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# 13th CEIES seminar

## Health and safety at work: EU statistics

Dublin, 10 and 11 May 2001

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EUROPEAN COMMISSION

eurostat

THEME 1
General statistics

A great deal of additional information on the European Union is available on the Internet.
It can be accessed through the Europa server (http://europa.eu.int).

Cataloguing data can be found at the end of this publication.

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# 1st day
# 10 May 2001

**9:00** **REGISTRATION**

**9:30** **OPENING SESSION**
**Welcome to the participants**:
*Mr J. Lamel, Vice-chairman of the CEIES*
**Opening address**:
*Mr P. Paoli, European Foundation, Dublin*
**Keynote speech**:
*Mr M. Skaliotis, Head of Unit E3, Eurostat*

**10:00** **THEME 1: MEASURING HEALTH AND SAFETY AT WORK - CURRENT SITUATION**
**CHAIR: MR M. SKALIOTIS**
**The producers view:**
*Mr D. Dupré, European Commission, Eurostat*
*Mr A. Fuente Martin, European Commisson, Directorate General Employment and Social Affairs*
*Mr P. Paoli, European Foundation, Dublin*
*Mr F. Alonso Arenal, Instituto Nacional de Seguridad e Higiene en el Trabajo, Spain*
*Ms I. Eklund, Statistics Sweden*

***11:00-11:30 Coffee / tea break***

**11:30** **The users view:**
*Ms A. Ruckert, European Agency for Safety and Health at Work, Bilbao*
*Mr R. Stamm, BG-Institute for Occupational Safety, Germany*
*Mr A. Grieco, Clinica del Lavoro, Milan, Italy*
*Ms T. Koukoulaki, European Trade Union Technical Bureau*

**12:15** **DISCUSSION**

***12:45-14:15 Lunch break***

**14:15** **THEME 2: FUTURE DEVELOPMENTS**
**CHAIR: MR P. PAOLI**
**The producers view:**
*Mr D. Dupré, European Commission, Eurostat*
*Mr J. Dyreborg, National Institute of Occupational Health and Mr P. Laursen, Danish Working Environment Authority, Denmark*
*Mr J. Hodgson, Health and Safety Executive, United Kingdom*
*Mr A. Karjalainen, Institute of Occupational Health, Finland*

***15:15-15:45 Coffee / tea break***

**15:45** **The users view:**
*Mr J. L. Marie, Institut National de Recherche et de Sécurité, France*
*Mr M. Donner, Federal Chamber of Labour, Austria*

**16:45** **DISCUSSION**

**17:15** **END OF THE FIRST DAY**

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# 2nd day
# 11 May 2001

**9:30** **THEME 3: CONCLUSIONS AND RECOMMENDATIONS**
**CHAIR: MR J. LAMEL**
**Reply from Eurostat**
*Mr M. Skaliotis, Head of Unit E3, Eurostat*

**9:45** **ROUND TABLE DISCUSSION**
Chair : *Mr F. Cunneen, Member of the National Statistical Board, Ireland*
*Ms. S. Wood, Deputy Director General of the Irish Health and Safety Authority, Ireland*
*Ms I. Willoch, Former Member of the Norwegian Parliament*
*Mr J. Sousa Fialho, Ministry of Labour, Portugal*
*Mr M. Imbrechts, Administration de la Sécurité du Travail, Belgium*
*Mr A. Fuente Martin, European Commission, Directorate General Employment and Social Affairs*

***10:45-11:15 Coffee / Tea break***

**11:15** **Summing up by the chairman of the subcommittee**
*Mr L. Frey, Italy*

**11:30** **Closing up by the chairperson**
*Mr J. Lamel, Vice-Chairman of the CEIES*

**11:45** **END OF THE SEMINAR**

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**Documents presented at the seminar on "Health and Safety at Work - EU Statistics"**

## Day 1



## Day 2

# MEASURING HEALTH AND SAFETY AT WORK – CURRENT SITUATION THE PRODUCERS' VIEW

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## Background

For the past thirty years the European Commission's policy on health and safety in the workplace has aimed to reduce accidents at work and occupational diseases to a minimum. This Community action on health and safety at work (HSW) has its legal basis in Article 137 (ex-Article 118a) of the Treaty establishing the European Union. Since 1989, on the basis of a Framework Directive 89/391/EEC[1], the Council has adopted a minimum number of individual Directives covering a maximum number of hazards as well as specific requirements of certain high-risk activities or sectors and certain categories of workers who are particularly vulnerable. To date almost all of them have already been transposed into national law by the Member States.

However, for the Commission, the preparation of a large body of legislation and its transposition into national law in the Member States are the means and not the end. The ultimate aim is to reduce accidents at work and occupational diseases. It is to prevent the suffering of workers and their families, the problems relating to the quality of work, the social rehabilitation and the economic impact of all this, which has repercussions on society as a whole.

For this reason, to check the effectiveness of existing legislative and non-legislative measures, EU statistical sources on HSW have been developed by the Commission in close collaboration with in the Member States. In 1990, following the Council Resolution 88/C 28/01[2], work began at European level to harmonise the criteria and the methodologies used to record data on accidents at work and occupational diseases.

The Framework Directive did in fact introduce, in Article 9, paragraphs c) and d), the obligation for employers to « keep a list of occupational accidents resulting in a worker being unfit for work for more than three days, and, in accordance with national laws and/or practices, to draw up reports on occupational accidents suffered by their workers ». For its part, the Recommendation of the Commission 90/326/EC[3] recommended in Article 3 that the Member States "ensure as far as possible that all cases of occupational disease are reported and progressively make their statistics on occupational diseases compatible with the schedule in Annex I » (European schedule).

In the same context, the Council, in its Resolution of 27 March 1995[4], specifically asked the Commission to endeavour to complete the work in progress on harmonising statistics on accidents at work and to improve, in

[1] Council Directive 89/391/EEC of 12/06/1989 on the introduction of measures to encourage improvements in the safety and health of workers at work, , OJ L 183 of 29/06/1989.

[2] Council Resolution 88/C 28/01 of 21/12/1987 on safety, hygiene and health at work, that indicates « The Council takes note of the Commission's intention of submitting to it in the near future … (an) harmonisation of statistics on accidents at work and occupational diseases ».

[3] Commission Recommendation 90/326/EC of 22/05/1990 to the Member States concerning the adoption of the European schedule of occupational diseases, OJ L 160 of 26/06/1990.

[4] Resolution 95/C 168/01 on the transposition and application of Community social legislation, OJ C 168 of 04/07/1995.

agreement with the Member States, the data available on occupational diseases. Finally, the Community Statistical Programme 1998-2002[5], in agreement with the work programme of DG Employment and social affairs (EMPL) on safety, hygiene and health at work (1996-2000), stipulated that «work will concentrate on the continuation of statistical projects on health and safety» and that «consistent series of data will be established to provide the means for the monitoring of HSW and the efficiency of regulation in this field».

## HSW Eurostat statistics : ESAW and EODS, LFS ad hoc module

In this framework, Eurostat together with DG EMPL have developed and implemented 3 main harmonised statistical tools in the field of HSW at EU level. These activities have been developed in close collaboration with the Member States, in particular in the framework of Eurostat specific Working Groups.

- ✓ The European Statistics on Accidents at Work (ESAW[6]) collect data from 1993 reference year on all cases of accidents at work with more than 3 days' absence from work and fatal accidents at work (administrative sources). Until 2000, ESAW has been covering 13 variables, with their respective harmonised concepts and classifications, on the characteristics of the victim, its enterprise and the injury (including severity : days lost, permanent incapacity, fatality). From 2001 reference year onwards, as decided by the ESAW Working Group of Eurostat in October 2000, a set of 9 additional variables (ESAW Phase III) on the causes and circumstances of the accidents, also based on harmonised concepts and classifications, will be progressively implemented in 2001-2004 (minimum of 4 priority variables) covering information on : workstation, working environment, activity, last event deviating from normality and leading to the accident, contact that injured the victim, associated material agents (objects, tools, machines, etc.). From 1996, ESAW also includes a separate data collection on commuting accidents (accidents on the normal journey between home and the place of work).
- ✓ The European Occupational Diseases Statistics (EODS[6]). A pilot data collection was carried out on the cases recognised in 1995 for 31 items of the European schedule of occupational diseases in the European Union. On the basis of this experience and of an important preparatory analysis led by the Finnish Institute of Occupational Health in collaboration with the Member States, the EODS Working Group of Eurostat decided in September 2000, the implementation of EODS Phase I that will collect annual data on new recognised cases of occupational diseases from 2001 reference year onwards in 14 Member States (Germany is not participating). Phase 1 will include information on the medical diagnosis, the exposure or factor that caused the disease as well as, for chemical and biological causal agents, the product that contained the agent. Gradually, data on diseases with a progressive nature will be also collected.
- ✓ The ad hoc module on health and safety at work in the 1999 Community Labour Force Survey (LFS) of Eurostat[7]; the module considered 11 variables on the accidents at work and the other health problems caused or made worse by work, suffered during the last 12 months. The data of this module is in the process of analysis and will make it possible to widen the field of Eurostat's statistics on HSW, on the one hand to the mild cases (e.g., accidents with less than 4 days' absence) and to the work-related pathologies non-covered as an occupational disease, on the other hand to cross-analyses with the information of the LFS on employment and labour market. Germany only participated partly to the module.

It should be noted that all Eurostat activities in this field comply with international standards. In particular, the ESAW project has been given international recognition by the ILO Resolution on "Statistics on occupational injuries resulting from accidents at work"[8] which adopted much of the EU methodology. The last ESAW Phase III developments on the causes and circumstances are both the methodological basis and the first actual attempt to use the supplementary information on the circumstances of accidents mentioned in the Resolution. Additionally, ILO is promoting modules on HSW in national LFS as done in the 1999 Community LFS ad hoc module.

[5] Council Decision 1999/126/EC of 22/12/1998 on the Community Statistical Programme 1998-2002, Title VIII, p 22-24, OJ L42 of 16/02/1999.

[6] See variables characterisation in Annex 1 (ESAW) and 2 (EODS).

[7] Commission Regulation (EC) No 1571/98 of the 20/07/1998 implementing the Council Regulation N°577/98 on the organisation of a labour force sample survey in the Community - OJ L 205 of 22/07/1998.
See description of the module in Annex 3.

[8] Adopted by the 16th International Conference of Labour Statisticians, Geneva, 6-15 October 1998.

## Implementation, data availability, relevance, accuracy and timeliness

Whilst compiling the European HSW statistical tools, the designers never deviated from their goal of creating tools for collecting information useful for prevention throughout Europe by ensuring a maximum compatibility with the existing statistical systems in the Member States. As far as possible common concepts, variables and classifications were developed to ensure the best harmonisation possible.

Concerning ESAW, despite the differences in the national reporting procedures and coverage of accidents at work, all Member States extract from their national data the informations in accordance with the ESAW definitions, methodology and variables, to submit the ESAW data to Eurostat. In particular, they provide data only for cases with more than 3 days' absence, they exclude accidents having only a medical origin, etc. . Concerning the coverage of the economic sectors, differences still remain but Eurostat harmonises the analysis by calculating incidences only on "common" branches of economic activity. The same occurs for the calculation of national fatality incidences by Eurostat where road traffic accidents are excluded. Finally, standardisation procedures are carried out to remove effects of the economical structure of each country. Moreover, for the Member States that have not insurance based system, Eurostat estimates the number of accidents occurred from the numbers of cases reported and reporting levels evaluated by the Member States. However, on this last point, the Commission recommends to these Member States to have as soon as possible, as in the insurance based system, reporting levels of about 100%. The full declaration of all accidents at work with more than 3 days' absence is the main way to avoid possible bias due to the current national evaluations of reporting levels.

Concerning EODS, the differences in the national reporting procedures and coverage of occupational diseases are much more important. However, the Phase I methodology adopted by the EODS Working Group already solves some difficulties. The diseases are not considered according to schedules, as these are not harmonised between Member States, but identifying each case by the ICD-10[9] code of the medical diagnosis and by the code of the agent that caused the disease (Eurostat classification). Moreover, diseases specific inclusion criteria have been set up. Finally, the severity of each disease will also be classified (Eurostat classification). allowing a better identification and, when necessary for comparability reasons, exclusion of mild cases (cases with a low temporary or permanent incapacity of work). The Commission is aware of the comparability issues that still remain in the domain of occupational diseases statistics. Nevertheless, the overall aim of EODS is to obtain gradually harmonised, comparable and reliable data on occupational diseases in Europe. The launch of EODS Phase 1, in which data will be collected for 2001 onwards in 14 Member States, is the first step of this progressive project.

As explained above, the main goal of the Commission is to check the effectiveness of both European and national legislative and non-legislative measures in the field of HSW. Within this framework, both for ESAW and EODS, comparability should be ensured as much as possible to obtain EU aggregated data and both EU and national harmonised trends sufficiently reliable and accurate to do this evaluation and to identify targets for new policy actions. However some limitations remain and caution should still be called when comparing results by Member State. Moreover, Eurostat and DG EMPL are carrying out the progressive improvements still necessary.

Finally, the timeliness of the EU statistical data on HSW is also being improved. In a first time both the Commission and the Member States focused their efforts on the methodological developments. This explains why in 2000 only 1996 reference year data have been published. Currently, Eurostat is doing a lot of efforts to reduce these delays for dissemination of the ESAW data. The 1998 data will be published in 2001, and in near future the publication of the data on a reference year N should be available by the end of N+2. Additionally, Eurostat is working on estimation methods for more recent periods. Nevertheless, the delays could not be cut without the collaboration of the Member States. Some countries provide data with 2 or 3 years delays. Another example is the HSW ad hoc module in the 1999 LFS. The Regulation stated that the 31/03/2000 was the deadline for submission of data to Eurostat. However, some data reached Eurostat only in December 2000, and some revisions are still expected from some countries. That explains why at the end of the first quarter 2001 Eurostat has not yet been able to publish results from this module. Timeliness is a key point for the accuracy of the EU harmonised statistical information for the purposes of prevention : Member States should participate actively to this effort.

[9] International statistical Classification of Diseases and related health problems, 10th revision, WHO, Geneva, 1992.

## Indicators

In the framework of the various initiatives in course to develop EU indicators, in particular those on « Job Quality », Eurostat has proposed mainly two key groups of indicators on the basis of the data available (future developments could be possible when new data will be available, for ex. from ESAW Phase III or EODS Phase I):

✓ The ESAW incidence rate of accidents at work with more than 3 days' absence from work for the EU and its Member States [10] :

$$\text{Incidence rate} = \frac{\text{Number of accidents with more than 3 days' absence}}{\text{Number of employed persons in the studied population}} \text{ X } 100\,000$$

The frequency rate proposed by ILO is theoretically better as it take into account the time of the exposition to the risk, but statistics on worked hours are not sufficiently developed up to date. However, the incidence rate could be progressively improved by considering full-time workers in the denominator.

The incidence rate is mainly broken down by economic activity, by Member States and for some key variables such as age, sex, occupation, employment status, and size of enterprise.

A similar but separate series of rates are calculated for fatal accidents at work.

✓ Total and/or mean number and/or rate by number of (full-time ) employed persons in the studied population, of days lost. This rate is calculated for accidents at work (ESAW) but could also includes in near future, when possible, other work-related health problems (data from the 1999 LFS ad hoc module) and occupational diseases (EODS Phase I data).

This second group of indicators is used as the variable "days lost" (including also permanent incapacity and fatalities) is a first approach of the socio-economic costs of the occupational accidents, diseases and other health problems.

## Development of new data and indicators

Eurostat, together with DG Employment and social affairs and Member States, continue to identify and develop new statistical tools required by the political needs in the area of Occupational Health and Safety strategies.

In particular, in addition to the above data and rates that provide the main current indicators in the field, first pilot collections of data on the direct costs of the accidents at work for the insurance system have been carried out in 1998 and 2000. These data covered either medical costs, sick leaves costs and permanent incapacity benefits (as well as compensation rents for fatal accidents). An improved methodology should be developed soon in this field of the socio-economic costs the accidents at work, including studies on the indirect costs for enterprises (damage to material, products, etc.) will be developed.

Specific analysis of the socio-economic costs could also be envisaged later for occupational diseases and other work-related health problems.

This new data on the socio-economic aspects is an important issue for the costs/benefits analysis of both the regulatory and non-legislative measures in the field of the health and safety at work. It is also a very valuable information for the development of incitement to prevention for enterprises.

## Other future activities

As explained above, Eurostat, together with DG Employment and social affairs and Member States, will continue the implementation and improvements of the current tools. They required 10 years work with the Member States in the framework of the ESAW and EODS Working Groups and a lot of preparatory activities in the Member States to adapt their national systems or draw up conversion procedures from national data to EU harmonised standards. Consequently the full implementation of ESAW (Phase III over the period 2001-2004) and

[10] During the reference period, calculated on 9 main "common" branches of agriculture, industry, energy, construction, trade, transport and business activities (NACE sections A, D, E, F, G, H, I, J, K). It could be further improved in terms of coverage of the other economic activity when they will be covered by ESAW data, or by evaluations from the 1999 Community LFS ad hoc module.

EODS (Phase I) is the first priority for the following years, together with the improvement of timeliness, quality and comparability of the data.

Cutting delays for data availability and dissemination of detailed analysis of the data, including the 1999 LFS ad hoc module data, are also important points in this framework.

As also indicated above, the second main issue for the next years activities, is the development and dissemination of high quality and timely indicators from the current or future available data.

A new important activity from 2001 onwards is the implementation of ESAW in the Candidate Countries. A Phare programme on ESAW and, when possible EODS, will be developed. The provision and dissemination of data from these counties and the furture Member States is a key goal for the 5 next years.

More generally, works are being developed at EU level, in close collaboration with other statistical sources in this field[11], to integrate other aspects of the quality of work and well being of workers.

## References

ILO Resolution of 1998 concerning "Statistics of Occupational Injuries: resulting from Occupational Accidents" (see above).

"European statistics on accidents at work – Methods and definitions – 1998 Edition" – Theme 3 Population and social conditions – Eurostat / Catalogue n° CA-19-98-908-EN-C. An updated 2001 Edition will be published in the second quarter 2001.

"European codification system of the causes and circumstances of accidents at work" – DG Employment and social affairs – Eurostat / Catalogue n° CE-25-99-843-EN-C.

"Statistics in focus – Theme 3 Population and social conditions – 4/2000 - Accidents at work in the EU in 1996" – Eurostat / Catalogue n° CA-NK-00-004-EN-C. A Statistics in focus on the accidents at work in the EU in 1998-1999 will be published in the second quarter 2001.

"Classification of the causal agents of the occupational diseases (in all official European languages) – EODS" - Eurostat Working Paper - Population and social conditions –3/2000/E/ n° 18.

"Europan Occupational Diseases Statistics (EODS) – Phase 1 methodology" - Eurostat Working Paper - Population and social conditions –3/2000/E/ n° 19.

Eurostat web site :

http://europa.eu.int/comm/eurostat/

[11] In particular the Working Condition Survey from the European Foundation for the Improvement of the Living and Working Conditions.

## Annex 1 : ESAW Variables.

| Variable | Number of characters | | | |
|---|---|---|---|---|
| | Phase III Data | | | Phase I and II Data |
| | Compulsory minimum | Optional ([1]) additional | Total ([1]) | |
| Case number | 11 | | 11 | 11 |
| Economic activity employer (NACE) | 2 | 2 | 4 | 2 |
| Occupation of the victim (ISCO) | 2 | | 2 | 2 |
| Age of victim | 2 | | 2 | 2 |
| Sex of victim | 1 | | 1 | 1 |
| Type of injury | 3 | | 3 | 3 |
| Part of body injured | 2 | | 2 | 2 |
| Geographical location | 5 | | 5 | 5 |
| Date of the accident | 8 | | 8 | 8 |
| Time of the accident | 2 | | 2 | 2 |
| Size of enterprise | 1 | | 1 | 1 |
| Nationality | 1 | | 1 | 1 |
| Employment status | 1 | 2 | 3 | 1 |
| Days lost | 3 | | 3 | 3 |
| Workstation | 0 | 1 | 1 | |
| Working environment ([2]) | 3 or 0 ([2]) | 0 or 3 ([2]) | 3 | |
| Working process ([2]) | 2 or 0 ([2]) | 0 or 2 ([2]) | 2 | |
| Specific physical activity ([2]) | 2 or 0 ([2]) | 0 or 2 ([2]) | 2 | |
| Material agent of Specific physical activity – 2 positions ( = 4 characters) | 0 | 4 | 4 | |
| Deviation | 2 | | 2 | |
| Material agent of Deviation – 2 positions ( = 4 characters) ([3]) | 4 or 0 ([3]) | 0 or 4 ([3]) | 4 | |
| Contact – mode of injury | 2 | | 2 | |
| Material agent of Contact - Mode of injury – 2 positions ( = 4 characters) ([3]) | 4 or 0 ([3]) | 0 or 4 ([3]) | 4 | |
| Weight ([4]) | 9 (3.6) ([4]) | | | |
| Total number of characters ([5]) | 63 or 64 ([2]) ([5]) | 18 or 17 ([2]) | 81 ([5]) | 44 |

([1]) When the optional position(s) is(are) not used for a variable, the value '0', '00', '000' or '00.00', depending on the variable, should be indicated as corresponding code or part of the code.

([2]) It is compulsory to code at least 1 of the 3 variables « Working Environment », « Working Process » or « Specific Physical Activity » (depending on the choice, as « Working Environment » has 3 characters and the 2 others have 2 characters, the total number of characters actually used therefore varies by 1). The 2 remaining variables not used for the compulsory part are consequently optional.

([3]) It is compulsory to code at least 1 of the 2 variables « Material agent of the Deviation » or « Material agent of the Contact - Mode of injury ». The remaining variable not used for the compulsory part is consequently optional.

([4]) The weight has 9 characters, including 3 for the whole number and 6 for decimal places.

([5]) When only the minimum of 4 priority variables is used, of which one with 1 position (the others should obligatorily have 2 positions), the minimum total number of characters used is « 63 or 64 ». Nevertheless, the data file should always have a length of 81 digits including all variables.

## Annex 2 : EODS Phase I Variables.

| Variable | Number of characters |
|---|---|
| Case number | 9 |
| Country of emergence | 2 |
| Age | 2 |
| Sex | 1 |
| Occupation at time of harmful exposure | 2 |
| Economic activity of employer at time of harmful exposure | 2 |
| European Schedule Reference N° (new Schedule only) | 5 |
| Diagnosis (ICD10) | 4 |
| Severity of Disease | 3 |
| Exposure : Short or long list | 10 |
| Exposure : Use categories | 3 |
| Year for the first recognition | 4 |
| Severity of Disease for first recognition (optional) | 3 |
| Total | 50 |

## Annex III - Labour Force Survey - Specification of the 1999 ad hoc module

1. All Member States are covered except Belgium, France, Austria.
2. Germany can provide Eurostat with data concerning accidents at work and work related health problems for a period of reference of 4 weeks. The variables that can be provided are: accidents at work, time off work due to the work accident, existence of a work related health problem and time off work due to the work related health problem.
3. The variables will be coded as follows:

| Column | Code | Description | Filters/remarks |
|---|---|---|---|
| | | **ACCIDENTS AT WORK HAPPENED TO PERSONS HAVING WORKED IN THE LAST 12 MONTHS** | |
| 209 | | *Accidental injury(ies), apart from illnesses, occurred during the past 12 months, at work or in the course of work* | (Col.24 = 1,2) or (Col.64 = 1 and Col.65/68 and Col.69/70 is not prior to one year before the date of the interview) |
| | 0 | None | |
| | 1-8 | Number of accidental injuries | |
| | 9 | Not applicable (Col.24 = 3-9 and (Col.64 ( 1 or (Col.65/68 and Col.69/70 is more than one year before the date of the interview, or is blank ))) | |
| | blank | No answer | |
| 210/211 | | *Month when the most recent accidental injury occurred* | Col.209 = 1-8 |
| | 00 | Current month | |
| | 01-12 | Month - 2 digits (accidents occurred before the current month) | |
| | 99 | Not applicable (Col.209 = 0, 9, blank) | |
| | blank | No answer | |
| 212 | | *Type of the injury caused by the most recent accident (code only the most serious type of injury)* | Col.209 = 1-8 |
| | 0 | Contusion, bruising | |
| | 1 | Burn, scald, frostbite | |
| | 2 | Cut, laceration, severed nerves or tendons | |
| | 3 | Amputation | |
| | 4 | Broken bone | |
| | 5 | Sprain, strain, dislocation | |
| | 6 | Poisoning, gassing or asphyxiation | |
| | 7 | Infection by virus, bacteria or contact with infected materials | |
| | 8 | Other types of injury | |
| | 9 | Not applicable (Col.209 = 0, 9, blank) | |
| | blank | No answer | |
| 213 | | *Work status after the most recent accidental injury* | Col.209 = 1-8 |
| | | Person has started work again | |
| | 1 | - Resumption of usual work activities | |
| | 2 | - Change of work or workplace because of the accidental injury | |
| | 3 | - Part time work or on reduced hours because of the accidental injury | |
| | | Person has not started to work again | |

| Column | Code | Description | Filters/remarks |
|---|---|---|---|
| | 4 | - Person has not yet recovered from the accidental injury and is not working at the date of the interview | |
| | 5 | - Person expects never to do paid work again because of the accidental injury | |
| | 6 | - Other reasons | |
| | 9 | Not applicable (Col.209 = 0, 9, blank) | |
| | blank | No answer | |
| 214 | | *Date when the person was able to start to work again after the most recent accidental injury* | Col.213 = 1-3, 6, blank |
| | 0 | On the same day as the accident or on the first day after the accident | |
| | 1 | From the second to the fourth day after the accident | |
| | 2 | From the fifth to the seventh day after the accident | |
| | 3 | From one week but before two weeks after the accident | |
| | 4 | From two weeks but before one month after the accident | |
| | 5 | From one month but before three months after the accident | |
| | 6 | Three months or later after the accident | |
| | 7 | No time off work | |
| | 9 | Not applicable (Col.213 = 4, 5, 9) | |
| | blank | No answer | |
| 215 | | *Job done when the accidental injury occurred (code first that applies)* | Col.209 = 1-8 |
| | 1 | Main current (first) job | |
| | 2 | Second current job | |
| | 3 | Last job (person not in employment) | |
| | 4 | Job one year ago | |
| | 5 | Some other job | |
| | 9 | Not applicable (Col.209 = 0, 9, blank) | |
| | blank | No answer | |
| | | **WORK-RELATED HEALTH PROBLEMS SUFFERED DURING THE LAST 12 MONTHS (apart from accidental injuries)** | |
| 216 | | *Illness(es), disability(ies) or other physical or psychic health problem(s), apart from accidental injuries, suffered by the person during the past 12 months (from the date of the interview) and that was (were), caused or made worse by the work* | (Col.24 = 1,2 or Col.64 = 1) |
| | 0 | None | |
| | 1-8 | Number of different complaints | |
| | 9 | Not applicable (Col.24 = 3-9 and Col.64 (1) | |
| | blank | No answer | |
| 217 | | *Type of the most serious complaint caused or made worse by work* | Col.216 = 1-8 |
| | 0 | Bone, joint or muscle problem | |
| | 1 | Breathing or lung problem | |
| | 2 | Skin problem | |
| | 3 | Hearing problem | |
| | 4 | Stress, depression or anxiety | |
| | 5 | Headache and/or eyestrain | |
| | 6 | Heart disease or attack, or other problems in the circulatory system | |
| | 7 | Infectious disease (virus, bacteria or other type of infection) | |
| | 8 | Other types of complaint | |

| Column | Code | Description | Filters/remarks |
|---|---|---|---|
| | 9 | Not applicable (Col.216 = 0, 9, blank) | |
| | blank | No answer | |
| 218 | | *Number of days off work due to the most serious complaint caused or made worse by work during the last 12 months* | Col.216 1-8 |
| | 0 | Less than one day | |
| | 1 | One to three days | |
| | 2 | Four to six days | |
| | 3 | At least one week but less than two weeks | |
| | 4 | At least two weeks but less than one month | |
| | 5 | At least one month but less than three months | |
| | 6 | Three months or more | |
| | 7 | Expects never to do paid work again due to this illness | |
| | 9 | Not applicable (Col.216 =0, 9, blank) | |
| | blank | No answer | |
| 219 | | *Job that caused or made worse the most serious complaint (code first that applies)* | Col.216= 1-8 |
| | 1 | Main current (first) job | |
| | 2 | Second current job | |
| | 3 | Last job (person not in employment) | |
| | 4 | Job one year ago | |
| | 5 | Some other job | |
| | 9 | Not applicable (Col.216= 0, 9, blank) | |
| | blank | No answer | |
| 220/221 | | *Economic activity of the local unit of the job that caused or made worse the most serious complaint (when not defined in another part of the survey)* | Col.219= 5, blank or (Col.219= 3 and the person did not work within the last 8 years) |
| | | NACE Rev.1 (2 digits) | |
| | 00 | Not applicable (Col.219= 1-2, 4, 9 or (Col.219= 3 and the person last worked within the last 8 years)) | |
| | blank | No answer | |

3

# MEASURING HEALTH AND SAFETY AT WORK – CURRENT SITUATION

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## Introduction

Ladies and Gentlemen, I should first of all like to thank the Committee, on behalf of the *Employment and Social Affairs DG*, for this invitation to the *13th CEIES Seminar* and for the opportunity to present to you the Directorate-General's point of view on the work to harmonise statistics on accidents at work and occupational diseases, particularly in the light of the *"New Strategy on Safety and Health at Work"* which it is currently drawing up.

Following what has just been presented by Mr Dupré, and despite the many obstacles encountered, we consider that great progress has been made in recent years on the harmonisation of statistics at European level.

The basic feature of the two projects was the adoption of common variables with their respective classification systems while largely respecting the national systems currently used in the Member States.

It should be said that, in order to achieve the present results, the work approach adopted proved successful. The "gentlemen's agreement" approach enabled the Member States, under the direction of Eurostat and with the support of the Employment and Social Affairs DG, to develop these two projects, which can be regarded as a success.

This means that since 2001 we have had a methodology and very complete harmonised criteria for reporting and recording accidents at work (ESAW project).

The work to harmonise a methodology and criteria for reporting and recording occupational diseases (EODS project) is also at a very advanced stage.

However, while we are grateful to the Member States for their efforts and generosity in enabling us to achieve the progress made so far, we firmly believe that, although we have come a long way, we have only covered the first part of the distance, since it is now necessary to *"consolidate"* and apply the methodology and criteria which have been developed.

We therefore hope that all the players involved - responsible public authorities, entrepreneurs, workers, accident-prevention experts, researchers and society in general - can make an effort to implement the two projects as soon as possible, otherwise all the efforts made so far could come to nothing.

### European legal framework

Starting from the systems which already exist in the Member States, it is obvious that during these ten years of work, in both the ESAW and EODS projects, the gentlemen's agreement approach adopted made it possible to draw up a methodology and minimum criteria for obtaining harmonised and complete information on accidents at work and occupational diseases.

In addition to the good results obtained by the gentlemen's agreement approach, I should like to point out very specially to the parties involved in this process, particularly entrepreneurs and the Member States, that at Community level there is also a legal framework which refers specifically to collecting data on accidents at work and on how they happened.

I refer to *Framework Directive 89/391/EEC*[1] adopted by the Council on 12 June 1989, Article 9(1)(c) and (d) of which lay down obligations on the employer to *"keep a list of occupational accidents resulting in a worker being unfit for work for more than three working days"* and to *"draw up, for the responsible authorities and in accordance with national laws and/or practices, reports on occupational accidents suffered by his workers"*.

This means that the Council considered that it was indispensable to have European-level statistics on accidents at work and occupational diseases and particularly on how the accidents happened, so that developments and trends in the safety and health of workers at work can be monitored.

The reason why the Council included this provision in Article 9 of the above-mentioned Directive could be seen as part of a broad view of prevention. Thus, for example, the Framework Directive also contains the following provisions: Article 5 *"General disposition"*, in which the employer is obliged to ensure the safety and health of workers in every aspect related to the work; Article 6 *"General obligations on employers"* stipulates that the employer shall take the measures necessary for the safety and health protection of workers, including prevention of occupational risks and provision of information and training, as well as provision of the necessary organisation and means; Article 7 *"Preventive and protective services"* lays down that the employer shall designate one or more workers to carry out activities related to protection from and prevention of occupational risks and that the undertaking is responsible for organising protection and prevention activities. Lastly, Articles 10, 11 and 12 make it compulsory for employers to *inform, consult* and *train* workers.

We can therefore see that the legislator has provided for all these obligations to supply both qualitative and quantitative information on the subject, but above all objective information so that the actual effectiveness of measures adopted to improve the safety and health of workers at work can be assessed.

Having harmonised statistics at our disposal will therefore enable us to determine the sectors and types of firms on which prevention measures should be concentrated, as regards both the most serious accidents and less serious accidents, the increasing incidence of which is a cause for concern.

At the same time, in its Resolutions of 21 December 1987[2] and 27 March 1995[3], the Council called on the Commission to initiate and continue the work to harmonise statistics on accidents at work and occupational diseases.

So that is the basic framework. However, the Commission preferred to adopt a more constructive and conciliatory approach along the lines of a gentlemen's agreement.

## Usefulness of harmonised statistics for the prevention of accidents at work and occupational diseases

It is clear that the new philosophy introduced by the Framework Directive, which obliges employers to ensure the safety and health of workers at work in all aspects, means that we need an appropriate tool for taking the necessary measures to reduce the number of accidents at work and the incidence of occupational diseases.

We also think that, in order to analyse the supervision, trends and monitoring of the implementation of this new legislation (a framework directive and 15 specific directives), it is indispensable to have both qualitative and quantitative information on which to base such an analysis, so that both the number and the seriousness of accidents at work can be reduced.

Hence the need to have harmonised statistics as a tool or instrument for conducting the above-mentioned monitoring, supervision and analysis and ultimately to be able to justify, as it were, the preventive measures taken or to be taken.

[1] Directive 89/391/EEC on the introduction of measures to encourage improvement in the safety and health of workers at work, OJ L 183, 29.06.1989.

[2] 88/C 28/01, OJ C 28, 03.02.1988.

[3] 95/C 168/01, OJ C 168, 04.07.1995.

We therefore consider that the currently available tool (under the ESAW project) is sufficiently developed, since it provides information on accident victims such as age, sex, type of injury, days lost as a result of accidents, the causes of accidents and the circumstances in which they occurred.

Lastly, this information on the basis of ESAW will give us a better insight into working conditions and the circumstances in which accidents or occupational diseases occur so that we can devise appropriate prevention policies for gradually reducing accidents at work and occupational diseases.

## New Community Strategy for Safety and Health at Work: *"Quality of work".*

During the Workshop held last week in Bilbao on the *"Quality of work – a Community Strategy for Safety and Health at Work"*, organised by the European Agency for Health and Safety at Work in cooperation with the Swedish Presidency and the Employment and Social Affairs DG, the speakers referred a number of times to the need for quantitative and qualitative socio-economic indicators for monitoring and assessing the effectiveness of the measures adopted to improve the safety and health of workers at work.

It was also mentioned that this new strategy should take account of traditional risks, new risks, emerging risks and risks associated with technological advances and types of work organisation.

Demographic factors must also be considered, particularly those relating to the ageing of the population, the integration of older workers at work or the occupational integration of disabled workers, especially those who have been victims of industrial accidents or occupational diseases. Aspects which have already been included in the ESAW project.

There are also the issues concerning the equality of women at work, new forms of work such as subcontracting or "bogus self-employment", teleworking or other problems associated with risks such as stress, violence at work, etc. We therefore need information and trends, which can only be objective if we have harmonised statistics, i.e. qualitative and quantitative data on accidents at work and occupational diseases.

So that is a broad view of the usefulness of harmonised statistics and their future development, which we regard as indispensable for the future new Community Strategy on Safety and Health at Work, which will have to be ambitious, be able to motivate people and take a number of different forms (variable geometry).

## Enlargement and the candidate countries

Another very important aspect of this exercise to harmonise and consolidate the existing methodology of the ESAW and EODS projects is the evaluation of THE safety and health situation in the candidate countries at the time of the next enlargement, so that the situation in these countries can be compared with the European Union average. To this end it would also be useful to involve the candidate countries as far as possible in the ESAW and EODS methodologies.

Thus any future development in statistics on accidents at work and occupational diseases will have to take account of these aspects both for devising the new strategy and for the candidate countries.

## Problems associated with harmonised statistics

Everything that has been said so far on the usefulness of harmonised statistics is worthless unless we are capable of solving a number of latent problems which make users suspicious of the validity of these harmonised statistics.

I refer to the *quality* and *reliability* of the statistics and to their *availability over time*.

It is obvious that, without a minimum degree of harmonisation of the data, users may be reluctant to use these data in the various aspects associated with the prevention of accidents and occupational diseases.

The *"quality of statistics"* depends on the method and the criteria adopted for collecting the data with a minimum degree of harmonisation. It is therefore very important that employers should be aware of this aspect, since if the original data are not of high quality, any subsequent processing cannot make up for the original poor quality.

The *"Reliability"* of statistics depends on the size of the sample and on similar cases which may have been considered, hence the need for harmonisation.

However, the *"Availability over time"* of statistics is also very important, since we can have data that are of high quality and very reliable but which arrive too late. It is obvious that such data will not be used or will simply be useless for practical purposes. Only if users obtain these data rapidly can they be of any use for detecting problems and hence speeding up measures to rectify them or making these measures more effective in improving the safety and health of workers at work.

We therefore believe that it is indispensable to ensure this *"Quality"* and *"Reliability"* of statistics while at the same time obtaining the data as rapidly as possible, thus ensuring their *"Availability"* over time.

At present, for various raisons and without going into detail, we now (May 2001) have data for 1998: a time lag of two years.

It is therefore very important to reduce to a minimum the time it takes for the statistics to become *"Available"*, and if this minimum is regarded as insufficient, *"Estimates"* for certain variables should be devised so that we can plan measures to rectify the most serious or worrying causes and circumstances.

## Conclusions

We hope that in the conclusions of this 13th CEIES Seminar it will be possible to draw up guidelines for future action in the field of statistics on accidents at work and occupational diseases by taking account of what has been achieved to date. But above all by taking account of the outlook in a globalised and changing world, where new technologies and the information society must be capable tackling the problems of accidents at work and of working conditions in the way expected by today's dynamic society.

## Consolidation

Among the guidelines, we would like to see all the parties involved - national administrations, employers, workers and those responsible for statistics - making an effort to ensure that the current ESAW and EODS projects are *consolidated.*

And that any development of *socio-economic indicators*, and in particular indicators on the quality of work, should be based on harmonised statistics.

## Estimates

Since the *"Availability over time"* of certain variables is not possible, it would also be useful to have *"Estimates"* of certain variables so that the parties involved in prevention (inspection agencies, prevention services, employers, workers, researchers etc.) can identify the most serious problems and tackle them sooner.

## Regulation

In this connection, and since the ESAW project has reached its maximum development, I issue a challenge to launch, if necessary, a broad debate to decide whether or not it should be compulsory for the Member States to collect and transmit to Eurostat data on accidents at work according to the harmonised ESAW variables, obviously after a transitional adaptation period.

## New strategy on Safety and Health at Work

Lastly, it must be possible to base the development of the future New Community Strategy on Safety and Health at Work, which will have to be ambitious, provide incentives and take on numerous forms, on statistics which are of high quality, reliable and available over time. This will help us to establish indicators for assessing progress in order to provide a solid foundation for new measures by taking account of an integrating view of the various Community policies aimed at improving the safety and health of workers, namely the *"quality of work"*.

Thank you very much for your attention.

# EUROPEAN SURVEYS ON WORKING CONDITIONS

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## Introduction

The Third Survey was carried out simultaneously in each of the 15 Member States of the European Union in March 2000. The previous Surveys were carried out in 1990/91 and in 1995/96. Therefore, time series can now be established, at least for some of the variables which have remained the same and the Report highlights these time series wherever possible.

These Surveys aim to provide an overview on the state of working conditions in the European Union, as well as indicating the nature and content of changes affecting the workforce and the quality of work. Since they are of a general nature, obviously these Surveys can not address all issues in detail. However, they might indicate the need for more detailed research, including qualitative research, on more specific issues.

This main report is limited to a straightforward presentation of the results. More detailed statistical analysis is published in separate specific reports. Some of the issues which are analysed in more detail are: gender and work; age and work; employment status; branch profiles; work organization and working conditions; time.

The Surveys are designed with the support of national and European experts, as well as representatives from the European Commission, employers' and workers' organisations.

A pilot group was set up to help the Foundation define the methodology and the questionnaire. The Foundation commissioned INRA-Europe to undertake the field work which was carried out between 1st March and 30th April 2000.

### 1. Sampling

A representative sample of the **total active population**, i.e. people who were, at the time of interview, **either employed or self-employed** was sought.

The basic sample design is a multi-stage random sampling, called "*random walk*".

The three European Surveys on Working Conditions use a *random walk* procedure. This method has the advantage of not requiring a complete poll basis, while providing precise guidelines to the interviewers. A precise itinerary is given to interviewers indicating at what stages they should carry out an interview. Although there might be some minor differences between one country and another, all national poll institutes comply with the principles. The process can be summarised as follows:

- The Eurostat territorial breakdown (NUTS II) has been adopted for each country. This coding does not exist everywhere (e.g. Denmark), in which case national institutes have to find the most appropriate regional/local breakdown.
- Population density is provided by urban size. Country tables are provided to each institute.

- On the basis of the two points above, a list of *sampling points* is established. Generally, postal codes (the most detailed territorial breakdown) are used to randomly select the sampling points.
- Next, one or several *starting points* are selected for each *sampling point* and the interviewers follow the *random walk* procedure.
- When several persons in a household fall within the scope of the Survey, the selection is based on the *first birthday method* (the one whose birthday is the closest to the interview date).

Individuals from the age of 15 years upward were interviewed (bearing in mind that after the age of 65 the number of active people would level off rapidly). All retired and unemployed people, as well as housewives and students, etc. were excluded. Non-Europeans were included, on the condition that they could be interviewed in the national language(s) of the country where they work.

Interviews were carried out in all Member States of the European Union. All interviews were scheduled at times of the day when employed and self-employed could be reached. The respondents were interviewed face to face in their own home.

The target was 1 500 cases per country (500 in Luxembourg). The actual numbers of interviews carried out in each country can be seen in Annex 5.

## 2. Weighting

The target was "persons in employment" as defined by the Labour Force Survey (Eurostat): "persons in employment" refers to those who did any work for pay or profit during the reference week[1] or those who were not working but had jobs from which they were temporarily absent. Family workers are also included.

As for all empirical methods, the *random walk* procedure implies a weighting of the selected sample so that the sample is identical to the target population according to the selected variable.

In order to categorize the target population in relation to the selected variables one has to use, if possible, a survey where the sample size is identical to the target population (e.g. Census), or the results of a survey deemed reliable, generally a probability poll with a very large sample (e.g. Labour Force Survey).

If the *quota method* is used, the interviewers have to control the distribution of the selected variables in the sample. There are free to interview anyone so long as they comply with the distribution. In this way the distribution of the sampling will be identical to the desired distribution.

