

Distr.
GENERAL

CES/SEM.41/17
28 April 2000

ENGLISH

**STATISTICAL COMMISSION and
ECONOMIC COMMISSION
FOR EUROPE**

**STATISTICAL OFFICE OF THE
EUROPEAN COMMUNITIES
(EUROSTAT)**

**CONFERENCE OF EUROPEAN
STATISTICIANS**

**INTERNATIONAL LABOUR
ORGANIZATION**

**Joint ECE-Eurostat-ILO Seminar on
Measurement of the Quality of Employment
(Geneva, 3-5 May 2000)**

Topic 6

OCCUPATIONAL SAFETY AND HEALTH

Invited paper submitted by the International Labour Office*

Occupational accidents and diseases remain the most appalling human tragedy of modern industry and one of its most serious forms of economic waste. ... The economic burden on the community cannot be expressed in compensation costs alone. It also includes loss of production, disruption of production schedules, damage to productive equipment ... But the economic burden is by no means the full measure of the human cost.¹

The burden of occupational injuries and illnesses

The best estimates currently available on a world-wide basis put the number of work-related fatalities at close to 1.3 million per year (see Tables 1 and 2). These, together with the millions of non-fatal work-related injuries and illnesses that occur each year, represent an enormous burden.

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Table 1: Fatal occupational injuries - global estimates²³⁴

Region	Fatality Rate $F_i/10^5$	Employment E, million	Fatalities $F_i \times E$
Established Market Economies	5.3	366.437	19,662
Former Socialist Economies of Europe	11.1	140.282	15,563
India	11.0	334.000	36,740
China	11.1	614.690	68,231
Other Asia and Islands	23.1	339.840	80,586
Sub-Saharan Africa	21.0	218.400	45,864
Latin America and the Caribbean	13.5	195.000	26,374
Middle Eastern Crescent	22.5	186.000	41,850
WORLD	14.0	2,394.667	334,870

A recent study in the United States⁵ estimated that there are 60,300 job-related deaths caused by disease. Applying the same methodology and percentage estimates for the whole world of working age, the figures in Table 2 for fatal work-related diseases were obtained.

Table 2 Estimates of global mortality due to work-related diseases 1990

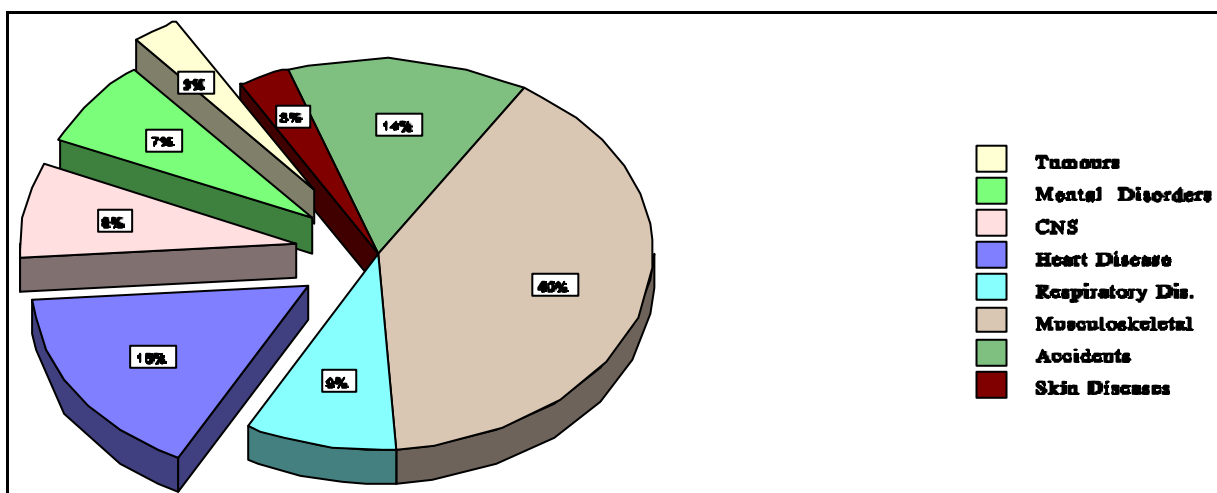
Causes of death	Number of deaths	Estimated percentage attributed to occupation	Number of deaths attributed to occupation
Cancer 30+ years	5,703,000	8 %	456,240
Cardiovascular and cerebrovascular disease 15 - 60 years	2,667,000	7.5 %	200,025
Chronic respiratory disease 15+ years	2750,000	10 %	275,000
Pneumoconioses (proportional estimate from US figures)	36,000	100 %	36,000
Nervous system disorders 15+ years	604,000	2 %	12,080
Renal disorders 15+ years	655,000	2 %	13,100
Total			992,445

