<td>Spain</td>
<td>1000</td>
</tr>
<tr>
<td>USSR</td>
<td>800</td>
</tr>
</tbody>
</table>

The big industry model has several advantages and at least one disadvantage. The provision of services within an undertaking enables personnel to collect all relevant information on the workplace, and eases work to control and eliminate hazards. Integration with safety services is also easier to organize than in other models. The disadvantage is the possibility of weaker links with primary health care services.

Group service model

Sometimes small and medium-size undertakings join to organize occupational health service units of a certain size and quality. Some countries (Austria, Belgium, France, the Netherlands and Spain) make legal provisions for the establishment of such group service centres by undertakings that are not large enough to organize their own services. These centres are administered by a body that usually includes representatives of both the employers and the workers of the participating undertakings. The undertakings pay for the services according to their use. Thus the member undertakings are the owners of or shareholders in the occupational health service units, which usually operate on a nonprofit basis.

In France, a unit may serve several different types of undertaking in a given geographical area, or a number of undertakings with the same type of economic activity. Classic examples of such industry-oriented services are also found in the construction industry in the German Democratic Republic, construction, agriculture and forestry, government administration and some food industries in Sweden, and various industries in Denmark.

Like other models for external services, this model does not enjoy all the advantages of the big industry model, owing to the lack of daily contact with the workplaces. The strengths of trade-oriented services are their mobility, flexibility and opportunities to accumulate knowledge on the special occupational health problems of the trade or branch of industry served.
Private health centre model

This model is used in several countries in western Europe. Physicians' health centres provide services; they function as a group service but are not managed by the industries concerned. These centres sell their services and are private undertakings in themselves. The undertakings and workplaces served are customers, and the profit principle is usually applied. This model is used to a small extent in Finland. In an alternative form of the model in the Federal Republic of Germany, a private physician is hired to provide occupational health services.

The strength of this model is its flexibility. Unfortunately, a concern for profit may influence the orientation of activities, and the undertakings served do not participate in the management of the services provided.

Community health centre model

This model implies the provision of occupational health services by municipal or other public health service units that give local-level primary health care. In Italy, local health units are legally responsible for providing occupational health services. Community-based health services are also used for this purpose, in part, in Norway and Sweden. In Iceland, all occupational health services are given by local health centres, although the plant physicians of large undertakings can carry out health examinations. Small undertakings in Yugoslavia are also served by this community-based model. On the basis of specific legislation in Finland, municipal health centres provide about 40% of occupational health services, particularly for small undertakings, the self-employed and agricultural workers.

This model, too, has both advantages and drawbacks. On the one hand, where the network of local health centres covers a whole country, the services are accessible to the workers. In addition, integration with primary health care is automatic. On the other hand, local health centres have difficulty handling the occupational health problems of a large number of undertakings engaged in widely varying activities. To meet the specific requirements of occupational health services, larger municipal health centres employ specially trained physicians and nurses on a full-time basis. The personnel in smaller units, working on a part-time basis, take special courses on occupational health, and may be supported by experts from a regional institute of occupational health or other appropriate institutions.

National health service model

The national health service model is another community-based alternative. Although the occupational health units are located in undertakings, their personnel are employed by the national health service. Used in Bulgaria, the
German Democratic Republic, Hungary, Poland, Romania, the USSR and, with certain modifications, Yugoslavia, this model shares the strengths of the big industry model. In fact, it provides services only for large industrial undertakings in these seven countries. The scope of the activities and the level of facilities needed require a large population to be served. Finally, this model effectively combines occupational with general health services, constituting a comprehensive workers' health service. Some concern has been expressed, however, about the possibility that broad curative activities may overshadow the preventive priorities of the occupational health services.

Social security institution model

In this model, a social security institution provides, and frequently finances, occupational health services. This model operates in a way similar to the group service model. It is used in part of the Federal Republic of Germany and in Turkey. In Israel, the national occupational health service system is organized and administered by the General Sick Fund of the General Federation of Labour.