If the *random walk* method is used, the interviewers are obliged to follow a compulsory itinerary and they do not have the freedom to interview whom they wish. In this case, the structure of the sample will be different from the desired sample as some respondents are not as easy to contact or refuse to respond. Therefore, the sample will have to be "weighted" to get an identical distribution as the one desired with regard to the selected variables. In order to do so, a weight is given to each individual, which varies according to the rarity of the variable it represents (e.g. a higher weight if his/her group is under-represented). Specific computer software is used to carry out such weighting as described above. On completion, when each of the individuals interviewed has been weighted, the weighted sample is identical to the desired sample.

The European Survey on Working Conditions (ESWC) has adopted the latter method. The selected variables in each country are: region, city size, gender, age, economic activity (NACE) and occupation (ISCO). The reference for such distribution is the Labour Force Survey (1997) (LFS). The LFS is based on national surveys with very large samples (therefore deemed to be reliable) and with identical categories. The ESWC weighting has been carried out on the basis of the LFS which means that the ESWC distribution by region, locality, size, gender, age, economic activity and occupation is identical to that of the LFS distribution.

The previous 1990/91 and 1995/96 European Surveys were carried out following the same methodology. However, in 1990/91 only 12 countries were covered and the weighting was done on the basis of the 1988 LFS. Although 15 counties were covered in 1995/96, Austria, Sweden and Finland were not covered by the 1993 LFS used for the weighting at that time and another active population structure was used to provide the weighting basis for these three countries. The categories' definitions (e.g.. the definition of the "public sector") were

[1] Reference week varied from country to country

sometimes different from the ones used in the LFS. Therefore a comparison between the 1995 and 2000 indicators for those countries should be considered with caution.

One has also to consider the limits of the job category coding used by the LFS. The ISCO-COM 88 coding as a job classification rather than a social classification. Employees and self-employed are not always distinguishable. For example, farmers and farm workers (category 6) are not separated, nor are independent craft workers and their employees in category 7. Industrial workers are categorized into 4 different categories (6, 7, 8 and 9) which do not take skill levels into account.

This job classification can also be found in some but not all national classifications. Therefore the "recoding" carried out by EUROSTAT from national classifications to a European classification creates problems. This can be seen in the LFS figures for category 1 (legislators and managers) in Italy and France: they show either strong variations from one year to another in France or abnormally low rates in Italy.

***Table 1.1: Number of legislators and managers shown as a percentage of the working population in France and Italy***

| % | **1992** | **1993** | **1994** | **1995** | **1996** | **1997** |
|---|---|---|---|---|---|---|
| **France** | 12.1 | 2.0 | 2.3 | 7.8 | 7.6 | **to be** |
| **Italie** | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | **completed** |

Source: Eurostat. Labour Force Survey. Results 1992, 1993, 1994, 1995, 1996, 1997.

This issue will have to be monitored closely particularly for the three most recent Member States (Austria, Sweden and Finland).

## 3. Response rates

The following table shows the response rates for the 1995/96 and 2000 Surveys.

***Table 1.2: Response rate for the 1995/96 and 2000 Surveys***

| **%** | **B** | **DK** | **D** | **EL** | **E** | **F** | **IRL** | **I** | **L** | **NL** | **A** | **P** | **FIN** | **S** | **UK** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1995/96 | 58 | 30 | 67 | 47 | 77 | 96 | 77 | 43 | 60 | 34 | 82 | 66 | 55 | nc | 58 |
| 2000 | 56 | 42 | 76 | 47 | 73 | 74 | 58 | 39 | 68 | 41 | 67 | 68 | 56 | 58 | 56 |

The response rate for Sweden was not available in 1995/96.

The rate is stable for Belgium, Greece, Spain, Italy, Portugal, Finland and the United Kingdom. It improves slightly in Luxembourg (+8) and in the Netherlands and considerably in Denmark (+12) and in Germany (+11).

There is a strong deterioration in France (-22), in Ireland (-19) and in Austria (-15).

It is always difficult to assess the impacts of non-responses on the results of a survey. One can expect that workers with the worst working conditions, particularly those with "unsocial" working hours (and therefore more difficult to contact), are less likely to be interviewed. If this hypothesis is correct – which is yet to be borne out – a low answer rate would create an optimistic bias.

The changes in response rate give an idea of the bias variation expected for each country. For half the countries, the stability of the rate between 1995/96 and 2000 allows one to think that the bias remains constant and therefore the changes affecting the various indicators are reliable. For the other countries the changes may be partly due to a measure effect.

The French response rate calls for a specific mention: the 1995/96 response rate was unrealistic; the figure for 2000 seems more realistic and remains one of the highest.

The gap between extremes has reduced (from 30 to 96 in 1996/96 to 39 to 76 in 2000) indicating a relative uniformity of response rates in the EU and making the results between countries slightly more comparable.

## 4. Limitations of the Survey

The methodology used and more generally international comparisons create a number of problems which users of the data should keep in mind when analysing and interpreting the results.

- The **Industrial Structure** differs widely between countries as well as the distribution of the workforce between sectors, therefore international comparisons should be considered with caution. The report provides where necessary the various breakdowns which can help understand (at least partly) why the results differ from one country to the other.
- The **Sample size** in each country is limited to 1 500 workers. This means that breakdowns may lead to subgroups with insufficient number of cases to draw conclusions and the number of cases in each group in each country may be too small to draw conclusions. Because of the sample size the breakdown between sectors had to be limited to one-digit categories.
- On some issues, the data provided by the Survey is not, by far, as detailed and possibly as reliable as the data provided by more specialised surveys. The aim was not to provide, for example where working hours are concerned, a review of working time in Europe, but rather to enable a link between working time and working conditions.
- The **legal and cultural differences** between countries may influence the way the questions are understood and must be taken into account when reading the report. The level of knowledge or awareness about the working environment problems and the attitudes and concern about such problems are very different from one country to another. In some countries the concept of working environment is well known and accepted, in other countries the working environment is perceived to be part of daily life and the problems experienced in connection with the working situations are only considered to be a “natural” part of life conditions and as such not worth giving special consideration.
- Some issues such as **occupational accidents** have not been addressed since harmonized data sources (EUROSTAT) already exist.
- The Survey describes **self-perceived working conditions**. As can be seen from the questionnaire people were asked, in so far as possible, to describe their working conditions, seldom to give an opinion on them. Nevertheless, when considering the figures from the Survey one should bear in mind that the description of the work situations is based on a reporting from the workers themselves in face to face interviews. The aim of the Survey is in fact to provide a picture of working conditions as they are. With regard to this objective and as indicated above, th e current Survey certainly has limitations, but nonetheless it helps provide such a picture. Obviously it could and should be complemented by other information sources (case studies, company based questionnaires, etc.) to improve the overall picture.

# TEN YEARS OF WORKING CONDITIONS IN THE EUROPEAN UNION

## Main findings

Work-related health problems, intensification of work and flexible employment practises are still causing problems for the working population in Europe.159 million people were employed in the European Union in 2000, of whom 83% were employees and 17% self-employed.

In 2000, the European Foundation for the Improvement of Living and Working Conditions carried out its Third European Survey and interviewed 21,500 workers, both employed and selfemployed about their working conditions - 1,500 in each Member State apart from Luxembourg where 500 were interviewed. The survey is a household survey carried out by face-to face-interviews. The two previous surveys were carried out in 1990 and in 1995.

**The 2000 Survey reveals that:**

- ⇨ The most common work-related health problems are:
  - ❍ back pain (reported by 33 percent of the respondents);
  - ❍ stress (28 percent);
  - ❍ muscular pains in neck and shoulders (23 percent)
  - ❍ overall fatigue (23 percent).
- ⇨ No progress is found among these health problems compared to earlier surveys. Bad health outcomes are relatedto poor working conditions, in particular, work intensity.
- ⇨ Exposure to physical risk factors (noise, vibrations, dangerous substances, heat, cold, etc.) and to poor design (carrying heavy loads and painful positions) remains prevalent.
- ⇨ Work is getting more and more intensive - a main factor already emerging in the previous surveys.
- ⇨ Control over work increased significantly between 1990 and 1995, but no further improvements are seen in 2000. One-third of workers still report little or no control over their work. Only three out of five workers can decide when to take holidays.
- ⇨ The nature of work is changing: it is not depending as much on the pace of machines or production norms – it is more driven by the customers and the clients. More and more people are working with computers.
- ⇨ Flexibility is widespread in all areas of work:
  - ❍ working time:
    - ◊ "round the clock" work with fluctuating work schedules;
    - ◊ extensive use of part-time work (17 percent of the respondents reports working part-time);
  - ❍ work organisation:
    - ◊ multi-skilling and teamwork;
    - ◊ empowerment;
  - ❍ labour market:
    - ◊ 18 percent of the employees indicate non-permanent contracts
- ⇨ Still problems remain with the traditional work organisation, such as repetitive work and monotonous work, although a decrease in monotonous work can be shown
- ⇨ Flexibility is not always conducive to good working conditions. This is particularly the case for temporary workers (employees with fixed-term contracts and temporary agency workers) who continue to report more exposure to risk factors than permanent employees.
- ⇨ Gender segregation and gender discrimination remain highly frequent and are disadvantageous to women.

## Health and work

Workers' perceptions of their health and safety being at risk due to their work have shown an improvement during the past ten years (as indicated in Figure 1).

However an increasing proportion of workers are reporting work-related health problems (see Figure 2). Musculo-skeletal disorders (backache and muscular pains, particularly in the neck and shoulders) are on the rise, as is overall fatigue. Stress remains at the same level (28%). There are strong correlations between stress and musculo-skeletal disorders and features of work organisation such as repetitive work and pace of work (see Table 1).

An indication of the demands imposed on workers by their job is provided in Figure 3 which shows whether or not they feel they can or want to do the same job until their sixties. This question could be considered as an indicator of "work sustainability". Blue collar workers and service/sales workers report the least "sustainable jobs".

***Figure 1: Workers reporting health and safety risks at work***

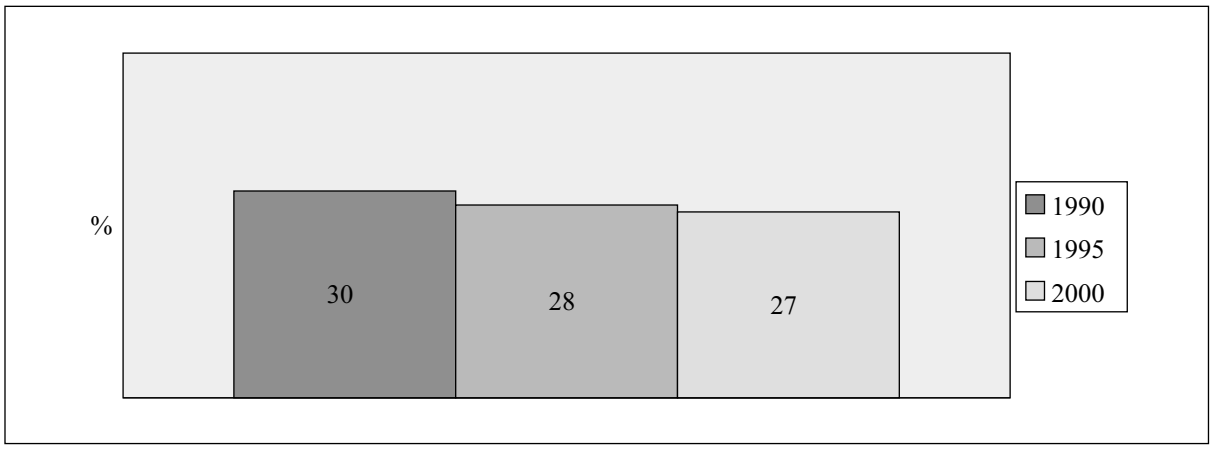
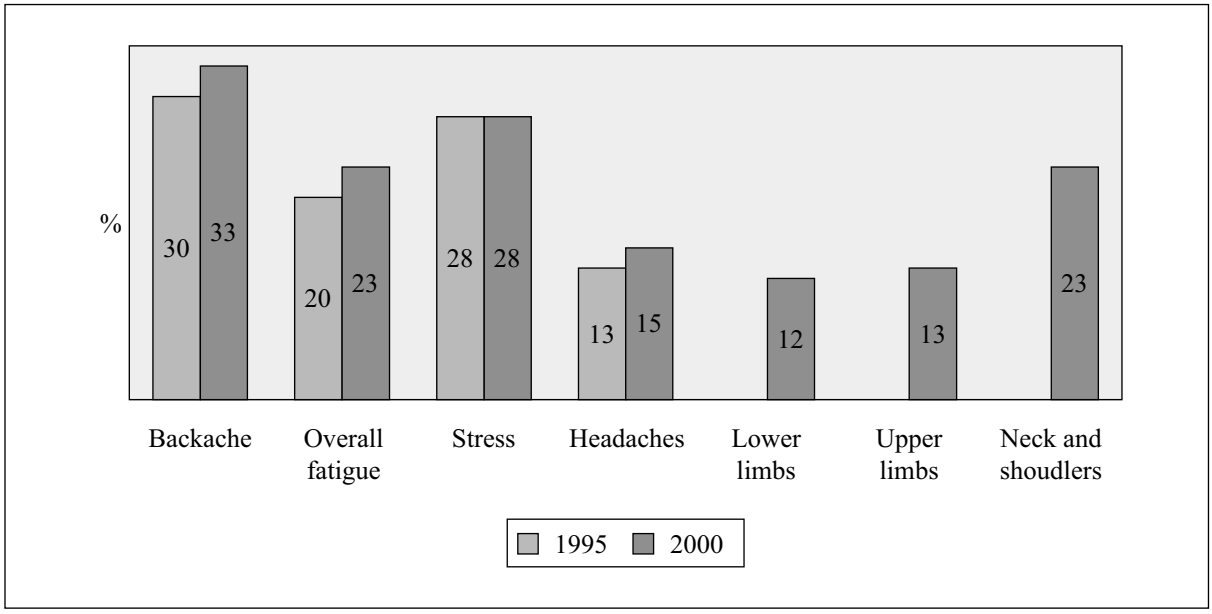
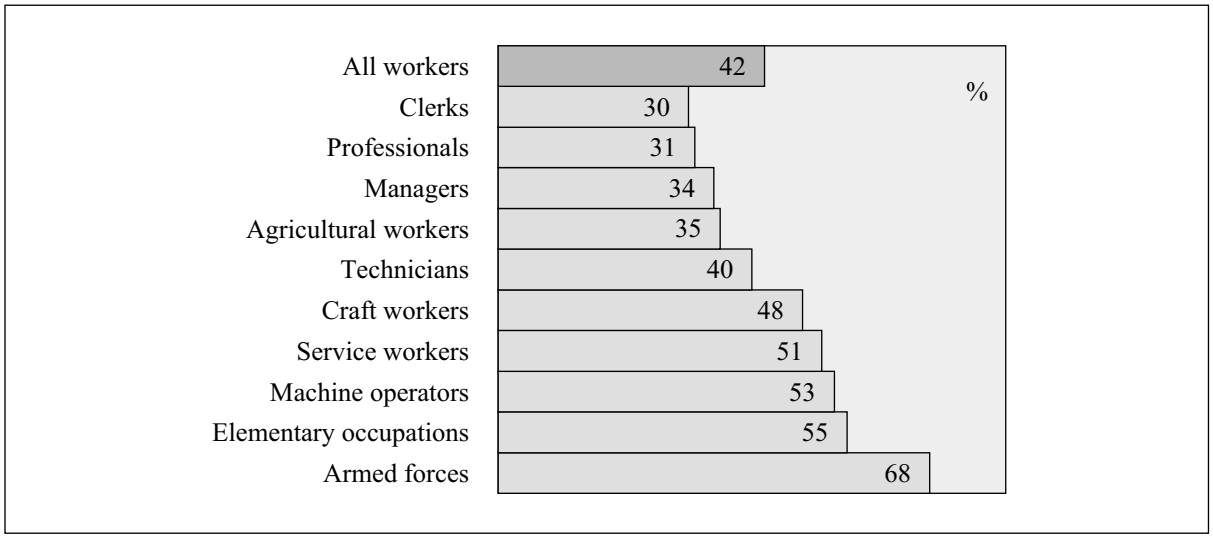



***Figure 2: Work-related health problems***




**(muscular pain)**

*Figure 3: Workers who do not think they will be able to or want to do the same job when 60 years old (excluding "don't know") (by occupation)*



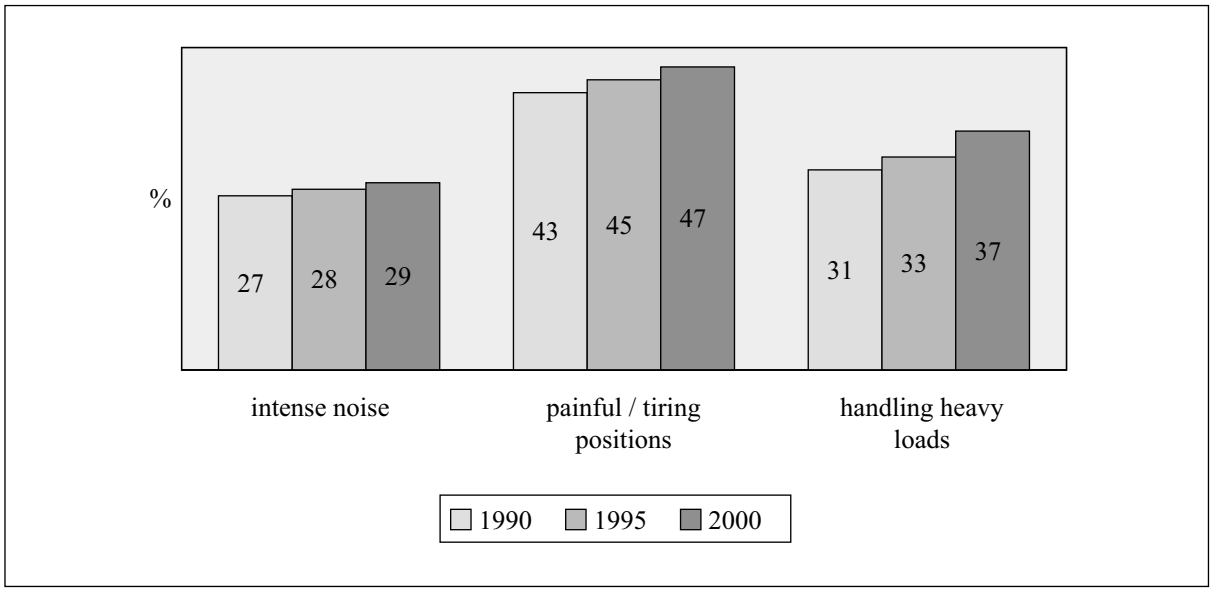

## Exposure to physical hazards

No improvements are reported about classical health and safety problems such as noise, polluted air, heat, cold, vibrations, carrying heavy loads and working in painful or tiring positions, see Figure 4. The proportion of workers exposed remains high.

In 2000, as in previous surveys, male workers are more exposed than female workers to all of these issues except for painful and tiring positions, where the percentage is the same.

Non-permanent employees, i.e. temporary agency workers and employees with fixed-term contracts, are more exposed to issues such as heavy loads and painful positions than employees on indefinite contracts, see Figure 11.

*Figure 4: Workers exposed to physical hazards*



## Repetitive work

Repetitive work is still widespread. In 1995, 57 percent of workers were reporting repetitive movements (33 percent of them on a continuous basis). In 2000, the proportion remains identical, but with a decrease for those continuously affected (31 percent).

The question about repetitive tasks was changed in 2000 and trends are therefore difficult to assess. 32 percent of workers reported carrying out repetitive tasks of less than 10 minutes in 2000, and 22 percent work tasks of less than 1 minute.

Those who have repetitive work also reported a high proportion of musculo-skeletal disorders (see Table 1).

***Table 1: Health problems related to making repetitive movements***

| % | Backache | Muscular pains in neck and shoulders | Muscular pains in upper limbs | Muscular pains in lower limbs |
|---|---|---|---|---|
| Repetitive movements | 48 | 37 | 24 | 21 |
| No repetitive movements | 19 | 11 | 4 | 5 |
| Average | 33 | 23 | 13 | 11 |

## Intensity of work

Intensity of work has increased during the past decade, more sharply between 1990 and 1995 than between 1995 and 2000.

In 2000, more than half of the workers report working at high speed and to tight deadlines during at least one quarter of their working time, see Figure 5. In addition, two out of five workers stated that they did not have enough time to do their job.

The intensity of work is strongly correlated to health problems and accidents at work, see Tables 2 and 3.

***Figure 5: Working at very high speed or to tight deadlines***

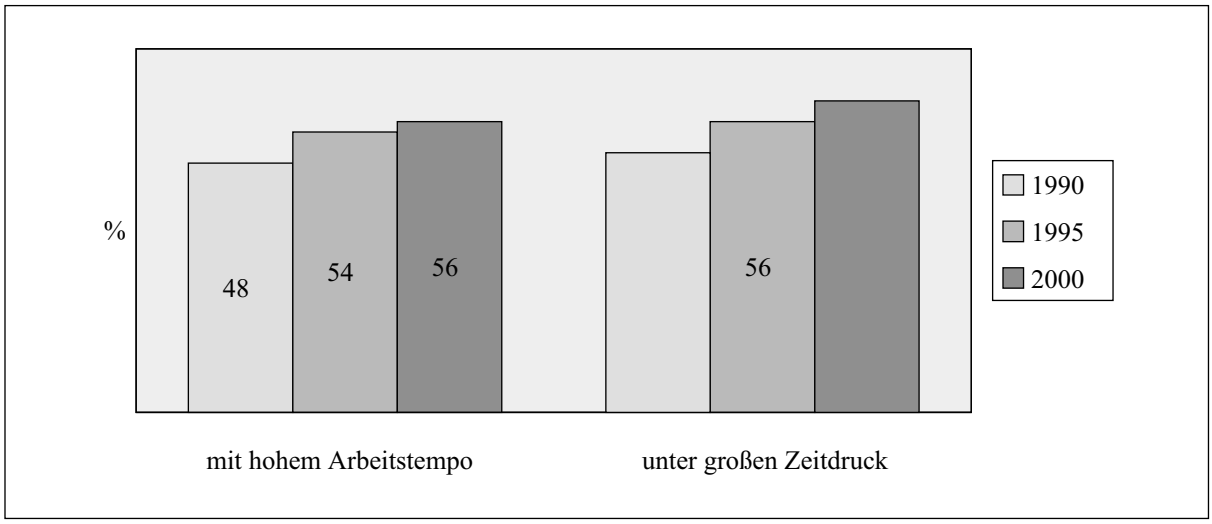


*Table 2: Health problems related to working at very high speed*

| % | backache | Stress | Muscular pains in neck and shoulders | Injuries |
|---|---|---|---|---|
| Working continuously at high speed | 46 | 40 | 35 | 11 |
| Never working at high speed | 25 | 21 | 15 | 5 |

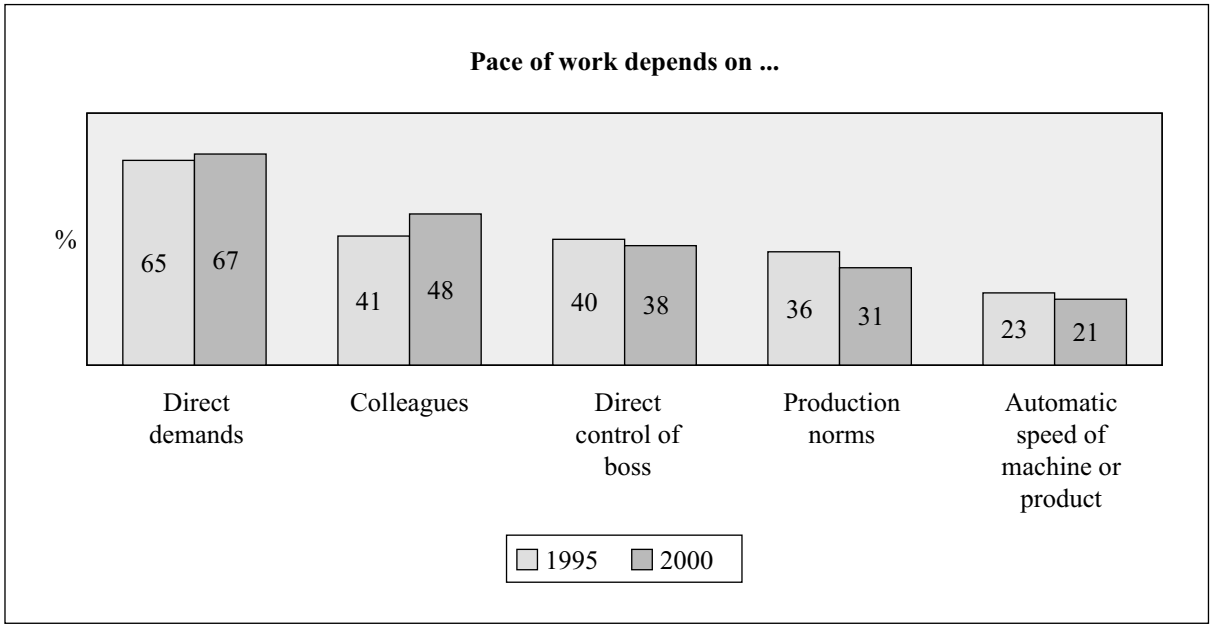
*Table 3: Health problems related to working to tight deadlines*

| % | Backache | Stress | Muscular pains in neck and shoulders | Injuries |
|---|---|---|---|---|
| Working continuously to tight deadlines | 42 | 40 | 31 | 10 |
| Never working to tight deadlines | 27 | 20 | 17 | 5 |

## Pace of work

Between 1995 and 2000 the pace of work has become increasingly generated by "human demands" (external demands from clients, passengers, users, patients, etc.) and by the work done by colleagues. At the same time "industrial constraints", such as production norms and automatic speed of a machine or moving of a product, or "bureaucratic constraints", such as direct control of the boss, have become less prevalent , see Figure 6.

*Figure 6: Pace of work (% of employees)*

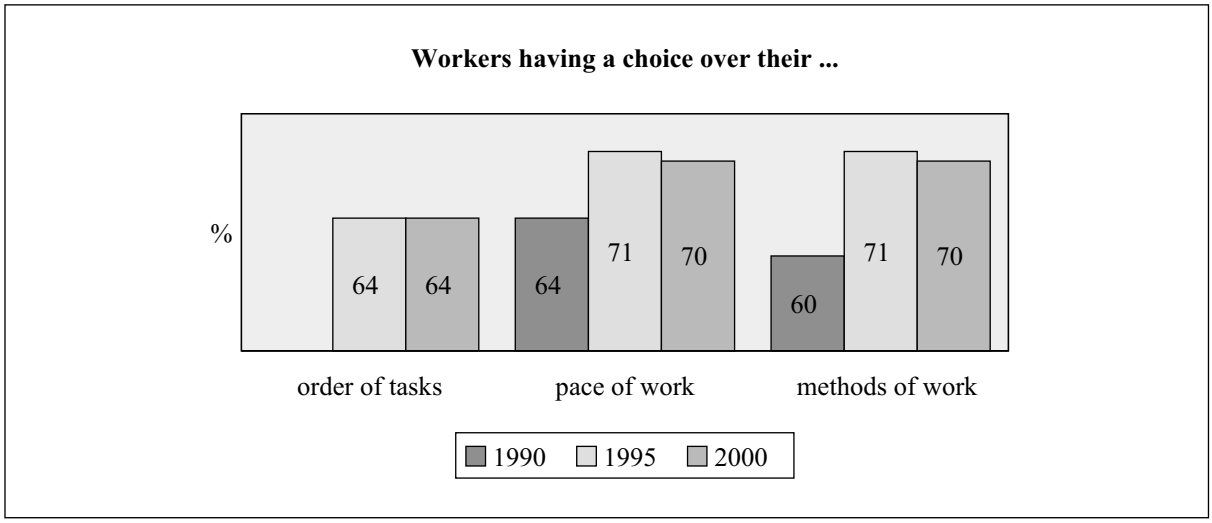



## Autonomy (job control)

Between 1990 and 1995 a significant increase in worker's control over their work occurred, while no further improvements were found in 2000. The same applies to workers' control over their work methods. No difference is likewise seen among possibilities to choose their order of tasks, see figure 6.

These averages sometimes hide wide differences. Among occupations, it is in particular plant and machine operators, and service workers who experience a sharp decline in their control over work. The same applies to the transport and communication sector.

*Figure 7: Autonomy*




Still in the year 2000 two out of five workers cannot decide when to take their holidays.

Two in five workers have an influence over their working time, while more than four out of five self-employed can decide themselves. Almost every second man can decide over his working time, but only two out of five women. Employees on permanent contracts have more control than those with fixed term or temporary agency contracts. More control is reported in occupational groups with professional skills

## Nature of work

The proportion of people working (at least occasionally) with computers has increased, from 39 percent in 1995 to 41 percent in 2000. The self-employed have reported a higher increase, but they still do not use computers as much as employees (33 percent versus 43 percent).

Teleworking on a full-time or nearly full-time basis is reported by a little more than one percent of the total population. It is more common in jobs among the higher-qualified professional categories, and in the financial intermediation and real estate sectors.

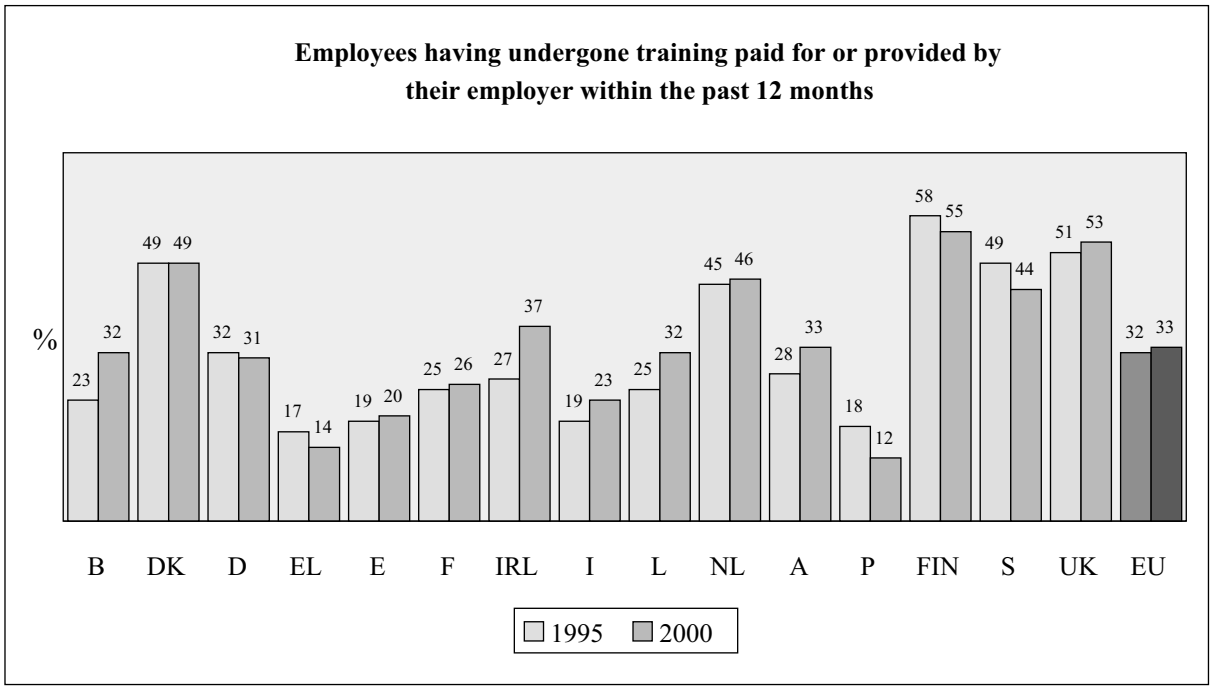
## Skills, training and support

Slightly more employees received training provided by their employer between March 1999 and March 2000 than in 1995. Temporary agency workers are catching up with permanent workers.

There are different trend in the member states countries as shown in Figure 8. The exact nature of the training provided is, however, not known and therefore comparison between countries should be made with caution.

8 percent of workers regard the demands of the job as too high for their skills compared to 7 percent in 1995. The same proportion regards the demands as too low (11 percent in 1995). 89 percent of the respondents, the same as in 1995, declare they can get assistance from colleagues.

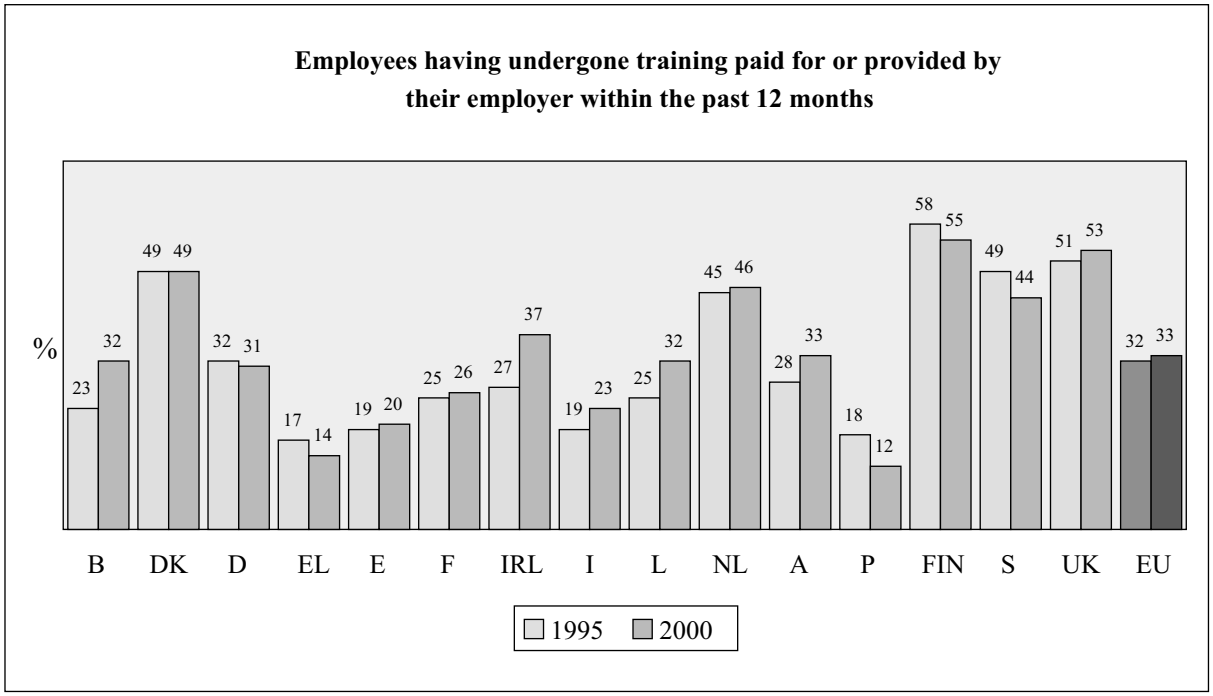
*Figure 8: Training*




## Job content

Overall, the job content factors remain stable over time with regard to the tasks workers have to perform (solving problems, quality control) or their complexity. Monotonous work has however decreased sharply, while on the other hand there is a negative development of learning opportunities in the job.

*Figure 9: Job content*



## Working time

### *Duration of work*

Average weekly hours hide wide differences between the different groups of respondents. The weekly average hours are about 38hours, where the self-employed reports 46 hours a week and the employees about 36,5 hours. As seen in table 4, many respondents are working less than 30 hours per week, while on the other hand another 20 percent report working 45 hours or more per week. This is of course more common among the self-employed.

Part-time work: 17 percent of all respondents report working part-time, but the definition of part-time varies between the member states. More women than men work part-time, 32 percent versus 6 percent). It is more common in some countries, such as the Netherlands and the United Kingdom. 23 percent of those working part-timers would prefer to work more while 9 percent would like to work less.

***Table 4: Working time***

| % Employees working: | 1995 | 2000 |
|---|---|---|
| < 30 hours per week | 15 | 17 |
| ≤ 45 hours per week | 16 | 14 |
| Part-time (spontaneous) | - | 18 |

### *Commuting*

Trends in commuting should be closely monitored, especially in the light of part-time developments. The average daily commuting time is 38 minutes, but wide disparities can be observed both in the group (18 percent of respondents report daily commuting times of more than 60 minutes) and between countries. The longest commuting times are found in the Netherland.

"Round the clock" work

The results from the 2000 Survey are consistent with those from 1995. "Round the clock" work is widespread with more than one out of two workers report working at least one Saturday per month and one in four at least one Sunday per month. 20 percent report shift work and 19 percent report working at least one night per month.

### *Flexible time patterns*

Not only are working hours spread over all days of the week and all hours of the day, time schedules are also fluctuating: 24 percent of workers report fluctuating weekly work schedules and 41 percent report fluctuating daily work schedules.

For 19 percent of the workers, working time flexibility does not fit with family and social commitments.

## Gender inequalities

- Gender segregation remains strong. It is not only that men and women do not have the same occupations (there are more men in managerial and professional occupations), but also within the same job category men are generally in the more senior positions.
- Gender inequalities are also clear when considering income levels in the same occupation groups, which is a consequence of the above-mentioned segregation, se table 5. Women also have less control over working time
- Finally, the double workload remains a strong feature of female work as shown in Table 6.

*Table 5: Income levels classified by gender (%)*

| Income level | Women | Men | Total |
|---|---|---|---|
| Low income | 26 | 9 | 16 |
| Low-medium income | 24 | 19 | 21 |
| Medium-high income | 17 | 22 | 20 |
| High-income | 10 | 22 | 17 |
| Refuse to answer | 23 | 29 | 26 |

*Table 6: Who does what at home (% of respondents doing it for 1 hour or more every day)*

| At home, who … | Women | Men |
|---|---|---|
| takes care of the children and their education ? | 41 | 24 |
| does the cooking ? | 64 | 13 |
| does the housework ? | 63 | 12 |

## Temporary workers

Temporary work remains a strong employment characteristic. 10 percent of employees are on fixed term contracts and 2 percent are on temporary agency contracts. Only half the employees who have worked less than a year in their company are on indefinite contracts, see Figure 10. It emerged clearly in the 1995 Survey that temporary work was linked to poor working conditions. The same applies in the 2000 Survey, see Figures 11 and 12.

*Figure 10: Employees having been less than one year in the company (%)*

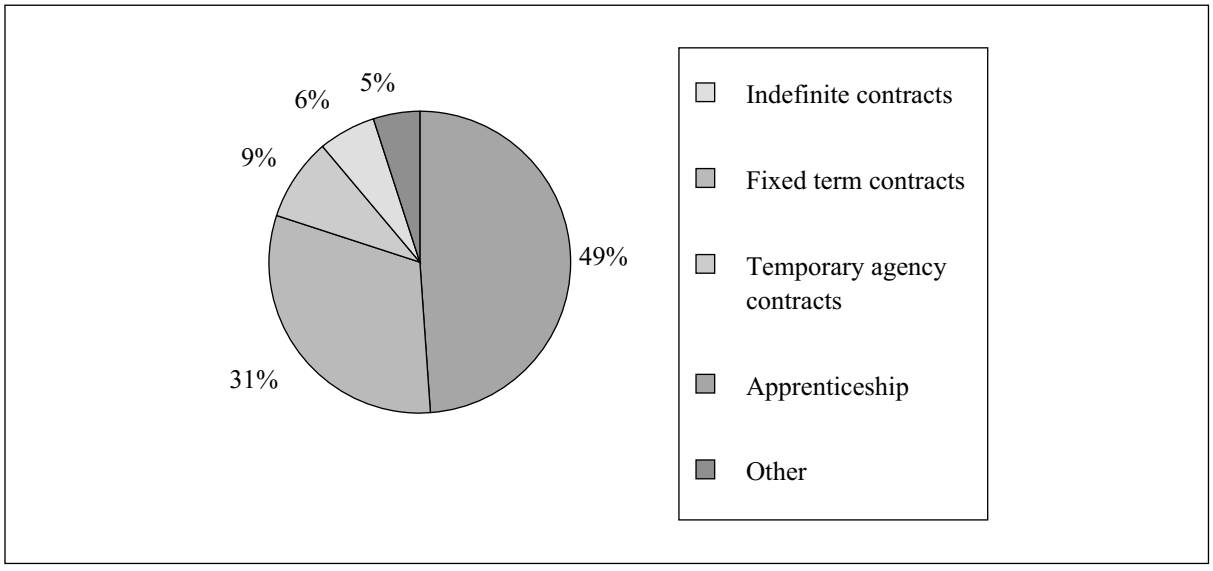


*Figure 11: Status and working conditions – physical hazards*

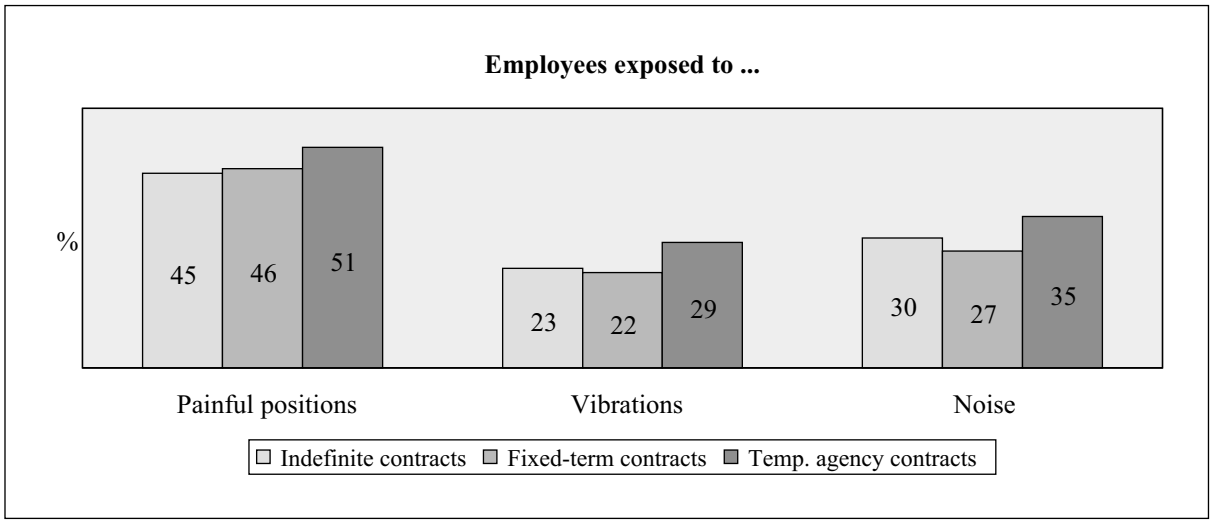
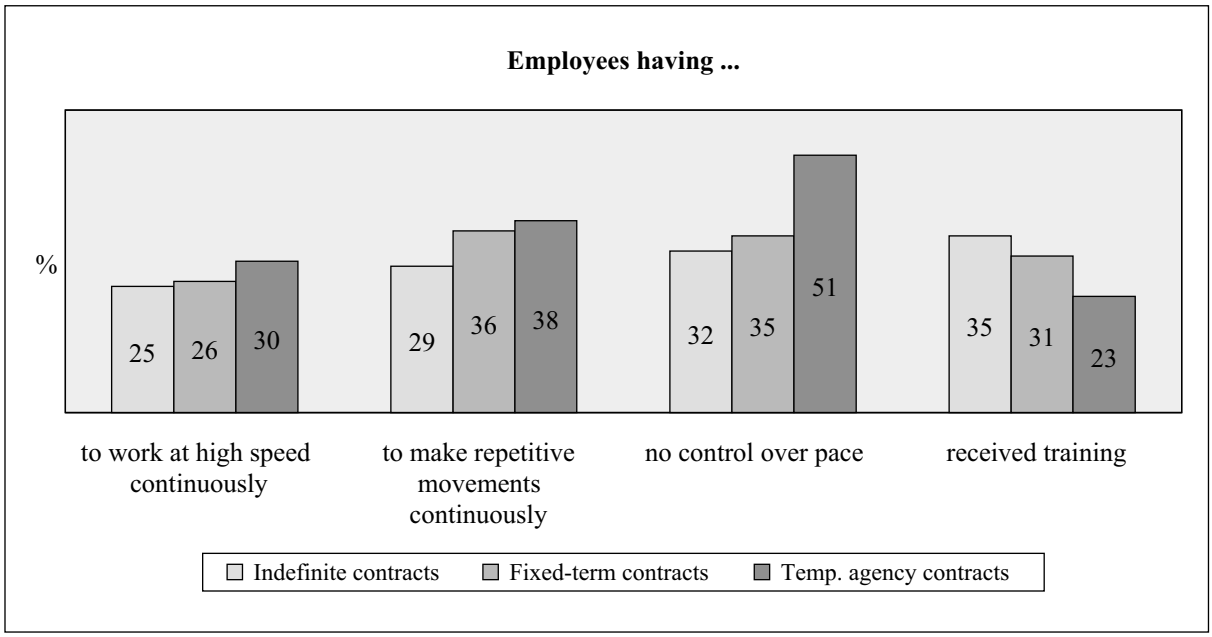



*Figure 12: Status and working conditions*




## Violence and harassment at work

Violence and harassment in the workplace, as reported in earlier surveys, remain major concerns (see Figure 12). The answering rate differs quite a lot between countries (from 4 percent to 15 percent on the issue of intimidation). The ay are possibly due to different attitudes to the subject, and whether harassment is a matter of matter of public debate or not. This may lead to under-reporting in some countries.

