European Foundation for the Improvement of Living and Working Conditions

Managing musculoskeletal disorders

This report is available in electronic format only.

Wyattville Road, Loughlinstown, Dublin 18, Ireland. - Tel: (+353 1) 204 31 00 - Fax: 282 42 09 / 282 64 56
e-mail: information@eurofound.europa.eu - website: www.eurofound.europa.eu

Work-related musculoskeletal disorders (MSDs) is the most widespread occupational-related illness in the EU. However, despite this prevalence, there have been few efforts to estimate the overall costs of the illness. Statistics on MSDs tend to underestimate the extent while failing to take the national situation and changing work context into account. Researchers agree that nowadays MSDs which are directly linked to strenuous working conditions are on the decline, while those related to stress and work overload are increasing. Organisational problems can be at the root of MSDs, and a participatory approach to prevention policies has found to be effective.

Definition and regulation of MSDs

Musculoskeletal disorders (MSDs) are characterised by pain and loss of physical function in the body, which limits a person's activities and restricts their participation in society. According to the definition (88Kb PDF) of the European Agency for Safety and Health at Work (OSHA), work-related MSDs cover a wide range of inflammatory and degenerative diseases of the body's musculoskeletal system. These include:

- inflammation of the tendons (tendonitis and tenosynovitis), notably in the wrists and forearms, elbows and shoulders, and in occupations involving prolonged periods of repetitive and static work;
- pain and functional impairment of the muscles (myalgia), occurring predominantly in the shoulder and neck regions, and in occupations involving static positions;
- nerve compression, or 'entrapment syndromes', occurring particularly in the wrist and forearm;
- degenerative disorders occurring in the spine, generally in the neck or lower back areas, particularly among workers involved in manual handling or heavy physical tasks – such disorders may occur in the hip or knee joints.

These diseases are chronic and their symptoms may appear after prolonged exposure to work-related risk factors, such as awkward postures, repetitive tasks, carrying heavy loads and applying force or pressure.

Despite extensive documentation, some controversy remains as to the true extent of MSDs. This may be related to difficulties in establishing specific diagnoses for many of these disorders: although MSDs often cannot be diagnosed with respect to a clinical pathology, they may still result in physical impairment and disability.

At the same time, many alternative definitions of work-related MSDs exist. Some of these definitions confine the domain of observation to a particular part of the body – for instance, work-related upper limb disorders; other definitions refer to the causes of such diseases – for example, repetitive strain injury (RSI), cumulative trauma disorder (CTD) or over-use disorders. Both 'disorders' and 'diseases' are used in this context, depending on the historical emergence of such diseases: some of the definitions stress the 'repetitive' risk factor, such as RSIs; others – such as CTDs or over-use disorders – underline the fact that 'work demands habitually exceed a worker's capacity to respond to these demands' (Putz-Anderson, 1988).

Sources at EU level agree that MSDs are the main occupational disease suffered by European workers. According to the European Occupational Diseases Statistics (EODS) (583Kb PDF) –managed by Eurostat , which collects data on occupational diseases as reported by national social security agencies – MSDs account for over 50% of occupational diseases. In addition, the European Labour Force Survey (LFS) 1999 ad hoc module on accidents at work and work-related health problems, also compiled by Eurostat, shows that MSDs represent more than 50% of serious work-related diseases (WRDs), with a prevalence rate of over 2.5% among employees – affecting the equivalent of more than four million employees. Some sectors show higher prevalence rates, namely health and social work (4.3%) and construction, transport and communication (3.2%). The 2007 ad hoc LFS module is being conducted in the second quarter of this year and will investigate work-related MSDs in more detail in relation to parts of the body affected and causal factors.

According to the 2005 Fourth European Working Conditions Survey (EWCS) , one in every four workers cites problems with backache, while 22.8% of workers claim to suffer from muscular pain in the shoulders and neck or in their upper and lower limbs. Some 4.3% more men than women report backache and 3.5% more men cite muscular pain, although job characteristics differ significantly. These figures are not comparable with previous surveys due to a change in the question framing. Results of the second EWCS (1995) and the third EWCS (2000) show comparable figures for backache only: the proportion of workers citing problems in this respect increased significantly from 28% of the 1995–1996 survey respondents to 33% of respondents in the 2000–2001 survey in the 15 EU Member States at the time (EU15). Conversely, a number of epidemiological studies have found that

women are at a higher risk of upper limb disorders, although workplace risk factors are generally found to be stronger than gender effects.

EU regulations and issues at stake

The health and safety at work framework directive – Council Directive 89/391/EEC – introduces general prevention principles applicable to all occupational risks. These aim to ensure a higher degree of protection for people at work through the implementation of preventive measures guarding against accidents at work and occupational diseases, and through the information, consultation, balanced participation and training of workers and their representatives. Article 6.2d of the directive states that the employer should take the necessary measures for 'adapting the work to the individual, especially as regards the design of workplaces, the choice of work equipment and the choice of working and production method, with the view, in particular, to alleviating monotonous work and work at a predetermined work-rate and to reducing their effect to health'.

EU directives

Other individual health and safety directives address risk factors for MSDs, namely:

- Council Directive 89/655/EEC , as amended by Council Directive 95/63/EC on minimum safety and health requirements for the use of work equipment by workers at work. Article 5a, under the heading 'Ergonomics and occupational health', states that 'the working posture and position of workers while using work equipment and ergonomic principles must be taken fully into account by the employer when applying minimum health and safety requirements';
- Council Directive 89/656/EEC on minimum safety and health requirements for the use of personal protective equipment (PPE) by workers states, in Article 4, that all PPE must 'correspond to existing conditions at the workplace' and that they must 'take account of ergonomic requirements and the worker's state of health';
- Council Directive 89/686/EEC on the approximation of the laws of the Member States relating to the PPE directive states that 'any impediment caused by PPE to movements to be made, postures to be adopted and sensory perception must be minimised; nor must PPE cause movements which endanger the user or other persons' (Article 1.2.1.3, Annex II);
- Council Directive 90/269/EEC on the minimum safety and health requirements for the manual handling of loads where there is a risk particularly of back injury to workers states that the 'employer should take appropriate organisational measures, or shall use the appropriate means, in particular mechanical equipment, in order to avoid the need for the manual handling of loads by workers' (Article 3.1);
- Council Directive 90/270/EEC on the minimum safety and health requirements for work with display screen equipment states that 'employers shall take appropriate measures to remedy the risks found, on the basis of the evaluation … taking account of the additional and/or combined effects of the risks so found' (Article 3.2), with specific reference to risk caused to eyesight, physical problems and problems of mental stress;
- Council Directive 92/57/EEC provides for specific provisions on the minimum safety and health requirements for work at temporary and mobile construction sites – an area of activity that exposes workers to particularly high levels of risk, with specific reference to the conditions under which various materials are handled (Article 8c);
- Council Directive 98/37/EC on the approximation of the laws of the Member States relating to machinery states that 'under the intended conditions of use, the discomfort, fatigue and psychological stress faced by the operator must be reduced to the minimum possible, taking ergonomic principles into account' (Article 1.2.1.3, Annex II);
- the annex of Council Directive 2001/45/EC concerning the use of work equipment provided for temporary work at a height states that 'if (it) cannot be carried out safely and under appropriate ergonomic conditions from a suitable surface, the work equipment most suitable to ensure and maintain safe working conditions must be selected' (Article 4.1.1, Annex);
- Council Directive 2002/44/EC on the minimum safety and health requirements regarding the exposure of workers to the risks arising from physical agents (vibration), states that 'it is considered necessary to introduce measures protecting workers from the risks arising from vibrations owing to their effects on the health and safety of workers, in particular muscular/bone structure, neurological and vascular disorders' (Point 3);
- Council Directive 93/104/EC concerning certain aspects of the organisation of working time, in relation to the minimum standards for weekly working time, rest, breaks and annual leave, relies on 'the general principle of adapting work to the worker, with a view, in particular, to alleviating monotonous work and work

at a predetermined work-rate, depending on the type of activity, and of safety and health requirements' (Article 15); this therefore includes MSDs.

The OSHA reports on Work-related neck and upper limb musculoskeletal disorders (444Kb PDF) and on Work-related low back disorders (450Kb PDF) concluded that the existing research could be used in the development of practical, preventive strategies and that there is limited but convincing evidence of the effectiveness of work system interventions that have incorporated ergonomics. Following the 2000 European Week for Safety and Health at Work – which was devoted to the issue of MSDs – the reports based on the third and fourth EWCS and on the 1999 LFS ad hoc module provided further comparative evidence. The European Working Conditions Observatory (EWCO) therefore undertook a study of MSDs through circulating a questionnaire among its network of national correspondents in the 27 EU Member States and Norway.

European health and safety strategy

The European Commission communication on Adapting to change in work and society: A new Community strategy on health and safety at work 2002–2006 (205Kb PDF) called for efforts aimed at ensuring a healthier occupational environment. The communication set three prerequisites for a high-quality working environment:

- a global approach to well-being at work, taking into account changes in the nature of work and the emergence of new risks;
- consolidating a culture of risk prevention by combining a variety of political instruments and by building partnership;
- better application of existing laws, highlighting the costs of an absence of policy.

As part of this approach, the Commission announced its intention to adapt existing legislation to the emerging problem of MSDs, 'proposing an amendment to the directive on visual display units (VDUs) and supplementing whenever necessary the existing problems so as to take better account of ergonomics at the workplace'.

At the same time, the Commission's 2002 scoreboard on implementing the Social Policy Agenda (134Kb PDF) draws attention to new types of risks emerging, which have given rise to new health problems involving MSDs.

Meanwhile, the 2002 Council resolution on a new Community strategy on health and safety at work (87Kb PDF) includes in its objectives the prevention of WRDs, especially those most widespread among European workers, such as those pertaining to exposure to toxic substances, hearing loss and MSDs. Such aims take into account changes in the working population according to gender, ageing, demographic dynamics, the conditions of disabled workers, ethnic and cultural diversities, transformations in labour regimes, working time and work organisation.

The Commission Recommendation of 19 September 2003 concerning the European schedule of occupational diseases (120Kb PDF) urges Member States to:

- introduce provisions concerning scientifically-recognised occupational diseases liable for compensation and subject to preventive measures included in the European Schedule of Occupational Diseases listed in Annex I of the recommendation;
- adopt provisions regarding the right of a worker to compensation in respect of occupational diseases, which can be proven to be occupational in origin and nature, particularly those listed in Annex II;
- develop and improve effective preventive measures for the occupational diseases mentioned, by actively involving all players and, where appropriate, exchanging information, experience and best practice via the European Agency for Safety and Health at Work (OSHA);
- draw up quantified national objectives with a view to reducing the rates of recognised occupational illnesses;
- ensure that all cases of occupational diseases are reported and progressively make their statistics on occupational diseases compatible with the European Schedule of Occupational Diseases, so that information on the cause or factor, the medical diagnosis and the sex of the patient is available for each case of occupational disease;
- promote an active role for national healthcare systems in preventing occupational diseases, in particular by raising awareness among medical staff with a view to improving knowledge and diagnosis of these illnesses.

In its communication Improving quality and productivity at work: Community strategy 2007–2012 on health and safety at work (70Kb PDF) , presented on 27 February 2007, the Commission warns of segmentation of the labour force, since some categories of workers are still overexposed to occupational risks, for example younger and older workers, non-permanent workers and migrant workers. At the same time, it warns of segmentation in the industrial

structure, where some sectors are overexposed to risks, in particular small and medium-sized enterprises (SMEs), which face more difficulties in implementing complex worker protection systems. The communication underlines the need to support SMEs in implementing such measures and in adapting and simplifying the legal framework to workplace changes. It adds that it 'will continue its work, through the ongoing consultations with social partners, to find ways of improving risk prevention with regard to MSDs' included in the EU research priorities on health and safety at the workplace.

Moves towards a single directive

On 12 November 2004, the European Commission launched a first-phase consultation of the social partners on musculoskeletal disorders at work (236Kb PDF) . Based on data from the third EWCS and the OSHA fact sheet on Work-related musculoskeletal disorders in Europe , the consultation highlights that MSDs are the work-related health problems most commonly reported by European workers. MSDs are related to poor ergonomic conditions for both women and men. The consultation emphasises that women 'often work in conditions associated with musculoskeletal disorders – work requiring awkward postures, monotonous and repetitive tasks, inappropriate work methods and organisation, and more often than is commonly recognised, heavy lifting'. The consultation paper summarises the existing recent legal provisions that have an impact on the prevention of MSDs in a number of directives, and states that there is no specific legal provision focusing on work-related MSDs.

In its response (189Kb PDF) , the European Trade Union Confederation (ETUC) emphasised the need for a comprehensive and integrated approach in relation to a new directive which is aimed at the primary prevention of MSDs. The new directive should summarise specific elements of the existing Community legislation, be complemented by provisions required to fill gaps, and eliminate any ambiguity. The regulations of all existing directives should be retained, updated and made feasible for companies to implement. A strategic approach towards MSDs should be comprehensive, multidisciplinary and participative; in particular, it should consider all parts of the human body and both biomechanical factors and specific work organisation factors – especially the issue of time pressure. The need for more precise language is also highlighted, particularly in relation to the term 'ergonomic principles' and to the concepts of repetition, weight or force. ETUC also calls for greater homogeneity in the recognition of occupational diseases within the European Union; this could, in turn, act as an incentive for the implementation of more proactive prevention policies.

Employer organisations rejected the idea of further Community action in the legislative field; they consider that the current legislative framework provides wide coverage of MSDs through both general and specific provisions. The employer groups involved include UNICE, now BusinessEurope , the European Association of Craft, Small and Medium-sized Enterprises (Union Européenne de l'artisanat et des petites et moyennes enterprises, UEAPME), the Association for Retail, Wholesale and International Trade Interests (EuroCommerce), the European Construction Industry Federation (Fédération de l'Industrie Européenne de la Construction, FIEC) and the European Centre of Enterprises with Public Participation and of Enterprises of General Economic Interest (Centre européen des entreprises à participation publique et des entreprises d'intérêt économique general, CEEP). Moreover, they share the view that progress on the prevention and management of MSDs cannot be made through the legislative route, although prevention and management of MSDs need to be taken seriously and progress on prevention is desirable.

The employer organisations are urging instead for the preparation of sector and workplace-oriented 'toolkits', with a view to closing the knowledge gap and enabling companies to develop well-adapted solutions, aimed at raising awareness and at the exchange of experience and good practice. They further share the view that 'MSDs have multiple causes, some of which lie outside the work environment and inside the private sphere of the individual' (see, for example, the UEAPME response (169Kb MS Word doc)). At the same time, EuroCommerce agrees with the European Commission that 'certain issues, such as seating ergonomics, are difficult to resolve'. Furthermore, BusinessEurope considers that data used in the consultation paper are insufficient for a thorough analysis of the current situation and of the differences at EU Member State level; it also questions the evidence of a rise in MSDs based on the available databases used.

While UEAPME underlines that 'excessive regulation could be even counterproductive, especially for small enterprises, which have specific constraints to implement current health and safety legislation', UNICE emphasises that considerable progress has been achieved over the years in terms of ergonomic factors at the workplace. According to CEEP,

prevention of work-related MSDs is not limited to scientific knowledge but is a combination of economic, social, managerial, psychological well-being and even political considerations. The preventative priorities should be ergonomics and work organisation. People who suffer from stress are more likely to have back pain, along with people who are unhappy in their work. But, overall, we need effective evaluation of methods of dealing with work-related MSDs.

At the same time, in its position paper of 31 January 2005, FIEC prioritises the following preventive actions: improving knowledge and analysis of MSDs, training, organisational changes, regular health checks, ergonomic modifications both in tools and packages, and technical changes, such as decreasing the weight of loads. It refers to the agreement of 19 November 2004 with the European Federation of Building and Woodworkers (EFBWW) on setting a work plan on health and safety, including MSDs, as an appropriate way of addressing this problem. Meanwhile, EuroCommerce recommends good practice in mainstreaming, for example the 'promotion of physical fitness by subsidising visits to regional fitness centres'.

The European Managers' Confederation (CEC) emphasises that symptoms of MSDs start to appear after between 10 and 15 years in a job; therefore, while preventive measures can be taken, nothing can cure a condition whose origins go back a long time. Moreover, no legislation exists for regulating the long-term impact of computer work, which might generate MSDs. CEC thus calls for surveys on the potential link between computer work and MSDs and for new indicators for companies, which are designed to measure and follow up on the evolution of MSDs over time.

A preliminary step in this direction is the European agreement on the reduction of workers' exposure to the risk of work-related musculoskeletal disorders in agriculture (40Kb PDF) , signed by the Employers' Group of the Committee of Agricultural Organisations in the EU (GEOPA-COPA) and the European Federation of Food, Agriculture and Tourism Trade Unions (EFFAT) on 21 November 2005, thus expressing a common position.

On the basis of a survey carried out in the telecommunications sector in 2003, which showed that 85% of workers were at risk of work-related MSDs, in October 2005 the social partners UNI-Europa and the European Telecommunications Network Operators' Association (ETNO) published a report on the Prevention of musculoskeletal disorders within the telecommunications sector (1.5Mb PDF) , which encompassed good practice guidelines.

The Second stage of consultation of the social partners on work-related musculoskeletal disorders (122Kb PDF) outlines that the existing body of directives covers only a limited number of work situations, such as manual handling, working with screen equipment and vibrations; conversely, other ergonomic risk factors, such as awkward postures, repetitive force or contact stress are not adequately addressed. According to current research in ergonomics, work-related MSDs are not sector and task-specific; they may occur in different activities, sharing characteristics in terms of intensity, frequency and duration of exposure. For these reasons, and since both employers and workers in SMEs are not sufficiently well informed about their risk factors, the Commission 'considers that there is a need to improve European workers' protection against exposure to risks that may result in work-related MSDs', by integrating Directives 90/269/EEC and 90/270/EEC into a single new directive. This directive would satisfy the need of the legislative framework, and would be complemented by non-legal measures such as better information, guidelines and outreach developed to help the relevant parties. Its main features would include the following elements:

- a comprehensive definition of work-related MSDs and work-related risk factors, paying particular attention to force, repetition, awkward postures, static postures and contact stress;
- an obligation on employers to evaluate risk factors, and to establish and implement ergonomic prevention programmes designed to control or to reduce exposure to the risks and symptoms of work-related MSDs;
- basic criteria that employers require to identify tasks involving exposure to a level of intensity, duration or frequency that would require an extended risk assessment, according to a two-stage procedure, by defining a methodological platform for an integrated analysis of workplace conditions and establishing a comprehensive set of prevention measures.

Such an assessment would include appropriate quantifiers in terms of hazard thresholds regarding the level of intensity, frequency and duration of exposure; it would involve observation-based analysis of tasks accomplished by the employee, workers' training, and engineering, administrative and work-performing controls. The consultation paper invited the social partners to forward an opinion or a recommendation and to give an indication

of their readiness to start a negotiation process.

In response, the employer organisations indicated that they did 'not wish to start a negotiation process' in accordance with Articles 138 and 139 of the Treaty, since they consider an MSD directive inappropriate and unrealistic (see BusinessEurope response of 8 May 2007 and UEAPME response (124Kb PDF)). In their joint response (28Kb PDF) to the second-stage consultation of the social partners, both EFFAT and GEOPA-COPA claim that the definition of work-related MSDs and the harmonisation of statistics 'responds to the proposals stated in the European agreement reached in the agricultural sector'; however, due to the specific characteristics of the industry, where employers have at most two employees, prevention and risk assessment continue to raise concern. On the other hand, the ETUC response (123Kb PDF) 'reiterates its demand for a directive aimed at preventing MSDs', adding that 'future negotiations will only be possible if they are based on the new "anti-MSDs" directive'; at the same time, it claims that the merging of the manual handling directive and the display screen directive goes beyond merely codifying these two documents.

Definition and regulation of MSDs at national level

A comparison between national definitions of work-related MSDs reflects, on the one hand, the variety of such definitions in ergonomics and occupational health and, on the other hand, national institutional features. Table 1 summarises the different national definitions of MSDs according to their leading demarcation principle. Overall, eight of the countries lack any definition of work-related MSDs: nevertheless, the social security institutions in these countries do provide a list of occupational diseases that entitle workers reporting such conditions to compensation. The Czech Republic is an exception in this respect, since accident insurance was managed by private companies and its social security system was only established in July 2006.

Table 1: National definitions of work-related MSDs

Type of definition	Legal	Social security	Doctors
RSI		FI, NL	
Work-related	BE	UK, NO	EE
Causal	FR*	DE, ES, (EL), IT, PT, LT, SK	BG, CY, LV
Both work-related and causal	RO	HU	
No definition/enumeration		AT, SE, MT, PL, SI, LU, IE	

Note: Greece represents a partial case in terms of a causal definition by the social security ministry. *With enumeration. See Annex 4 for list of country codes.

Source: EWCO correspondents 2005–2006

The largest group of countries relies on a causal link based on a 'double track' approach: accordingly, social security agencies (or legislation in France) set the list of diseases for which the occupational cause is presumed; for other diseases, the burden of proof is placed on the applicant or such an opportunity does not hold at all. In the former case, this holds true for any MSD in some of the countries concerned, provided that the applicant is able to demonstrate the causal link; in other countries, this opportunity is restricted to diseases detailed in additional lists. An example of the latter can be seen in Italy, where two further lists exist: namely, that in which the work-relatedness of an MSD has a low probability (list 2), and that in which the probability of having an MSD with an occupational origin cannot be specified (list 3).

Work-relatedness is established by four countries: for example, Belgium enjoys a legal definition which was introduced in July 2006 and which substitutes the consolidated 'double track' causal system of recognition. In the UK, the government Health and Safety Executive (HSE) avoids any definition and focuses instead on the extent of

the problem and on its social and economic impact.

Some countries – such as Hungary and Romania – categorise both work-relatedness and the causal link, while definitions by public institutions in Finland and the Netherlands take RSI as the reference for MSDs.

The actual definitions are not clear-cut. For instance, the Greek definition gives a prominent role to RSI, while the Italian definition, which was revised in 2004, expresses a causal link in terms of the degree of likelihood. Finnish multiple definitions are not dissimilar from the Hungarian and Romanian framework. Finally, in those countries without a legal definition, social security lists implicitly rely also – although not exclusively – on the causality principle.

The extent of MSDs for which an occupational cause is presumed also varies noticeably across the countries. Diseases are accurately listed in relation to levels of exposure to risk factors, especially under the French legal framework: accordingly, 'core' diseases are those pertaining to vibrations in both hand-arm movements and the use of compressed air tools, to the manual handling of heavy loads, to meniscus from awkward or squatting positions, and to repeated micro-traumas in the upper limbs caused by bio-mechanical overload. Recent definitions devised by Lithuania and Slovakia have been extensive in the list of diseases included, while the exposure threshold may vary over time. In Greece, the list of diseases is shorter and includes cramps in the upper limbs and disorders caused by vibration and compressed air. In Italy, among the diseases listed are those caused by continuous and repetitive tasks and those caused by driving heavy vehicles, which show a reversal of the burden of proof onto the applicant.

Countries whose lists do not rely on an occupational causal link show a wider variability. While the list of recognised diseases in Austria and Slovenia is relatively similar to that of the aforementioned group of countries, the Swedish list does not rely on exposure to risk factors but is instead based on a case-by-case investigation. Finally, in Ireland and Luxembourg, the list of diseases focuses on upper limb disorders and tendonitis.

Therefore, the countries that lack any definition of MSDs, but which have devised a list of diseases for which the occupational cause is implicitly or explicitly presumed, could be ultimately included under the previous group of countries, although they show a greater variability of diseases included. It could be presumed that the main criteria for their inclusion follow from their occurrence and through bargaining with the social partners.

Thus, the causality link plays a dominant role in the national definitions of work-related MSDs across EU countries, although the most recent definitions increase, on the one hand, the scope of the 'double track' approach and tend to substitute 'causality' with the less demanding principle of 'likelihood' and 'exposure limits', where work-relatedness is not explicitly set.

Organisational factors

Work-related MSDs were usually associated with repetitive tasks or with those involving the carrying of heavy loads, vibrations and awkward postures, such as those found in the economic sectors of construction, transport, agriculture and, more recently, among caregivers. According to ergonomic specialists, MSDs are 'multifactorial in nature. In the work environment, these are problems attributable to repetitive work under strict spatio-temporal constraints' (Bourgeois, 2000). The OSHA report entitled Expert forecast on emerging physical risks related to occupational safety and health (2.12Mb PDF) clearly identifies the lack of physical activity among workers as one of the biggest emerging problems, along with the combined effect of exposure to MSD risk factors and psychosocial risk factors, such as job insecurity and fear of the future, thus widening the target of such diseases.

MSDs affect all parts of the body which enable an individual to move and work, with strong interrelations between the body's nervous and muscular systems: the parts of the body affected include the back, neck, shoulders, and upper and lower limbs. Such disorders result from problems such as an accumulation of mechanical constraints, repetitive movements, a short production cycle, heavy lifting and poorly designed work stations.

Epidemiological studies show that work intensification due to time pressure and deadlines, and following the introduction of 'just-in-time' production methodologies, have increased the influence of organisational factors in

relation to MSDs. ‘Even more than risk factors, work organisation “determines” the characteristics of work situations and may potentiate pathogenic effects’ (Douillet and Schweitzer, 2002 (200Kb PDF)).

Unlike the so-called traditional risks, MSDs arise as the result of a ‘singular combination of multiple personal and collective, material and psychological factors bound up with the practical way work is organised’ (ibid). In relation to psychological factors, there is increasing evidence of a significant interplay between stress and MSDs, with a causal link in both directions.

The main workplace factors affecting the occurrence of MSDs can be related to five areas (Buckle and Woods, 2002):

- social support – received by colleagues, supervisors or management; this tends to reduce the occurrence of MSDs because of its impact on mental and physical health and stress;
- access to health information – this has a similar impact because of its role in implementing improvement strategies;
- job insecurity, temporary work and piecework – less skilled manual workers at the lower end of the labour market are most affected by this factor, including part-time workers with poor job-specific experience and/or who are confined to the worst jobs;
- low status work – in other words, low-paid, unskilled, paced and repetitive work, where no training is required and where there is poor job control, resulting in higher MSD occurrence rates;
- income – this shows a negative correlation with MSD occurrence because of its impact on living conditions, in particular housing, education, clothing and fuel.

These factors can be modified by organisational and ergonomic interventions, while individual factors cannot. In relation to the latter factors, education, age, gender and ethnicity are deemed to be significant.

Foundation research

Some reports of the European Foundation for the Improvement of Living and Working Conditions (hereafter referred to as the Foundation), based on the findings of the second and third EWCS, investigate the interplay between health at work and organisational factors. According to the 2002 report Work organisation and health at work in the European Union , MSDs are concentrated among workers performing heavy tasks, typically those working in construction and agriculture, and among those performing repetitive tasks, frequently those working in manufacturing. The incidence of MSDs is also significant among workers engaged in automated tasks – mainly clerical tasks – with figures not differing greatly from those pertaining to more physically demanding jobs. Of the 28% of women who report backache, 41% belong to the category of workers involved in automated tasks. Meanwhile, of the 21% of women reporting muscular neck and shoulder pain, 28% are workers engaged in automated tasks, although their exposure to physical risk factors is far lower (pp. 52–53). Similar figures are shown for men, although those working in physically demanding jobs are usually involved in heavier tasks, while women tend to perform more repetitive jobs.

According to the 2003 Foundation report Time and work: Work intensity , work intensity is on the increase in Europe: between 1995 and 2000, employees experienced an intensification of their jobs; in particular, the increase in time pressure at work has affected workers’ health. In the majority of cases, ‘there is a positive link between the physical problems recorded and the work intensity factors’ (p. 66). This link is significant for most or all of the MSDs listed in the case of automatic constraints, dependence on colleagues’ activities, direct supervision by the boss and the presence of a customer for at least three quarters of the working time; commercial constraints do not show such a correlation.

The Foundation’s 2002 report on Employment status and working conditions shows that non-permanent and self-employed workers are significantly more exposed to unfavourable ergonomic conditions, which can give rise to ‘classical’ MSD symptoms; part-time workers, on the other hand, do not display such significant differences. Furthermore, according to its report on Types of employment and health in the European Union , backache is more likely to be reported among self-employed people, while muscular pain is more likely to be cited by self-employed and full-time employees on fixed-term contracts than full-time permanent workers. Extreme temperatures, repetitive movements and exposure to vapours are the most common unfavourable working conditions which are likely to increase the occurrence of both backache and muscular pain. A weak correlation exists between the absence of social support and the incidence of backache, while no significant correlation is evident in relation to

muscular pain. Both job control and job demand appear to have a strong impact on the incidence of these two disorders.

According to the 2002 Foundation report Gender, jobs and working conditions in the European Union , gender differences in ergonomic working conditions are largely the result of men's greater involvement in blue-collar (manual) jobs, while these differences are negligible in professional jobs. Men more frequently report 'carrying heavy loads' and hazardous ergonomic conditions, while women more frequently cite 'monotonous work'. However, a slightly higher proportion of women report muscular-related problems.

The 2002 Foundation report Quality of work and employment in Europe: Issues and challenges summarises these results as follows: 'organisational change does not always meet expectations' and 'the development of "new" forms of work organisation … is not necessarily resulting in improved working conditions … lean organisations are often associated with more intensive working. This in turn leads to higher stress and MSDs and accident rates' (p. 16). Finally, gender differences could be explained by the double workload and other psychosocial factors relating to working conditions and job status.