Experiments with new models

Small undertakings, mobile workplaces and the self-employed constitute a challenge for occupational health services. Attempts to solve the problem of serving workers in small undertakings include services provided by: groups of undertakings, a network of community-based primary health care units and industry-oriented units. In the German Democratic Republic and Hungary, units located in large undertakings also serve small undertakings located in the same area. Italy has carried out an interesting experiment in which a number of small undertakings are clustered, analysed and served by local health service units. The information gathered is used to plan activities for all similar undertakings in the district.

For industries whose work sites move from place to place (which include construction, transport and traffic, seafaring, forestry and agriculture), some countries (such as Finland, the Federal Republic of Germany, the Netherlands and Sweden) have used mobile occupational health service units with considerable success. In France, group services have also used mobile units to reach small undertakings.
Coverage

Coverage is both quantitative and qualitative. Quantitatively, it measures the extent to which occupational health services are available for undertakings and workers. Qualitatively, coverage refers to the type and number of activities performed. In both senses, coverage differs markedly in the countries surveyed.

Quantitative coverage

Coverage is not recorded in a uniform way in the Region. Some countries record the number of undertakings that have services, while others record the number of workers covered. In a number of countries, legislation limits coverage to undertakings employing a minimum number of workers:

- 250 in Austria
- 500 in the Netherlands
- 100 in Spain.

In the Federal Republic of Germany, undertakings requiring 60 hours per year of a physician's working time must organize occupational health services for their workers. The need for a physician's time is calculated by a formula that takes account of the occupational health and safety hazards of the workplace.

In Denmark, Norway and Sweden, however, legislation stipulates occupational health services at workplaces with a recognized need for them. In Belgium, Finland, France, and the eastern European countries, the services are supposed to cover the entire working population.

Thus, coverage may be given as the proportion of the legally eligible population that is actually covered. Figures are given in some countries as the percentage of engaged employees served, and in other countries as the percentage of the total economically active population that is served. These differences in calculation make the comparison of data difficult.

Legislation defines the workers to be covered in various ways. Some countries' legislation covers only employees with a clearly defined relationship
with an employer. In others, occupational health services are supposed to cover everyone who works. In the Netherlands, the legislation covers a defined group of workers, but voluntary services substantially expand coverage.

**Qualitative coverage**

Coverage also refers to the activities included in occupational health services. As stated earlier, services are limited to health examinations in some countries, but comprise a wide spectrum of preventive and curative activities in others, particularly those in eastern Europe. Activities may also vary widely within a country. The activities of in-plant units often differ from those, for example, of external service providers.

**Coverage rates for Europe**

The coverage of occupational health services for the whole Region cannot be calculated from the data gathered in the survey, although it can be estimated (Table 2). Such estimates, however, are based on assumptions of remarkable uncertainty. Coverage can be estimated as a percentage of the total economically active population (estimated at 354,603,000 for the Region as a whole), which is recorded rather similarly in all countries. This approach is also justified from the point of view of occupational health; in the light of recent international guidelines, such as ILO Convention 161 (23), the entire economically active population should be covered by occupational health services. Rough approximations can also be made of the number of workers covered by in-plant or group units and by services linked with primary health care, as is often the case for small industries, agricultural workers and the self-employed.