*Figure 13: Violence and harassment at work*

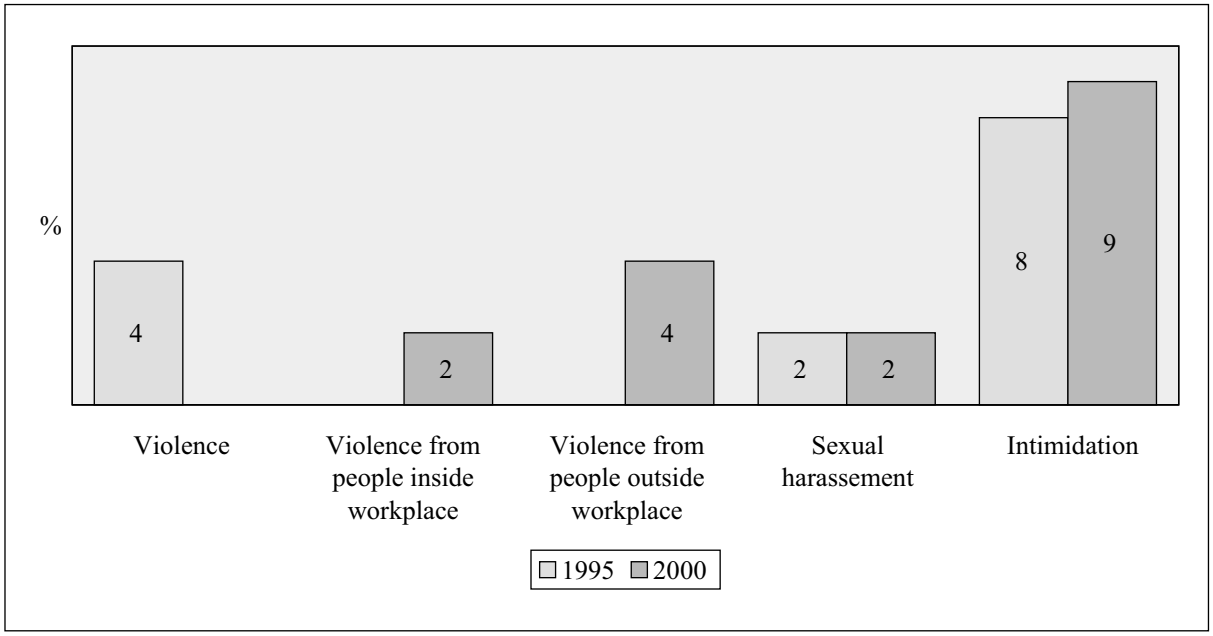
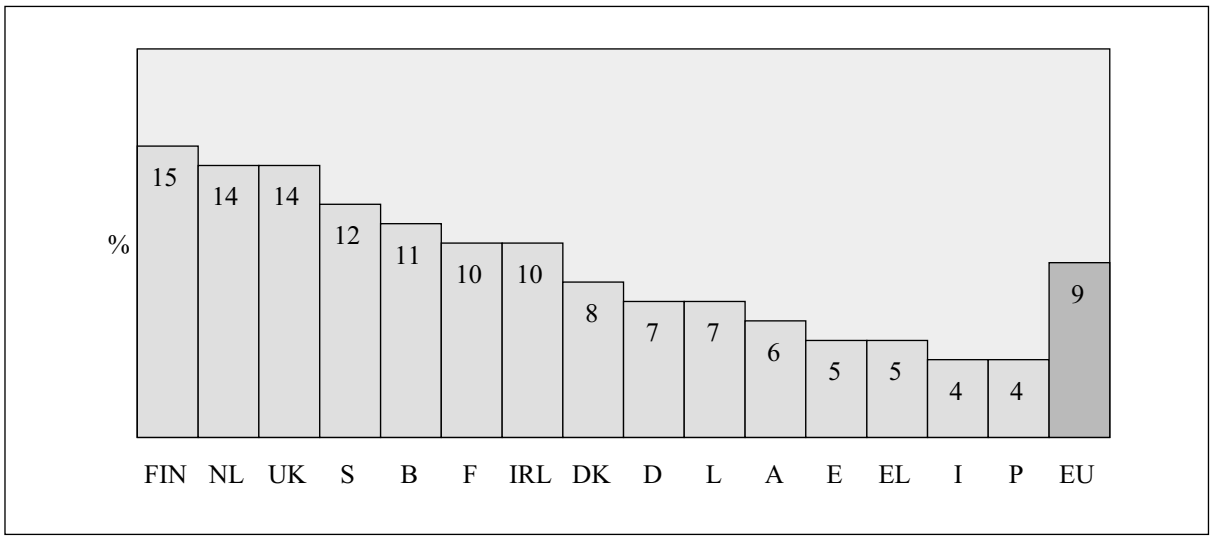



*Figure 14: Workers subjected to intimidation*




## Further information on the Foundation's Surveys on Working Conditions

Every 5 years the European Foundation carries a European-wide Survey on working conditions. The first Survey was carried out in 1990, the second in 1995 and the third in 2000. The full report will be published both on the Internet as a pdf.file and in a printed version. The latter can be ordered from the office of Publication, address. email etc

The aim of these Surveys is to provide an overview on the state of working conditions in the EU, to identify major issues and changes affecting the workplace and to contribute to a better monitoring of the quality of work and employment in Europe.

In 2000, 21,500 workers were interviewed in face-to-face interviews, conducted outside the workplace, 1,500 in each Member State (except in Luxembourg, 500). The Survey was carried out simultaneously in all 15 Member States and the 1997 Labour Force Survey was used as the basis for the sampling. The questionnaire covers all aspects of working conditions: physical, organizational and social factors of work, time patterns and working hours, work related health problems.

As a tripartite organization the Foundation involves Union, Employers and Government representatives from the Member States and from the European Commission (in particular from Eurostat) in the design of the Survey.

***This document was written by Damien Merllié, Maison des Sciences de l'Homme, Paris, and Pascal Paoli, European Foundation, Dublin.***

| Labour Force Survey 1996 (EU 15) | | EF Survey 1996 (EU 15) | |
|---|---|---|---|
| **Part Time Work (spontaneous answers)** | | **Part Time Work (< 30h/week)** | |
| 16% | | 15% | |
| Employees part time: | 17% | Employees part time: | 14% (24% ( 35h) |
| • Females: | 32% | • Females: | 27% (41%) |
| • Males: | 5% | • Males: | 4% (11%) |
| Part time by choice: | 60% | Not available | |
| • Imposed: | 20% | | |
| • Training: | 10% | | |
| • Illness: | 3% | | |
| **Working hours (usual during reference week)** | | **Working hours (usual weekly hours in main job)** | |
| All workers: | 38.4 | All workers: | 39.3 |
| • Females: | 33.6 | • Females: | 34.9 |
| • Males: | 41.8 | • Males: | 42.5 |
| Employees: | 36.9 | Employees: | 37.7 |
| • Females: | 32.8 | • Females: | 33.7 |
| • Males: | 40.1 | • Males: | 40.9 |
| **Night Work ("implies abnormal sleeping pattern")** | | **Night Work ("at least 2h between 10 pm and 5 am")** | |
| Usually | 5% \| 16% | ( 10 nights/months | 4% \| 21% |
| Sometimes | 9% \| | 1-10 nights/months | 16% \| |
| Never | 84% | Never | 79% |
| 5 Top Countries | | 5 Top Countries | |
| United Kingdom | 23% | Finland | 33% |
| Ireland | 22% | Greece | 28% |
| Finland | 21% | Ireland | 26% |
| Austria | 18% | United Kingdom | 26% |
| Sweden | 17% | Austria | 22% |
| **Shiftwork** | | **Shiftwork** | |
| Usually | 11% \| 13% | | |
| Sometimes | 2% \| | Yes, shiftwork | 13% |
| Never | 86% | | |

| Labour Force Survey 1996 (EU 15) | | EF Survey 1996 (EU 15) | |
|---|---|---|---|
| **Evening Work** | | **Evening Work** | |
| Usually | 14% | No information | |
| Sometimes | 19% | | |
| **Sunday Work** | | **Sunday Work** | |
| Usually | 12% \| 28% | 1 Sunday/month | 8% \| |
| Sometimes | 16% \| | 2 Sundays/month | 10% \| 29% |
| | | 3 Sundays/month | 3% \| |
| | | 4-5 Sundays/month | 8% \| |
| **Saturday Work** | | **Saturday Work** | |
| Usually | 28% ) 50% | 1 Saturday/month | 11% ) |
| Sometimes | 22% ) | 2 Saturdays/month | 14% ) 55% |
| | | 3 Saturdays/month | 5% ) |
| | | 4-5 Saturdays/month | 25% ) |
| **Training ("employees 25-59 during the previous *4 weeks*")** | | **Training ("all employees (15+) during the previous *12 months*")** | |
| Yes | 7% | Yes | 32% |
| 5 Top Countries | | 5 Top Countries | |
| Finland | 20% | Finland | 53% |
| Sweden | 20% | Sweden | 47% |
| Denmark | 19% | Denmark | 47% |
| Netherlands | 15% | United Kingdom | 46% |
| United Kingdom | 14% | Netherlands | 43% |
| **Contracts of limited duration** | 14,1% | **Fixed term contracts and temporary agency contracts** | 14,9% |

# NEW SYSTEM OF INFORMATIONONHEALTH AND SAFETY AT WORK IN SPAIN

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## 1. Introduction

Spain, like the other EU countries, has long been concerned to have reliable information on industrial accidents and occupational diseases (INJURIES arising from work), as a basis for drafting prevention policies which are properly "targeted".

The Spanish information system, like that of other countries, was originally designed from the point of view of Social Security, to ensure that those involved in accidents were covered, and despite the fact that it is a good system, it is obviously suffering from various deficiencies which we are trying to put right by two adaptations:

— one to meet new internal requirements for information on safety and health at work, and

— the second to comply with the European model, so that analyses can be carried out within the EU.

This note provides brief information on what Spain has done in this field - approaches taken, work carried out and expectations for the future. For us, there is always a dual and complex process of integration: internal harmonisation without upsetting the balance between the national government and the Autonomous Communities, alongside external integration and harmonisation within the EU.

## 2. The situation in Spain

As already indicated, Spain's concern to have a good system of statistical information on the rate of accidents at work is by no means new. But it has been reawakened in the last few years, possibly because since 1994 (when the Spanish economy began to boom) our accident rate figures have not been good.

Eurostat's publication of the first summary, "harmonised" statistical data (relating to 1994), which did not show Spain in a very good light and led to criticism of the system used at that time, was a fresh incentive and a further challenge.

In the wake of that report, the Spanish Ministry of Labour and Social Affairs (MTAS) instructed the INSHT to carry out a study of the methodology and systems used in the EU Member States which, in addition to helping us to find out "a little bit more" about what was going on in other countries, enabled us, above all, to find out about the effect - or, at least, the apparent effect - which the various systems of insurance against accidents at work, and the differences in the systems of accident notification and statistical monitoring, have on actual accident rate statistics.

It emerged from the report that all these systems could be grouped around one of two "models", depending basically on the system of insurance used, and more particularly on whether or not there was a "specific" system

[1] National Institute for Safety and Health at Work

of insurance against industrial accidents and occupational diseases other than the general system of coverage for all other types of risk.

The first of these models could be defined as follows:

— Insurance against industrial accidents and occupational diseases is provided by units - most of them public or under public control - which cooperate with the Social Security system in the specific management of this type of risk. In a few cases, the units are private insurance companies, which in turn may be subject to some form of public control.

— In no case do these systems cover all of the occupied population (even when the population not specifically covered has another type of general coverage).

— Notifiable events - i.e. the accidents taken into account - are in general broadly defined and not strictly limited to those which occur at work and involve trauma.

— The benefits, both economic and in terms of health, are in most cases specific and higher than with joint risks.

— The insurance premiums are paid by the companies, and generally vary by sector and/or company, with distinct variants.

— Accident notification rates are generally high (100%), which makes these systems the most reliable from the point of view of statistical information.

— Nevertheless, despite the observations in the report, this group of countries with high notification rates has the highest standardised accident rate indices, according to data published by Eurostat.

Secondly, we have another - smaller - group of countries with the following characteristics:

— They do not have a different system of insurance for industrial accidents, which means that these risks are part of and incorporated into the national insurance system or included in private insurance systems.

— Consequently, the coverage rate tends to be the same as the system's general coverage and is normally fuller than with the other model (although some activities may be excluded).

— The benefits of the system are normally one-off benefits, and the same for risks connected with industrial accidents or occupational diseases as for joint risks.

— Similarly, the insurance premium may be a single premium and/or included in with and inseparable from taxes paid by companies or workers.

— Consequently, notification rates are generally lower and thus the systems of statistical information on accident rates are less reliable.

— On the other hand, and bearing in mind the comments already made, the countries in this model produce standardised accident indices which are much lower than those produced by the other countries.

As regards Spain, which is obviously in the first model group of countries and has a system which is fully compatible with that model, the following points are important:

— The Spanish system of statistical information on industrial accidents is perfectly compatible with that used by the majority of the EU countries, and could even be considered above the European average as regards its flexibility, degree of detail and reliability.

— In Spain, as in all the other countries, there are, no doubt, circumstances in which it might appear advisable not to report certain accidents (especially those which are only slight, which happen in small businesses or in urban areas, etc.). But there may also be circumstances which lend themselves to the overreporting of industrial accidents, in particular the fact that benefits may be better for industrial accidents than for joint risks.

— With only minimal adaptation, Spanish accident rate statistics are able to comply with the Eurostat/EU re— The information supplied by the "index of incidence" and the "average duration of incapacity" appears crucial, since it can be used to calculate the indicator of average days lost per worker per year as a result of industrial accidents, which seems to be a basic component for the setting up of a system of tarification which provides for different rates of payment depending on the accident rates - and hence the costs - which apply to the various economic activities and/or companies.

## 3. Initiatives already up and running or planned

The "Plan de Acción sobre la Siniestralidad Laboral" approved by our National Committee for Health and Safety at Work (CNSST) in October 1998 provided for a specific plan to be introduced to update and improve accident reports ... and advocated at the time the setting up of a "unified" register of industrial accidents and occupational diseases within the EU, with a common methodology, which could be used for comparison purposes.

Under this plan, the MTAS and the CNSST itself have launched various initiatives. For example, a special group has been set up under the Committee to revise the INDUSTRIAL ACCIDENTS REPORT, as a key, common and basic component of our system of health and safety at work statistics.

In parallel, and coordinating with the work of this group, the MTAS has set up what is known as the "PROYECTO DELT@" (DELT@ is the Spanish acronym for the Electronic Declaration of Workers involved in @ccidents), the aim of which is to develop an overall system for communicating, processing and exchanging information on accidents at work, using new information technologies and communications.

### 3.1. The new industrial accidents report

As the key element in the new system of information on industrial accidents, the group set up for that purpose considers that various fundamental aspects of the industrial accidents report should be revised.

a) The first of these aspects has to do with relevance to the existing, new socio-employment structure (new forms of employment, new forms of work organisation, etc).

   In particular, the new report should provide detailed information on temporary work, however long it may last, and on workers belonging to companies specialising in temporary or subcontracted work, given that they may be at more of a disadvantage as regards risk prevention than regular workers. There should be a distinction between these two types of company and the principal company, or the one "using" the workers.

   We also plan to introduce information on nationality, in view of the increase in immigrant workers who may have additional problems when it comes to safety and health.

b) Secondly, revision of the industrial accidents report should deal with the need to define more precisely - for the sake of obtaining more accurate information and making the information comparable with EU data - certain important variables, including:
   - the degree of injury (i.e. the seriousness of each industrial accident);
   - the criterion for accounting for fatal accidents (especially if the fatality is not immediate);
   - differentiating, within the "location of the accident", between the normal place of work, journeys during the working day (other than commuting) and locations/workplaces other than the usual one;
   - the coding of "economic activity", which should be at the NACE five-digit level, so that more detailed statistics can be compiled which would be more useful for accident prevention in that they would differentiate between activities and risks which at three-digit level or below would be lumped together.

c) The third line of revision of our accident at work report should obviously concentrate on compliance with the "European model". To this end, our new information system plans to incorporate as many of the procedures as possible and to meet the criteria specified for the harmonisation of industrial accident statistics developed by the European Commission via the ESAW project.

   This objective has already been incorporated into the DELT@ project, as summarised below.

### 3.2. The delt@ project

As already stated, alongside the revision of the content of the industrial accidents report, the MTAS is developing a global model for the communication, processing and exchange of information on accidents at work, using the new information technologies and communications available. This has been termed the "Proyecto DELT@".

The objectives and organisation of this project can be seen in the following transparencies:

I should like to refer particularly to transparency number - , because it shows that the experimental version of DELT@ already includes the new variables, with their corresponding codes, as developed under the ESAW project.

This new electronic model for the reporting and notification of accidents at work has already been presented to the units cooperating with us in Social Security (the MUTUAS, i.e. mutual insurance companies), which will be responsible for filling in most of the data in the new report, and to the employment authorities in the Spanish Autonomous Communities, which:

— "vouch for" the data communicated and act as official quality control bodies for those data;

— adopt whatever means of intervention (inspection, penalties, etc.) they consider appropriate, and

— carry out the statistical processing and analysis within their Community.

Thus it is crucial that the Autonomous Communities work closely with us on this project. For this reason, use of the model will initially be voluntary, until each of the Communities has set up whatever mechanisms it considers appropriate for use of the system. As from that date, its use will be mandatory, although the form in which it is used may vary.

Thus the model is a common one but it will be applied flexibly.

### 3.2. Other components of the information system

***A) Statistical information and investigation of accidents at work***

The information collected during investigations carried out after notification of a serious or fatal accident at work are especially important from the point of view of prevention.

The added value of the information collected during such investigations comes from the detail supplied on the causes of the accident and prevention in the business concerned. The information comes from technical experts, from exhaustive analyses which they have carried out.

Since investigations are the general practice in Spain, and thus no fresh routines are needed, it is planned that the future notification system will include a subsystem able to collect information on the most relevant aspects of the investigations carried out by the employment authority (labour inspectorate and/or technical bodies reporting to the Autonomous Communities).

In this way, the new system would combine statistics and research, and whilst the statistics would give us information on the size and concentration of the problem, accident investigations would provide information on its underlying causes.

***B) New requirements for information on health and safety at work***

*b.1) The "Centinela" ["Sentinel"] studies*

The information required on working conditions does not remain the same indefinitely, but, depending on the state of the art as regards technology or socio-employment conditions, either now or in the future, requirements may include special objectives or interests. In this sense, we have considered it important for the new notification system, firmly based as it is on the industrial accidents report, to be given flexible instruments which meet other requirements, either short-term or strategic, such as incorporating a given technology or monitoring a specific employment group or given cause of accidents. To this end, in each Autonomous Community, the possibility is being studied of setting up "Centinela procedures" linked to the specific types of production in the Community in question or, in some cases, national conditions.

*b.2) National Survey of Working Conditions*

Finally, accident rate statistics provide details on the magnitude and seriousness of injuries, accidents and illnesses arising from existing shortcomings in the prevention of occupational risks. But they do not provide information on organisation and preventive activity, conditions of work or type of occupational exposure, or on health problems which are not legally considered to be occupational diseases.

The need to fill these information gaps, and to collect information on new risks arising from changes in the world of work, led us to develop additional strategies for obtaining information. The "National Survey of Working Conditions", which we have been carrying out in Spain since 1987, is intended to meet those requirements.

The Survey considers two different levels of information: the business and the worker, which can be analysed in different ways with two specific questionnaires.

The questionnaire for businesses concentrates on collecting data on the characteristics of the establishment, organisation and preventive activities, training, information and technological innovation.

The questionnaire for workers is aimed primarily at providing information on their conditions of employment and work, preventive activities and training received, identifying any damage to health and personal variables which may be relevant to a worker's state of health.

This dual analysis approach means that we can locate data linked to a specific job and a broader organisational context, on the basis of which the data can be correctly interpreted and used to draw up effective preventive strategies.

As I have said, this Survey was first carried out in 1987 and we are currently preparing the fifth survey, to be conducted in 2002.

The general opinion in Spain is that this type of study is a useful - not to say necessary - addition if we are to have more accurate information on conditions of health and safety at work in our country. In any event, it is vital if we are to be able to speak of a genuine system of information in this field.

# WORKING ENVIRONMENT STATISTICS IN SWEDEN

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## Working environment statistics in Sweden

There are, in principle, four different ways of collecting information about the working environment. One can:

- make technical measurements
- let experts form their opinions
- collect data on occupational injuries
- interview (or send questionnaires to) the employees themselves.

At present, work environment statistics are based mainly on two of the above options. They are produced partly by compiling data on injuries sustained during work and partly by assembling data from answers to questions put to employees in interview and questionnaire surveys. Many studies of working conditions have used technical measurements and expert opinions, which is how this type of data should preferably be produced. However, the information collected in this way has been unsuitable for use in statistical compilations.

In general, these various studies have been conducted in connection with local surveys at specific workplaces or in association with different research projects. The methods employed have varied, depending on the purpose of the study. As a result, the information obtained from these studies is not comparable and cannot be aggregated into statistical tables. Nor are the workplaces studied a representative sample of all the workplaces in the country; instead, they are workplaces with an unusually high incidence of problems. It is therefore impossible to make any generalisations on the basis of the results.

To be able to use this kind of data as basic data in the future, thorough coordination and standardisation are needed. However, a great deal of money is required to construct a new, independent survey operation based on technical measurements and expert opinions. At present this is not a realistic option.

## Industrial accidents at the workplace itself

Statistics on occupational injuries have existed in Sweden ever since 1906. At that time the data only included accidents, but it has since been extended to also include illnesses caused by work. The figures are based on reports submitted to the Social Insurance Office. The employer is obliged to report an industrial accident as soon as it occurs or an illness caused by work as soon as it has been diagnosed. In theory this ensures that the statistics on occupational injuries are complete. However, in practice this is not the case. Despite the legal obligation, far from all accidents are reported.

The most problematic aspect of the omissions in the occupational injuries statistics is that they do not seem to be of equal size in all population groups.

This makes it difficult to compare frequencies of industrial accidents at the workplace between groups and over time.

When we examine the number of reported industrial accidents, they fluctuate in what appears to be an illogical manner. Taking a closer look at these variations, however, we find a clear relationship between changes in the number of reported accidents and changes in underlying administrative and insurance conditions. It appears that new and more favourable rules lead to a higher reporting rate, i.e. that the figures are very sensitive to changes in the surrounding world. However, it is probably reasonable to believe that it is mainly the reporting of less serious accidents that is affected by changes in the world around. In all likelihood, there is always good reason to report serious accidents. Indeed, studying the figures for relatively serious accidents, one can in fact discern more logical and reasonable patterns with uniform and clear trends. The frequency of fatal accidents decreased continuously throughout the 20th century and the safety of our working environment appears to have increased over time. Data on illnesses caused by work is even more problematic than data on occupational injuries and accidents, since it is rarely clear whether a certain illness is caused by work or not. The reporting rate is therefore dependent on the state of people's knowledge and upon their ideas and assumptions.

## The potential for occupational injury statistics to reflect the true working environment

Information about occupational injuries is valuable for many reasons. It can, for example, provide a perspective on working environment problems and make it possible to estimate values for them. By comparing the frequencies and magnitudes of various injuries one can form an opinion about which problems should be viewed as the most serious. Further, comparisons between occupational injuries and injuries caused by other circumstances in society give an idea of the special importance of the working environment. However, there are three main reasons why it is far from enough to use occupational injury data as the sole type of information about the working environment.

Firstly, there are interpretation problems.

Secondly, it is problematic that occupational injuries cannot be used as an instrument for measuring all types of bad work environment conditions. Poor working conditions can be troublesome even if they do not necessarily result in poorer health.

A poor psychosocial working environment is an example of a circumstance that sometimes, but not always, leads to ill health, and thus does not necessarily show in the occupational injury figures. The importance of psychosocial working environment conditions is expected to grow in the future. The major changes on the Swedish labour market due to new computer technology and other technological innovations may cause psychosocial problems to grow in relative importance.

Thirdly, there is generally a lag in the statistics for occupational injuries since poor working conditions may not noticeably affect the health for many years. In other words, it can be very difficult to follow present changes in the work environment using occupational injury statistics. It may also be difficult to study the effects of measures taken.

In order to obtain better knowledge about working environment conditions, we need more direct information. By direct information we mean information from interview and questionnaire surveys.

## Description of methods used in the Swedish Working Environment Survey

For a number of years extensive work has been underway at Statistics Sweden on developing methods to describe conditions in the working environment on the basis of interviews and questionnaires. This methodological work has consisted of, among other things, a number of validation studies in which responses to many different types of questions have been compared with other types of information, e.g. technical information. Studies have been conducted in which employed persons have reported how they interpret the questions asked and the words used in the questions. Specially trained interviewers have performed the interviews and afterwards gone through the interview with the respondent. They have discussed the subject on a question by question basis in order to find out if there is anything that is difficult to understand and if there are questions or words that can be understood in different ways by different persons, due to, for example, their education, occupation and so on. A similar process has been used for the questionnaires: watching the respondent while he/she fills in the form and afterwards going through the questionnaire in the same way as for the interviews. The methodological work has provided insight into the contexts in which one can expect meaningful respons-

es to questions of a particular kind and also insight into how questions should be formulated to achieve the most satisfactory results.

One important conclusion has been that for satisfactory results, questions must be formulated with great precision. They should also deal with things that people can easily observe with their senses. Furthermore, questions should make use of limits and measures that are natural and easy to express in words. Questions that meet high standards in these respects seem capable of eliciting answers that describe actual working conditions in a meaningful and illuminating fashion.

One result of these development efforts is a continuous series of statistics that Statistics Sweden started producing in 1989 (since 1994 these statistics have been commissioned by the Swedish Work Environment Authority). Every other year, between 10 000 and 15 000 individuals are contacted and asked to answer 100 to 150 questions about their working conditions. These questions deal with both the physical environment and psychosocial conditions.

The questions asked are also suitable for use in other connections. Such use then makes it possible to utilise results from Statistics Sweden surveys as reference data.

The new statistical results are reported in the Statistical Reports series and in thematic publications in the series entitled “Information on the Labour Market”. The latter series uses statistics to illuminate especially interesting issues relating to working life and the working environment. (The reports are written in Swedish with a summary in English.)

## Note on the background to the questions chosen

As regards the physical working environment, the questions deal with heavy work, lifting, awkward work postures and movements, difficult climatic conditions, noise, vibration, and chemical and biological health hazards. As concerns the psychosocial working environment, the questions focus on the amount of work, the qualifications required, level of concentration demanded, reactions to work/feedback, ability to influence, monotonous and repetitive tasks, social community, and social support. The questions also take up ailments and complaints resulting from work, along with many aspects relating to background conditions.

As indicated above, when choices between alternative formulations are finalised in each area, great consideration is given to unambiguously defining the concepts involved. However, attention is paid not only to aspects that might be considered easy to ask about in an exact and precise manner, but also to points that can be seen as central to each subject area. Let us give a few examples to illustrate the considerations that have led to our choice of indicators.

**Heavy work** is generally defined in terms of strain on the heart and lungs. A purely technical measurement attempts to estimate the extra consumption of oxygen resulting from the work. In practice this can mean that the employee is asked to wear equipment on his/her back to register inhaled and exhaled air. In questionnaires it is possible to approximate the issues taken up in this connection quite closely. We can ask, for example, if the work leads to heavier breathing. Breathing is directly related to oxygen consumption. Our questions take up precisely this point.

**Lifting** is often heavy work as well. The central problem in such work, however, is normally not the strain on the heart and lungs but rather the wear on discs in the spine. The strain is directly dependent on the weight of the object lifted and how the lifting is carried out. It seems possible to ask questions regarding both estimates of weights and working postures. These are the questions we take up.

**Strenuous work postures and movements** can affect the back and joints. Another key aspect in this context is the effect on muscles. Physiologically there is a distinction between dynamic and static muscle work. In dynamic muscle work the muscle is tensed at intervals with intermittent periods of relaxation. In these contexts the muscle functions as a circulatory pump, increasing the circulation of blood. Waste products can more readily be removed. In static muscle work the muscle chokes the flow of blood instead and problems arise – initially short-term problems, but later long-term. Fixed work postures and monotonously repeated movements (resulting in constant tensing) are decisive factors in the prevalence of problems. It seems possible to ask meaningful questions in surveys regarding fixed postures and monotonously repeated movements. These are the questions we ask.

In describing the impact of **climatic conditions** on humans it is necessary from a purely technical point of view to take into account a number of different conditions. One must measure temperature and humidity, and also air movements. One must consider the subject's clothing, his/her physical constitution, and the physical work he/she is performing, among other things. It is extremely complicated to aggregate different technical parameters into a comprehensive measure of climate. It is therefore normal even in expert studies to use the human being him/herself and his/her reactions as a measure of the total climatic picture. The employees themselves should be quite capable of describing these reactions in responses to interview questions. These are the questions we take up.

What is discussed most in regard to **noise** is the general noise level measured in decibels. Questions dealing with the disturbing effects of noise on conversation and the ability to hear conversation should make it possible to describe the level of noise. These are the questions we ask.

**Chemical and biological health hazards** constitute a complex and elusive field. Even with access to the best technical apparatus and ample economic resources it is difficult to satisfactorily map the working environment in these respects. One of the general problems we confront is that conditions often vary greatly across time and place. It can also be difficult to determine exactly which factors should be considered most critical and dangerous in the long term, since new knowledge is acquired all the time. The number of potentially dangerous substances is also great. Interview responses obviously cannot provide information that is as exact as technical measurements can offer. By asking employees what they see and feel with their senses, it should be possible to get some general idea of whether conditions have been arranged well or poorly. These are the sorts of questions we ask. The answers should provide us with significant information in the context. It should perhaps be emphasised, too, that employees often seem to be able to look back over a relatively long time span, often longer than it is feasible to cover with technical measurements. This gives questionnaires a special edge.

As regards our choice of questions in the **psychosocial area**, we have employed two general theoretical approaches as our starting point. These approaches appear in one way or another to lie behind the majority of theoretical discussions in the field.

The first approach is based on reasoning about the body's reactions to stress. This approach is predicated upon what seems to be the body's built-in, automatic way of functioning under stress. This includes accelerated breathing, an increased flow of blood to the muscles, increased mobilisation of energy by the muscles, increased propensity of the blood to coagulate, etc. These reactions are programmed genetically, and human beings share them with large sections of the animal kingdom. Stress reactions can help the individual to survive, but in the long run they can also create an extra burden on the bodily organs.

It seems that stress reactions can be triggered by a wide variety of conditions. With regard to environmental conditions in the workplace, it is usually said that the risk of stress is especially high if the employee experiences excessive performance demands or has too much to do. Excessively low demands and having too little to do are thought to trigger similar reactions. Conflicts between people can naturally produce stress reactions and the like. This approach means that our interest will naturally focus on certain aspects of the working environment.

The second psychosocial approach has a more or less historical basis. In this approach working life today is often compared with the situation a hundred or more years ago. In pre-industrial society most people worked in agriculture. They worked in small groups – family groups or other small local groups. These small groups were largely self-sufficient, that is, they made most of what they needed, produced food, sewed clothing, repaired tools, etc. Each person generally performed a variety of different tasks. In general it was easy to see the results of one's work.

The industrial revolution changed much of this. It is often assumed that the consequences have been the following:

- the ability of the individual to influence the tempo and priority of work became more limited
- tasks became more limited in scope and more repetitive
- tasks often required less skill and knowledge
- it became more difficult to gain a picture of the whole and harder to see the importance of one's own role
- the risk arose of people working in greater isolation from each other.

Subsequent technological and other developments have often been assumed to reinforce these tendencies.

This second psychosocial approach, like the first, is interesting, and helps to focus our interest on certain conditions. With the aid of interview and questionnaire questions it would seem possible to describe the conditions these two approaches touch upon relatively well.

Questions dealing with these approaches often have to do with one of the following eleven areas. We have developed indicators in each of the areas.

1. General mental stress
2. Amount of work
3. Skill/knowledge requirements
4. Skill/knowledge requirements in relation to the worker's capacity
5. Monotonous and repetitive tasks
6. Availability of support and help
7. Sense of community
8. Influence, choice, relation to superiors
9. Possibility of continuing education and of development in occupation
10. Constraints and the need to concentrate
11. Risk of accidents, violence, and the like

***Table 1 Questions in the Swedish Survey on Working Environment***

| **Questions about physical factors such as** | **Questions about psychosocial factors such as** | **Questions about problems and complains resulting from work such as** |
|---|---|---|
| Heavy work | Amount of work | Pain in different parts of the body |
| Heavy lifting | Exposure to risk of being laid off | Cannot dismiss thoughts of job when one is off work |
| Strenuous working postures and movements | Amount of and flexibility in working hours | Physically exhausted after work |
| Difficult climatic conditions | Demands for qualifications | Have been tired and listless |
| Noise | Opportunities to learn new things and develop | Itchy or irritated eyes |
| Vibration | Demands for concentration | Difficulty sleeping - thoughts about work keep one awake |
| Chemical and biological health hazards | Reactions to work/feedback/appreciation | Feel ill at ease going to work |
| | Ability to influence | |
| | Monotonous and repetitive tasks | |
| | Social support | |
| | Bullying | |
| | Sexual harassment | |

## The response scales

It is important to create exact response scales. For example, it may be difficult to answer "yes" or "no" or in terms such as "often" or "sometimes" in cases where problems certainly exist but only to a minor extent. The alternatives "yes" or "no" and "often" or "sometimes" may feel logically correct but create problems of vagueness. Asking for responses expressed in time increases the precision in the formulation of the questions. Good response scales make it possible to reduce subjectivity in the descriptions. Precise questions and response

scales expressed in fractions of time should make it possible to give a clearer picture of the extent and size of a problem.

By preference, the Working Environment Survey uses response scales that give information about fractions of time. This type of response scale enables the respondent to give information about how common the phenomenon is that is asked about. In the Working Environment Survey we also ask some questions about attitudes. For these questions we use scales that run from one extreme to the other.

The most frequent scales used in the Working Environment Survey are:

1. A scale for frequency
Every day
A few days a week (1 day in 2)
One day a week (1 day in 5)
A few days a month (1 day in 10)
Not at all/Seldom in the last 3 months.

2. A scale for when it's important to measure if something has happened for example during the last year
Every day,
A few days a week (1 day in 2)
One day a week (1 day in 5)
A few days a month (1 day in 10)
Sometimes during the last 3 months
Once or twice during the last 12 months
Not at all during the last 12 months.

3. A scale for parts of working time, for example, measuring a person's exposure to a specific phenomenon
Nearly all the time
Roughly 3/4 of the time
Half of the time
Roughly 1/4 of the time
Some (perhaps 1/10 of the time)
No, not at all.

4. A scale for a more general estimate of the frequency of a phenomenon
Always
Mostly
Mostly not
Never.

5. A scale for attitudes, a 5-digit scale with extremes at the far ends

Fully agree
Partly agree
Neither nor
Partly agree
Fully agree

## The survey population, the frame, and the sample

The Swedish Labour Force Survey (LFS) is used as a foundation for the Working Environment Survey. The LFS describes the current labour market situation and produces information about labour market trends and developments. The LFS is conducted on a continuing basis (monthly) by Statistics Sweden and gives an extensive and up-to-date description of the labour market.

The survey population in the LFS consists of all those in Sweden who are in the civil registration system, and who have reached the age of 16, but are not yet 65 years of age in the month in which the survey is conducted. The sample frame is the Total Population Register.

Using the LFS and adding the Working Environment Survey, it is possible to utilise all the variables collected in the LFS as background variables when reporting and analysing the data. The results can be categorised by sex, age, occupation, economic activity and socio-economic classification. Other information about educational level, full-time/part-time work, permanent job or fixed-term contract (temporary employment) is also useful in describing the working environment.

The LFS sample consists of three separate samples, one for each month in a quarter. Each of the samples, which consists of about 17 000 individuals, is rotated in such a way that an eighth leaves the sample every three months. Persons in the sample are interviewed once a quarter, making a total of eight interviews during a two-year period, after which they leave the sample.

The Working Environment Survey uses a sub-sample of the LFS sample. The sub-sample consists of persons who are classified as employed when the LFS interview is conducted.

## Description of data-gathering work, sampling procedure, nonresponse rate

The investigation of the working environment is carried out partly by interviews, partly by questionnaires. In the latest Working Environment Survey, in 1999, the questionnaires consisted of 137 questions (37 questions in the telephone interview and 100 questions in the postal questionnaire). The telephone interview lasts for about five minutes and it takes about another 20 minutes to fill in the questionnaire.

Normally two reminders are sent out during the period of data gathering. In the 1997 and the 1999 surveys three reminders were used in order to lower the nonresponse rate.

Surveys have been conducted during the late autumn and winter of 1989, 1991, 1993, 1995, 1997 and 1999. Sub-samples of 15 683 persons (1991), 14 506 persons (1993), 14 530 persons (1995), 14 397 persons (1997) and 14 642 persons (1999) who were employed at the time of the interview were drawn from the LFS sample. In connection with the LFS interview, individuals who were on leave of absence or on long-term sick leave were excluded from the sample.

## Nonresponse

The LFS contains information about total nonresponse (approximately 13% in 1991, 12% in 1993, 13% in 1995, 14% in 1997 and 16% in 1999). However, there is no information about the level of nonresponse for the sub-groups “employed” and “unemployed” respectively.

***Nonresponse in the Working Environment Survey 1989-1999***

| | **1989** | **1991** | **1993** | **1995** | **1997** | **1999** |
|---|---|---|---|---|---|---|
| Gross sample | 10 916 | 15 683 | 14 506 | 14 530 | 14 397 | 14 642 |
| Losses in LFS between the sampling procedure and the time of the interview | 369 | | | | | |
| Overcoverage | 455 | 523 | 428 | 316 | 344 | 408 |
| **Net sample** | **10 092** | **15 160** | **14 078** | **14 214** | **14 053** | **14 234** |
| Nonresponse to telephone interviews | | | | | | |
| Proxy interviews | 24 | 9 | 75 | 77 | 20 | 9 |
| Refusals | 20 | 255 | 375 | 510 | 691 | 939 |
| Language problems | 9 | 79 | 50 | 78 | 90 | 121 |
| Other | 319 | 517 | 287 | 376 | 454 | 619 |
| Total nonresponse to telephone interviews | 372 | 860 | 787 | 1 041 | 1 255 | 1 688 |
| **Total responses to telephone interviews** | **9 720** | **14 300** | **13 291** | **13 173** | **12 798** | **12 546** |
| Nonresponse to questionnaires | | | | | | |
| Nonresponse to telephone interviews | 372 | 860 | 787 | 1 041 | 1 250 | 1 688 |
| Refusals | 116 | 234 | 290 | 441 | 694 | 670 |
| Other | 1 182 | 1 604 | 1 289 | 1 872 | 1 650 | 2 078 |
| Total nonresponse to questionnaires | 1 670 | 2 698 | 2 366 | 3 354 | 3 594 | 4 436 |
| **Total responses to questionnaires** | **8 422** | **12 462** | **11 712** | **10 860** | **10 459** | **9 798** |

Nonresponse arises at various points in the survey. The figures presented below are estimates of the magnitude of nonresponse in the survey population at various stages. The estimates of nonresponse in the LFS are based on results from earlier nonresponse studies.

*Nonresponse expressed in per cent (%)*

| | 1989 | 1991 | 1993 | 1995 | 1997 | 1999 |
|---|---|---|---|---|---|---|
| Nonresponse in the regular LFS | 8 | 10 | 12* | 13* | 14* | 16* |
| Nonresponse to the additional telephone interview | 4 | 6 | 6 | 7 | 9 | 12 |
| Nonresponse to the questionnaire | 17 | 18 | 17 | 24 | 26 | 31 |

*) The estimate refers to total nonresponse in the LFS. There is no separate estimate for nonresponse among the employed.

## The nonresponse reduction project

Before the 1997 survey a project was started aimed at reducing nonresponse in the questionnaire part of the survey. Since nonresponse after the second reminder was at a higher level than in 1995, a third reminder was sent out in which special letters were addressed to self-employed persons, persons on fixed-term employment contracts and young adults (16-29 years old). These groups were chosen since the nonresponse rates were noticeably higher in these groups than in other groups. The letter, which differed from group to group, emphasised the importance of the addressee's cooperation. It also mentioned that the nonresponse rate was particularly high in that group and explained how the final data can be affected by nonresponse. The other groups were sent a more generally worded letter.