The pattern of diseases varies in different regions of the world, particularly in developing countries. Overall estimates are based only on non-communicable diseases, which are still less dominant in the developing world, although rapidly increasing with urbanisation and industrialisation. In addition, in developing countries many communicable diseases, such as schistosomiasis, malaria, viral and bacterial infections, are clearly linked to work activities, such as agriculture and fishing where major parts of the labour force are employed. Close to 50 per cent of work-related deaths take place in Asia.

The trends in occupational accidents and diseases are mixed. In industrialised countries there has been a clear decrease in rates of serious injuries, resulting from both structural changes, so that fewer workers are engaged in hazardous agricultural, industrial, construction and mining activities, and real improvements in making work healthier and safer. Another contributing factor is the increasing capacity to provide first aid and emergency care which saves lives, although it does not reduce the number of occupational accidents. While rates of traditional accidents are declining, musculo-skeletal problems, stress and mental problems, asthmatic and allergic reactions and problems caused by hazardous materials including carcinogens, such as asbestos, are becoming more prevalent.

The economic costs of work-related injuries and diseases are rising rapidly. While it is impossible to place a monetary value on human life, compensation figures give a rough idea of how an estimated 4 per cent of gross domestic product disappears with the costs of diseases through absenteeism, medical treatment, disability and survivor benefits⁶ (see Chart 1).

Chart 1 Distribution of total costs of occupational and work-related diseases



In developing countries, the trends are even less favourable. People are migrating to cities, more industries are being set up - often informal and dangerous ones⁷; globalization involves workers without previous experience are drawn into industrial work; new housing and premises are needed which leads to increased volume of construction work; infrastructure such as roads, dams, telecommunication facilities and power generation installations is built up; road traffic increases; agriculture is more mechanized and pesticide use is growing; and new products and synthetic materials are produced using chemicals, fibres and minerals. All these factors influence the rates and numbers of injuries and diseases, for which upward trends are visible in many developing countries.

A fatal accident represents a tip of an iceberg. It has been calculated that for every fatal injury there are at least 750 other accidents causing either temporary or permanent disability. This means more than 250 million non-fatal injuries caused by occupational accidents in a year. In Finland it has been calculated that the average temporary disability time or absence from work is 14 days. On this basis, days lost by non-fatal injuries would total then 9.6 million years. Table 4 shows the estimated number of years lived by workers with disability caused by both injuries and diseases. The total, 7.4 million years (YLDs), is most likely an underestimate of the actual loss.

Table 4. Burden of disease and injury attributable to occupation in 1990⁸

Deaths (000)		YLL		YLD		DALY	
Total (000)	attrib. to occupation as % of total	Total (000)	attrib. to occupation as % of total	Total (000)	attrib. to occupation as % of total	Total (000)	attrib. to occupation as % of total
Established Market Economies							
154.0	2.2	2826	5.7	2144	4.4	4971	5.0
India							
185.2	2.0	3671	1.8	2159	2.5	5830	2.0
China							
247.1	2.8	4937	4.2	3295	3.6	8232	3.9
Other Asia and Islands							
148.1	2.7	3060	2.7	1940	3.1	5001	2.8
Sub-Saharan Africa							
111.8	1.4	2328	1.0	1537	2.2	3860	1.3
WORLD							
1129	2.2	22 493	2.5	15 394	3.3	37 887	2.7

YLL years of lost life **YLD** years lived with disability **DALY** Disability adjusted life years

Source: Murray, Lopez: *Global Burden of Disease* and ILO.

It is probable that these levels are increasing as other risks of disability and disease are gradually reduced. The communicable diseases will have a clearly smaller impact in both mortality and disability rates in the future while the relative and absolute share of problems caused by work - and other non-communicable diseases - will be higher as already experienced in industrialised countries. This trend can be seen in certain newly industrialized countries in Asia. For example, the fatal injury rate for compensated occupational accidents in the Republic of Korea was 29 per 100,000 insured workers, which shows the increasing importance of safety and health in rapidly industrializing Asia. The average fatality rate for the world was 14 per 100,000 workers (Table 1).