These reports constitute just part of the widespread research which shows that MSDs are not only found in traditional type jobs, mainly linked to certain manual tasks involving repetitive movements, the carrying of heavy loads and vibrations, but are also becoming increasingly common in the services sectors – in particular, healthcare and hotels and restaurants – and among those working with computers and information and communication technology (ICT) devices.

According to the opinion (235Kb PDF) of the then Advisory Committee on Safety, Hygiene and Health Protection at Work (ACSHH), adopted in May 2001, the risks of MSDs should be taken into account especially when changes are made to the work organisation; such changes require comprehensive information and awareness-raising policies.

Structural changes

From this brief outline, three structural changes can be underlined in explaining the increased relevance of MSDs:

- changes in organisations – resulting in increased time-based competition, with low levels of supervisory staff and without an increase in work autonomy;
- changes in work status and labour regimes – resulting in a higher proportion of atypical jobs;
- changes in the workforce composition – according to gender, age and ethnicity and with respect to social habits that differ from the traditional male breadwinner reference model.

The first two types of structural changes affect the quality of work itself, while the third type affects the reference workforce based on which jobs are designed and therefore the perceived quality of work.

As Brenner, Fairis and Ruser (2004) show, cumulative trauma disorders (CTDs) significantly increased in the 1980s and early 1990s in the US (Figure 1). 'Despite the importance of this trend in CTDs and the link posited with workplace transformation, surprisingly little research has been undertaken to explore this relationship' (p. 245).

Figure 1: Rate of new illnesses and new CTDs in the US, 1982–2001

Source: US Bureau of Labor Statistics, Occupational injuries and illnesses in the United States by industry, 1982–2001

The CTD trends identified by Brenner, Fairis and Ruser (2004) in the US raise a number of questions for EU-level discussion.

- Is the EU still on an upward trend in relation to the incidence of CTDs?
- Is such a trend homogeneous across countries?
- Is such a trend homogeneous across diseases, parts of the body affected or causes?
- What are the main variables affecting such trends?

Reporting and monitoring systems

According to the 2003 OSHA report entitled A review and analysis of a selection of OSH monitoring systems (305Kb PDF) , monitoring systems in the occupational safety and health domain can be categorised according to three typologies:

- surveys – including working conditions surveys conducted among employees, medical surveys of professional risks and surveys on employers;
- registers – derived from social security institutions (for example, on accidents, diseases and absenteeism) and health institutions (on specific diseases or hospitalisation);
- workplace observatories – maintained by inspectorates.

However, such monitoring systems have varying drawbacks: in general, both registers and workplace observatories suffer from underreporting due to different reasons. At the same time, employers raise questions about employee surveys due to the instability of subjective beliefs and feelings, as the employer organisations' position in the European Commission's first-phase consultation process highlights. As Karjalainen and Virtanen (1999) have pointed out, 'statistics on recognised cases (by legal definition) underestimate the impact of work-related health problems that are only partly caused by factors encountered at work'. MSDs are included among those diseases that suffer the most from such underreporting, due to the non-specific nature of many of these disorders. In addition, social security records about acknowledged cases of incapacity to work suffer from a significant time delay between the initial declaration and recognition of the condition, as agencies have to carry out an investigation for each case in order to check whether the declared disease resulted in a permanent impairment. Therefore, such records do not refer to the present situation but to the past.

According to the report European action towards better musculoskeletal health (2.7Mb PDF) , owing to the problems arising due to underreporting, existing data are more useful for interpreting trends as well as identifying high-risk occupations, rather than estimating the true number of disorders. Moreover, not all registers have adequate reporting systems in place, while in some cases, other public institutions, such as national statistics bureaux and welfare ministries, report from various sources.

For these reasons, a proper evaluation of occupational diseases in general, and of MSDs in particular, needs to take into account the various types of sources, avoiding as much as possible reliance on just one particular source.

At EU level, the LFS ad-hoc module on health and safety, carried out by Eurostat, and the EWCS conducted by the Foundation can be assigned to the category of surveys. Meanwhile, the EODS are based on nationwide registers. At national level, the variety of sources increases significantly in relation to these monitoring systems, as discussed below.

Reporting on MSDs at EU level

European Occupational Diseases Statistics

The EODS, which are compiled by Eurostat, collect data and information on occupational diseases which result in an inability to work – either temporary or permanent. The data gathered at national level for the EODS conform to these criteria and are taken either from public sources of information, such as social security statistics, or private insurance data pertaining to occupational diseases (in all countries except the Netherlands), or declarations obtained from other relevant national authority bodies (in the Netherlands) (see EODS summary methodology). Cases which are not recognised as an occupational disease are excluded, even when they are compensated under the health at work insurance scheme.

The main partners of the EODS are the national statistics offices, social security institutions (workers' compensation or similar), and the labour ministries, which provide official statistics on health and safety at work. Eurostat disseminates EODS statistics regarding the incidence of occupational diseases and the number of deaths arising due to occupational diseases, as reported by all the national systems, and calculates the EU aggregates.

As the 1999 Eurostat report European statistics on occupational diseases – Evaluation of the 1995 pilot data (403Kb PDF) summarises, the 1995 EODS pilot survey took into account just 31 occupational diseases recognised by – rather than those reported to – the social security agencies, collecting definitions according to the various

national criteria. A total of four occupational diseases are relevant when discussing work-related MSDs, namely: 'osteoarticular diseases of the hands and wrists caused by mechanical vibration' (550.01); 'diseases of the periarticular sacs due to pressure' (506.10), which were expected to be defined as MSDs according to the World Health Organization (WHO) International Classification of Diseases (ICD-10); 'angioneurotic diseases caused by mechanical vibration' (550.02); and 'paralysis of the nerves due to pressure' (506.40). The two latter were related to neurological diseases. However, 40% of the 506.10 category diseases were recorded as being of unknown origin, while over 20% of diseases under the 506.40 category were either related to 'MSDs' or 'other or unknown' causes. Further observation revealed that the abovementioned diseases were sometimes described as being cardiovascular related (505.01, 505.02).

The report also refers to the difficulties faced in collecting such data from national systems and in comparing these data. It points out that statistics based on recognition systems are unable to fully evaluate the work-related disease burden because of: firstly, the 'underreporting of causal occupational diseases'; or secondly, 'legal constraints regarding the degree of causality.'

The data on recognised occupational diseases reflect not only the occurrence of such diseases, but inevitably also the way in which the concept of occupational disease has been integrated into the social security systems. This integration determines the (legal and financial) motivation of the patient, the doctor and the employer to notify cases, and the motivation of social security authorities and respective bodies to allocate them under the coverage of the normal social security or to define them as occupational diseases.

Such institutional aspects give rise to some heterogeneity in the data collection and in evaluating the incapacity to work. Referring to 'mild cases' – that is, cases where the level of disability is lower than 10% (or 20% in Germany) – as a means of limiting compensation or distinguishing between levels of compensation, and cases without a measurable disability make it difficult to compare the incidence rate across countries and give rise to further difficulties both in reporting and comparability because of regulatory differences.

The EODS entered the first phase in 2001. These data refer to the incidence of occupational diseases, recognised for the first time during the reference year, and to deaths due to occupational disease in accordance with level four of the ICD-10 classification established by WHO. The diseases are rated according to the degree of severity, causal factors, sector and occupation.

Diseases included under the category of the ICD-10 classification are: arthrosis of the elbow (M192) and of the wrist (M931), degenerative lesions of the meniscus (M232), excluding most acute lesions which are considered to be workplace accidents, bursitis of the elbow (M703) and of the knee (M704), tenosynovitis of the elbow and wrist (M700), and medial (M770) and lateral (M771) epicondylitis. Carpal tunnel syndrome (G560) is defined as a neurological disease, while Raynaud's syndrome is ranked as a cardiovascular disease (I730), although some countries also regard these as MSDs. Data for back, neck and shoulder pain, and related disorders, are not collected.

Data on the number of deaths are included if the person died due to an occupational disease during the reference year, regardless of when this disease was recognised for the first time.

In relation to the incidence of occupational diseases, data are available for all of the EU15 combined for the 1995 pilot data and for 12 of these Member States (Austria, Belgium, Denmark, Finland, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the UK) with respect to the 2001 data. From 2002 onwards, the data are available for the same countries, except Ireland, and have gained some degree of homogeneity in reporting mild cases.

LFS module on accidents at work and occupational diseases

Eurostat established the ad hoc LFS module on accidents at work and occupational diseases in order to complement the administrative sources of the European statistics on accidents at work and the EODS. The LFS module aims 'to cover groups that are not comprehensively included in the administrative statistics, namely self-employed and public sector workers, less severe accidents (resulting in less than four days' absence) and WRDs not recognised by national authorities' – see Eurostat background note (73Kb PDF) ; the data are based on 'subjective information from the respondents'. WRDs reported by the interviewed population are described as 'illness(es), disability(ies) or

other physical or psychic health problem(s), apart from accidental injuries, suffered by the person (...) and that was (were), caused or made worse by the work'. The first ad hoc module was carried out by Eurostat in 1999, the results of which were presented in the 2002 report European social statistics: Accidents at work and work-related health problems (in English, French and German, 2.6Mb PDF) . The 2007 phase of the module was conducted in the second quarter of this year and aims to complement the EODS administrative data.

The 1999 module was carried out in 11 of the EU15 countries: Denmark, Finland, Germany, Greece, Ireland, Italy, Luxembourg, Portugal, Spain, Sweden and the UK, in addition to Hungary which acted as a complementary data source. All sectors of economic activity were covered; the specification of industries was based on the General industrial classification of economic activities within the European Communities (*Nomenclature générale des activités économiques dans les Communautés européennes* , NACE). One of the questions (Q217) investigated the 'type of the most serious complaint caused or made worse by work'. MSDs were represented as 'bone, joint or muscle problems'. A further question (Q219) investigated the 'job that caused or made worse the most serious complaint' (see Annex 1 for further details).

The LFS 2007 ad hoc module (668Kb MS Word doc) on accidents at work and work-related health problems covers all of the present EU27 Member States, paying particular attention not only to non-accidental health problems accepted as an occupational disease in the national system – as in the 1999 module – but also to new emerging types of WRDs not yet included in the administrative lists of occupational diseases – in particular, musculoskeletal and psychosocial health problems.

Question 9 invites respondents to consider the most serious illness caused or made worse by work. In Question 10 (C215/216), MSDs are defined as 'bone, joint or muscle problems' and distinguished according to those affecting the 'neck, shoulders, arms or hands' (00), 'hips, legs or feet' (01) and 'back' (02). The survey further investigates (Q221) psychosocial factors, such as harassment and bullying, violence, time pressure or work overload, taking mental well-being as the focus. Question 222 addresses physical risk factors, including ergonomic factors such as work posture, work movements or the handling of heavy loads, thus focusing on physical well-being (see Annex 1 for further details).

For non-accidental health problems, the indicators used are the percentage distribution, number, prevalence rate and relative prevalence rate of health problems, relative to the overall rate for the participating countries, which is marked at 100. The prevalence rate is defined as the number of people suffering from the health problem during the last 12 months per 100,000 employed workers (see summary methodology).

European Working Conditions Surveys

In the first edition (1991) of the EWCS questionnaire, the Foundation included the question: 'Do you think your health and safety is at risk because of your work?' Since the second edition (114Kb PDF) (1995), 'work-related diseases' reported by the sample population have been investigated by submitting a list of diseases under the following question: 'Does your work affect your health or not? If yes, how does it affect your health?'; the list includes 'backache' and 'muscular pains in the arms and legs'. The third edition (47Kb PDF) (2000) of the EWCS questionnaire makes a further distinction between 'muscular pains in the upper limbs' and 'muscular pains in the lower limbs', also adding 'muscular pains in the neck and shoulders'.

Risk exposure and ergonomic factors that could cause MSDs have been investigated since the third edition of the EWCS questionnaire (Q11: 'are you exposed at work to...', Q12: 'does your main paid job involve...', Q21a: 'repetitiveness', Q21b: 'characteristics of time constraints'). The fourth edition (2005) of the questionnaire investigates in greater detail both exposure to risk factors (10 items compared with seven in the previous edition) and task requirement of the main paid job (13 items instead of eight), while the investigation of repetitiveness is noticeably simplified (see Annex 2 for further details).

In the third EWCS questionnaire, health was investigated through the question: 'Does your work affect your health or not? If yes, how does it affect your health? The list of options features some 22 items, including 'no, it does not affect my health' (item 1) and 'my work improves my health' (item 22).

The fourth EWCS questionnaire investigates work-related health by introducing some modifications both in the question framing and in the list of items. Question 33 asks the respondent the following: 'Does your work affect

your health or not – yes or no?' If yes, the respondent is asked to reply to Q33a: 'How does it affect your health?'; the respondent is offered the option of a list of 17 items. This latter question shows some modifications in the number of items: the items 'no, it does not affect my health' (item 1) and 'my work improves my health' (item 22) have been removed; at the same time, the items 'yes, muscular pain in the neck and shoulders', 'muscular pains in the upper limbs' and 'muscular pains in the lower limbs' are grouped together under a single item 'muscular pains in the shoulders, neck and/or upper/lower limbs' (see Annex 2).

Such amendments have a significant impact in practice. In the third survey, the respondents could change their mind when they looked at the list and may have possibly recognised that they did in fact experience certain symptoms of illness. However, in the fourth version, the respondents were not given such an opportunity, since Q33a was not submitted once they had said 'no' and therefore workers could not alter their response. Thus, according to the 2005 questionnaire, reported work-related health is restricted; therefore, any trend data drawn are affected by such a differing specification. This does not imply that there is overreporting or underreporting in either survey.

For this reason, the 2005 EWCS figures on work-related health cannot be compared with previous editions, which allowed for trend data to be drawn and for relative changes in respect of the impact of work factors and individual characteristics on health.

National-level statistics

A preliminary analysis of statistical sources gives an insight into how variable the knowledge and awareness is of MSDs' impact on both welfare systems and working conditions.

Registers on occupational diseases can vary in extent and accuracy. The minimum information provided is the number of cases recorded; sometimes, these consist of the number of recognised cases, other times the number of reported cases, or both. In some countries, these figures also include data on the number of days of absence. These registers are therefore far from being homogeneous.

While some working conditions surveys investigate WRDs such as MSDs, others contain several questions on exposure to risk factors, the occurrence of occupational injuries and health at work in general – such as in Belgium, France, Italy, Portugal and the Baltic Working Life Barometer carried out in Finland, Estonia, Latvia and Lithuania. On the other hand, the HSE in the UK commissioned surveys in 1990, 1995, 2001/02, 2003/04, 2004/05 and 2005/06 on Self-reported work-related illness (SWI) . The latter was undertaken in conjunction with the LFS to gain an insight into work-related illness based on individuals' perceptions, adopting a similar approach as the LFS ad hoc module. In some countries – such as France, Germany and the Netherlands – more than one working conditions survey has been carried out, featuring specific questions on work-related MSDs.

The French health surveillance of risks survey (*Surveillance Médicale des Risques* , SUMER) combines a self-reported questionnaire with a survey conducted among company occupational doctors (FR0603SR01). Such a model is also applied in other epidemiological surveys, for example at national level in the 2001 survey by the National Agency for the Improvement of Working Conditions (Agence Nationale pour l'Amélioration des Conditions de Travail, ANACT) and the National Institute for Health and Medical Research (Institut national del la santé et de la recherche médicale, INSERM). An example at local level is the survey on MSDs in the Loire Region, carried out by the Institute for Health Surveillance (Institut de veille sanitaire, InVS).

Overall, therefore, five institutional settings can be highlighted in relation to monitoring WRDs and MSDs in particular (Table 2). Epidemiological studies at sectoral, company or local level are not taken into account in drawing such a taxonomy:

- registers only – this pattern predominates in both southern and eastern countries, with some notable exceptions and including Belgium and Ireland. Most of the new Member States (NMS) fall into this group, since it takes some time to develop a reliable set-up of administrative sources, which is understandable, although some notable exceptions arise in this regard. Most of these countries do not allow for any trends to be drawn, with the exception of Italy among the southern countries, and Latvia and Slovakia among the NMS. Some of the latter group of countries rely on health registers rather than on social security registers, since the transition to free market social institutions has not yet been completed or has only recently been

achieved;

- both registers and employee surveys – this is the standard in the 'continental' and Nordic welfare states, although with some notable exceptions and including other countries. Some of the NMS fall into this group, filling the gap in administrative sources. Such countries include: the Czech Republic whose state-driven occupational insurance system was established in July 2006 and whose administrative sources have a public health origin; Bulgaria whose social security registers are not yet considered to be fully reliable; and Estonia, which integrates these basic monitoring tools with a survey conducted among employers and employees – this includes a section on workplace risk factors but not on WRDs. On the other hand, Denmark combines a number of social security and public health records. In general, these cover quite an extensive time series of at least 10 years;
- countries combining administrative sources and employer and employee surveys – this is the case in the Netherlands and Spain. In the latter country, a bilateral survey is conducted by the National Institute of Safety and Hygiene at Work (Instituto Nacional de Seguridad e Higiene en el Trabajo, INSHT). These sources cover an extensive time series of over 10 years;
- countries using differentiated sets of sources – this is the case in France and the UK, which integrate social security records with combined surveys conducted among both employees and occupational doctors, and investigating risk factors and occupational diseases. However, their approaches differ: while in France, an effort is made to study work-related illnesses objectively, the UK uses a subjective approach in a vast array of self-reported surveys conducted among employers, workers and doctors; this constitutes the cornerstone of the monitoring and reporting system, at the same time reconstructing the 'objective' reality by combining them with benefit claims;
- Luxembourg can be seen as a singular case – in this country, social security records do not distinguish between occupational diseases and occupational accidents. However, occupational diseases are investigated by a survey conducted among doctors and by labour inspectorate registers.

Table 2: National-level sources on MSDs

Country	Employer surveys	Employee surveys	Doctor surveys	Social security registers	Public health registers
AT		x		x	
BE				x	
BG		x			x
CY				(x)	
CZ		x		x	
DE		x		x	
DK		x		x	x
EE		x		x	
EL				x	
ES	x	x		x	x (regional)
FI		x		x	
FR		x	x	x	
HU				x	
IE				x	
IT		x (regional)		x	
LT				x	x
LU			x	x	

LV				x	x
MT				x	
NL	x	xx		x	x
NO		x			
PL				x	
PT				x	
RO				x	x
SE		x		x	
SI				x	x
SK					x
UK	x	x	x	x	

Note: Cyprus represents a partial case: according to the Ministry of Labour and Social Insurance, no public authority, including the national insurance funds, has categorised musculoskeletal disorders either according to the part of the body affected or according to occupational and demographic characteristics. However, some of the causes of musculoskeletal disorders are cited both in the list of occupational diseases of the Department of Social Insurance and also in the list included in the Draft Regulations on Notification of Occupational Diseases.

Source: EWCO correspondents, 2005–2006

The degree of detail found in these sources varies according to the countries. Overall, three main strategies can be used:

- the interviewees are asked to name specific diseases from which they suffer – as in the Austrian *Mikrozensus* ;
- an aggregate is obtained of the parts of the body affected – usually between three and five areas – with variations in the way that this is investigated: for instance, frequency after working (Germany, Sweden); suffering over a recent time span (seven days in Denmark, 30 days in the Estonia, 12 months in most countries); symptoms involved (UK's 1995 SWI, Netherlands' Working Conditions Survey (*Nationale Enquête Arbeidsomstandigheden* , NEA); medical consultation (UK's 1995 SWI) followed by an investigation of days lost; specifically referring to each disease (Denmark) or in general;
- a detailed investigation of each part of the body affected is carried out (in Spain, 12 items); this is followed by a further investigation of whether a medical consultation and a diagnosis occurred.

The UK SWI module mirrored the 1999 LFS ad hoc module both in terms of the methodology used and the questions posed to interviewees. This ad hoc module was added to the UK LFS; MSDs were investigated by means of just one item in the 1990 and 1995 surveys (as in the 1999 EU-level ad hoc module), then divided into three items according to the parts of the body affected (neck, shoulder and upper limbs; lower limbs; and back) in the 2001, 2003 and 2005 editions. The Bulgarian, Czech and Italian regional and subregional-level surveys followed the third EWCS questionnaire format.

Cost estimates

The European Bone and Joint Health Strategies Project report *European action towards better musculoskeletal health* divides the economic impact of MSDs into the following categories:

- direct costs – that is, the healthcare costs faced in different environments, such as in hospitals and the home;
- indirect costs – that is, the costs in nursing and home care; the loss of productivity both of employed patients and their carers; reduced employability;

- intangible costs – that is, the loss of quality of life for the patient and their family.

Obviously, it is much more difficult to estimate both indirect and intangible costs, especially the latter. Such a general scheme is nevertheless useful for comparing the different cost estimates carried out by each country in relation to work-related MSDs. From an occupational perspective, such a scheme needs to be revised, as national reporting systems show: social security costs (mainly sick leave, work disability benefits) are counted as direct costs.

As the results in Table 3 indicate, not many Member States report figures on MSD costs of any extent. While direct health costs are standardised across these countries, direct social security costs reveal some differences: some countries – Austria, Estonia, Finland and Slovakia – monitor only sick leave which is the responsibility of both social security bodies and employers, where it occurs, while Swedish estimates are reported in a more informal way. The number of countries reporting estimates of indirect costs is even smaller and restricted to losses encountered by the employer. Only Danish trade union estimates include workers' employability losses. No estimate of intangible costs has been made up to now. As the OSHA report Economic impact of occupational safety and health in the Member States of the European Union (1.83Mb PDF) shows, most countries aggregate their cost estimates, distinguishing only between occupational diseases and work accidents.

Table 3: Economic impact of MSDs, by extent of estimate and source

	Public source
Direct costs (health)	BG, FR**, LT, NL, NO, RO**
Outpatient costs	
Inpatient costs	
Personal costs	
Other disease-related costs	
Direct costs (social security)	LT, NL, NO, SE***, UK
Sick leave and compensation costs faced by employers	AT, EE*, FI, SK*
Work disability benefits	
Indirect costs	
Change in living status	
Productivity loss	LT, NL, UK
Employability loss	
Out-of-pocket expenses	
Intangible costs	

Notes: *Jointly with occupational accidents, **Forecast, ***Informal estimate.

Source: EWCO correspondents 2005–2006

As the national questionnaires show, cost estimates of MSDs vary across countries both for objective reasons, such as the actual costs of a refined monitoring system, and as a result of incomplete monitoring. By mapping cost estimates according to the monitoring systems of MSD occurrence (Table 4), four groups of countries can be drawn:

- countries whose monitoring system is restricted to administrative sources – these countries (excluding

Slovakia and Latvia) monitor to some extent the economic impact of MSDs;
- countries whose monitoring system is more oriented towards the social and health aspects rather than the economic impact of MSDs – this includes the Czech Republic, since its occupational health insurance system was private, and Spain and France, although the latter will implement economic monitoring from 2009 onwards;
- countries that have a weakly-developed economic monitoring system, since they only monitor the direct costs in part, that is, health or social security costs;
- countries that have a refined although incomplete monitoring system, assessing both the economic and social impact of MSDs.

Table 4: Economic and socio-clinical reporting of MSDs, by country

	No estimate	Direct costs – partial	Direct costs – full	Productivity losses
Only registers	BE, CY, EL, HU, IE, IT, PT, RO**, LV, MT, PL, SI	SK*		LT
Registers and surveys	CZ	AT, BG, FI, SE***	NO	
Registers and bilateral surveys	ES	EE*		DE
Differentiated sets of sources	FR**			UK, NL
Other	LU			

Note: * jointly with occupational accidents, **forecast, ***informal estimate.

Source: EWCO correspondents 2005–2006

Comparing this picture with the practitioners' belief that 'direct costs due to compensated work-related musculoskeletal disorders are only a relatively low proportion (30%–50%) of the total costs' (Kuorinka et al, 1995), it appears that most countries have significantly more work to do in order to achieve a relatively affordable and complete monitoring system. It is worth noting that, according to Danish estimates, direct costs account for less than 20% of the total costs pertaining to MSDs, while marginalisation costs constitute the largest proportion – accounting for over 40% of their total costs.

Socio-demographic trends in MSDs

Trends per part of body affected and by gender

Reporting by disease – EODS

According to the 1995 EODS pilot study, the four diseases that could be referred to as MSDs in the broader sense accounted for almost 18.6% of all occupational diseases recorded (Table 5).

Table 5: Occupational diseases also counted as MSDs, EU15, 1995

	Total no. of cases
Osteoarticular diseases of hands and wrists caused by mechanical vibration	2,539
Angioneurotic diseases caused by mechanical vibration	2,454

Diseases of periarticular sacs due to pressure	2,305
Paralysis of nerves due to pressure	3,392
Diseases with a possible musculoskeletal aspect	10,690
Total occupational diseases	57,414

Source: Karjalainen and Virtanen, Eurostat, European statistics on occupational diseases – Evaluation of the 1995 pilot data, 1999

As discussed above, the first phase of the EODS offers more detailed figures for the EU15 countries over the 2001–2004 period, including occupational diseases that are obligatory in terms of reporting as well as those that may be counted on an optional or voluntary basis. Table 6 gives a breakdown of these diseases according to the European Schedule of Occupational Diseases classification. Overall, four diseases – angioneurotic diseases caused by mechanical vibration, diseases due to overstraining of the tendon sheaths, diseases due to overstraining of the muscular and tendonous insertions and carpal tunnel syndrome – account for over 90% of diseases related to MSDs. A strong gender component can be identified in relation to MSDs: while MSDs due to overstraining show a rather 'balanced' gender composition, diseases caused by mechanical vibration, along with bursitis and lesions related to meniscus are strongly male dominated. Conversely, carpal tunnel syndrome, paralysis of the nerves due to pressure and tenosynovitis are clearly female dominated.

Table 6: Rate of musculoskeletal occupational diseases, by gender, EU15, 2001–2004 (%)

	2001			2002			2003			2004	
Total	M	W	Total	M	W	Total	M	W	Total	M	W
Osteoarticular diseases of hands and wrists caused by mechanical vibration	1.5	2.1	0.1	1.2	1.8	0.2	0.1	0.1		0.1	0.1
Angio-neurotic diseases caused by mechanical vibration	18.3	26.8	0.2	9.6	14.8	0.2	6.1	9.7	0.1	4.0	6.5
Diseases of the periarticular sacs due to pressure	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pre-patellar and sub-patellar bursitis	2.5	3.5	0.3	2.7	3.8	0.8	2.6	3.8	0.7	2.7	3.9

Olecranon bursitis	1.1	1.5	0.1	1.0	1.4	0.3	1.0	1.4	0.2	0.9	1.3
Shoulder bursitis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Diseases due to overstraining of the tendon sheaths	31.9	23.5	50.1	36.0	28.6	49.5	39.0	32.9	49.4	37.5	33.0
Diseases due to overstraining of the peritendineum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Diseases due to overstraining of the muscular and tendonous insertions	27.2	27.6	26.1	30.4	32.4	26.6	31.7	34.3	27.3	34.7	37.8
Meniscus lesions following extended periods of work in kneeling or squatting position	1.9	2.7	0.1	1.2	1.8	0.1	0.7	1.1	0.0	1.6	2.4
Paralysis of nerves due to pressure	0.9	0.7	1.2	0.0			0.0	0.0	0.0	0.0	0.0
Carpal tunnel syndrome	14.7	11.5	21.7	17.7	15.2	22.3	18.7	16.6	22.3	18.5	14.9
Total MSDs	16,854	11,468	5,348	26,145	16,833	9,293	27,133	17,046	10,071	28,974	17,743

Note: Based on European Schedule of Occupational Diseases classification.

Source: Eurostat, Health and safety at work statistics

A strong increase in MSDs of about 55% emerges between 2001 and 2002, followed by a more moderate increase of 10.8% in subsequent years (Table 7). The rather sharp increase in the 2001–2002 period is partly due to an improvement in the countries matching their national data to the EODS specifications, particularly in relation to the milder occupational diseases.

Trends according to gender provide an important insight into the changes that occur both in the labour force and occupational structure. The trends discussed here reflect both vertical (across sectors) and horizontal (across occupations) gender segregation. These are discussed in more depth later in the report. Between 2001 and 2004, women experienced a twofold increase in MSDs compared with that experienced by men (109.8% compared with 54.7% respectively). Diseases caused by mechanical vibrations showed a strong decrease, largely owing to the decline of the mining industry, while the incidence of paralysis of the nerves due to pressure disappeared. Conversely, other diseases showed strong increases, some increasing by over 100% – for example, diseases due to overstraining and carpal tunnel syndrome. Women experienced a significantly higher increase than did men in relation to all of the diseases, with the exception of diseases caused due to overstraining of the tendon sheath.

Table 7: Variation in rate of occupational MSDs, by gender, EU15, 2001–2004 (%)

	2001–2004			2001–2002	
	Men	Women	Total	Men	Women
Osteoarticular diseases of hands and wrists caused by mechanical vibration	-92.7		-92.1	22.4	128.6
Angioneurotic diseases caused by mechanical vibration	-62.4	0.0	-62.2	-18.9	90.0
Olecranon bursitis	32.6	187.5	39.3	38.3	250.0
Diseases due to overstraining of tendon sheaths	117.3	86.9	102.2	78.7	71.7
Diseases due to overstraining of muscular and tendonous insertions	111.9	139.1	119.4	72.4	76.9
Meniscus lesions following extended periods of work in kneeling or squatting position	37.5	450.0	42.7	-1.0	200.0
Paralysis of the	-100.0	-100.0	-100.0		

nerves due to pressure						
Carpal tunnel syndrome	100.8	135.2	116.0	95.3	78.7	
Total	54.7	109.8	71.9	46.8	73.8	

Note: Based on European Schedule of Occupational Diseases classification.

