

Musculoskeletal disorders

An ill-understood “pandemic”

Roland Gauthy

Researcher,

ETUI-REHS, Health and Safety Department

Contents

Preface	4
1. MSDs: Europe's main work-related health problem	7
Lower extremity problems, a disregarded medical condition	9
2. Description and causes	12
What are MSDs?	12
Is each type of MSD confined to a single body area?	12
A descriptive approach to MSDs	15
Probable risk factors or causes	17
The most exposed workers by sector and anatomical site	21
3. Human, economic and societal impacts	23
Human impacts	23
Impacts on workers' working life	24
Economic impacts	25
4. European legislative instruments	29
The existing legislative framework	30
The European preventive model	31
The modern ergonomic approach	31
Focus on primary prevention	32
5. Possibilities for a trade union action plan to combat MSDs	35
Concerted action on the causes by all participants	35
What works	36
Essential trade union action	39
6. Conclusions	42

Bibliography	45
Appendices	49
1. MSDs typified by anatomical structure or type of injury	49
2. ETUC's response to proposals made in the second stage of the consultation with social partners on work-related musculoskeletal disorders	50

Preface

Recent assessments, especially those made by the Dublin Foundation for the Improvement of Living and Working Conditions in its fourth report, all concur that musculoskeletal disorders (MSDs) are still the biggest concern for European workers.

It is as if nigh-on 20 years of action (legislation, guidance, statistics, etc.) and resource allocation (to training, awareness-building campaigns, etc.) has had not the slightest effect. Being ineffective or unsuitable, they represent a grotesque squandering of resources. Squandered not only because the instruments and means have been proven not to work, but especially because of the collateral costs that spending on them has generated.

Let there be no mistake about these wider costs: the main and biggest costs inevitably associated with MSD are not to be reckoned in cash terms! We mean the human costs in the form of suffering and functional impairments, like joint or muscle pain with every movement, or an inability to bend the knees, back or wrists.

These work-related pains and disabilities have untold effects on the movements and postures of everyday life – housework, DIY, walking to the shops, getting treatment for rheumatic pain, etc. While most of these disorders have their origin at work – repeating the same movements and postures, the same efforts, the same physical and mental loads 40 hours a week, week after week – their ramifications stretch beyond the workplace. Work then permeates “non-work” life through shooting pains and functional disability that seriously downgrade workers’ quality of life. It is these individual and resulting societal repercussions that are the main passed-on cost of work-related MSDs.

Individual first, because of the pain it means when performing tasks whose harmful effects are compounded by the burden of an ageing body and the impairment built up over years of gruelling work. Difficulty in working, or complete or partial work invalidity, also results in a loss of income and skills not maintained at “peak level” in an increasingly competitive world. And finally, because the price of pain with every movement is increased by the cost of care and rehabilitation to be paid out of dwindling incomes.

But societal, too, because these “MSD cases” are a burden on Europe’s care units (surgery, radiology, orthopaedics, rehabilitation) that are already overstretched by less avoidable and more accidental ordinary medical problems, and disastrously under-resourced, as is seen from the need to “import” healthcare workers to make up staff shortages! The huge amounts of workers affected by MSD are leaving social welfare systems with an astronomical drugs bill. Also, the lost productivity they create seriously undermines the business contribution to social well-being. On top of this are the costs unfairly socialised by rogue firms and organisations that destroy workers’ health and shift the burden onto society at large, including other organisations and firms that care more about people, rules and good practice in health and safety at work.

And yet the causal links of work-related MSD are well-established and extensively reported in a body of scientific literature that forms an unequalled store of knowledge. Despite this, there are still those who confidently intone or argue from self-interest that the cause-effect relations are too flimsy...

So widespread is the consensus of risk analysis statements clearly reporting that repetitive movements, heavy loads, movements in extreme reach distances, vibrations and protracted postures promote the development of MSD that the link between these risk factors and MSD is now taken as read.