Measurement of occupational injuries

National practices

The above-mentioned figures are estimates, necessary because currently most national systems for compiling statistics on occupational injuries are incomplete in coverage and level of identification or reporting. The major sources of the national statistics are the administrative records of schemes for the compensation of occupational injuries and of systems for their notification, e.g. to labour inspectorates. These types of source (which account for 95 per cent of the information on occupational injuries provided by national statistical offices for publication in the ILO *Yearbook of Labour Statistics*) are generally governed by legislation or regulations determining their coverage, in terms of economic activities, sectors, types of workers and types of establishments⁹. Few countries have schemes providing universal coverage. 46 of the countries 114 shown in the *Yearbook* cover only paid employees in their statistics; where the self-employed fall within the scope of compensation schemes or notification systems, this is often on a voluntary basis. 40 countries exclude certain economic activities or sectors, generally public administration, agriculture, and the armed forces. 51 countries apply a minimum threshold (most commonly three days or more) on the duration of absence from work before an accident is reported or compensated.. These limitations mean that, in many countries, a majority of occupational injuries fall outside the scope of the statistical system. Coupled to this is the acknowledged underreporting of occupational injuries, which occurs for many reasons, including ignorance of legislation, fear of increased insurance premia, fear of penalties and fear of job loss. Comparability of data from these sources over time is also compromised when changes occur in legislation or regulations. Comparison of data between countries is hazardous, due to the differences noted above, as well as variations in definitions of occupational accidents, the classifications used and other methodological issues, including the inclusion or exclusion of occupational diseases and injuries resulting from commuting accidents.

A few countries compile data on occupational injuries through surveys of establishments, where the information is collected from the records maintained by employers. To a great extent, the data are subject to the same limitations as the data compiled from the administrative records of notification systems and compensation schemes, since these latter prescribe the types of information to recorded by employers.

An important innovation in the past decade has been the collection of data on occupational injuries through labour force surveys. This approach was pioneered in the United Kingdom, when in 1990 the Health and Safety Executive sponsored a supplement to the 1990 Labour Force Survey in order to establish the true level of workplace injury and of work-related ill health, and also to confirm the degree of underreporting and the relative risk in the main industries¹⁰. The results showed that, of workplace injuries reportable to a safety authority, employers reported less than a third, and self-employed persons reported less than five per cent. The EUROSTAT project, European Statistics on Accidents at Work (ESAW) also recognized the benefits of attaching a supplement to a regular labour force survey, which has the advantage of covering all workers, of all status in employment, in all economic activities and sectors, and a small module of questions was added to the regular labour force survey questionnaires in many member States of the European Union in 1999¹¹.

Developmental work in the ILO to improve the measurement of occupational injuries

As a result of the diversity of situations regarding the availability and quality of information on occupational injuries and diseases in member States, the Governing Body of the ILO convened a Meeting of Experts in October 1994 to draw up a code of practice on the recording and notification of occupational accidents and diseases. In adopting the Code of Practice⁴, the Meeting noted that ILO provisions should be considered as the basic requirements for the collection, recording and notification of reliable data on occupational accidents and diseases, and related statistics. The Code provides guidance to the competent authorities on the development of systems for the recording and notification of occupational accidents and diseases, and for action by governments, social security institutions and other organizations aimed at the overall prevention of occupational accidents and diseases. It gives more prominence to the effective use of recorded and notified data for preventive action than to the collection and compilation of statistics, but nonetheless sets out requirements for a basic set of statistics regarding occupational accidents and injuries, and a more extended set of data to provide a better picture of how accidents occur and their consequences.

Because of the need for guidance on the statistical measurement of occupational injuries expressed by many member States, as well as the evident lacuna in the national data on this subject, the Governing Body of the ILO convened a Meeting of Experts on Labour Statistics in 1998, to examine proposals for new statistical guidelines, covering both methods of measurement and classifications of occupational injuries¹². These proposals developed on the provisions of the Code of Practice, as well as other areas for which guidance was needed, such as the use of different data sources. The conclusions of that Meeting¹³ were taken into account in the preparation of a draft resolution on the subject, which was considered by the 16th International Conference of Labour Statisticians (ICLS), also in 1998. New recommendations were adopted by the 16th ICLS in the form of the Resolution concerning statistics of occupational injuries (resulting from occupational accidents)¹⁴.

