OCCUPATIONAL HEALTH RISKS IN THE WORKPLACE

Technical Discussions held in conjunction with the forty-sixth session of the Regional Committee

The majority of the countries of the Western Pacific Region are undergoing rapid national development. This developmental process is accompanied by a major transformation of work practices. Agriculture is becoming mechanized and is using a greater range and volume of chemicals; industrial processes are becoming increasingly sophisticated, and there is a rapid growth in the services sector in some countries. All of these changes have resulted in an increase in health hazards for those at work. Furthermore, there is an increasing recognition of the need to keep the workforce safe and healthy through an occupational health service.

This document outlines the rationale for an occupational health service and proposes the primary health care approach as the most appropriate for such a service. In addition, the document recognizes the role of the health sector and that of the labour sector in the delivery of occupational health services. The health sector is seen as being responsible for providing health care to the worker, and the labour sector as being responsible for ensuring the safety of the workforce and implementing labour laws.
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1. INTRODUCTION

The origins of occupational health lie in the industrial revolution in Europe, where the focus initially was on factories and mines. In an attempt to ensure safety at the workplace, limited legislation, e.g., the Factory Act in England in 1833, was developed and was implemented largely by ministries of labour. The main emphasis of such legislation was on the safety of the work environment, and little attention was paid to the provision of health care services to workers.

It is only over the last few years that the concept of occupational health has changed. The working population has been identified as a distinct sector of the community (Figure 1) requiring the provision of health services as an integral part of the national health care service. Their right to health and safety at work has been stipulated in the constitutions of the World Health Organization (WHO) and the International Labour Organisation (ILO). Specifically, Article 2 of Chapter II of the WHO Constitution calls for prevention of accidental injuries and the promotion of improvement of working conditions. Recently, a document has been prepared by the Western Pacific Regional Office, entitled *New horizons in health*. This has as one of its objectives the need to reduce occupational and work-related diseases. Additionally, in a number of reports, WHO has pointed out that occupational health is not limited only to preventing and controlling specific occupational diseases but rather, it should deal with the full relationship between work and the total health of workers.

Figure 1. Components of a community and health care service

- Family
  - Mother and child (MCH programme)
- Sick and disabled (hospital and rehabilitation services)
- Community
- Aged (geriatric services)
- Schoolchild (School health programmes)
- Working population (occupational health services)
Modern occupational health is thus understood to be the concern for the total health of all persons at work. This includes care for: (i) the general diseases of the community which may occur among workers (e.g., malaria, AIDS, etc.); (ii) work-related diseases (diseases stemming from a range of factors in which work may contribute or aggravate the condition, e.g., cardiovascular disease, psychosomatic illnesses, and cancer); and (iii) occupational diseases (those in which exposure at the workplace is essential to the causation of such disease, e.g., lead poisoning, silicosis, asbestosis, and noise-induced deafness). Clearly, occupational health involves more than just prevention and cure of occupational diseases.

2. THE WORKING POPULATION

2.1 The population at risk

In the 1990s, the world population is over 5 billion people, 90% of whom live in the countries of the developing world. The total workforce is estimated to be in excess of 2 billion people, about 85% of whom live in developing countries and areas.

The working population thus comprises almost half of the total global population; they spend one-third of their life at work contributing actively to the development and well-being of themselves and of society. The working population - those in some form of paid employment - accounts for 60%-70% of the male population and 30%-60% of the female population. If informal work and work at home are taken into consideration, the proportion of the working population is even higher.

2.2 Work and its effects on the workforce

Work may have both a positive and adverse effect on a worker's health. Work provides the income or the produce with which to meet the necessities of life; it also has a positive impact on social, psychological and physical health and well-being. Within this context, good occupational health and safety conditions contribute to a more efficient workforce. However, the working environment in many occupations remains hazardous to health, well-being and performance at work. Mining, forestry, construction and agriculture continue to be high-risk industries: one-fifth to one-third of workers in these sectors are at risk of occupational injury or disease, and sometimes death. Less dramatic but
distinct occupational health problems occur among service and office workers: these are largely due to psychological stress factors and increased workloads, which lead to job dissatisfaction and ill-health.

3. HEALTH AND DEVELOPMENT

There is a two-way relationship between health and socioeconomic development. The health of a nation as a whole and its workforce in particular is crucial to such development. The economic status of a nation generally is a reflection of the life expectancy of its people and could be considered as an indicator of health as well, as seen in Figure 2.

Figure 2. Selected countries' per capita gross domestic product (GDP) for latest available year plotted against life expectancy

Life expectancy at birth (years), 1990

GDP per capita (US$) 1985-1988

Although a strong correlation exists between socioeconomic development and health, the latter is not adequately recognized as a positive force driving development. Health therefore should be seen as more than a consumer item; it is an investment in development.

3.1 Changing patterns of employment

Social and economic development leads to changes in employment patterns and in how each employment sector contributes to the national economy. An understanding of this change in the balance between the sectors allows for a better understanding of the relationship between work and health at various stages of social and economic development.