Source: Calculations based on Eurostat, Health and safety at work statistics

The findings in Table 8 show the MSD incidence rate per 100,000 workers, according to the ICD-10 classification, over the 2001–2004 period. Accordingly, hand and wrist tenosynovitis show the highest incidence rate, followed by lateral epicondylitis, while Raynaud's syndrome declined from a rate of 3.6 in 2001 to 1.3 in 2004. The gender characterisation remained stable over time. While men show a higher incidence rate than women in relation to most MSDs and Raynaud's syndrome, women are more prevalent in relation to the rates of carpal tunnel syndrome and hand and wrist tenosynovitis.

Table 8: Rate of occupational MSDs per 100,000 workers, by gender, EU15, 2001–2004

	2001			2002			2003			2004	
M	F	Total	M	F	Total	M	F	Total	M	F	Total
Carpal tunnel syndrome	2.6	3.2	2.9	5.2	5.6	5.4	5.8	6.0	5.9	5.4	7.1
Raynaud's syndrome	6.2	0	3.6	5.1	0.1	2.9	3.5	0	2.0	2.4	0
Musculoskeletal diseases	14.1	11.2	12.9	24.2	19.7	22.3	26.1	21.0	23.9	28.5	22.2
Arthrosis of the elbow	0	:	0	0	:	0	0	0	0	0	0
Meniscal lesions	0.7	0	0.4	0.9	0.1	0.5	0.8	0.1	0.5	0.9	0.1
Hand or wrist tenosynovitis	5.4	7.3	6.2	9.8	12.5	11	11.5	13.3	12.3	11.9	13.1
Bursitis of elbow	0.4	0	0.2	0.5	0.1	0.3	0.5	0.1	0.3	0.5	0.1
Bursitis of knee	0.8	0	0.5	1.3	0.2	0.8	1.3	0.2	0.8	1.4	0.2
Medial epicondylitis	0.6	0.3	0.5	1.0	0.5	0.8	1.3	0.8	1.1	1.6	1.2
Lateral	5.8	3.5	4.8	10.0	6.2	8.4	10.6	6.6	8.9	12.1	7.6

epicondylitis											
Arthrosis of the wrist	0.5	0	0.3	0.6	0.1	0.4	0	:	0	0	:

Note: Based on ICD-10 classification.

Source: Eurostat, Health and safety at work statistics

Table 9 summarises the variation in incidence rates of MSDs according to gender. Apart from Raynaud's syndrome, which is largely a male-dominated disease and which showed a significant decrease, dropping by 63.9%, MSDs doubled on average. In particular, the incidence of both medial and lateral epicondylitis increased well above average levels. However, since the inclusion of 'mild diseases' did not occur until 2002, it is useful to also compare the figures for 2004 with those for 2002. In this context, the decline of Raynaud's syndrome is once again confirmed, while both MSDs in general and carpal tunnel syndrome experienced a similar increase of 15.2% and 13% respectively. The gender characterisation discussed earlier (Table 7) is confirmed: while a stronger increase in medial epicondylitis and carpal tunnel syndrome is recorded among women, a larger increase in tenosynovitis is observed among men.

Table 9: Variation in MSDs, by gender, 2001–2004 (%)

% increase/decrease in 2004 compared with 2001			% increase/decrease in 2004 compared with 2002		
M	F	Total	M	F	Total
Carpal tunnel syndrome	107.7	121.9	110.3	3.8	26.8
Raynaud's syndrome	-61.3		-63.9	-52.9	-100.0
MSDs	102.1	98.2	99.2	17.8	12.7
Meniscal lesions	28.6		25.0	0.0	0.0
Hand or wrist tenosynovitis	120.4	79.5	101.6	21.4	4.8
Bursitis of elbow	25.0		50.0	0.0	0.0
Bursitis of knee	75.0		80.0	7.7	0.0
Medial epicondylitis	166.7	300.0	180.0	60.0	140.0
Lateral epicondylitis	108.6	117.1	110.4	21.0	22.6
Arthrosis of the wrist	-100.0		-100.0	-100.0	

Source: Calculations based on Eurostat, Health and safety at work statistics

Self-reported MSDs – EWCS

According to results from the fourth EWCS, which covers some 31 countries, 24.7% of workers reported problems with backache in 2005, while 22.8% cited problems with muscular pain. A higher proportion of men reported both forms of MSD: 26.6% of men compared with 22.3% of women reported backache, while 24.3% of men compared with 20.8% of women complained of muscular pain (Figure 2). The gender gap thus ranged from 3.5 percentage points to 4.3 percentage points in relation to muscular pain and backache respectively.

Figure 2: Reported backache and muscular pain, by gender, 2005 (%)

Source: Calculations based on results of fourth EWCS

The aforementioned Foundation report *Work organisation and health at work in the European Union* provides a summary of backache trends from 1995 to 2000 for the EU15: accordingly, the proportion of women reporting backache problems increased from 30% to 34% in this period, while the percentage of men citing this problem increased from 29% to 34%. Moreover, the report found that the percentages observed for muscular pain in both the upper and lower limbs 'tend to show an increase of the problem' (p. 20). The 2002 Foundation report *Types of employment and health in the European Union* , based on findings for 2000–2001 for the EU15, along with Norway, and the then 12 candidate countries (CC12), found that the level of various muscular pain reported increased from 18.6% in 1995 to 30.8% in 2000. Furthermore, according to the 2000 data, gender differences are not significant for backache, while a significantly higher proportion of women (20% higher) than men reported muscular pain – a problem which is increasing.

According to results from the third EWCS, a higher level of backache is reported in most countries; however, in Bulgaria, Denmark, Estonia, Finland, Latvia, the Netherlands, Poland and Sweden, a higher proportion of workers reported problems with muscular pain (Figure 3).

Figure 3: Reported backache and muscular pain, by country, 2000–2001 (%)

Note: *Result based on 2001 survey.

Source: Based on results of third EWCS

In 10 of the countries covered by the EWCS, more men than women reported backache problems, although this gender gap widened to more than 5% only in Cyprus and Greece. At the same time, over 5% more men than women cited muscular pain in Greece and the UK. On the other hand, over 5% more women than men reported backache in Malta, Denmark and Germany. Meanwhile, over 5% more women than men reported muscular pain in Estonia, Germany, Latvia, Lithuania, Malta, Romania and Slovenia, along with greater than 10% more women than men in Denmark, Finland and Sweden (Figure 4).

Figure 4: Gender gap in reported backache and muscular pain, by country, 2000–2001 (%)

Note: *Result based on 2001 survey.

Source: Third EWCS

According to the results of the fourth EWCS, Greece, the NMS – with the exception of the Czech Republic – along with Finland, Portugal, Spain and Sweden show figures higher than the EU average for both reported backache and muscular pain (Figure 5). In Luxembourg, only the findings for reported levels of backache are higher than this average, while in Denmark and the Czech Republic the levels of reported muscular pain are higher than the EU average.

Figure 5: Reported backache and muscular pain, by country, 2005 (%)

Source: Calculations based on fourth EWCS

Men reported problems with backache more often than women did in 20 countries; of these countries, Spain, Greece, Lithuania, the Czech Republic, Slovakia, Denmark, Hungary and Poland showed a gender gap of over 5%

(Figure 6). At the same time, more men than women cited muscular pain in 18 of the countries. Nevertheless, in Luxembourg and Slovenia, over 5% more women than men reported backache, while greater than 5% more women than men cited muscular pain in Finland, Slovenia and Sweden.

Figure 6: Gender gap in reported backache and muscular pain, by country, 2005 (%)

Source: Calculations based on fourth EWCS

Evidence at national level

According to the national correspondents, 10 countries report MSDs to the fullest extent, that is, according to the main disease classification. Only Slovenia follows the full WHO ICD-10 classification, while in France, the register of the National Health Insurance Agency For Wage Earners (Assurance Maladie des Travailleurs Salariés, AMELI) is limited to private sector non-agriculture employees and based on diseases and sectors as defined by national joint committees. Registers in Germany, Italy and Spain provide details on the main MSDs, while those in Finland, Slovakia and the UK provide details on some of them. Registers in Slovenia and the UK are the only ones that report figures from a gender perspective.

Trends were provided by 19 out of 28 countries, while four countries provided only a static picture in 2005 (or 2002 in the case of Ireland). Six correspondents were unable to provide any evidence adding to the EWCS findings. Among the countries showing trends, five countries showed an upward trend over the entire time span, based on social security or public health sources. Bulgaria is the only country showing trends based on both administrative records and working conditions surveys: while the former showed an increase, over a 10-year period, in the number of patients discharged from hospitals having MSDs, the latter showed a stable situation when comparing the 2001 and 2005 surveys. Finland goes in the opposite direction: while the Quality of Working Life Survey (QWLS) reported a steady increase in work-related MSDs from 1997, a report (810Kb PDF) published by the Finnish Institute of Occupational Health (Työterveyslaitos, FIOH) and based on the findings of the Finnish Register of Occupational Diseases found that the proportion of recognised RSI cases halved between 1990 and 2002, although there has been a moderate increase since 2000 (Table 10).

Only Denmark shows a clear decrease in the level of MSDs between the 1990s and early 2000s. Over the same period, most UK trends show a decline, except in relation to the Musculoskeletal Occupational Surveillance Scheme (MOSS)-Occupational Physicians Reporting Activity (OPRA) source. This latter survey collects data from rheumatologists and occupational doctors, who are referred to as the Health and Occupation Reporting (THOR) network; the data indicate an increase in cases between 1998 and 1999 and again between 2003 and 2004.

In Slovenia, a small decrease in the number of cases is observed between 2003 and 2004, despite a marginal increase in the number of days' absence. Meanwhile, eight of the countries show a change of direction with respect to MSD cases: their turning point occurs between 2000 (in Germany and Estonia) and 2003. In the Netherlands, MSD trends are formulated based on two different working conditions surveys – namely, the Integrated System of Surveys on Living Conditions/Permanent Quality of Life Survey (*Periodiek Onderzoek Leefsituatie* , POLS) and the TNO Work Situation Survey (*TNO Arbeidssituatie Survey* , TAS) – both of which show a substantial stabilisation of MSDs in 2002. Public health statistics in the Czech Republic show a considerable decline in the level of occupational diseases, including MSDs; however, this is counterbalanced by an increase in the duration of incapacity by about 25% (from an average of 43 to 53 days) between 2000 to 2004.

In Belgium, a change was observed in 2003 in the number of reported cases, distinguished according to disease and classification criteria (see the 2006 annual report (1.17Mb PDF) of the Fund for Occupational Diseases (Fondes des maladies professionnelles/Fonds voor de beroepsziekten, FMP/FBZ)): in the period 2001–2006, clear trends can be drawn for carpal tunnel syndrome (strong increase) and tendonitis (stable). Overall trends in relation to MSDs show an increase up to 2002 and then a decline.

Finally, in most of the countries in question, the proportion of MSDs is increasing, including those showing a declining trend with respect to occupational diseases: the UK SWI – which summarises reported WRDs – shows a negligible decline over total occupational diseases.

Table 10: General trends in MSDs at country level, 1970–2006

Trend	Absence/cases from administrative sources	Reported WRDs	Time span	Turning point
Increase in MSDs	BG ES FR* HU IT LT		1996–2004 2000–2004 1979–2001 1995–2004 2000–2004 1996–2005	
		FI NL – POLS**	1977–2003 1997–2000	
More/less stable	SI		2003–2004	
Downward changes in MSDs	BE CZ (cases) DE EE NO SK		2001–2006 1990–2004 1970–2005 1995–2005 2002–2006 1996–2000	2002 2002 2000 2000 2003 1999
		NL – TAS** SE	2000–2004 1996–2005	2002 (stable) 2002
Upward changes in MSDs	FI		1990–2002	up since 2000
		UK (THOR)	1998–2005	1999 and 2004
Decline in MSDs	AT DK SI UK (IIS)		1991 and 2004 1993–2003 2003–2004 1995/6–2004/5	after 1998
		BG UK (SWI)	2001–2005 1995–2005	

Notes: *Only periarticular disorders (T57), **RSI. IIS = Industrial Injuries Scheme.

Source: EWCO correspondents 2005–2006

However, disability benefits recognised as being MSD related by the UK Industrial Injuries Scheme (IIS) reached their maximum level in 1992–1993, reverting to a downward trend until 2002–2003, after which a slight increase was observed, thus confirming figures obtained from the MOSS-OPRA survey. These findings therefore add to the MSD trends formulated by Brenner et al (2004) (Figure 7).

Figure 7: Number of new MSD cases recognised in UK, 1991–2005*

Note: * Mainly upper limb disorders; ‘Beat conditions’ refer to a beat hand, elbow or knee, that is, damaged by strain.

Source: UK HSE, Musculoskeletal disorders – summary

Specific MSD trends in terms of part of body affected can differ from each other or from general MSD trends (Table 11). Among the countries showing a general decline in MSDs reported to social security institutions,

Denmark shows an increase in diseases of the neck and shoulders, while diseases of the lower limbs remain relatively stable over time. In Germany, only lower limb diseases show an increase since 2000. More frequently contrasting trends are observed in relation to self-reported MSDs compared with those reported to social security bodies. In Norway, pains in the upper limbs are on the increase, while the incidence of other musculoskeletal pains remains stable. In Finland, the decline in reported pains in the upper limbs, back and lower limbs contrasts with the general increase in self-reported MSDs. Meanwhile, in Spain, the decrease in pains in the legs, feet and ankles contrasts with the general increase in MSDs, while in the Netherlands, reported pains in the lower limbs and backache remain stable despite a general increase.

Overall, in distinguishing between parts of the body affected, a relative increase emerges in relation to MSD disorders of the neck, shoulders and/or upper limbs in two out of three countries. Such differing trends should be placed against the background of underlying changes both in professional and industrial composition, and in organisational as well as health and safety policies.

Table 11: MSD trends, by part of body affected, as reported by social security and health services sources

Neck, shoulders, upper limbs		Back		Lower limbs	
Absence/cases	Reported	Absence/cases	Reported	Absence/cases	Reported
Increasing	DK (neck-shoulders)	ES FI (neck, shoulders) NL NO (upper limbs)		ES	DE HU 1995–2004 (meniscus)
More/less stable		NO (neck, shoulders)		NL NO	DK 1993-2003 (legs)
Downward trend	DE (2000) UK-THOR (1999)		UK-THOR (1999)		UK-THOR (1999)
Upward trend	UK-THOR (2004)	FI (upper limbs)	UK-THOR (2004)	FI (1997)	UK-THOR (2004)
Decreasing	DK1993–2003 (arms)	UK-SWI (2003/2004)	DK 1993-2003	NL-POLS 1997–2000 UK-SWI	

Note: Year in brackets refers to turnaround year.

Source: EWCO correspondents 2005–2006

Gender issues arising from national sources

Based on the EWCO correspondents' contributions, trend data with a gender perspective can be obtained from 14 sources pertaining to 11 countries. At an aggregate level, women show higher rates of MSDs, either reported or recognised, in seven countries: namely, Bulgaria, Estonia, Finland, the Netherlands, Norway, Slovakia and Sweden. At the same time, men report higher rates of MSDs in Estonia, although this has significantly reduced over time, from 62% in 2002 to 55% in 2004. In the Czech Republic, fewer MSDs are reported by women, although the duration of cases is longer, while the data for Lithuania show different gender trends according to sector. In the Italian regions of Lombardy and Tuscany, carpal tunnel syndrome is clearly a female-dominated disorder, while in Poland absenteeism is male dominated except for scoliosis and neck and vertebrae conditions. In the UK, all of the sources show generally higher MSD rates for men, although the IIS (recognised diseases) and MOSS-OPRA sources show different patterns in terms of the part of the body affected or the disease. According to the latter source, a steady increase emerges over the entire time span in the proportion of women reporting hand-wrist-arm MSDs – other than Raynaud's syndrome – and spinal diseases in both the upper and lower back.

Norway is the only country which shows gender-related trends arising from both administrative sources in terms of

absenteeism and reported WRDs: both sources reveal a higher proportion of women than men in general. However, in relation to back pain, men report a greater number of days' absence than women do. Nonetheless, a higher proportion of women report being 'immensely affected' or 'quite affected' by both lower back and neck, shoulder and upper back disorders. Conversely, a greater share of men report being 'immensely affected' or 'quite affected' by lower limb disorders, despite a lower number of days' absence pertaining to such problems. It should be noted, however, that both types of administrative sources are based on reported diseases, since Norway has a unique social security institution which deals with both occupational diseases and incapacities.

Against the background of a relatively stable picture in recent years (generally 2003–2004), further evidence of gender differences can be observed in relation to MSDs. In the Netherlands, findings from the 2003 NEA show that women report higher levels of absenteeism due to RSI than men do. When further distinguishing between absenteeism levels according to cases and duration of sickness, the findings for Austria, Bulgaria, the Czech Republic, Denmark and Germany indicate that the duration of absence for women is longer than that for men. In Finland (QWLS 2003), the MSDs reported by women are more strongly related to age than those reported by men. In Spain, more women than men report musculoskeletal pains, apart from in the lower back, knees and ankles; similarly, 2002–2004 findings (in French, 1.7Mb PDF) for the French Loire region revealed that a higher proportion of women reported diseases of the shoulders, hand and wrist, as well as the cervical vertebral column and spinal column.

According to results of the 1999 survey from the German Federal Institute for Vocational Education and Training (Bundesinstitut für Berufsbildung, BIBB) and the Institute for Labour Market and Employment Research (Institut für Arbeitsmarkt- und Berufsforschung, IAB), more women reported MSDs of the legs and neck/shoulders; the latter finding was confirmed by results of the 2004 survey by the International Institute for Socioeconomic Research (Internationales Institut für Empirische Sozialökonomie, INIFES) on the New Quality of Work Initiative (*Initiative Neue Qualitaet der Arbeit* , INQA). In Estonia, results of the 2005 survey Health behaviour among the Estonian adult population (partly in English, 1.5Mb PDF) revealed that women complained more frequently than men about MSDs pertaining to all parts of the body investigated.

Finally, in Denmark, the probability of developing an MSD in 2000, if it was absent in 1995, is significantly higher for women than for men in relation to most parts of the body. The reverse holds true with respect to knee-related MSDs.

Age

LFS

The EODS source provides figures on occupational disease by age only in an aggregate form. It is therefore necessary to rely on the 1999 LFS ad hoc module on accidents at work and occupational diseases.

Work-related MSDs account for almost one in two occupational diseases, 46.8% of which account for at least 14 days of work lost. Their proportion of total occupational diseases is moderately sensitive to age – only the youngest workers aged 15–24 years show a noticeably lower weight, at 42.3%; the effect of age slightly declines after the 45–54 year age group (Figure 8). Severe MSDs resulting in at least 14 days' work lost show a more straightforward relationship with age, accounting for 35% of severe occupational diseases among workers aged 15–24 years.

Figure 8: MSDs as proportion of total occupational diseases, by age, 1999 (%)

Source: Eurostat, European social statistics: Accidents at work and work-related health problems, 2002

As the findings in Figure 9 show, the proportion of MSDs increases higher than that of WRDs as seniority or length of tenure in the company increases up as far as the 45–54 year age group, after which it declines. Moreover, the share of severe WRDs increases with seniority in general, particularly with respect to MSDs. Such trends are consistent with the cumulative character of MSDs, whereby the most severe outcomes increase more rapidly over time than the milder ones and than WRDs in general.

Figure 9: Work-related MSDs and WRDs, by severity and work seniority, 1999 (%)

Note: Total by age = 100.

Source: Eurostat, 2002

Figure 10 compares general trends in relation to age with both MSD prevalence rates and their share of total WRDs. While MSDs as a proportion of WRDs increase rapidly among the 15–24 year and 25–34 year age groups and then become stable, with a slight decline evident among those aged 55–64 years, MSD prevalence rates continuously increase up as far as the 55–64 year age group, after which they rapidly decline.

Figure 10: MSD prevalence rates and as proportion of WRDs, by age, 1999 (%)

Source: Eurostat, 2002

In terms of sector, transport and communication, construction and agriculture show the highest MSD prevalence rates (Table 12). Prevalence rates increase with age up to the 45–54 year age group and then decline in most industries: agriculture, manufacturing, hotels and restaurants, financial intermediation, public administration and defence, health and social services, and other service activities. In construction, transport and communication, education and household activities, MSD prevalence rates increase up to the 55–64 year age group and then, when significant, decline. Meanwhile, MSD prevalence rates show a U-shaped behaviour with age in electricity, gas and water supply and in wholesale and retail trade.

Table 12: Number of self-reported MSDs, by sector and age, 1999

	15–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65+ years
Agriculture	1,272	1,930	2,691	5,389	2,891	:
Fishing	:	6,554	1,725	:		:
Mining and quarrying	:	1,111	3,158	1,151	4,185	
Manufacturing	1,235	2,046	2,711	3,190	2,631	589
Electricity, gas and water supply	3,699	1,249	1,221	2,760	3,389	:
Construction	531	2,400	3,546	4,083	5,479	2,770
Wholesale and retail trade	2,333	1,961	2,390	3,276	4,281	:
Hotels and restaurants	1,060	1,905	1,881	2,238	1,596	:
Transport and communication	1,483	2,661	3,160	3,424	5,450	:
Financial intermediation	:	1,152	1,465	2,213	1,792	:
Real estate and business activities	948	1,829	2,954	3,444	2,141	5,412
Public administration	:	1,741	2,415	2,507	2,486	1,236

and defence						
Education	640	1,643	1,939	2,312	3,664	:
Health and social work	2,822	2,878	4,118	5,713	5,312	2,160
Other service activities	2,120	2,340	2,773	3,485	2,778	:
Household activities	:	987	1,187	2,209	2,932	:
Extra-territorial organisations	:	:				
Total	1,457	2,049	2,743	3,399	3,555	1,647

Note: Prevalence per 100,000 workers.

Source: Eurostat, 2002

The percentage of MSDs as a proportion of total WRDs varies considerably across sectors according to age (Table 13). Agriculture and construction report the highest level of MSDs as a proportion of total WRDs, while education showed the lowest. In agriculture, manufacturing, construction, hotels and restaurants, real estate and business activities, and household activities, the proportion of MSDs increases with age up to the 45–54 year age group, and then declines. Their prevalence shows a continuous rise in transport and communication; this share tends to decline with age in financial intermediation and in public administration and defence, while showing a more irregular pattern according to age in electricity, gas and water supply, wholesale and retail trade, health and social services, and education.

Table 13: Self-reported work-related MSDs, by sector and age, 1999 (%)

	15–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65+ years
Agriculture	42.3	64.6	56.1	71.4	61.3	
Fishing		100.0	67.0			
Mining and quarrying		29.4	78.8	49.6	61.0	
Manufacturing	43.1	51.5	56.4	58.6	41.4	26.8
Electricity, gas and water supply	73.1	43.6	33.1	64.4	60.6	
Construction	33.7	65.6	63.3	65.4	61.9	62.5
Wholesale and retail trade	63.0	52.9	53.8	54.2	67.1	
Hotels and restaurants	26.3	56.0	54.0	58.2	34.4	
Transport and communication	29.5	58.0	56.1	57.5	73.5	

Financial intermediation		42.4	42.6	37.5	35.5	
Real estate and business activities	28.8	41.9	51.9	52.3	50.4	88.5
Public administration and defence		46.8	45.4	42.4	43.6	100.0
Education	19.1	32.2	29.5	29.9	38.5	
Health and social work	51.1	44.7	49.4	52.8	48.0	44.2
Other service activities	47.8	47.7	44.1	48.8	54.0	
Household activities		37.4	42.3	63.8	70.2	
Extra-territorial organisations						
Total	42.3	48.6	49.6	50.5	49.7	48.8

Source: Eurostat, 2002

EWCS

Findings of the fourth EWCS in relation to the prevalence of MSDs according to age show a reversed U-shape. The highest figures in relation to backache and muscular pain are reported among those aged 40–54 years (Table 14).

When gender is taken into account, men share such a general pattern: however, the gap between those aged under 25 years and those aged 40–54 years amounts to 6.1 percentage points when backache is reported and to 5.8 percentage points with respect to muscular pain. A slightly higher proportion of those aged over 55 years report problems with backache compared with those under 25 years of age.

A different pattern emerges in relation to women: only small differences are evident between the over 40 year age groups for both forms of MSD, while a gap of 10.4 percentage points emerges between those aged under 25 years and those aged 40–54 years in relation to backache; this same gap stands at 10 percentage points in respect of muscular pain. Furthermore, women aged over 55 years report higher figures than men do in relation to backache and muscular pain, creating a gender gap of 2.4 and 2.8 percentage points respectively.

According to the report, *Types of employment and health in the European Union* , which is based on findings from the third EWCS, MSD reporting reveals a reversed U-shape: the probability of reporting backache is 28% higher among those aged 35–44 years compared with those aged 15–24 years, while the probability of reporting muscular pain is 46% higher among those aged 45–54 years compared with those aged 15–24 years.

Table 14: Reported backache and muscular pain, by age and gender, 2005 (%)

	Backache			Muscular pain	
Age group	Men	Women	Total	Men	Women
Less than 25 years	23.1	16.1	17.7	21.2	15.1

25–39 years	27.5	22.4	24.3	24.8	21.1
40–54 years	29.2	26.5	27.3	27.0	25.1
55+ years	23.8	26.2	24.1	22.7	25.5
Total	27.1	23.6	24.7	24.9	22.3

Source: Calculations based on fourth EWCS

Evidence at national level

In a comparison between national sources, MSDs tend to increase with age but then decline after a certain point. Such a turning point tends to vary according to country and extent of age groups: retirement age is a key variable in explaining national trends.

Surveys in the Netherlands show a contrasting picture. NEA figures indicate that absenteeism caused by RSIs increases significantly with age, while POLS figures for 1997–2001 show that the complaint of backache increases with age but not in the case of RSIs. Meanwhile, the TAS survey shows that, while RSI complaints continuously increase with age over time (2000–2004) up to the 46–55 year age group, the number of complaints declines in the 56–65 year age group.

Reported MSDs tend to decline among those aged over 64 (or 65) years in Austria (1994) and Slovenia (2004), although in the latter country workers aged over 65 years record the highest index of severity. In France and Lithuania, a decline occurs among those aged over 60 years, although in the latter case no prevalence rate is reported. In the Czech Republic and Estonia, rates tend to decline among those aged over 55 years. The UK shows a contrasting picture in relation to its survey findings: according to the SWI survey, incidence rates are higher for the 45–54 year age group, except in the case of women in 2004–2005 and men in 2001–2002, both of whom recorded higher self-reported MSDs among the 35–44 year age group. The MOSS-OPRA survey observed higher self-reported MSD levels for both sexes among the 35–44 year age group.

A similar trend can be observed in relation to 1991 Austrian figures, which showed a decline in self-reported MSDs among workers aged over 65 years, while in France the same was evident among those over 60 years of age. In the Czech Republic and Estonia, MSD levels declined among those aged 55 years and over, more specifically in relation to back pain and neck/shoulder pain for women. The highest value in the Latvian manufacturing and transport and communication sectors is observed among the 50–59 year age group, although no information on the prevalence rate is reported. Finally, Slovenia shows a peak in the incidence and frequency of sick leave and temporary disability for both sexes in the 45–64 year age group.

In Finland, patterns differ according to gender: reported MSDs become stable for men after 50 years of age, while they increase for women, apart from neck and shoulder problems, despite a generalised strong increase of reported MSDs from 1997 to 2003. Italian regions show different peak values, for example in Lombardy (30–49 years) and Tuscany (50–59 years). In Bulgaria, MSD peak levels are observed among those aged 35–44 years for all parts of the body.

In Norway, MSD levels generally increase with age, although the age cohort is quite broad, at 45–66 years: the levels tend to decline over time for some parts of the body (lower back, lower limbs), while for others (neck, shoulders, upper limbs) they increase. Swedish figures show no decline in the incidence of MSDs per 1,000 workers as age increases, although different patterns emerge according to gender: while women show a strong increase in the central age groups (35–44 years and 45–54 years), followed by a more moderate growth, men show an almost linear positive relation with age.

It is useful to relate MSD figures to the employment rate of older workers aged 55–64 years, taking as a reference the Stockholm target of an employment rate of 50% among older workers by 2010 (Table 15). Germany, Norway and Slovenia could not be included because of the cohort width, while the Danish figures do not allow for MSD trends to be drawn according to age. Countries well above the Stockholm target, such as Finland and Sweden, show no decline in reported MSDs as age increases, while countries well below the target indicate a peak in reported

MSDs in the 35–44 year age group. However, overall, the picture is not so clear-cut: Austria, Slovenia and the UK seem to differ to other countries, while the Netherlands surveys show contrasting figures. The general hypothesis that the peak value increases as the country's retirement age rises should be opened to further scrutiny in terms of variations of the older workers' employment rates, working conditions, probability of early retirement caused by work-related illness, and return-to-work policies. As Molinié and Volkoff (2003) emphasise in their findings (in French, 84Kb PDF) , MSDs have a significant impact on perceived quality of work and job satisfaction, identified as the key variable for retirement age.

Table 15: Age group most affected by MSDs, by employment rates of older workers

	Under 35 years	35–44 years	45–54 years	55–59 years	60–64 years
Over 60%		UK (MOSS-OPRA)	UK (SWI)	EE	
50%–60%					
40%–50%	NL/POLS (only RSI)		NL/TAS (only RSI)	CZ, LT	
Below 40%		BG, IT (Lombardy)	IT (Tuscany)	FR	AT

Source: EWCO correspondents 2005–2006

Labour contract

LFS

As discussed, for instance by Buckle and Woods (2002), job insecurity affects the incidence of MSDs, since temporary workers are at the margins of labour markets.