And the result of all this scientific evidence, sufferers’ painful experiences, trade union efforts, legislation and sound common sense is that – nothing has happened and the MSD “pandemic” * is spreading. What has gone wrong?

Is it because the law is taken as just empty words to be flouted at will? That certainly, but also because MSDs are seen as an inevitable part of the job and man’s nature as “the tottering biped”, and so fated like 80% of his kind to suffer at least one episode of low back pain in his life.

There is no question that MSDs are also connected with working patterns which, leaving biomechanical factors aside, create muscle tension even where work is neither excessively painful nor repetitive. They are therefore tied into the other forms of cognitive, sensory and psychosocial load that restrict job control and as stressors elicit the release of chemical mediators of muscle, vascular and nervous tension. These tensions in turn are experienced as sharp pains in the back, shoulder blades and elsewhere.

MSDs reflect lifestyle changes that work small skeletal muscle groups intensely while the rest of the body is virtually static. And our hyper-mechanised and -automated world where all resources are piped directly to home over intelligent networks leaves little or no scope for our bodies to move: recreational physical effort (walking, sport or physical exercise) no longer fits into that world in which the seasonal and circadian rhythms so vital to recharging the batteries of both body and mind are a thing of the past.

* Although MSDs are not caused by a pathogen as commonly understood, the term **pandemic** is used advisedly because some risk factors do act as clearly-identified pathogens and their consistent involvement in the development of MSDs has been extensively reported.

European society, its representatives, workers and employers generally have so far largely failed to prevent MSDs. The situation can be likened to climate change, where the magnitude of what is happening is only now dawning on us. Musculoskeletal systems are overheating: time is running out to take care and start over from scratch to come up with new, sustainable, more imaginative approaches to human work. Approaches that take account of the inherent value of the human capital for which trade unions fight, and the need to take the care of it that an extraordinarily sophisticated, complicated and delicate machine deserves. Respect, ethics and imagination must drive this discussion without which many of our society's established gains could be thrown into question for want of "fighters" still able or simply wanting to act because they are well aware of the complete mismatch between what is on offer and current technical and economic developments.

Marc Sapir

Director of the Health and Safety Department, ETUI-REHS

1. MSDs: Europe's main work-related health problem

The history of musculoskeletal disorders (MSDs), like that of human health, goes back to the dawn of time. When the human body is set to work, the musculoskeletal system is immediately in play with the work environment. The hands, feet, upper and lower extremities and back make movements and exert forces that either act on production machinery and equipment, or enable the individual to move, grasp, displace and modify objects by applying stresses to them. These human interventions on the work environment modify it and generate added value. The inevitable price to be paid for these benefits is the toll taken on joints, muscles and tendons by exposing the body to the different sources of risk intrinsic in that environment.

Human health is still today seen as a liability whose costs need to be capped in the highest-income societies. But health economists who have studied the economic contribution of health for the European Commission have discovered convincing evidence of the significant benefits that could be achieved by health improvements¹:

- health is seen as a key determinant of economic development;
- the potential contribution of health to the economy has received less attention in high-income countries which see health promotion and health care delivery as costs to be contained;
- there is a sound theoretical and empirical basis to the argument that human capital contributes to economic growth, because health and wealth are mutually reinforcing;
- this question ties in with the Lisbon agenda because greater investment in human capital helps make the European economy more competitive.

Working conditions are decisive for public health, and improved during the 20th century. This, the study argues, was also favourable to the EU economy. Unfortunately, the concurring evidence of several recent surveys points to sharp reversal in this trend.

Physically gruelling work has not gone away: building, farming, fishing, the footwear, clothing and hospitality industries are among the biggest primary contributors to the perpetuation of physically demanding work.

¹ Suhrcke, M., et al., *The contribution of health to the economy in the European Union*, European Communities 2005.