In the early stages of such development, agriculture accounts for a large part of the workforce and contributes extensively to national wealth. With industrialization, the role of agriculture begins to decline and the role played by the manufacturing sector in the national economy and employment becomes dominant. During later or post-industrialization, the services sector becomes the largest generator of national wealth, as seen in high-income countries. This applies to the Western Pacific Region, where its Member States' incomes are widely diverse (see Figure 3). While a number of countries and areas have reached newly industrialized country (NIC) status, many still belong to the low-to-middle-income status of the developing world. In newly industrialized countries and areas such as Hong Kong, the Republic of Korea and Singapore, the services sector accounts for about two-thirds of GDP with no contribution, or very little, coming from agriculture. At an earlier stage of development, countries such as Malaysia and the Philippines, services contribute under half of the GDPs, with about a quarter of the GDP coming from the agriculture sector. This underscores the fact that occupational health services must respond to the needs of each nation's workforce depending on the stage of development.
Figure 3. Structure of economies of low, lower-middle, upper-middle and high-income countries, Western Pacific Region

Percentage contribution to national income

Economic sectors

3.2 Changing patterns of disease

There is also a noticeable change in disease pattern which may be related to development. As shown in Figure 4, with increasing GDP, there is an increase in life expectancy, and a change in the disease pattern. A marked decline in deaths due to infectious diseases is observed, while there are large increases in deaths due to cardiovascular diseases and cancer.
Figure 4. Estimated percentage distribution of deaths by major causes in relation to life expectancy

Percentage of deaths

100%

injury

cancer

other

50%

50%

25%

25%

0%

45 55 65 75

Life expectancy (years)


4. HEALTH RISKS AT WORK

4.1 Hazards

Chemical, biological and physical agents, as well as adverse ergonomic, physiological and psychosocial factors are found in today's work environment. Such agents and factors, individually or in complex combinations, threaten workers' safety and health and reduce well-being and productivity. Depending on the country, type of economic activity and enterprise, from 30% to 50% of workers – in some high-risk industries, over 50% – may be exposed to these hazards at exposure limits that exceed those adopted for many industrialized countries. As a consequence, a high proportion of workers may suffer adverse health effects.
In the past few years new infectious agents have threatened workers' health, particularly those in the health services. In addition, previously controlled infections, such as tuberculosis, have re-emerged in many industrialized and industrializing countries and continue to be health hazards.

Considering the numerous problems of health at work and among working people, the need for occupational health services is therefore evident in all countries (industrialized, newly industrialized and developing) including the least developed ones. The types of problem may, however, vary substantially according to national and local needs and conditions, cultural influences, and other local factors. Likewise, occupational health standards for workers and workplaces vary according to economic structure, level of industrialization, development status, climatic conditions, and traditions in occupational health and safety.

Some hazards have been well defined while others, such as non-ionizing radiation and indoor air pollution, still need research and risk assessment. Occupational health problems caused by new developments in working methods, production technology and work organization should therefore be anticipated and assessed early enough that effective preventive action can be taken.

4.1.1 Chemicals

About 100,000 different chemicals are in use in modern work environments and the number is growing constantly. Exposure is most prevalent in industries processing chemicals and metals, in the manufacture of certain consumer goods (such as metal products and plastics), in the production of textiles and artificial fibres, and in the construction industry. Chemicals are increasingly used in virtually all types of work, including non-industrial activities such as hospital and office work, cleaning, cosmetic and beauty services and numerous other services. The extent of exposure varies widely by industry, activity, and country. Fortunately only 1500-2000 chemicals are widely used, making assessment and management of risks somewhat easier, although not simple. Metal poisoning, solvent damage to the central nervous system and liver, pesticide poisoning, dermal and respiratory allergies, dermatoses, cancers and reproductive disorders are among the health effects of such exposures.
4.1.2 Biological agents

Some 200 biological agents, viruses, bacteria, parasites, fungi, moulds and organic dusts have been found to occur in occupational exposures. In industrialized countries, around 15% of workers may be at risk of viral or bacterial infection, allergies and respiratory diseases.

In many developing countries, the major occupational diseases among the working population result from exposure to organic and biological agents. Hepatitis B and C and tuberculosis infections (particularly among health care workers), asthmas (among persons exposed to organic dusts) and chronic parasitic diseases (particularly among agricultural and forestry workers) are the most common occupational diseases resulting from such exposures. The growing mobility of people from disease-endemic areas to areas of low risk has increased the risk of disease, particularly among health care personnel. Immunizations can be used to control some hazards such as the hepatitis A and B viruses, while for some others careful personal and occupational hygiene and use of personal protective devices or immunoglobulins (hepatitis C) may be the main preventive strategies.

A new occupational health problem affecting health service workers and certain other groups is the re-emergence of traditional epidemics of communicable diseases such as tuberculosis. The risk of occupational transmission of HIV to health care personnel has proved to be lower than originally expected.

4.1.3 Physical factors

Workers may be exposed to several physical factors such as noise, vibration, ionizing and non-ionizing radiations and microclimatic conditions which may affect their health. Between 10% and 30% of the workforce in industrialized countries and up to 80% in developing and newly industrialized countries are exposed to such physical factors. In some high-risk sectors such as mining, construction, and some manufacturing sectors, almost all workers may be affected.

Noise-induced hearing loss has been found to be one of the most prevalent occupational diseases in both developing and industrialized countries. Numerous preventive means are available, including design of low-noise technologies and work methods, noise reduction at the source, enclosures, isolation of noise source, protection of workers' hearing by personal protectors and, if other methods are not available, shortening of the exposure times. Similar preventive strategies have been developed for other physical factors, particularly for localized vibration and ionizing radiation.
4.1.4 Human factors/ergonomics

Recent surveys show increasing exposure to psychological stress at work, particularly in industrialized countries. Such hazards have been shown to cause remarkable loss of health, well-being and working capacity and concomitantly diminished productivity, quality of working life, and economic status of individuals, companies and nations. Psychological stress and overload have been associated with sleep disturbances, burn-out syndrome, depression, and increased risk of cardiovascular disorders, particularly coronary heart disease and hypertension. Severe psychological conditions (psychotraumas) may also be seen among workers involved in serious catastrophes or major accidents where human lives are threatened or lost.