The 1999 LFS ad hoc module on accidents at work and occupational diseases investigates relative prevalence rates according to labour contract and severity. In general, work-related MSDs are higher among those with permanent jobs and very low for workers in training or on a probationary period: this is due to the higher average age of the former type of workers. In agriculture and fishing, relative prevalence rates are higher across temporary jobs than across permanent ones because of the high proportion of the former (Table 16). At the same time, in education, health and social work, and transport and communication, the relative prevalence rates are above average both for permanent and temporary workers. In these sectors, with the exception of health and social work, a sharp decline emerges among temporary workers as the severity increases; thus, temporary workers are likely to experience milder MSDs compared with their permanent counterparts.

Table 16: Work-related MSDs, by labour contract and work days lost, 1999 (%)

	Permanent job		Temporary job		Training or probationary period		Total
	14+ days lost	Total	14+ days lost	Total	14+ days lost	Total	14+ days lost
Total	106	104	71	92	21	22	100
Agriculture, hunting and forestry	88	87	105	105	67	97	89
Fishing	195	84	587	190	:	:	256
Mining	64	57	72	24	:	:	62

and quarrying							
Manufacturing	79	84	31	46	:	13	74
Electricity, gas and water supply	84	79	:	:	42	14	79
Construction	93	75	64	71	32	33	86
Wholesale and retail trade	87	85	55	70	11	26	82
Hotels and restaurants	83	84	48	66	:	:	73
Transport and communication	121	109	73	103	85	31	118
Financial intermediation	68	75	46	37	50	15	67
Real estate and business activities	95	105	79	111	43	37	92
Public administration and defence	121	97	76	56	30	21	114
Education	157	159	79	155	:	11	144
Health and social work	191	187	137	158	18	21	177
Other service activities	87	105	24	82	:	:	79
Household activities	71	81	61	85	:	:	67
Extra-territorial organisations		:	:	:	:	:	93

Source: Eurostat, 2002

EWCS

According to the 2005 EWCS, temporary agency workers report the lowest incidence of MSDs among personnel, at about 20% for both backache and muscular pain, while workers without any labour contract – and therefore

undeclared – report the highest rates, at 26.6% for backache and 24.6% for muscular pain (Table 17). Apprentices score the highest values across regular employees, at 25.9% and 23.9% respectively. Women report higher figures than men do for both forms of MSD when they do not hold any employment contract: 29.3% in each case, representing a 4.9 percentage point gender gap in the case of backache and an 8.4 percentage point gap in respect of muscular pain. Women also report higher proportions for backache than men do when they have a temporary agency contract. Conversely, men working as apprentices – citing 30.2% for backache and 28.6% for muscular pain – and men holding a fixed-term employment contract – citing 27.7% and 25.4% respectively – report both the highest figures and reflect the widest gender gap.

Table 17: Reported backache and muscular pain, by labour contract, 2005 (%)

Type of labour contract	Backache			Muscular pain	
	Men	Women	Total	Men	Women
Indefinite contract	25.0	21.9	23.6	22.5	20.1
Fixed-term contract	27.7	20.0	23.7	25.4	20.6
Temporary agency contract	19.5	21.5	20.4	21.1	19.2
Apprenticeship or other training scheme	30.2	20.2	25.9	28.6	16.9
No contract	24.4	29.3	26.6	20.9	29.3
Other	36.1	16.7	27.5	34.9	18.2
Total	25.2	22.1	23.8	22.8	20.9

Source: Calculations based on results of fourth EWCS

Meanwhile, part-time workers report fewer complaints for both backache and muscular pain, at rates of 19.6% and 17.8% respectively (Table 18).

Table 18: Reported backache and muscular pain, by working time, 2005 (%)

	Backache			Muscular pain	
Men	Women	Total	Men	Women	Total
Part-time	21.0	19.1	19.6	17.8	17.8
Full-time	27.3	25.3	26.5	25.2	24.0
Total	27.0	23.6	25.6	24.9	22.3

Source: Calculations based on results of fourth EWCS

According to the report *Types of employment and health in the European Union* , based on the 2000 EWCS, self-employed persons had more risk of reporting muscular pain than had those in full-time permanent employment. Part-time self-employed people were 21% more likely to report muscular pain than those in full-time permanent jobs, while those in part-time temporary employment had a 30% lower risk than full-time permanent workers. Regarding backache, positive significant associations were also found among part-time self-employed people – who reported a 24% higher probability of citing backache than those in full-time permanent jobs. At the same time, those in part-time temporary employment and part-time permanent employment cited a statistically

significant lower risk of backache than full-time permanent workers, by 40% and 11% respectively.

Evidence at national level

The EWCO national correspondents reveal a less clear-cut picture. According to the Danish study by Burr and Jensen (2002), in the 2000 Danish Work Environment Cohort Study (DWECS) (DK0312SR01) job insecurity was found to affect significantly the probability of workers' who had not reported such diseases in 1995 experiencing disorders in their hands and lower back. Data from the Finnish QWLS show that permanent workers complain more frequently of MSDs, but that the proportion of non-permanent workers reporting neck or shoulder pain, hand or arm pain, and back pain increased faster between 1990 and 2003.

According to the 1999 BIBB/IAB survey, German permanent workers in general complain more often of MSDs than non-permanent workers do except for both upper and lower limbs, but the gaps between both groups of workers are usually relatively small. However, Spanish temporary workers report shoulder, upper limb, knee and leg pains more frequently than their permanent counterparts. Finally, according to the UK SWI, self-employed people reported MSDs at higher prevalence rates than employees did – at 2.4 compared with 1.6 – while part-time workers report lower incidence rates than full-time staff. Overall, the relation between MSDs and type of labour contract is rather ambivalent since it should be controlled with respect to age.

Occupational status

EODS

The EODS source allows an in-depth investigation of MSDs according to both occupational status and economic sector. In order to gain a comprehensive overview and for simplicity, MSDs are discussed together with carpal tunnel syndrome and Raynaud's syndrome on the basis of occupation and gender. Craft workers, machine operators and assemblers, and unskilled workers show incidence rates consistently higher than average and increasingly female dominated, while service workers and skilled agricultural workers report rates below average – albeit higher than among the professional and administrative groups (Table 19).

Table 19: MSDs, by occupation and gender, EU15, 2001–2004 (%)

	2001			2002			2003			2004	
Total	M	W	Total	M	W	Total	M	W	Total	M	W
Legislators and managers	0.5	0.4	0.5	0.6	0.4	0.8	0.4	0.3	0.5	0.3	0.2
Professionals	1.4	1.2	1.5	2.6	2.2	3.1	3	3.1	2.9	2.5	2.1
Technicians and associate professionals	2.2	2	2.6	3.9	3.5	4.2	4.5	3.7	5.2	4.1	3.7
Administrative staff	3.7	2.9	4.1	9.4	16.7	5.9	5.7	5.3	5.8	6.7	5.5
Service and sales workers	6.3	4.3	7.4	13.3	8.1	16.2	16.4	10.7	19.4	19.6	13
Skilled agricultural workers	12.8	11.8	15.2	18.4	17.5	20.1	22.9	22.9	22.5	23.4	21.3

Craft and related trades workers	52.9	47.3	99.7	90.5	77.5	203.7	101	86.7	227.4	109	93.3
Plant and machine operators and assemblers	61.8	65.4	44.5	73.8	71.1	85.5	64.8	58.1	96	68.1	56
Unskilled workers	39.7	30.2	50.9	66.6	56.1	79.1	70.8	63	80.1	74	65.5
Armed forces	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0
Total	19.4	22.9	14.4	30.6	34.5	25.4	31.8	35.4	27	33.1	36.3

Source: Calculations based on Eurostat, Health and safety at work statistics

Service workers – up by 47.4% – and skilled agricultural workers – up by 27.2% – record the highest increase of incidence rates between 2002 and 2004, while legislators and managers show a significant decline (Table 20); comparison over this time span takes into account that implementation of the concept of mild diseases was substantially achieved in 2002. The gender impact is strongly differentiated across the occupational groups and women generally show a higher increase in incidence of MSDs than men do. In terms of trends in incidence rates, the gender gap is widest among administrative staff, machine operators and assemblers, skilled agricultural and service workers, legislators and unskilled workers.

Table 20: Variations in MSDs, by occupation and gender (%)

	% increase/decrease in 2004 compared with 2001			% increase/decrease in 2004 compared with 2002	
	Total	Men	Women	Total	Men
Total	70.6	58.5	103.5	8.2	5.2
Legislators and managers	-40.0	-50.0	0.0	-50.0	-50.0
Professionals	78.6	75.0	93.3	-3.8	-4.5
Technicians and associate professionals	86.4	85.0	76.9	5.1	5.7
Administrative staff	81.1	89.7	73.2	-28.7	-67.1
Service and sales workers	211.1	202.3	205.4	47.4	60.5
Skilled agricultural	82.8	80.5	94.1	27.2	21.7

workers					
Craft and related trades workers	106.0	97.3	153.8	20.4	20.4
Plant and machine operators and assemblers	10.2	-14.4	185.2	-7.7	-21.2
Unskilled workers	86.4	116.9	65.2	11.1	16.8

Source: Calculations based on Eurostat, Health and safety at work statistics

LFS ad hoc module

Figure 11 outlines relative prevalence rates of MSDs and WRDs according to occupational status. While legislators and professionals show relatively high rates of WRDs, they experience comparatively low rates of MSDs, especially the most serious disorders. Other workers report higher prevalence rates for MSDs, particularly service and sales workers, unskilled workers and machine operators and assemblers. In fact, all of these occupations and the armed forces experience high prevalence rates of MSDs implying at least 14 days off work.

Figure 11: Relative prevalence rates of MSDs and WRDs, by occupation, 1999 (%)

Source: Eurostat, 2002

EWCS

According to the fourth EWCS, a clear distinction emerges in both forms of reported MSDs among professional and manual workers: backache or muscular pain are reported by fewer than 20% of professionals, while 27.3% of unskilled workers report backache and 25.9% report muscular pain (Table 21). Meanwhile, 38.2% of craft workers report backache and 35.6% cite muscular pain, while these proportions total 37.7% and 34.4% of machine operators and assemblers, and 50.5% and 48.7% of skilled agricultural workers.

Investigation according to gender highlights the relevance of composition effects when discussing MSDs. Women report consistently higher figures than men do for both forms of MSD, apart from administrative staff – among whom the proportion of women working part time is three times the share of men according to LFS figures – plant and machine assemblers, and unskilled workers; these occupations reveal gender gaps of less than two percentage points.

According to the report *Types of employment and health in the European Union* , based on the 2000 EWCS, self-employed legislators and managers and agriculture workers show a 69% higher probability of reporting backache than permanent workers do. Previously, the 1995 survey revealed that small employers in the agricultural sector showed a largely higher probability of reporting MSDs – at 148% higher for backache and 127% higher for muscular pain – than did permanent employees.

Table 21: Reported backache and muscular pain, by gender and occupational status, 2005 (%)

	Backache			Muscular pain	
Men	Women	Total	Men	Women	Total
Legislators and managers	17.0	20.3	17.9	16.2	18.5

Professionals	15.2	18.1	16.7	13.3	17.5
Technicians	16.2	19.6	18.1	13.2	18.8
Administrative staff	17.0	15.5	16.0	14.8	14.3
Service and sales workers	18.9	20.7	19.9	16.8	20.2
Skilled agricultural workers	47.0	58.6	50.5	45.9	55.2
Craft and related trades workers	36.8	45.9	38.2	34.2	43.6
Plant and machine operators and assemblers	37.9	37.1	37.7	34.8	32.8
Unskilled workers	27.7	26.9	27.3	26.3	25.4
Armed forces	21.4	33.3	22.1	13.6	33.3
Total	27.1	23.6	25.6	24.9	22.4

Source: Calculations based on fourth EWCS

Evidence at national level

A total of 12 national correspondents give further details on the most widespread MSDs according to occupational status. Manual workers (both craft workers and fitters) and skilled agricultural workers still dominate both self-reported work-related MSDs and social security reporting in most countries, with certain notable exceptions.

According to the Spanish 2003 National Working Conditions Survey (*Encuesta Nacional de Condiciones de Trabajo* , ENCT), administrative staff and technicians report the highest rates of neck and upper back pain; in Denmark, childcare workers, social workers and shop retailers are among the occupations with the highest relative prevalence rates, while in Finland social carers report high levels of neck, shoulder and upper limb, and back complaints. Furthermore, in the UK health personnel, ambulance staff and paramedics show the highest MSD prevalence rates.

Economic sector

EODS

The 1995 EODS pilot survey shows a wide variation across industries (Table 22). Diseases of the periarticular sacs due to pressure account for 18% of occupational diseases in agriculture, while angioneurotic diseases caused by mechanical vibration represent 13.6% of work-related illnesses in mining and quarrying. At the same time, osteoarticular diseases of the hands and wrists caused by mechanical vibration account for 16.1% of illnesses in transport and communication, and paralysis of nerves due to pressure records the highest proportions in financial intermediation and real estate, wholesale and retail trade, and hotels and restaurants – at 17.2%, 15.3% and 12.4% respectively. In general, mining and quarrying, wholesale and retail trade, financial intermediation and real estate, and transport and communication report a higher proportion of MSDs in relation to all occupational diseases.

Table 22: Occupational diseases, by sector, 1995 (%)

	Osteoarticular diseases of the hands and wrists caused by mechanical vibration	Angioneurotic diseases caused by mechanical vibration	Diseases of the periarticular sacs due to pressure	Paralysis of the nerves due to pressure
Agriculture and fishing	1.6	1.3	18.0	1.5
Mining and quarrying	7.0	13.6	5.9	1.5
Manufacturing	2.9	3.9	2.4	7.2
Electricity, gas and water supply	2.6	5.4	2.1	2.3
Construction	7.6	3.7	9.3	4.6
Wholesale and retail trade	5.8	2.6	3.2	15.3
Hotels and restaurants	2.3	0.0	0.4	12.4
Transport and communication	16.1	2.8	2.5	5.1
Financial intermediation; real estate and business activities	3.1	3.2	3.6	17.2
Public administration and defence	6.6	2.4	1.5	6.5
Health and social work	0.7	0.3	0.3	3.8
Other service activities	2.0	1.8	1.6	6.5
Unknown	4.1	1.2	1.7	3.2
Total	4.4	4.3	4.0	5.9

Source: Karjalainen and Virtanen, Eurostat, 1999

MSDs show the highest incidence rates in the mining and quarrying sector, at over 60 times the EU15 average in 2001 and almost 30 times the average in 2004 (Table 23). Manufacturing, construction and – since 2002 – fishing are also above the EU15 average. In these sectors, men experience higher incidence rates than the overall average.

Women show significantly higher MSD incidence rates than men do in manufacturing, agriculture and all service industries except for education and transport and communication. In 2001, women's MSD incidence rates were above average in manufacturing, agriculture, real estate, hotels and restaurants, financial intermediation, public

administration, other service activities, and wholesale and retail trade. By 2004, these sectors in addition to transport and communication, and health and social work showed higher than average incidence rates for women.

Table 23: MSDs, by sector and gender, EU15, 2001–2004 (%)

	2001			2002			2003			2004	
Total	M	W	Total	M	W	Total	M	W	Total	M	W
Total	19.4	22.9	14.4	30.6	34.5	25.4	31.8	35.4	27	33.1	36.3
Agriculture	15.8	12.1	23.8	20.7	14.9	34.1	18.9	14.9	28.6	20.5	14.9
Fishing	10.6	9.3	0	45.3	43.8	41.4	36.2	37.3	0	52.9	59
Mining and quarrying	1,271.1	1,413	112.3	1,225	1,368	200.6	958	1,019	462.9	977	1,020
Manufacturing	40.2	34.9	53.8	73.8	63.4	100.3	80.7	69.5	109.3	89.1	74
Electricity, gas and water supply	11.1	13.7	0	18.7	21	7.8	20.9	25.1	4.6	19.3	22.9
Construction	26.6	27.4	13.8	46.9	49.4	15.1	49.6	52.4	14.7	52.3	55.5
Wholesale and retail trade	8.6	7.6	9.8	16.8	14.4	19.6	18.4	16.7	20.2	20.1	18
Hotels and restaurants	7.9	3	12	15.4	7.8	21.7	18.8	10.1	25.8	22.1	12
Transport and communication	4.1	4.3	3.6	9	9.1	8.2	12.2	11.5	14.4	13.2	12.7
Financial intermediation	2	0.7	3.5	1.8	1.1	2.8	2.2	0.7	3.7	2.6	0.7
Real estate and business activities	11.4	5.2	18.8	18.1	8.9	29.1	17	7.7	27.8	18.2	9.3
Public administration and defence	4.9	3.6	6.8	7.5	6.6	8.5	8.7	7.7	10.2	8.8	8
Education	1.3	1.7	1.1	2	1.8	2.1	1.7	1.4	1.9	2.1	1.6
Health and	4	2.8	4.4	8.6	7	9.1	8.9	6	9.6	8.7	5.5

social work											
Other service activities	6.6	5.8	7.3	16.1	12.6	19.5	20.1	15.8	24.2	19.4	14.8
Armed forces	0	0	0	1.6	8.2	0	2	6.9	1.4	2.5	18
Unknown	0	0	0	0	0	0	0	0	0	34.7	0

Source: Eurostat, Health and safety at work statistics

The MSD incidence rate among men declined significantly in the mining sector between 2001 and 2004, with a very slight decrease in education, while women's incidence rate declined in construction. However, the discussion in relation to trends will be based on the 2002–2004 period as implementation of the concept of mild diseases was substantially achieved in 2002.

Incidence rates show a strong increase in transport and communication, amounting to 46.7%, in financial intermediation, increasing by 44.4%, and in hotels and restaurants, constituting a 43.5% increase (Table 24). Men experienced the highest increases in armed forces (+119.5%), hotels and restaurants (+53.8%) and the sharpest decline in financial intermediation (-36.4%), while women reported higher increases in mining and quarrying (+194.7%) and transport and communication (+78%). However, such trends are subject to a sudden jump when the reference group is relatively small.

Table 24: Variations in MSDs, by sector and gender (%)

	% increase/decrease in 2004 compared with 2001			% increase/decrease in 2004 compared with 2002	
Total	Men	Women	Total	Men	Women
Total	70.6	58.5	103.5	8.2	5.2
Agriculture	29.7	23.1	39.1	-1.0	0.0
Fishing	399.1	534.4		16.8	34.7
Mining and quarrying	-23.1	-27.8	426.4	-20.2	-25.4
Manufacturing	121.6	112.0	138.7	20.7	16.7
Electricity, gas and water supply	73.9	67.2		3.2	9.0
Construction	96.6	102.6	-4.3	11.5	12.3
Wholesale and retail trade	133.7	136.8	128.6	19.6	25.0
Hotels and restaurants	179.7	300.0	152.5	43.5	53.8
Transport and communication	222.0	195.3	305.6	46.7	39.6
Financial	30.0	0.0	28.6	44.4	-36.4

intermediation					
Real estate and business activities	59.6	78.8	51.6	0.6	4.5
Public administration and defence	79.6	122.2	48.5	17.3	21.2
Education	61.5	-5.9	109.1	5.0	-11.1
Health and social work	117.5	96.4	115.9	1.2	-21.4
Other service activities	193.9	155.2	221.9	20.5	17.5
Armed forces				56.3	119.5

Source: Eurostat, Health and safety at work statistics

In a sectoral breakdown, tenosynovitis shows a significant decrease – of about 15% – in health and social work and in agriculture, but increased by over 100% in transport, mining and quarrying, fishing and financial intermediation (Table 25). Hotels and restaurants and other services also show an increase well above average, at 43.8% and 33.9% respectively. Trends by gender reveal that men experienced a higher increase in most industries, in electricity and public administration, with a simultaneous decrease among women. Nonetheless, women show a higher increase in mining. Table 26 below outlines the situation with regard to lateral epicondylitis.

Table 25: Hand and wrist tenosynovitis, by sector and gender, 2001–2004 (%)

	2001			2002			2003			2004			2002–2004		
	M	W	Total	M	W	Total	M	W	Total	M	W	Total	M	W	Total
Total	5.4	7.3	6.2	9.8	12.5	11	11.5	13.3	12.3	11.9	13.1	12.5	21.4	4.8	13.6
Agriculture and forestry	5.9	14.9	8.7	6.1	18.6	9.9	6	14.4	8.5	5.4	15.3	8.4	-11.5	-17.7	-15.2
Fishing	:	:	4.1	11	:	11.6	9.6	:	9.6	26.4	:	24.2	140.0		108.6
Mining and quarrying	32.1	62.4	35.4	39.5	78.5	44.3	61.9	233.1	80.6	78.5	254	96.1	98.7	223.6	116.9
Manufacturing	12.9	29.6	17.6	24	52.5	32	27.9	57.9	36.3	29.4	59.3	37.6	22.5	13.0	17.5
Electricity, gas and water supply	:	:	:	2	5.5	2.7	2.8	3.1	2.8	3.7	0	2.9	85.0	-100.0	7.4
Construction	7.1	5.1	6.9	15.4	6.1	14.7	17.3	5.9	16.4	16.8	5	15.9	9.1	-18.0	8.2
Wholesale and retail	3.4	4.9	3.6	4.5	10.4	7.3	5.7	10.5	8	6	10.7	8.3	33.3	2.9	13.7

trade															
Hotels and restaurants	1	5.7	3.6	2.9	9.2	6.4	4.5	11	8.1	5.1	12.5	9.2	75.9	35.9	43.8
Transport and communication	1.3	1.8	1.4	2	3.9	2.4	4.1	9.5	5.5	4.8	7.8	5.5	140.0	100.0	129.2
Financial intermediation	0.2	2.1	1.1	0.3	1.2	0.7	0.5	1.9	1.2	:	2.8	1.4		133.3	100.0
Real estate and business activities	1.8	7.6	4.4	3.4	12.4	7.5	2.9	10.4	6.4	3.9	11.4	7.4	14.7	-8.1	-1.3
Public administration and defence	0.8	3.3	1.8	1.4	4	2.5	2.2	4.1	3	2.3	3.8	3	64.3	-5.0	20.0
Education	0.1	0.3	0.6	0.6	0.7	0.6	0.4	0.7	0.6	0.4	0.7	0.6	-33.3	0.0	0.0
Health and social work	1.1	1.7	1.6	3.5	4.2	4.1	2.3	4.3	3.9	1.9	4	3.5	-45.7	-4.8	-14.6
Other service activities	2	3.7	2.9	2.9	8.9	5.9	4.2	11.5	7.9	5.2	10.3	7.9	79.3	15.7	33.9

Source: Calculations based on Eurostat, Health and safety at work statistics

Table 26: Lateral epicondylitis, by sector and gender, 2001–2004 (%)

	2001			2002			2003			2004			2002–2004		
	M	W	Total	M	W	Total	M	W	Total	M	W	Total	M	W	Total
Total	5.8	3.5	4.8	10	6.2	8.4	10.6	6.6	8.9	12.1	7.6	10.1	21.0	22.6	20.2
Agriculture and forestry	4	6.2	4.6	5.5	9.8	6.8	6.3	8.7	7	6.7	11.9	8.2	21.8	21.4	20.6
Fishing	6.5	:	6.5	14.9	0	13.3	19.3	:	18.1	23.8	0	20.9	59.7		57.1
Mining and quarrying	67.7	18.7	62.4	109.6	66.9	104.4	105.1	119.9	106.7	169.2	122.6	164.5	54.4	83.3	57.6
Manufacturing	12.5	11.8	12.4	21.3	21.3	21.4	22.8	23.1	22.9	25.6	29	26.6	20.2	36.2	24.3
Electricity, gas	2.3	0	1.8	2.8	:	2.7	3.2	:	2.8	5.4	3.9	5	92.9		85.2

and water supply															
Construction	8.8	3.5	8.4	16.4	4.3	15.5	16.9	4.1	15.9	20.4	4	19.2	24.4	-7.0	23.9
Wholesale and retail trade	3.8	2.2	2.5	5.6	4.3	5	5.9	4.7	5.3	6.9	5.9	6.4	23.2	37.2	28.0
Hotels and restaurants	1.4	2.8	2.1	2.5	6.6	4.7	3.5	6.8	5.3	4.7	9.6	7.4	88.0	45.5	57.4
Transport and communication	1.6	0.9	1.5	3.3	2.6	3.1	4.4	2.8	4	4.4	3.8	4.2	33.3	46.2	35.5
Financial intermediation	0.4	0.8	0.6	0.3	1	0.6	0.2	0.8	0.5	0.3	0.9	0.6	0.0	-10.0	0.0
Real estate and business activities	1.7	6	3.7	3.2	9.3	6	2.5	9.1	5.6	3.4	8.7	5.9	6.2	-6.5	-1.7
Public administration and defence	1.5	1.9	1.7	2.7	2.4	2.6	2.8	3.3	3	2.9	3	2.9	7.4	25.0	11.5
Education	0.3	0.4	0.4	0.8	0.9	0.9	0.3	0.6	0.5	0.6	0.8	0.7	-25.0	-11.1	-22.2
Health and social work	1.1	1.6	1.5	2.5	2.7	2.7	2.1	2.9	2.7	1.9	3.2	2.9	-24.0	18.5	7.4
Other service activities	2.4	1.7	2	6.6	4.5	5.5	7.2	6.1	6.7	5.7	6.3	6	-13.6	40.0	9.1
Household activities	0	0	0	:	:	1	6.9	1.2	1.9	13.9	:	1.6			60.0
Extra-territorial organisations	0	0	0	0	:	:	0	0	0	:	39.7	21.7			

Source: Calculations based on Eurostat, Health and safety at work statistics

LFS

Table 27 summarises work-related MSDs by economic sector, days lost and labour contract. Among all workers, health and social work and education show the highest relative prevalence rates for all MSDs, while the fishing industry surpasses both of the aforementioned sectors with regard to the most severe diseases (those resulting in 14

days or more of work absence). Mining and quarrying and construction show the lowest relative prevalence rates.

This picture is confirmed in respect of permanent workers, although the experience in the fishing sector is somewhat milder. However, temporary workers show significantly higher relative MSD prevalence rates in fishing, agriculture and real estate, while manufacturing and financial intermediation report the lowest relative prevalence rates.

In terms of gender, women show higher incidence rates than men do in all sectors except construction, particularly in real estate and agriculture.

Table 27: Work-related MSDs, by days lost, labour contract and sector, 1999 (%)

	Permanent job		Temporary job		Training or probationary period		Total
14+ days lost	Total	14+ days lost	Total	14+ days lost	Total	14+ days lost	Total
Agriculture and forestry	88	87	105	105	67	97	89
Fishing	195	84	587	190	:	:	256
Mining and quarrying	64	57	72	24	:	:	62
Manufacturing	79	84	31	46	:	13	74
Electricity, gas and water supply	84	79	:	:	42	14	79
Construction	93	75	64	71	32	33	86
Wholesale and retail trade	87	85	55	70	11	26	82
Hotels and restaurants	83	84	48	66	:	:	73
Transport and communication	121	109	73	103	85	31	118
Financial intermediation	68	75	46	37	50	15	67
Real estate and business activities	95	105	79	111	43	37	92
Public administration	121	97	76	56	30	21	114
Education	157	159	79	155	:	11	144

Health and social work	191	187	137	158	18	21	177
Other service activities	87	105	24	82	:	:	79
Household activities	71	81	61	85	:	:	67
Extra-territorial organisations		:	:	:	:	:	93
Total	106	104	71	92	21	22	100

Source: Eurostat, 2002

EWCS

According to the fourth EWCS, agriculture and fishing, construction, transport and communication, and mining and manufacturing show the highest rates of self-reported backache and muscular pain (Table 28). In general, complaints of backache are more numerous than of muscular pain. In the construction sector, men report considerably higher figures than do women, amounting to a 21.5 percentage point higher rate for backache and to a 20.2 percentage point higher rate for muscular pain. In transport and communication, men report a 13.9 percentage point higher rate than women do for backache and an 8.7 percentage point higher rate for muscular pain; in electricity, gas and water supply, men also report an 8.7 percentage point higher rate than women do for muscular pain. Conversely, women show considerably higher figures in agriculture, with a 10.6 percentage point higher rate for backache and an 11.1 percentage point higher rate for muscular pain. In male-dominated industries, such as construction and transport, men report a considerably higher rate of MSDs than women do, while in sectors representing a larger proportion of women, these latter report higher figures.

According to the report *Types of employment and health in the European Union* , based on the 2000 EWCS, the worst levels of health were mainly observed in agriculture, construction, mining and manufacturing, and transport and communication, while financial intermediation showed low levels of fatigue, backache and muscular pain.

Table 28: Reported backache and muscular pain, by sector and gender, 2005 (%)

	Backache			Muscular pain	
	Men	Women	Total	Men	Women
Agriculture and fishing	43.8	54.4	47.0	43.0	54.1
Manufacturing and mining	28.0	31.2	29.0	25.7	29.1
Electricity, gas and water supply	24.7	17.2	23.3	26.7	18.0
Construction	39.2	17.7	37.0	34.8	14.6
Wholesale and retail trade	21.0	18.7	19.8	18.6	17.6
Hotels and restaurants	20.0	24.9	22.2	16.7	23.7

Transport and communication	31.4	17.5	27.9	27.1	18.4
Financial intermediation	9.7	14.6	11.9	9.8	14.6
Real estate and business services	16.6	16.7	16.6	14.8	17.1
Public administration	19.7	19.7	19.7	16.9	18.3
Education and health	19.6	22.4	21.7	18.2	21.3
Other services	21.1	21.2	21.2	21.3	18.7
Total	27.0	23.6	25.6	24.9	22.3

Source: Calculations based on fourth EWCS

Evidence at national level

According to the EWCO national correspondents, a sectoral breakdown in relation to the incidence of MSDs is available in eight countries, while five further countries provided figures on the selected industries required by the questionnaire, namely, manufacturing, mining, health, education, and transport and communication. A total of six countries – Finland, Lithuania, the Netherlands, Norway, Slovakia and the UK – provide trends of varying extent.