The growth of the feelgood society and environmental consciousness have created new physically gruelling tasks which, as Philippe Askenazy points out, “requires men and women to hunt out and manually correct our selective sorting mistakes on a steady stream of household waste”².

Contingent employment has spread alongside new forms of work organisation based on just-in-time, lean and zero defect production, and continuous performance monitoring. The 24/7 workweek achieved through more variable and more frequent breaks and split day working, with no real alternation between work and rest, undermine the necessary work-life balance. New forms of more insecure or more non-standard employment contracts, the reduction of individual job control through a simultaneous increase in physical and cognitive demands³, and the increase in more exposed jobs are adding to the casualisation of a steadily growing share of the working population.

The findings of the Dublin Foundation’s fourth five-year survey of working conditions confirm that MSDs are still the main health complaint of European workers⁴. Backache tops the list (24.7%), followed by muscle pains (22.8%), fatigue (22.6%) and stress (22.3%). Investigation of these complaints can no longer focus on biomechanical factors alone, but must also embrace work organisation issues. The European survey reveals that work intensity is on the rise in Europe: it affected 43% of workers in 2005 (EU-27) and where it was measured in 1991 (EU-12), it is rising sharply across the board.

The share of European workers employed in traditional sectors (industrial production, agriculture) may be shrinking, but some physical risks remain and are even slightly more prevalent. The shift towards a service economy has not been a magic bullet, as the following figures illustrate: 62% of European workers are exposed to repetitive arm or hand movements for 25% or more of their working time, and close to 50% work in painful or tiring positions for at least 25% of their working time. The situation is even worse in the new EU Member States: 77% of Romanian workers, for example, report carrying out repetitive movements and arm movements for at least 25% of their working time.

In France, the European data are backed up by the 2002-2003 Sumer survey among 50 000 employees. It found that 48% of workers were affected during their work by at least one postural or joint constraint that could be considered “painful”⁵. Two-thirds of manual workers are affected versus “just” 20% of managerial staff.

Postural or joint constraints add to the physical hardship of work and lead to premature wear and ageing as well as illnesses. Many workers have to stop working before career-end. So, 27% of French employees aged 50-59 dropped out of the labour market early, while 42% of unemployed older people suffer ill-health that limits their working capacity. When the limiting health conditions behind exclusion from paid work are considered, the linkage with MSDs becomes clear. Among manual, non-manual and self-employed workers, three-quarters of the limiting conditions are limb or back problems, a figure that “falls” to 58% among professionals and associate professionals.

² Askenazy, P., Santé au travail : l’impact des nouvelles formes de pénibilité, *Le Monde*, 20 December 2005.

³ Philippe Askenazy cites the example of check-out operators who handle tons of purchases each day but also have to “locate the position of thousands of barcodes, the scanner, answer questions, anticipate payment methods, etc.”. Askenazy, *ibid.*

⁴ Fourth European Working Conditions Survey, Dublin, European Foundation for the Improvement of Living and Working Conditions, 2007, 139 p. Downloadable free from www.eurofound.europa.eu > EWCO > Surveys.

⁵ Contraintes posturales et articulaires au travail, *Premières Synthèses Informations*, DARES, March 2006, No. 11.2., 6 p. Downloadable free from www.travail.gouv.fr/IMG/pdf/2006.03_11.2.pdf.

Figures from Sweden bear out that career-end workers pay for the physical effort of doing much more physically laborious work in their youth. Table 1 shows that young people (age 19-29) are more exposed to very strenuous physical work – manual handling of heavy loads, uncomfortable positions, work above shoulder height – than their elders. Although physical workload tends to decrease with rising age, there is a clear over-representation of musculoskeletal pains among workers over 50. More than 40% of women aged 50-plus experience pain in the lower extremities every week against just under 29% of men.