The resolution provides guidance on, *inter alia*, concepts and definitions, coverage, classifications, comparative measures and data sources, with a view to generating comprehensive and timely information on occupational injuries for prevention purposes. In adopting the resolution, the 16th ICLS also recommended that the ILO should prepare a manual to provide further technical guidance, which should include advice on the collection of information through household surveys and establishment surveys.

In furtherance of this recommendation, the ILO InFocus Programme on SafeWork (SAFEWORK) and the Bureau of Statistics are currently collaborating on a joint project to develop and test new instruments for the collection of basic information on occupational injuries from sources other than notification systems and compensation schemes. Modules of questions to be attached to the questionnaires of regular labour force surveys and labour-related surveys of establishments (such as surveys of employment and earnings) have been developed as well as outlines of information that might be available from other sources, such as occupational safety and health organizations, employers= organizations, workers= organizations, hospitals, and registers of deaths. The objective is to test the feasibility of obtaining reliable, comprehensive data using these tools, as well as the possibility of integrating information from the different sources. A preliminary test for a labour force survey module was applied in Pakistan in 1997-98, with promising results¹⁵. The present experimental data collection is now approaching the final stages in the three countries selected for the project: Jamaica, Nigeria and the Philippines. The experience gained in these countries will be taken into account for finalizing the methodologies, which will be the subject of a technical manual aimed at providing guidance for member States, as well as for use in training and technical assistance by the ILO. The data collected during the project will provide valuable inputs to assist SAFEWORK/Bureau of Statistics in refining the global estimates of occupational injuries².

Measures of occupational injuries

The 16th ICLS resolution provides guidance for the collection of information within a framework which situates the victim within his or her working environment, then indicates the various states and relevant elements which lead up to the accident and injury, and finally shows their consequences.

The framework starts with the individual worker, the environment in which he or she is working and the type of work carried out. This provides the background to the accident. The worker has a set of personal characteristics, including sex, age, education, training and experience, and is engaged in an occupation, with a particular status in employment, in an establishment of a certain type, size and economic activity and at a certain location. Before the accident happens, the person is carrying out a work process (type of work) and, when the accident occurs, is performing a specific activity at a particular place, often using a tool or working with a material of some kind. Up to this point, the information describes any worker, whether or not he or she is subsequently involved in an accident.

However, something goes wrong, and an abnormal, unexpected and undesired events (deviation from the normal) or perhaps a chain of incidents occurs, which causes an accident. In many cases, this involves an item or object. As a result, the person is injured in a certain way, usually by an object or item, incurring a type of injury to a part of his or her body, which either kills him or her, or causes him or her to stop working for first aid at the workplace, or for medical treatment, perhaps at a hospital. Subsequently, if the worker cannot return to work immediately, there is a period of absence from work for recover, convalescence and, if necessary, rehabilitation. If the injury is such that the victim sustains a permanent incapacity (such as the loss of the use of a limb or eyesight), he or she may not be able to work again, or may not be able to return to the same work in which he or she was employed at the time of the accident. An accident could also lead to the development of a disease at a later stage, particularly in the case of exposure to a virus or radiation.

Within this framework, the 16th ICLS recommends collection of the following types of data:

- (a) information about the enterprise, establishment or local unit:
 - (i) location;
 - (ii) economic activity;
 - (iii) size (number of workers);
- (b) information about the person injured:
 - (i) sex;
 - (ii) age;
 - (iii) occupation;
 - (iv) status in employment;
- (c) information about the injury:
 - (i) whether fatal or non-fatal;
 - (ii) type of injury;
 - (iii) part of body injured;
- (d) information about the accident and its circumstances:
 - (i) type of location of the accident: *such as the usual workplace, another place within the establishment, outside the premises of the establishment;*
 - (ii) date and time of the accident;
 - (iii) mode of injury: *how the person was injured by a physical contact with an item or object which caused the injury or was psychologically affected by an event; if there are several injuries, the mode of the most serious injury should be recorded;*
 - (iv) material agency of injury: *the item, agent, object or product associated with the injury, i.e. the physical tool, object, element, etc. with which the victim came into contact and was injured by; if there are several injuries, the material agency associated with the most serious injury should be recorded.*