The social security institutions of France, Italy and the UK provide an overall picture, although at different levels of sectoral detail. In Italy, this breakdown is based on an administrative division among agriculture, the public sector and other private industries, including manufacturing and services. Between 2000 and 2004, agriculture showed a substantial increase of 250% in relation to the incidence of MSDs, according to the national correspondent, and further notable increases of 60% were reported in manufacturing and services; the incidence of invertebral discal diseases increased the most. French data are available only for the non-agricultural private sector: the 'other manufacturing industries' category reveals the highest prevalence rates of MSDs, followed by services and chemical industries.

According to data from the UK IIS , the mining, and energy, gas and water supply industries showed the highest MSD prevalence rates, at 21.5 new assessments per 100,000 workers between 2003 and 2005. Manufacturing reported 3.1 new assessments per 100,000 workers, while public administration, including education, reported 1.5; these results were above the UK average of 1.4 new assessments per 100,000 workers. The MOSS-OPRA survey identified electricity, gas and water supply, mining and manufacturing as experiencing the highest prevalence rates. SWI partly draws on the other British sources. While agriculture, when significant, records the highest values, construction, manufacturing, transport and communication, and health and social work also show above average levels of self-reported disease. This picture is confirmed by SWI self-reported figures.

Self-reported surveys in Finland, the Netherlands, Norway and the UK, as well as administrative occupational diseases data from Slovakia, outline the incidence of MSDs differentiated by part of body affected or disease.

In Finland, from 1990 to 1997 across the previous three QWLS, self-reported 'recurrent pain and ache' of a musculoskeletal nature – excluding neck and shoulder pain – showed a generalised increase in the mining and manufacturing and transport and communication sectors. The 2003 edition highlights that transport and communication records the highest proportion of self-reported recurrent pain or ache of the neck, shoulders, legs, and hands and arms, while service workers report the highest rates of discomfort of lumbar regions.

In the Netherlands, back complaints decrease in the industries taken into consideration (including construction)

apart from health and social work. However, RSI shows a generalised increase after a decline in 1998, although the transport and communication sector reveals a more erratic trend.

In Norway, reported diseases in relation to neck and shoulders decline in the education sector but increase in mining and electricity supply. At the same time, hand and arm diseases show an increase in health and social work and in transport and communication, lumbar diseases decline in health and social work, leg diseases decrease in mining and electricity supply, while manufacturing demonstrates more irregular trends.

In Slovakia, recognised MSDs are mainly tenosynovitis and paralysis of nerves. Transport and communication, education, and public health and social work report few cases, while mining and manufacturing account for almost three in four cases: the proportion of tenosynovitis increased between 1996 and 2000 but paralysis of nerves has declined since 1998. According to the full series of sectoral data covering the period 1996–2005, recognised MSDs in mining and manufacturing tend to increase, while in manufacturing the rates have fluctuated back to 2002 levels. This outcome may reflect an increase of labour productivity well above the EU average over the last 10 years and above that of the Organisation for Economic Cooperation and Development (OECD) (OECD, 2007 (19Kb MS Excel file)).

Size of workplace

EWCS

As discussed by Hasle (2004) (582Kb PDF) , size of the workplace has an ambivalent effect on occupational diseases and MSDs in particular. On the one hand, small companies do not have the resources to allow for ergonomic and managerial expertise, and usually have to concentrate every day solely on their survival, so they face time pressures. On the other hand, small size allows the employer to maintain closer relations with the workers, and provides opportunities for direct negotiation and flexibility; this context – also incorporating a greater variety of tasks – reduces the risk of MSDs, according to Clot (2005). The reverse arguments hold for large companies: however, in these organisations, the workers' representative can bargain and control over risk factors affecting health at work and MSDs.

A lack of formal guidance on working methods has an equivocal effect on the insurgence of MSDs: workers develop work methods over time in order to meet not only the 'satisfactory performance' requirement set by the employer, but also – although not explicitly – personal comfort. This implies an ergonomic evaluation based on personal experience rather than on an expert assessment, and such methods are not unique. However, lack of an expert assessment could lead to the selection of methods on the basis of performance demands, without any balance between the needs of the workers and the employer. In general, the overall impact on health of such informal arrangements in relation to work performance and methods relies heavily on both the bargaining power held by individual workers and the management style.

According to the fourth EWCS, sole trading companies show the highest values in respect of backache and muscular pain (Table 29). An approximately U-shape forms as the size of the workplace increases: both complaints are lowest in companies with between 100 and 249 employees. In micro-enterprises employing fewer than 10 personnel, these negative MSD features prevail, mainly due to competitive pressure and poor managerial and health and safety competences. At the same time, in workplaces with more than 250 employees, both the organisational structure and task allocation tighten and thereby counterbalance the better health and safety competences among both workers and managers. However, SMEs with between 10 and 250 workers are able to minimise the drawbacks of both the micro-enterprises and large organisations, by combining the fluid organisation of the former with the competences of the latter.

According to the report *Types of employment and health in the European Union* , based on the 2000 EWCS, the impact of workplace size on MSDs is not significant, thus supporting the ambivalences discussed above.

Table 29: Reported backache and muscular pain, by gender and company size, 2005 (%)

	Backache			Muscular pain	
Men	Women	Total	Men	Women	Total

Sole trader	31.2	26.9	29.6	30.1	26.2
2 to 9 employees	29.5	24.5	27.2	27.9	22.6
10 to 49 employees	24.5	21.2	23.0	21.4	20.5
50 to 99 employees	25.6	22.8	24.3	22.2	22.4
100 to 249 employees	22.3	23.1	22.6	19.3	21.6
More than 250 employees	25.7	25.1	25.5	23.4	22.9
Total	26.9	23.6	25.5	24.6	22.4

Source: Calculations based on fourth EWCS

Evidence at national level

As discussed earlier, in Norway reported pains in upper limbs show a significant increase, while reported MSDs affecting other parts of the body remained stable between 1996 and 2003 (see again Table 11). Workers report a more significant decline in lower limb pain in companies employing 1–19 personnel and 50–199 personnel. The latter group also cites an above average decline in lower back pain.

UK SWI figures show a steadily lower MSD prevalence rate for workers in companies employing 1–49 staff than for those in companies hiring 50–249 employees. Meanwhile, those working in large workplaces of over 250 employees report medium incidence rates in cases of self-reported MSDs caused or made worse by the current or most recent job.

Hasle (2004) presented the following picture of ergonomic hazards in Danish companies (Figure 12). Most ergonomic hazards decrease as the company size increases except for repetitive strain, which shows a U-shaped pattern, and awkward positions of standing or squatting, which indicate a less clear-cut pattern.

Figure 12: Ergonomic hazards, by company size, in Denmark (%)

Note: Sample of independent private enterprises, measured on a scale of 0–100. p = probability.

Source: Hasle, 2004

MSDs and working conditions

Physical and ergonomic factors

Physical and ergonomic risk factors are probably the most investigated aspects in the related literature, and the significance of their impact is conclusive. They are often reported as physical factors in statistics on occupational diseases, but their distinction from other causes – such as repetitive movements – is not as clear-cut in all countries included in this report.

EWCS

The influence of physical factors on MSDs is assessed by making use of the index defined in the fourth EWCS

report in relation to reported backache and muscular pain (Figure 13). This index assigns a value of 0 to 'never', 10 to 'almost never', 25 to 'a quarter of the time', 50 to 'half of the time' and so on, and each value is weighted by marginal values of risk factors. This approach focuses on the impact on the reporting of such diseases as the exposure to each risk factor increases, shifting the attention from absolute values to relative ones.

Tiring or painful positions, carrying or moving heavy loads and extreme temperatures show the highest association with both backache and muscular pain, while repetitive hand or arm movements show the least association. Most risk factors apart from low temperatures show higher sensitivity to complaints of backache than of muscular pain.

Figure 13: Backache and muscular pain, by ergonomic and physical risk factors, 2005 (%)

Note: Data based on a weighted exposure index.

Source: Calculations based on fourth EWCS

Evidence at national level

The main ergonomic factors investigated by the national-level studies reported in the EWCO national contributions are manual handling, especially heavy loads, postural constraints and quantitative demands.

In Sweden (SE0601SR01), such factors are primarily discussed with regard to WRDs in general, among which MSDs play a dominant role.

According to the InVS epidemiological survey carried out in the French Loire region, the main risk factors identified include postural and articular constraints, at a rate of 70.7% among men and 78.9% among women, and manual handling, amounting to a rate of 50% among men and 39% among women. At the same time, 'vibrating machine tools' are of concern for 8% of men.

According to Austrian social security registers, about 25% of work absence days as a result of MSDs are due to physical hazard such as vibrations, strenuous positions and forced posture.

The Netherlands' POLS survey investigates MSD complaints and work absence days caused by physical strain and by hand and arm vibration. Both complaints and absence days caused by hand and arm vibration increased from 1996 to 1999 – from 16% to 20% and from 20% to 27% respectively – but complaints declined in the subsequent years, to 18% in 2002. However, absence days show an uncertain pattern and increased in 2002 to 29%. Also unclear are the trends for complaints of physical strain, which increased from 40% in 1996 to 45% in 2000, and then showed a slow decrease. Meanwhile, work absence days due to physical strain declined from 24% in 1996 to 16% in 1997 and then increased again to 21% in 2002.

According to the Danish register of occupational disease held by the Work Environment Authority (Arbejdstilsynet, AT), reported occupational diseases caused by heavy lifting halved over the decade 1993–2003. A breakdown by part of body affected reveals that this reduction was concentrated in back and arm complaints, which showed decreases of 53.5% and 60.5% respectively, while reported neck and shoulder disorders remained stable and leg disorders declined after 2001. On the other hand, reported occupational diseases caused by repetitive movements between 1993 and 2003 increased by about 30% from 1993 to 1998, and then declined back to 1993 figures.

Using data from DWECS 2000, Burr and Jensen (2002) investigate the probability of developing MSDs among workers who were not affected by such disorders five years previously; they reveal differentiated results according to the part of body affected and the physical agent. Working with a fixed work posture is a significant risk factor for developing neck, hand and shoulder disorders; a walking or standing posture for at least three quarters of working time is a significant risk factor for developing hand, lower back and knee disorders; holding the neck bent forward for at least a quarter of working time is a significant risk factor for developing shoulder and lower back disorders; while physically strenuous work for at least three quarters of working time is a significant risk factor for developing knee disorders. Furthermore, monotonous repetitive finger and arm motions indicate a 31% higher probability of developing MSDs in general, but no significant value is associated with a specific part of the body in

this regard.

In Finland, according to the 2002 FIOH data (810Kb PDF) , monotonous and repetitive movements caused 24% of diagnosed occupational diseases among men and this proportion rose to 34% among women. Moreover, physical agents caused 28% of diagnosed occupational diseases among men and this proportion declined to 19% among women; the category of physical agents includes a wide array of factors, for example affecting hearing.

Data for Finland from the last three QWLS between 1990 and 2003 show a significant decline from 1990 to 1997 in MSDs in connection with the performance of repetitive and monotonous movements. However, this decline was followed by a strong increase in 2003 above the 1990 figures – reaching 56% for neck and shoulder complaints, 36% for hand and arm pain, 38% for aches in the lumbar region and 30% for leg and hip complaints. Gaps between workers performing repetitive movements and those not doing so widen in relation to the reporting of recurring neck and shoulder aches, decline with regard to the reporting of recurring pain in the lumbar region, and remain stable in respect of the reporting of recurring hip and hand/arm pain. Gaps associated with tight working schedules are minor but stable over time, and decline in relation to reported hand and arm aches, with considerably lower figures with respect to repetitive and monotonous movements.

Respondents to the UK SWI 1995 survey were asked their opinion of what work factors caused their MSDs. Over half of the people considered that manual handling activities, mainly lifting, were the cause, 28% believed that the posture they adopt at work caused the problem and 18% thought that their MSD was a result of repetitive work.

According to the UK's MOSS-OPRA survey, MSD causal factors are reported both according to type of movement and work tasks performed (Tables 30 and 31). According to the former, activities related to persons and load carrying – such as lifting, carrying and materials handling – account for 37% of reported MSDs. Postural movements such as bending or sitting are also highly significant and account for 18% of MSDs, while 'fine hand' movements account for 13%. According to work tasks performed, materials handling such as lifting, carrying, pushing, pulling and materials manipulation account for 32% of MSDs reported by occupational doctors and rheumatologists, followed by guiding or holding tools, at 19%, and working on a keyboard, at 13%.

Table 30: MSDs, by type of movement, in the UK, 2003–2005

Movement	Annual average
Forceful upper limb/grip	1,582
Other	961
Lifting	867
Materials handling n.e.s.	1,019
Fine hand	788
Postural n.e.s.	403
Bending	161
Carrying	179
Sitting	94
Standing/walking	123
Pulling	99
Pushing	73
Overhead work	48
Torque upper limb	47
Twisting (postural)	62

Kneeling	59
No movement category assigned	1,151
Total individuals	6,148

Note: Individuals could choose more than one movement. Annual average estimated cases between 2003 and 2005. n.e.s. = not elsewhere specified.

Source: HSE, 2006

Table 31: MSDs, by work tasks, in the UK, 2003–2005

Work tasks	Annual average
Heavy lifting/carrying/pushing/pulling	1,254
Guiding or holding tool	1,182
Keyboard work	816
Materials manipulation	461
Light lifting/carrying/pushing/pulling	290
Packing or sorting	202
Other	193
Machine operation (heavy or forceful)	187
Assembly (large or heavy parts)	131
Machine operation (light or technical/scientific)	128
Driving: Automobiles	113
Coordinated whole body movement	90
Hammering, chopping, sawing	66
Driving screw, cutting	48
Assembly (small or delicate parts)	34
Driving: Heavy plant, forklift	24
Meat boning or filleting	7
No task category assigned	1,218
Total individuals	6,148

Note: Individuals could choose more than one task. Annual average estimated cases between 2003 and 2005.

Source: HSE, 2006

Working time

Time-related aspects are twofold. On the one hand, they concern working time issues, including the challenge of achieving a work-life balance . On the other hand, they also consider the internal aspects of working time, that is,

its intensity – including pace of work and repetitiveness – and its variability according to market demands, as filtered by the organisational design and company hierarchy.

EWCS

It is a common view that incidence of MSDs increases as weekly working hours increase and both their predictability and work–life balance decline. Nevertheless, as discussed in literature, part-time workers usually experience poorer working conditions than full-time personnel do in terms of training, working conditions and career opportunities. It was shown earlier that part-time workers reported fewer MSD complaints than full-time workers did and that this gap is widening. However, such a finding could be questioned on the basis of the length of the part-time work – that is, whether it counts as marginal time with less than 20 hours – which may introduce a composition effect.

Reported MSDs show a positive association with average weekly worked hours: the lowest rates are reported for both backache and muscular pain when weekly hours worked lie between 10 and 19 hours (Table 32). Meanwhile, the gap between those working 41 to 45 hours and those working more than 45 hours has widened considerably.

A gender breakdown highlights further differences. As weekly working hours increase, the growth in reported MSDs is higher for women than for men. Moreover, women report higher figures for both forms of MSD than men do when they work more than 45 hours a week.

Table 32: Reported backache and muscular pain, by weekly working hours and gender, 2005 (%)

Working time	Backache			Muscular pain		
	Men	Women	Total	Men	Women	Total
Less than 10 hours	21.7	14.0	16.9	19.4	14.0	16.0
10 to 19 hours	14.3	12.2	12.8	16.0	11.0	12.3
20 to 30 hours	18.3	20.9	20.3	15.9	18.7	18.0
31 to 35 hours	16.0	18.8	17.4	14.6	20.0	17.2
36 to 40 hours	23.6	22.7	23.2	21.4	21.9	21.6
41 to 45 hours	25.6	22.0	24.5	23.7	22.1	23.2
45+ hours	37.3	40.5	38.1	34.5	36.9	35.2
Total	27.0	23.6	25.6	24.8	22.3	23.8

Source: Calculations based on fourth EWCS

Quality of work–life balance shows a strong effect on MSDs, with similar trends across the type of disease and according to gender. Some 15.6% of respondents who report that they can manage their work–life balance ‘very well’ complain of backache, while this proportion increases to 53.8% among those reporting a poor work–life balance (Table 33). At the same time, 14.9% of respondents who manage their work–life balance ‘very well’ complain of muscular pain, but this proportion increases to 51.2% among those faring poorly in terms of work–life balance. MSDs reported by women increase faster than those reported by men: women report lower rates of MSD than men when their work–life balance fits ‘very well’ and higher rates than men when their work–life balance does not fit at all well.

Table 33: Reported backache and muscular pain, by work–life balance and gender, 2005 (%)

Work–life balance	Backache			Muscular pain	
	Men	Women	Total	Men	Women
Very well	16.1	15.0	15.6	15.3	14.5
Well	24.2	22.2	23.4	22.1	20.4
Not very well	40.5	40.0	40.3	36.4	39.2
Not at all well	53.1	55.4	53.8	50.7	52.5
Total	27.0	23.6	40.5	24.9	22.3

Source: Calculations based on fourth EWCS

Figure 14 shows the impact of work schedules on reported MSDs. Respondents report lower figures, particularly in relation to muscular pain – at 20.9% – when they work in daily split shifts, that is, having a break of a variable extent, usually of half an hour or more. In cases of shift work, the MSD incidence rates vary from 28.5% to 30.2% in respect of muscular pain. Meanwhile, respondents working permanent shifts report the highest backache figures, at 33.9%.

Figure 14: Reported backache and muscular pain, by work schedules, 2005 (%)

Source: Calculations based on fourth EWCS

Figure 15 shows the impact on MSDs of changes in work schedules and of the length of time before workers are informed of these changes. Some 35% of workers who are informed the same day or the day before the schedule change report backache and about 31.5% of these workers report muscular pain. At the same time, about 25% of those informed at least several days in advance report both backache and muscular pain, thereby showing somewhat higher figures than those not reporting changes in work schedules. Overall, the health impact of the work schedule change is significant only when the advance notice is too short.

Figure 15: MSDs, by changes of work schedules, 2005 (%)

Source: Calculations based on fourth EWCS

According to the report *Types of employment and health in the European Union* , based on the 2000 EWCS, shift work increases the probability of reporting backache by 48% and increases the probability of muscular pain by 29%.

According to the EWCO correspondents, the influence of working times on MSDs is reported only in the epidemiological survey in the French Loire region. Here, it was found as a minor risk factor with respect to posture, manual handling and working pace constraints.

Work intensity

Repetitiveness and speed – characteristics of work intensity – are counted among the classical factors causing MSDs, as cited for example in the literature review of Buckle and Woods (2002), who refer to them as characterising ‘low status’ work, that is, ‘unskilled, paced or repetitive work; jobs where no training is required; where there is a low requirement to make decisions; low pay; or low control over the job’ (p. 29). The 1997 review of work-related MSDs carried out by Bernard et al (1997) for the US National Institute for Occupational Safety and Health (NIOSH) summarises that evidence exists of the effect of repetitiveness on neck and shoulder pain, carpal tunnel syndrome and tendonitis; however, evidence is insufficient of the effect with regard to elbow pain. Meanwhile, according to the 2000 OSHA report *Work-related low back disorders* , there is moderate evidence of work or time pressure as a cause for low back disorders.

EWCS

Manufacturing systems are based on the division, integration and coordination of tasks, which are usually governed by machinery; these therefore regulate social aspects of work, including the pace of work.

Work with machines of automatic speed reveals the most significant impact on reported MSDs: in 2005, reported backache by workers carrying out such work was 10.1 percentage points above the average value for all workers, while reported muscular pain was 9.4 percentage points above average (Table 34). Repetitive tasks of less than one minute constitute the ideal type of assembly line. The 2005 EWCS shows that short repetitive tasks have an impact of 7.1 percentage points above the average value with regard to complaints of backache, and generate a 6.9 percentage point increase in relation to reports of muscular pain. Both manual and non-manual tasks may be subject to numerical or performance targets and such demands have a noticeable impact on MSD complaints: the 2005 data show an impact of 4.1 percentage points in relation to backache and of 4.3 percentage points in respect of muscular pain.

Work done by colleagues could depend both on technological integration – for example, work on an assembly line – and/or on organisational integration, such as teamworking. The impact on MSD reporting in 2005 amounts to 2.9 percentage points in relation to complaints of backache and to three percentage points with regard to muscular pain. Finally, tasks characterised by direct demands from customers or clients result in a slightly lower than average experience of MSDs – by about one percentage point.

Table 34: Reported backache and muscular pain, by pace of work factors, 2005 (%)

Pace of work based on:	Backache
Automatic speed of a machine or movement of a product	35.7
Repetitive tasks of less than one minute	32.7
Numerical or performance targets	29.7
Work done by colleagues	28.5
Direct demands from customers/clients	24.6
Total	25.6

Source: Calculations based on fourth EWCS

Figure 16 summarises – similarly to Figure 13 – the association between MSDs and time pressure, measured by an index capturing the incidence of working at very high speed and working to tight deadlines. Backache shows a stronger association with both of these time pressure indicators than muscular pain does, and both forms of MSD show slightly higher values in the case of working at high speed. However, most physical work factors show higher associations with both of these health indicators apart from repetitive hand or arm movements, which show a lower association with backache and a higher relation with muscular pain.

Figure 16: MSDs and time pressure, 2005 (%)

Note: Data based on a weighted exposure index.

Source: Calculations based on fourth EWCS

Work interruption is discussed as a further factor of MSDs. Workers who report that they never experience unforeseen work interruptions reveal lower levels of reported MSDs than the other groups do, but these latter do not show an association between the extent of being interrupted and MSDs. Nonetheless, the group who very often experience unexpected work interruptions report the highest rates of both backache and muscular pain, at 5.4 percentage points and 6.9 percentage points higher respectively than for the group who are never interrupted in

their work.

Table 35: MSDs, by work interruption for unforeseen task, 2005 (%)

Backache	Muscular pain
Very often	27.9
Fairly often	25.3
Occasionally	26.8
Never	22.5
Total	25.6

Source: Calculations based on fourth EWCS

Evidence at national level

While most of the Member States investigate repetitiveness and speed according to a temporal – and therefore a socioeconomic – point of view, both the Danish and Finnish surveys investigate this issue on the basis of movements, thereby emphasising the ergonomic aspects.

Speed of work and repetitiveness are both associated with higher rates of reported MSDs in Austria. Studies based on the surveys in the Netherlands summarise this issue in a quantitative demands index, which captures both the pace of work and its strenuousness. According to the epidemiological survey carried out in the French Loire region, pace constraints represent the third risk factor of diagnosed MSDs – concerning men to a marginal extent, at 2.9%, and women to a more significant extent, at 17%.

The German 1999 BIBB/IAB survey investigated the issue of pace of work according to 'precisely regulated procedures', such as the International Organization for Standardization's ISO 9001 quality certification, and according to 'restrictive regulation on time and performance of work', that is, workers being submitted to strict time and motion calculation. In the former case, 42.4% of respondents reported being 'often concerned during or immediately after work' by arm and hand pain 'always' or 'frequently', while 40.4% of respondents claimed that their hips were affected 'always' or 'frequently'. At the same time, up to 32.4% of respondents were 'always' or 'frequently' concerned by neck and shoulder pain, which is the least affected part of the body. In the latter case (regulation on time and work performance), arms and hands were still the most concerned 'always' or 'frequently' – cited by 37.9% of respondents – while neck and shoulder pain was the least concerned 'always' or 'frequently', cited by 30% of respondents. However, those working under pressure do not show significant differences according to the different parts of the body: 59% to 60% of respondents report pains 'practically always' and 'frequently' for most parts of the body, apart from the legs (53%) and lower back (56.9%).

The POLS survey in the Netherlands, which is carried out by the Central Bureau of Statistics (Centraal Bureau voor de Statistiek, CBS), reports relatively stable figures between 1994 and 2003 among those reporting RSI when performing at a high pace of work: after an increase up to 1997 – from 38% to 43% – a slow decrease is reported, to 41% in 2003. Meanwhile, RSIs among those reporting high time pressure increased from 32% in 1996 to 38% in 1999, then declined back to 32% in 2003. By summarising these time-related aspects in the composite quantitative demands indicator, both private and public (including health) services report the highest figures, showing a declining trend from 1997 to 2001 and then a moderate increase in 2003 in both sectors.

According to a survey carried out by Malchaire at al (2004) (553Kb PDF) in Belgium, MSDs were less frequent in workplaces where workers were allowed to take sufficient individual breaks. Finally, in Austria workload is not separated according to strenuous working conditions and, as such, MSDs are reported as the first cause of absenteeism.

Impact of ICT

EWCS

Table 36 summarises the impact of working with ICT devices. Association with both forms of MSD first declines as use of ICT declines, then increases and extends beyond average values when these tools are 'almost never' used. The lowest figure is reported when they are used 'almost all the time', while the gap between the average level and those who 'never' use ICT tools is 7.2 percentage points for reported backache and 6.8 percentage points for muscular pain. Similar patterns are shown when working with the internet and email for professional use. Such figures underline that working conditions are diverging from those systematically using ICT devices – mainly clerical workers – and those not having access to them – mainly skilled and unskilled workers.

Table 36: Reported backache and muscular pain, by working with computers, 2005 (%)

Use of computers at work	Backache
All of the time	15.8
Almost all of the time	13.3
Around 3/4 of the time	17.4
Around half of the time	20.4
Around 1/4 of the time	19.7
Almost never	27.1
Never	32.8
Total	25.6

Source: Calculations based on fourth EWCS

Evidence at national level

Between 1990 and 2003, the Finnish QWLS investigates use of ICT devices in two steps. First, it examines the impact of various ICT devices on MSDs and, secondly, it differentiates reported MSD complaints according to exposure to ICT equipment in a manner similar to the EWCS methodology. In general, users of ICT devices report fewer MSD complaints but the gap between users and non-users is narrowing and, in some cases, has closed or reversed. This is the case for neck and shoulder complaints in 1997, and for lumbar region and leg pain from 1997 onwards among those working as computer tellers – that is, engaged in clerical work on computers all of the time. In 2003, the gap had also closed in relation to leg complaints between other ICT users and non-users.

The impact of length of exposure to ICT in terms of working time offers interesting insights according to gender and part of body affected, and confirms that trends are converging between men and women with regard to the case of using computers 'all the time' and that the gender gap is also narrowing in the case of 'never' using computers. A converging trend is also found in respect of part of body affected in both of these cases of computer use. Men show a substantial increase of reported MSDs as use of ICT devices declines for all investigated parts of the body, and this pattern is more clear-cut in the 2003 QWLS. On the other hand, women show a different pattern according to the part of body affected: neck and shoulder, hand and arm pains present higher figures for those working all the time with ICT equipment than for those who never work with ICT, while pains in the lumbar region and legs increase as the use of ICT devices declines. Furthermore, changes in this pattern are significant across time: for instance, women in 1990 showed decreasing levels of neck and shoulder pain as ICT use decreased.

According to the UK's MOSS-OPRA survey, which gathers data from occupational doctors and rheumatologists, keyboard work is the fourth most prevalent cause of MSDs, with 13% of reported new cases over the 2003–2005 average; this represents a small relative decline from the 14% reported over the 2002–2004 average.

The Hellenic Institute for Occupational Health and Safety (ELINYAE) carried out a study on computer operators in Greece: 55.8% of workers in banks reported neck pain during the previous month. The neck, waist, right

shoulder/chest area, right wrist and right hand/fingers are the parts of the body reported as being under the most strain (see the Greek national contribution). Moreover, according to the German 1999 BIBB/IAB survey, 52% of workers using ICT devices report neck and shoulder pain, 42% report back pain, while about 30% of respondents report pain in other parts of the body.

According to the Dutch TAS survey, workers using video display units (VDUs) reported higher RSI complaints than those not using VDUs between 2000 and 2004. While the VDU users showed an increase from 26.9% in 2000 to 29.9% in 2002 and then a slight decline in 2004 to 29.1%, the latter group reported a constant increase from 25.3% to 27.6%.

The ENCT, carried out by the Spanish National Institute for Health and Safety (Instituto Nacional de Seguridad e Higiene en el Trabajo, INSHT), investigates MSDs according to the main part of body affected and the tools used at work. Workers using ICT devices reported the highest figures in relation to neck pain, at 45% in 1999 and 56% in 2003, while those using manual tools cited the lowest rate of neck pain, at 17.4% in 1999, and those working with panel controls reported a 26.5% level in 2003. Similarly, workers using ICT equipment reported the highest complaints of upper back pain, at 27.1% in 1999 and 30.3% in 2003, while those using portable tools recorded the lowest rate, at 14.2% in 1999, and workers using manual tools cited a rate of 17.9% in 2003. Meanwhile, workers using vehicles reported the highest level of lower back complaints, at 43.9% in 1999, and those using non-engine powered instruments recorded the highest rates in 2003, at 59.1%, while those using the telephone cited the lowest rates in both surveys, at 23% and 29.3% respectively. Workers who complain less of lower back pain are affected more than average by neck and upper back pain.