Table 1 Sweden, Official Statistics – Work environment 2005

% by sex and age bracket		Male			Female		
		19-29	30-49	50-64	19-29	30-49	50-64
Strenuous physical labour	Very	30.5	20.8	16.6	28.5	21.0	18.0
	Average	35.3	28.4	25.7	36.3	29.2	29.9
	Not	34.2	50.8	57.7	35.2	49.9	52.1
Pain each week in	Neck (upper back)	23.0	29.2	29.6	41.6	43.4	44.8
	Lumbar region (lower back)	23.1	25.5	27.8	36.0	30.5	34.6
	Shoulders, arm	18.5	27.0	33.9	32.3	37.7	45.5
	Wrists, hands	12.6	14.4	17.1	16.6	20.1	31.4
	Hips, legs, knees, feet	18.2	21.5	28.8	29.2	25.4	40.4

Source: *Arbetsmiljön 2005 (The Work Environment 2005)*, Arbetsmiljöverket-Statistics Sweden, 221 p.

Do these figures really chime with the Lisbon Strategy aims? Surely, more and better jobs in a more dynamic, innovative and appealing Europe can only be achieved by averting the demographic shock, which means keeping older workers more employable? Is it not therefore supremely irresponsible in the 21st century still to be offering working conditions which instead of promoting self-actualisation through work, impair health and encourage a jobs and know-how drain?

Lower extremity problems, a disregarded medical condition

There are copious epidemiologic studies on work-related MSDs for back and upper extremity disorders, but many fewer for the lower extremities notwithstanding that historically, housemaid's knee (fluid-filled swelling of the patellar bursa) was among the earliest recognised occupational diseases. If health and safety at work policies are to be believed, mechanical strains today are limited to the lower back and upper extremities (hands, wrists, elbows and shoulders). This is not to say that work-related lower extremity pain has been eliminated. Has the sense of history gone so far awry as to forget that the weight-bearing joints – body weight plus objects carried – are fundamental to human locomotion (bipedal) and all human movement?

If anything, the few figures below suggest that we should not dismiss a set of particularly debilitating MSDs which, by affecting the body's weight-bearing joints (hips, knees and feet) undermine individuals'

future autonomy, exposing them to the likelihood of being a charge on society in older age. The least conscientious employers' disregard for or failure to take preventive measures throws back onto society the damaging build-up of effects over years of labour in the form of extremely debilitating impairment of feet, knee or hip joints.

Table 2, taken from an American study published in 2003, shows the very high risk of knee disorders among workers in jobs that involve work in a kneeling or squatting position.

Table 2 Association of meniscal injury with occupational activities

Occupational activity (in an average working day)	Activity	Daily duration total	Higher risk [OR (95% CI)]
	Standing or walking	> 2 h	1.5
	Kneeling	> 1 h	2.5
	Squatting	> 1 h	2.5
	Climbing flights of stairs	> 30 min.	2.0
	Working in an occupation involving kneeling or squatting		2.3
	Sitting	> 2 h	0.8

Source: Baker, P., *et al.*, Knee disorders in the general population and their relation to occupation, *Occupational Environmental Medicine*, 2003, 60, p. 794-797

Another US study on a cohort of 1242 taxi drivers found that those who drove for over 6 hours a day were at 2.5 times greater risk of knee pain than those who drove less than 6 hours a day⁶.

Health and social welfare sector workers are particularly vulnerable to lower limb problems. A survey done in France by three occupational health services (Lille, Clermont-Ferrand and Paris)⁷ found that while 40% of employees suffered lower extremity chronic venous insufficiency, this proportion rose to 76% amongst health and social welfare sector workers.

Is it reasonable to ignore these parts of the musculoskeletal system and those afflicted with them while at work and back home? Should society as a whole bear the burden of the serious motor disabilities and impairments of a cohort of "grandpa-boomers" for whom we are told the pension pot will soon be empty unless they stay working much longer than is now the norm? Should we now dismiss the developmental value of work, especially as a way of being and staying healthy throughout working life?