More detailed information could be collected as follows:

- (d) information about the injury:
 - (i) incapacity for work expressed in calendar days of absence from work;
- (e) information about the accident and its circumstances:
 - (i) shift, start time of work of the injured person and hours worked in the activity when the accident occurred;
 - (ii) the total number of workers injured in the accident;
 - (iii) place of occurrence: *the type of place where the accident occurred, such as a production or construction area, trade or service area, farm, street or highway;*

- (iv) work process in which the injured person was engaged when the accident occurred: *the main type or kind of work being carried out by the victim during the period up to the accident (this is a subset of the tasks covered by the occupation of the victim), such as setting up machines, cleaning of working area, teaching;*
- (v) specific activity of the injured person at the time of the accident: *the activity actually being carried out by the victim when the accident occurred; the duration of the activity may range from very short to long; it may or may not be associated with an item or object, such as feeding the machine, operating transport equipment, carrying loads;*
- (vi) material agency associated with the specific activity of the injured person: *the tool, object, element, product, etc. used by the victim in the specific activity when the accident happened (this may not necessarily be implicated in the accident), such as floors, doors, hand tools, mobile cranes;*
- (vii) deviation which resulted in the accident: *what occurred in an abnormal way, deviating from the normal way of working or the normal process, i.e. what went wrong, the event leading to the accident, such as breakage, loss of control of machine, fall of person, aggression; if there are several interlinked or successive events, the last one should be recorded;*
- (viii) material agency associated with the deviation: *the tool, object, element, product, etc. linked with what occurred in an abnormal way, such as floors, doors, hand tools, mobile cranes.*

The resolution also provides guidance on the calculation of the following measures in order to permit meaningful comparisons of the statistics, for example between different periods, economic activities, regions and countries, account needs to be taken of the differences in employment size, changes in the number of workers in the reference group, as well as in the hours worked by those in the reference group (the term *Aworkers in the reference group* refers to those workers in the particular group under consideration and covered by the source of the statistics of occupational injuries [for example those of a specific sex or in a specific economic activity, occupation, region, age group, or any combination of these, or those covered by a particular insurance scheme]):

- (a) Frequency rate of new cases of occupational injury:

$$\frac{\text{Number of new cases of occupational injury during the reference period}}{\text{Total number of hours worked by workers in the reference group during the reference period}} \times 1,000,000$$

separately for fatal and non-fatal occupational injuries; the denominator should be the number of hours actually worked by workers in the reference group, which may be calculated on the basis of normal hours of work, taking into account entitlements to periods of paid absence from work, such as paid vacations, paid sick leave and public holidays.

(b) Incidence rate of new cases of occupational injury:

$$\frac{\text{Number of new cases of occupational injury during the reference period}}{\text{Total number of workers in the reference group during the reference period}} \times 1,000$$

separately for fatal and non-fatal injuries; the number of workers in the reference group should be the average for the reference period, taking account of the hours normally worked by those persons; the number of those working part time should be converted to full-time equivalents.

(c) Severity rate of new cases of occupational injury:

$$\frac{\text{Number of days lost as a result of new cases of occupational injury during the reference period}}{\text{Total amount of time worked by workers in the reference group during the reference period}} \times 1,000,000$$

only for temporary incapacity for work.

(d) Days lost per new case of occupational injury:

Median or mean of the number of days lost for each new case of occupational injury during the reference period.

Occupational safety and health policies

Occupational safety and health policies and laws are crucial for reducing the incidence of occupational injuries and diseases, but their coverage is not satisfactory in many parts of the world.

While occupational safety and health law enforcement covers practically 100 per cent of workers in the Nordic countries, the figure for many developing countries is close to 10 per cent or less, leaving major hazardous sectors and occupations unprotected, such as agriculture, small-scale enterprises and the informal sector. Often dangerous sectors, such as fishing, forestry and construction are not covered. As noted earlier, basic compensation in cases of occupational injury also suffer from similar restrictions. Occupational and work-related diseases are seldom covered for compensation and are often not even recorded as such. Denmark records and compensates annually some 15,000 work-related diseases, but many industrialized countries register only a fraction of that number and a large number of countries practically none, although the problem clearly exists. Some 80 per cent of the workforce in Finland are covered by occupational health services, as are 50 to 60 per cent in Sweden.