Psychosocial factors

EWCS

In the last two decades, studies on MSDs have found significant empirical evidence that psychosocial factors have an important impact. Literature reviews, such as Buckle and Woods (2002), outline the relevance of psychosocial factors such as stress and social support in explaining the growth of MSDs.

The association of MSDs with stress is very strong (Table 37): when stress is not reported, backache is reported by 11.2% of respondents and muscular pain by 9.1%, but these proportions increase to respectively 71.1% and 68.8% of respondents under stress. Such a strong association supports the view of the UK national correspondent that preventive actions in coping with stress are valid when coping with MSDs.

Table 37: Reported backache and muscular pain, by stress, 2005 (%)

Backache	Muscular pain
No stress	11.2
Stress	71.1
Total	25.6

Source: Calculations based on fourth EWCS

Satisfaction with working conditions also shows clear associations (Table 38). Some 11.8% of ‘very satisfied’ respondents report backache and 11.2% of this group cite muscular pain, but these proportions increase to 59.9% and 58.7% among those ‘not at all satisfied’. A wide gap emerges between ‘satisfied’ and ‘not very satisfied’ respondents, ranging from 21.4 percentage points in the case of muscular pain to 23.8 percentage points in the case of backache.

Table 38: MSDs, by satisfaction with working conditions, 2005 (%)

Backache	Muscular pain
Very satisfied	11.8

Satisfied	22.7
Not very satisfied	46.5
Not at all satisfied	59.9
Total	25.6

Source: Calculations based on fourth EWCS

Table 39 summarises the effect of social support on MSDs, according to the different persons with whom workers establish stable relationships. Both reported backache and muscular pain regularly increase as support from superiors decreases, from 20.2% and 19.4% respectively in the case of 'almost always' getting such support to 31.8% and 29.2% when the worker 'almost never' gets such support. The impact of external assistance shows a significant discontinuity from 'often' getting such support to 'sometimes' getting this help, from 19.6% to 25.3% in the case of backache and from 17.8% to 24.3% in the case of muscular pain; little noticeable difference emerges between 'almost always' and 'often' and between 'sometimes' and 'rarely' in this situation. The impact on reported MSDs of having assistance from colleagues increases as their support declines: those 'almost always' availing of such support report a backache level of 24.2% and a rate of 22.6% for muscular pain but these proportions increase to 29.9% and 29.4% respectively when workers 'rarely' get support from colleagues. Interestingly, the rates decline again for workers who 'almost never' get such support, to 26.2% and 23.5% respectively: a plausible hypothesis in explaining this pattern is that the assistance is probably not expected in this instance.

Table 39: MSDs and social support, 2005 (%)

	Assistance from superiors		External assistance		Assistance from colleagues
Backache	Muscular pain	Backache	Muscular pain	Backache	Muscular pain
Almost always	20.2	19.4	19.4	19.6	24.2
Often	21.4	19.8	19.6	17.8	23.7
Sometimes	25.8	23.1	25.3	24.3	28.1
Rarely	31.7	28.6	26.6	24.1	29.9
Almost never	31.8	29.2	28.4	25.9	26.2
Total	25.6	23.8	25.6	23.8	25.6

Source: Calculations based on fourth EWCS

Evidence at national level

According to the EWCO national correspondents, evidence about the impact of stress on MSDs is limited to a few cases – in Belgium and Sweden – but appears to be consistent. According to the German 1999 BIBB/IAB survey, stress and work pressure changes have a strong impact on the growth of MSDs: when these factors decrease, reported MSDs are below 4% for any part of body, and when they are stable, reported MSDs vary from 35.8% in respect of hip pain to 40% for lower back pain. However, when both stress and work pressure increase, reported MSDs vary from 54.2% for leg pain to 59.2% for hip complaints. Meanwhile, the number of Swedish women reporting at least five weeks of sick leave as a result of MSDs affecting the upper part of the body is 1.5 times higher in cases of stress.

Social support is investigated on the basis of two issues. According to the Danish surveys, role conflict has a significant impact on developing pains in the hands among those not affected five years before, while Dutch studies

by Hoogendoorm et al (2000) and Ariëns et al (2001, 2001a) found a negative association between social support and back and neck pain.

Autonomy and control over work

According to various studies, such as those summarised in Bourgeois et al (2000), both MSDs and stress-related disorders arise out of work situations which limit workers' discretion. On the other hand, they have a signalling role of organisational dysfunctions and of the reliability of the socio-technical system, 'a symptom among others of organisational rigidities' (Hubault, 1998).

According to the report *Work organisation and health at work in the European Union* , the scope to manoeuvre for workers is defined as 'the degree of autonomy in the organisation of their work and the degree of control over the work via qualitative standards and self-evaluation' (p. 6). In other words, this scope represents the latitude of self-regulation allowed by work organisation in order to manage 'space of the unforeseen' (Coutarel, 2004) given both external and internal constraints, that is, both task and personal variations. Such scope allows workers to commit themselves to improving their work quality, with a benefit for both efficacy and health at work. Thus, according to such an approach, MSDs could be seen as the result of a lack of scope to manoeuvre and a symptom of the worker's deprivation of the possibility to act (Coutarel, 2004).

Scope to manoeuvre may be both individual and collective. In the former case, workers have the opportunity to adapt their tasks to themselves, by choosing the appropriate pace of work, tools and methods in order to fulfil the required tasks according to their intrinsic variability, as assumed by all 'post-Fordist' production models, for example lean production based on flexible mass production (Streeck, 1992). Collective scope to manoeuvre concerns the opportunities of cooperation and mobility, such as job rotation and opportunities to change tasks, by organising activities in such a way that, given the variety of personal characteristics of a group, different work situations are offered to a group of employees. Increasing workers' scope to manoeuvre means allowing them regulatory power over their performance, by establishing a link between first-level learning – concerning the task accomplishment – and third-level learning – that is, the ability to manage the variability of work situations (Vézina et al, 1998 (in French, 2.6Mb PDF)).

According to this approach, MSDs are not only a pathology of individuals but a symptom of work organisation failures (Daniellou, 1995), having therefore a signalling role. Furthermore, MSDs mirror employees' lack of scope to manoeuvre in their tasks, and such a deficit is linked to a lack of room to manoeuvre among a number of other actors inside the organisation (Coutarel, 2004), not only those more exposed than average.

EWCS

Table 40 summarises the impact of various organisational factors that could confer to workers some control over their tasks and performance. They may be categorised into four groups: the room to manoeuvre in a proper sense, that is, the opportunity to choose the most appropriate way to achieve their tasks; the evaluative dimension, that is, the assessment ability both before and after a task – thus incorporating part of the supervisory tasks, according to the various post-Fordist models; the nature of the task; and the learning dimension.

Reported MSDs are slightly below average values for individual room-to-manoeuvre indicators: when people are able to choose their work methods, the rate of reported backache is 1.2 percentage points below average and that of muscular pain is 0.6 percentage points below average. Similarly, when respondents can influence the speed of their work, levels of backache and muscular pain are 0.8 percentage points and 0.4 percentage points below average respectively, while being able to choose the order of tasks implies rates of backache and muscular pain that are 1.6 percentage points and 0.9 percentage points below average.

Supervisory tasks on one's own work and, to a lesser extent, problem solving are associated with above average MSD figures: in the case of solving unforeseen problems, reported backache is 0.7 percentage points above average and muscular pain is 0.9 percentage points above average. When self-assessment of work is reported, then backache is 1.2 percentage points above average and muscular pain is 1.3 percentage points above average, while having to meet quality standards implies a 1.3 percentage point above average level of backache and a 1.2 percentage point above average level of muscular pain. Finally, for workers who are included in teamwork, reported backache is 2.2 percentage points above average while muscular pain is 2.5 percentage points above

average. Thus, conferring some supervisory tasks in terms of self-assessment tends to increase work intensity, and adds to the extent of the usual tasks due to the increased autonomy of judgement and higher sense of work intrinsic to any action conferring control over one's own tasks. The impact on MSDs is probably indirect and mediated by an increase in stress, which is the best-known impact of such organisational actions.

The impact of MSDs on the nature of the tasks themselves follows similar lines. Monotonous tasks – as expected – show significantly higher levels of reported MSDs, at 6.7 percentage points above average for backache and 6.8 percentage points above average for muscular pain. Complex tasks also result in higher than average rates of backache and muscular pain, albeit at a lower level than for monotonous work. Moreover, rotating tasks are associated with higher than average levels of both forms of MSD, at 3.9 percentage points above average for backache and 3.8 percentage points above average for muscular pain.

Finally, learning new things at work is associated with a slightly lower level of reported MSDs over time, while training provided by the employer implies a significantly lower rate of reported MSDs, at 3.4 percentage points below average for backache and 2.2 percentage points below average for muscular pain. This seems to validate the view shared by ergonomists that 'training is a way for workers to increase their power to act in their daily interaction with their own world' (Coutarel, 2004). However, a composition effect should also be taken into account, namely, that more training is provided in good quality jobs.

Table 40: Reported backache and muscular pain, by autonomy, 2005 (%)

Backache	Muscular pain
Able to choose speed or rate of work	24.8
Able to choose or change methods of work	24.4
Able to choose or change order of tasks	24.0
Solving unforeseen problems	26.3
Meeting quality standards	26.9
Self-assessment of work	26.8
Monotonous tasks	32.3
Complex tasks	27.4
Rotating tasks	29.5
Inclusion in teamwork	27.8
Learning new things	25.0
Training provided	22.2
Total	25.6

Source: Calculations based on fourth EWCS

Thus, summarising the results presented in Table 40, while room to manoeuvre and training reduce the incidence of reported MSDs – although this effect is limited in respect of the former – self-assessment tasks, teamwork and in particular job rotation are clearly associated with higher MSD levels. The lean production model incorporating intensified work pace and demands, as outlined in the 2002 Foundation report New work organisation, working conditions and quality of work: Towards the flexible firm? , seems to be increasingly prevalent among European companies, featuring a teamwork approach rather different from the socio-technical and 'neo-artisanal' model, which is based on autonomous teams where team members enjoy significant room to manoeuvre, including the choice of their team leader. The new production model, requiring flexible performance in a lean organisation, represents a challenge of constant problem solving, conceived as the constant pressure to perform highly repetitive

tasks at an intensified pace, combined with wider margins of responsibility. The old 'accordance with the rules' has been replaced by a logic of 'tacit obligation' (De Terssac, 1992) towards productive aims, in terms of capacity of mobilisation of specific resources, such as sustained attention and problem solving; the pressure on work performance is defined by considerable tacit constraints – quantitative and qualitative.

These results are consistent with findings by Valeyre (2006) (in French, 475Kb PDF) , based on data from the third EWCS, that the 'learning' and 'traditional' organisational forms show significantly lower levels of reported backache and muscular pain than do lean production and Taylorist models, thus reflecting different exposure to physical and ergonomic factors.

Table 41 further highlights the impact of forms of command and involvement in decision making. Workers who report that their pace of work is dependent on the direct control of their superior experience above average MSD levels, by 1.4 percentage points in the case of backache and by 0.8 percentage points for muscular pain. When respondents discuss work-related problems with their superior, reported MSDs are slightly above average. However, when such problems are discussed with employee representatives, the reported MSDs are 2.1 percentage points above average for backache and 2.9 percentage points above average for muscular pain. Finally, when workers are consulted about organisational changes or changes in working conditions, reported MSDs are below average, by 1.8 percentage points for backache and 1.3 percentage points for muscular pain. This latter association is consistent with the room-to-manoeuvre claims that consultation over changes in work organisation and work stations – particularly in the planning phase – has a more significant impact on preventing MSDs.

Thus, discussing problems with supervisors shows little impact, since 'discussion' does not imply identifying solutions and implementing them, and this depends on both the worker's bargaining power and the managerial style of the supervisor and the company. Nonetheless, exercising a collective voice could deploy a preventive role – especially when the industrial relations setting is participative – or a corrective role after changes have been made: this latter scenario seems to prevail.

Table 41: Reported backache and muscular pain, by form of worker involvement, 2005 (%)

Backache	Muscular pain
Pace of work dependent on direct control of superior	27.0
Discuss work-related problems with superior	25.7
Discuss work-related problems with employee representative	27.7
Consulted about changes in the organisation or working conditions	23.8
Total	25.6

Source: Calculations based on fourth EWCS

Table 42 examines further issues of room to manoeuvre and feelings of self-realisation. When these aspects have poor scope at a practical level, then reported MSDs are higher. The gap between reported levels and the average rate is rather limited, at about one to three percentage points, when work breaks can 'rarely' or 'almost never' be taken at will. When the 'opportunity to do one's best' 'rarely' occurs, then reported backache is 7.1 percentage points above average, while muscular pain is 5.1 percentage points above average. When the 'feeling of work well done' is 'almost never' experienced, backaches are reported at a level 14.7 percentage points above average, while muscular pain is 12.8 percentage points above average. Finally, when workers are 'almost never' able to apply their own ideas, then reported backache is 5.4 percentage points above average while muscular pain is 6.3 percentage points above average. Therefore, poor creativity and in particular poor opportunities in incorporating workers' own identity in the work done – amounting to alienation – are associated with higher levels of MSDs.

Table 42: Reported backache and muscular pain, by opportunities at work, 2005 (%)

	Take work breaks at own discretion		Opportunity to do one's best		Feeling of work well done		Able to apply own ideas
Backache	Muscular pain	Backache	Muscular pain	Backache	Muscular pain	Backache	Muscular pain
Almost always	23.7	23.1	24.8	23.7	24.1	23.0	24.1
Often	24.8	23.9	23.6	21.6	24.7	22.9	23.2
Sometimes	24.4	22.0	24.7	22.7	27.7	24.1	26.0
Rarely	27.2	26.3	32.7	28.9	33.2	30.4	27.8
Almost never	28.6	24.8	29.2	27.4	40.3	36.6	31.0
Total	25.6	23.8	25.6	23.8	25.6	23.8	25.6

Source: Calculations based on fourth EWCS

Figures discussed in this section are consistent with the claim by Coutarel et al (2003) that job rotation is not the solution for preventing the growth of MSDs, since 'job rotation is not automatically a synonym of multi-competence' and could have as its sole objective 'to break the job monotony or lighten task constraints' without any significant job enrichment. On the other hand, job rotation can make a positive contribution under an appropriate 'pedagogical framework', having as a starting point the competences held by each worker involved, and integrating an ergonomic intervention based on the increase of room to manoeuvre in the task design. Thus, early consultation, opportunities of learning, choosing work methods, creativity and training constitute the room-to-manoeuvre bundle of both organisational and ergonomic interventions interacting with each other. These confer a different sense to the 'high performance work practice' bundle of task rotation, teamworking and self-assessment of performance, resulting in a significant positive impact on reducing levels of MSDs. However, an intervention based on the latter bundle only, according to a strict lean production approach, would worsen rather than alleviate such diseases.

Evidence at national level

According to Austrian social security registers, about 40% of work absence days due to MSDs result from 'low levels of control over the job' and 'work requiring low mental involvement'.

The Finnish QWLS investigates workers' ability to influence the content of their tasks and opportunities to take work breaks. Reported MSDs are steadily lower for all parts of the body over time for workers who can take breaks, and who are able to influence the pace of work and working methods. However, in the 1990 survey those who were able to influence the content of tasks were most likely to report MSDs affecting all parts of the body, although this trend has reversed since 1997.

According to the Burr and Jensen (2002) investigation of the probability of developing MSDs among workers not affected five years before – based on the DWECS 2000 data – workers with low job latitude have a significantly higher probability of reporting knee pain.

According to the Swedish Work Environment Survey 2003, the probability of incurring more than five weeks of sick leave because of disorders of the upper part of the body doubles for men who cannot influence their work pace, while such a probability is 30% higher in the case of women. Furthermore, such a probability is 20% higher for women unable to influence the organisation of work.

The Czech 2001 working conditions survey reveals that all work-related autonomy dimensions – such as choice of

work methods, pace of work or when to take breaks – correspond to lower levels of MSDs for all parts of the body. According to the study carried out by Malchaire et al (2004) in Belgium, the growth of MSDs is lower when workers have frequent rotation across different tasks and when they are allowed to take sufficient breaks.

Workplace strategies in managing MSDs

Prevention strategies

Participatory ergonomics

As summarised above, the EU regulatory health and safety framework gives significant scope to workers' participation – with various degrees of involvement, both individually and collectively by means of worker representatives – and prescribes work adaptation to the individual. This principle, stated by the framework Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work, could be ascribed to so-called 'participatory ergonomics'. The latter concept is defined in a loose form as 'the involvement of people in planning and controlling a significant amount of their own working activities, with significant knowledge and power to influence both processes and outcomes in order to achieve desirable goals' (Haines and Wilson, 1998 (2.6Mb PDF)). Overall, three arguments are made in favour of participatory ergonomics:

- employee empowerment is a distinctive feature of high performance companies competing on quality, flexibility and customer service, as well as on quantity of output and cost control. These competitive levers call for greater workforce participation, according to an array of formalised managerial tools – such as teamworking, quality circles and total quality management – as well as informal community-based practices, which vary according to the socio-economic environment, as the 'varieties of capitalism' theory states (Hall and Soskice, 2001; Crouch and Streeck, 1997; Amable, 2003);
- there is 'some evidence that, to be successful, a physical ergonomic programme would need an organisational dimension and involvement of the workers' (European guidelines for prevention in low back pain, 2004 (294Kb PDF)). As Buckle and Woods (2002) state, 'modern approaches to ergonomic interventions have shown the importance and value of a participatory approach that involves facilitation, access to information and appropriate participation'. According to the 1999 OSHA report *Work-related neck and upper limb musculoskeletal disorders* , there is a growing belief that the 'social dimension to MSDs may require additional strategies to intervention'. However, 'participatory ergonomics offers the potential for developing an integrated approach' although 'there is insufficient evidence to recommend stand-alone work organisational intervention' (*European guidelines for prevention in low back pain*);
- organisations need to be more self-reliant in ergonomics, so they need to elicit internal knowledge: 'involving current job holders in analysis, diagnosis and redesign can result in improved ideas and information' (Haines and Wilson, 1998) – with higher motivation and increase in job control, according to the Karasek and Theorell (1990) principles.

The varieties of participatory ergonomics reflect the range of participatory management practices. A total of three dimensions may be detected:

- the modes of participation, ranging from individual consultation, group consultation and joint decisions by means of negotiation between managers and staff, on the one hand, and involved employees, on the other;
- the way workers are involved, that is, in a direct way or indirectly by means of a worker representative;
- the issues in which workers are involved, that is, in the design of a new workplace or in improvements to the existing workplace (Coutarel, 2004).

As Haines and Wilson (1998) highlight in their literature surveys, intervention strategies are often a mix of different dimensions according to the areas, professional roles and priorities of intervention. The organisational dimension, worker involvement and substantial changes in risk exposure levels are the conditions for successful intervention (Westgaard and Winkel, 1997).

'Scope-to-manoeuvre' approach to prevention

The scope-to-manoeuvre approach constitutes a more ambitious theorising of participative ergonomics. According to Douillet and Schweitzer (2002), 'expanding workers' discretion … becomes a key prevention priority: not just to

reduce the physical and psychological stressors, but also as a way of recognising the individual's creativity at work.' The organisational changes in order to prevent MSDs must therefore include all of the concerned stakeholders (Daniellou, 2005).

Thus, the scope-to-manoeuvre approach calls for preventive strategies based on interventions at an early stage in the design of the workplace, according to a participative method, which may be referred to under a variety of labels and applied in different ways across countries. This calls for the opportunity to develop quality indicators in order to set benchmarking policies, such as good quality working conditions, possibilities of cooperation, mobility, rotation, organisation of work which optimises workforce performance, training, stability in the workforce and low staff turnover.

Factors limiting such a preventive approach are economic constraints, such as productivity, overall performance maintenance and further investment, and social constraints, such as population characteristics, level of experience, training and levels of exposure.

EU-level preventive action

The website www.msdonline.org , promoted by the EU-level social partners in the telecommunications sector, ETNO and UNI-Europa Telecom, reports findings from a review of scientific literature on good practice in the industry. The website also reports the results of a review on working practices across all EU countries relating to telecommunications activities assessed as being associated with a risk of MSDs, in order to define best practices. Occupations most exposed to MSD risks in this sector are service technicians and call centre workers. The website proposes appropriate working procedures and outlines a common approach to data collection.

The European Senior Labour Inspectors Committee (SLIC) inspection and communication campaign has issued a Guide for National Labour Inspectorates (73Kb PDF) on manual handling of loads in transport and care, as part of the 2007 OSHA campaign 'Lighten the load '. The guide aims to ensure a better compliance with Council Directive 90/269/EEC on the manual handling of loads by improving the inspection and communication methods of the national labour inspectorates through learning from existing methods and integrating them. Member States face challenges such as a lack of useful standards or assessment methods for situations of manual handling, a lack of knowledge among employers and employees, and difficulties in changing the prevailing work culture. Furthermore, the guide identifies the risk of competitive distortion due to the disproportionally high investments required in some countries compared with other countries where few measures are needed.

Evidence at national level

Investigation into country-level policies on MSDs has paid particular attention to organisational intervention, focusing on forms of participatory ergonomics that could be reported according to the following dimensions:

- policy level – national, local and workplace level – and social partner interplay;
- governance of MSD policies, in particular the interplay among social partners, public institutions and specialised agencies;
- different mainstreaming strategies, such as guidelines, good practice, indicators and benchmarking.

Prevention policies could be situated according to two dimensions:

- the territorial dimension – which may encompass both national and regional levels, as the French, Italian and Spanish national correspondents emphasise – where the regulatory framework and a network of specialised services are set. The regulatory framework may be established by legislation, collective agreement or guidelines, and the network of services may include public agencies in the area of occupational health or inspection bodies, as well as private consultants. Various actors in public roles may set guidelines and standards, such as for example in the German case of INQA. Governance is established at these levels;
- the workplace level by means of both worker and employer representatives on health and safety, occupational services and ergonomic intervention, in its wider sense.

Most of the Member States have implemented at least EU health and safety principles, based on both risk information and elimination. In addition, territorial-level guidelines set by public agencies with the intervention of the social partners play an important role, both at national and local level. Strategies vary according to the regulatory settings in health and safety and industrial relations models.

The French National Institute of Research and Safety (Institut National de Recherche et de Sécurité, INRS) specialises in the prevention of work-related accidents and occupational diseases, and is funded by social security institutions. Its guide on MSD prevention Les troubles musculosquelettiques du membre supérieur: Guide pour les préventeurs (in French, 2.5Mb PDF) states (current author's translation):

One cannot talk of risk elimination but only of risk management. This latter notably needs to consider work organisation since work organisation is not a physical object that can be reproduced in a laboratory. An ergonomic practice structured as a form of project management is the best way to develop an appropriate prevention path. Such a strategy must incorporate careful inspection of work situations, particularly processes, workplaces and tools, in close liaison with all relevant company actors.

Following a similar approach to the French case, the Belgian SOBANE (Screening, Observation, Analysis, Expertise) strategy to health and safety at work has been developed by the Occupational Health and Work Physiology Unit of the Catholic University of Louvain, with the support of the Federal Public Service of Employment, Labour and Social Dialogue (SPF Emploi, Travail et Concertation sociale/FOD Werkgelegenheid, Arbeid en Sociaal Overleg). Meanwhile, the aim of the British HSE 'Better back campaign' is to 'reduce the incidence and/or severity of back pain' by eliminating or reducing risk factors, reviewing the situation 'in conjunction with the workforce to ensure the changes are effective'.

However, a group of mainly Nordic countries has gone further in pursuing workplace health promotion with the strong involvement of the social partners, encouraging local-level intervention – particularly at workplace level. As part of the strategy for a more inclusive workplace, the 2001 Norwegian tripartite agreement was renewed in 2006, aiming to reduce sick leave and raise the average age of retirement. The social partners carried out several projects on their own initiative and published a joint document on how to find solutions at enterprise level in respect of disabled workers in general. For the Swedish case, see the feature from the European Industrial Relations Observatory (EIRO) Tripartite talks launched on improving health at work , which outlines an 11-point programme. Meanwhile, in Denmark the social partners committed themselves in a 1992 agreement to reduce hazardous repetitive work by 50% in 2000. The Action programme for a clean working environment 2005 reveals that MSDs, which accounted for over half of reported occupational diseases, were a primary target. The 2005 Report on future working environment 2010 – New priorities for the working environment (125Kb PDF) by the Danish Ministry for Employment (Beskæftigelsesministeriet) includes MSDs among most significant work-related consequences caused by a poor working environment, and their importance is expected to continue. Their prevention 'is vital for future working-environment efforts' since 'it is an extremely widespread problem which can have extensive consequences both for the individual and from an employment-policy perspective because of absenteeism due to sickness and early exit from the labour market.'

In Austria and Denmark, tripartite-managed public organisations play a strong promoting role, while in Belgium, France and the Netherlands, the social partners intervene mainly at workplace level with ministerial support. Finally, in Germany involvement of the social partners in advisory committees is a structured way of participatory representation at workplace level.

Hasle, Hansen and Moller (2004) assess the Danish case in detail: although the objective of a 50% reduction in hazardous repetitive work was not achieved, they find that 'agreements between the labour market parties need substantial backing from the authorities in order to be effective' and that a 'strategy based on agreements seems to be a valuable approach to the solution of those working environment problems that are difficult to regulate by clear and measurable standards'.

On the other hand, national-level benchmarking techniques are applied in the Czech Republic and Portugal, by awarding companies which demonstrate good health and safety policies overall and sometimes specifically in respect of MSDs. Good practice could therefore play a significant role, while the general setting encourages workplace policies: this is the case of good practices quoted by the French, Maltese, Slovenian, Swedish and UK correspondents. In France and Sweden, such good practices rely on participative organisational intervention, while the other three countries offer more time for physical activities such as stretch breaks and exercise.

Finland, France, the Netherlands, Norway and the UK have established room-to-manoeuvre indicators. Finland and Norway set macro-level indicators for nationwide actions; both countries choose this method to address the issue of the ageing population and workforce. In addition, the Norwegian indicators aim to achieve better inclusion and the

reduction of sick leave, while the Finnish indicators seek to combine productivity with well-being and worklife issues. Both the Dutch and French micro-level indicators strongly focus on workload – such as pace of work, breaks and posture – drawn from working conditions surveys. In 2004, the UK HSE launched management standards for work-related stress that could work as room-to-manoeuvre indicators focused on six issues: demands, control, support, relationship, role and change (UK0412104F). Finally, the Swedish report Systematic work environment management and stress (191Kb PDF) , published by the Swedish Work Environment Authority (Arbetsmiljöverket, AV), proposes the room-to-manoeuvre approach as a way to cope with both stress and MSDs.

Return-to-work policies

The importance of return-to-work policies increases as the workforce is ageing and quality of work and promotion of health at work strategies are put in place. Furthermore, since most social security systems recognise incapacity to work only if a causal link is established, as previously discussed, opportunities for early retirement due to incapacity are limited in the case of MSDs, and absenteeism is a major symptom. Overall, three approaches may be identified.

A first approach emphasises intervention on the employer side. This strategy may be advanced by providing employers with support in consultancy and job redesign to ease the return to work of affected workers, as is the case in Austria and Slovenia. Alternatively, legislation may underline the employer's responsibility in setting up a recovery plan under the supervision and with the support of social security institution and/or national guidelines; the Netherlands and Sweden adopt this strategy.

Intervention on the employee side represents a second approach. This method may be addressed by categorising affected workers as disabled, thus offering them: rehabilitation training and clinical treatment, as is done in Finland and Luxembourg; training and placement support, as in Luxembourg; or reserve shares at workplaces, as is the case in France. Lithuania is also moving in this direction, while in 2007 Finland introduced a partial sickness benefit, similar to the parental leave scheme (see the EIRO comparative report Family-related leave and industrial relations).

The third approach is to address the needs of the social partners in an integrated way; the Danish case can be considered as a concerted example of this strategy. According to Labriola (2006) (444Kb PDF) , 'longer sickness absence is associated with a reduced probability of return to work and subsequent economic and social deprivation' and 'sickness absence records may provide a useful risk marker for predicting future disability retirements'. Heavy physical labour, repetitive or continuous strain, musculoskeletal strain and uncomfortable working positions all prolong work disability: all of these factors are associated with MSDs, with significant interactions regarding management quality. In 2003, the Danish government launched a plan for reducing long-term sickness absence in particular and facilitating return to work. Taking an integrated approach, the plan addressed the roles of – and challenges for – various stakeholders, including workplaces, employer and employee organisations, the healthcare system and the managing municipal authorities, as well as researchers from a broad array of disciplines.

In Norway, the 2001 tripartite agreement on a more inclusive workplace, which was renewed in 2006, states that the following general principles will apply:

- earlier intervention and qualitatively better follow-up of employees on sick leave in order to prevent prolonged absence and 'exclusion';
- the measures must be rooted in the individual workplace and responsibility for them must lie with the employer and employee;
- greater emphasis on functional capacity;
- active dialogue between the employer and employee;
- more goal-oriented use of government aid schemes in support of preventive and inclusive measures in the workplace.

Norwegian employers, in cooperation with employees on sick leave, are obliged – within six weeks of the start of sick leave – to make a plan for return to work outlining the actions needed to bring the employees back to work, including a description of the need for change of design of the workplace. Within 12 weeks of the commencement of sick leave, the employer is obliged to hold a meeting inviting the worker on sick leave, the doctor and the occupational health services to find solutions to help the worker return to work.

Reciprocal obligations are also set up. Enterprises which enter into a cooperation agreement with the authorities must undertake to work systematically to reduce sickness absence. The authorities undertake to provide these enterprises with both administrative and financial support in order to ensure that the enterprises receive the assistance they need to make a greater effort. At the same time, employees on sick leave must agree to discuss with the employer the possible reorganisation of their work and to participate in the solutions available to the employer and employee. The 'Active back' project at the University of Bergen validates such an approach.