Up to half of the workers in industrialized countries judge their work to be "mentally heavy". Psychological stress caused by time pressure and hectic work has become more common during the past decade. Heavy responsibility for human or economic concerns, monotonous work or that which requires constant concentration, shift-work, work under the threat of violence, e.g., police or prison work, and isolated work are identified as factors that may cause adverse psychological effects.

In industrialized countries, problems of the modern work environment, such as psychological stress, new models of work organization, computerization and indoor air quality in office buildings, are important concerns for the majority of workers. These more complex job demands should be modified to the limited capacities and declining physiological functions of the aging employee. Thus, the maintenance and promotion of health of the working elderly becomes a priority task.

Rapidly industrializing countries often use technologies that are less advanced than those of industrialized countries. In such situations, occupational accidents and traditional physical ergonomic hazards and occupational diseases are important problems. However, the need for further preventive and control measures may still go largely unrecognized; notification and registration of such outcomes are often incomplete.

Strategies to prevent adverse psychological factors are directed towards the elimination of psychological overload and stress through modification of the work environment, work organizations and, if necessary, managerial systems. Organization of teamwork, training and education, introduction of stress management methods for individuals at risk and psychological support from supervisors, fellow-workers and psychologically competent occupational health services can be selectively implemented as prevention and control measures. Occupational psychologists also recommend
increasing workers' self-determination and self-regulation as preventive strategies. Faced with the threat of violence, measures for eliminating the likelihood of such hazards (e.g., working in pairs instead of working alone) and provision of adequate protection structures and equipment for emergencies will improve workers' confidence.

Several social aspects of work may raise health concerns. For example, aspects of work that may reduce social contacts include gender distribution and segregation of jobs, lack of gender equality at the workplace, poor social relations between managers and employees, and no social support from co-workers. In many services and public jobs, social pressure from customers or the public may cause an additional psychological burden. Such problems can be alleviated through the creation of open and positive contacts at the workplace, support for individual identities at work, and greater teamwork.

Working conditions, type of work, vocational and professional status and geographical location of the workplace and employment also have profound impact on the social status and social well-being of working people. Historically, occupational health programmes have been developed hand-in-hand with the improvement of social conditions for underserved and underprivileged occupations. In many countries, social policy, and coverage of social protection is closely linked with employment, and occupational health issues may be understood as part of the social component of collective agreements. As the mobility of workers increases and numbers of migrant workers rise in a number of countries, workers' health, well-being and social support require special attention from occupational health experts.

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

Other types of work, such as seafaring, and supervision of prisons may require longer shifts than the regular 8-10 hours per day. In extreme cases periods at the worksite may be several months. In such conditions, living and working at the same place may create specific environmental and psychosocial problems and needs. Such situations may become common in the future, as mining,
forestry and oil activities move to remote areas. Offshore oil and gas drilling is constantly expanding and moving farther from land. In addition, underwater mining may become a major source of ores in the future. Research is therefore needed on hazards and their prevention and on the development and provision of occupational health services for these unique conditions.

Between 10% and 30% of the workforce in industrialized countries, and between 50% and 70% in developing countries, may be exposed to a heavy physical workload, unergonomic working conditions such as lifting, moving of heavy objects or repetitive manual tasks. People exposed to a constant physical workload include miners, farmers, lumberjacks, fishermen, construction workers, storage workers and health care personnel, particularly those caring for the elderly. Repetitive tasks and static muscular load are found in many industrial and service occupations. Damage to the cardiorespiratory or musculoskeletal system and traumatic injuries may be the consequence of such hazardous factors.

In many industrialized countries musculoskeletal disorders are the main causes of both short-term and permanent work disability causing economic losses that may amount to 5% of GDP. Hazardous conditions can be minimized through proper design of machinery and tools, automation and mechanization, better organization of work, and training in appropriate working practices. Growing numbers of elderly workers and the female workforce require regular monitoring to prevent overexposure to hazardous conditions and a heavy physical workload.

4.1.5 Mechanical factors and accident risks

Mechanical factors, unshielded machinery, unsafe structures at the workplace and dangerous tools are some of the most prevalent environmental hazards in both industrialized and developing countries. There is a growing body of data showing that most accidents are preventable and that relatively simple measures in the work environment, in working practices, in safety systems and in behavioural and management practices are able to reduce accident rates even in high-risk industries by 50% in a relatively short period of time. On the other hand, ignorance of precautions, particularly in sectors where there has been rapid economic expansion, has led to increasing rates of occupational accidents. Accident prevention programmes are an important and technically feasible part of occupational health services. They are shown to have high cost-effectiveness and yield rapid results.
4.2 Special concerns

4.2.1 Reproductive health hazards

Growing attention was paid in the 1980s to the risk from reproductive health hazards of work. Some 200-300 chemicals known to be mutagenic or carcinogenic tend to have adverse effects on reproduction (including infertility in both sexes, spontaneous abortions, foetal deaths, teratogenesis, foetal cancer, foetotoxicity or retarded development of the foetus or the newborn). Numerous organic solvents and toxic metals are associated with adverse effects on reproductive health. Many biological agents and heavy physical work are also associated with an increased risk of reproduction disorders. The reproductive health hazards caused by ionizing radiation have been well established, while hazards from non-ionizing radiations are still under intensive study.