**Table 2. Estimates of the quantitative coverage of occupational health services (OHS) in the European Region**

<table>
<thead>
<tr>
<th></th>
<th>Number of workers (thousands)</th>
<th>Percentage of economically active population</th>
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<tbody>
<tr>
<td>In-plant or group OHS</td>
<td>157,575</td>
<td>44.4</td>
</tr>
<tr>
<td>OHS linked to primary health care</td>
<td>104,298</td>
<td>29.4</td>
</tr>
<tr>
<td>Total</td>
<td>261,873</td>
<td>73.8</td>
</tr>
</tbody>
</table>
Less than three quarters of the European working population have access to occupational health services. Figures vary greatly between countries, ranging from less than 10% to almost 100% of the economically active population. These estimates are subject to error, which may lead to overestimation or underestimation of actual coverage. In particular, the occupational health services provided by primary health care units (which lack specially trained physicians and nurses) may often be nothing more than curative, operating at the general practitioner level without any specific preventive or occupational health content. Occupational health services stipulated to be strictly preventive, on the other hand, may carry out health examinations and workplace visits rather mechanically and fail to reach the recommended objectives. If the full spectrum of activities described earlier is used as a reference, the coverage of well functioning services in the Region is much less than 74% and probably nearer to 30%.

To summarize, the coverage of workers by occupational health services is almost complete in 8 European countries, and approaches 50% in 12 others where information is available. Large factories are usually fully covered, and medium-size workplaces are covered by occupational health service centres, which are multiplying in many countries. In several countries, workers at very small workplaces in industry or in agriculture, forestry or other nonindustrial undertakings are not covered at all. Most of these countries indicate a need to expand coverage to these areas. The needs for services at such workplaces are different from, but not lesser than those of large factories, and activities must be adjusted accordingly. In Finland and Sweden, pilot studies on occupational health services for small workplaces have recently been carried out, and ways of cooperating with primary health care units investigated. Considerable experience of the services in small workplaces is also available in France, and practical, large-scale activities to provide services to small undertakings and the self-employed are going on in Italy and Yugoslavia.
The need for specially trained personnel to provide occupational health services is emphasized by ILO and WHO (18), and professional groups. Owing to the long tradition of these services, more occupational physicians and nurses are available in the European Region than in the other WHO regions. The other kinds of expert needed to make up a multidisciplinary occupational health team, however, are not as widely available. Such a team requires a minimum of six kinds of professional: an occupational health physician, nurse and physiotherapist, an industrial hygienist, a psychologist and a safety engineer.

The survey replies mentioned varying categories of expert. All countries included the occupational health physician and nurse. Five countries mentioned the physiotherapist, and four listed the psychologist or behavioural scientist. Nineteen mentioned the safety engineer or similar technical expert, and twelve, the industrial hygienist. Thirteen countries mentioned at least four different categories of expert. All six groups are available for occupational health services in two countries.

In two thirds of the countries, therefore, the personnel adequately cover the medical, technical and hygienic parts of occupational health services. Behavioural, ergonomic and physiotherapy services are only available in about 10% of the countries.

Very few undertakings can maintain such a multidisciplinary team, particularly when the needs for the various professionals are not equal. In one solution, an undertaking hires the core of a team, usually the physician and the nurse. The services of other experts (except safety engineers, who are frequently available) are secured from external sources, such as institutes of occupational health, government or other public authorities, certain industries or group service centres. In the Federal Republic of Germany and the United Kingdom, for example, government inspectorates are an important source of advisory experts. In eastern European countries, institutes of occupational health and regional sanitary and epidemiological stations give external support.
services. In addition, private consultants may give expert advice in countries such as the United Kingdom.

Numbers and density

The survey's coverage of information on occupational health personnel cannot be considered complete. Many countries gave figures only on occupational health physicians, for example. According to a rough estimate, based on the survey and complemented with information obtained from other sources (7,8), the total number of physicians appointed by countries is 81 000. This may be an underestimate; a more likely total may be 100 000 physicians. Of these, about one third to one half work on a full-time basis, and roughly the same number are specialists or holders of diplomas in occupational health. The reported number of occupational health nurses is 172 500, of whom about 60 000 have specialist training and one third work on a part-time basis. In addition, about 25 000 industrial hygienists and 70 000 safety engineers are available. The number of clerical and other support personnel is estimated to be 100 000. At a rough estimate, the total number of occupational health personnel in the European Region is about 450 000. These figures form the basis of an estimate of the ratios of the personnel to the labour force in the Region (Table 3).