As a result of the reminder letter the nonresponse rate obtained was just slightly higher than in the 1995 survey. The increase was caused by a higher nonresponse rate in the telephone part of the survey. The proportion of people who declined on the telephone to participate in the questionnaire part of the survey increased to a total of approximately 4%, while the proportion who received the questionnaire but never replied declined to approximately 2%. Nonresponse fell slightly more in the groups that received specially worded reminder letters than in the groups that were sent a general reminder letter. However, the nonresponse rate was still higher in the groups receiving special letters than in the other groups.

| **Proportion of the net sample** | **Declining to accept the** | **Nonresponse to questionnaire** | |
|---|---|---|---|
| | | **questionnaire after…** | |
| | | **..two reminders** | **..three reminders** |
| **1997 survey** | | | |
| Young adults | 13% | 33% | 28% |
| On fixed-term contracts | 20% | 38% | 32% |
| Self-employed | 29% | 48% | 43% |
| Others | 13% | 25% | 22% |
| **Total 1997** | **15%** | **30%** | **26%** |
| **1995 survey (two reminders only)** | | | |
| Young adults | 9% | 26% | |
| On fixed-term contracts | 15% | 29% | |
| Self-employed | 20% | 38% | |
| Others | 10% | 20% | |
| **Total 1995** | **11%** | **24%** | |

This method was also used in the 1999 survey. Even so, the nonresponse rate after the third reminder was higher in the 1999 survey than in 1997. Consequently, efforts in this area continue to be an important part of the work on improving the survey.

## The results

The results from the Swedish Working Environment Survey are used in describing working life, exposure to different factors and the effects of such exposure. They can be used, for example, to calculate the risks of developing physical pain or repetitive strain injuries linked to strain in the working environment.

These studies are very extensive, and by combining the results from several studies we can produce extremely thorough statistical material which, in turn, makes it possible to subdivide the labour market and report on many different categories.

Using data from the Working Environment Survey, it is possible to describe the link between work load and various psychosocial factors: the crucial role of demands, influence and support if work is to be a source of stimulation and lead to personal development, or, conversely, the risk of psychosocial pressure and problems. On the basis of variables from the Working Environment Survey, a number of analyses have been made of the occupations where such factors pose the greatest risk.

To highlight the link between strain in the working environment and the risk of developing physical pain or repetitive strain injuries, and to examine whether problems in the working environment lead to absence from work, the Working Environment Survey has been used in combination with data from another survey on work-related health problems. In this study, the Working Environment Survey's descriptions of exposure to different factors have been linked to data about work-related health problems from the other survey.

The study shows that daily pain in the upper back or neck is three times as common among women who work in a twisted posture at least _ of their working time and who every week have so much to do that they have to skip lunch, work late or take work home with them, than among those who spend less than _ of their working time in a twisted posture and who are obliged to skip lunch, etc., less often than every week. A comparison between corresponding categories of men shows a frequency nearly four times as high.

Another example of a result from this study is that 3 out of 5 women who work with their hands raised to shoulder level and have so much to do that they have to skip lunch, etc., report pain in their shoulders or arms. Of these women, 2 out of 5 also report that their problems mean they have difficulty in performing their work or doing routine housework. It has been demonstrated that there is a connection between the physical working environment – repetitive and/or heavy work, work in a twisted posture – and influence in planning work, the pace of work and the amount of work.

*Some data from the Working Environment Survey 1999:*

— 28% of the women and 38% of the men work more than regular hours at least once a week.

— About every third person (32%) has flexible working hours.

— 20% of the women and 25% of the men work at home at least some hours per week.

— 61% of the women and 67% of the men indicate that that they need continuing education and training to be able to perform their work.

Swedish workplaces are highly computerised. About 66% of the working population use highly computerised equipment, and about 60% spend some time in front of a display monitor. During the last fifteen years, the proportion of people doing computerised work that needs a display monitor has increased greatly, rising from 16% to 63% among women, and from 17% to 68% among men.

46% of people answering the questionnaire report that at least one day a week they are unable to dismiss their job from their thoughts when they are off work and 20% have difficulty sleeping because thoughts about work keep them awake. 33% of the women and 39% of the men feel they have so much to do that they have to skip lunch, work late, or bring work home, at least one day a week.

During the last 12 months, 17% of the women and 10% of the men have been exposed to violence or threats of violence at work. About 9% of both women and men have been exposed to bullying from superiors or fellow workers during the same period. More than 6% of the women and 1% of the men have been exposed to sexual harassment from persons other than superiors or fellow workers at their workplace during the last 12 months. About 10% of the women and 3% of the men have been exposed to harassment from superiors or fellow workers due to their gender.

The data from the Working Environment Survey has been used for a number of special analyses, focusing, for example, on:

• Those who face an uncertain future because they run the risk of being laid off or given notice of dismissal.

A greater proportion of those who risk being transferred than of those not at risk report troubles such as: tiredness and listlessness, headaches, feeling ill at ease and despair, heartburn, a burning sensation in the pit of their stomach or upset stomach, difficulty sleeping or inability to dismiss work from their thoughts.

• Those who are threatened, bullied or sexually harassed at work.

Bullying is a phenomenon that hits those exposed to it very hard and creates more distress than exposure to violence/threats or sexual harassment.

About one in five women and one in ten men are exposed to violence or threats of violence. There is a connection between the extent of exposure to violence or threats of violence, and occupation. Both women and men who are exposed to violence or threats of violence more often feel distress at going to work and more often have trouble with their stomach than people not similarly exposed.

About one in ten women and men in Sweden are exposed to bullying from bosses or fellow workers. The consequences of being bullied are similar to the consequences of exposure to violence or threats of violence.

Women are exposed to sexual harassment to a greater extent than men – both from bosses and fellow workers, and from clients, customers, etc. Women suffering harassment more generally consider that they are left without help in critical situations.

• Different ages give a different working life and therefore a different working environment.

A large proportion of those who are relatively old (aged 50 or more) still have work that is physically strenuous, though at the same time people in this age group are well established in the labour market and have a great deal of influence over their working situation. Older people are less negative towards their work than younger people doing the same kind of work.

Work-related health problems increase with age, especially for those who have physically strenuous work.

•The occupations most at risk for negative stress.

The analysis shows the link between demands, influence and support, and also the link with certain psychosocial problems.

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# THEME 1: CURRENT SITUATION - THE USERS VIEW

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The European Agency for Safety and Health at Work began work in 1996 on creating an occupational safety and health resource which would provide information to all workers and employers on legislation, good practice, programmes, research, statistics and other areas related to safety and health at work. As an information resource primarily based on the world wide web with selected information in the form of printed publications and products, the Agency's role is to provide information to those who need it to help inform them about work place risks and to enable information exchange between health and safety administrations and organisations in order to improve workers' safety and health. Several Europe-wide networks of designated experts and organisations have been established in Member States to participate in the work of the Agency. The Focal Points network - existing of national OSH authorities - represents the Agency and co-ordinates national information at Member State level, including the national web site.

The Agency has begun its work through concentrating on horizontal health and safety issues such as policies and priorities, economic issues, work organisation and on certain risks which affect many workers such as work-related stress, musculoskeletal disorders and dangerous substances.

Within the Agency Work Programme aiming at the promoting of the quality at work, a core activity will be the development of a comprehensive European occupational safety and health monitoring system in close co-operation with the Member States, the European Commission, Eurostat and the Dublin Foundation. A Pilot Study on the state of occupational safety and health in the Member States in the European Union was finalised in 2000. Within the Pilot Study a number of specific indicators considered best suited for describing the exposure situation at work, the context of work, the OSH outcomes and the preventive capacity in the Member States were selected (Appendix 1) and included in a manual sent to the Focal Points and their networks for data collection. This manual provided the framework for each Focal Point to use in order to establish the state of OSH on national level. Completing the manual required a combination of data sources to be used, primarily from national sources as well as from European sources including the Second Survey on working conditions from the Dublin Foundation and European statistics on accidents at work from Eurostat. The national reports were then consolidated to give the European picture.

The Pilot Study provides different types of findings on the state of occupational safety and health at work.

To give a quick European overview of each exposure indicator/ OSH outcome the so-called summary pages were introduced. They are based on the findings of information collated from all fifteen national reports. The information summarised includes:

- Description of potential health effects caused by the exposure indicator;
- European picture;
- Sector categories most at risk as reported in the national reports;
- Occupation categories most at risk as reported in the national reports;
- Information on other risk categories company size, gender, age, employment status;

- Trends;
- Identified needs for additional preventive actions;
- Description of indicated preventive actions;
- Summary of comments received.

Appendix 2 and 3 present examples of these summary pages for 'noise' and 'accidents with more than 3 days' absence'.

They offer to the OSH experts and even to a broader audience a current 'snap shot' about the individual exposure indicator/ OSH outcome.

The Focal Points were requested to give an evaluation of the present state regarding the individual exposure indicator/ OSH outcome (three options were given: 'preventive actions taken/planned are sufficient to deal with the existing exposure related problems', 'development of additional preventive action is necessary', 'other'). In case, they marked 'development of additional preventive action is needed', the Focal Points should elaborate this action. The following table (Appendix 4) ranks the exposure indicators and OSH outcomes by the number of Focal Points reporting additional preventive actions are required.

Stress was identified in ten national reports as topic requiring the development of further preventive actions. Vibration and lifting/ moving heavy loads follow with nine indications.

These were examples which type of qualitative information was produced by the Agency within the Pilot Study.

There is little doubt that the Pilot Study has identified several key areas for future discussion where potential improvements in the whole process could be made, which may also stipulate the discussions during this seminar.

A significant fact from carrying out the Pilot Study has highlighted the contrasting differences in the OSH systems across the fifteen Member States. This emphasises the difficulties in comparing the information collected from such systems and using it to present an overall general European picture. Other information providers on European level know as well as the Agency this bottleneck. The Agency will carry out an inventory especially focusing on the national OSH monitoring systems as a part of the follow-up project to get more in-depth background information for the preparation of a future 'State of OSH' exercise.

Further, if Focal Points have presented quantitative national data on the listed exposure/ OSH outcome category, they were asked to come forward with conclusions on the national data, particularly in comparison with the data from the 2nd European Survey on working conditions, taking the two questions into account: '*Are there differences between the national data and the data from the European sources?'* and *'Does the additional national information highlight sectors or occupations that are not evident from 2nd European survey data?'.* The lack of available data and the comparability problems by the Focal Points between the national data and the EU is presented in the following table (Appendix 5). From all of the national reports 66% of the responses could not make the comparison either there was a lack of data or because of difficulty in comparing the data. 34% of the responses made a comparison.

Regarding the 2nd question 76% of the responses could not make the comparison. Of those who did a comparison 2/3 reported that the additional national information highlight sectors or occupations that are not evident from the European data.

The Pilot Study highlighted where the national reports contained national data and where there was a short fall for the risk categories company size, gender, age and employment status. The next table (Appendix 6) shows the shortage of data for each of the exposure indicators/ OSH outcomes used in this study. Clearly the table reveals a complete deficit of national information relating to employment status. With company size and age, the data situation was almost as poor, with data only available for two and three exposure indicators/ OSH outcomes, respectively. For gender, national data was available on ten exposure indicators/ OSH outcomes. If these risk categories are to be considered in any future OSH monitoring exercises then further discussions may be necessary to initiate schemes to collect reliable information. For this the Agency depends on the support of other European information providers and/or the Member States.

Finally, a couple of 'wishes' regarding future strategies and developments in the area of OSH statistics/ surveys:

- Ensure topicality of data,  especially to keep pace with the fast changes in working life;
- Check feasibility to cover ‘soft’ OSH topics, e.g. violence at work, by harmonised statistics or use of other tools e.g. case studies;
- Create data/ information about the link between the ‘quality of work’ and OSH outcomes;
- Repeat inclusion of OSH topics in Labour Force Surveys on a regular basis as a complementary approach to Dublin survey on working conditions;
- Accidents at work and occupational diseases represent the ‘hard core’ of OSH. A pilot project to develop a perspective about statistics on work-related ill health should be initiated.

The Agency and its European network of experts offer to contribute actively to fulfillment of the ‘wishes’.

## Appendix 1

Exposure indicators/ OSH outcomes included in the manual encompassed:

- Physical exposures: *noise, vibration, high temperature, low temperature;*
- Posture and movement exposures: *lifting/ moving heavy loads, repetitive movements, strenuous working postures;*
- Chemical exposures: *handling chemicals, carcinogenic substances, neurotoxic substances, reproductive hazards;*
- Exposure to biological factors;
- Psycho-social working conditions: *high speed work, workpace dictated by social demand, machine dictated workpace, physical violence, bullying and victimisation, sexual harassment, monotonous work;*
- Occupational safety and health (OSH) outcomes: *accidents with more than 3 days absence, fatal accidents, musculoskeletal disorders, stress, occupational diseases, occupational sickness absence.*

## Appendix 2 Example summary page exposure indicator 'noise'

| | |
|---|---|
| **Potential health effects** | Noise induced hearing loss, tinnitus (permanent ringing can be heard in the ears), threshold shift (initially temporary but becoming permanent with prolonged exposure), loss of high frequency sounds resulting in communication problems, loss of interaction at social functions. Noise exposure can also have secondary effects such as stress and interference with communication in the workplace causing accidents. |
| **European picture** | 28% of all workers interviewed were exposed to noise. |
| **Sector categories most at risk from the national reports using NACE code** Figures in brackets represent the number of Focal Point responses | 28 Manufacture of fabricated metal products except machinery and equipment (10);<br>20 Manufacture of wood, wood products and cork, except furniture and manufacture of straw articles and plaiting materials (10);<br>27 Manufacture of basic metals (9);<br>21 Manufacture of paper and paper products (7);<br>45 Construction (7);<br>17 Manufacture of textiles (6). |
| **Occupation categories most at risk from the national reports using ISCO code** Figures in brackets represent the number of Focal Point responses | 82 Machine operators and assemblers (14);<br>72 Metal, machinery and related trades workers (12);<br>81 Stationary plant and related operators (10);<br>93 Labourers in mining, construction, manufacturing and transport (9);<br>71 Extraction and building trades workers (6);<br>83 Drivers and mobile plant operators (5);<br>74 Other craft and related trades workers (5);<br>73 Precision, handicraft, craft printing and related trades workers (5). |
| **Other risk categories** | Company size: In their comments the Focal Points considered that smaller businesses were at a greater risk from noise for a number of possible reasons. These reasons included the use of older machinery, fewer resources available, less knowledge and expertise of the risks and of the control measures available to tackle noise problems in the workplace.<br>Gender: Eleven Focal Points identified males, particularly 'blue collar' workers, as being most at risk from noise exposure;<br>Age: The younger person was considered by the Focal Points to be most vulnerable to noise exposure and potential hearing loss and that their risk was aggravated by social factors.<br>Employment status: The Focal Points mentioned temporary workers, self-employed workers, fixed term contract workers, those on apprenticeships and casual labour to be the status of worker at risk from noise exposure in the workplace. These groups often have less information available relating to safety and health issues, less training and less formal supervision and control in the workplace. |
| **Trends** | With regard to the trend of noise exposure in the workplace over the past 3-5 years the Focal Points were almost evenly balanced between a reduced trend and a stable trend. Six Focal Points reported that exposure had reduced, whereas six also reported that the exposure trend has remained stable. Only two had identified an increase in the exposure trend and one further Focal Point could not establish a particular trend pattern. |
| **Focal Points identifying the need for additional preventive action**<br>**Description of indicated action** | Belgium, Finland, Ireland, Italy, Portugal, Spain and United Kingdom.<br><br>Two Member States have launched national programmes to combat noise at work e.g. to reduce exposure to harmful noise levels for particular identified sectors by about 50% within five years. |
| **Other Relevant information** | Where exposure to noise levels was reported to have been reduced this was achieved through a number of factors such as the introduction of low noise machinery, automation of work processes and remote operation of equipment to isolate the worker from the noise source. These methods have been effective in industries such as mining, steel, paper and chemical production.<br>The increased use of casual labour can also have the affect of reducing risk by reducing individual exposure thereby spreading the overall risk amongst a greater number. Although, groups such as casual labour maybe more vulnerable to noise exposure because of the lack of information, supervision and control in the workplace. |

## Appendix 3 Example summary page OSH outcome 'accidents with more than three days absence'

| | |
|---|---|
| **European picture** | Some 4, 757, 611 accidents with more than 3 days absence from work were reported in total in 1996;<br>In the two-year period 1994 and 1996, the risk of accidents with more than three days absence from work fell by 3.3% in the EU.<br>Sectors: 1, 357 022 accidents recorded in the Manufacturing and 831,000 accidents recorded in the Construction;<br>Company size: the majority of accidents occurred in companies with less than 49 employees;<br>Gender: 3, 668 266 males and 920,000 females experienced accidents with more than 3 days absence;<br>Age: The incident rate for accidents at work was highest for the 18 – 24 age group;<br>Length of absence from work: of all accidents reported 47% resulted in less than two weeks absence and 48% resulted in from two weeks to less than three months absence from work. |
| **Sector categories most at risk from the national reports using NACE code**<br>Figures in brackets represent the number of Focal Point responses | 45 Construction (11);<br>28 Manufacture of fabricated metal products, except machinery and equipment (8);<br>20 Manufacture of wood and of products of wood and cork, except furniture manufacture of articles of straw and plaiting materials (6);<br>15 Manufacture of food products and beverages (5);<br>01 Agriculture, hunting and related service activities (4). |
| **Occupation categories most at risk from the national reports using ISCO code**<br>Figures in brackets represent the number of Focal Point responses | 82 Machine operators and assemblers (9);<br>72 Metal, machinery and related trades workers (8);<br>71 Extraction and building trades workers (6);<br>93 Labourers in mining, construction, manufacturing and transport (6);<br>81 Stationary-plant and related operators (4). |
| **Other risk categories** | Company size: Companies with less than 49 employees were considered to be at risk, although this was not the case across all sectors.<br>Gender: Thirteen Focal Points reported the male gender to be most at risk from accidents involving three days or more absence from work.<br>Age: Six Focal Points identified the age category 'less than 25 years' old to be most at risk from three days or more accidents at work.<br>Employment status: Out sourcing of labour was said to increase the risk of accidents for two reasons. Firstly, subcontractors are not always under their employer's direct supervision. Secondly, subcontractors often service several contracts at the same time. These jobs are often of a short duration leaving little time for an individual to become familiar with the work surroundings. Such unfamiliarity can increase the chance of mistakes as well as increasing the level of mental stress. |
| **Trends** | A total of nine Focal Points reported a decreased trend for workplace accidents with more than 3 days absence. |
| **Focal Points identifying the need for additional preventive action** | Belgium, Finland, Ireland, Italy, Luxembourg, Portugal and Spain. |
| **Description of indicated action** | Prevention of accidents in the workplace was one of the key areas for some Member States. |
| **Other Relevant information** | Slips, trips and falls were identified in the national reports as the main causes of accidents, which resulted in three days or more absences from work. The full list of identified causes of accidents is presented below.<br>A number of Focal Points raised the general issue that they recognised that reporting of accidents at work is subject to a degree of under reporting. However, it is primarily accidents with a less serious consequence, which tend not to be reported. |

## Appendix 4 The need for additional preventive actions indicated by the Focal Points

| Exposure indicator/ OSH outcome | Number of Focal Points reporting the development of additional preventive action is necessary |
|---|---|
| STRESS | 10 |
| VIBRATION | 9 |
| LIFTING/ MOVING HEAVY LOADS | 9 |
| HANDLING CHEMICALS | 8 |
| MUSCULOSKELETA,DISORDERS | 8 |

## Appendix 5 Comparison European/ national data

| | ***Question 1*** ***'Are there differences between the national data and the data from European sources?'*** | | | | ***Question 2*** ***'Does the additional national information highlight sectors or occupations that are not evident from the EU-data?'*** | | | |
|---|---|---|---|---|---|---|---|---|
| | **Yes** | **No** | ***No comparison reported*** | | **Yes** | **No** | ***No comparison reported*** | |
| | | | Lack of national data | Difficulty in comparing data | | | Lack of national data | Difficulty in comparing data |
| ***Physical exposures*** | | | | | | | | |
| Noise | 4 | 4 | 2 | 5 | 4 | 4 | 3 | 4 |
| Vibration | 3 | 4 | 4 | 4 | 3 | 2 | 6 | 4 |
| High temperature | 0 | 2 | 9 | 4 | 1 | 2 | 9 | 3 |
| Low temperature | 1 | 2 | 8 | 4 | 0 | 3 | 9 | 3 |
| ***Postures and movement exposures*** | | | | | | | | |
| Lifting/moving heavy loads | 5 | 2 | 4 | 4 | 4 | 2 | 5 | 4 |
| Repetitive movements | 5 | 2 | 4 | 4 | 3 | 2 | 6 | 4 |
| Strenuous postures | 5 | 2 | 4 | 4 | 3 | 3 | 6 | 3 |
| Handling chemicals | 3 | 2 | 6 | 4 | 3 | 2 | 7 | 3 |
| ***Psycho-social working conditions*** | | | | | | | | |
| High speed work | 6 | 1 | 5 | 3 | 1 | 1 | 9 | 4 |
| Workpace dictated by social demand | 3 | 1 | 8 | 3 | 2 | 0 | 9 | 4 |
| Machine dictated workpace | 3 | 1 | 9 | 2 | 1 | 0 | 11 | 3 |
| Physical violence | 2 | 2 | 7 | 4 | 4 | 0 | 9 | 2 |
| Bullying and victimisation | 2 | 2 | 6 | 5 | 1 | 0 | 9 | 5 |
| Sexual harassment | 3 | 3 | 7 | 2 | 2 | 2 | 10 | 1 |
| Monotonous work | 4 | 2 | 6 | 3 | 2 | 1 | 9 | 3 |
| ***Context of work*** | | | | | | | | |
| Personal protective equipment | 1 | 2 | 7 | 5 | 1 | 0 | 11 | 3 |
| Information about risks | 1 | 2 | 8 | 4 | 0 | 0 | 10 | 5 |
| Training | 1 | 2 | 11 | 1 | 1 | 2 | 10 | 2 |
| ***OSH outcomes*** | | | | | | | | |
| Musculoskeletal disorders | 2 | 1 | 5 | 7 | 2 | 1 | 8 | 4 |
| Stress | 3 | 2 | 6 | 4 | 1 | 1 | 8 | 5 |
| Occupational sickness | 5 | 1 | 8 | 1 | 5 | 0 | 10 | 0 |
| **Overall Totals** | **60** | **38** | **115** | **72** | **43** | **26** | **154** | **62** |
| | **98** | | **187** | | **69** | | **216** | |

## Appendix 6 Information gaps on national level

| Exposures/OSH outcomes | Company size | Gender | Age | Employment status |
|---|---|---|---|---|
| Noise | ● | ● | ❍ | ❍ |
| Vibration | ❍ | ● | ❍ | ❍ |
| High temperature | ❍ | ● | ❍ | ❍ |
| Low temperature | ❍ | ● | ❍ | ❍ |
| Lifting/moving heavy loads | ❍ | ● | ❍ | ❍ |
| Repetitive movements | ❍ | ● | ❍ | ❍ |
| Strenuous working postures | ❍ | ❍ | ❍ | ❍ |
| Handling chemicals | ❍ | ❍ | ❍ | ❍ |
| High speed work | ❍ | ❍ | ❍ | ❍ |
| Workpace dictated by social demand | ❍ | ❍ | ❍ | ❍ |
| Machine dictated workpace | ❍ | ❍ | ❍ | ❍ |
| Physical violence | ❍ | ❍ | ❍ | ❍ |
| Bullying and victimisation | ❍ | ❍ | ❍ | ❍ |
| Sexual harassment | ❍ | ● | ❍ | ❍ |
| Monotonous work | ❍ | ❍ | ❍ | ❍ |
| Accidents with more than three days absence | ● | ● | ● | ❍ |
| Fatal accidents | ❍ | ● | ● | ❍ |
| Occupational diseases | ❍ | ● | ● | ❍ |
| Musculoskeletal disorders | ❍ | ❍ | ❍ | ❍ |
| Stress | ❍ | ❍ | ❍ | ❍ |
| Occupational sickness absence | ❍ | ❍ | ❍ | ❍ |

*Legend*

● Data provided in national reports allowed the European picture to be given

❍ Data not provided in the national reports and therefore a European picture could not be given

# HEALTH AND SAFETY AT WORK – EU STATISTICS

## Statistics on and indicators of accidents at work and work-related health hazards in Europe: a critical appraisal

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Statistics on accidents at work and occupational diseases are compiled by almost all Member States of the European Union, especially those in which a separate social insurance system provides compensation in such cases. Eurostat combines and processes the statistical data. This paper examines workplace-accident statistics throughout the EU and shows that the data cannot be used to make a direct comparison between levels of occupational health and safety in the various countries. This is because the figures are distorted by factors unconnected with preventive measures and have to be interpreted with caution. /1-2/

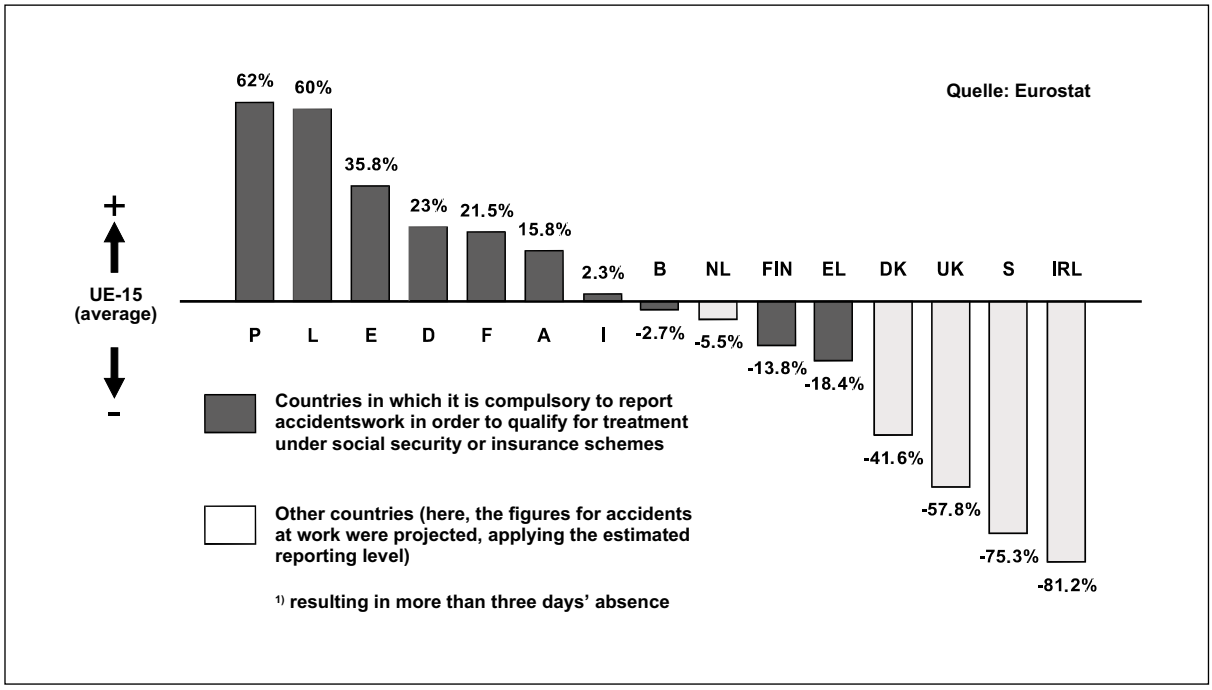
Under the EU's framework directive on safety and health at work, companies must take preventive measures not only in respect of accidents and occupational diseases but in respect of all risks to life and health to which employees might be exposed. Such risks are accordingly also monitored by labour inspectorates. Unlike accidents and occupational diseases, these "work-related health hazards" do not usually give rise to administrative acts, except possibly in the form of complaints by labour inspectorates. As a result, the task of compiling statistical documentation and determining indicators is particular problematic.

On the basis of the Dublin Foundation's "European Surveys on Working Conditions" and the report by the European Agency for Safety and Health at Work entitled "The State of Occupational Safety and Health in the European Union – Pilot Study", the data available from EU countries are compared and the scope and limits of their informative value set out.

## A. "Reported" accidents at work

One of the first EU-wide surveys to collect data on accidents at work was carried out for the year 1994. The results and the underlying methodology have been published by Eurostat over the past two years /3-5/. Figure 1 shows how widely the standardised number of accidents at work (per 100 000 persons in employment) varies across the Member States /3/. Some countries post figures 60% or more above the EU average, while others are 70 to 80% below.

*Figure.1: "Reported" accidents at work[1] in EU Member States compared with the average (1994) /3/*




The work-accident data collected in the study were taken mainly from national administrative sources. The reporting level, i.e. the number of accidents reported as a percentage of those that actually occurred, varies from one country to another, in some cases substantially. The authors of the study found, for example, that in Member States where it is compulsory to report accidents at work in order to qualify for treatment under social security or insurance schemes the total number of occupational accidents is known. In other Member States (Denmark, Greece, Ireland, the Netherlands, Sweden and the United Kingdom), data on accidents at work are collected only in part. The reporting levels in these countries range from 17 to 56%. To make transnational comparisons possible, Eurostat estimated the reporting levels for these countries on the basis of information provided by the Member States concerned. Projections were then made of the actual numbers of accidents at work. In spite of this adjustment, the differentials are remarkable and cannot be readily explained.

Eurostat also determined the number of work accidents in the European Union in 1996 /6/. The Eurostat figures were seized upon by the media (Figure 2) and the statistics were also used in the political arena and by government services /7/, though without any reference being made to the variations in data quality.

[1] resulting in more than three days' absence

*Figure 2: Risk of accidents at Europe's workplaces*


The figures for 1996 shown in Figure 2 are examined in closer detail in the following. The number of work accidents resulting in more than three days' absence was calculated as approximately 4.8 million /6/. This figure relates to 131.5 million employed persons, representing around 88% of all persons in employment in the European Union. The survey covered nine major branches of activity employing a total of 91.5 million people: agriculture, hunting and forestry; manufacturing; construction; wholesale and retail trade (including maintenance and repair); hotels and restaurants; transport and communication; financial intermediation; services (mainly for businesses); electricity, gas and water supply. For these branches of activity, the following average values (EU-15) were calculated for the frequency of accidents at work:

4 229 accidents at work[2] per 100 000 persons in employment

3.6 fatal accidents at work[3] per 100 000 persons in employment

According to these figures, an average of one worker in 24 in the European Union had an accident at work in 1996 and one in every 28 000 employed persons suffered a fatal work accident.

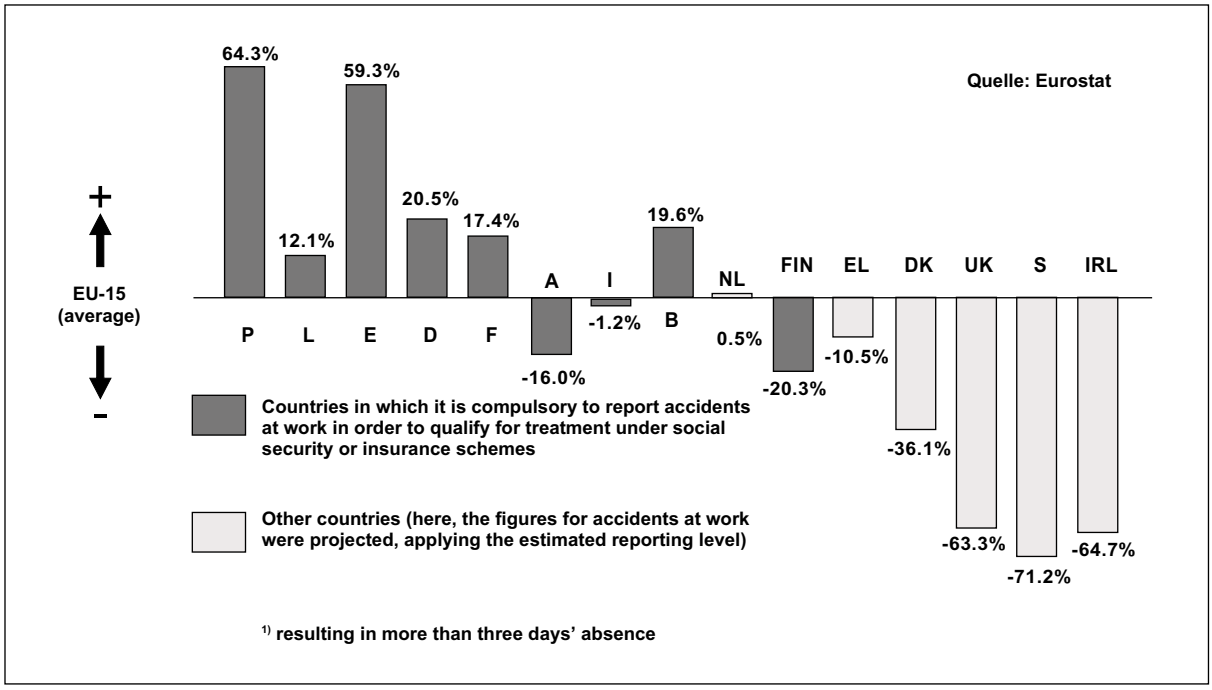
The frequency of work accidents calculated by Eurostat for individual Member States is shown in Figure 3. Once again, there are appreciable deviations from the average for the European Union as a whole, with some countries around 60% above the average figure and others 60 to 70% below. As with the 1994 figures, it is also striking in respect of 1996 that the majority of countries where it is compulsory to report accidents at work in order to qualify for treatment under social security or insurance schemes had a workplace accident frequency above the EU average. Countries without such full statistical coverage generally lie well below the average for the EU. A comparison of the figures published by Eurostat for the frequency of accidents at work in the individual countries in 1994 and 1996 shows up some marked changes, which are probably to be explained not so much by the actual pattern of accident occurrence as by a shift in the data-collection strategy pursued. For example, for 1996 Ireland posted a 75% increase, Luxembourg a 34% decrease and Austria a decrease of 32% in the number of reported accidents at work per 100 000 persons in employment

[2] resulting in more than three days' absence

[3] not including road accidents and deaths from natural causes

compared with 1994. These marked changes in the number of reported cases explain the major differences for these countries in Figures 1 and 3, whose timeframes are only two years apart. Persons in employment in Luxembourg, for example, include an unusually high proportion of commuters from neighbouring countries. If, as for 1994, the number of accidents at work is related to the relatively low number of Luxembourg nationals in employment, the frequency of accidents at work is too high in relative terms. The 1996 figures were adjusted accordingly.

***Figure 3: "Reported" accidents at work in the Member States compared with the average for the EU (1996) /6/.***




## Fatal accidents at work

In the case of fatal work accidents, too, the statistical data of the Member States display major differences, see 0Figure 4. The figure for Portugal is well over twice the average, while the United Kingdom posts just on half the EU average.

***Figure. 4: Fatal accidents at work in Member States compared with the EU average in 1996 /6/***

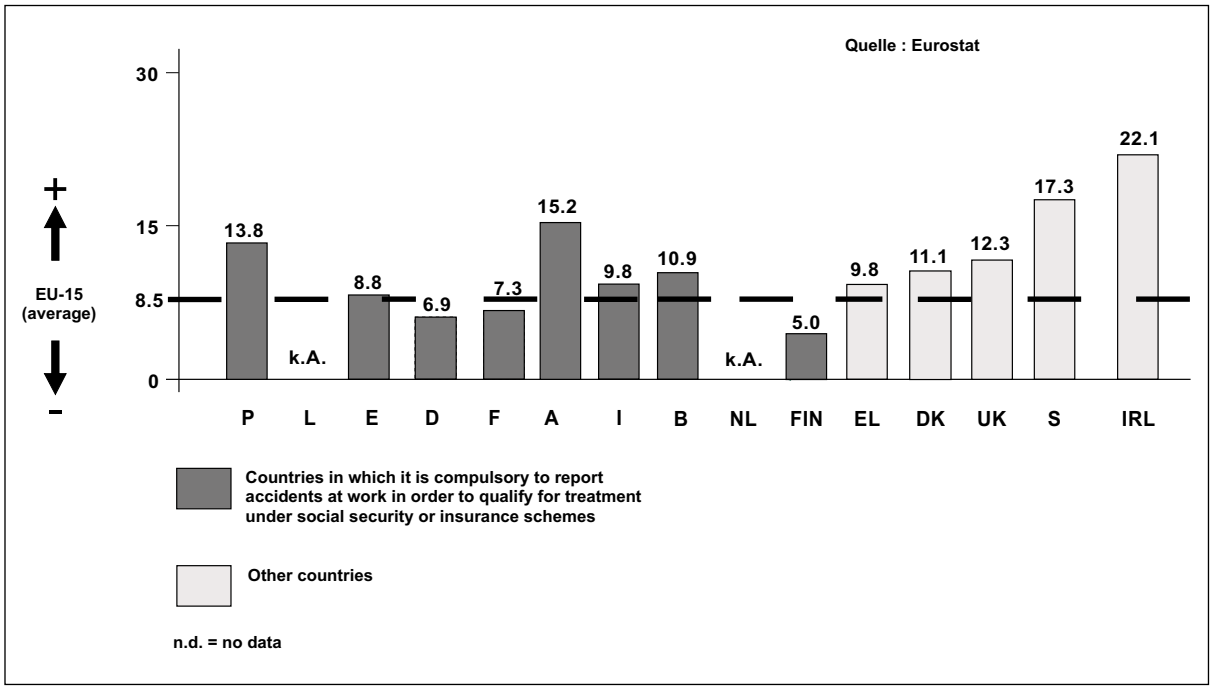
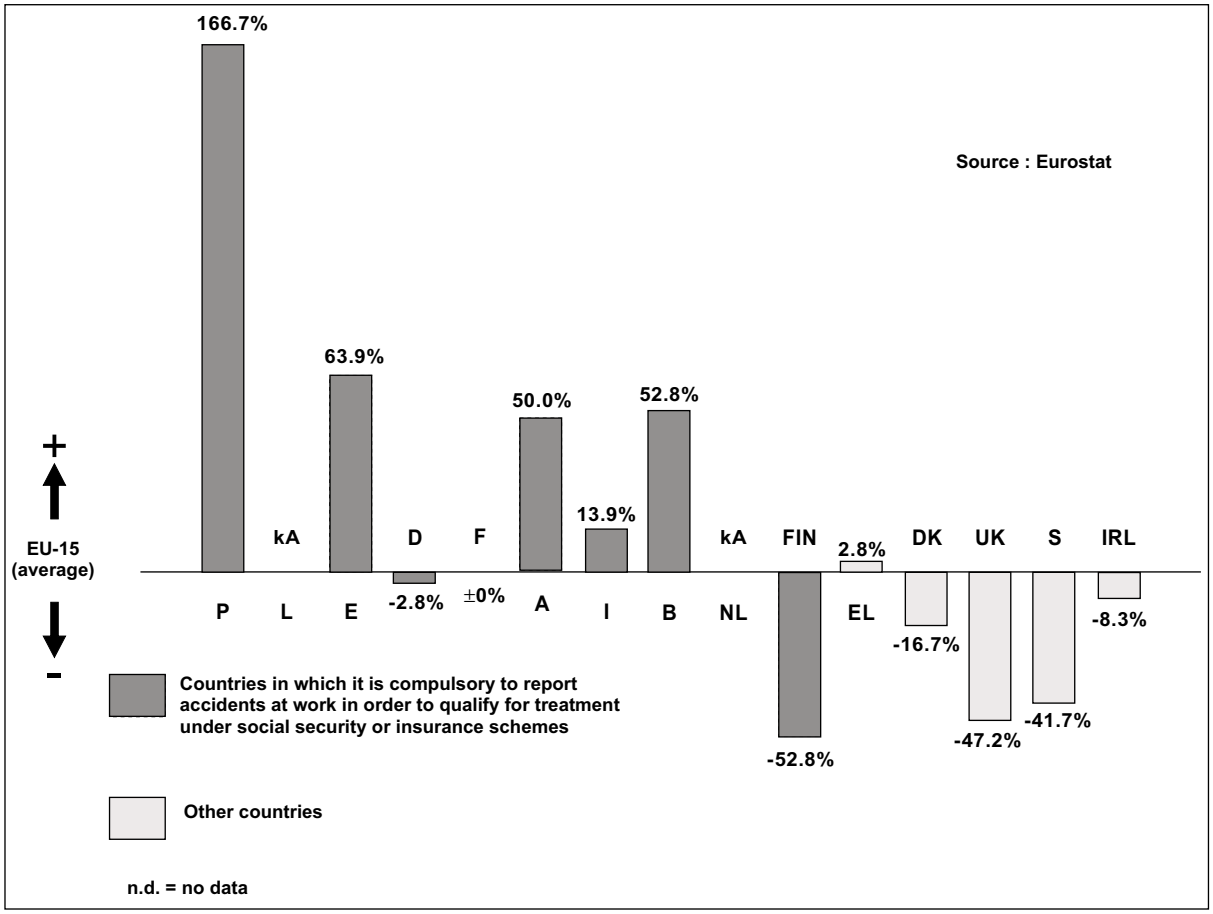


*Figure 5: Number of fatal accidents at work[4] per 10 000 reported accidents at work51 (1996)*




A striking feature of Figures 4 and 5 – as with Figure 1 – is that, in spite of the adjustment made, most countries where it is compulsory to report accidents at work in order to qualify for treatment under social security or insurance scheme post figures in some cases markedly above the EU average. In the case of the other countries, the opposite is true. The obvious assumption is that the corrective factors applied where reporting levels are insufficient do not sufficiently offset the distortion in results. In the case of fatal work accidents, too, two countries posted very different figures for 1996 compared with 1994: Austria (+59%) and Finland (-53%).

## Accident severity

Confirmation of this assumption is obtained by comparing the relative severity of accidents in the individual countries. Figure 5 shows the number of fatal work accidents per 10 000 reported accidents at work. This variable represents a measure of accident severity. Of every 10 000 work accidents reported in the European Union and resulting in at least three days' absence, an average of 8.5 are fatal.

There is no plausible reason why the share of fatal accidents in total accidents, i.e. accident severity, should vary so markedly in the individual countries. Rather, the obvious assumption is that the reporting behaviour in the individual countries differed to a greater extent than assumed in the study and the arithmetical corrections did not adequately offset the distortions in the data collected. There is good reason to assume that in all countries fatal accidents are the subject of the fullest statistical coverage. Accordingly, the discrepancy is probably mainly attributable to even lower reporting levels than estimated in the case of countries where it is not compulsory to report accidents and costs are borne by parties other than social security or insurance schemes.

[4] not including road accidents and deaths from natural causes

[5] resulting in more than three days' absence

### Germany compared with the EU as a whole

Despite the limited comparability of the data available, Germany's figures can be gauged against the EU average as follows:

- In the case of fatal accidents at work, Germany lies slightly below the EU average.
- The number of accidents at work resulting in more than three days' absence is higher in Germany than in the European Union on average. However, the figure gives Germany only a middle ranking among those countries where it is compulsory to report accidents at work in order to qualify for treatment under social security or insurance schemes. Figure 5 strongly suggests that the reporting level in Germany for these accidents at the workplace is one of the highest in the European Union.
- The average severity of workplace accidents reported in Germany is markedly lower than the EU average. Of 10 000 reported accidents at work in Germany, 6.9 are fatal. This compares with an EU average of 8.5, i.e. a figure that is $^1/_4$ higher.