Both male and female workers may be affected by occupational hazards but particular concern is usually given to the protection of women of fertile age and during pregnancy. In addition to the conventional preventive activities of occupational health and hygiene services, special arrangements have been made in some countries to remove pregnant women from exposure that may be hazardous to the health of the mother or foetus. The modern occupational health approach looks at primary prevention for protection of reproductive health of both genders in all stages of the reproductive life of the worker.

4.2.2 Special problems of working women

The special occupational health problems of working women are recognized in both developing and industrialized countries. In the former, heavy physical work, the double work burden of job and family, less developed working methods and traditional social roles increase the burden of female workers. In industrialized countries, where women also have the double work burden, lower-paid manual jobs are often left to female workers. In addition, the design of machinery and work tools are often made on the basis of male anthropometry, although female workers use such equipment. Women may also face problems of occupational exposures that are hazardous to reproductive health. In many service occupations the female workers may be exposed to the threat of violence from clients or to sexual harassment from fellow workers. Some studies indicate a higher than average risk of unemployment among low-paid female workers which may also have negative social and health consequences on families. Equal job opportunities for women and men, and equal payment for the same job, are still rare in the world.
4.2.3 Carcinogens

About 300-350 different agents - chemical (e.g., benzene, chromium, nitrosamines, asbestos), physical (e.g., ultraviolet radiation, ionizing radiation) and biological (e.g., aflatoxins, tumour viruses) - have been identified as occupational carcinogens. The most common cancers resulting from occupational exposures are tumours of the lung, bladder, skin, mesothelium, liver, haematopoetic tissue, bone and soft connective tissue. Estimates for occupationally-determined cancer morbidity vary between 2% and 38% of the total cancer cases. Among certain occupational groups such as asbestos sprayers, occupational cancer may be the leading factor in ill-health and mortality.

Due to the special character of occupational cancer the only effective strategy for its control is primary prevention that aims at total elimination of the exposure or effective isolation of the worker from carcinogenic exposure.

4.2.4 Allergens

There are about 3000 allergenic factors in our environment, most of them occurring as workplace exposures. Allergic dermatoses are among the most prevalent occupational diseases. This could lead to incapacity for work and to a need to move the worker to another occupation. The respiratory tract, followed by the skin surface, is the most important route for hazardous agents to enter the body. This makes occupational respiratory diseases the priority problem in any occupational health programme. Occupational asthmas are caused by exposure to several organic dusts, to microorganisms such as bacteria, fungi and moulds, and to chemicals, both organic and inorganic.

This has been caused by the increasing tendency of the population to develop an allergic response, coupled with high numbers of allergenic exposures at work and better diagnostic methods. There has been a steady growth in numbers on the registry of occupational asthma cases, especially in several industrialized countries. Again the primary prevention approach is the most important preventive strategy.
5. OCCUPATIONAL HEALTH SERVICES

5.1 The rationale for occupational health services

The previous section has outlined a discussion on a wide range of hazards to the workforce. As has been discussed, the working population is vulnerable to injury and diseases as a consequence of exposure to these hazardous working conditions. The worker is at risk of developing diseases directly caused by work, e.g., occupational diseases, as well as those diseases for which work is partly the cause or which aggravates existing conditions, e.g., work-related diseases. At the same time, he or she is equally susceptible to the health problems likely to be seen among the general population.

A healthy workforce is essential for the economic development of any nation. A high standard of occupational health and safety has been found to have a strong positive correlation with high GDP per capita. Countries which have invested most in occupational health and safety show the highest productivity and strongest economies. Active input in occupational health and safety is, therefore, associated with economic growth.

The rationale for providing such an occupational health service is similar to that which led to the development of maternal and child health services in many countries. For instance, the mother and child group is essential for the continuation of life just as the working population is necessary for national economic development. Both the mother and child group and the working population are large significant sectors of the population. Furthermore, both of these groups are vulnerable to ill-health and disease because of their status. But whereas the provision of maternal and child health services is accepted as a norm in most countries, the provision of occupational health services is often yet to be realized.

Depending on the country and region, about 20% to 90% of workers do not have access to occupational health services. The need for such services is particularly acute in the developing and newly industrialized countries. In most of these countries, occupational health is not a priority and it is not given sufficient resources to carry out the preventive, control or curative activities that are necessary. Thus many well-known occupational exposures continue to have a negative effect on workers' health, although prevention would have been both realistic and cost-effective.
5.2 Responsibility for the provision of occupational health services

The presence of occupational health services in countries is largely dependent on historical tradition and national legislation. Legislation is a principal instrument in the development of occupational health services. However, the coverage of such legislation varies among countries and areas (see Table 1).

Table 1. Status of legislation for occupational health services in selected countries and areas of the Region

<table>
<thead>
<tr>
<th>Country/area</th>
<th>Legislation for all workers</th>
<th>Legislation for specific workers</th>
<th>No legislation</th>
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<td>China</td>
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<td>Niue</td>
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<td>Papua New Guinea</td>
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Historically, occupational services have been closely linked with labour laws. Occupational health legislation started with the industrial revolution, when the first provision for the protection of child labour was made in England. The Factory Act of 1833 introduced two fundamental innovations: the appointment of factory inspectors, and the necessity of certification by a medical authority that a child seemed by its strength and appearance to be at least nine years old (as registration of births was introduced only in 1837), the age below which employment was prohibited in textile mills.
The initial involvement of health professionals was necessary only to implement a labour law, and as such the occupational health professional came within the scope of the ministry of labour rather than the ministry of health.