Fourteen countries have official or semi-official norms for the ratio of personnel to workers or for the work-time input per worker, or regulate both of these aspects. In the countries that categorize undertakings according to the risks to occupational health and safety (such as Czechoslovakia, France, the German Democratic Republic and the Federal Republic of Germany), the risk category of the workplace is used to set the norms for the staff or time devoted to occupational health services. The norms of various countries and industries range from 1 full-time physician per 800 workers in the most hazardous

Table 3. Estimated ratios of expert occupational health personnel to the economically active population and to the population covered by occupational health services (OHS) in Europe

<table>
<thead>
<tr>
<th></th>
<th>Economically active population</th>
<th>Population covered by OHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians</td>
<td>1 : 4378</td>
<td>1 : 3233</td>
</tr>
<tr>
<td>Nurses</td>
<td>1 : 2056</td>
<td>1 : 1518</td>
</tr>
<tr>
<td>Industrial hygienists</td>
<td>1 : 3732</td>
<td>1 : 2753</td>
</tr>
<tr>
<td>and safety engineers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1 : 1018</td>
<td>1 : 751</td>
</tr>
</tbody>
</table>
occupations, to 1 per 2500–3000 workers in less hazardous occupations. The
time input of the physician varies from 1.3 hours per worker per year for those
in hazardous occupations to 0.15 hour per worker per year in the least hazardous
occupations. In contrast, Finland, Sweden and the United Kingdom do not give
official norms but guidelines for the appropriate amount of activity, which are
determined by the authorities or agreements of the social partners.

Training

Fifteen countries reported officially recognized training that is required for
physicians wishing to provide occupational health services. Some countries
also set specific requirements for nurses. The required postgraduate training
varies from an introductory course for physicians or nurses, lasting 1–4 weeks,
to one- to two-year diploma or certificate curricula that may end with an official
examination.

At the undergraduate level, most countries organize training in occup-

tional health as a separate course or in connection with subjects such as
hygiene and social medicine. Nurses, safety engineers and physiotherapists
receive 20–50 hours’ undergraduate training in occupational health, depending
on the country and discipline. Six countries have a curriculum leading to a
diploma, certificate or a degree as Bachelor of Science, or other schedules for
training occupational health physicians.

In 14 countries, a course of study lasting 3–6 years is needed to specialize
in occupational health, occupational health services, occupational medicine or
industrial hygiene. In Finland and the Federal Republic of Germany, there are
specialties in both occupational health services and occupational medicine, the
former focusing on prevention and the latter on clinical occupational medicine.
Eight countries have industrial hygienists at the diploma or full specialty level.

In eastern European countries, the curricula for industrial hygienists are
intended for experts with a basic medical education. In western European
countries, including Finland and the United Kingdom, the basic education of the
industrial hygienist is most frequently in natural sciences (physics or chemistry)
or engineering.

Eight countries report a special training programme for occupational health
service nurses. Only two countries have a diploma or specialty for safety
engineers; two others have special training for occupational psychologists.

Ten countries require complementary training at stipulated intervals (from
1 to 5 years). The duration of such training may range from one day every year
to a few months after longer periods (for example, a three-month course taken
every five years).
Support systems

Support services are needed to ensure that occupational health services function, solve problems at the workplace and achieve a multidisciplinary approach; this support cannot be provided by service units except in the largest undertakings.

Industrial hygiene, ergonomics and psychology

The identification of hazards, the measurement of exposures and the assessment and control of risks from physical, chemical and biological factors at work require the expertise of staff trained in occupational hygiene, laboratory analysis and control technology. The identification and assessment of ergonomic, physiological and psychological factors also require special competence and methodology that may be beyond the capability of local occupational health service units. These support functions are usually delegated to institutes of occupational health or other research and advisory organizations.