However, 80 to 90 per cent of countries in the world have neither ratified the ILO Convention on Occupational Health Services (No. 161) nor enacted other mechanisms to provide such services.

WHO estimates that this inaccessibility can be as high as 50 per cent even in developed countries.

It is worth noting that those countries which have ratified most of the ILO Conventions tend to have the highest legal coverage and the lowest rates of injury.

Occupational safety and health policies and laws cover a number of areas, including occupational health services, enforcement, provision of treatment by occupational health professionals, research into occupational safety and health, information, protective equipment and training in its use, safety committees, and systems for the notification of occupational injuries and diseases, amongst other things. They may also set standards for working conditions, including levels of noise and dust in the workplace.

Table 5: Number of ratifications of 20 key ILO occupational safety and health conventions¹⁶

Country	Number of key safety and health conventions(*) ratified
Sweden	16
Finland	15
Norway, Spain, Uruguay	14
Brazil	13
56 countries	from 4 to 12
Austria, Bolivia, Burkina Faso, Canada, Central African Republic, China, Democratic Republic of the Congo, Djibouti, Guyana, Honduras, Kenya, Lebanon, Niger, Nigeria, Paraguay, San Marino, Suriname, Turkey, Viet Nam, Zambia (20 countries)	3
Afghanistan, Armenia, Bangladesh, Belize, Benin, Burundi, Cameroon, Côte-d'Ivoire, Dominican Republic, Estonia, Iceland, Indonesia, Israel, Jordan, Kazakhstan, Kuwait, Lithuania, Luxembourg, Mauritania, New Zealand, Pakistan, Senegal, Sierra Leone (23 countries)	2
Angola, Australia, Barbados, Botswana, Cambodia, Chad, Comoros, Ethiopia, Gabon, Guinea-Bissau, Lao People's Democratic Republic, Malaysia, Mali, Mauritius, Moldova, Mongolia, Myanmar, Papua New Guinea, Philippines, Republic of Korea, Rwanda, Seychelles, Singapore, South Africa, Sri Lanka, Thailand, Togo, Uganda, Zimbabwe (29 countries)	1
Albania, Antigua and Barbuda, Bahamas, Bahrain, Cape Verde, Dominica, El Salvador, Equatorial Guinea, Eritrea, Fiji, Gambia, Georgia, Grenada, Haiti, Islamic Republic of Iran, Jamaica, Lesotho, Liberia, Libyan Arab Jamahiriya, Malawi, Mozambique, Namibia, Nepal, Oman, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sao Tome and Principe, Saudi Arabia, Solomon Islands, Somalia, Sudan, Swaziland, Trinidad and Tobago, Turkmenistan, United Arab Emirates, United States, Uzbekistan, Yemen (40 countries)	0

Source: ILOLEX - ILO's data base on International Labour Standards

(*) Excluding conventions dealing with labour inspection and compensation for occupational injuries and diseases.

Environment and work

In the follow-up to the 1992 United Nations Conference on Environment and Development and in the 1997 Special Session of the United Nations General Assembly aimed at promoting sustainable development based on social justice and meaningful, healthy and decent employment, environmental issues have become integral to many of the ILO's activities, intrinsically linked with occupational safety and health.

An Australian estimate of the magnitude of mortality due to occupational exposure to hazardous substances produced a number (2,290 deaths) that was four times higher than that caused by occupational accidents¹⁷. When the same methodology is applied to the world, exposure to hazardous substances could cause some 340,000 deaths per year, not counting the acute injuries caused by chemicals.