In many developing countries today, occupational health professionals continue to remain under the ministry of labour. However, responsibility for occupational health services is not the sole responsibility of a single agency. In Malaysia, the Philippines and Viet Nam, a dual responsibility for occupational health services has been identified, which is possibly the best approach (Table 2).

**Table 2. Distribution of selected countries and areas showing sectoral responsibilities for occupational health services**

<table>
<thead>
<tr>
<th>Health (2)</th>
<th>Labour (4)</th>
<th>Both (6)</th>
<th>None (4)</th>
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<tbody>
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Taking into consideration the multisectoral nature of an occupational health service, the best approach would be to have the health sector responsible for the provision of health services, the ministry of labour responsible for the implementation of labour laws to ensure the safety of the work environment, and the employers and the employees involved as active partners in the provision of occupational health services. The need for such collaboration efforts for health-related activities is identified in the WHO Western Pacific Regional Office document *New horizons in health*, which states, "Health professionals must work closely with a wide range of other groups and disciplines to plan and execute health-related activities".

5.3 Development of occupational health services

5.3.1 The primary health care approach

The concept of primary health care is to make it acceptable, affordable and accessible to the community. This involves developing and empowering the community to be actively involved and
responsible for the health of its members. As the first level of health care in the community, it is the entry point to more expensive and sophisticated levels of health services. The different hierarchies of health care and mechanisms for referrals have then to be developed.

Primary health care is available in most countries. Its components include the following: health promotion activities which cultivate good health through regular exercise, balanced diet, stress reduction, anti-smoking activities and alcohol reduction; prevention of diseases through immunization against major infectious diseases; early detection of disease through screening of specific diseases (monophasic screening) or through multiphasic screening, early treatment of medical conditions and provision of adequate facilities; and rehabilitation.

The primary health care approach therefore appears to be the most logical and feasible framework for developing occupational health services. Like primary health care, occupational health services should be perceived as a spectrum of health-related activities for the working population, from health promotion to disease prevention, identification of health hazards in the workplace, screening for early detection, treatment and rehabilitation. Occupational health services for the economically active population can therefore be integrated with primary health care, as the principles and components of both are similar. Countries and areas which have occupational health services integrated with primary health care are shown in Table 3.

Table 3. Distribution of selected countries and areas showing integration of occupational health services with primary health care, Western Pacific Region

<table>
<thead>
<tr>
<th>Occupational health services integrated with primary health care (9)</th>
<th>Separate primary health care and occupational health services (7)</th>
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<tr>
<td>China</td>
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The difference between occupational health services and primary health services is that, in the former, the health professional is more alert to the relationship of disease to the work environment. The primary health care doctor should be made more aware of this association so that occupationally-related diseases can be readily identified. Consequently, treatment can be more effective since the source of irritation or disease can be identified, removed, or the worker distanced from it.

Apart from occupational health personnel becoming more aware of disease association with the working environment, and thereby providing appropriate preventive, screening and treatment services such as vaccination, ear plugs, hearing tests, screening for organophosphorous poisoning, etc., they should also take into consideration the health promotion aspects of different job categories so that appropriate health education can be given. They can also provide advice on nutrition and exercise tailored to meet the needs of different groups of the working population. Although the basic principles in the provision of care are the same, the strategies and methods may vary according to the needs of the different categories of the workforce.

The primary health care approach can therefore be effectively utilized to enhance occupational health services. This can be done through strengthening understanding in undergraduate medical education, postgraduate family practice training, continuing medical education or special courses on occupational diseases for primary health care doctors, as well as increasing public awareness. The latter is significant because occasionally, the patient himself draws the doctor's attention to the possible occupational causes of his illness, while greater awareness of occupational diseases on the part of the primary health care doctor will lead to better detection. Treatment can still be the domain of the occupational health specialists, to whom such patients are referred. In all, a holistic approach towards the health of the working population will result in a healthier and more productive workforce.

5.3.2 Models of occupational health services

There are several models of occupational health services operational in different countries. The need is to consider a model which recognizes the dual responsibilities of the health sector and the labour sector, and which addresses the country's specific situation such as existing legislation, etc. Furthermore, the model should lend itself to implementation without too many administrative changes in each of these sectors.

One model is based on the joint responsibility of the labour and health sectors. At the central level, a structure covering the health and labour sectors — already used in some countries — is
recommended (Figure 5), with an occupational health advisory board composed of occupational health professionals, employers, workers and representatives of voluntary agencies. The role of this advisory board, which is intended to be an independent body, is to reflect the needs of the community in the policies and programmes on occupational health, and to provide advice to the health and labour sectors on matters pertaining to occupational health. The interdepartmental coordinating committee ensures that the health and labour sectors work together with the greatest possible efficiency.