In the Netherlands, the 2004 'Gatekeeper Law' follows similar lines to the Norwegian regulation.

The Danish approach is consistent with the claim by Buckle and Woods (2002) regarding the importance of the social and community network in determining how workers cope with problems or in their return to work after an MSD, whereas the Norwegian strategy is more workplace-focused in setting inclusive active labour market policies.

The UK shows a twofold approach. On the one hand, absence management policies are widespread at company level, according to the national correspondent. On the other hand, active case management is a goal-oriented approach to keeping employees at work and facilitating an early return to work. This latter approach is combined with suitable rehabilitation interventions, according to an integrated strategy managed on behalf of the employer by a case manager who functions as a 'broker', passing on information and arranging referrals without direct contact. The case manager may also act as a 'generalist', providing both coordination and direct services such as advocacy, casework and support systems, or may be viewed as a 'primary therapist' who supplements the therapeutic relationship with case management functions. According to Hanson et al, 2006 (1.5Mb PDF) :

The benefits observed include reduced healthcare costs, reduced treatment duration, reduced sick leave and time off work, improved worker productivity, reduced compensation claims and litigation, reduced claim duration and more rapid claim closure.

Both the employer-sided and the integrated approaches are consistent with recommendations in the *European guidelines for prevention in low back pain* for the working population. The guidelines encourage temporary modified work and ergonomic workplace adaptations to facilitate earlier return to work for workers on sick leave due to low back pain.

A second way to classify return-to-work strategies is to consider the focus of the inclusive labour policies: when the workplace is the focus, the policies aim to reshape the workplace not only for an individual need of re-insertion but in general. Meanwhile, return-to-work policies may also focus on the labour market, so that workers returning to the labour force are assimilated as disabled people and therefore supported by a set of both active and passive measures. It is worth noting that countries which have introduced either type of return-to-work policy have also introduced national targets in order to reduce occupational diseases, with the exception of Sweden, or have defined room-to-manoeuvre indicators. Only Lithuania and Slovenia do not show such a structured national strategy as a background for any kind of return-to-work policies.

According to Table 43, all countries that have implemented a return-to-work policy show long-standing declining trends in MSDs; the Slovenian trend for 2003–2004 is too short to be taken into account (see again Table 10). Only France and Lithuania report an increase, although return-to-work policies do not aim to reduce sick leave but rather ease employability. In fact, countries showing upward changes in MSD trends also show a small increase with respect to their long-term decline. However, recognition criteria are not homogeneous over time for any of the countries, and 10 Member States (excluding Slovenia) do not indicate any trend.

Although the impact of return-to-work policies is positive in most countries, the effect seems to be more relevant from a social security approach in terms of work absence days and permanent incapacity to work rather than in terms of self-reported work-related MSDs. Therefore, the impact on mild MSDs seems rather uncertain. Further evidence is needed in order to better assess the impact of these policies.

Table 43: Return-to-work policies and trends in MSDs

	No long-term trend or data on MSDs	Increase in MSDs	Downward changes in MSDs	Upward changes in MSDs

No return-to-work policies	CY, EL, HU, IE, LV, MT, PL, PT, RO	BG, ES, HU, IT	BE, CZ, DE, EE, SE, SK	
Return-to-work policies in labour market	LU	FR, LT		
Return-to-work policies in workplace	SI		NL, NO	FI, UK (THOR)

Source: EWCO national correspondents

Commentary

Any discussion of MSD trends must take into account several aspects, which precludes any straightforward interpretation. First, national-level recognition criteria change over time, and thus have an impact on figures from social security institutions. A European-level panel of sources was completed only in 2001 with the development of the EODS, and these data show a certain homogeneity for the EU15 Member States only from 2002. Enlargement poses further challenges for both the EODS and the LFS ad hoc module, also administered by Eurostat. Furthermore, changes in the question settings in the fourth edition of the EWCS – the oldest EU-level source – make it impossible to draw any trends; instead, this study has examined the links identified in the survey between MSDs and an array of organisational factors.

According to the EODS, trends in MSDs over the 2002–2004 period show a moderate increase, but with significant changes: diseases caused by arduous working conditions such as vibration and awkward postures – mainly Reynaud's syndrome – have declined, while diseases caused by repetitiveness and force exertion have increased. The EODS reflect previous, albeit relatively recent, working conditions, while self-reported work-related MSDs pertain to the last 12 months. Therefore, the 2007 LFS ad hoc module should provide the clearest trends of the MSD issue – albeit with a greater risk of individual subjectivity – since the framing of questions is unchanged with respect to the 1999 module. The most recent edition is however more detailed both in reporting and causal factors.

Investigation of national trends from administrative sources, such as social security and health services, and from national working conditions surveys identifies four groups of countries:

- countries with a long-term decline of MSD cases, although self-reported diseases do not always show similar trends. This decline is due to long-run prevention policies which have recently evolved towards return-to-work strategies, well-established participatory ergonomic approaches and accurate monitoring of both the social and economic impact. However, there are signs of a resurgence of MSD cases due to the new organisational and technological features of a service-dominated economy. This group includes Denmark, Finland and the UK, while the Netherlands shows a recent decline;
- countries having reversed the trend of increasing MSDs around 2000 or later and reporting at least a moderate decline in self-reported MSDs. This group includes Belgium, the Czech Republic, Germany, Norway, Slovakia and Sweden. These countries monitor MSDs according to the social and economic impact, while those states from among the EU15 – as well as Norway – have adopted participatory ergonomic approaches in prevention policies, and some have introduced return-to-work policies. Austria and Slovenia could also be included in this group because of their similarities both in terms of institutional settings and policies;
- 'peripheral' countries having experienced recent industrialisation and an increase in MSDs – for example, Ireland and Portugal, both of which lie at the far western points of Europe. Alongside these, most of the NMS still show an increase of MSDs and a lack of monitoring systems, as a result of profound changes in their economic structures since the 1990s;
- France, Hungary, Italy and Spain are in an intermediate position between the second and the third group, showing conflicting trends. France, Italy and Spain share a 'Mediterranean lean production model' (Camuffo

and Micelli, 1997) characterised by job rotation and multi-tasking with poor scope to manoeuvre.

When organisational and technological issues are discussed, some key results emerge from the fourth EWCS:

- the association of traditional physical factors with MSD complaints is stronger than in the case of time pressure – both in terms of speed of work and tight deadlines – and repetitive movements;
- the importance of psychosocial factors with regard to the prevalence of MSDs is confirmed by the strong association with stress and by a positive association with lack of support from colleagues and superiors in particular;
- work–life balance plays a significant role in relation to MSDs, especially for women, while timely advance notification of work schedule changes is important in preventing disruptive effects of working time flexibility on workers' health;
- while organisational features shared by all post-Fordist production models, such as job rotation, teamworking and quality assessment, are associated with higher MSD levels, room-to-manoeuvre and in particular learning indicators – especially training provided by employers – are associated with lower MSD levels. Consultation about organisational or working conditions changes is also associated with lower levels of MSDs.

It is worth noting that such results are consistent with findings from the third EWCS, thus underlining their persistence over time. Further investigation is required in order to examine the impact of a 'high performance work practice' bundle on reported MSDs, according to the adoption of the 'room-to-manoeuvre' bundle of work practices – thereby refining the Valeyre (2006) study on the third EWCS data.

The results are also consistent with discussion among ergonomists (Buckle and Woods, 2002; Coutarel, 2004) and with national-level evidence reported by the EWCO correspondents. They therefore set an agenda of prevention policies based on participatory ergonomics principles aimed at a proper workplace redesign. So far, this strategy has been embraced most fully in the Norwegian 'inclusive workplace' strategy and the Danish 'Clean Working Environment' action plan. These participatory and holistic elements constitute the prerequisites for return-to-work policies and non-discriminatory absence management.

Mario Giaccone, Fondazione Regionale Pietro Seveso, Italy

References

Amable, B., *The diversity of modern capitalism* , Oxford, Oxford University Press, 2003.

Aptel, M., Cail, F. and Aublet-Cuvelier, A., *Les troubles musculosquelettiques de l'art supérieur: Guide pour les préventeurs* , French National Institute of Research and Safety (Institut National de Recherche et de Sécurité, INRS) Brochure ED 957, Paris, 2006, available online at: http://www.inrs.fr/htm/ed957.pdf

Ariëns, G.A.M., Bongers, P.M., van Mechelen, W., Hoogendoorn, W.E. and van der Wal, G., 'High qualitative job demands and low coworker support as risk factors for neck pain: Results of a prospective cohort study', *Spine* , Vol. 26, 2001.

Ariëns, G.A.M., van Mechelen, W., Bongers, P.M., Bouter, L.M. and van der Wal, G., 'Psychosocial risk factors for neck pain: A systematic review', *American Journal of Industrial Medicine* , Vol. 39, No. 2, 2001.

Belgian Fund for Occupational Diseases (Fondes des maladies professionnelles/Fonds voor de beroepsziekten, FMP/FBZ), *Premieres statistiques 2006* , Brussels, 2007, available online at: http://www.fmp-fbz.fgov.be/Pdfdocs/Rapports/premieres_statistiques_2006.pdf

Benach, J., Gimeno, D. and Benavides, F., European Foundation for the Improvement of Living and Working Conditions, *Types of employment and health in the European Union* , Luxembourg, Office for Official Publications of the European Communities, 2002, available online at: http://www.eurofound.europa.eu/publications/htmlfiles/ef0221.htm

Berg, A., European Industrial Relations Observatory (EIRO), European Foundation for the Improvement of Living and Working Conditions, *Tripartite talks launched on improving health at work* , Dublin, 2001, available online at:

http://www.eurofound.europa.eu/eiro/2001/11/feature/se0111108f.html

Bernard, B. (ed.) et al, *Musculoskeletal disorders and workplace factors: A critical review of epidemiologic evidence for work-related musculoskeletal disorders of the neck, upper extremity, and low back* , Cincinnati, Department of Health and Human Services, National Institute for Occupational Safety and Health (NIOSH) Publication No. 97–141, 1997, available online at: http://www.cdc.gov/niosh/docs/97-141/

Boisard, P., European Foundation for the Improvement of Living and Working Conditions, *Time and work: Work intensity* , Luxembourg, Office for Official Publications of the European Communities, 2002, available online at: http://www.eurofound.europa.eu/publications/htmlfiles/ef0248.htm

Bourgeois, F. (ed.), *TMS et travail: Quand la santé interroge l'organisation* , Lyons, Agence Nationale pour l'Amélioration des Conditions de Travail (ANACT), 2000.

Brenner, M., Fairis, D. and Ruser, J., '"Flexible" work practices and occupational safety and health: Exploring the relationship between cumulative trauma disorders and workplace transformations', *Industrial relations* , Vol. 43, 2004.

Brun, E., Flaspöler, E. and Reinert, D., *Expert forecast on emerging physical risks related to occupational safety and health* , European Agency for Safety and Health at Work, Luxembourg, Office for Official Publications of the European Communities, 2005, available online at: http://osha.eu.int/publications/reports/6805478/full_publication_en.pdf

Buckle, P. and Devereux, J., *Work-related neck and upper limb musculoskeletal disorders* , European Agency for Safety and Health at Work, Luxembourg, Office for Official Publications of the European Communities, 1999, available online at: http://osha.europa.eu/publications/reports/201/wruld_en.pdf/at_download/file

Buckle, P. and Woods, V., *Work, inequality and musculoskeletal health* , Health and Safety Executive (HSE), London, Contract research report 421, 2002, available online at: http://www.hse.gov.uk/research/crr_htm/2002/crr02421.htm

Burr, H. and Jensen, C., *Bevægeapparatbesvær* , Copenhagen, National Institute of Occupational Health, now known as the National Research Centre for the Working Environment (Nationale Forskningscenter for Arbejdsmiljø, NFA), 2002.

Burton, A.K., Balagué, F., Cardon, G., Eriksen, H.R., Henrotin, Y., Lahad, A., Leclerc, A., Müller, G. and van der Beek, A.J., *European guidelines for prevention in low back pain* , 2004, available online at: http://www.backpaineurope.org/web/files/WG3_Guidelines.pdf

BusinessEurope (formerly UNICE), *Work-related musculoskeletal disorders – BusinessEurope reply to the second-stage consultation of the social partners* , Brussels, 8 May 2007, available online at: http://www.businesseurope.org/Content/Default.asp?pageid=424

Camuffo, A. and Micelli, S., 'Mediterranean lean production supervisors, teamwork and new forms of work organisation in three European car makers', *Journal of Management and Governance* , Vol. 1, 1997.

Clot, Y., 'Les TMS: Hypersollicitation ou hyposollicitation', paper presented at the *1.er congrés francophone sur les TMS du membre supèrieur* , Nancy, 30–31 May 2005.

Council of the European Union, *Council resolution on a new Community strategy on health and safety at work (2002–2006)* , Brussels, 3 June 2002, available online at: http://eur-lex.europa.eu/LexUriServ/site/en/oj/2002/c_161/c_16120020705en00010004.pdf

Coutarel, F., *La prevention des troubles musculo-squelettiques en conception: Quelles marges de manoeuvre pour le dèploiment de l'activitè?* , thesis, Victor Segalen University of Bordeaux 2, Institute of Public Health, Epidemiology and Development (Institut de Santé Publique, d'Epidémiologie et de Développement, ISPED),

Laboratory of Ergonomics in Complex Systems, 2004.

Coutarel, F., Daniellou, F. and Dugué, B., 'Interroger l'organisation du travail au regard des marges de manoeuvre en conception et en fonctionnement. La rotation est-elle une solution aux TMS?' *Pistes* , Vol. 5, No. 2, 2003, available online at: http://www.pistes.uqam.ca/v5n2/articles/v5n2a2s.htm

Crouch, C. and Streeck, W. (eds), *Political economy of modern capitalism: Mapping convergence and diversity* , London, Sage, 1997.

Daniellou, F., 'L'introduction de l'ergonomie dans la conception de nouveaux systèmes de production ou la définition de nouvelles organisations', in *Santé au travail* , seminar report, Trade Union Institute for Socioeconomic Research (Institut syndical d'études et de recherches économiques et sociales, ISERES), Études et recherches No. 133, 1995.

Daniellou, F., 'TMS et modèles d'organisation du travail et de la production', paper presented at *1.er congrés francophone sur les TMS du membre supèrieur* , Nancy, 30–31 May 2005.

Danish Ministry for Employment (Beskæftigelsesministeriet), *Report on future working environment 2010 – New priorities for the working environment* , Copenhagen, 2005, available online at: http://www.at.dk/graphics/at/Engelsk-pdf/Andre-informationsmaterialer/Future-working-environment.pdf

Daubas-Letorurneaux, V. and Thébaud-Mony, A., European Foundation for the Improvement of Living and Working Conditions, *Work organisation and health at work in the European Union* , Luxembourg, Office for Official Publications of the European Communities, 2002, available online at: http://www.eurofound.europa.eu/publications/htmlfiles/ef0206.htm

De Beeck, R. and Hermans, V., *Work-related low back disorders* , European Agency for Safety and Health at Work, Luxembourg, Office for Official Publications of the European Communities, 2000, available online at: http://osha.europa.eu/publications/reports/204/lowback_en.pdf/at_download/file

De Terssac, G., *Autonomie dans le travail* , Paris, French University Presses (Presses Universitaires de France, PUF), 1992.

Douillet, P. and Schweitzer, J-M., 'MSD, stress: Expanding discretion', European Trade Union Technical Bureau for Health and Safety (TUTB) Newsletter, No. 19–20, September 2002, available online at: http://hesa.etui-rehs.org/uk/newsletter/files/2002-19p57-58.pdf

Estonian National Institute for Health Development (Tervise Arengu Instituut), *Health behaviour among the Estonian adult population, 2004* , Tallinn, 2005, available online at: http://www.tai.ee/failid/TKU2004_kogumik.pdf

European Agency for Safety and Health at Work, *Economic impact of occupational safety and health in the Member States of the European Union* , Bilbao, 1998, available online at: http://osha.europa.eu/publications/reports/302/ec.im-en_en.pdf

European Agency for Safety and Health at Work, *Work-related musculoskeletal disorders in Europe* , Factsheet Issue 3, Bilbao, 2000, available online at: http://osha.europa.eu/publications/factsheets/3/facts3_en.pdf/at_download/file

European Association of Craft, Small and Medium-sized Enterprises (Union Européenne de l'artisanat et des petites et moyennes enterprises, UEAPME), *UEAPME response to the Commission's second stage consultation of the social partners on work-related musculoskeletal disorders (MSD)* , Brussels, 23 April 2007, available online at: http://www.ueapme.com/docs/pos_papers/2007/070423_pp_2nd_consultation_MSD.pdf

European Association of Craft, Small and Medium-sized Enterprises (Union Européenne de l'artisanat et des petites et moyennes enterprises, UEAPME), *UEAPME response to the first stage consultation of the social*

partners on musculoskeletal disorders at work , Brussels, 16 December 2004, available online at: http://www.ueapme.com/docs/pos_papers/2004/UEAPME pp MSD 1st consul final.en.doc

European Bone and Joint Health Strategies Project, *European action towards better musculoskeletal health* , 2004, available online at: http://www.boneandjointdecade.org/ViewDocument.aspx?ContId=534

European Commission, *Communication from the Commission. Adapting to change in work and society: A new Community strategy on health and safety at work 2002–2006* , COM(2002) 118 final, Brussels, 11 March 2002, available online at: http://europa.eu.int/eur-lex/en/com/pdf/2002/com2002_0118en01.pdf

European Commission, *Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. Scoreboard on implementing the Social Policy Agenda* , COM(2002) 89 final, Brussels, 19 February 2002, available online at: http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/com/2002/com2002_0089en01.pdf

European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Improving quality and productivity at work: Community strategy 2007–2012 on health and safety at work* , COM(2007) 62 final, Brussels, 21 February 2007, available online at: http://ec.europa.eu/governance/impact/docs/ia_2007/com_2007_0062_en.pdf

European Commission, *First-phase consultation of the social partners on musculoskeletal disorders at work* , Brussels, 9 November 2004, available online at: http://ec.europa.eu/employment_social/news/2004/nov/musculoskeletaldisorders_en.pdf

European Commission, *Recommendation concerning the European schedule of occupational diseases* , Brussels, 19 September 2003, available online at: http://ec.europa.eu/employment_social/news/2003/sep/occdis_recc_en.pdf

European Commission, *Second stage of consultation of the social partners on work-related musculoskeletal disorders* , Brussels, 29 March 2007, available online at: http://ec.europa.eu/employment_social/social_dialogue/docs/musculoskeletaldisorders2_en.pdf

European Construction Industry Federation (Fédération de l'Industrie Européenne de la Construction, FIEC), *FIEC position on the Commission's first-phase consultation of the social partners on musculoskeletal disorders at work* , 31 January 2005, available online at: http://www.fiec.org/Content/Default.asp?PageID=22 (click on 'Health and Safety' for the relevant listing)

European Federation of Food, Agriculture and Tourism Trade Unions (EFFAT) and Employers' Group of the Committee of Agricultural Organisations in the EU (GEOPA-COPA), *European agreement on the reduction of workers' exposure to the risk of work-related musculoskeletal disorders in agriculture* , Brussels, 2005, available online at: http://www.effat.org/files/2586934a0ee3b0c935b0f8b099583800_1149589232.pdf

European Federation of Food, Agriculture and Tourism Trade Unions (EFFAT) and Employers' Group of the Committee of Agricultural Organisations in the EU (GEOPA-COPA), *Second-stage consultation of social partners on work-related musculoskeletal disorders. Joint response from EFFAT and GEOPA-COPA* , Bucharest, 25 May 2007, available online at: http://www.effat.org/files/f2b47922b2b9bfec71659fb6d5df8129_1181576714.pdf

European Foundation for the Improvement of Living and Working Conditions, *Quality of work and employment in Europe. Issues and challenges* , Luxembourg, Office for Official Publications of the European Communities, 2002, available online at: http://www.eurofound.europa.eu/publications/htmlfiles/ef0212.htm

European Senior Labour Inspectors Committee (SLIC), *Manual handling of loads in Europe 2007 in transport and care* , Brussels, 2007, available online at: http://www.handlingloads.eu/pdf_files/en/en-slic-guide.pdf

European Trade Union Confederation (ETUC), *ETUC's response to proposals made in the second stage of the consultation with social partners on work-related musculoskeletal disorders* , Brussels, 3 May 2007, available online at: http://hesa.etui-rehs.org/uk/dossiers/files/TMSConsult-EN2.pdf

European Trade Union Confederation (ETUC), *First stage consultation with social partners on musculoskeletal disorders in the workplace: ETUC response* , Brussels, 15 March 2005, available online at: http://hesa.etui-rehs.org/uk/newsevents/files/ConsultTMScommR%C3%A9ponseCES-EN.pdf

Eurostat, *European Occupational Diseases Statistics (EODS)* , Population and social conditions 3/2000/E/No. 19, 2000, available online at: http://circa.europa.eu/Public/irc/dsis/hasaw/library?l=/occupational_statisstics/working_2000_methodo/_EN_1.0_&a=d

Eurostat, *European social statistics: Accidents at work and work-related health problems* , Luxembourg, Office for Official Publications of the European Communities, 2002, available online at: http://epp.eurostat.cec.eu.int/cache/ITY_OFFPUB/KS-BP-02-002-3A/EN/KS-BP-02-002-3A-EN.PDF

Fagan, C. and Burchell, B., European Foundation for the Improvement of Living and Working Conditions, *Gender, jobs and working conditions in the European Union* , Luxembourg, Office for Official Publications of the European Communities, 2002, available online at: http://www.eurofound.europa.eu/publications/htmlfiles/ef0249.htm

Goudswaard, A. and Andries, F., European Foundation for the Improvement of Living and Working Conditions, *Employment status and working conditions* , Luxembourg, Office for Official Publications of the European Communities, 2002, available online at: http://www.eurofound.europa.eu/publications/htmlfiles/ef0208.htm

Ha, C. and Roquelaure, Y., *Réseau expérimental de surveillance épidémiologique des troubles musculo-squelettiques dans les Pays de la Loire* , Institute for Health Surveillance (Institut de veille sanitaire, InVS), 2005, available online at: http://www.invs.sante.fr/publications/2007/protocole_tms_loire/protocole_tms_loire.pdf

Haines, H. and Wilson, J., *Development of a framework for participatory ergonomics* , Health and Safety Executive (HSE), London, Contract research report 174, 1998, available online at: http://www.hse.gov.uk/research/crr_pdf/1998/crr98174.pdf

Hall, P. and Soskice, D., *Varieties of capitalism: The institutional foundations of comparative advantage* , Oxford, Oxford University Press, 2001.

Hanson, M., Burton, K., Kendall, N., Lancaster, R. and Pilkington, A., *The costs and benefits of active case management and rehabilitation for musculoskeletal disorders* , Health and Safety Executive (HSE), London, Research report 493, 2006, available online at: http://www.hse.gov.uk/research/rrpdf/rr493.pdf

Hasle, P., *Work environment activities in SMEs – A review of the literature* , Department of Manufacturing, Engineering and Management, Technical University of Denmark, 2004, summary presentation available online at: http://www.ttl.fi/NR/rdonlyres/04A102F8-8165-44C3-B61B-350F20755D29/0/HasleMMVEnglish.pdf

Hasle, P., Hansen, N., and Moller, N., 'Agreements between labour unions and employers' associations as a strategy for the prevention of repetitive strain injury', *Economic and Industrial Democracy* , Vol. 25, No. 1, 2004.

Hermans, V., Verjans, M. and De Beeck, R., *Prevention of musculoskeletal disorders within the telecommunications sector* , Telecommunication sector European Social Dialogue working group, Brussels, 2005, available online at: http://www.msdonline.org/docs/pdf/III_Background_report.pdf

Hoogendoorn, W.E., van Poppel, M.N.M., Bongers, P.M., Koes, B.W. and Bouter, L.M., 'Systematic review of psychosocial factors at work and in the personal situation as risk for back pain', *Spine* , Vol. 25, No. 16, 2000.

Hubault, F., 'Articulations rigides pour coordinations souples? Le TMS comme syndrome de la crise du modèle taylorien de régulation', in Bourgeois, F. (ed.), *TMS et evolution des conditions de travail* , seminar report, Paris, 1998.

Juanico, R., European Foundation for the Improvement of Living and Working Conditions, *A review of working conditions in France* , Dublin, 2006, available online at:

http://www.eurofound.europa.eu/ewco/surveys/FR0603SR01/FR0603SR01.htm

Karasek, R. and Theorell, T., *Healthy work: Productivity and the reconstruction of working life* , New York, Basic Books, 1990.

Karjalainen, A. and Virtanen, S., *European statistics on occupational diseases – Evaluation of the 1995 pilot data* , European Commission, Eurostat, Population and social conditions 3/1999/E/No. 2, available online at: http://circa.europa.eu/Public/irc/dsis/hasaw/library?l=/eods_collection/workpap_fioh_en/_EN_1.0_&a=d

Kuorinka, I. et al, *Work-related musculoskeletal disorders (WMSDs): A reference book for prevention* , London, Taylor and Francis, 1995.

Labriola, M., *Work environment factors associated with long-term sickness absence and return to work* , PhD thesis, Institute of Public Health, University of Copenhagen, 2006, available online at: http://www.arbejdsmiljoforskning.dk/upload/mla_phd.pdf

Leclerc, A., Landre, M-F., Chastang, J-F. and Niedhammer, I., 'Age et troubles du membre supérieur dans le travail répétitif. Résultats issus de l'enquête nationale ANACT-INSERM', in *Travail, santé, vieillissement. Relations et évolutions* , Toulouse, Octarès, 2001.

Lorenz, E. and Valeyre, A., *Organisational change in Europe: National models or the diffusion of a new 'one best way'?* , Danish Research Unit for Industrial Dynamics (DRUID) Working Paper, No. 04-04, Aalborg University, 2004, available online at: http://www.druid.dk/wp/pdf_files/04-04.pdf

Lundberg, J., European Foundation for the Improvement of Living and Working Conditions, *Work-related disorders in Sweden* , Dublin, 2006, available online at: http://www.eurofound.europa.eu/ewco/surveys/SE0601SR01/SE0601SR01.htm

Malchaire, J., Cock, N., Karnas, G., Pirotte C., Bundervoet, J. and Dombrecht, J., *Organisational and psychosocial factors and the development of musculoskeletal disorders of the upper limbs. Final report* , Brussels, Belgian Science Policy (Politique scientifique fédérale/Federaal Wetenschapsbeleid), 2004, available online at: http://www.belspo.be/belspo/home/publ/pub_ostc/PS/rPS11_en.pdf

Math, A. and Meilland, C., European Industrial Relations Observatory (EIRO), European Foundation for the Improvement of Living and Working Conditions, *Family-related leave and industrial relations* , Dublin, 2004, available online at: http://www.eurofound.europa.eu/eiro/2004/03/study/tn0403101s.html

Molinié, A.F. and Volkoff, S., *Départs en retraite: Les deux facettes de la 'pénibilité' du travail* , Centre for Employment Studies (Centre d'études de l'emploi, CEE), 2003, available online at: http://www.cee-recherche.fr/fr/publicationspdf/4pages60.pdf

Oeij, P. and Wiezer, N., European Foundation for the Improvement of Living and Working Conditions, *New work organisation, working conditions and quality of work: Towards the flexible firm?* , Luxembourg, Office for Official Publications of the European Communities, 2002, available online at: http://www.eurofound.europa.eu/publications/htmlfiles/ef0274.htm

Organisation for Economic Cooperation and Development (OECD), *OECD Factbook 2007: Economic, Environmental and Social Statistics* , Paris, OECD, 2007, relevant extract available online at: http://ocde.p4.siteinternet.com/publications/doifiles/302007011P1T010.xls

Paoli, P., European Foundation for the Improvement of Living and Working Conditions, *First European Survey on the work environment 1991–1992* , Luxembourg, Office for Official Publications of the European Communities, 1992, available online at: http://www.eurofound.europa.eu/publications/htmlfiles/ef9211.htm

Paoli, P., European Foundation for the Improvement of Living and Working Conditions, *Second European Survey on Working Conditions in the European Union* , Luxembourg, Office for Official Publications of the European

Communities, 1997, available online at: http://www.eurofound.europa.eu/publications/htmlfiles/ef9726.htm

Paoli, P. and Merllié, D., European Foundation for the Improvement of Living and Working Conditions, *Third European Survey on Working Conditions* , Luxembourg, Office for Official Publications of the European Communities, 2000, available online at: http://www.eurofound.europa.eu/publications/htmlfiles/ef0121.htm

Parent-Thirion, A., Fernández Macías, E., Hurley, J. and Vermeylen, G., European Foundation for the Improvement of Living and Working Conditions, *Fourth European Working Conditions Survey* , Luxembourg, Office for Official Publications of the European Communities, 2007, available online at: http://www.eurofound.europa.eu/publications/htmlfiles/ef0698.htm

Parker, K.R. and Byron, J., *Work, health and safety in the UK oil industry* , Health and Safety Executive (HSE), London, Contract research report 314, 2000, available online at: http://www.hse.gov.uk/research/crr_htm/2000/crr00314.htm

Pedersen, H.S., Mahler, S. and Hansen, C.B., European Foundation for the Improvement of Living and Working Conditions, *Danish Work Environment Cohort Study, 2000 (DWECS)* , Dublin, 2003, available online at: http://www.eurofound.europa.eu/ewco/surveys/DK0312SR01/DK0312SR01.htm

Pezé, M., 'Approche psychosomatique et psychodynamiques des TMS. De l'usure mentale à la lésion musculo-squelettique', in *Santé et travail* , Vol. 35, 2002.