Table 6. Estimated annual average number of deaths attributable to occupational exposure to hazardous substances by condition, world 1990^{8 17}

Causes of death	No. of deaths		Estimated percentage attributed to hazardous substances		No. of deaths attributed to hazardous substances
	Men	Women	Men	Women	
Cancer					236,566
Lung cancer and mesothelioma	707,000	237,000	15 %	5 %	117,900
Liver cancer	354,000	141,000	4 %	1 %	15,570
Bladder cancer	96,000	34,000	10 %	5 %	11,300
Leukemia	92,000	82,000	10 %	5 %	13,300
Prostate cancer	193,000		1 %		1,930
Cancer of mouth	185,000	97,000	1 %	0.5 %	2,335
Cancer of oesophagus	270,000	118,000	1 %	0.5 %	2,990
Stomach cancer	469,000	282,000	1 %	0.5 %	6,100
Colorectal cancer	237,000	235,000	1 %	0.5 %	3,545
Skin cancer	27,000	27,000	10 %	2 %	2,880
Pancreas cancer	100,000	84,000	1 %	0.5 %	1,420
Other and unspecified	631,000	1199,000	6.8 %	1.2 %	57,296
Cardiovascular disease 15 - 60 years	2,667,000		1 %	1 %	26,670
Nervous system disorders 15 + years	604,000		1 %	1 %	6,040
Renal disorders 15 + years	655,000		1 %	1 %	6,550
Chronic respiratory disease	2,621,000		1 %	1 %	26,210

15 + years				
Pneumoconioses estimate	36,000	100 %	100 %	36,000
Asthma 15 + years	129,000	2 %	2 %	2,580
TOTAL				340,616

Occupational injuries and occupational diseases are the outcomes of a combination of many factors. Their statistics can identify problem areas at which preventive action may be targeted, but it is not always possible to identify a single element that could be considered to be the cause of an accident or disease, since a number of factors usually contribute to the risks inherent in work, including working conditions themselves.

Surveys of working conditions are being conducted by a growing number of countries. For example, in France conditions of work surveys (*enquêtes Conditions de travail*¹⁸) have been conducted since 1984, at seven-year intervals. Information is collected from all economically active persons with a job in a sample of households throughout the country. The survey covers physical efforts, occupational risks and the work environment. Two surveys of working conditions in the European Union have been conducted by the European Foundation for the Improvement of Living and Working Conditions, in 1991 and 1996¹⁹. One thousand workers in each of the 15 member States of the European Union were questioned simultaneously about topics relevant to their working conditions. Sweden also conducts surveys of working conditions every other year²⁰, covering a sample of 10,000 and 20,000 workers, who are asked to answer 100 to 150 questions dealing with both the physical environment and psychosocial conditions.

These types of surveys typically do not deal with objective measures, job descriptions or work analyses carried out by ergonomists, but rely rather on the views of respondents vis-à-vis their work environment. The results are generally expressed in terms of the percentage of workers exposed to, or experiencing, certain constraints or conditions in their work.

In addition to the characteristics of respondents (age, sex) and their work (occupation, sector, economic activity, etc.) The following topics are usually covered (apart from remuneration systems, hours of work and organization of working time) :

Physical efforts:

Position: standing, uncomfortable or tiring positions, walking

Effort: carrying or moving heavy loads, moving in painful or tiring ways, making other physical efforts, subjected to vibrations

Physical environment:

Exposure to: noise, radiations, high temperatures, low temperatures, air pollution, dangerous substances

Exposure to other risks: exposed to being hit by falling materials, fall, electrocution, being

burned, being injured using a machine, being injured by tools or materials, traffic accidents, contact with explosive substances; information on risks supplied
 Status of workplace: damp, draughty, availability and state of toilet facilities, access to exterior view, use of artificial light, ventilation

Workstation characteristics: position of seat, position of bench/table, instruments/equipment, ability to adjust elements for own comfort, possibility of speaking with colleagues

Protective equipment: use of protective equipment, training in use

Mental efforts:

Responsibilities: consequences of an error

Urgency

Job content: possibility of looking up from work; required to read letters or figures of very small size, examine very small objects or very fine details, monotony of tasks, complexity of tasks, problem solving, repetitive tasks or movements, rotating tasks,

Stress situations and conflicting orders

Other topics are also included in certain surveys, such as violence at work, harassment, facilities provided by employers, job satisfaction, etc.

Indicators

Occupational safety and health can be appraised in many ways, using a variety of indicators - both objective and subjective. Such indicators could be determined in terms of capacity and capability, conditions, activities and outcomes, for example:

- \$ indicators of capacity and capability: number of inspectors or health professionals dealing with occupational safety and health in relation to total employment
- \$ indicators of conditions: percentage of workers exposed to hazardous chemicals
- \$ indicators of activities: number of inspections in relation to total employment, percentage of workers trained in use of protective clothing
- \$ indicators of outcome,: rates of occupational diseases and of occupational injuries, average number of days of incapacity per case of injury.