Clinical occupational medicine

The diagnosis, treatment and rehabilitation of occupational and work-related diseases and injuries require special support from occupational medicine, supported in its turn by several other clinical specialties and a battery of diagnostic facilities. This can be organized in the departments of occupational medicine of institutes of occupational health, or the inpatient or outpatient occupational medicine clinics in well equipped central or regional hospitals. Both models are used in Europe, and are sometimes available in the same country (as in Finland and the USSR).

Well organized nationwide networks for the diagnosis and treatment of occupational disease and for issues involving occupational medicine have been
organized in the eastern European and Nordic countries. Sweden has a network of eight regional hospitals, each with a unit for occupational medicine. The five central university hospitals in Finland have established outpatient units for occupational medicine jointly with the central and regional institutes of occupational health. Spain has four regional institutes of occupational health. In many other European countries, a network of clinics of occupational medicine has been created on the basis of institutional traditions or by the efforts of interested personnel in the units involved.

Research and training

Occupational health personnel and other experts require training at many levels. Training at the expert level requires teachers with research experience who can provide new information and educate trainers. In most countries (such as those in eastern and northern Europe), research and training are the responsibilities of institutes of occupational health; in others (such as the Federal Republic of Germany and Italy), universities mainly perform these tasks.

In 1981, the Nordic Council of Ministers established a unique institute for advanced multidisciplinary studies in all areas of occupational health and safety. Training is given principally to experts from the Nordic countries, although a limited number of people from other countries also participate.

Twenty countries have a national institute of occupational health or an organization with similar functions. In Italy, the activities of the National Institute of Occupational Health and Safety constitute a strong occupational health programme; the National Institute of Public Health is also active in this field. In the United Kingdom, the Health and Safety Executive, a government authority, plays the role of a national institute of occupational health.

In Italy and the eastern European and Nordic countries, the national occupational health institutes are government organizations; most report directly to the ministries responsible for occupational health services. The institute in Israel, on the other hand, is administered by a social security organization.

The Federal Republic of Germany has a national institute for occupational safety and accident prevention, and an employers’ association for accident insurance that runs eight research institutes. Both organizations are safety-oriented and give support on this issue to occupational health services. Support on health aspects comes mainly from universities or their research institutes, and from clinics of occupational medicine. The institutes of occupational health in countries such as Finland provide all categories of support, including services, research and training. In Bulgaria, Poland and the USSR, the institutes give high-level support; routine services are provided by sanitary and epidemiological stations or general health service units. In 13 countries, universities substitute for national or regional institutes of occupational health to some extent; they play a substantial role in supporting occupational health services in the Federal Republic of Germany, Italy, the Netherlands and the United Kingdom.
In eight countries, regional activities are carried out by institutes either linked to or independent of the national institute of occupational health. For example, Poland has four institutes, located in different regions, that are responsible for certain occupational health fields of national importance. Work has been divided in a similar way between the four regional institutes of occupational health in Spain and the six regional institutes in Finland.

**Funding**

Some countries' health services are financed directly by governments or by social security or sickness insurance schemes. In most countries, however, the employer or the undertaking is primarily responsible for funding occupational health services. In eastern European countries, the national health service pays the salaries of occupational health physicians and nurses, but the undertakings served are responsible for all the other costs. Legislation in the Nordic countries gives employers the primary responsibility for funding, but undertakings may receive subsidies covering up to 60% of the total costs of establishing and maintaining services.

In addition, some services are given by public primary health care units, which may or may not be authorized to charge employers or undertakings for them. This service provision model can be seen as a form of subsidy, since any charges made usually do not correspond to the real costs of the activity. The coverage of the salaries of occupational health personnel by the national health services in eastern European countries can be seen in a similar way.

Some countries link subsidies to compliance with legislation. In Finland, the employer is reimbursed 55% of the costs of services if these services meet two criteria. The content and operation of the services must be in accordance with the legislation and other guidelines, and the services must be considered acceptable by the undertaking's joint occupational safety committee or the workers' safety representative.