## B. Surveys of work-related health hazards

Under the EU's framework directive on safety and health at work, both employers and institutions responsible for monitoring safety and health in the workplace have a duty to ascertain and prevent work-related risks to health. Europe-wide surveys on safety and health at work are in place whose scope includes work-related health hazards. The main ones are:

The "European Survey on Working Conditions" conducted by the European Foundation for the Improvement of Living and Working Conditions in 1991, 1996 and 2000. /8/

The report by the European Agency for Safety and Health at Work entitled "The State of Occupational Safety and Health in the European Union – Pilot Study". /9/

In addition, there are individual reports which address specific work-related health risks, e.g. mental stress, and make transnational comparisons. The recently published ILO report entitled "Mental Health in the Workplace" can be mentioned in this context. /10/

Not least, a number of EU Member States have data and survey results on work-related risks to health. In Germany, for example, results are available from the six surveys which have been carried out since 1979 by the Federal Vocational Training Institute (*Bundesinstitut für berufliche Bildung* - BIBB) and the Institute for Employment Research (*Institut für Arbeitsmarkt- und Berufsforschung* - IAB) of the Federal Employment Services (*Bundesanstalt für Arbeit*). To varying degrees, these surveys also collected information on work-related health risks as seen from the subjective perspective of those surveyed - most recently in 1998/99 in cooperation with the Federal Institute for Occupational Safety and Health (*Bundesanstalt für Arbeitsschutz und Arbeitsmedizin* - BAuA)/11/. Results from these surveys were incorporated, as supplementary national data, into the above-mentioned report of the European Agency for Safety and Health at Work. In Germany, the Employers' Liability Insurance Associations (*Berufsgenossenschaften*) have objective data on specific work-related risks to health, e.g. measurements of noise levels, hazardous substance exposure levels, stresses acting on the spinal column and vibrations, as well as the in-house findings of company supervisors.

However, the very fact that the report of the European Agency for Safety and Health at Work is largely based on the results of the Dublin Foundation's 2nd European survey (1996) illustrates just how little - possibly - comparable data material on work-related health risks is available at European level.

### Report by the European Agency for Safety and Health at Work entitled "The State of Occupational Safety and Health in the European Union – Pilot Study"

Both the report by the European Agency for Safety and Health at Work and the survey by the Dublin Foundation attempt to cover, as broadly as possible, health hazards, stresses and exposure levels at the workplace, whether or not the hazards concerned are liable to lead to accidents or occupational diseases. The methodologies underlying these surveys display fundamental differences compared with the methods used to collect data on and document accidents at work and occupational diseases, but also have some features in common with those methods. One difference, for example, is that no "cases" are documented and no objective measurements of stresses and exposure

levels are carried out. Rather, using social-science methods, employees are interviewed and their replies evaluated. In one key respect, however, the methodologies match: data are collected on a person-specific basis. In the study conducted by the European Agency for Safety and Health at Work, this database is supplemented, in each case, by a national appraisal by occupational health and safety experts. This appraisal relates to:

— a comparison of national findings and data with the respective country-specific results of the Europe-wide survey,
— the expected trend and
— national prevention needs in respect of the individual health hazards.

The following factors with a bearing on work-related health hazards were covered6:

— group of physical and chemical exposures:
noise, vibrations, high and low temperatures, handling of chemicals;
— stresses caused by posture and movement:
constantly repeated movements, strenuous work postures, lifting and moving of heavy loads;
— psychosocial working conditions:
work cycles dictated by social requirements, work cycles dictated by machines, high pace of work, monotonous work, physical violence, sexual harassment.

The survey covered not only stresses and exposure levels but also their impact on health[6]:

musculoskeletal disorders, mental stress, time lost as a result of occupational diseases.

## Comparison of selected work-related health hazards

From the work-related health hazards surveyed, a representative selection was made. This included, in particular, sample hazards which were considered to be highly important both by the employees interviewed and by the experts who assessed prevention needs in the agency's report:

— vibrations, EU average: 24%
— handling of chemicals, EU average: 14%
— high pace of work, EU average: 55 %
— mobbing, EU average: 8 %
— mental stress, EU average: 28 %

In contrast to statistics on accidents at work and occupational diseases, the data collected ought to be largely independent of the legal framework in the individual countries. At the level of the individual employee, however, they reflect a mixture of objective and subjective conditions not only at the workplace but also in the living environment, e.g.:

— economic and employment structures
— variations in predominant workflow and organisational conditions, e.g. extent of part-time working
— varying work cultures and employee attitudes, e.g. acceptance of hazards
— varying socio-cultural conditions, e.g. sensitivity regarding stresses, exposures and encroachments

## Situation in the EU Member States

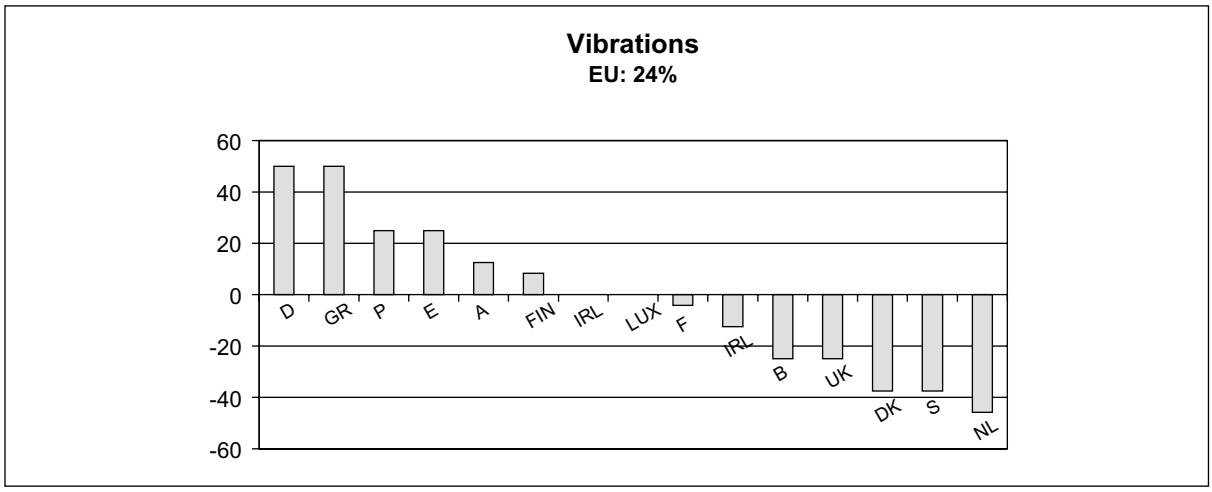
Set out in the following are the survey results obtained in the EU Member States for the five work-related health hazards cited above. An attempt is made to find plausible explanations for the differences.

In each case, the results for the individual EU Member States are represented as a relative deviation (in %) from the average figure for the European Union (Figures 6-13).

It should be borne in mind that deviations from the average and differentials between individual figures are statistically relevant only if they exceed around 30%. For that reason, only a few major differentials and general trends are highlighted.

Except in the case of vibrations, Germany's figures for the cited work-related health hazards are generally at or slightly below the average level for the EU. As regards vibrations, Germany shares top position with Greece (Figure 6).

*Figure. 6: Vibration stresses at the workplace in EU Member States (survey results according to /3/), relative percentage deviation from EU average.*




One possible approach to explaining the differences is to consider the occupations and sectors of activity stated by the employees interviewed: most affected by vibration stresses are craftsmen and employees in the agricultural, fishing and construction sectors. An in-depth analysis would have to be carried out to determine whether it is the construction sector in Germany and the agricultural and/or fishing sector in Greece which are "responsible" for the relatively high occurrence of vibration stresses in those two countries.

The Netherlands, Italy and Belgium lie well below the EU average for almost all five work-related health hazards. On the other hand, the Netherlands' figures for mental stress and pace of work and Italy's figure for mental stress are 30 to 40% higher than the EU average (Figures 7 and 8). The Netherlands is the EU Member State with by far the largest proportion of part-time employees (Figure 9). This is a factor that could be examined as a possible explanation of the results for mental stress and pace of work. Italy, on the other hand, is at the other end of scale in the EU when it comes to part-time and precarious employment, so that other explanations would have to be sought for that country.

*Figure 7: Mental stress at the workplace in EU Member States (survey results according to /9/), relative percentage deviations from the EU average.*

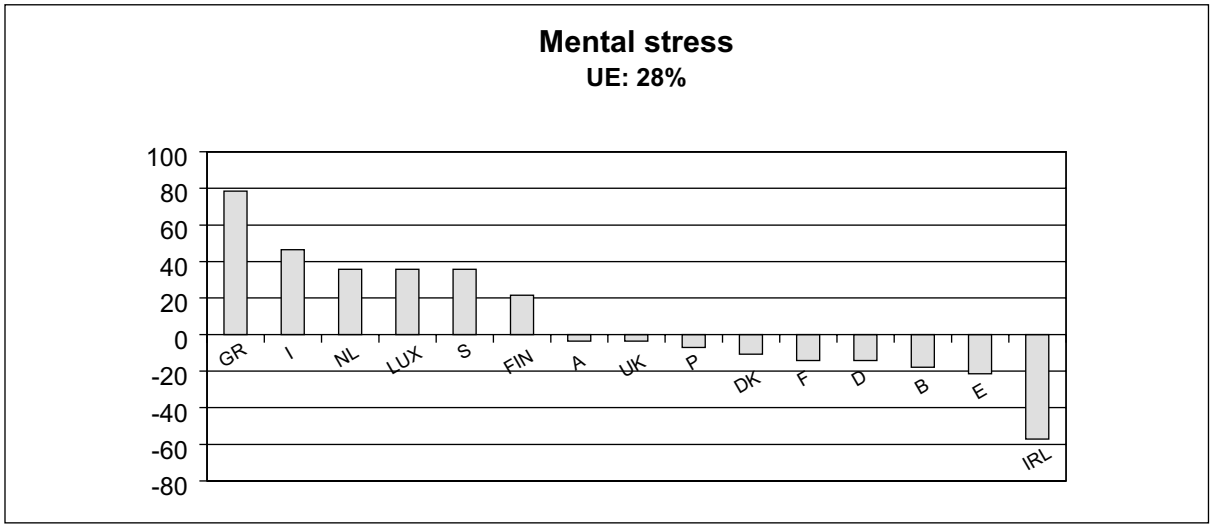
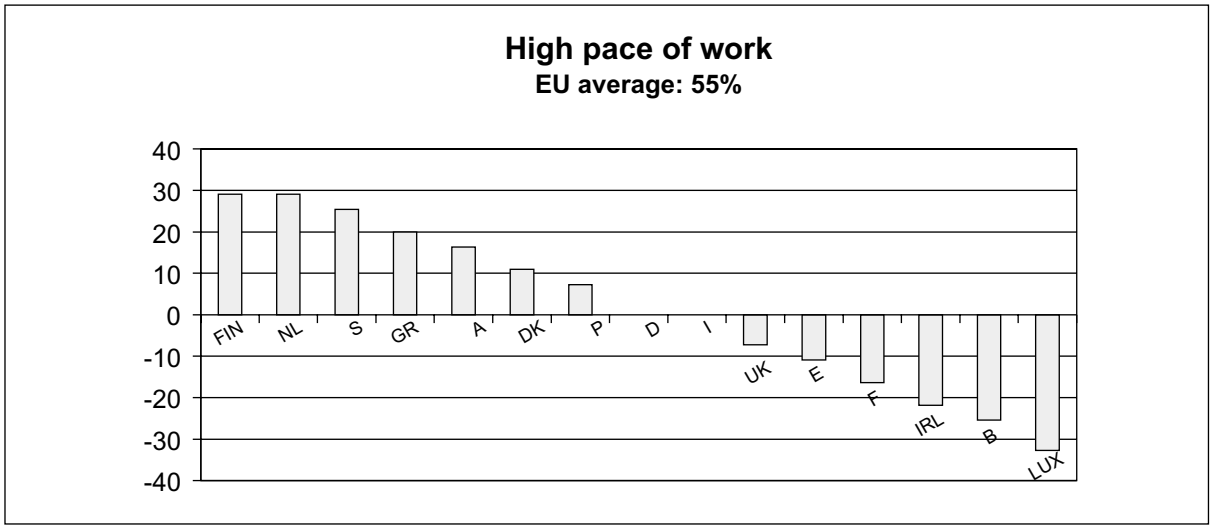


*Figure 8: Stress caused by high pace of work in EU Member States (survey results according to /9/), relative percentage deviations from the EU average*




For most of the five selected work-related health hazards, Greece's and Finland's figures are above the EU average. This relates to both hard and soft factors. No hypothetical explanation of this phenomenon is immediately evident. The Greek figure for the handling of chemicals is far higher than those of all other EU Member States and is 125% above the EU average (Figure 10). A possible explanation for this lies in the country's employment structure (Figure 11): 20% of all Greek workers are employed in agriculture, the highest proportion in the European Union, and agriculture is the sector of activity most frequently cited in connection with the handling of chemicals.

*Figure 9: Percentage share of part-time employees in EU Member States (according to /12/)*

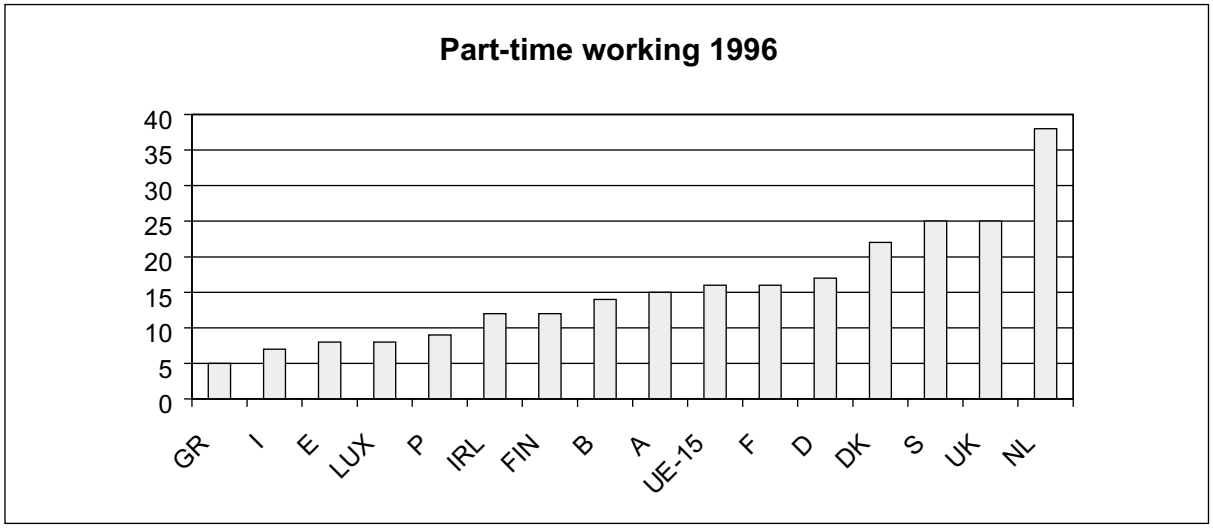


*Figure 10: Exposure through the handling of chemicals at the workplace in the EU (survey results according to /9/), relative percentage deviations from the EU average.*

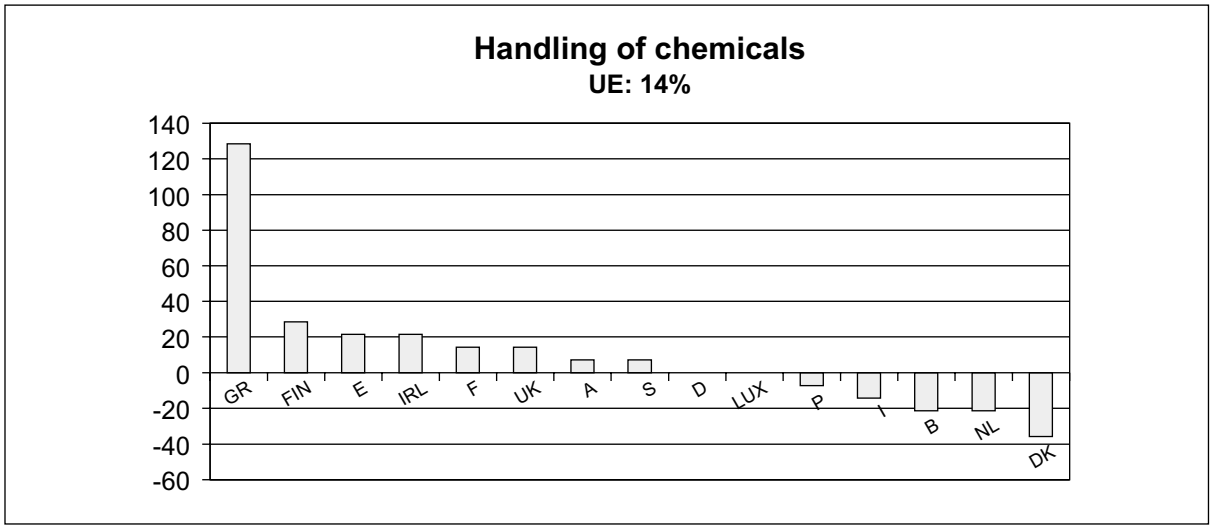



*Figure 11: Employment structure in the European Union (according to /12/)*

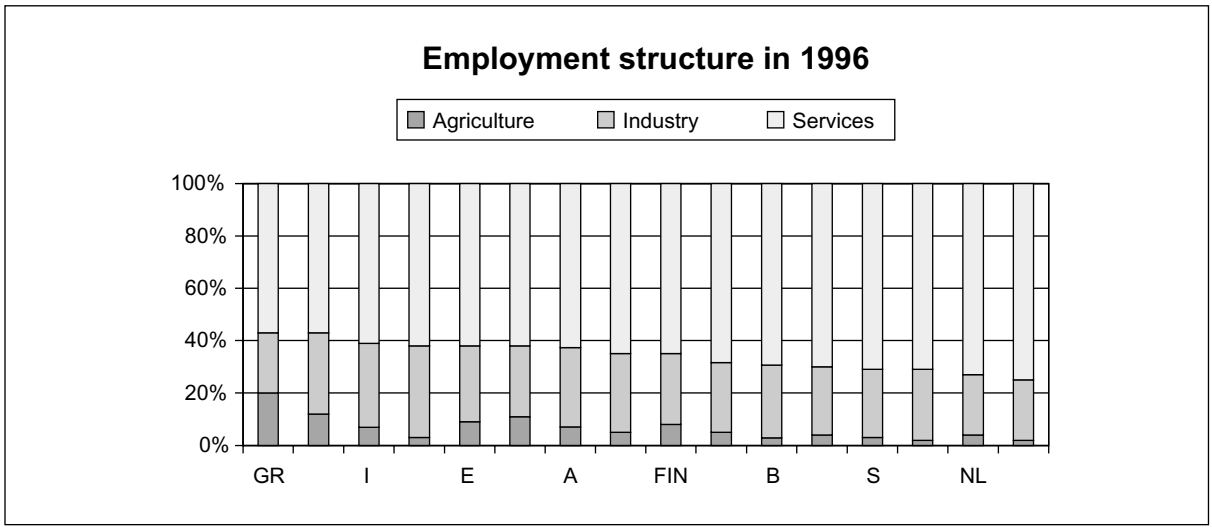
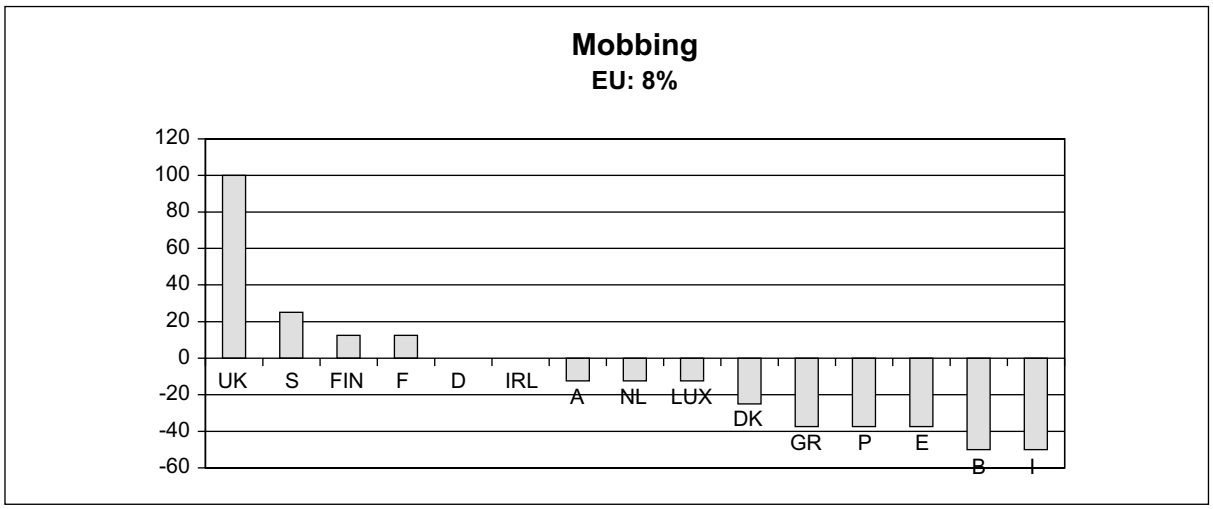


*Figure 12: Stress caused by mobbing at the workplace in EU Member States (survey results according to /9/), relative percentage deviations from the EU average.*



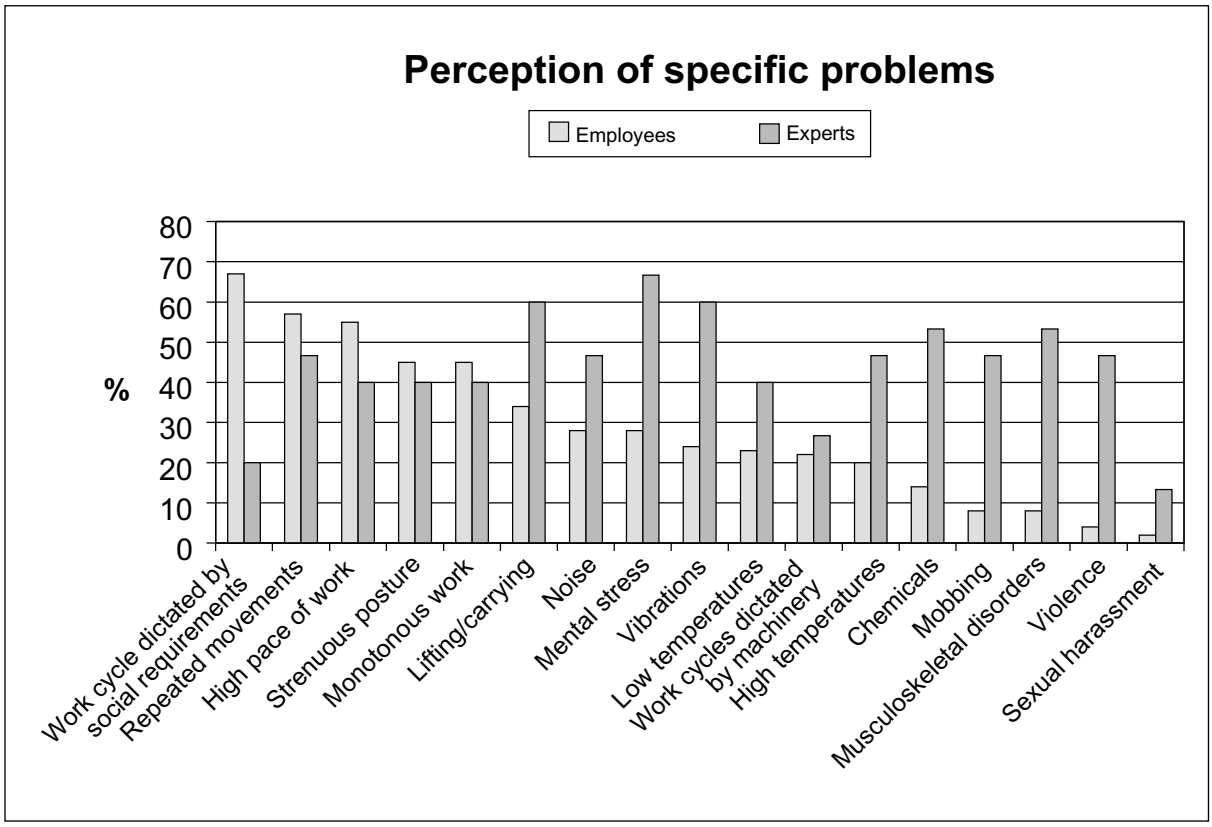

In the case of mobbing, there is a striking split into northern and southern countries (Figure 12): apart from France, the southern Member States lie below the average for the European Union as a whole, while the northern countries post above-average figures, with the exception of Belgium and the Netherlands. The obvious initial hypothesis here is to regard cultural differences as the cause of the differentials in both mobbing trend and perception.

One-to-one country comparisons do not - except in certain cases - suggest any obvious reasons for the differences.

## Priorities: from the employee's and expert's viewpoint

In addressing the issue of prioritising preventive measures, it is interesting to study the "league table" of stresses and exposures as perceived by employees (Figure 13): Over 50% of employees in the European Union feel that their job involves a high pace of work, constantly repeated movements and a work cycle dictated by social requirements. Other factors which more than 30% of employees see themselves as exposed to are: strenuous posture, monotonous work and the lifting and carrying of loads. Factors such as noise and vibrations achieve middle rankings, together with mental stress: between 20 and 30% of employees feel they are affected. There is only a small degree of agreement between this employee perspective and the perception of the national experts who expressed their views on prevention needs in the report by the European Agency for Safety and Health at Work. In the opinion of the experts, the most important factors are: mental stress, lifting and carrying, handling of chemicals, musculoskeletal disorders, noise, high temperatures, mobbing and violence at the workplace. To this extent, interviews with employees are certainly a useful means of viewing expert opinions in a critical light.

*Figure 13: Percentages of employees perceiving exposure to stress factors and of national experts perceiving a need for preventive measures in respect of those factors (according to /9/).*




## Summary and outlook

In summary, interviewing employees about stresses and exposures at the workplace would appear to be a highly useful instrument for identifying prevention needs and priorities. For benchmarking between the various EU Member States, however, it would still appear unsuitable - at least on the quantitative and methodological basis applied to date.

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# MEASURING HEALTH AND SAFETY AT WORK
# CURRENT SITUATION - THE USERS' VIEW

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## 1.0.0. Introduction

Historical origins and consequent cultural and social developments of Occupational Health and Safety (OHS) significantly differ in the various European countries. Therefore it is not surprising that there are major discrepancies in the national norms in force in each country of our continent, in spite of the successes of the harmonization process started from the 80's by the European Union, specially in the OHS field. An inevitable consequence of this can be observed in the equally significant differences of information systems and of the statistical tools in use in each country.

Obviously there are common qualities and defects but they are not such as to justify and support the usefulness of a general treatment at least in this historical stage which is certainly a transition stage.

Therefore let us limit our descriptions and considerations to the "Italian case", in order to provide on one side a realistic picture of conditions and problems and on the other side the possibility of going into more details.

First of all it is worth briefly mentioning which and how many are the "users", since passing from one user to the other may cause significant changes in the goals that are the targets of collected statistical data. Then, the different statistical tools available in Italy in the present situation will be summarized with particular reference to assets and deficiencies in a perspective scenario.

Finally we highlight some arising problems owing to the tremendous transformations under way in productive processes of the different sectors and the labour market.

## 2.0.0. The users

They are quite different one to another with equally different targets and cultural backgrounds.

2.1. *Politicians:* to know and change reality

2.2. *Administrators*: to manage processes

2.3. *Trade Unions*: to improve workers' health and safety conditions

2.4. *Entrepreneurs*: to make strategic choices and assess costs/benefits

2.5. *Professionals*: for operational requirements

2.6. *Researchers*: to estimate the epidemiological magnitude of each assumption.

The list may be not exhaustive but it is sufficient to clarify the concept of the variety of subjects at stake. At this point we could ask ourselves whether, given this variety, it may be possible to implement statistical systems able to meet any requirement.

Certainly one or more of the above mentioned users expect from OHS statistics some contribution on one or more of the following points

- information on causes of working accidents and work-related diseases
- description and monitoring of the state of health of populations exposed to occupational hazards (and of non-exposed populations for necessary comparisons)
- preparation of prevention programmes
- estimate of drawbacks (on single individuals and homogeneous groups) of occupational (or environmental) exposures, also in view of legal and insurance purposes.

## 3.0. Statistical tools

OHS statistical tools are not so many and differ one to another also in the goals of concerned information systems. The objectives stated at 2.0.0. can be achieved both by starting *ad hoc studies and statistics* and using the so-called *current information systems*. Let us consider separately these two issues.

### *A. Ad hoc studies and statistics*

Ad hoc studies and statistics (under all the methodological forms suggested by epidemiology: analysis of individual case histories of offended subjects, cross and/or longitudinal studies - cohort, check case - geographic studies, etc.) may be concerned with any topic, obviously, even if it is worth noting that so far there has been much (even too much) attention mainly on some chronic-degenerative pathologies and in particular on cancer, also by specific information collection instruments (like, e.g. cancer registers).

In this connection it is particularly important to arise the professionals' attention mainly to other issues like for example the ones listed here below.

- *In the field of chronic-degenerative pathologies*: cardiocirculatory, digestive and respiratory systems or musculoskeletal apparatus diseases, etc. which are neither less relevant (in terms of negative outcomes on individual and associated life) nor less frequent than oncological illnesses. Availability of information on phenomena other than fatalities (hospitalization, drug consumption, ward and instrumental diagnostics performances, etc.) is dramatically changing the picture of population health conditions (and also of the working population), specially as to community diseases (in terms of allocated resources, costs, assistance, etc.). There is no time to go into more quantitative details but if cancers and cardiocirculatory diseases are by far the major causes of fatalities in statistics, as soon as we leave the mortality planet to get into statistics concerning, for example, hospitalization, there is a marked prevalence of thoroughly different pathologies and conditions such as digestive system or musculoskeletal apparatus disorders.
- Always in the field of chronic diseases, we can still consider pathologies with shorter chronicity (therefore with a shorter latency between exposure and onset) or whose invalidating effect is less serious (both for individuals and the community): think for example of illnesses or conditions that can be kept more easily under control even though negatively affecting health (using different treatments starting from pharmacological drugs - hypertension) or of the illnesses or conditions not having a fatal outcome but nevertheless not less invalidating (the entire musculoskeletal system).
- Think then of acute illnesses, not only infectious, and specially of traumatic ones.
- And so on.

In these years the etiological research on health and safety, health monitoring of exposed working population, planning of prevention and treatment and even insurance recognition of work-related etiological diseases suffered from a restricted observation range, energies being devoted to quite important but too limited areas. *It is now time, first of all, to break this encircling which sometimes proved to be even monothematic (think of oncological pathology in primis) by identifying and developing new fields of interest to be addressed resources and energies, priorities and actions.*

It is just because it is a new field that we have to consider the experimental characteristics of this approach, realizing first of all that new paths and new tools have to be studied and explored: in this view ad hoc studies and statistics are an essential tool.

***B . Current information systems***

There is however another field of major interest suggesting problems and rationale likely to be better and more profitably tackled using the so-called *"current" recording tools* both under the form of *"current" statistics* and, more generally, of *"current" recording systems*.

A current recording system collects simple and essential, homogeneous, rapid and non-specific information in view of a general and generic goal, frequently an administrative one. Typically the system is exhaustive to the planned goals.

There are several current information systems: fatality is maybe the most well-known and the most widely used, but hospitalization discharge forms, ward and instrumental diagnostics performances, medical prescriptions are quite relevant as well. Also cancer registers (and generally pathology registers) fall into this category of recordings and equally important in the work-related field are the claims of work-related diseases or accidents.

The current systems have often a completeness logics able to cover the phenomena of interest on a territory basis and are frequently a starting point to be then followed by ad hoc specific and aimed approaches. *The current systems are more fit to respond to planning, assessment and monitoring logics while being more far away from etiological objectives.*

Generally speaking the current information systems have been so far concerned with collecting information on the damage suffered by the exposed workers and in particular some diseases and some accidents. We said "some diseases" since the altogether of illnesses investigated is rather limited: cancers, for example, but not cardiopathies, or only some illnesses reported by law (different lists of illnesses from one country to another). Also as to accidents, we said "some accidents" since not all accidents are considered. But if some information is available on damages, *current information systems are completely absent on exposures*. Therefore while there are registers of ill and injured subjects, there are no registers (but for a few exceptions in some countries) of exposed subjects or registers of work-related situations producing definite exposures.

Some law acts would have favoured this approach: for example in Italy law decree 626/94 stated and technically regulated the necessity of collecting systematic information (currently) on diseases and exposures under the form of registers though for the time being the law text deals only with the problem of exposure to cancerogenic and biological agents.

According to a rationale favouring the extension of the institution where they were produced and are still managed, information tools can be classified in three groups worth being analytically examined as follows.

## 3.1.0. European tools

Up to date, four main harmonized statistical tools have been implemented at EU level:

*3.1.1. The European Statistics on Accidents at Work* (ESAW) of Eurostat collecting data from 1993 reference year on all cases of accidents at work with more than 3 days' absence from work and fatal accidents at work (administrative sources).

3.1.2. *The European Occupational Diseases statistics* (EODS): a first pilot data collection was carried out on the cases (diseases) recognized in 1995 for 31 items of the European Schedule of Occupational Diseases in the European Union.

*3.1.3. The ad hoc module on health and safety at work* in the 1999 Community Labour Force Survey (LFS) of Eurostat: the module considers 11 variables on the accidents at work and the other health problems caused or made worse by work, suffered during the last 12 months.

*3.1.4. The European Survey on Working Conditions* of the European Foundation for Improvement of Living and Working Conditions (1991, 1996, 2000): in particular the survey provides information on exposures to physical agents, hazardous substances, fumes, dust and other risks, status at workplace, workstation characteristics and protective equipment, and finally work-related health problems.

More details on each tool are available on "Background Paper" of the 13th CEIES Seminar "Health and Safety at Work (HSW) - EU statistics".

In Italy only the two first tools are well-known at INAIL.

### 3.2.0. Italian statistical tools

In Italy there are two national data recording systems: one (describing the productive tissue) is run by the Italian Body for Statistics (ISTAT) and one recording work-related damages (accidents and diseases) run by the Public Insurance Body for Work Accidents and Diseases (INAIL).

3.2.1. **ISTAT** is in charge, among others, with the task of surveying every 10 years the population and ***working activities*.** This picture provides valuable data to all public health professionals at different levels having to plan actions and consequent funding allocation. In particular, ISTAT is the main source of knowledge of the Italian working tissue size and characteristics for professionals working in the field of workplace prevention: number of enterprises, number of employees, independent workers, size of enterprises, geographic breakdown by municipality of companies, workers, etc. Data, unlike those supplied by other statistical sources, are concerned with both private and public bodies and are independent of any insurance and register whatsoever.

*The major drawback of this statistical system is the long time running between one recording and the following one,* which is likely to strongly affect the validity of available data above all in periods of great transformations like the one our country has just gone through in the past decade. It is also true that every 5 years the data on working activities are being updated but this occurs only for industry and not for the other working sectors. Sectorial studies on labour market characteristics are performed by different bodies or associations of enterprises or trade unions, but none of these has the characteristics of a current recording system.

3.2.2. The recording system of *work-related damages (*accidents and diseases) is quite consolidated. This system is entirely managed by **INAIL**, the institution ensuring by law the entrepreneurs for civil responsibilities associated with the damages suffered by workers because of their working disability.

Though several ad hoc studies have been developed for different kinds of risks (e.g. the large number of surveys by working sectors developed by the National Health Service local prevention units and some University Institutes), *there are not in Italy recording systems of work-related* ***risks*** *and consequently of their size (number of involved employees) and territory spreading.* For some kinds of risks (e.g. ionizing radiations, cancerogeneous and biological agents, asbestos, noise) this could also be done since there is a company recording system in accordance with the regulations in force. For other kinds of risks (e.g. chemicals, adverse microclimatic conditions) there do not exist at present the technical and prescriptive requirements to hypothize a systematic recording. In any case a strong commitment by the central institutions of our National Health Service would be necessary in addition to a specific planning of the recording system including the necessary prescriptive acts.

*The system concerning* ***accidents*** *only records the cases that caused an absence exceeding three days,* recording a series of parameters allowing to evaluate the phenomenon spreading by productive sector, geographic area, gender, age, etc.

*The Italian system is aligned with the ESAW system, even if there still are some discrepancies. In particular the most outstanding is the definition itself of work accident which is more restrictive in the Italian system than in ESAW, since it records the cases with an etiological link between work and accident and not, like in ESAW, all the events occurred during work.*

The system in force is historically consolidated, homogeneously spread over the national territory and data are processed according to consolidated methods. Therefore, it is a valuable observatory steadily recording the trend of the phenomenon in time, space and different kinds of working activities.

*It is however strongly affected by the insurance nature of the institution and keeps little into account preventive requirements.* In this way it just provides a rough overall view being usable only for a macro analysis and a general planning and not for a more specific design of actions by prevention actors, be they the public bodies in charge with control as well as promotion initiatives and social forces and figures involved within enterprises.

Some examples to better understand this statement. *The system available at present does not allow cross checks of different parameters (sector/ material agent and/or form; form/ material agent), is not sufficiently detailed for some items of material agent or form (i.e. it is impossible to make a distinction between the fall from a scaffold and a portable ladder, the accident occurred when driving a road transport motor vehicle or a vehicle used in the company for internal lifting and transport). Besides, and this is a point of utmost interest for*

*all those who, in different positions and with different functions are concerned with prevention, it describes "how" an accident has occurred and does not allow to understand "why".* It is desirable that when implementing stage III of ESAW, only recently started, this criticality may be mostly overcome.

*How can we overcome this situation by adopting a preventive logics supported by an epidemiological approach?*

First of all we have to thoroughly *redefine the concept of accident* which classifies levels of severity of damages (e.g. death, permanent invalidity, temporary invalidity, no invalidity) but is also able to identify all the accidental events, independently of the fact that they produced a sick leave and in particular a sick leave exceeding three days. In fact, the few statistics available on one side indicate that accidents exceeding three days of sick leave are a minimum share (10% to 30% according to working situations) of overall accidents and, on the other side, they say that accident risk sources causing temporary inability are the same as those producing permanent inability or no inability. And this is of major interest for prevention purposes.

Second, it is convenient *to focus not on single events but on groups and specially on groups of exposed subjects rather than groups of cases:* which means, for example, that much more space should be given to the collection of information on exposure (that is to the potential causes of the accidental event). Hence also the idea of *defining epidemiological parameters – incidence and prevalence – whose calculation requires the definition of proper denominators*. Then, a prevention epidemiologically oriented system should be aimed at identifying proper denominators, like for example the number of working hours or the number of exposed subjects.

Finally it becomes natural *to think that data available on exposure and on effects may determine whether there is some kind of relationship between the two events.*

Such a logics may be not alternative to an insurance protection but it completes it and opens it to prevention issues that might be tackled by an insurance logics only episodically and occasionally. But it is also worth adding that such a logics does not yet characterize the information systems that we are trying to implement at a European level, which are still governed by an insurance logics.

Also as to ***work-related*** *diseases* the only national recording system is managed by INAIL, the Italian public insurance body. *The kind of identified work-related diseases falls into only one category of work-related exposure diseases: the category of more specific diseases for which the effect is referable to only one necessarily work-related cause.* They are, among others, pathological forms which are progressively disappearing in the technologically advanced countries thanks to the technological advances and prevention initiatives implemented in the past decades.

*The world of multifactorial origin diseases, which is certainly wider and in some cases of greater importance as to disease seriousness, is still to be explored,* e.g. target organ neoplasias, cardiocircular and respiratory apparatus diseases: it is a world nearly thoroughly escaping the INAIL recording system.

Besides, early alterations of different organs and apparatuses are still to be investigated: though they do not as yet cause irreversible or anyhow serious damages, they indicate risk situations susceptible of preventive interventions.

*Also the alignment of our system to EODS of Eurostat, whose yearly data recording was systematically started within the European Union this year, does not shift the main problem.*

A special processing of INAIL Italian data on accidents at work are (national and regional) maps recently produced in collaboration with the National Institute for Occupational Health and Safety (ISPESL) and Regions ("S.I.P.R.E: Project") using the data provided by the register of workplaces of the industry sector of ISPESL starting from 1996. These registers allow to overcome the deficiencies of INAIL traditional data, by introducing some risk measurement indices through an acceptable approximation of the number of exposed subjects and number of worked hours per year.

In the draft of the National Health plan for 2001-2003 (January 26, 2001), special attention is devoted to accidents and work-related diseases. The central government is well aware of the stringent necessity to take actions aimed at a more effective prevention of workers' health damages. More in particular, its commitment is towards a better knowledge of causes of accidents and work-related diseases through epidemiological surveillance systems.

As far as we know, *there are no recording on costs of lack of prevention or implementation of prevention ,* so that it is impossible to make a balance of actions undertaken at different levels to improve the workers' safety levels.

### 3.3.0 Regional systems

Some Italian regions carried out interesting tests of data recording and analysis on work-related accidents and diseases.Two initiatives of the Lombardy Region are worth being shortly mentioned.

- The first is concerned with a **register of fatalities,** based on the information collected by the National Health Service local units which are compelled, among others, to estimate causes and liabilities of all serious and fatal accidents, reporting to the judicial Authority and give necessary prescriptions. This system allowed to analyze some parameters missing in the INAIL statistics that suggested useful information on prevention actions to be undertaken. Data on work relationship evidenced that irregular workers or ex post (after accident) regularized workers as well as company owners and subordinate workers are mostly affected. The seniority parameter highlighted a late regularization of work relationship as well. Studying causes allowed to better understand the reasons by disclosing several violations of the current regulations on safety at work.
- *The second initiative* is concerned with the **recording system of work-related diseases** based on cases reported (by law) mostly by company medical doctors to prevention local services and hence analysed and investigated. In many cases indications were actively solicited through promotional initiatives.

In 1999, the regional system recorded 4,245 cases reported against 3,123 claimed to INAIL and a number of cases with documented causality connection 5 times higher than the cases compensated by INAIL (1,774 against 355 cases of INAIL), thus starting to explore the world of multifactorial origin diseases which is quite difficult to identify in a system strongly ruled by the insurance logics.

Besides, the regional system provided assessments which are useful for prevention goals but impossible with INAIL data: the distinction of different pathological pictures caused however by the same risk agent (in various cases INAIL data register under the same item some diseases which are caused by nosological pictures greatly differing in severity and prognosis), the breakdown of different pathological pictures in working sectors by job and age classes. In addition, the role and degree of accuracy of the different indication sources could be estimated, thus providing useful elements to identify initiatives to improve the quality of diagnostic processes.

It is the first experience in Italy and it will be progressively applied to other regions with the adjustments arising from the first two years of application.

### 4.0.0. Two additional problems

We stressed the importance of having current information systems, but for all of them it is essential that the basic information unit is the single subject both when his task is describing the individual damage and when his goal is describing group exposure. *This rationale has necessarily to take into account the problem of* ***privacy****.*

All countries, in the attempt to guarantee safety and confidentiality to the information collected for single individuals, adopted more or less restrictive regulations for personal information management. Such rules – and Italy is a clear example of this situation – often were so rigid as to strongly conditioning (if not preventing at all) any use of single data not only for study and research but also for monitoring, assessment and intervention.