The table below provides a suggested list of indicators on occupational safety and health, as a starting point for the discussion of this point.

Table 7. Possible indicators of occupational safety and health

AREA	INDICATOR
1. Occupational safety and health policies and laws P Compensation P Enforcement	a) Number of ratifications of ILO Conventions (especially Nos.155 and 161) b) Percentage of total employment covered by compensation for occupational injury or disease c) Percentage of total employment covered by labour inspection

2. Occupational health services	a) Percentage of total employment covered by services
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AREA	INDICATOR
3. Infrastructure and manpower P Manpower P Capacity of enforcement P Capacity of occupational health care P Training in OSH P Research in OSH P Information in OSH	a) Percentage of total employment in specific OSH occupations (medical, inspection, hygienists, safety officers, full-time safety representatives) b) Size of inspectorate (number of inspectors as percentage of total employment; percentage of professionally qualified inspectors) c) Percentage of doctors, nurses, etc. in total employment d) Number and capacity of training institutes, universities, safety councils, workers-education units e) Number of researchers, research reports in relation to total employment f) Number of information centres, service capacity, in relation to total employment
4. Recording of: P Occupational injuries P Diseases R work-related R occupational P Costs of occupational injuries and diseases	a) Percentage of total employment covered by recording and notification systems b) Rates of fatal injuries per 100,000 workers, and non-fatal injuries with lost worktime per 100,000 workers c) Number of recognized diseases d) Estimated rates of work-related diseases per 100,000 workers (incidence, frequency and mortality) e) Recorded rates of occupational diseases per 100,000 workers (incidence, frequency and mortality) f) Costs as a percentage of GDP
5. Advisory bodies and voluntary systems	a) Existence of a tripartite advisory body and the number of possible sectoral bodies b) Number of safety committees and safety committee members (often compulsory) in relation to the number of enterprises and to total employment c) Percentage of enterprises with established occupational safety and health management systems d) Number of consultancy companies specialized in OSH in relation to total employment
6. Work environment: P Physical conditions P Mental conditions	Percentage of workers: a) exposed to: high temperatures, low temperatures, dust, vibrations, dangerous substances, noise, radiation, dirt, humidity, draughts, infections b) with work involving: painful or tiring posture, heavy loads, considerable time standing or walking c) without access to: adequate sanitary facilities, lighting d) using protective equipment e) with responsibilities (possible consequences of an error) f) with time constraints for work g) with physical constraints (required to read letters or figures of very small size, examine very small objects or very fine details, monotony of tasks, complexity of tasks, problem solving, repetitive tasks or movements, rotating tasks) h) in stress situations

Some of these indicators could be established according to economic activity, sector, or other characteristics.

Certain of them would give a direct view of particular aspects, such as the percentage of total employment covered by policies and the percentage of total employment covered by compensation schemes, etc. Others may show relative positions, or progress or deterioration over time, such as the number of workers exposed to particular physical conditions or risks.

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16. 20 key ILO conventions dealing with occupational safety and health (634 ratifications in total):
- Occupational safety and health, 1981 (No. 155)
 - Occupational health services, 1985 (No. 161)
 - Prevention of major industrial accidents, 1993 (No. 174)
 - White lead (painting), 1921 (No. 13)
 - Radiation protection, 1960 (No. 115)
 - Benzene, 1971 (No. 136)
 - Occupational cancer, 1974 (No. 139)
 - Asbestos, 1986 (No. 162)
 - Chemicals, 1990 (No. 170)
 - Guarding of machinery, 1963 (No. 119)
 - Maximum weight, 1967 (No. 127)
 - Working environment (air pollution, noise and vibration), 1977 (No. 148)
 - Safety provisions (building), 1937 (No. 62)
 - Hygiene (commerce and offices), 1964 (No. 120)
 - Safety and health in construction, 1988 (No. 167)
 - Safety and health in mines, 1995 (No. 176)
 - Marking of weight (packages transported by vessels), 1929 (No. 27)
 - Protection against accidents (dockers) (revised), 1932 (No. 32)
 - Occupational safety and health (dock work), 1979 (No. 152)
 - Prevention of accidents (seafarers), 1970 (No. 134)
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