All the data on funding show that public financial support increases the coverage of occupational health services. No adverse effects from such support have been reported. The government grant system in Sweden has clearly expanded coverage in a short time. Subsidies are particularly needed to establish and maintain services for underserved sectors.
Main problems and trends

In spite of the great variation in the structure and content of occupational health services in different countries, the survey replies mentioned very similar occupational health problems, planned solutions and expected trends. These can be grouped into five needs:

- solutions for priority problems
- the development of the functions of occupational health services
- the development of occupational health personnel
- research and information
- the development of occupational health service systems.

Priority problems and proposed solutions

The countries' replies gave priority to strikingly similar problems in occupational health. They can be summarized as exposure to hazards in the workplace or the adverse health effects recognized as the consequences of exposure.

In general, the problems are exposure to noise, dust and chemicals, and the physical and psychological working environment. In ten countries citing noise exposure and hearing loss, the planned solutions include: the establishment of noise abatement programmes, the regulation of exposure, the setting of emission norms for machines and other sources of noise, and education and information on personal protection. Eight countries targeted exposure to dust, frequently the dusts of minerals such as asbestos, and consequently the prevention of dust-induced lung diseases such as pneumoconiosis and lung cancer. Thirteen countries listed the long-term effects of chemicals, particularly the carcinogenic, allergenic and reproductive effects of new chemicals. Some respondents expect standard setting to be the solution. Eight countries named the physical workload, ergonomic problems, monotonous work and, as a consequence, musculoskeletal disorders as priority problems, and listed a number of solutions. Psychological strain and mental health and psychosocial problems are
priorities in nine countries, and action to improve the psychosocial working environment is envisaged by a number of Member States.

Functions of occupational health services

Logically, the planning of occupational health service activities starts with the identification of needs, that is, the identification of hazards at the workplace. The surveillance of the working environment and hazards at work, and the determination and measurement of exposures at work are targets for development in 14 countries. Some Member States listed planned action on these topics. The development of methodology for surveillance of the psychological and psychosocial environment at work was mentioned by seven countries; in particular, a few cited the psychological problems of adolescent and elderly workers. Countries are also interested in methods for assessing the working capacity of the aged worker, and envision action to develop rehabilitation services within or in connection with occupational health services. Some Member States plan programmes for the prevention of occupational diseases; the prerequisites listed are methods for the early detection of occupational and other work-related diseases. Predictive risk assessment, particularly for new chemicals, working procedures and technical installations, as well as primary prevention through the participation of occupational health services in the planning of new industrial facilities and installations, are seen as new trends by eight countries. Several respondents expressed an interest in developing the general preventive strategies of occupational health services.

Personnel development

Sixteen countries consider a shortage of expert personnel a limiting factor for the development of occupational health services. Several countries indicated a need for trained experts in addition to physicians and nurses, such as physiotherapists, psychologists, engineers, social scientists and, in particular, industrial hygienists. Several desirable additions to the content of training were mentioned: the assessment of new chemicals, the psychosocial and psychological aspects of work, problems of assessing working capacity and the occupational health of elderly workers. Training programmes at all levels should be strengthened and modified to meet these needs. Improved training is also required for an effective response to the priority problems in occupational health, the functional development of services and the expansion of coverage.

Research and information

Fourteen countries indicated needs for several types of research.
Epidemiological research was the most frequently mentioned. Several topics were specifically cited: the health effects of specific types of exposure at work (particularly long-term effects), occupational and other work-related diseases, and the general morbidity and health status of working populations.

Research is also needed to develop further a number of methods used every day in occupational health services, such as those for:

- surveillance of the work environment, particularly the environmental and biological monitoring of exposure to chemicals;
- risk assessment of new chemicals;
- industrial hygiene in general; and
- examinations and follow-up of workers' health.