There are numberless examples and many have even become anecdotes in the collective imaginary, but if we want to produce assembled information for prevention and in general for describing health phenomena, we cannot neglect individual information. *Therefore it is necessary that confidentiality and safety requirements to be guaranteed to the single subject harmonically match research, study, intervention and health planning requirements, so that the goals of one do not interfere with the goals of the other.*

But there is also another problem associated with the ***new working conditions*** of some countries, including Italy. In the past few years there has been a huge flow of immigrated population from underdeveloped European and extra-European countries. *The quite large number of immigrated people produced, among others, two phenomena closely connected with the topics so far discussed.* On one side a major change in the productive tissue (organization, processing, productive modalities, kinds of workers…..) with the consequences related to

fitness of information collection modalities and, on the other side, the setting of a large portion of work that can be euphemistically considered as non regular (clandestinity, concealed labour, etc) often associated with uncertain health jobs and unsafe working conditions. Abstractly speaking, these are conditions that should lead to a remarkable increase in work-related diseases just because of (often irregular) uncertain safety working conditions. Since these diseases escape recording, paradoxically there is an improvement in merit statistics.

## 5.0.0. References

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# CURRENT SITUATION

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## 1. Introduction

Nowadays the concept of benchmarking in Health and Safety (H&S) is been promoted at European level among Member States. Indicators for Quality of working life will serve as a tool to this process. At the same time the reality of working life and labour market has changed dramatically the last years. The traditional perception of employment, workplace and working time has almost disappeared. The flexible employment has increased by 15% in the decade 1985-1995 according to the International Labour review. The latest report of Eurostat states that 18% European workers have part time job and 13% work contacts with limited duration. According to the 3rd European Survey on working conditions of Dublin Foundation almost 50% of the new jobs are temporary.

Sub-contracting and outsourcing is embraced more and more as a practice in large enterprises. Frequently it is not only the job that is sub–contracted but also the occupational risk. Though flexibility in the labour market can create new jobs working conditions can be aggravated. This new nomadic workforce leaving from one contract to another, enterprise or even country cannot pragmatically be covered efficiently by H&S Preventive Services and Inspection authorities although minimum H&S requirements should be applied across Europe. There is a current diffusion of the employer and pertinent responsibility. These new circumstances inter alia are creating inequalities among working groups. The groups that have job insecurity like the temporary workers (employees with fixed-term contracts and temporary agency workers) are exposed to more hazardous conditions and continue to report more difficult work situations than permanent employees (3rd European Survey in working conditions, Dublin Foundation, 2000).

In addition, Europe is shifting to a post-industrialized stage that is to say from the traditional industry to services. As a consequence certain trends like the declining trend of accidents in Europe the last 10 years could be partially explained by the dwindling of certain high hazard industries like mining and the coverage of increasingly smaller fraction of the actual workforce.

Conventional indicators like occupational accidents and diseases proved to be week in recording this new actuality. Therefore in order to promote a proactive policy on health and safety at work, existing indicators should be improved and additional indicators that are sensitive to current labour market fragmentation, structural changes in economic sectors, future trends and emerging risks should be identified.

## 2. Available data on OHS at European level / Existing weaknesses and deficits in actual use

European statistics for health and safety are scarce. The last official European data on occupational accidents and diseases are coming from Eurostat' European Statistics of Accidents at Work (ESAW) and European Occupational Diseases Statistics (EODS) projects, with reference years 1994 and 1995. Still these data suffer from lack of reliability and inter-country comparison. The recent adhoc H&S module added in the Labour Force Survey of 1999 is an encouraging effort to overcome such problems. The only survey on general working condi-

tions at European level is the 3rd survey of the Dublin Foundation. There is one information source available on different risks' exposure in Europe, the CAREX database referring merely to carcinogens. No comprehensive assessment report is yet available by the European Commission for the Framework Directive for H&S. If the aim of the European Unions' Institutions is to establish an effective monitoring system for Health & Safety in Europe in the light of the results of the Lisbon Summit in 2000, still much has to be done.

Trade Unions at European level are using existing H&S statistics in order to:

i. Propose new prevention strategies at European level

ii. Monitor the application and sufficiency of European Directives

iii. Promote working equipment design improvement in the standardization context

iv. Reassure worker involvement at workplace level

v. Keep track of the new trends and organizational changes

vi. Identify emerging risks and future needs for action

To take the example of the last debate at the Adhoc group for MSD in recommending future Community actions, a combination of statistics namely occupational diseases, exposure data, research data and workers data were used to back the argument of the need of further legislation on the topic. In such a context, data on increasing trends in workers exposure in relevant risk factors can better define future prevention initiatives. Occupational diseases data though indicate the size of the problem at European level do reflect the morbidity of workers with exposure in the past.

In order to monitor the application of legislation, occupational accidents and diseases statistics are quite indirect indicators. In addition they are likely to increase right after the introduction of legislation as a result of raised awareness on the topic. Only after a long period say 10 years some conclusions could be drawn that are still greatly susceptible to independent factors as indicated below in section (a).

To assess the application and sufficiency of legislation, data that indicate the exposure on the risk factors those legislation provides for prevention, are required. Risk assessment is the tool that legislation provides for monitoring the risks at the workplace level. So along with the picture (though distorted) we now have on morbidity of the workforce, a hazard map (at least for target hazards in each sector) should be drawn to describe Europe' working conditions. Also infrastructure indicators like coverage of workforce by Preventive Services and workers representation in H&S, introduced in 1989 by the Framework Directive, can give evidence on the first level of application. No such data are systematically collected at European level.

On standardization context, in EN 1050: " Safety of machinery. Principles for Risk assessment", in paragraph 4.2: Information for risk assessment, the manufacturers must take into account any accident and incident history with similar machine. This process in practice is not activated. Yet it must be acknowledged that incidents or near misses are not collected at European level and there is little technical knowledge that can be extracted in improving a specific machine by the existing accident records. This worked as an alibi to some point. Furthermore in a course of 5 years standards must be revised. Often accidents constitute basic reasons for amendments specifically if it is proved that they are caused by shortcomings in the machines themselves or the standards according to which are getting the presumption of conformity with the Machinery Directive. Authorities in collaboration with Trade Unions have so far activated the safeguard clause for machines and standards, provided by Machinery Directive that is to say to withdraw a non conformed machine or harmonized standard, and alarmed the need to amend standards for certain hazardous machines (e.g. woodworking machines, truck mixers).

Finally although the number and frequencies of occupational diseases can provide some basis for monitoring and prioritizing preventive actions, existing records are not sensitive in emerging risks. The example of the health effects of the new labour market and intensification was revealed by national surveys and presented by the Working Conditions Survey at European level. To this direction health symptoms should be investigated and problems identified by the workers should be collected. Links should also be made among public health data and work exposure.

Below follows a more thorough analysis of the existing indicators for H&S.

### *a) Traditional indicators of H&S situation – Existing issues*

The traditional indicators used for monitoring health and safety have always been the outcomes of occupational hazardous exposure, namely the accidents at work and occupational diseases.

During the Sixteenth International Conference of Labour Statisticians, ILO in Geneva 1998, the experts considered that the principal objective of a programme of statistics on occupational injuries was to provide the comprehensive information required for the purposes of accident prevention. European Commission also embraces a similar approach declaring that statistical sources on H&S have been developed in Europe in order to check the effectiveness of existing legislative and non-legislative measures. However, the reality is far removed from that concept. With the exception of certain national Databases that provide some basis for accident prevention, the European picture is incomplete in this respect. No matter how useful these indicators may be they do have their limitations. Some points of skepticism and potential improvements are presented below:

*- Behind definitions/ Aiming primarily at compensation not prevention*

Many efforts have been made to give a semantic definition to occupational accident. The developed definitions no doubt reflect the philosophy of approaching occupational accidents.

The Framework Directive 89/391/EEC in Article 9 defines as reportable occupational accident the event that makes the worker unfit for work for more than three working days. It is evident that this definition is aiming primarily at determining the compensation of the worker rather than analyzing its underlying reasons and contributing to prevention at the workplace.

Moreover in practice there are cases where severe accidents do occur but victims are obliged or persuaded to return at work before the recovery -if it takes more than 3 days- and perform lighter duties in order to avoid reporting them. Since the principal objective of compiling statistics of occupational injuries is to provide information for accident prevention purposes, it would be useful, to cover all occupational injuries which are serious enough to cause accident from work e.g. which prevent workers from performing their jobs for at least one day. In the Resolutions of the Sixteenth International Conference of Labour Statisticians in Geneva, the coverage of all fatal and non-fatal injuries resulting in an absence from work of at least one day, excluding the day of the accident, was recommended.

Similarly the Commission in its recommendation to the Member States concerning the adoption of a European schedule of occupational diseases (Official Journal of the European Communities L 160/39, 22/4/1990) is focusing more in diseases with occupational origin liable to compensation and less on the relevant preventive measures.

Without detracting from the indisputable value of the right of workers to receive compensation for the accidents or diseases that they may experience, the importance of using these data for prevention reasons must be highlighted.

The best approach to extract diagnostic knowledge from the occupational accidents and diseases is to link the occurrences with the hazardous exposure in the workplaces. This linkage is difficult in the current form of the existing recording models. The new modules launched the year 2000 by Eurostat' European Statistics of Accidents at Work (ESAW) and European Occupational Diseases Statistics (EODS) projects are attempting to be more descriptive than their predecessors did and promote a preventive scope in data collection. Indeed they have included some aspects of exposure and causes of accidents as new variables in the recording models. Still some problems do remain. For occupational accidents the description of the occupation and work tasks of the victim, which denote the exposure and the circumstances of the event are not adequate.

"Deviation" is the key word for the causal analysis of accidents. Deviation from the normal work process and the prescribed procedures is alleged to be the cause of the accident. Etymologically, deviation implies that the whole working process is inherently safe and only a deviation from that can provoke an accident. This approach does not contribute so much to the analysis of the root causes that might lie in the work system or the working process that need to be improved in order to avoid a similar or identical accident. Some times the deviation is not the underlying cause of an accident but only the activator of a chain reaction of events resulting from failings or shortcomings in the work system. In addition deviation could mean seek-

ing for unsafe acts that could be used as victim blaming instead of investigating the real causes of an accident. At last if a deviation do occurs the reason or the sequence of events are not recorded thus little conclusion can be made on the real accident causes. Only the final event is described.

Two research projects recently carried out by TUTB on safety in woodworking machines further elaborated in section "2", brought in some interested points on causality after an in depth analysis of related accidents. The basic causes identified were, poor machine design, machine guarding poorly designed although in compliance with standards, machine guards misused by the workers and inappropriate operating procedures. The investigation on the spot revealed that the operating procedures were written without consulting the workers, not having taken to account all tasks performed with the machines and the appropriate adjustments, the general working environment or workers' training. Also guards some times were removed because they obstructed the work. This kind of analysis is not feasible by the existing structure of the recording forms. There is little information on the general environment and ergonomic factors related to the accidents.

Therefore other users than the enterprise itself hardly ever can use the results of a potential investigation of such accidents. Important information is lost if not included in the national recording systems where all enterprises have to report accidents.

Coming to the occupational diseases there are cases where the exposure accountable for them is not one-track. For multifactorial diseases like Musculoskeletal Disorders (MSD) for example not all risk factors can be recorded sufficiently. Data about the task involved with the disorder are often inadequate. For example in a compensation record a job description "assembler" does not provide information on intensity or other aspects of work in order to extract MSD risks exposure. Production data that can give a clue on frequency are seldom used on these records.

In the new EODS project exposure factors have been added. Phychosocial factors are also classified in the list but referring only to their psychic effects or effects on good proceeding of work. Potential influence of phychosocial factors in other diseases like MSD is not mentioned even though there is considerable body of scientific evidence specifically in the Nordic counties that "psychosocial factors" (Reference No 2) could be controlling MSD risk factors. Also a new codification system for occupational diseases for data harmonization purposes has been suggested in the current EODS project. To take again the example of MSD, a separate codification is applied for each disease instead of the group of diseases previously proposed in Commission' recommendation to the Member States in 1990. Although this approach is positive, in terms of better identifying the morbidity of a specific disease like carpal tunnel syndrome and comparing statistics at European level, it could entail some problems should it generally applied in the European schedule. The existence of groups can be broader and include prospectively more diseases where a list of individual diseases can never be exhaustive. Besides, in the new EODS project, back pain, neck pain, shoulder pain and related disorders are not included in this phase of data collection although considered to be a significant and increasing problem in Europe according to the last reports of the Bilbao Agency for Health & Safety. (References No 12, 13)

- *Data are not representative of the morbidity and mortality of all workers in Europe*

The picture of occupational accidents and diseases is only partial in Europe. There is high level of underreporting and lack of data consistency among Member States.

In 1990, the Health and Safety Executive of the United Kingdom sponsored a supplement to the 1990 Labour Force Survey containing questions on workplace injuries and ill health. The aim was to "establish the true level of workplace injury and of work – related ill health and also to confirm the degree of under reporting and the relative risk in the main industries (Stevens, 1992). The findings showed that, of workplace injuries reportable to a safety authority, employers reported less than a third and self employed persons reported less than one in 20. This was an impetus for Commission Regulation No 1571/98 on the organization of labour force sample survey in the Community adding a H&S ad hoc module covering year 1999.

*Table 1: Occupational diseases (o.d) declared and recognized in the 12 Member States of EU in 1997*

(Source: Eurogip, 1999)

| Countries | Population covered * | Number of declared o.d. | O.d. declared per 100.000 workers | Number of recognized o.d. | Percentage of o.d. recognized / o.d. declared | O.d recognized per 100.000 workers |
|---|---|---|---|---|---|---|
| Greece** | 1 889 167 | 87 | 5 | 79 | 90,8% | 4 |
| Luxembourg | 190 000 | 121 | 64 | 17 | 14,0% | 9 |
| Italy | 17 400 000 | 31 259 | 180 | 4 263 | 13,6% | 25 |
| Portugal** | 4 153 959 | 2 657 | 64 | 1 063 | 40,0% | 26 |
| Finland | 2 055 700 | 5 182 | 252 | 626 | 12,1% | 30 |
| Austria | 2 578 970 | 2 893 | 112 | 1 177 | 40,7% | 46 |
| Germany | 42 117 106 | 77 310 | 184 | 21 187 | 27,4% | 50 |
| Denmark | 2 430 709 | 15 653 | 644 | 1 991 | 12,7% | 82 |
| France ** | 15 345 626 | 18 546 | 121 | 13 278 | 71,6% | 86,5 |
| Spain | 10 436 000 | ? | ? | 9 640 | ? | 92 |
| Sweden | 3 827 502 | 10 078 | 263 | 4 066 | 40,3% | 106 |
| Belgium | 2 216 040 | 6 075 | 274 | 3 011 | 49,5% | 136 |

* The population covered varies from one country to another. The differences basically lie in the inclusion of public sector, agriculture and independent workers.

** Countries where the reference year was 1996.

The above table is an illuminating example of how deceptive statistics can be. At a first reading of these different national data one would not arrive to a safe conclusion by saying that one country like Greece or Portugal has more effective control of occupational diseases comparing to Belgium or Denmark. It is more likely that national differences in diagnosing, declaring and compensation of occupational diseases do influence considerably these figures.

Also it is clear that the population covered by compensation schemes varies significantly from one country to another hence the statistics are not directly comparable. For the majority of the Member States not all sectors are covered. In addition some types of workers fell outside the requirements of notification namely the atypical workers. The statistics should cover all workers regardless of their status in employment, including, informal sector workers and homeworkers, where they exist. Finally the access to rehabilitation, recognition and compensation of occupational diseases should be an ensured and harmonized right across Europe.

*- Indicators susceptible to external factors: National recognition and compensation systems structure and subsequent changes/ Structural changes in economic sectors.*

The case of Sweden is a good example in demonstrating how changes in national compensation systems can influence the figures of occupational diseases.

*Table 2: Claims and recognition of Occupational diseases in Sweden*

(Source: Eurogip, 1999)

| Year | Insured population | Claims for recognition | Number of claims per 100.000 employees | Recognized/ Approved cases | Recognized Ods/Notified Ods Ratio | Number of recognized ods per 100.000 |
|---|---|---|---|---|---|---|
| 1990 | 4.473.350 | 68.186 | 1.524 | 55.544 | 81,5% | 1.242 |
| 1991 | 4.304.567 | 72.682 | 1.688 | 56.243 | 77,4% | 1.307 |
| 1992 | 4.052.827 | 70.453 | 1.738 | 48.779 | 69,2% | 1.204 |
| 1993 | 3.748.125 | 71.312 | 1.903 | 43.214 | 60,6% | 1.153 |
| 1994 | 3.800.427 | 50.479 | 1.328 | 23.846 | 47,2% | 627 |
| 1995 | 3.850.862 | 24.048 | 642 | 9.943 | 41,3% | 258 |
| 1996 | 3.827.502 | 10.078 | 263 | 4.066 | 40,3% | 106 |

In the above statistics after 1993 the number of claims as well as the number of recognized cases has decreased dramatically by half every year. This radical change has explanations in the national compensation system.

'The work injury legislation was changed in 1993 in Sweden, including a redefinition of the work injury concept and a limitation of the scope of the work benefits. The question as to whether a particular injury is a work injury or not, was subject to a rule of evidence, which was considerably narrowed in 1993' (Reference No 19). The new system discouraged workers to claim for diseases and get involved in an uncertain procedure where the final benefits of the recognition have been significantly reduced. In addition the percentage of recognized diseases fell to 44% comparing to 69% in 1992.

Also structural changes in economic sectors, as mentioned in the introduction can give a misleading picture of general improvement in working conditions in Europe.

### *b) Supplementary sources of data on OHS/ - Concerns and Potential*

Including H&S modules in Labour Force Survey (LFS) is a very positive initiative to face existing accident and health data problems namely underreporting, limited coverage of working population, record accidents only above 3 days of absence and health symptoms not covered in the existing recording systems. Although in the current proposal the size and content of the H&S module are limited the results of the first LFS with reference year 1999 are expected with great interest. They would probably give a momentum to new amendments and improvements to the existing recording systems.

This important plan could provide some solutions to data reliability problems in Europe and should be permanently applied in a more extended form including more variables. In order to make a meaningful comparison with Eurostat's data the definitions and context must be some how equivalent. Furthermore more detail is needed for the occupational exposure of the reference persons. In this module only accidents and health complaints are covered with no link with the risk factors in the workplace.

Statistics Sweden (SCD) conducts a survey by order of the Swedish work environment authority (SWEA) with a sample of 10.000-15.000 every second year since 1989. The late Labour Force Survey (LFS) in October-November 1999 in Sweden asked about 130 supplementary questions regarding working conditions. An interesting point is that the questions referring to working environment are comparative to previous years or jobs, that is to say persons answer if they feel now more stressed or having a more repetitive work. Also psychosocial factors and issues of harassment were dealt. The questionnaire of 1995 was revised for 1999 to provide better coverage of current trends in the work environment and work environment factors that are common among women (Reference No 17). Several new questions were added about the sex distribution at the workplace. Supplementary questionnaires were sent to the persons that answered the questions in the LFS. This national survey has positive aspects, particularly dealing with changes in working life and work environment that could be considered broadly at European level.

But still this approach would only deal partially with the problem of coherent prevention policy for H&S in Europe. The feasibility of developing new sources of data should be concurrently examined. Public health data

from hospitals should be combined to correlate morbidity of population and workplace exposure in order to promote primary prevention of occupational risk. One relevant example linking public data from a disease with occupational factors is a survey conducted in Denmark from the Danish Cancer Society recently published in Epidemiology journal (Reference No 7), involving 7.500 women with breast cancer identified in the Danish Cancer Registry. The survey suggested that work that requires artificial light lead to suppression of pineal secretion of melatonin, which may induce continuous production of estrogen involved in breast carcinogenesis. It was found out that there was an increased breast cancer risk among women who worked predominantly at night. Indeed the odds ratio for breast cancer among women who worked at night at least half of a year was 1,5 and there was a tendency to increasing odds ratio by increasing duration of nighttime employment.

Also health surveillance and risk assessment data including quantitative and qualitative description of the hazards present at workplace level could provide with documented information on occupational risk exposure and its outcomes at European level. In Denmark for example, Trade Safety Councils and Occupational Health Services (BST) at sectoral level collect data on exposure and preventive plans from a number of enterprises in a same sector for specific risks each year. The authorities in order to promote prevention use these data to suggest national plans (Reference No 10).

Absenteeism and sick-leave data could also be useful indicators of working conditions although are not so appropriate for all types of employees. The workers with precarious work are less likely to report sickness.

## 2. Subjective data aiming at prevention/ National case studies

As objective or 'passive' data we are referring to the existing records and data from national or European statistics on accidents or occupational diseases that have been elaborated above. The objective data are mostly quantitative. Seldom do they provide qualitative information. They are representing data that have been collected principally for another purpose as mentioned above.

Considering the shortcomings and limitations of the objective data, Trade Unions sought after new types of data namely the **subjective** data that more precisely describe the working conditions and can be used proactively to avoid accidents. As **subjective** or 'active' data we define the data that are arising from users through a dynamic process. That is to say information on real work, complaints of discomfort or pain, users' opinions and experienced problems from interaction with the work system.

These data were used in the standardization context in order to improve existing standards specifying the design of machinery. It was considered important that manufacturers should not only consider the accomplished facts like accidents but also take into account the dynamics of potential hazards that are not properly safeguarded in the initial design to improve their products or design new ones.

These types of data are not included in the obligatory information for risk assessment on the present form of the basic standard EN 1050 concerning risk assessment of machinery (This standard is under revision). That way important user-machine interaction information after the construction of a machine is lost and seldom it reaches manufacturers. There must be an information link between workplace and manufacturers to reassure machinery design improvement. Users are the beneficiaries of ergonomics and safety provisions as well as the sufferers of their lack so their opinions should be integrated in the machinery design process. Besides, users of the machines have an idea on general workplace layout and the system that a machine operates. So they are more aware of the systemic consequences of machine alterations and are more likely to propose good solutions taking to account the workplace as a whole. In the design process manufacturers run a financial risk by withdrawal of a deficient machine while operators run the risk of an accident or a permanent impairment.

### Two pilot projects were initiated by TUTB involving users of woodworking machines in Sweden and Italy.

***- Swedish Project:***

TUTB initiated a pilot project on collecting information on users' experience in woodworking machines by means of questionnaires. The project was carried out in collaboration with Swedish Trade Union Confederation and the Swedish Wood Industry workers union.

After consulting Swedish and French Information systems in woodworking machines related accidents, the moulding machine was selected for further analysis. This machine was having the highest average severity rate for accidents.

At a first stage the basic causes of the accidents were identified after further analysis. These machines were used for wood pieces of many different sizes. It was found that the alteration in the size of the material made it difficult for the operator to perform his/hers job safely. The problems involved in handling the material and subsequently the effects in workload or working postures were not revealed in the databases. At a second stage focused questionnaires concerning moulding machines related risks were administrated to around 100 safety delegates. Finally telephone interviews were performed to collect additional information. The safety delegates identified successfully technical shortcomings in the design of the machine and a number of ergonomic improvements were suggested.

***- Sindnova Project:***

TUTB in 1999 commissioned Sindnova (a research body of Trade Unions in Italy) to develop a project aimed at involving workers and enterprises in the assessment of effectiveness of technical standards concerning the safety of woodworking machines. The project was carried out in Toscana with the collaboration of the Local Health Authority Unit (USL). The project aimed at introducing a participatory model in a specific high-risk industrial environment, collecting contributions from machine users and integrating them into a strategy improving machinery standards. The final product of the project was concrete comments for necessary improvements in the technical standards related to the design of the target machines. Circular saws and spindle moulders were selected for the project since they were responsible for the majority of related accidents. Its worth noting here that data for the same accidents were combined by many sources namely the First Aid, Police Offices and Public Central Institute of Occupational safety Prevention (ISPESL) and they were found highly heterogeneous.

Working groups were then formed composed by workers using the same machine independently of the enterprise, employees and/or employers with technical knowledge and technical staff from the public prevention service in order to analyze all operating tasks of the machines. For each task of the machine the operating procedures, the knowledge base and the risk factors were described. Finally suggestions for injury prevention were made for each task. This exercise made possible the formulation of concrete recommendations in the related standards. The conclusions of this project were to set up an Observatory with similar composition of people to systematically monitor specific machines and form recommendations to new or existing standards.

From these two projects it was evident that accident data in their current form can basically be used to pinpoint a hazardous sector or type of machine. Still when seeking information on more tangible proposals in improving prevention, user' experience data were proved to be extremely useful.

Apart from projects initiated by Trade Unions there are national cases that should be pointed out where authorities incorporated data from workers' experience for standardization purposes. Such a national project is running currently in France:

***- Alarm Sheet (Fiche d' alerte)- An example of shop floor data collection***

France Labour Inspectorate in collaboration with AENOR (French Association of Standardization) has initiated a project where remarks and comments on machinery related problems and Personal Protective Equipment (PPE) are periodically reported by the operators in enterprises and collected by the authorities in order to detect potential hazards. Also ergonomic problems that can lead to accidents or MSD development or bad fit with PPEs are mentioned. This project aim at collecting at an early stage the misfit comments between operator and machine and PPE and user before an accident occurs or a disease is developed. It does not seek to bring charges to manufacturers but it more serves standardization purposes on relevant C standards (Standards presenting design specifications for specific machinery) improvement and furthermore machinery improvement.

## 3. Defining new indirect indicators for monitoring working conditions

Apart from the direct OHS indicators dealing with exposure-effect statistics other indirect indicators could provide additional information that could also draw conclusions for H&S situation. Information on H&S infra-

structure in prevention research, inspection authorities' performance, percentage of workers' coverage of Preventive services and relevant quality, workers participation in H&S as well as quantity and quality of vocational training are all part of the same picture. Other social indicators like, gender, racial or employment status inequalities in working conditions and health care, general health situation of workers and life expectancies can also fill up the missing parts of the puzzle.

## 4. Epilogue

In conclusion it was evident in this intervention that different data and sources should be combined to complete and restore the picture of working conditions and health impact in Europe. Workers that are exposed to health and safety hazards on a daily basis should be able to contribute in data collection process by giving an input of their experience for prevention purposes. Such data could fill the gaps in the existing information systems.

Nevertheless, H&S statistics should focus in hazard surveillance at workplaces that describe the current situation in a more accurate way. European surveys in working conditions like the Dublin Foundation ones, investigating risk factors, do provide invaluable information on current H&S situation and trends and should carry on periodically. National action plans on reducing risk factors can also give a momentum to other countries to start similar projects. The **Danish action plan on monotonous work** for example where Trade Unions have been successfully involved will be evaluated this year for effective reduction of MSD risk factors in enterprises. The target was to reduce dangerous repetitive work to 50% by the year 2000. These types of "hazards reduction" plans are likely to be more effective comparing to those that set targets in outcomes reduction like diseases and accidents that are greatly depending, as mentioned above, by many external and internal (at undertakings level) factors.

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# THEME 2, FUTURE DEVELOPMENTS

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## Management and safety culture – Important elements in accident causation?

### 1. Introduction

During the last 10 to 15 years the prevention of occupational accidents has moved from merely technical and socio-technical issues to focus also on safety culture and the way companies manage and control the risk of work accidents. Within the same sector and with the same types of technology and hazards some companies are much more successful than others in controlling the risk of accidents. It seems that organisational and management aspects - together with safety culture, play a major role in the occupational safety and health performance of an enterprise.

There have been interesting, but disparate activities in this field in the various Member States with respect to statistical information on safety management and safety culture. Concepts, definitions and methodologies are not comparable in this field. There is therefore a need for an exchange of experience between Member States. In order to be abreast of the need for information on a European level, it is recommended that indicators be identified or developed to cover these aspects of safety and health performance.

In the following the development in the understanding and concepts of accident causation will be described briefly. Some examples are presented indicating the need of including information about root causes and safety management and culture.

Finally, some recommendations will be given for developing this field on a European level in relation to preventing work accidents in the future.

### 2. Background

Information on occupational accidents has been collected in most of the Member States for many decades. Data on accidents that have occurred are primarily collected for administrative purposes and often in relation to insurance systems. Such occurrence related data have been used as a basis for preventive measures and for setting up national priorities in accident prevention. In addition, some Member States have set up national work environment surveys in order to establish a more complete picture of the state of health and safety at work.

During the 1980's, health and safety at work became on of the most active aspects of EU social policy in the employment field. Particular the adoption of the Single European Act in 1986 gave new impetus to health and safety measures taken by the Commission. This was followed up by launching projects on data collection in the field of occupational diseases and accidents at work. During the last 10 years the European Commission and the Member States have used a lot of efforts in order to establish European wide and comparable data on accidents at work in relation to the ESAW project (European Statistics on Accidents at Work).

Important work has been done at a European level in terms of harmonising definitions, variables and classifications, and making the comparison possible by analysing differences in reporting procedures and coverage of groups in the various Member States. A methodology has been established for the collection of occupational accident data. (Eurostat 1998)

The third phase of the ESAW methodology concerned the causation variables. The aim of this part of the project was to supply additional information about the circumstances of the work and how the accident occurred in order to establish an adequate prevention strategy (European Commission 2000). The methodology focused on the immediate cause of the accident, as it was the most viable information to collect from Member States. The immediate cause of the accident is also considered to provide statistically more reliable information compared to the events more distal in time to the injury. However, these distal factors have shown to be very important in identifying and developing appropriate preventive measurements (see example 1 below).

## 3. More focus on the management and safety culture in prevention

It is well known that the understanding and concepts of accident causation have changed during the last hundred years, and so have preventive measures. The understanding and concepts of accident causation have also changed, particularly in relation to the type of factors and how they interact with each other. First, simple single factor models were used in the analysis and prevention of accidents. The focus could be on either human factors, e.g., behavioural factors or technical factors as, e.g., machine guards and the like.

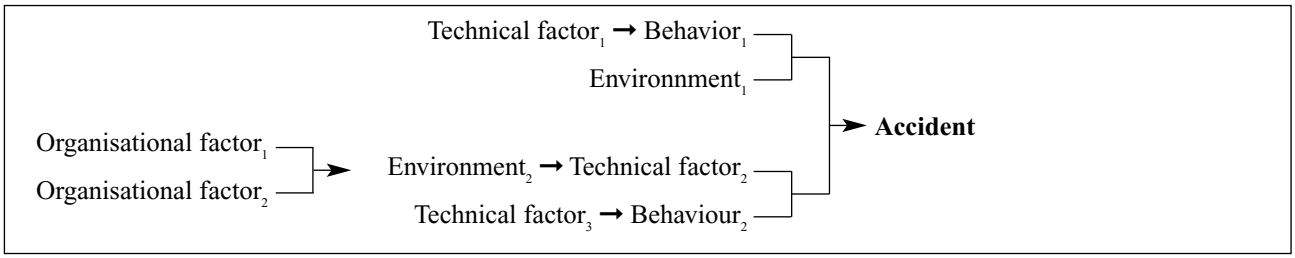
***Fig. 1. Single factor model***

**Behavior$_1$ → Accident,**

**Technical factor$_1$ → Accident**

Later on more complex models with sequential and multi-linear interactions between factors were developed. The socio-cultural models of the 1990's also included organisational aspects as, e.g., management perception, norms and values in relation to risk and safety (Spangenberg et al. 2000, Kjellén 2000). These factors attracted an increased attention in accident prevention as a basis for establishing adequate indicators for the health and safety performance of companies.

***Fig. 2. Multi-linear interactions model***




Management and cultural aspects of models for accident prevention have been described as the *third age of safety* (Hale and Hovden 1998). The technical aspects of accident causation dominated the first age of safety, and technical preventive measures were developed. Nevertheless, one learned that the operators in the system did not implement even well known technical measurements. This insight led to the second age of safety, where focus moved to human failures, and adaptation of technology to the operators in the system.

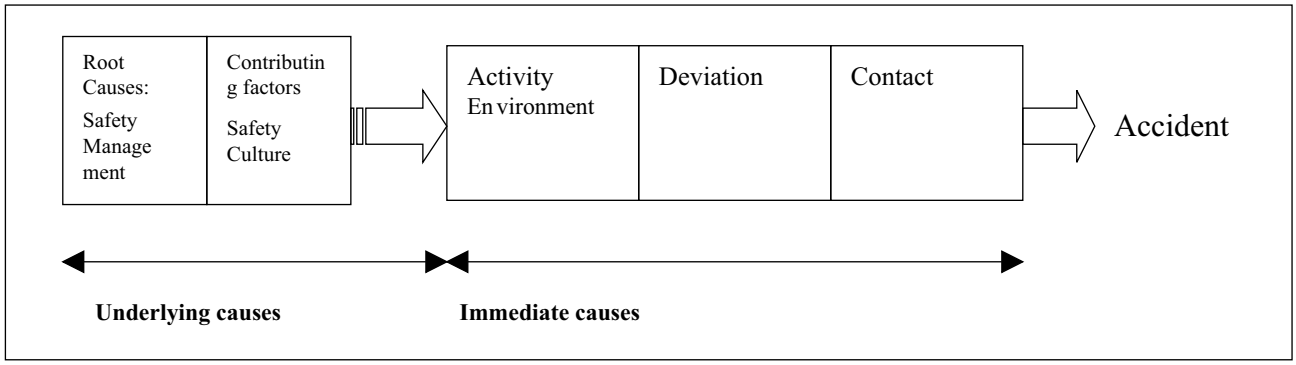
However, some companies have been much more successful at implementing well-known approaches and tools in accident prevention than others. But, why are some companies much more successful in this respect compared to others? This question brought us to the third age of safety, where safety management and safety culture are in focus. This question might also explain differences between countries.

This development from the first to the third phase of accident prevention should not be understood as if there had been no effect of the efforts in the first two phases. We could rather speak about a "process of maturation" in the field of accident prevention. The efforts, which have been based on the insight in each of the phases, reach a certain level of preventive effect that cannot be improved with the existing methods. New types of efforts would then be needed in order to reach a new level in the reduction of accidents.

The third age of safety indicates that a new leap in accident prevention could be reached if more emphasis is given to safety management and safety culture. It is in this perspective that many studies of the root or underlying causes of work accidents should be seen. Many such studies have been carried out in order to draw attention to the importance of management responsibility and control of safety at work.

This is the future challenge for a European Statistics on Accidents at Work – how to take into account this development? Most information systems on occupational accidents provide information on the consequence(s) of an accident, and to a certain extend, the immediate cause of the accidental injury. These systems describe well how, when and where accidents occur and provide therefore important starting points for setting up preventive strategies. However, limited information is available on the underlying or root causes of the accidents and therefore why accidents occur. Important underlying factors have shown to be organisational factors, safety management, safety climate etc. (figure 3). In order to point out appropriate preventive measures it would be necessary to collect information on management and safety culture/climate. Some examples will be given below.

***Fig. 3. Process model of accident causation.***




It is not only some companies that are more successful than others, but also some countries are more successful than others in reducing accidental injury at work. From a research point of view – and also for the practitioners, it is very important to investigate these differences in safety and health performance in order to learn from the more successful ones.

In the following, 3 examples will be presented. The first example is a study of fatal work accidents in Australia, which is included because it provides one of the most detailed studies of the root causes of fatal work accidents. Example 2, is a comparative study of accident rates between two Member States, i.e., Denmark and Sweden. This example is included because it allows for investigating differences between countries in a study where reporting procedures have been the same.

The third example is included in order to provide an example of a national approach (Denmark) to study safety management and safety culture, by using company panels in a survey approach.

*Example 1.:* Fatal work accidents in Australia

The following study is mentioned here, because it succeeded in pointing factors in the whole causal chain of events, leading to the accidents. In this study, the causes of all fatal work accidents in Australia, in a three-year period, were investigated (Feyer and Williamson 1991). The data were collected from coroners' reports on

work-related fatalities, which provided comprehensive information on the circumstances of the accidents, and the subsequent fatality including further details on the nature of the injury etc.

Feyer and Williamson classified the causes of the accident including immediate causes and causes removed in time from the actual accident (underlying causes). The classification system allowed coding of 3 causative sequences which immediately preceded the accident (corresponding to those in the ESAW project) and which led to the fatality. Furthermore three precursor events (PE1, PE2 and PE3) and contributing factors were coded, which were more distal in time compared to the injury event.

This study revealed that task errors, poor work practices, and environmental factors were the factors most frequently involved in accident causation. The study also showed that factors more removed in time (and location), as, e.g., work-practice and pre-existing environmental factors, played a more important role than the events leading immediately to the fatal accidents. These distal factors had mainly to do with organisational and management factors.

Thus, factors occurring early on in the sequence were identified as much more influential in causing the fatalities than events closer to the fatality. They concluded in their study that events (underlying/distal factors) occurring early in the causal chain have important implications for drawing inferences about preventive strategies. However, the whole accident causation sequence is important in order to know where a particular factor is likely to occur and its importance. This provides the starting point for identifying targets for prevention.

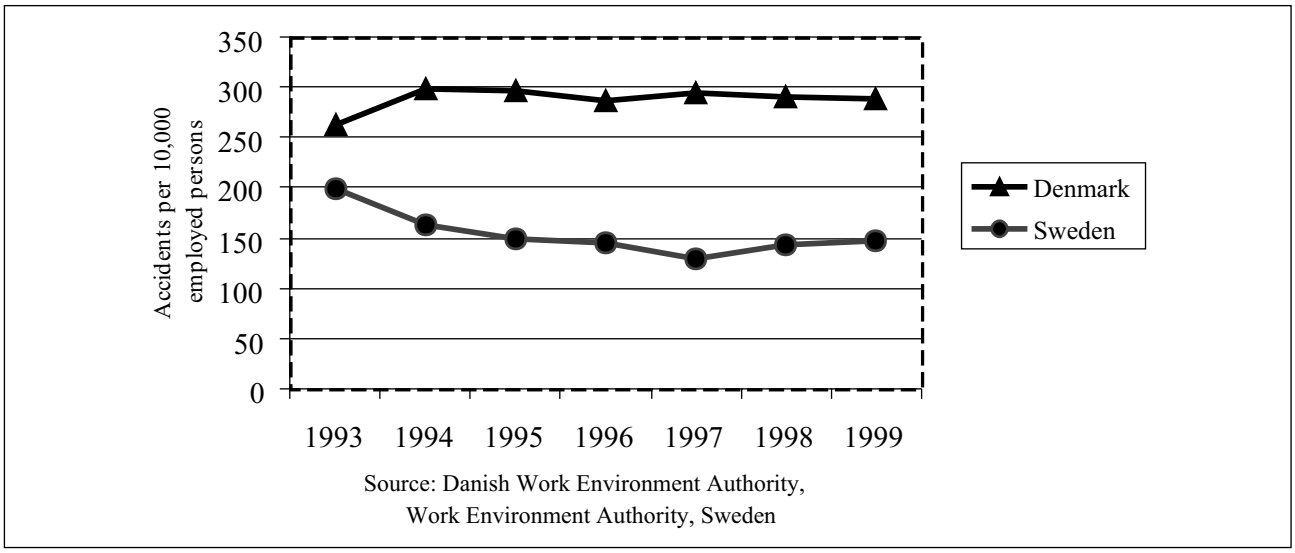
This change in focus, to include management and cultural aspects, should not exclude technical or other factors, nor immediate factors. There is a need for a broad focus on the causation of work accidents.

*Example 2.:* The Sound link between Sweden and Denmark

An ongoing study carried out at the National Institute of Occupational Health concerns a comparative study of the lost-time-injury rates in the Danish and Swedish building and construction industries. The overall rate of the Danish construction industry is about double the rate of the Swedish Construction Industry (fig. 4).

The basic question is, whether the factors, which make the Swedish building and construction industry more successful than the Danish, can be identified and transferred to the conditions in Denmark.

***Fig. 4: Reported accidents in the Building and Construction Industry, Denmark and Sweden***




Source: Danish Work Environment Authority,
Work Environment Authority, Sweden

Reporting levels for accidents at work are not the same for Denmark and Sweden, due to differences in national reporting procedures, as we know from the ESAW statistics.

Data from the building of the Sound Link between Denmark and Sweden - a 16 km tunnel and bridge link including land works on both sides - were collected and analysed. Fortunately, the data provided very good opportunities to study differences in accident rates on the basis of the same methodology for data collection and the same work environment. Danes and Swedes worked within the same main consortium and were subjected

to the same reporting procedures for work accidents. The type of construction work was mainly the same, i.e., heavy construction work, which means that the level and types of hazards were considered to be similar for Swedes and Danes.

The results revealed that the Swedish teams sustained significantly fewer accidents than the Danish teams. In fact the LTI- rate was *four times* higher for Danish Workers compared to Swedish workers (Spangenberg et al, forthcoming). This study is still in progress, but preliminary results show that there are no significant differences in the immediate causes or the types of accidents sustained by the Swedish or Danish construction workers, which could explain the differences in accident rates.

We would therefore have to search for other more distal causes in order to explain the difference in the accident rates between Danish and Swedish construction workers. National definitions and differences in reporting procedures cannot explain the differences in this case, as the same reporting procedures were used for both nationalities. The decisive factors must be sought in-between the immediate factors and the national differences.

Even though the study, at this point, cannot point out the exact explanatory factors, it can pin down that the main factors were better control of hazards at the work place level on the Swedish side. Further investigations will take a closer look at the distal factors in accident causation, which may explain the differences in accident rates between Danish and Swedish construction workers.

The interest in these explanatory factors is not restricted to research. In later years national policies in Denmark and other countries (UK in particular), to a higher degree, have focused on the organisational factors in accident prevention, i.e., improvement of safety management in companies, including risk perceptions and attitudes.

*Example 3.*

In 1998 the Danish Government launched an action plan “Clean Working Environment 2005”. Seven fields of action are included in this Government action plan, which are; work accidents; carcinogens and brain damage; injuries among children and young people; heavy loads and monotonous work; psychosocial factors; indoor climate and hearing loss.

Only the action field concerning *work accidents* will be referred to in the following. The targets/goals for this field have been to reduce, in particular, fatal and serious work accidents, which have been on the same level during/over the last 20 years. Several approaches have been set up in order to survey and monitor the progress towards the targets. These surveying and monitoring activities are not limited to the outcome, i.e., accident rates, but include also the progress of the health and safety activities of the companies. This is because one could not expect the number of accidents to be reduced if it was not supported by more intensive preventive activities at the company level.

It is in this view that the Enterprise Monitoring Study (VOV, is the Danish abbreviation) should be seen. The National Institute of Occupational Health in Denmark is involved in this project, and the aim is to develop an instrument for the surveillance and monitoring of the safety and health performance of companies. The study is carried out for the Danish Work Environment Authority. The key element is to measure the ability of companies to control hazards connected to their work activities.

The main dimensions included in this part of the study are presented in the box below. These dimensions are considered as important elements in the measurement of the safety performance of a company. A company panel has been established by randomly selection of 800 companies. Information on the above mentioned dimensions will be collected by the means of a questionnaires to the 800 randomly selected companies. Furthermore, detailed on site qualitative studies will be carried out on 80 companies, which have been randomly selected from the 800 panel companies.

The study was only initiated recently (2000) and therefore no empirical data are available at this moment. The aim, in this context, is to provide a national example of the need to collect information on organisational and safety culture factors in relation to accidents at work. It should also be noticed, that national authorities need more information on the processes going on at company level, which could be related to poor safety outcome.

This is well in accordance with the results in the study mentioned in example 1, that the distal factors were identified as much more influential in causing accidents. These factors are often related to the lack of control of the hazards at the work place level. The monitoring study should throw more light on these distal factors related to management and safety culture.