Figure 5. Administrative structure for intersectoral collaboration for occupational health services

At the organizational level within the health sector, the ministry of health should be in a position to provide a leadership role. Many countries have staff who could contribute to the provision of occupational health services. At the secondary and tertiary levels, these range from rehabilitation specialists, dermatologists with an interest in occupational dermatoses, respiratory physicians with an interest in work-related respiratory diseases, to neurologists, cardiologists and trauma and plastic surgeons. What is necessary is an organizational network to bring these activities within the framework of an occupational health service (Figure 6).
At the primary level, it is possible to consider three types of model (Figure 7) for the delivery of occupational health services which could be linked to the secondary and tertiary care services. For very large enterprises with their own occupational health service, the large enterprise model is applicable. The general practitioner model is for general practitioners who spend part of their time providing occupational health services to enterprises.
5.3.3 Basic concepts and elements of occupational health services

Comprehensive occupational health services are understood to be front-line services, active in workplaces, containing preventive, curative and promotive elements and using, where appropriate, the primary health care approach. They constitute the health component of comprehensive occupational safety and health programmes aiming at progressive development of working conditions. Their
activities incorporate the following functions: prevention and promotion; adaptation and adjustment of working conditions to the worker; rehabilitation; curative services and emergency response (which includes first aid).

The ILO conventions and recommendations have specifically addressed the issue of what the guiding principles are and what functions and activities occupational health services should have (see Annex).

6. CONCLUSION

About 100,000 chemicals, 200 biological factors, 50 physical factors, 20 adverse ergonomic conditions, and a number of physical workloads associated with incalculable numbers and types of psychological and social problems, have been identified as hazardous factors or conditions of work. These usually occur in combinations and have several interactions. They contribute to the risk of occupational injuries, diseases and stress reactions, job dissatisfaction and absence of well-being. Most such problems are, in principle, preventable and should be prevented both in the interests of the health and well-being of the individual, and of a country's wider economy and productivity.

The ultimate objective of occupational health is a healthy, safe and satisfactory work environment and a healthy, active and productive worker, free from both occupational and nonoccupational diseases and able and motivated to carry out his or her daily tasks with job satisfaction and with the potential to develop both as a worker and as an individual.

Several sectors of society are involved in or have an impact on occupational health. This therefore calls for intersectoral and interagency action. Ministries of labour and health, as well as the employer and the employee, should be actively involved in working out mechanisms to ensure that appropriate legislation is formulated and implemented, and adequate health services are delivered.

Occupational health services should be developed within the context of primary health care to ensure their availability and accessibility. Consequently, models for the delivery of occupational health services should be tailor-made or adapted to each country's needs based on their existing health and safety legislation, resources, level of industrialization, and their culture and traditions.
FUNCTIONS AND ACTIVITIES OF OCCUPATIONAL HEALTH SERVICES

The ILO occupational safety and health convention 1981 (No. 155) and its associated recommendation (No. 164) prescribe the progressive application of preventive measures and the adoption of a coherent national policy to promote occupational safety and health and to improve the working environment; they are positive contributions to national development and represent a measure of the success of any economic and social policy. In implementing the occupational safety and health policy and programmes, these instruments emphasize the following:

1. Tripartite participation (government, employers and workers) in formulation, implementation and reviewing of policies and practice measures.

2. Responsibilities of employers in ensuring that the workplace, machinery and equipment and processes under their control are safe and without risk to health, and in providing measures to deal with emergencies and accidents including first aid.

3. Cooperation between management, workers and their representatives recognizing the important role of collective bargaining and training and of action at the enterprise level.

4. Rights of workers to remove themselves from an imminent and serious danger while reporting to their supervisors, and to adequate information on safety and health matters.

Convention No. 161 and its recommendation on occupational health services stress that occupational health services are entrusted essentially with preventive functions, and are responsible for advising employers, workers and their representatives on maintaining safe and healthy working conditions, as well as on the adaptation of work to the capabilities of workers. These standards are
comprehensive and place emphasis on primary prevention and the best use of resources and cooperation, rather than on structures that can be inflexible.

The occupational health services should have the following basic tasks that are adequate and appropriate to the occupational risks of enterprises and in accordance with national conditions and practices. These would include:

1. pre-placement medical examinations;
2. periodic medical examination of workers in relation to specific hazards that they may be exposed to in the workplace, such that workers' health is protected and to undertake early detection of disease;
3. provision of health education, health promotion and protection programmes at the workplace;
4. provision of basic treatment and rehabilitation services;
5. coordination of first-aid services;
6. recording and analysis of health data and sickness absence records with due respect to confidentiality and professional ethics;
7. analysis and interpretation of results of surveillance of workers' health and the working environment, as well as biological monitoring and personal monitoring of workers' exposure to occupational hazards;
8. assessment of preventive and control measures, and collective and personal protective equipment;
9. advisory services for the employer, the workers and their representatives in the undertaking, such as:
   a. planning and organization of work, including the design of the workplace;
   b. maintenance and condition of machinery and other equipment;
c. substances used at work;

d. selection of the equipment necessary for the personal protection of workers against occupational hazards;

e. possible impact of the use of technologies on the workers' health;

f. occupational health, hygiene and safety and ergonomics.

(10) participation in:

a. the development of programmes for the improvement of working practices as well as testing and evaluation of health aspects of new equipment;

b. job analysis and the study of organization and methods of work with a view to securing better adaptation of work to the worker;

c. the analysis of occupational accidents and accident prevention programmes, providing information, education and training in the fields of occupational health and hygiene and ergonomics;

d. organizing first-aid and emergency treatment;

e. research and studies or enquiries with a view to collecting data for epidemiological purposes and their preventive activities. Thus, the results of the measurements carried out in the working environment and of the assessments of the workers' health may be used for research purposes;

f. measures to prevent any adverse effects on the general environment (in cooperation with other services of the enterprise).
REFERENCES

This document is based on the following:


WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR THE WESTERN PACIFIC

REPORT ON THE
TECHNICAL DISCUSSIONS
ON
OCCUPATIONAL HEALTH RISKS IN THE WORKPLACE

held in conjunction with the forty-sixth session of the Regional Committee
Manila, Philippines
11-15 September 1995

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NOTE

The views expressed in this report are those of the participants of the technical discussions on occupational health risks in the workplace and do not necessarily reflect the policies of the World Health Organization.