Third, research is needed on new occupational health concerns, such as psychological and psychosocial services and early rehabilitation, particularly of elderly workers. Methods are required to identify adverse psychological factors at work, and to detect and measure their consequences for mental health. The need to develop new strategies to adapt the work to the worker was frequently mentioned in this context, as was health promotion as a new aspect of occupational health services. In addition, the manner in which the services could provide criteria for and advice on planning and designing new production processes, work organization and industrial structures requires investigation.

Finally, two countries specifically mentioned studies to evaluate the efficiency and effectiveness of occupational health services; others made indirect reference to the topic.

Nine countries recognize a need to develop information systems within occupational health services:

- to collect, analyse, register and communicate data on occupational health hazards and on health effects such as occupational and work-related diseases and labour accidents;
- to supply employers and workers with information on occupational health problems and how to solve them, and for health education; and
- to provide the research data needed routinely by occupational health services on hazards such as chemicals.

Only a few countries propose specific action to meet these needs. International guidance may be required in this area.

Development of occupational health service systems

Virtually all countries cited a need for further development of their occupational health services. Eleven Member States intend to expand coverage. Expanded coverage in turn requires the adoption of new functions, the introduction
of new methods, and the quantitative and qualitative development of service personnel. Several countries also see a need to coordinate the functions of occupational health and rehabilitation services.

Several countries whose occupational health services are not statutory are interested in introducing legislation. Several others want to amend and update existing provisions, particularly to widen coverage.

Almost all countries are considering the development of support systems for occupational health services, particularly those for training, information, advice and research. A few countries intend to establish national institutes of occupational health.

Seven countries consider multidisciplinary approaches and multisectoral collaboration necessary for the further development of their occupational health services. The coordination of service activities in the plant with the overall production principles of the undertaking and particularly with occupational safety services was frequently mentioned. In addition, multisectoral coordination was found desirable at the national level. The coordination of occupational health services was requested:

— with primary health care services, and thereby ministries of health, in countries whose labour ministries administer occupational health services; and

— with occupational safety policies in countries whose occupational health services are administered by health ministries.

Conclusion

To summarize, the problems given priority and the development trends of occupational health services in response to such problems indicate that countries are interested in developing their services along the lines recommended by WHO and ILO. International guidance in implementing development programmes is clearly needed, and a model scheme for occupational health services should be elaborated as an international reference.
Conclusions

Although occupational health services are better developed in the European Region than elsewhere, about 100 million workers in the Region still do their jobs with no services at all and another 100 million are covered by services that barely meet the ILO and WHO standards. In particular, some groups are seriously underserved.

Rapid changes in economic structures within the Region, new production methods, and chemical, physical, biological and psychosocial factors require new responses from occupational health services. Demographic changes, the aging of working populations, the increasing national and international mobility of workers and the growing numbers of migrant workers constitute major challenges.

To respond effectively to such challenges, occupational health services must further develop their coverage, content and activities, personnel and facilities. New multidisciplinary training programmes, increased research and well developed advisory and information support services are needed to achieve the overall goals. The Member States of the Region have emphasized the importance of developing systems of occupational health services and their links with other health and occupational safety services.
References


12. **Targets for health for all.** Copenhagen, WHO Regional Office for Europe, 1985 (European Health for All Series No. 1).


More than 100 years ago, occupational health services began in Europe. They were a response to needs created by industrialization, and have developed in accordance with the legal, political and social conditions and traditions in each country. This book is the result of a groundbreaking study of these services throughout the European Region.

Based on countries’ own descriptions of their services and on information from international agencies and experts, this publication puts occupational health services in an international perspective. It summarizes the principles and functions of occupational health services, and reviews the services available in the 32 Member States of the Region, describing their legislative basis, administrative agencies, objectives, activities, organizational models, coverage, personnel, links with other kinds of service and support systems. The publication concludes with a look at current problems and expectations for the future.

This overview is the first of its kind. It provides valuable and interesting reading for people in any of the sectors or disciplines involved in choosing, planning and delivering occupational health services — an important part of work for health for all.