**Enterprise Monitoring Study**
**- Accidents at work**

**Dimensions included in the study**

**1** Organisational and management commitment to safety

**2** Training, instruction and knowledge about risk and accident prevention

**3** Management and employees' perception of risk and safety (safety culture / safety climate)

**4** Prioritising safety in work activities

**5** Investigation and use of information about accidents and near-accidents

**6** Management communication and visibility in relation to safety and prevention

**7** Employee involvement in safety issues

The three examples above should indicate the need to have more information relating to the root and underlying causes – or distal factors, in accident prevention. This concerns, in particular, safety management and safety culture as important indicators that mirror the ability of the company to control work place hazards. Nevertheless, more work needs to be done in order to be able to find appropriate indicators for statistical purposes, which can be compared across companies or countries.

## Discussion: Future development in EU-statistics on work accidents

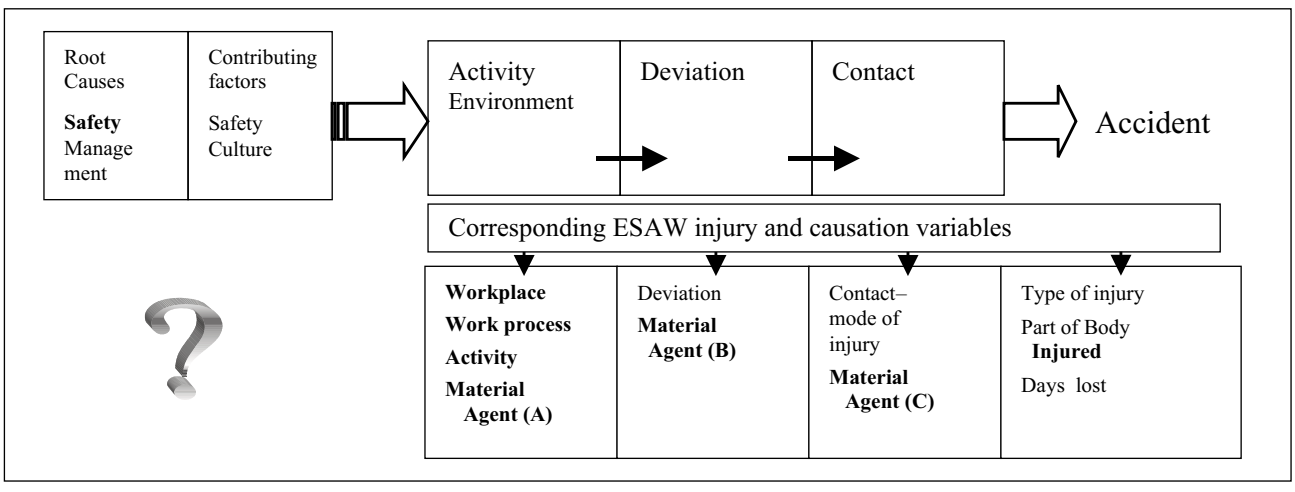
In the discussion above, the need for information on organisational factors and safety culture has been outlined.

There has been a general trend in research over the later years to include organisational, management and cultural aspects in the analysis of work accidents. This development has been referred to as the third age of safety. Management and culture have been considered important elements in the explanation of why some companies are much more successful in accident prevention than others.

Empirical data also indicates that more distal factors in the accident causation sequence are more decisive for causing work accidents. Safety management and safety culture have become important preventive elements for health and safety authorities in some countries.

The existing knowledge we have on accident causation at the European level is based on the ESAW data (fig. 5). Surely, this will become a very important data source for pointing out where to prevent and what to prevent in future. However, information is restricted to the immediate causes and therefore the data would provide limited information on how to prevent accidents. Would it be possible to cover also organisational and safety cultural aspects of accident causation in the EU-statistics?

***Fig. 5. Process model of accident causation including ESAW methodology.***



Taking into consideration the actual status of the ESAW project it would not be feasible at this moment to include more causation variables in the methodology. In addition, reliable indicators would need to be identified and developed, and would definitely not be available in the national system. For this reason, it would not be recommended at this point to include indicators on these factors in the ESAW methodology.

Instead, the feasibility of the following approaches could be investigated:

Occupational Health Performance Indicators:

- Collection of data on the preventive capacity of the occupational health systems in the Member States. Labour inspectors (numbers, professions and coverage of industry); Occupational Health Service (number, professions and coverage of industry); Safety representatives (number of persons, rules and formal status). Such indicators correspond to indicators as hospital beds, doctors, nurses etc, used in the Public Health Statistics. (Initial steps were already taken in relation to the State of OSH projects conducted by the European Agency in Bilbao)
- Cross-national studies of the implementation of workplace assessment in order to investigate differences in practice and implementation in various industries and countries. In particular, hazard identification, planning and steps taken to reduce the risk of accidents. Whether the work place assessment has been carried out, gives a good indication of the safety management system of a company.
- The European Survey on Working Condition has already proven to be an important source for information on the development of the working environment in Europe. It is recommended to include some questions about risk perception and attitudes to safety and prevention (safety culture/climate) in the survey. Even some psycho-social indicators are included in this survey, this could be extended by some general information on perceived safety climate (risk perception, risk taking etc.).
- Establish a European Company Panel Survey with focus on Safety (and Health) management, in order to provide information on how companies in the European Union assess and control risk at the workplace. This method could provide some indicators related to the implementation of European Health and Safety Legislation at the workplace level, as e.g., Workplace assessment. Indicators could be derived from several studies, as, e.g., the one mentioned in example 3 above.

Management and safety culture are already important elements in the prevention of accidents in spearhead companies. The above recommendations could provide a starting point for moving European accident statistics into the *third age of safety*. This is a future challenge for a European Statistics on Accidents at Work.

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# THEME 2, FUTURE DEVELOPMENTS

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## Seeking the true prevalences and incidences of ill-health due to exposures at work. Do we have sufficient methods to estimate them in a valid way?

In Denmark we have a rather long tradition for doing surveys of the working conditions and for keeping registries of reported injuries at work. My colleague, Mr Dyreborg, will deal with our experiences and considerations about the accident-at-work-sphere while I will concentrate on indicators of health as a function of the working conditions.

Although this seminar is not established to discuss national figures I have taken the liberty to present three tables to illustrate, what problems we are facing today, especially the problems related to the methodology of *data collection* and *validation*.

To illustrate the problem I have chosen three different types of health problems which all have that in common that we expect them to be more frequent in the future and that our knowledge about them more or less rests on "soft" data. The three fields are 1) psychic and psychosomatic reactions due to any type of stressors (not only of psychosocial origin), 2) musculo-skeletal disorders due to work involving repetitive movements of a small part of the body (not only machine operators at the classical assembly line), and 3) ill health related to the quality of the indoor climate in rooms other than in industrial production plants.

### Psychic and psychosomatic reactions

Psychic and psychosomatic reactions as a function of the working conditions is a very difficult entity to handle, because such reactions may relate to any kind of exposure (physical, (bio)chemical, psychosocial, etc.) because 1) any worker has some sort of consciousness and/or attitude to everything in his/her environment, and 2) because mental health is mutually bound to somatic health by the neuro-endocrine linkage. Consequently poor mental health needs not only to manifest itself as fear, anxiety, depression, concentration difficulties, sleep problems etc. but may also show up as excessive muscle tension, permanently increased blood pressure or other more severe cardiovascular disorders or diseases, disorders in the function of the digestive organs, skin reactions, etc.

In Denmark physicians are obliged to report to the National Working Environment Authority every case of work related illness (verified or suspected) they come upon. The obligation exists for both verified and assumed cases. The form used for the reporting includes a section where the physician can write diagnoses (maximum four) and exposures (maximum three). As in most medical examinations much of the information is supplied by the patient. In addition, most of the reports received by the Registry are made by general practitioners, who seldom have/can have detailed knowledge about occupational diseases and the various exposures at the workplaces. Therefore, the physician has to base his/her report on what the patient tells about the situation. Important factors in relation to psychic reactions are, however, that many people are relatively reluctant to consult a physician (there is no prescribable medicine to cure a sick working condition), and that the majority of general prac-

titioners are trained in what I will call “classical medicine” and hence have only little experience about the impact of work on health. In addition, psychic reactions are still to a large extent a kind of taboo in Denmark and very few cases have been recognised as occupational disease by the authorities. In short, this could be the reason why a relatively small number of psychic and psychosomatic reactions actually is reported as occupational disease.

Table 1 (column B) shows the number of cases of psychic and psychosomatic reactions reported to the National Registry of Occupational Diseases 1993-1999. In the beginning of the period the frequency appears to be rapidly increasing and then decreasing. However, the fraction of this type of health problem in relation to the total number of reported cases is constantly increasing over the period. The question is: Do we here face a true increase of a problem, or are we just witnesses to an accumulation of ill-health that is now released little by little thanks to a more open dialogue about this category of disorders? We do not know.

In spite of the increasing tendency in reporting frequency, massive underreporting of work induced psychic and psychosomatic reactions is foreseeable and understandable. It seems likely that we will never get a representative statistics in this field if we are only going to base our knowledge on reported cases. Therefore another question is: What other means of collecting information of this type of reaction do we have?

An important alternative source of information could be surveys. In Denmark we have about three decades of experience in general surveys of the working conditions and their impact on health. Table 1 (column D) shows among other things the results from such surveys, i.e. prevalences expressed in percentage of four elaborated indicators (each indicator is based on a combination of several questions) of psychic and psychosomatic reactions and the corresponding number of workers suffering from these symptoms when these percentages are converted into number of influenced individuals of the entire workforce.

In 1990 9% of the Danish workers (approx. 234,000) turned out to suffer from a high degree of stress (positive answer to at least four of seven questions). In other words the *prevalence* of high degree of stress in 1990 was estimated to concern 234,000 individuals. Assuming that this figure holds for 1993, which is the first year covered by of our latest revision of our national registry of reported cases of occupational disease, under the assumption that the annual *incidence* is 5%, 11,700 cases should have been reported to the Registry instead of the 961 which actually were notified, i.e. a factor 12 difference. However, here it should be admitted that the questions in the survey were very general. There was no direct indication that the respondents should relate their answers to their work; therefore the cautious estimation that only 5% would be new cases due to the working conditions.

Table 1 also shows the proportions between the number of cases reported to the Registry and the percentage of workers suffering from what was called “poor mental health in general”, “poor vitality in general”, and “poor psychosomatic health in general” in 1995. When these percentages are converted to absolute numbers of workers we get the figures shown in the lower half of column E of the table. Applying the same assumptions as above (that a 5% fraction are new cases that year and that all 5% are due to the working conditions) 21 to 61 times more cases than the actual 1,243 should have been reported to the registry.

That there is a substantial number of cases of significantly affected mental health is illustrated by the number of persons, who are granted early retirement benefit due to that reason, and of those who use various tranquillisers. In 1992 the number of early retired persons due to ill mental health was 12,268. A few years earlier it was estimated that approximately 370,000 consumed full daily dose of tranquillisers. Probably, none of these cases have turned up in the years they were counted. It leaves us with the question: How large a part of the suffering individuals had actually caught their mental disorder at work?

One can, however, discuss the validity and reliability of the rather general questions underlying what here is labelled high degree of stress, mental health status, vitality and psychosomatic health status and the other two listed indicators. Is it at all possible to extract valid and reliable information on *work-related* ill mental health on the basis of a few rigid questions? Well, this is not the forum for such detailed methodological discussions, but as a trained clinician I will say: Probably not. One would need a much more varied set of questions, but time and space usually do not allow thorough question batteries in general surveys. Hence it seems only possible to obtain valid information in studies dedicated to special topics. Until such studies have been carried out I think we need to accept that the truth lies somewhere between what is obtainable from a registry of cases reported by clinicians and what can be deducted from the more or less successful surveys of the working conditions.

## Repetitive work

Repetitive work has traditionally been associated with work at the assembly line. Nowadays, repetitive work occurs in many different types of jobs outside the classical manufacturing industry, particularly in jobs involving several working hours in front of a desktop computer. Actually, computer work offers very limited possibilities to vary one's working position and to enter information by other means than keyboard and mouse. With other words, static and light muscle work involving only a few muscles, often combined with a high and intensive work pace, is suspected to be responsible for a significant proportion of ill health. In that connection it is important to remember that psychic stress per se often is accompanied by somatic reactions, e.g. increased tension in muscles of the upper back, the neck, shoulders and jaw.

But how well does our information systems actually depict this kind of problems?

Some illustration of the situation in Denmark is found in Table 2 showing partly the number of reported cases of occupational disease related to repetitive work (column B) and partly the prevalence expressed by the percentage of workers who claimed to be suffering from symptoms on a list of musculo-skeletal symptoms associated with repetitive work (column E), the latter collected by a country-wide survey conducted in 1995.

As above, 5% of the 1995 prevalence is assumed to be new cases that year (column F), and therefore de facto reportable. The ratios between actually reported number of cases and the 5% fraction of persons with the questionnaire positive symptoms (column G) indicate that also in this field we probably deal with underreporting although it appears to be less pronounced compared to what was the result in the case of the psychic and psychosomatic disorders. The apparently better coverage of the statistics of reported cases of ill-health related to repetitive work is understandable, because ache and pain by most people is perceived to be more acceptable than anxiousness, nervousness, fatigue, depression etc. In addition, it has been far more easy to get a case of disease recognised as occupational when it has relation to muscles and skeleton than if it is related to mental health.

## Indoor climate

Health problems due to indoor climate also seem to be a methodologically delicate matter. The symptoms most often referred to are fatigue, headache, concentration difficulties, memory problems, skin eruptions and symptoms from the mucous membranes in the eyes, nose, mouth and throat. However, none of these symptoms can be considered specific for reactions due to indoor climate. Alternative reasons may be common diseases like colds, flues, stress, etc.

In addition, researchers have come to different conclusions about indoor climate complaints reaching from perceiving them as a "mass psychogenic illness" over reactions to small doses of organic compounds evaporating from paints, glues and sealants used in buildings and furniture, waste from fungi, to reactions to physical factors like heat, cold, draught, sound, lightning, electromagnetic fields etc.

Although these exposures can occur in all sectors we have decided in Denmark only to deal with indoor climate problems in non-industrial settings.

Table 3 shows the number of cases of occupational disease related to indoor climate reported to the National Registry of Occupational Injuries 1993 to 1999 (a complex selection tallying cases of symptoms primarily from the eyes, the respiratory organs, and the skin combined with certain exposures). Over this period of time the annual number of reported cases varies from 234 to 412 but all the time making approximately a 2% fraction of the total number of annually reported cases of occupational disease. What does this constancy tell us? Is the reporting of indoor climate problems little by little changing to reporting of psychosocial problems? We do not know.

Also in this case I have made the experiment to relate the number of reported cases to 5% of the prevalence of the questionnaire positive symptoms from the mucous membranes in eyes, nose, mouth and throat found in a country-wide survey. From the latter only positive responses present during working hours are included. At the moment, our specialists view these three questions as the best available indicators of self-reported symptoms although one may argue that the reference period of three months is rather long (risk of confounding from colds, flues, etc.). A more relevant reference period could be a week.

If we assume that this 5% fraction includes all new cases of indoor climate disease in 1995 the national registry should have received from 29 to 61 times more reports of just this disease category than it actually did receive.

As is the case with the other two work environmental factors neither of the two sources of information can be considered to tell the truth. In the case of indoor climate problems it should be remembered that confounding from psychosocial factors is very likely, because, in most cultures, it is easier to blame physical and chemical factors of the indoor climate than e.g. the boss or the work organisation.

## Conclusion

As I view the situation none of the present ways of data collection shows the true prevalences and incidences of the specified health problems. Probably the truth lies between what is collected by the official reporting system and what can be retrieved from general survey of the working conditions.

To achieve a more valid and reliable picture it seems necessary to carry out extremely detailed and dedicated investigations of each theme, maybe even of homogeneous job groups like teachers, office clerks, traffic controllers, etc. However, in spite it someday would be possible to do such advanced studies it still leaves us with the open question of validity. Which criteria of validity do we actually have and which do we need when we deal with symptoms with no unequivocal link to an exposure?

In addition to these hard-to-solve scientific problems the scientists more and more faces the practical problem that people nowadays are fed up with telephone interviews, postal questionnaires, etc., and therefore refuse to participate in even very serious investigations.

***Table 1*** (Peter Laursen)

Reported cases of health problems related to psychosocial factors at work 1993-1999 (actual number of reports and percent of total number of reported cases) and indicators of the psychosocial condition (in general) in Denmark 1980s and 1990s

| **Year**<br>**A** | **Reported cases to National Registry of Occupational diseases**<br>**B** | **Other indicators**<br>**C** | **Countrywide survey Percent**<br>**D** | **Countrywide survey figures converted to number of persons of entire working population suffering from symptoms**<br>**E** | **Assumed 5% annual incidence (new cases)**<br>**F** | **Ratio F/B**<br>**G** |
|---|---|---|---|---|---|---|
| 1993 | 961 (6%) | • High stress index score (1990, elaborated survey data) | 9 | 234,000 | 11,700 | 12 |
| | | • Consumption of tranquillisers converted to full daily dose (1989, general figures) | 15* | 371,428 | 18,571 | 19 |
| | | • Early retirement benefit due to poor psychic health (1992, general figures) | - | 12,268** | - | - |
| 1994 | 1,221 (8%) | | | | | |
| 1995 | 1,243 (8%) | • Poor mental health in general (elaborated survey data) | 22 | 578,343 | 28,917 | 23 |
| | | • Poor vitality in general (elaborated survey data) | 20 | 533,746 | 26,687 | 21 |
| | | • Poor psychosomatic health in general (elaborated survey data) | 58 | 1,509,231 | 75,462 | 61 |
| 1996 | 1,401 (9%) | | | | | |
| 1997 | 1,300 (8%) | | | | | |
| 1998 | 1,301 (9%) | | | | | |
| 1999 | 1,145 (9%) | | | | | |

The table should be interpreted with great care.
* Assuming same consumption as in the entire population. ** Data from the National Registry of Early Retirement.
Sources: National Registry of Reported Injuries at Work, Denmark, National Occupational Safety and Health Survey 1990 and 1995, Danish Institute of Social Research 1993, Danish Institute of Clinical Epidemiology 1989.



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*Table 2* (Peter Laursen)

Reported cases of health problems related to exposure to repetitive work 1993-1999 (actual number of reports and percent of total number of reported cases) and questionnaire-positive symptoms related to repetitive work from a countrywide survey of working conditions 1995 (N=5,575)

| Year<br>A | Reported cases to National Registry of Occupational diseases<br>B | Countrywide survey Question<br>C | Countrywide survey Percent<br>D | Countrywide survey figures converted to number of persons of entire working population suffering from symptoms<br>E | Assumed 5% annual incidence (new cases)<br>F | Ratio F/B<br>G |
|---|---|---|---|---|---|---|
| 1993 | 3,177 (20%) | | | | | |
| 1994 | 3,233 (20%) | | | | | |
| 1995 | 3,563 (24%) | • Ache in the neck within latest 7 days<br>• Ache in the shoulders within latest 7 days<br>• Ache in the elbow within latest 7 days<br>• Ache in the wrist within latest 7 days<br>• Ache in the upper part of the back within latest 7 days | 13<br>14<br>4<br>7<br>7 | 347,381<br>352,075<br>93,887<br>184,957<br>183,548 | 17,369<br>17,604<br>4,694<br>9,248<br>9,177 | 5<br>5<br>1<br>3<br>3 |
| 1996 | 4,210 (27%) | | | | | |
| 1997 | 4,635 (29%) | | | | | |
| 1998 | 4,442 (31%) | | | | | |
| 1999 | 3,762 (30%) | | | | | |

The table should be interpreted with great care.
Sources: National Registry of Reported Injuries at Work, Denmark, National Occupational Safety and Health Survey 1995

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***Table 3*** (Peter Laursen)

Reported cases of health problems related to exposure to indoor climate constituents 1993-1999 (actual number of reports and percent of total number of reported cases)and questionnaire-positive symptoms with a possible relation to a poor indoor climate from a countrywide survey of working conditions 1995 (N=5,575)

| **Year**<br>**A** | **Reported cases to National Registry of Occupational diseases**<br>**B** | **Countrywide survey Question**<br>**C** | **Countrywide survey Percent**<br>**D** | **Countrywide survey figures converted to number of persons of entire working population suffering from symptoms**<br>**E** | **Assumed 5% annual incidence (new cases)**<br>**F** | **Ratio F/B**<br>**G** |
|---|---|---|---|---|---|---|
| 1993 | 283 (2%) | | | | | |
| 1994 | 338 (2%) | | | | | |
| 1995 | 371 (2%) | • Tired, dry or smarting eyes at work within latest 3 months<br>• Dry or irritated feeling in mouth or throat at work within latest 3 months<br>• Bleary eyes or running nose at work within latest 3 months | 17<br>14<br>8 | 449,718<br>373,670<br>212,184 | 22,486<br>18,684<br>10,609 | 61<br>50<br>29 |
| 1996 | 412 (2%) | | | | | |
| 1997 | 287 (2%) | | | | | |
| 1998 | 332 (2%) | | | | | |
| 1999 | 234 (2%) | | | | | |

The table should be interpreted with great care.
Sources: National Registry of Reported Injuries at Work, Denmark and National Occupational Safety and Health Survey 1995.
All sectors included (indoor climate usually not considered relevant in manufacturing etc.) No breakdown of data into sectors has been made to avoid to small cell sizes of the table.

# FUTURE DEVELOPMENTS

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The statistical issues arising in the health and safety halves of "Health and Safety" are generally quite distinct. Because safety failures arise in a generally evident manner - accidents in the workplace - they can be directly observed and recorded by a variety of methods. That is not to say that the statistical measurement is without problems, especially when we want to make comparisons between countries. But the problems are of a practical nature, and are, in principle soluble. For occupational illness the difficulties start at a more fundamental conceptual level. What is a case of occupation illness? How can such cases be recognised? How reliably? While these questions to apply more acutely to the newer concerns such as "stress" and musculoskeletal disorders, they have long applied to the measurement of occupational disase as the following quote from the UK Chief Inspector's annual report for 1900 shows:

> "With a malady, such as lead poisoning, showing wide variation in the degree of severity, and attended in many cases with considerable difficulty in diagnosis, a tabulation only of the number reported as so suffering conveys hardly any useful information. Only careful analysis according to severity, to the length of time of exposure to ... lead, to the number of previous attacks, to the nature of the symptoms, and to the precise occupation at which the poisoning was contracted, can make them permanently useful."

Deciding the status of individual cases is thus unavoidably an uncertain and expensive business. It therefore tends to be done only where there is some financial or administrative need. In most countries there is compensation for the most serious and clearly occupational disease. In some, medical treatment of occupational disease is covered by a separate insurance system which therefore triggers the need for a decision process for each episode of illness.

In the UK there is a compensation system, but this is only triggered at quite a high severity threshold - 14 percent permanent (or long term) disability and over 80% of cases occurring represent "old economy" illnesses (Pneumoconiosis, Asbestos related diseases, Deafness and Vibration white finger).

Prior to social security reforms in 1982 there was a short term benefit for work absences due to occupational illness, but the real value of this benefit had fallen steadily over a number of years and by the early 1980s was 80 percent lower than it had been 10 years earlier. Its disappearance in 1982 evoked little public reaction. However the disappearance of this benefit had a profound effect on the statistics of health and safety in the UK. It led to the introduction of legislation to establish employer reporting as a basis for statistical information and to the development of self- reporting surveys linked to the labour force survey. On the illness side it also led HSE to support a range of voluntary medical reporting systems of which the original was SWORD.

Over a number of years therefore, HSE has been developing the use of a range of sources to document the scale of occupational disease in the UK. The following table summarizes these sources with some notes on their relative strengths and weaknesses.

| Advantages | Disadvantages |
|---|---|
| **Compensated cases** | |
| Cases individually validated | Rules may change |
| Generally more serious cases | propensity to claim variable |
| consistent severity and diagnostic criteria | limited list of diseases. |
| National coverage | |
| **Death certificates** | |
| Universal national data of high reliability | Only covers fatal diseases |
| Consistent over time | Only a few occupational categories distinguished (pneumoconiosis, asbestosis, farmers lung, (arguably) mesothelioma) |
| **Household surveys** | |
| Compete, representative national coverage | Cases self-reported (some by proxy) |
| Consistent occupational data for cases and source population. | Small numbers limit detailed analysis |
| **Specialist medical surveillance** | |
| High quality clinical input | Based on single opinion |
| Can achieve high participation rates | coverage uncertain |
| Scope for detailed follow-up | Criteria may be variable. |

So we have a number of information sources: but do they add up to a satisfactory information base to inform policy? The major problem is that of interpretation. With no single source giving an acceptable overall picture without important qualification, every apparently straightforward question becomes difficult and requires significant analysis to provide the answer. Understandably, uses find this difficult to deal with.

These difficulties have recently been highlighted in the UK by the adoption of Health and Safety outcome targets. The government has declared its intention that by the year 2010:.

- to reduce the number of working days lost per 100,000 workers from work-related injury and ill health by 30%;
- to reduce the incidence rate of cases of work-related ill health by 20%;
- to reduce the incidence rate of fatalities and major injuries by 10%;

and to achieve half the improvement under each target by 2004.

It is clear that deciding whether these targets have been met poses a significant challenge. We held a workshop with our stakeholders in December and are preparing to issue a “statistical note” outlining our approach to the statistical challenge, inviting comments from stakeholders.

The details are still under discussion but the following key points seems clear:

*In general*

(1) Progress measurement will involve more than one data source and some adjustment or integration of data from the different sources will be necessary; as a rule this will only be appropriate at the global level.

(2) Changes over time are what matter for monitoring progress against the targets, so efforts should be focused on measuring change; estimates of absolute levels may vary as information sources evolve.

(3) To support the ‘outcome’ data on injuries and ill health, supplementary approaches should be explored, for example collecting data on economic, social and cultural factors.

*For injuries*

(1) The incidence rate of fatalities and major injuries will be adjusted for under-reporting using data from the Labour Force Survey.

*For illness*

(1) Progress should be measured separately for different diseases, using the most appropriate data source(s) for each.

(2) The existing data sources should be refined (e.g. estimating the effects of raised awareness), and new sources developed (e.g. workplace-based surveys), to meet the needs of progress measurement

(3) Data from the various sources should be integrated to produce an overall judgement about progress against this target, for individual diseases and in aggregate.

(4) Diseases with long latency periods between exposure and health outcome should be included in this target, but should be separately identifiable.

*For days lost*

(1) The only sources currently available rely on self-reports (the LFS and SWI surveys). Steps will be taken to ensure greater consistency between them but limitations will remain, especially in respect of ill health.

(2) In future it may be possible to develop innovative additional sources to help measure progress, in the context of broader government targets for reducing sickness absence.

## The need for new sources

The available data sources on occupational ill health, while adequate to establish the general scale and distribution of work-related illness, have significant weaknesses as an instrument to monitor the government's targets. It is by no means clear that alternative feasible systems will solve this problem, which is a combination of statistical (sampling accuracy) and logical (definition and attribution) difficulties. However we see a need to review options for new data sources (including self-reporting, GP-based reporting, attributable fraction estimation, exposure/hazard surveys and measures of awareness, attitudes and behaviours) and to develop the existing sources.

The following paragraphs outline our view of the main options under each of these headings. The intention is that in the first half of the strategy period - up to 2004 - monitoring will be based on existing sources. By 2004, assuming the review does identify feasible options for improved data, new systems will be in place to supplement or replace existing ones.

### *(i) Main options for new sources*

*1. Workplace-based SWI.*

Switching from a household sample to a workplace sample for collecting self-reported data would presents a number of advantages. These would mainly be a consequence of having the opportunity to collect good data at the workplace level as well as at the individual worker level. For example, much better information about sector of activity, workplace size, exposures and the presence (or absence) of health and safety management systems would be generated. There would be some disadvantages too, notably poorer coverage of certain parts of the economy (e.g. the informal sector). There are existing surveys which have successfully used such a workplace-based approach, incorporating responses from both employers and employees, notably the Workplace Employee Relations Survey (WERS). If this approach were adopted, it would make sense to combine illness and injury questions in the same survey.

*2. GP-based reporting.*

Many cases of work-related health ill health will not present to specialist or occupational physicians but will be seen by General Practitioners (GPs). This represents a gap in the xisting surveillance arrangements, and feasibility studies of different ways of filling it (perhaps on a regional basis) have already been commissioned.

*3. Attributable fraction estimation.*

This approach was advocated by some participants at the December workshop. It would be modelled on the surveys (funded by HSE) recently undertaken by the MRC environmental epidemiology unit on the proportion of cases of finger blanching, back pain and hearing loss that are attributable to vibration (hand and whole body) and noise. This kind of survey has the advantage that the problem of attributing individual cases to occupational factors is avoided. By establishing the symptom rate in representative samples of exposed and unexposed individuals, the excess (if any) of cases among those exposed can be estimated and the "attributable" number of cases estimated. A large sample size would be needed to produce reliable estimates of change. Because of practical limits on questionnaire length, only a limited number of endpoints and suspect exposures can be treated in a single survey, so there would need to be a range of such surveys. For the results to carry conviction, there must be a clear causal link between the outcome and the assessed risk factors, and ideally a means of validating both symptom and exposure reports.

*4. Exposure/hazard surveys.*

Certain hazards lend themselves to some sort of biological monitoring (e.g. of blood-lead levels, or radiation doses), but for many the only obvious means of data collection is by self-reported surveys. These have been adopted by a number of EU member states, and the Dublin based European Foundation for the Improvement of Living and Working Conditions has organised EU-wide surveys of this kind, though with quite small samples in each country. HSE has done one survey of this kind in parallel with SWI 95, the Self-reported Working Conditions (SWC) 1995 survey. For those hazards which can reasonably be self-reported, these surveys give an efficient way of assessing population exposure. The Dutch government, who have also recently set Health and Safety policy targets, have set their targets in terms of self-reported hazard levels, rather than health outcomes.

*5. Trends in awareness, attitudes and behaviours.*

Along with hazard/exposure measurement, the levels of awareness, attitudes and behaviours (including conformance with regulations or more generally with good practice) could be used as an indicator of the impact of actions taken under the strategies. Statisticians and others in HSE plan a number of initiatives in this area, for example through a module of health and safety questions on the British Social Attitudes Survey in 2001.

***(ii) Potential development of existing sources***

As well as reviewing the potential for new sources, there is a need to look at ways of strengthening existing sources. The main options are listed below:

SWI: Self-reported Work-related Illness Surveys

— research to assess the effect of changing awareness on self-reported work-related illness

— qualitative research to understand what respondents mean when they report an illness as work-related

— research to validate self-reports against detailed occupational health review of reported cases

ODIN: Occupational Disease Intelligence Network

— producing estimates of sampling variation and confidence intervals for levels and changes

— developing a model to extract trend information, allowing for non-participation and non-response, and identifying necessary improvements

IIS: Industrial Injuries Scheme

— research into the factors underlying claimant behaviour, to give a better understanding the degree and nature of under-counting (i.e. under-claiming)

— assessment of the effects of any discontinuities due to administrative changes

RIDDOR: Reportable Diseases

— research to assess the effect of changing awareness and compliance on the reporting of occupational illness by employers

— consideration of the role of RIDDOR in any employer-based information strategy introduced under Securing Health Together

The next few years will to see an intensive effort in the improvement of the UK's information base relating to occupational illness.

# INDICATORS IN OCCUPATIONAL HEALTH AND SAFETY

## Occupational disease statistics

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## 1. Introduction

This presentation aims to:

(1) summarise the experiences of a Finnish exercise which examined the basic concepts of indicators used in national/regional surveillance of occupational health and safety (OHS)
(2) describe a draft set of OHS indicators prepared according to the Finnish experiences for further discussion and piloting
(3) compare points 1 and 2 to the results of the European Occupational Disease Statistics (EODS) project

The details of points 1 and 2 have been published as a report prepared for WHO (Rantanen et al. 2000) and the details of point 3 as Eurostat publications (Eurostat 2000 and Karjalainen and Virtanen 1999).

Throughout the industrialised world the basic requirements for health, safety and environment have been stipulated by legislation, including the Directives on Safety and Health at Work by the European Union. The further development of policies for occupational health and safety and those for environment and health are nevertheless increasingly based on information steering. Such a policy is critically dependent on up-to-date information describing the current status of health and safety, the exposures and risks threatening health, and information on the consequences of such exposures at individual and population levels. Such information is also of critical importance for setting priorities for further development, identification of needs for actions, including the development of capacities and infrastructures, and attracting partners and allies to join the OHS actions.

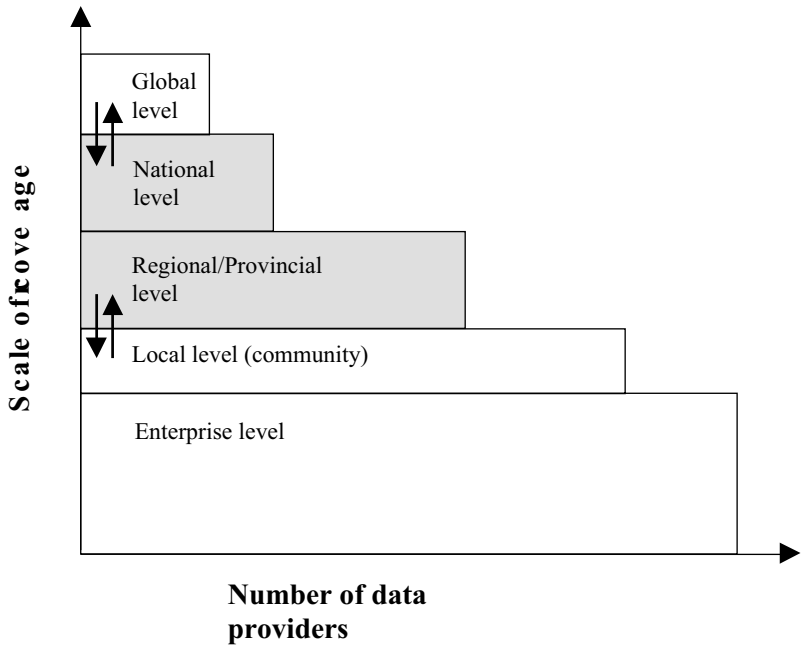
Appropriate indicator systems can also be used for comparing the needs of policies in different parts of the Region, and for the recognition of the impact of actions and programmes undertaken for health and safety.

The new information-based strategy also requires effective networking of actors at all levels, i.e., policy, administrative, managerial and practical levels. Such networking can be effectively stimulated and supported through appropriate, relevant and reliable information.

It is important that the indicator systems which provide an opportunity to build up national profiles are made as descriptive as possible, without rendering them too complex, and kept manageable and feasible for very heterogeneous suppliers of information. It is also most important to compile even a limited amount of reliable and valid information rather than to try to establish too heavy, complex and less practical systems with high numbers of parameters. In such attempts compromises between ideal and feasible systems need to be done.

The comparability of data requires the harmonisation of concepts, definitions and methods for data compilation. This is a difficult task due to many differences, for example, in the legal systems of different countries. Therefore, the construction of profiles requires not only the mechanical compilation of registered data, but full knowledge and understanding of the principles on which the data are collected and how they should be interpreted.

*Figure 1. Relationships between different indicator systems (modified from Rantanen et al. 2000)*




There are two major sources of official information for indicator systems, a) the official statistics on registration of data for defined purposes, such as for the follow-up of impact of safety and health policies (e.g., official accident statistics) and b) statistics for insurance and compensation purposes (insurance statistics). Such information systems have several merits with their wide coverage, stable definitions and usually long history. But even they are vulnerable to poor implementation and variation in practices. Criteria, concepts and definitions are bound to the national laws and practices which may vary substantially between countries. Differences in the efficiency of registration may lead to under-registration or registration gaps which may substantially bias the results and invalidate comparisons. Even more they may lead to the so-called registration paradox showing a worse situation for countries which very accurately register all the relevant events, while poor registration may be interpreted as a low level of risk. Official statistics are also rigid, and cannot be adjusted to give answers to questions which crop up unexpectedly on issues that are not included in the original registration schemes. Furthermore, the delay time in the registries may be substantial. In terms of the rapid changes in work life, the data need to be collected with short delays and the questions to be answered need to be flexible according to the context and situation. For this purpose surveys provide a useful tool. But surveys also have their strengths and weaknesses. The project described in this presentation proposed an indicator system that is based on the combination of registered data and data provided by surveys and expert assessments.

## 2. Indicators and their sources of information

An **indicator** is a device which indicates some quality, change, etc., of a situation or system, and draws attention or gives warning. While efforts are normally made to quantify indicators, this is not always possible. Moreover, evaluations cannot always be made by aggregating numerical values alone. Qualitative indicators are therefore often used, for example to assess people's involvement and their perception of the health status. WHO has proposed four categories of indicators: **health policy indicators**; **social and economic indicators**; **indicators of health care delivery**; and **indicators of health status**, including quality of life. It should be emphasised that, while indicators help to measure the attainment of targets, they are not in themselves targets. Indicators have to be selected carefully to make sure that they are responsive to current trends of development and that they are useable for the analysis of ongoing activities.

An ideal indicator would be:

**Valid.**. I.e. the indicator actually measures what it is supposed to measure.

**Objective.** I.e. even if the indicator is used by different people at different times and under different circumstances, the results will be the same.

**Sensitive.** I.e. the indicator should be sensitive to changes in the situation or phenomenon concerned.

**Specific.** I.e. the indicator reflects changes only in the situation or phenomenon concerned.

**Available.** I.e. it should be possible to obtain the data required without undue difficulty.

The indicator systems may address different geographical levels spanning from global to enterprise levels (see Figure 1). This project described in this presentation covered indicators of **national and regional/provincial** levels.

### *2.1 Choosing indicators*

There are too basic approaches to select indicators: **a data-drive approach** and **a concept-driven approach**.

Our overall aim is to define a set of OHS indicators applicable in countries with different economic structures, cultures, levels of statistics, etc. The need for wide applicability might lead us to take feasibility (i.e., availability of data) as the starting point. However, such an approach might result in a set of indicators which are not the most relevant and scientifically most valid. An alternative to data-driven indicators is to adopt a concept-driven approach.

Concept-driven indicators are developed on the basis of a conceptual framework irrespective of the availability of data. Theory determines an ideal set of indicators which then are operationalised and measured. Concept-driven indicators are primarily science-based and valid, whereas data-driven are primarily feasible. An approach of theoretically and methodologically well-grounded indicators was adopted in the development of European social indicators (EUSI system)(Noll 2000). In the project described in this presentation, the approach was concept-driven as far as possible, but also the availability of data and their comparability across countries were taken into account in the selection of core indicators.

Choosing an indicator involves also discussing the policy/normative aims and priorities of OHS. Indicators should address relevant phenomena in OHS.

WHO has published a list of criteria for checking the relevance of environmental health indicators (Corvalan et al. 1998). Relevant indicators are

— directly related to a specific question of concern
— related to conditions which are amenable to action
— easily understood and applicable by potential users
— available soon after the event or period to which it relates
— based on data that are available at an acceptable cost-benefit ratio
— selective, so that they help to prioritise key issues in need of action
— acceptable to the stakeholders.

The relevance of various OHS issues varies by country and period. There is a very clear difference as to the relevance of OHS hazards between the industrialised and developing countries. This is evident from the following priority lists generated at ILO (Takala 2000).

Priorities of industrialised countries:

— Stress, overload and pace of work, psychological factors, workplace relations and management
— Problems caused by ageing workforce, maintaining ability to work
— Right-to-know, right to be informed, hazard communication
— Chemical substances, carcinogens, asbestos
— Ergonomics, repetitive work and musculoskeletal problems
— Organisational issues and safety and health (quality) management issues
— Preventive occupational health services, health promotion
— New technologies.

Priorities of developing countries:

— Agricultural work accounts for 2/3 of manpower and work-related problems
  Other hazardous sectors, such as mining, construction, fishery, logging, and particularly dangerous occupations

— Major industrial accidents and fires
— Traditional accident and safety problems, housekeeping and productivity
— Occupational diseases, Global Programme on the Elimination of Silicosis
— Vulnerable groups, in particular, child labour
— Transfer of technology.

Most of the indicators described in this presentation relate to the priorities of the industrialised countries, such as psychosocial, ergonomic and chemical factors, as well as work ability, management issues of OHS, and occupational health services. The priorities of developing countries gave rise to the indicator on the consumption of pesticides. Also traditional indicators on work accidents and occupational diseases are included among the core indicators.

The European Agency for Safety and Health at Work has published a document on priorities and strategies in OHS policy in the EU countries (EASHW, 1998). Also many national bodies have set priorities for OHS. One of the largest efforts is the NORA (National Occupational Research Agenda) project in the United States (www.cdc.gov/niosh/norhmpg.html).

### *2.2 Validity and comparability*

Validity refers to the ability of an indicator to describe accurately and precisely the phenomena of concern. The validity of an indicator depends on the completeness of the data and the reliability of its source. Sometimes validity can be tested by contrasting information from different sources, or studying a smaller sample carefully. Because of the difficulties of measuring validity in surveillance, it has been described merely as a goal which should be reached by defining the studied phenomena and indicators accurately, and by using tested methods whenever possible (Tüchsen et al. 1998).

A detailed checklist of validity criteria for environmental health indicators has been published by WHO (Corvalan et al. 1998). The criteria are:

— based on a known linkage between the environment and health
— sensitive to changes in the conditions of interest
— consistent and comparable over time and space
— robust and unaffected by minor changes in methodology/scale
— unbiased and representative of the conditions of concern
— scientifically credible, not easily challenged
— based on data of a known and acceptable quality.

This list is a useful guideline also in the construction of OHS indicators. Many items of the list can be condensed to the requirement that an indicator should be relevant, valid and feasible.

### *2.3 Sources of indicator data*

#### *2.3.1 Administrative registers and statistics*

Administrative registers maintained by governmental agencies, insurance companies or research institutes typically provide data on the numbers of work accidents and occupational diseases. Their basic purpose is not surveillance. Often they are constructed to support compensation and prevention activities stated in the national legislation. Data on the numbers of accidents or diseases are a by-product of these registers and depend significantly on national regulations, their coverage and recording praxis. On rare occasions, standard statistics provide also information on production, export and import of hazardous agents (e.g., asbestos, pesticides) which may be useful in the construction of crude national exposure indicators.

Some advantages and disadvantages of administrative registers and other similar sources providing standard statistics:

**Advantages**

- systematic data collection, often nation-wide and based on legal obligation
- continuous data collection and production (continuity and stability)
- internal comparisons within data often valid and informative for preventive purposes

**Disadvantages**

- coverage often incomplete in spite of obligatory nature of data collection (under-reporting)
- restricted to fixed (case) definitions of administrative nature (inflexibility)
- comparability across countries often poor
- data production often slow

**An example: Pilot project on European Occupational Disease Statistics (EODS)**

A Pilot Project on European Occupational Disease Statistics (EODS) was launched in 1991 to assess the comparability of the data drawn from the existing systems (Karjalainen and Virtanen 1998). Eurostat collected data on recognised occupational diseases in the 15 Member States for 31 selected items of the European Schedule of Occupational Disease for the year 1995. The data did not cover the entire working population for some member states, and for some member states it did not represent recognised cases. A questionnaire was used to clarify the inclusion criteria of mild diseases in general, coding of the medical diagnosis and specific recognition and inclusion criteria of six selected items. Labour Force Survey data were used to build reference populations that would correspond to the total workforce and the workforce that was covered by the recognition/compensation scheme (filtered workforce).