Putz-Anderson, V., *Cumulative trauma disorders: A manual for musculoskeletal diseases of the upper limbs* , London, Taylor and Francis, 1988.

Riihimäki, H., Kurppa, K., Karjalainen, A., Palo, L., Jolanki, R., Keskinen, H., Mäkinen, I., Saalo A. and Kauppinen T., *Occupational diseases in Finland in 2002* , Helsinki, Finnish Institute of Occupational Health (Työterveyslaitos, FIOH), 2004, available online at: http://www.occuphealth.fi/NR/rdonlyres/AF1A239E-A09D-47AB-9F69-16ED2B6D12ED/0/Occupational.pdf

Smulders, P., *A review and analysis of a selection of OSH monitoring systems* , European Agency for Safety and Health at Work, Luxembourg, Office for Official Publications of the European Communities, 2003, available online at: http://osha.europa.eu/publications/reports/406/2003-1180workingpaperweb_en.pdf

Streeck, W., 'National diversity, regime competition and institutional deadlock: Problems in forming a European industrial relations system', *Journal of Public Policy* , Vol. 12, 1992.

Svärd, E., Aringer, L., Baneryd, K., Frostberg, C. and Kemmlert, K., *Systematic work environment management and stress* , Solna, Swedish Work Environment Authority (Arbetsmiljöverket, AV), 2002, available online at: http://www.av.se/dokument/inenglish/books/h366eng.pdf

UK Health and Safety Executive (HSE), *Musculoskeletal disorders – summary* , London, 2007, available online at: http://www.hse.gov.uk/statistics/causdis/musc.htm

Valeyre, A., *Conditions de travail et santé au travail des salaries de L'Union Européenne: Des situations contrastées selon les formes d'organisation* , Centre for Employment Studies, Working Paper No. 73, 2006, available online at: http://www.cee-recherche.fr/fr/doctrav/travail_conditions_sante_europe_73.pdf

Vézina, N. et al, *Problèmes musculo-squelettiques et organisation modulaire du travail dans une usine de fabrication de bottes. Phase 2: Étude de l'implantation des recommandations* , Québec, Robert Sauvé Occupational Health and Safety Research Institute (Institut de recherche Robert-Sauvé en santé et en sécurité du travail, IRRST), 1998, available online at: http://www.irsst.qc.ca/files/documents/PubIRSST/R-345.pdf

Westgaard, R.H. and Winkel, J., 'Ergonomic intervention research for improved musculoskeletal health: A critical review', *International Journal of Industrial Ergonomics* , Vol. 20, 1997.

Annex 1: 1999 and 2007 LFS ad hoc module

1999 questions

Work-related health problems suffered during the last 12 months (apart from accidental injuries)			
216		Illness(es), disability(ies) or other physical or mental 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 work	(Col.24 = 1,2or 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
	00	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	
	9	Not applicable (Col.216 = 0, 9, blank)	
	blank	No answer	

218		Number of days off work during the last 12 months due to the most serious complaint caused or made worse by work	Col.216 = 1-8
	0	Less than one day or no time off	
	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 work again due to this illness	
	9	Not applicable (Col.214 = 0, 9, blank)	
	blank	No answer	
219		Job that caused or made worse the most serious complaint (code that first 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.214 = 0, 9, blank)	
	blank	No answer	

2007 questions

Work-related health problems suffered during the last 12 months (apart from accidental injuries)			

214		Illness(es), disability(ies) or other physical or mental 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 work	(Col.24 = 1,2or Col.84 = 1)
	0	None	
	1	One	
	2	Two or more	
	9	Not applicable (Col.24 = 3-9 and Col.84 #1)	
	blank	No answer	
215/216		Type of the most serious complaint caused or made worse by work	Col.214 = 1-2
	00	Bone, joint or muscle problem which mainly affects neck, shoulders, arms or hands	
	01	Bone, joint or muscle problem which mainly affects hips, legs or feet	
	02	Bone, joint or muscle problem which mainly affects back	
	03	Breathing or lung problem	
	04	Skin problem	
	05	Hearing problem	
	06	Stress, depression or anxiety	
	07	Headache and/or eyestrain	
	08	Heart disease or attack, or other problems in the circulatory system	
	09	Infectious disease (virus, bacteria or other type of infection)	
	10	Other types of complaint	
	99	Not applicable (Col.214 = 0, 9, blank)	
	blank	No answer	

217		Whether the most serious complaint caused or made worse by work limits the ability to carry out normal day to day activities either at work or outside work	Col. 214 = 1-2
	0	No	
	1	Yes, to some extent	
	2	Yes, considerably	
	9	Not applicable (Col.214 = 0, 9, blank)	
	blank	No answer	
218/219		Number of days off work during the last 12 months due to the most serious complaint caused or made worse by work	Col.214 = 1-2
	00	The person has not been working during the past 12 months, but for reasons not related to the complaint caused or made worse by work (e.g. normal retirement)	
	01	Expects never to work again due to this illness	
	02	Less than one day or no time off	
	03	At least one day but less than four days	
	04	At least four days but less than two weeks	
	05	At least two weeks but less than one month	
	06	At least one month but less than three months	
	07	At least three months but less than six months	
	08	At least six months but less than nine months	
	09	At least nine months	
	99	Not applicable (Col.214 = 0, 9, blank)	
	blank	No answer	
		Factors at work that can	

		adversely affect mental well-being or physical health	
221		Whether at the workplace the person has particular exposure to selected factors that can adversely affect his/her mental well-being	Col.24 = 1,2
	0	No	
	1	Yes, mainly to harassment or bullying	
	2	Yes, mainly to violence or threat of violence	
	3	Yes, mainly to time pressure or overload of work	
	9	Not applicable (Col 24 = 3-9)	
	blank	No answer	
222		Whether at the workplace the person has particular exposure to selected factors that can adversely affect his/her physical health	Col.24 = 1,2
	0	No	
	1	Yes, mainly to chemicals, dusts, fumes, smoke or gases	
	2	Yes, mainly to noise or vibration	
	3	Yes, mainly to difficult work postures, work movements or handling of heavy loads	
	4	Yes, mainly to risk of accident	
	9	Not applicable (Col 24 = 3-9)	
	blank	No answer	

Annex 2: Development of MSD-related questions in EWCS

Second EWCS

Q14 How often are you exposed at work to each of the following? (all of the time, almost all of the time, around 3/4 of the time, around half of the time, around 1/4 of the time, almost never, never, don't know)

- Vibrations from hand tools, machinery, etc.
- Noise so loud that you would have to raise your voice to talk to people
- High temperature which makes you perspire even when not working
- Low temperatures whether indoors or outdoors
- Breathing in vapours, fumes, dust, or dangerous substances such as chemicals, infectious materials etc.
- Handling or touching dangerous products or substances
- Radiation such as X-rays, radioactive radiation, welding light, laser beams

Q15 How often does your main paid job involve each of the following? (all of the time, almost all of the time, around 3/4 of the time, around half of the time, around 1/4 of the time, almost never, never, don't know)

- Painful or tiring positions
- Carrying or moving heavy loads
- Short repetitive tasks of less than 10 minutes
- Repetitive hand or arm movements
- Wearing personal protective equipment
- Working with computers: PCs, network, mainframe
- Working at very high speed
- Working to tight deadlines
- Dealing directly with people who are not employees at your workplace such as customers, passengers, pupils, patients etc.
- Working at home

Q34 Does your work affect your health, or not? (IF YES) **How does it affect your health?**

- No, it does not affect my health
- Yes, ear problems
- Yes, eye problems
- Yes, skin problems
- Yes, backache
- Yes, headaches
- Yes, stomach ache
- Yes, muscular pain in arms or legs
- Yes, respiratory difficulties
- Yes, stress
- Yes, overall fatigue
- Yes, sleeping problems
- Yes, allergies
- Yes, heart disease
- Yes, anxiety
- Yes, irritability
- Yes, personal problems
- Other (spontaneous)
- My work improves my health (spontaneous)
- Don't know

Third EWCS

Q11 Please tell me, using the following scale, are you exposed at work to …? (all of the time, almost all the time, around half of the time, around 1/4 of the time, almost never, never, don't know, refusal)

1. Vibrations from hand tools, machinery, etc.
2. Noise so loud that you would have to raise your voice to talk to people
3. High temperatures which make you perspire even when not working
4. Low temperatures whether indoors or outdoors

5. Breathing in vapours, fumes, dust, or dangerous substances such as: chemicals, infectious materials etc.
6. Handling or touching dangerous products or substances
7. Radiation such as X-rays, radioactive radiation, welding light, laser beams

Q12 Please tell me, using the following scale, does your main paid job involve …? (all of the time, almost all the time, around half of the time, around 1/4 of the time, almost never, never, don't know, refusal)

1. Painful or tiring positions
2. Carrying or moving heavy loads
3. Repetitive hand or arm movements
4. Working with computers: PCs, network, mainframe
5. Teleworking from home with a PC
6. Working at home (home being your normal workplace), excluding teleworking
7. Dealing directly with people who are not employees at your workplace such as customers, passengers, pupils, patients etc
8. Wearing personal protective equipment

Q34 Do you think your health or safety is at risk because of your work?

1. Yes
2. No
3. Don't know/no opinion (spontaneous)

Q35 Does your work affect your health, or not? (IF YES) **How does it affect your health?** (SHOW CARD 'Q35' – READ OUT – SEVERAL ANSWERS POSSIBLE)

No, it does not affect my health 219 1

Yes, hearing problems 2

Yes, problems with my vision 3

Yes, skin problems 4

Yes, backache 5

Yes, headaches 6

Yes, stomach ache 7

Yes, muscular pains in shoulders and neck 8

Yes, muscular pains in upper limbs 9

Yes, muscular pains in lower limbs. 10

Yes, respiratory difficulties 11

Yes, heart disease 12

Yes, injury 13

Yes, stress 14

Yes, overall fatigue 15

Yes, sleeping problems 16

Yes, allergies 17

Yes, anxiety 18

Yes, irritability 19

Yes, trauma 20

Other **(** spontaneous**)** 21

My work improves my health **(** spontaneous**)** 22

Don't know . . . . . .

Fourth EWCS

Q10 Please tell me, using the following scale, are you exposed at work to …? (all of the time, almost all the time, around half of the time, around 1/4 of the time, almost never, never, don't know, refusal)

A - Vibrations from hand tools, machinery etc.

B - Noise so loud that you would have to raise your voice to talk to people

C - High temperatures which make you perspire even when not working

D - Low temperatures whether indoors or outdoors

E - Breathing in smoke, fumes (such as welding or exhaust fumes), powder or dust (such as wood dust or mineral dust) etc. **(MODIFIED)**

F - Breathing in vapours such as solvents and thinners **(NEW)**

G - Handling or being in skin contact with chemical products or substances **(MODIFIED)**

H - Radiation such as X-rays, radioactive radiation, welding light, laser beams

I - Tobacco smoke from other people **(NEW)**

J - Handling or being in direct contact with materials which can be infectious, such as waste, bodily fluids, laboratory materials etc **(NEW)**

Q11 Please tell me, using the same scale, does your main paid job involve …? (all of the time, almost all the time, around half of the time, around 1/4 of the time, almost never, never, don't know, refusal)

A - Tiring or painful positions

B - Lifting or moving people **(NEW)**

C - Carrying or moving heavy loads

D - Standing or walking **(NEW)**

E - Repetitive hand or arm movements

F - Working at company/organisation premises

G - Teleworking from home with a PC

H - Working at home, excluding telework

I - Working in places other than home or company/organisation premises, e.g. client's premises, on the road

J - Dealing directly with people who are not employees at your workplace such as customers, passengers, pupils, patients, etc.

K - Working with computers: PCs, network, mainframe

L - Using internet/email for professional purposes **(NEW)**

M - Wearing personal protective clothing or equipment

Q32 Do you think your health or safety is at risk because of your work?

1 - Yes

2 - No

8 - Don't know/no opinion (spontaneous)

9 - Refusal (spontaneous)

Q33 Does your work affect your health, or not?

1 - Yes ---------- > **CONTINUE WITH Q33a**

2 - No ---------- > **GO TO Q34a**

8 - Don't know/no opinion (spontaneous) ---------- > **GO TO Q34a**

9 - Refusal (spontaneous) ---------- > **GO TO Q34a**

Q33a How does it affect your health? (SHOW CARD Q33a – READ OUT – MULTIPLE ANSWERS POSSIBLE)

A - Hearing problems (mentioned / not mentioned / don't know / refusal)

B - Problems with your vision (mentioned / not mentioned / don't know / refusal)

C - Skin problems (mentioned / not mentioned / don't know / refusal)

D - Backache (mentioned / not mentioned / don't know / refusal)

E - Headaches (mentioned / not mentioned / don't know / refusal)

F - Stomach ache (mentioned / not mentioned / don't know / refusal)

G - Muscular pains in shoulders, neck and/or upper/lower limbs (mentioned / not mentioned / don't know / refusal)

H - Respiratory difficulties (mentioned / not mentioned / don’t know / refusal)

I - Heart disease (mentioned / not mentioned / don’t know / refusal)

J - Injury(ies) (mentioned / not mentioned / don’t know / refusal)

K - Stress (mentioned / not mentioned / don’t know / refusal)

L - Overall fatigue (mentioned / not mentioned / don’t know / refusal)

M - Sleeping problems (mentioned / not mentioned / don’t know / refusal)

N - Allergies (mentioned / not mentioned / don’t know / refusal)

O - Anxiety (mentioned / not mentioned / don’t know / refusal)

P - Irritability (mentioned / not mentioned / don’t know / refusal)

Q - Other (spontaneous) (mentioned / not mentioned / don’t know / refusal)

Annex 3: Development of MSD-related questions in national surveys on working conditions

Austria

Microzensus, 1994

Are you currently suffering from one of the following diseases, impairments or disorders? Please name up to three diseases, impairments or disorders from this list.

.....

- Defects of the spine
- Signs of wear and tear of joints, arthritis

.....

Bulgaria

Working conditions survey, 2001 and 2005

Does your job affect your health?

- Yes, backache
- Yes, muscular pain in shoulders and neck
- Yes, muscular pain in upper limbs
- Yes, muscular pain in lower limbs

(items referring to MSDs)

Czech Republic

Working conditions survey 2000

Q34 Do you think that the work exposes you to risks threatening your health and safety? (yes, no, don’t know)

Filter: Q35 can be answered only by those who answered YES to Q34.

Q35 If you are exposed to work-related risks, what kind of effect does this risk pose to your health?Response options: 1 to 23, the same as Working conditions survey 2001 below.

Working conditions survey 2001

Q30 Do you think your health or safety is at risk because of your work, or not? (yes, no, don't know)

Q31 Does your work affect your health, or not? (IF YES) How does it affect your health?

1. No, it does not affect my health

2. Yes, hearing problems

3. Yes, problems with vision

4. Yes, skin problems

5. Yes, backache*

6. Yes, headaches

7. Yes, stomach ache

8. Yes, muscular pains in shoulders and neck*

9. Yes, muscular pains in upper limbs*

10. Yes, muscular pains in lower limbs*

11. Yes, respiratory difficulties

12. Yes, heart disease

13. Yes, injury

14. Yes, stress

15. Yes, overall fatigue

16. Yes, sleeping problems

17. Yes, allergies

18. Yes, anxiety

19. Yes, irritability

20. Yes, trauma

21. Other (spontaneous)

22. My work improves my health (spontaneous)

23. Don’t know

* The options in bold text pertain to MSDs.

Denmark

DWECS 2000

Some 22 questions in the DWECS 2000 concern musculoskeletal disorders. The three different numbers before each question indicate the number for the question in the three different questionnaires applied for unemployed persons (A), employees (B) and self-employed persons (C) respectively.

A77/B160/C157: How many days have you been troubled by pain or discomfort in the neck within the last 12 months? (0 days, 1–7 days, 8–30 days, more than 30 days, every day)

A78/B161/C158: Please state the degree of pain or discomfort in the neck on a scale from 0 to 9, where 0 is not at all troubled and 9 is worst possible pain. What has your trouble been within the last 3 months on average? (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)

A79/B162/C159: Have you had trouble in the neck within the last 7 days? (Yes, No)

A80/B163/C160: How many days have you been troubled by pain or discomfort in your left hand/wrist within the last 12 months? (0 days, 1–7 days, 8–30 days, more than 30 days, every day)

A81/B164/C161: Please state the degree of pain or discomfort in the left hand/wrist on a scale from 0 to 9, where 0 is not at all troubled and 9 is worst possible pain. What has your trouble been within the last 3 months on average? (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)

A82/B165/C162: Have you had trouble in the left hand/wrist within the last 7 days? (Yes, No)

A83/B166/C163: How many days have you been troubled by pain or discomfort in your right hand/wrist within the last 12 months? (0 days, 1–7 days, 8–30 days, more than 30 days, every day)

A84/B167/C164: Please state the degree of pain or discomfort in the right hand/wrist on a scale from 0 to 9, where 0 is not at all troubled and 9 is worst possible pain. What has your trouble been within the last 3 months on average? (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)

A85/B168/C165: Have you had trouble in the right hand/wrist within the last 7 days? (Yes, No)

A86/B169/C166: How many days have you been troubled by pain or discomfort in your left shoulder within the last 12 months? (0 days, 1–7 days, 8–30 days, more than 30 days, every day)

A87/B170C167: Please state the degree of pain or discomfort in the left shoulder on a scale from 0 to 9, where 0 is not at all troubled and 9 is worst possible pain. What has your trouble been within the last 3 months on average? (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)

A88/B171/C168: Have you had trouble in the left shoulder within the last 7 days? (Yes, No)

A89/B172C169: How many days have you been troubled by pain or discomfort in your right shoulder within the last 12 months? (0 days, 1–7 days, 8–30 days, more than 30 days, every day)

A90/B173/C170: Please state the degree of pain or discomfort in the right shoulder on a scale from 0 to 9, where 0 is not at all troubled and 9 is worst possible pain. What has your trouble been within the last 3 months on average? (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)

A91/B174/C171: Have you had trouble in the right shoulder within the last 7 days? (Yes, No)

A92/B175C172: How many days have you been troubled by pain or discomfort in your lower back within the last 12 months? (0 days, 1–7 days, 8–30 days, more than 30 days, every day)

A93/B176/C173: Please state the degree of pain or discomfort in the lower back on a scale from 0 to 9, where 0 is not at all troubled and 9 is worst possible pain. What has your trouble been within the last 3 months on average? (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)

A94/B177/C174: Have you had trouble in the lower back within the last 7 days? (Yes, No)

A95/B178/C175: How many days have you been troubled by pain or discomfort in one or both knees within the last 12 months? (0 days, 1–7 days, 8–30 days, more than 30 days, every day)

A96/B179/C176: Please state the degree of pain or discomfort in one or both knees on a scale from 0 to 9, where 0 is not at all troubled and 9 is worst possible pain. What has your trouble been within the last 3 months on average? (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)

A97/B180/C177: Have you had trouble in one or both knees within the last 7 days? (Yes, No)

A98/B181/C178: Have you ever, after an accident either in or outside work, been exposed to injuries of a longer duration in the head, neck, shoulders, hands, lower back or knees that you still suffer from today? (a. Yes, in the head, b. Yes, in the neck, c. Yes, in the left shoulder, d. Yes, in the right shoulder, e. Yes, in the left hand/wrist, f. Yes, in the right hand/wrist, g. Yes, in the lower back, h. Yes, in the knees, i. No)

Finland

QWLS 1977, 1984, 1990, 1997 and 2003

E10. Do you suffer from recurrent ache or pain in the (Yes, No):

A. Neck, cervical spine or shoulders?

B. Hands or arms?

C. Lumbar region?

D. Legs, including hips?

Germany

BIBB/IAB survey 1998/99

Question: F227

On this list, health problems are listed. Please tell me by which of these you are often concerned during or immediately after work?

- pain in lower back
- pain in neck or shoulder
- pain in arms and hands
- pain in knees
- pain in legs, feet, swollen legs

(items referring to MSDs)

German Socio-Economic Panel (GSOEP), specific module on working conditions in 2001

Do you work with a computer screen to an extent which is unhealthy?

Ad-hoc survey 'Was is Gute Arbeit?' (What is good work?)

Question G2: In the following, a number of health problems and symptoms are listed. Please tell us all problems and symptoms that frequently appear on working days.

- pain in the lower back
- pain in the neck, shoulder
- feelings of paralysis or pain in arms/hands
- feelings of paralysis or pain in legs/feet

Netherlands

Living Conditions Survey/POLS

In the past 12 months did you have one or more complaints caused by physical load in your work, such as pain in the neck, shoulders, hands or arms? (No, Yes)

In the past 12 months did you have one or more complaints such as pain in the neck, shoulders, arms or hands caused by driving a truck, fork-lift truck and/or working with vibrating tools? (No, Yes)

In the past 12 months did you have a persistent back disorder (longer than 3 months) or slipped disc? (No, Yes)

NEA

In the last three months did you feel in your neck, shoulders, arms, wrists, hands and/or fingers:

- An uncomfortable feeling
- An awkward feeling
- A tingling feeling
- A burning sensation
- ……etc. (a total of 12 possible RSI symptoms)

Answer categories: always (1 point), often (2), sometimes (3), never (4).

What was the reason for your last leave of absence?

- Back complaints
- Complaints of the neck, shoulders, arms, wrists, hands
- Complaints of the hip, legs, knees, feet
- ……..(other reasons)

Do you have the impression that these complaints were related to the work you performed?

- Yes, predominantly caused by my work
- Yes, partly caused by my work
- No, not caused by my work
- Don't know

TAS

In the past 12 months, have you had regular (multiple times, but of short duration each time) or long lasting (one or more times) inconvenience (pain, discomfort) in your 1) neck, 2) shoulders, 3) arms/elbows and/or 4) wrists/hands? For each body region, possible answers were: 'no, never', 'a single time, but of short duration', 'a single time, of long duration', 'multiple times, but of short duration each time'.

Were these complaints partly or totally caused by work? Possible answers: 'not applicable, had no complaints' or

'had complaints but they were not caused by work' or 'had complaints that were totally or partly caused by work'.

Norway

Living conditions survey – Work environment survey 1996

1. Have you during the last month been i) immensely affected, ii) quite affected, iii) little affected, iv) not affected from pain in the neck or upper part of the back? (IF YES) Is this totally or partly caused by your present work?
2. Have you during the last month been i) immensely affected, ii) quite affected, iii) little affected, iv) not affected from pain in the lower part of the back? (IF YES) Is this totally or partly caused by your present work?
3. Have you during the last month been i) immensely affected, ii) quite affected, iii) little affected, iv) not affected from pain in the shoulders or arms? (IF YES) Is this totally or partly caused by your present work?
4. Have you during the last month been i) immensely affected, ii) quite affected, iii) little affected, iv) not affected from pain in the wrist or hands? (IF YES) Is this totally or partly caused by your present work?

Living conditions survey – Work environment survey 2006

1. Have you during the last month been i) immensely affected, ii) quite affected, iii) little affected, iv) not affected from pain in the lumbar region or lower back? (IF YES) Is this totally or partly caused by your present work?
2. Have you during the last month been i) immensely affected, ii) quite affected, iii) little affected, iv) not affected by pain in the neck, shoulder or upper back? (IF YES) Is this totally or partly caused by your present work?
3. Have you during the last month been i) immensely affected, ii) quite affected, iii) little affected, iv) not affected by pain in arms, wrist, or hands? (IF YES) Is this totally or partly caused by your present work?
4. Have you during the last month been i) immensely affected, ii) quite affected, iii) little affected, iv) not affected by pain in the hips, legs, knees or feet? (IF YES) Is this totally or partly caused by your present work?

Portugal

Working conditions survey

Group 7, Q8 – Do you have any occupational disease? (Yes: What disease? / No)

Q9 – Regarding that disease, what was its main cause? (Insufficient or inadequate safety conditions / Technical failure / Distraction / Fatigue / Stress / Other cause. What?)

Q10 – How long were you absent from work? (Not absent / Less than three days / Four to 30 days / More than 30 days)

Q11 – That same disease provoked: (No incapacity / Temporary partial incapacity / Temporary total incapacity / Permanent total incapacity regarding the occupation carried out up to then)

Q12 – Do you have special working conditions as a consequence of that disease? (Yes / No)

Q13 – Did you/Do you receive any allowance or compensation as a consequence of that disease? (Yes / No)

Spain

Fifth National Survey on Working Conditions 2003

Employee questionnaire: Q32 Indicate the three main parts of your body where you feel a slight pain which you think may be due to 'body postures' or 'work-related efforts': 1) Neck/back of the neck; 2) Shoulder(s); 3) Arm(s)/forearm(s); 4) Elbow(s); 5) Hand(s)/wrist(s); 6) Upper back; 7) Lower back; 8) Buttock(s)/hip(s); 9) Thigh(s), 10) Knees; 11) Legs; 12) Feet/ankles; 13) Other. Please specify.

Employee questionnaire: Q90 Which was the disease or pain that prompted you to request a medical consultation? (30 possible answers, of which the following seven are related to MSDs: 1) Neck pain; 2) Backache; 3) Lumbar disc disease; 4) Upper limb pain: shoulder, arm, elbow, forearm (excluding wrist or hand); 5) Hand or wrist pain; 6) Lower limb pain: hip, thigh, knee, leg, ankle, foot; 7) Sprain, dislocation, fracture and muscular rupture)

Employee questionnaire: Q85 Have you been diagnosed as having an occupational disease in the last two years, or are you currently in a clinical examination process? If so, which of the following diseases did/do you suffer from? (Eight possible answers, one of them being: **'** Bones, muscular or articular disease')

Sweden

Work Environment survey, 2003

First a few questions about how you feel after work at this time of year.

1) After work, do you experience pain in any of the following places:

- upper parts of your back or neck?
- lower part of your back?
- shoulders or arms?
- wrists or hands?
- hips, legs, knees or feet?

UK

SWI 2001/2002, 2003/2004 and 2004/2005

During the past 12 month period, have you suffered from any illness, disability or other physical or mental problem that was caused or made worse by your job or work done in the past? (1. Yes 2. No 3. Don't know)

How many illnesses have you had (in the last 12 months) that have been caused or been made worse by your work? (Enter a numeric value between 1 and 8)

(If one illness reported) When were you first aware of this illness? (1. Within the last 12 months 2. More than one year ago)

(If more than one illness reported) When were you first aware of the most serious of these illnesses? (1. Within the last 12 months 2. More than one year ago)

How would you describe this illness? (if one illness is reported)

How would you describe the most serious of these illnesses? (if more than one illness reported)

1. Bone, joint or muscle problems which mainly affect (or is mainly connected with) arms, hands, neck or shoulder
2. Bone, joint or muscle problems which mainly affect (or is mainly connected with) hips, legs or feet
3. Bone, joint or muscle problems which mainly affect (or is mainly connected with) back
4. Breathing or lung problems
5. Skin problems, disease (virus, bacteria)
6. Hearing problems
7. Stress, depression or anxiety
8. Headache and/or eyestrain
9. Heart disease/attack, other circulatory system problem
10. Infectious diseases (virus, bacteria)
11. Other

Annex 4: Country codes and abbreviations

Country codes

Countrycode
AT
BG
BE
CY
CZ
DE
DK
EE
EL
ES
FI
FR
HU
IE
IT
LT
LU
LV
MT
NL
NO
PL
PT
RO
SE
SI
SK
UK

Abbreviations frequently used

BIBB/IAB – Bundesinstitut für Berufsbildung/Institut für Arbeitsmarkt- und Berufsforschung (Federal Institute for Vocational Training/Institute for Labour Market and Employment Research), Germany

CTD – Cumulative trauma disorder

DWECS – Danish Work Environment Cohort Study

EIRO – European Industrial Relations Observatory

ENCT – Encuesta Nacional de Condiciones de Trabajo (National Working Conditions Survey), Spain

EODS – European Occupational Diseases Statistics

EU15 – 15 EU Member States before May 2004 (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the UK)

EU27 – 27 EU Member States, comprising the EU15 and NMS (see below)

EWCO – European Working Conditions Observatory

EWCS – European Working Conditions Survey

FIOH – Finnish Institute of Occupational Health

HSE – Health and Safety Executive, UK

ICT – Information and communication technology

IIS – Industrial Injuries Scheme, UK

INQA – Initiative Neue Qualitaet der Arbeit (New Quality of Work Initiative), Germany

InVS – Institut de veille sanitaire (Institute for Health Surveillance), France

LFS – Labour Force Survey

MOSS/OPRA – Musculoskeletal Occupational Surveillance Scheme/Occupational Physicians Reporting Activity, UK

MSD – Musculoskeletal disorder/disease

NEA – Nationale Enquête Arbeidsomstandigheden (National Working Conditions Survey), Netherlands

NMS – New Member States, 10 of which joined the EU in May 2004 (Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia); Bulgaria and Romania joined in January 2007

OSHA – European Agency for Safety and Health at Work

POLS – Periodiek Onderzoek Leefsituatie (Permanent Quality of Life Survey), Netherlands

PPE – Personal protective equipment

QWLS – Quality of Work Life Survey, Finland

RSI – Repetitive strain injury

SMEs – Small and medium-sized enterprises

SWI – Self-reported work-related illness, UK

TAS – TNO Arbeidssituatie Survey (TNO Working Situation Survey), Netherlands

THOR – The Health and Occupation Reporting (THOR) network, UK

WRD – Work-related disease

EF/07/86