This report has been prepared by the Regional Office for the Western Pacific of the World Health Organization for governments of Member States in the Region and for those who participated in the technical discussions on occupational health risks in the workplace which was held in conjunction with the forty-sixth session of the Regional Committee in Manila, from 11 to 15 September 1995.
SUMMARY

Occupational health risks in the workplace was the topic of this year's technical discussions held in conjunction with the forty-sixth session of the WHO Regional Committee for the Western Pacific. Dr Jimmie Rodgers, Undersecretary of Health Care, Ministry of Health and Medical Services, Solomon Islands acted as the Moderator for the session. The background paper for the technical discussions was presented by Professor J. Jeyaratnam of the National University of Singapore.

The participants demonstrated a keen interest in the subject of occupational health. For many countries this was a relatively new issue but all participants recognized the need for it in the context of rapid development in the Region.

It was noted that one of the preconditions for the provision of occupational health services was the recognition that occupational health was concerned with the total health of all persons at work. As such it was not concerned merely with occupational disease of persons working in, for example, factories and mines; occupational health was seen to be much wider in scope.

The discussions emphasized the point that although the health sector had the major responsibility for the provision of health care, it required the collaboration of the labour sector — government, employer and employees.

Training and education in occupational health was acknowledged to be a major need for the countries of the Region. Such training and education should be targeted not only at occupational health professionals but also at employers and employees. In this context programmes on workers' health education should be integrated with occupational health services.

A legislative framework was regarded as necessary for the provision of occupational health services.

The participants expressed the view that occupational health needed to be accorded greater emphasis in the countries and areas of the Region.

In accordance with resolution WPR/RC46.R11 of the forty-sixth session of the Regional Committee, technical briefings on appropriate subjects would be arranged for the forty-seventh and forty-eighth sessions of the Regional Committee on an experimental basis, in lieu of the Technical Discussions.
1. INTRODUCTION

The topic of the technical discussions at the forty-sixth session of the Regional Committee for the Western Pacific was Occupational health risks in the workplace. The discussions were held in the afternoon of Friday, 15 September 1995, in Manila, Philippines.

The objectives of the technical discussions were:

(1) to bring to the attention of the Member States the wide range of occupational health issues, and to alert them to the need for attention to these areas;

(2) to promote commitment to a national health-care policy for the working population;

(3) to facilitate an exchange of views on suitable legislation for a safe and healthy work environment;

(4) to promote intersectoral collaboration for occupational health services.

Dr Jimmie Rodgers, Undersecretary of Health Care, Ministry of Health and Medical Services, Solomon Islands, acted as Moderator for the discussions.

The Moderator opened the session with a brief statement on the growing importance of occupational health for those countries and areas of the Region which were in a phase of rapid development and industrialization. Workers' health was not only affected by the risks in the workplace, but was also exposed to all of the health problems faced by the wider community, such as infectious diseases and malnutrition. Given this background, the Moderator stated that it was appropriate for the technical discussions to be focused on this important issue of providing for the health care of all persons at work. He then called on Professor Jerry Jeyaratnam, National University of Singapore, on behalf of the WHO Secretariat, to introduce the subject for discussion.

2. PRESENTATIONS

2.1 Introductory remarks by the Secretariat

Introducing the topic, Professor Jeyaratnam pointed out that although the concern for health risks in the workplace had originated in the industrial revolution in the United Kingdom, in the late twentieth century, the problem was clearly important in many of the countries and areas of the Western Pacific Region which were undergoing their own industrial revolution.

The title of the technical discussions "Health risks in the workplace" in effect meant occupational health. The WHO and the International Labour Organisation considered occupational health as being concerned with the total health of all persons at work. Such a definition reflected the understanding that occupational health was not concerned merely with occupational diseases; the health of the worker – or his illness, from whatever source – would have an impact on work. In short, the definition recognized the two-way relationship between work and health.
Professor Jeyaratnam outlined three main reasons for developing an effective occupational health service to cater to the needs of the working population.

Firstly, the countries and areas of the Western Pacific Region were in a phase of rapid national development, accompanied by major transformation in work practices. Agriculture was becoming mechanized and chemicals extensively used; industrial processes were becoming increasingly sophisticated; and rapid growth in the services sector in some countries and areas was evident. All of these changes meant that the working population was increasingly vulnerable to hazards to health at work.

Secondly, the working population in much of the Region accounted for 60% of the total population. Approximately one billion people were estimated to be at work in the Region. This figure itself justified an occupational health service.

Finally, there was an economic imperative to provide for the health care of the working population. For instance, poor occupational health and reduced working capacity of workers was estimated as causing an economic loss of 10%-20% of gross national product.

For these reasons, Professor Jeyaratnam believed, an occupational health service was justified. This view was shared by the World Bank, which estimated that the loss of two-thirds of occupationally determined disability-adjusted life years (DALYs) could be prevented by occupational health and safety programmes. The provision of an occupational health service should be the joint responsibility of the health sector and the labour sector.