The main factors restricting comparability were: (1) definition of the reference population, (2) varying inclusion criteria, (3) the coding of the medical diagnosis, and (4) differences in the recognition of mild cases.

*Definition of the reference population.* Self-employed, family workers and workers in certain sectors were not covered or were only partly covered by national recognition systems.

*Inclusion criteria.* There was variation in the inclusion of specific diseases in the 31 items studied, e.g., the inclusion of asthma, rhinitis and alveolitis in respiratory allergies or pulmonary fibrosis, and the various pleural abnormalities in asbestosis.

*Coding of the medical diagnosis.* Coding by diagnosis in the 31 items studied varied by country. A draft list was proposed according to the ICD classification of WHO.

*Recognition of mild cases.* Some countries recognised occupational diseases at an early stage when they did not yet cause any disability in medical terms, while some member states recognised only cases with a certain minimum level of disability. It was not possible to directly compare the total incidence rates for most of the occupational diseases. This concerned, e.g., noise-induced hearing loss.

*Strengths of the data.* The data on recognised cases of occupational disease represent a high degree of causality. They also provide detailed information on exposure and on medical and social consequences. Such data can be used in the prevention and evaluation of the impact of the problem. Finally most systems offer these data on a continuous and more or less nation-wide basis. If the effect of the varying inclusion criteria for severity and type of disease is eliminated by comparing the industry-specific incidence rates after adjustment for the national incidence rate in the pilot data, one can conclude that the risk industries identified by the national systems and the incidence rate ratios are similar in the member states for items in which the number of cases allows statistical comparison.

*Weaknesses of the data.* After the above improvements, two general restrictions remain: (A) The data on recognised occupational diseases reflect not only the occurrence of such diseases, but inevitably also the way in which the concept of an occupational disease has been integrated into the social security system. Questionnaire data on the national recognition criteria of specific items proved to be informative in this regard. (B) The EODS pilot data indicate that underreporting is probable even for some classical occupational diseases, while it is quite clear that statistics on recognised cases do not rapidly identify new health problems.

Revised data collection specifications have been proposed (Eurostat 2000).

### *2.3.2 Questionnaire-based surveys*

Interview surveys and other questionnaire-based surveys on working conditions are carried out in many countries and areas. They provide valuable information on the prevalence of perceived exposure to some physical agents, ergonomic factors, physiologic factors, psychosocial factors, life-style factors, on work ability, and on the occurrence of work-related symptoms.

Some advantages and disadvantages of questionnaire-based surveys:

**Advantages**

- contents flexible, can be tailored to address issues of current interest
- based on a representative sample of population
- repeated data collection and production (rather continuous)
- comparability rather good across countries, if questions and methods similar
- sensitive to changes in working conditions
- rather rapid and inexpensive to carry out

**Disadvantages**

- based on subjective perception of working conditions (indirect nature of information)
- validity of questions may be unknown
- questions may be imprecise and variably understood by respondents (imprecision) and results difficult to interpret
- sensitive to context (e.g., economic recession may influence responding)

**An example: Second European Survey of Working Conditions (ESWC)**

The European Foundation for the Improvement of Living and Working Conditions has conducted EU-wide surveys on working conditions in 1991, 1996 and 2000 (ESWC 1997). These surveys produced harmonised and original data on situations and trends in the European Union.

Although the ESWC survey questions were uniform and the data were collected in a similar fashion in every country, comparability of the results was not good for each question. Linguistic issues and responding culture may have influenced the comparability across countries.

The questions in ESWC were developed partly on the basis of questions used in Nordic surveys. The validity of Nordic questions has been comprehensively tested in Sweden (Wikman 1991). The answers of workers to survey questions were compared to the actual conditions at work places. The conclusion of the study was that valid questions are simple and based on observations on the work environment or on physical reactions. If the question includes concepts which can be interpreted in different ways by the respondents, it is advisable to illustrate them with examples (e.g., noise, cold, heat, heavy lifting) or to show pictures (e.g., difficult positions). The response scales should also be as specific as possible. For example, it is better to ask for a proportion of time exposed than for a simple answer ‘yes/no’, or ‘always/often/rarely/never’.

ESWC data have been used to construct indicators for the work environment in the member states of EU (Dhondt and Houtman 1997). Most of the EU countries have carried out also their own national surveys, but their methodologies differ so much that the results are not comparable across countries. The long preparatory work on ESWC questions including relevance and validity considerations and the same methods used to collect data in all countries makes ESWC a preferable source for indicator data.

### *2.3.3 Expert assessment systems*

When administrative sources and questionnaire-based surveys fail to provide reliable information on the prevalence of exposure or on the occurrence of a health outcome, an expert assessment project can be a feasible approach. Such an approach has proven to be useful when estimating specific chemical exposures, which are too numerous to be inquired in questionnaires and difficult to identify by the respondents. The idea is that one expert or a team of experts familiar with national exposure patterns and workforce characteristics estimates the numbers of exposed persons (and their exposure levels) for a country.

Some advantages and disadvantages of expert assessment systems:

**Advantages**

- based on uniform definitions and methodology
- systematic, can be extended to issues and countries where data are missing or unreliable
- comparability rather good across countries
- rather rapid and inexpensive to carry out

**Disadvantages**

- definitions may be difficult to follow in practice
- based partly on degree of knowledge and subjective views of experts
- validity of results may remain unknown

**An example: International information system on occupational exposure to carcinogens (CAREX)**

CAREX is an international information system on occupational exposure to known and suspected carcinogens (Kauppinen et al. 2000).

*2.3.4 Observational surveys*

Observational surveys at the national level are rare. They are usually very extensive because the variability of working conditions requires large numbers of work places to be studied to allow generalisations on the whole labour force. Therefore they also require a substantial amount of organisation, expert work and travelling. Their strength is thought to be the reliability of the results because they are based on observations and data interpreted by experts.

Some advantages and disadvantages of observational surveys:

**Advantages**

- based on uniform definitions and methodology
- systematic, based on a representative sample
- based on observations of experts and visits to actual workplaces (reliability)

**Disadvantages**

- conceptual definitions may be difficult to apply in practice
- based partly on subjective observations
- validity may remain unknown
- exposure levels difficult to assess
- comparability poor across countries
- slow and very expensive to carry out

**An example: National Occupational Exposure Survey (NOES)**

The National Occupational Exposure Survey (NOES) was conducted by the US National Institute for Occupational Safety and Health. NOES was a nation-wide observational survey conducted in a sample of 4,490 establishments in 1981-83 (Seta et al. 1988, Greife et al. 1995).

## 3. Proposed core set of OSH indicators (Rantanen et al. 2000)

The ideal properties of a good core set of indicators of OHS are the following:

— consistency (indicators well-defined, valid and comparable)

— non-redundancy (each indicator addresses a different issue)

— comprehensiveness (indicators cover all relevant areas of OHS)

— parsimoniousness (indicators are as simple as possible, and not too many).

The selection of proposed core indicators is presented in Table 1. They are considered relevant for OHS, and many of them address high priority issues predominantly in industrialised countries. Their validity is generally good in the defined form, and most of them provide rather comparable data across countries. Comparability is a serious problem for the indicator on occupational diseases, and problematic for indicators on prerequisites of OHS (except ILO ratifications), pesticide consumption and work accidents. The set was also planned to be non-redundant and parsimonious. The set contains only simple (non-composite) indicators and is limited

to 16 key indicators. It was decided to avoid composite indicators because they require complete data on component indicators which are usually not available, and judgement on the weights of component indicators which is subjective and therefore debatable. The set therefore became incomprehensive. By selecting only the most relevant simple indicator from one area (e.g., high level noise to represent physical agents), the approach omits other indicators of the area which may be significant at the national level (e.g., cold, heat, etc.). Another implication of this approach is that countries can not be directly ranked by the overall state and performance of the OHS system according to this set of indicators. The ranking would require construction of an algorithm which summarises information (and lack of information) from different indicators into one index.

The core set proposed is just a crude comparative tool to evaluate the state of OHS in a country/region in regard to other countries/regions. Therefore more detailed indicator sets and surveillance methods should be used at the national/regional/provincial level to identify risks and problems in OHS aiming at effective prevention of adverse health outcomes and improvement of the health of workers. Therefore also the construction of more comprehensive country profiles including essential descriptions and indicator data is highly recommended.

***Table 1. Recommended national core indicators on OHS (Rantanen et al. 2000)***

| |
|---|
| **Occupational Safety and Health System** |
| Ratification of ILO OHS conventions (% of conventions) |
| Human resources in labour safety inspection (inspectors/ 1000 employed) |
| Human resources in labour safety at workplaces (safety representatives and managers/ 1000 employed) |
| Human resources in occupational health services (physicians and nurses/ 1000 employed) |
| Coverage of occupational health services (% of the employed) |
| **Working Conditions** |
| High-level noise (% of employed) |
| Handling dangerous substances (% of employed) |
| Asbestos consumption (kg/capita/y) |
| Pesticide consumption (kg/agricultural worker/y) |
| Heavy loads (% of employed) |
| Working at very high speed (% of employed) |
| Working at least 50h/week (% of employed) |
| **Occupational Health and Safety Outcomes** |
| Fatal work accidents |
| Work accidents |
| Occupational diseases (incomparable across countries) |
| Perceived work ability (0-10 scale) |

The analysis and proposal on core indicators is preliminary by nature. The feasibility of this indicator set and approach is unknown apart from Finland which was used as a test country in the project.

The proposed set of key indicators should first be discussed and, if appropriate, modified by interested parties. The next step could be testing of the feasibility of the core set of OHS indicators in some countries. The piloting could take place for example in one EU country, in one EU candidate country, in one newly industrialised country, and possibly in one developing country (Rantanen et al. 2000).

It is already known that the availability of indicator data varies from very good to very limited. The aim was to include relevant and valid indicators, for which data are either available, or can be made available with reasonable effort. A substantial part of the missing data can be collected by adding a simple question in national questionnaire-based surveys. This may be rather easy in countries where questionnaire-based surveys are established, but difficult in countries without a tradition and sufficient infrastructure for carrying out such surveys. Another major approach to collect missing data is expert assessment. This method requires a team of experts which plans a suitable estimation procedure and contacts national focal points which can provide national in-

formation needed in the estimation. National experts can also check the results of the estimation, modify them, and interpret them together with the international expert team. Expert assessment projects could be organised, e.g., by WHO/EURO, EU/Bilbao, EU/Dublin, WHO or ILO which all have networks of national focal points (Rantanen et al. 2000).

If piloting and evaluation suggest that this kind indicator set is useful and feasible, the project could continue by construction of an international database, data collection for indicators from focal points, expert assessment efforts to generate missing data, organisation of questionnaire-based surveys in selected countries, and reporting and dissemination of information through the Internet.

## 4. Concluding remarks on Occupational Diseases as an indicator of OSH

It would be difficult to imagine a core set of indicators of OSH, which did not include some data on occupational diseases. This is the reason why, despite of problems of comparability across countries, incidence of occupational diseases was included in the set described in this presentation.

Overall, many of the proposed indicators are perhaps not sensitive enough to detect relevant differences in the state of OHS in time or across countries for member states of the European Union. This is probably true also for occupational diseases. Most member states collect more detailed information on diagnosis, causative factor, occupation, industry and severity of occupational diseases. A detailed data collection procedure and the test of its feasibility has already been planned for the next phase of the EODS pilot project (Eurostat 2000).

The experiences from the European Surveys of Working Conditions (ESWC) were already found useful in the preparation of the draft indicator set described in this presentation and some of the questions used in these surveys were adopted as such. It is also very likely that experiences from past and future EODS and ESAW efforts will simlarily provide helpful information for the future development of indicator sets for OSH.

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# HEALTH AND SAFETY AT WORK - EU STATISTICS

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By way of introduction, I would like to give you a brief overview of our Institute and its role in the system of prevention in France.

The National Research and Safety Institute, or INRS, was founded at the same time as Social Security, in 1947, as part of the branch responsible for insurance against accidents at work and occupational diseases.

It is part of the French system of prevention, which is divided into two branches:

- The first branch is accountable to the Ministry of Labour, and includes the Industrial Relations Directorate (DRT), the Labour Inspectorate, and the protection of occupational health;
- the second is Social Security.

The INRS belongs to this second branch, which also includes the National Sickness Insurance Fund (CNAM), Eurogip, the risk prevention services of the 16 Regional Sickness Insurance Funds (CRAM) and the four General Social Security Funds (*Caisses Générales de Sécurité Sociale)*, and 16 measurement laboratories. All of these bodies are valued partners in the INRS's work with enterprises.

The INRS has 650 staff, who carry out two main tasks:

— assisting operators in the field in finding solutions to the prevention problems they face;

— anticipating future prevention needs by building up new knowledge through the transformation of current knowledge into practical know-how.

It is active in four main areas:

— studies and research;

— medical and technical assistance;

— training;

— information.

In its various activities, the INRS uses a large number of figures, statistics and national surveys. One of the sources of these to which it often turns is the National Sickness Insurance Fund for Employed Persons (CNAMTS). This fund publishes annual and quarterly statistics on accidents at work and occupational diseases.

Before continuing, I would like to congratulate those responsible on the work they have done in the past, and that they continue to carry out today.

Despite the fact that the European Union is made up of countries with vastly differing cultures and regulations in our field, ESAW (European Statistics on Accidents at Work) manages to provide us with harmonised data that is almost directly comparable. I think this is extremely impressive.

**I would like to begin by explaining why we find this kind of data so useful.**

Although this was mentioned during our discussions on Theme One, I would like to review what these statistics provide and how they are used, as well as the difficulties in interpreting them which persist.

**I would then like to move on to how they might develop in future.**

**The usefulness of these data is undeniable.**

They allow us to track trends, but, what is more, as they become more sophisticated, they enable us to follow up new areas for research and they provide support for approached chosen on the basis of national statistics.

- Firstly, European statistics on accidents at work allow us to *monitor the evolution of and trends concerning safety at work,* not only at the national level, as previously, but for the whole European Union.

Thus, if the decrease over time in the number of work-related deaths appears to be representative of positive developments in overall conditions, it is interesting to be able to look at certain trends in greater detail – and compare them across countries. Nowadays simply making the overall observation that the number of work-related deaths is down is not enough. One must determine how much of this can be attributed to prevention and how much is due to, for example, changes in the economic structure and technological progress. One must determine which sectors and types of enterprises future prevention should focus on. This can only be achieved by comparing statistical information – no longer only that on accidents at work and occupational diseases, but also that on the economy, working conditions and their evolution, public health, etc.

- This is equally true for less serious accidents, which, on the other hand, have seen a worrying increase. It therefore looks as though, following a decrease in certain types of accidents, the number of such accidents once again begins to rise. This upswing then leads us *to reflect on and search for the root causes*. For example, is it due to increased pressure on employees or a more dynamic labour market? Is the same trend present in each of the countries of Europe, and does it have the same causes? This is where the European surveys on working conditions carried out by European Foundation for the improvement of Living and Working Conditions come into their own.
- These European figures also help us to address major national concerns and *provide us with the justification, in a manner of speaking, for action on prevention within enterprises.*

For example, in France – and across Europe – a major concern is prevention in small and medium-sized enterprises. The INRS has been studying and taking action in this area for years. Being able to relate our statistical arguments to a larger community provides us with additional elements that can help us earn our various partners' confidence - including that of business partners.

Another example is that of traffic accidents while travelling on business. This is the largest single cause of fatal accidents at work in France. Eliminating traffic risk as an occupational hazard is no easy matter. Firstly, enterprises themselves find it hard to grasp this risk, and, secondly, a large number of players, including the public authorities, are involved. The figures for Europe show that such accidents make up a third of fatal accidents at work, thus confirming the general importance of the phenomenon. *These are arguments which must be put to our partners.* At the same time, they emphasise that the situation in France is particularly serious, as such accidents make up 40% of fatal accidents there. We thus return to the subject of local particularities and the need to develop more detailed studies.

**I will now turn to the vast subject of future developments of European statistics and the complex problems which we will have to face.**

I will now describe the difficulties in comparing and accessing the national data systems on occupational diseases and in harmonising data collection and medical criteria.

- The statistics take into account the structure of industry in each country, which makes it possible to obtain standardised incidence rates. However, this impressive work, which is carried out at European level, is, of course, limited by the quality of the data collected in each of the countries and by our ability to place these statistics in a more general societal context.

For example, if we look at situation concerning traffic described above, the traffic accident rates while travelling on business for the various countries cannot be compared without looking at the overall situation for traffic accidents together with the policies on traffic accident prevention and their results. And this need for additional information, or rather, since in most cases this information already exists, the need to make information more accessible and comparable is the first point I would like to emphasise with regard to the future development of European statistics.

By way of illustration, I would like to give a second example: viral hepatitis. The work-related incidence rates cannot be compared without being weighed against the incidence rates and prevalence in the general population, and without taking into account the policies on vaccination against hepatitis B which apply to both the general population and to those working in high-risk sectors.

So, if the work-related incidence rate of viral hepatitis in France appears to be one of the lowest in Europe according to the evaluation of the 1995 pilot data carried out by the Finnish Institute of Occupational Health, is it safe to conclude that a policy of compulsory vaccination is better?

This problem of interpreting statistics and their evolution rears its head wherever the incidence of occupational infectious diseases must be placed in the context of the local health situation for both humans and animals (with regard to the risk of zoonosis).

The case of viral hepatitis leads me to the subject of statistics on occupational diseases in general. This is a particularly difficult field. We should be proud of the fact that, despite the difficulties, we have achieved the essential first step: we have managed to draw up a European list of diseases which can be recognised as occupational in nature in all European countries. However, the problem of the comparability of data from widely-differing systems remains, whether with regard to the data collected, the declarations made (and who makes them, as a different approach is required for the employee in question and for the doctor) or the principles of recognition. An additional difficulty is that, unlike statistics on accidents at work, which are relatively seriated since accidents are sudden, independent events which are relatively easy to keep track of, thus enabling us to provide reliable statistics (especially since the European system has been harmonised), occupational diseases are altogether more complex. This is particularly the case because the origins of these diseases are often insidious, and the symptoms may only appear after a considerable length of time. All of these difficulties were highlighted by the evaluation of the 1995 EODS pilot data and the comparative study of reporting procedures and conditions, recognition and compensation for occupational diseases in 13 countries of Europe, which was coordinated by Eurogip as part of the European Forum. The contribution made by this study was that it compensated for the differences between the various national systems, and was thus able to analyse them.

In the field of occupational diseases, with regard to known and identifiable risks, i.e. measurable physical risks such as noise, an analysis of the data on occupational deafness allows us to effectively monitor the improvement in working conditions brought about by the advent of quieter systems and the use of general protective equipment such as acoustic enclosures or personal protective equipment. In practice, this reveals a causal relationship between exposure to industrial noise and deafness. The data provides us with an effective indication of approaches to prevention which should be taken. This field of measurable physical risk is probably where one may hope that the data available will become more easily comparable.

However, in this example, as in many others, the data on occupational diseases reflect not only the incidence of these diseases, but also the way in which they have been incorporated into the system of recognition and compensation. One then comes face to face with difficulties related to the fact that the disease is defined according to a national medicolegal framework and that declaration and recognition is intertwined with the economic and social consequences, both for society and the individual.

- This brings me to the second point I would like to discuss on future developments in statistics, more specifically *the harmonisation of the collection of data and medical criteria.*

There should be a harmonised collection system. It should use precise definitions of illnesses based on standardised diagnostic criteria. It should be divorced from any financial considerations concerning compensation and independent of any social negotiations. As this is not the case, comparing statistics on occupational deafness, for example, requires thorough knowledge of the recognition criteria used. The same is true for musculo-skeletal disorders and many other diseases – not to forget the additional problem of under-reporting, which is a major concern in most European countries.

Even more than for accidents at work, developing a more efficient European system can only be done if an effort is made to harmonise medical criteria and the collection of data. The quality of European statistics is determined by the quality of data collection and the consistency of that data both within and between these countries. This brings us back to the analysis of weaknesses in our national systems, and to the efforts that must be made and the development that is needed to improve them. Pushing the harmonisation of the definitions and diagnostic criteria of the diseases implies that *consensus meetings be held*, both at national and European level. At least two things need to be done to improve data collection. The national systems must be developed in such a way as to allow applications for the recognition of a disease to be dissociated from reporting that disease – as is already the case in Denmark, for example – so that the victim is not deprived of his right to choose whether he would like to have his disease recognised. This implies that doctors – particularly family doctors – should be made more aware of the value of taking occupational diseases into account, receive more training on the subject and have the relevant information made accessible to them so that they will be able to advise their patients properly. In France, for example, at the request of the CNAMTS, the INRS has spearheaded such an approach by producing a guide to accessing the tables on occupational diseases which is available on the Internet.

Improving the collection of data and the quality of the data on all occupational diseases is a long and complex undertaking. For the short-term, it might be wise to limit our ambitions to *zooming in on certain professional areas* (new information technologies, and, considering recent events, the meat sector), *certain kinds of risk* (stress, biological risk, etc.) or *certain diseases* which are cause for particular concern (musculo-skeletal disorders, such as backache, certain allergies, etc.). If such studies were carried out on a Community-wide basis, they would have the additional advantage of providing information on the feasibility of optimising the collection of data on occupational diseases before undertaking more wide-ranging action.

- Still on the subject of occupational diseases, *I would like to speak to you about anticipating risk* with regard to two areas: occupational cancers and emerging diseases and risks.

It is, of course, interesting to monitor statistics on occupational cancers, even if it is agreed that they are underreported. However, it is important to be aware that, by doing so, we are looking at the past, as there is a considerable lag before these cancers appear. Therefore, in this field, it is essential that studies try to look into the future, stringent monitoring be carried out, and tough preventive measures be put into place.

As for emerging risks and diseases, we know that statistics on occupational diseases do not enable us to identify new health risks. At most, they allow us to highlight increases in a certain type of risk, as was the case for musculo-skeletal disorders in several European countries. This makes it clear how important it is to set up systems to monitor and anticipate occupational risks.

As a research institute, we are always looking for ways to **push the envelope of the research plan** in order to add elements that meet the needs of the world of work. This poses problems of strategy and of choice. There are too few of us to cover all the fields of occupational risk, and figures for Europe help clarify data that is not necessarily available in France. Such clarification can, for example, guide us towards making better choices in the research strategies we adopt. But, if the work is looking far into the future and examining systems whose risks are not even suspected, statistics cannot meet this need. *Surveys on living and working conditions are better able to provide us with indicators*.

In such conditions, only studies which look at new technologies and new ways of organising could potentially detect the new risks as well as highlighting sensitive data that may hint at risks which are not yet detectable, but which can be envisaged. Taking such a direction could be extremely useful, particularly in the field of research. If we intend to increase forward-looking work on prevention, we need to find a metric that allows us to raise the alarm on emerging risks. Our colleague Jorma Rantanen in Finland did exactly that a few years ago, when he looked at the evolution of a disease related to a new working environment – that of musculo-skeletal disorders. Through his contacts with the Ministry for Labour and some doctors, he was able to assess the appearance of an emerging phenomenon rapidly – with rough figures included as a guide. This allowed him to take action on research and prevention.

*If monitoring (or even an observatory or network of observatories) of emerging risks were to be set up*, it could be an early opportunity to detect harmful effects on operators and could lead to various proposals. The monitoring might take the form of information being provided on, for example, “reporting forms” filled out by busi-

ness partners and others, such as occupational physicians, social welfare bodies, the Labour Inspectorate, etc.. Such an information network should also be able to distinguish between “weak” and “strong” signals, i.e. those which have a high profile in the media and can lead to the wrong choice being made. From these snapshots and the general context, the monitoring could alert us to the emergence of new problems that should be investigated. Hypotheses concerning them should then be formulated, and from these, we would be able to determine what action should be taken in future. It is here that statistics would prove their usefulness. There would be a great benefit in working in such a network, which linked monitoring structures, expert opinion and consensus meetings, and was truly European. But it is obvious that, as a bare minimum, such an approach would require all the European players concerned to come to an agreement. Doubtless the creation of such a network, perhaps with European Union support, would bring to light situations which required further research. In this way, thanks to figures and quantification, we would be able to improve quality for the greater benefit of the working world.

# THE 18-TON MAN (AND WOMAN) – A TRUE RECORD!

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Thank you for the invitation to speak at this seminar, which offers the opportunity of exposing the current state of health and safety at work, the hazards related to it and possible impacts on social politics, based on reliable statistics.

Coming from Austria and being an orthopaedic surgeon by profession as well as consultant occupational hygienist for the Austrian Chamber of Labour, I'll focus on the current situation of work related muscular-skeletal disorders, its management and its principal causes, leading to sickness, loss of production force and a considerable number of work-related accidents.

According to the Austrian General Accident Insurance Board (AUVA) the cost of every work-related accident affecting the respective company amounts to app. 27.000,— ATS, totalling 3,47 bn ATS in 1999 for 128.643 accidents. (4,4 bn for 164.469 accidents in 1994). Over the five-year period, the number of accidents has steadily declined, 132.719 in all, compared to the 1994 basic figure, saving 3,6 bn ATS in cost, thereby considerably increasing the competitiveness of Austrian enterprises.

On the other hand, the total number of muscular-skeletal disorders requiring medical treatment has continually risen over a nine-year period (1990-1998). In 1990 143.000 patients had hospital care for that reason, compared to 212.000 in 1998, on the average for 11,5 days. In 1999 452.000 were on sickness leave on account of muscular-skeletal disorders (MSD) – 18,6 days per person- out of a total 3,170.000 work force (14,25%). In 1990, the respective figures were 337.000 of 2,908.000 (11,59%). Pensions on account of reduced or total disability to work covered by social insurance schemes in 1999 show a 41,6 % portion for MSD`S (191.000 of 460.000).

Data from the Austrian microcensus in June 1994 and June 1999 show an increase of various health hazards at the workplace, closely related to the increased possibility of work accidents. Of 3,7 million employees, 2 millions (54%) complained about work under time stress, 1,3 million (35%) about heavy and/or inadequate physical strain, and 30% worried about discomfort resulting from continuous computer work. Only 7% had no substantial complaint.

Time stress at the work place is the leading hazard for both sexes: 58,5% male and 47.7% female employees complain about it. Blue and white collar workers alike list time stress in the first place among typical work place health hazards; the former fear increased possibility of accidents and injuries, the latter increased pressure for concentrated work, quite often resulting in static overload of various muscles, notably the cervical and thoracic spine muscles and the muscles of the shoulder and the forearm. Consequently it is a common fact that people beyond the age of 40, working in a `sitting` profession, regularly present a pathological posture and highly degenerative signs in their cervical x-ray, due to continuous and forced forward inclination.

Today, disc damages as a result of lifting and carrying heavy loads are quite familiar already at the age of 35-40. Long ago Swedish researchers have proved the excessive strain on lumbar discs with consequent injuries, including slipping discs, due to high pressures caused by too heavy loads and unphysiological lifting procedures.

To give a practical example from the medical point of view, how the combination of time stress and physical strain in handling loads can lead to chronic muscular overburdening, I would now like to draw your attention to a `Provisional European Norm 1005/1-4 of 1998`considering `Human physical performance in manual handling of machinery and component parts of machinery`, thereby standardizing the Council Directive of May 29th 1990 (90/269/EEC) `on the minimum health and safety requirements for the manual handling of loads where there is a risk particularly of back injury to workers`. It states that:

`Manual handling of loads at high frequencies for long durations and/or in awkward postures can lead to a high risk of injury to the musculoskeletal system. Disorders of the musculoskeletal system are of a common occurrence throughout Europe. Manually applied effort is often required by operators working with machines for their intended purpose. Risks exist if the design of the machinery is not in accordance with ergonomic design principles. When designing and constructing machinery where manual handling is required, this standard provides relevant data for working posture, load, frequency and duration. The design criteria given in this standard can be used by designers when making risk assessments.`

The following risk assessment model involves 3 methods; they have the same basis but are employed at different risk levels. All three are based on the assumption that for 85 % of the adult working population a mass constant 25 kg (i.e. the maximum load under optimal circumstances) may be recommended. Actual weight limits could then be set on condition that all of the following criteria are met:

x) moderate ambient thermal environment

x) two-handed operation only

x) unrestricted standing posture

x) handling by one person only

x) smooth lifting

x) goodcoupling between the hands and the objects handled

x) goodcoupling between feet and floor

x) manual handling activities, other than lifting, are minimal

x) the objects to be lifted are not very cold, hot or contaminated

If one or more of these items does not apply, method No 2 is recommended, which uses estimation tables. If all requirements are met, the total weight to be handled by a person (regardless of sex, age, skill, daytime, training situation, physical constitution or other (!) ) within an 8-hour shift is determined by means of three critical variables:

1) critical mass

2) critical vertical displacement

3) critical frequency

ad 1) the critical mass (maximum load to be handled) must not exceed 70 % of the mass constant (25 kg) = 17,5 kg, provided

that:

x) the vertical displacement (lifting distance between hip and shoulder) does not exceed 25 cm

x) the object can be handled in an upright, not twisted position

x) the object can be held close to the body axe

x) the frequency is not more then 1 per 5 minutes.

The resulting daily load is 1680 kg.

ad 2) the critical vertical mass displacement may exceed 25 cm but must stay within knee and shoulder, provided that:

x) the load is not more than 60 % of the mass constant (Mc) = 15 kg

x) all other criteria are the same as under 1)

The resulting daily load is 1440 kg.

ad 3) If the load is limited to 30 % of Mc = 7,5 kg or 12,5 kg alternatively and all other criteria are the same as under 1) then the frequency may be altered in the following way:

7,5 kg. may be lifted every 12 seconds throughout an eight hour shift, 5 days a week. This amounts to a daily total of

18 000 kg. (18 tons)

Alternatively, 12,5 kg may be lifted every 24 seconds totalling 15 000 kg. (15 tons) per day.

If one or more of the afore mentioned criteria regarding thermal environment, standing posture, handling process etc. are not met, the above method of weight assessment by critical variables is replaced by weight estimation using estimation tables (method 2) or by calculation, using a formula where all variables enter in order to limit the maximum weight at a lower level.

The resulting Risk Index may vary between 0,85 and 1,0, meaning that even if one or more of the original risk assessment criteria are not met, the daily work load may still reach 15.300 kg at the 7,5 kg – level or 12.750 kg at the 12,5 kg-level. The Austrian Trade Union Federation together with the Federal Chamber of Labour has qualified such work loads as inhuman and not tolerable and has expressed strong criticism. In the meantime several amendments and changes have been worked out, among them a reassessment study by the Austrian Chamber of Commerce (WKÖ) and a comprehensive study by the Austrian Central Work Inspectorate (ZAI), a Vienna based Federal Authority, overseeing and controlling the implementation of the complex legislation on health and safety at work. Both studies aim at adapting the individual weight limit to gender differences, age, biological parameters such as static muscular load limits and other criteria. It remains to be seen, whether human aspects may be set against a too technologically minded concept of physical strain on man (and woman).

What has all this to do with statistics?

I think that a concise, empirical and statistically proof exposure and listing up of all possible health hazards related to the above mentioned problem of weight lifting at work can and will contribute to a better understanding of what hard and heavy work load really is, even by those who are not so much affected by it.

# SUMMING UP

*by Luigi Frey*

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This summing up is not yet the official CEIES conclusion, but it contains some reflections and preliminary suggestions which will first be proposed to the members of the CEIES Subcommittee on Social Statistics and after the necessary corrections, to the CEIES plenary meeting for adoption.

These observations are prepared with the decisive contribution of two very active members of the Subcommittee, Margit Epler and Ineke Stoop.

## A) Current Situation

Health and Safety at Work is an important subject in the light of the Lisbon Summit and of social policy strategies in the European Union for the next decade.

As Mr Lamel remarked at the opening of this seminar, these strategies require statistics and indicators in the field. Mr Skaliotis described tasks of European Statistics in that area, namely the provision of harmonised quantitative information on work-related accidents and diseases for monitoring purposes, policy-making and policy evaluation and, of course, prevention. Several speakers, for example Mr Alonso Arenal and Ms Koukoulaki, referred to the background from which these data needs arise: a rapid transformation of labour markets and their changing structure, changing working patterns (more flexible work and reduced time temporary work), participation of new groups in the labour market (more women, immigrants, aged people) and the recognition of new types of illnesses and disabilities such as RSI, stress and new kinds of mental disability.

Some statistical information on health and safety at work is already available based on surveys or administrative registers and files. The producers at European level (Mr Dupré, Mr Paoli and Ms Rückert) and at national level (Mr Alonso Arenal, Ms Eklund, Mr Hodgson, Mr Karjalainen and Mr Dyreborg) informed us about the characteristics, methodological aspects and problems of those sources.

Briefly summarising these sources, there are:

— ESAW = the European Statistics on Accidents at Work;

— EODS = the budding European Occupational Diseases Statistics;

— the ad hoc module in the European Labour Force Survey 1999;

— the European Survey on Working Conditions from our host, the Dublin Foundation;

— the integrative information framework, built up by the European Agency Safety and Health at Work /localised at Bilbao); and

— several national data sources: surveys and administrative registers.

These sources offer different types of data, direct and indirect, quantitative and qualitative, objective and subjective, on exposure and outcome, provided by workers and by experts. All these types of data may be required and can complement each other.

In the discussion on the deficiencies and weaknesses of available data, firstly *timeliness* of statistics was mentioned. Mr Dupré announced that the speed of delivery will be improved. Mr Fuente Martin urged to deliver provisional data or estimates if final figures are not yet available.

Secondly, data quality should be considered as a major information problem. Several speakers underlined that data quality is threatened by different types of errors, such as sampling errors, which was mentioned by Mr Paoli. Other speakers underlined low response rates, which may lead to important bias, especially in the case of small samples, and coverage errors and limits. Incomplete coverage of the self-employed, a number of sectors and particular (i.e. road) accidents make statistics different to compare. The most outspread type of error however, is the measurement error. Mr Hodgson, Mr Stamm and Mr Larsen stressed the importance of clarity of concepts and definitions before measuring. Mr Grieco made similar remarks, mentioning the problem of a current definition of 'accident'. Differences between insurance systems make cross-national comparisons of the incidence of accidents difficult. As Mr Stamm noted, the data correction process of Eurostat has not fully succeeded in removing the institutional differences. Others, amongst whom Mr Paoli, mentioned improbable results with respect to the incidence of bullying in different countries.

These differences may be rather due to general attitudes, values and discussions in the media (and public opinion in general), than to occurrencies at the working place. So, comparability is a big issue, but, as Mr Hodgson said, sometimes situations cannot be compared. However, we can look at trends and ignore cross-national differences. But, as Mr Skaliotis remarked, if you do not compare national (or regional) figures, others will do so and with probably less competence. Moreover, to interpret results of cross national (cross regional) comparisons, adequate documentation is indispensable.

In this context, Mr Grieco maintains that focus must be put on groups of exposed subjects rather than on groups of cases.

Thirdly, the problem emerges of disaggregation of social and institutional groups, which cannot be solved by using sample techniques alone, but by using complementary information from administrative registers and files intensively.

Many speakers stressed the importance of looking at health and safety at work in depth, while considering different subgroups of population, the more if we want to evaluate *prevention procedures, causes and circumstances of accidents and diseases*. As Mr Grieco and Ms Koukoulaki mentioned, an accident is not an isolated event, but it is part of a process, where we have to take prevention measures into account. On the other hand, for good statistics, a knowledge of causes and circumstances is required, whereas researchers on the subject need data to monitor and evaluate policies and prevention programmes.

## B) Future Perspectives

Looking at the future, we have to stress again that the process activated by the Lisbon agreements will push the European Union to be a competitive and dynamic, knowledge based global economic area in which sustainable economic growth with more and better jobs and greater social cohesion will be pursued.

Under these perspectives we have to formulate all future statistical needs, including those in the field of health and safety at work.

One of the outcomes of the seminar is that the quality of existing tools must be improved. The consolidation of ESAW and EODS is inevitable to speed up the availability of data which are very important for political and institutional actions. Estimation tools have to be implemented.

As I mentioned before, many speakers in the seminar urged the need for better comparable data. This implies that definitions, concepts, methods, and mainly national reporting systems should be improved.

Another outcome of the seminar (stressed for example by Laursen, Karjalainen, Marie, Donner, and Marques) was the need to have new tools. Principally, the expected rapid changes of working conditions and growing flexibility in labour markets ask for new tools and cross-sectional analyses of statistics on health and safety at work

and other important statistics, like for instance, education statistics. We need tools that allow the analysis of socio-economic causes: this means that combining and linking-up different information are needed. New tools would have to be developed to get information on the risk perception and the exposure to accidents and occupational diseases; needed to improve research oriented to effective prevention policies. The opportunity of improvements in the field of indicators has been considered evident. Some speakers stressed the importance of indicators of health status and more generally on quality of life, as well as the need for indicators on the working environment.

These observations and proposals are useful for formulating some suggestions deriving from the precious occasion as such seminars where users and producers of statistics meet and collaborate.

## C) Suggestions

The seminar resulted in the following suggestions:

1) to implement and consolidate ESAW on the basis of the methodology developed in 2001 and the programmed third phase by Eurostat, and EODS. This means an extensive collaboration between national statistical institutes or rather national statistical systems, including institutions which collect administrative data. This also means that Eurostat should make an effort to improve the coverage, the comparability, the timeliness and the dissemination of data. Full comparability may be a very difficult goal, which makes the availability of meta-data even more important. Therefore, the seminar suggests a stricter co-operation (also in terms of frequent and critical use of Eurostat data bases) between research institutes and Eurostat;
2) to valorise the coordination and information collected at European level by Eurostat and other European agencies, like the Dublin Foundation and its European Survey on Working Conditions and the Agency for Safety and Health at Work of Bilbao. It is necessary to move towards a more integrated European system of quantitative and qualitative information on health and safety aspects of the changing working environment;
3) to valorise the potential contribution of LFS to this European system, analysing and discussing in depth, perhaps in the next Eurostat Task Force meeting on the adjustment of the LFS variables in June, the significance and the limits of the 1999 experience. Suggestions should also be made to improve the general quality of the LFS in terms of core questionnaires and the possibility of new recurrent ad hoc modules on working conditions and health and safety at work;
4) to progressively build up an harmonised/integrated system of European social statistics in which statistics on health and safety at work will be analysed jointly with labour/education and training/health statistics. Such a system will provide an increasing possibility to obtain cross structural and behavioural information from households and individuals about work and well-being;
5) to open the possibility of collecting information from work-based surveys at a European level. At the moment, the problems of direct and indirect costs for surveys borne by enterprises appears an important constraint. However, in the near future, it will become necessary to integrate information from households and both social and economic information from the productive units, as resulted already from the CEIES seminar on labour cost and wages statistics in London (1997). The need to incorporate information on costs caused by lacking prevention (Mr Grieco) and to link together productivity and labour intensity (Mr Paoli) is an important stimulus not to forget this probable future development.

Mr Chairman, ladies and gentlemen, we will bring these observations and suggestions to the CEIES Plenary meeting and afterwards to a wider community of users of quantitative and qualitative information.

I would like to thank the Dublin Foundation, the Irish Central Statistical Office, the Secretariat of CEIES (Mrs Nollen and Mrs Lauwerijs), Eurostat, the speakers and the participants of 16 countries (of whom 2 candidate countries) who made this seminar a success.

# ATTENDANCE LIST

| | |
|---|---|
| **Eurostat** | CUBITT Roger<br>DUPRE Didier<br>LAUWERIJS Nicole<br>SKALIOTIS Michail |
| **CEIES** | LAMEL Joachim, Wirtschaftskammer Österreich<br>EPLER Margit, Chamber of Labour<br>FREY Luigi, University of Rome (La Sapienza)<br>GEARY Patrick, NUI MAYNOOTH<br>STOOP Ineke, Social and Cultural Planning Office<br>WILLOCH Ingrid, Østfold Fylkeskommune |
| **European Commission** | FUENTE MARTIN Angel, Employment and Social Affairs Directorate General |
| **Austria** | DONNER Martin, Bundesarbeitskamer Ostetzreich<br>KRYDA Eva, Allgemeine Unfallversicherungsnstalt |
| **Belgium** | CAROYER Jean-Marie, Fonds des Maladies Professionelles<br>DE BRUCQ Danielle, Ministere des Affairs Sociales, de la Sante Publique et de l'Environnement<br>IMBRECHTS Marc, ADM Arbeidsveiligheid<br>KOUKOULAKI Theoni, TUTB |
| **Denmark** | DYREBORG Johnny, Researcher<br>LAURSEN Peter, National Working Environment Authority |
| **Finland** | KARJALAINEN Antti, Finnish Institute of Occupational Health<br>PAANANEN Seppo, Statistics Finland<br>VÄNSKÄ Jukka, Statistics Finland |
| **France** | BASTIDE Jean-Claude, Institut national de Recherche et de Sécurité (INRS)<br>DAUBAS-LETOURNEUX Veronique, Universite Paris XIII<br>DELON Geraldine, Caisse des Dépôts et Consignations Secteur invalidité<br>GUIGNON Nicole, DARES Dept. CTRP Ministere de l'Emploi et de la Solidarite<br>MARIE Jean-Luc, Institut national de Recherche et de Sécurité (INRS)<br>MOREL Jean-Yves, Caisse des Dépôts et Consignations Secteur invalidité |

| | |
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| **Germany** | SCHLOWAK Kirsten, Bundesministerium fur Arbeit und Sozialordnung<br>STAMM Roger, Berufsgenossenschaftliches Institut fur Arbeitssicherheit – BIA |
| **Hungary** | PRUZSINSZKI Judit, Hungarian Central Statistical Office |
| **Ireland** | CUNNEEN Frank, National Statistical Board, Ireland<br>FEERICK Denise, Irish Business & Employers' Confederation<br>KOBAYASHI Yuki, Health and Safety Authority<br>PAOLI Pascal, European Foundation, Dublin<br>WOOD Sylvia, Health and Safety Authority |
| **Italy** | FANO Daniela, Clinica Del Lavoro Luigi Devoro, Milan University<br>FORZATO Giliola, I.N.A.I.L<br>FRASCHERI Cinzia, CISL<br>GRIECO Antonio, Milan University<br>LUCARELLI Carlo, ISTAT |
| **The Netherlands** | SMULDERS Peter, TNO Work & Employment |
| **Norway** | LOWER Hege, Directorate of Labour Inspection |
| **Portugal** | DE SOUSA FIALHO Jose Antonio, Ministry of Labour<br>MANUEL PIRES Fernando Marques, CGTP-IN<br>REBELO Maria Joao, DETEFP do MTS |
| **Romania** | PISICA Silvia, National Institute for Statistics and Economic Studies<br>PLUTEANU Carmen, Ministry of Labour and Social Solidarity |
| **Spain** | ALONSO ARENAL Florentino, Instituto Nacional de Seguridad e Higiene en el Trabajo<br>RÜCKERT Anette, European Agency for Safety and Health at Work |
| **Sweden** | BROBERG Elisabet, Swedish Work Environment Authority<br>EKLUND Inger, Statistics Sweden<br>FREDRIKSSON Kerstin, Statistics Sweden |
| **United Kingdom** | DUDMAN Jerry, Analytical Services Division<br>Dept. of Social Security<br>HODGSON John Timothy, Health and Safety Executive<br>STEVENS Graham, Health and Safety Executive |