The health sector should be responsible for the provision of health care to all persons at work; the labour sector should implement labour laws to ensure that workplaces were safe and did not harm health. In addition, for such joint sectoral responsibility to be effective, there was a need for a coordinating inter-ministerial committee.

If an occupational health service was to be integrated into the national health care system incorporating the primary health care approach, countries and areas needed to take certain steps: review their current situation; undertake a summary of their needs and problems; enact appropriate legislation; and train occupational health professionals.

2.2 Background paper

The background paper for the technical discussion had been prepared in collaboration with Professor Jeyaratnam. The paper was used as the basis for the above presentation.

In summary, the background paper identified the rationale for an occupational health service and argued that the primary health care approach was the most appropriate for such a service. In addition, the document recognized the role of the health sector and that of the labour sector in the delivery of occupational health services. The role of the health sector was seen as having the responsibility for providing health care to workers, and the labour sector as being responsible for ensuring the safety of the workforce and implementing labour laws.
3. GENERAL DISCUSSIONS

The Moderator thanked Professor Jeyaratnam for his presentation of an overview of Occupational health risks in the workplace. The general thrust of the presentation was that the workforce needed to be provided with health care, and safety and health needed to be ensured in the workplace. This required a collaborative approach with the national health sector providing health care and the labour sector providing a legislative back-up for safety and health in the workplace.

The Moderator highlighted the main objectives of the technical discussion.

The discussion began with a participant from Japan suggesting that there were four main sectors involved in occupational health: employees, employers, the regulatory authority and the health providers. A key issue was the need to motivate employers. Incentives for them could be in the form of reduced health insurance premiums or government subsidy for health costs.

A participant from the Philippines described the occupational health care services in the Philippines in some detail. In principle, the Government had been able to integrate occupational health services into the basic health services, using the primary health care approach.

A participant from Kiribati identified the special needs of small island countries in the Region, where, frequently, there were no specifically delineated workplaces. The workplace was often the home. Consequently, the need to incorporate the control of work generally into the general health care system was even greater in those countries.

A participant from Papua New Guinea highlighted the problem of the transfer of hazardous industries from the developed world to developing countries and areas in the Region, and to his country in particular. He drew attention to the need for control in such situations to forestall future problems.

A participant from Singapore outlined six features of the occupational health service in his country. They were: a legislative framework with effective enforcement; regular occupational health surveys of the workplace; investigations of complaints by the Ministry of Labour; training and education of workers, employers, and occupational health personnel; self-regulation; and reliable support services for occupational health, e.g., laboratories.

A participant from Malaysia informed the group that although occupational health was not yet at an advanced stage in his country, the recent Occupational Health Act of 1994 was likely to change the picture somewhat.

A participant from New Zealand stated that the Government had recently decided to transfer occupational health from the health sector to the labour sector. The decision was probably political rather than based on technical considerations.

She also raised the concern of the cost of compliance. In the discussions it was considered that especially in developed countries, the cost had to be met, under the influence of environmental pressure groups, trades unions, and manpower shortages.

It was also mentioned that New Zealand was on the path towards deregulation rather than towards legislative controls. In the discussions it was noted that that was appropriate for New Zealand in its current stage of development but that developing countries would still need legislation.
A participant from China referred to the problem in his country of rapid development, (a growth rate of around 11% a year), and to its adverse impact on occupational health and the environment. In the discussion it was noted that such a mismatch was inevitable and that every effort should be made to minimize it. It was hoped that, with time and with development of occupational health services, such problems could be resolved.

In China occupational health was provided through the health sector using the primary health care approach. In addition there was also active collaboration with the labour sector.

A participant also identified a need for workers' health education. In the discussions it was recognized that workers' health education programmes represented an excellent example of integration of occupational health services into the national health care system.

A participant from Vanuatu reiterated the need for collaboration and particularly the requirement to involve employees and trade unions. He also mentioned that occupational health services should not be a vertical programme but a programme targeted at the needs of particular sectors of the community.

In the discussions there was much interest and concern raised over the potential problem the countries and areas of the Region might face following the transfer of hazardous industries and chemicals. It was considered necessary for countries and areas so affected to control the problem and to make every effort to be vigilant for potential difficulties caused by it.

4. CONCLUSIONS

In conclusion, the Moderator recapitulated the main themes of the discussions:

(1) Occupational health was concerned with the total health of all persons at work. As such it was not merely concerned with occupational diseases of persons working in, for example, factories and mines; occupational health was seen to be much wider in scope.

(2) The provision of occupational health services was multifaceted and multisectoral, requiring the health sector to collaborate with other relevant sectors, particularly the labour sector.

(3) Training and education in occupational health was a major need for the countries of the Region. The training should be targeted not only at occupational health professionals but also at employers and employees. In this context programmes on worker health education should be integrated with occupational health services.

(4) There was a need for legislation to ensure the provision of occupational health services.

(5) Occupational health services were acknowledged as a need in the countries and areas of the Region.

The Moderator urged participants from the more developed countries to exchange documentation on this subject with their counterparts from other countries and areas, especially the Pacific island countries.
He added that, in accordance with resolution WPR/RC46.R11 of the forty-sixth session of the Regional Committee, technical briefings on appropriate subjects would be arranged for the forty-seventh and forty-eighth sessions of the Regional Committee on an experimental basis, in lieu of the Technical Discussions.