We think not. Which is why the European workers' movement calls for a more holistic approach to productive man and a strategy for tackling MSDs that draws on practical prevention principles, i.e., that firmly sidelines reactive approaches, which in any event have proved not to work.

But preventive measures do work, as the findings of the 2006 Swedish survey on working conditions show. This survey of 20 000 workers indicates that systematic prevention delivers benefits and helps reverse a very bleak trend in MSDs (see Table 3).

⁶ Chen, J.C., *et al.*, Knee pain and driving duration: a secondary analysis of the Taxi Drivers' Health Study, *American Journal of Public Health*, April 2004, 94 (4), p. 575-581.

⁷ Faber, C., La maladie veineuse est sous-estimée, *Le Quotidien du médecin*, February 2004.

Table 3 Sweden: work-related health disorders, 2006 (% of employees)

State during the past year	1997	2000	2003	2006
Physical disorders	19.4	23.6	24.8	20.8
Neck	5.9	7.1	7.8	5.7
Shoulders, arm	9.5	11.1	11.4	9.8
Hands, wrists, fingers	2.9	3.3	3.3	2.8
Back	8.3	10.2	11.4	9.6
Hips, legs, knees	2.2	2.6	2.9	2.3

Source: *Arbetsorsakade besvär 2006 (Work-Related Disorders 2006)*,
Arbetsmiljöverket-Statistics Sweden

This makes an all-out offensive against MSDs absolutely vital. Measurable effects will be achieved only with the committed involvement of all the parties concerned: workers, trade unions, employers, tool and work system designers, prevention professionals, health and safety inspectors, politicians, etc.

2. Description and causes

What are MSDs?

In this brochure, the term “musculoskeletal disorders” and its abbreviation “MSDs” are used to mean “any affliction of the musculoskeletal system that appears at work and causes discomfort, difficulty or pain when performing work”.

The definition applies to any disorder of the musculoskeletal system, i.e., the structures that make the body move, use its motor and prehensile abilities, or allow it to be kept in the different static positions – upright, seated and variants – which we call postures.

MSD is therefore a general term used to describe a range of ailments connected with:

- sites: upper extremities (arm, hands and fingers), lower extremities (thighs, legs and feet), trunk or spinal column (including the neck), pelvic or thoracic girdles;
- tissues or organs: bone, tendon, joint (and components), nerve, vessel, etc.;
- pathogenic mechanisms or causes: mechanical (force, load, movement, vibration), organisational (speed, just-in-time, lean production), psychosocial (climate, culture, organizational relationships), etc.

This has resulted in MSD being used as shorthand for a wide range of medical conditions (see Appendix 1, p. 49) with complicated names, including:

- tension neck syndrome or carpal tunnel syndrome – site-related ailments;
- lateral epicondylitis (tennis elbow) and plantar fasciitis (heel spur) – describing both the tissue affected (epicondylus and fascia) and the site (elbow, heel);
- CTD (cumulative trauma disorders) or RSI (repetitive strain injuries) – based on injury or pathogenic mechanisms.

Is each type of MSD confined to a single body area?

To confine each type of MSD to a single body area would be tantamount to denying the plain fact of the functional unity of the body and,

therefore the way its physiological subsystems operate in synergy. None of these subsystems can work independently apart from the body.

In fact, the physiology of motion, movements and postures results from:

- the integration of reasoned and voluntary choices: movements are tactically devised to achieve an expected result (moving an object from one place to another, for example);
- reflexes that enable the body to be kept upright and in balance without having to concentrate on each muscle of the trunk and legs while the arms and hands perform a considered and mentally “loading” activity for which visual, auditory or tactile information is collected, analysed and processed by the brain;
- different sensations:
 - proprioceptive, i.e., relating to the position of the body and its segments in space,
 - nociceptive, i.e., which tell the body what is painful, hot or cold,
 - sensory (auditory, tactile, visual and others) which tell about the environment and interfaces, but also enable work in co-operation with other human or technological systems;
- stored impressions resulting from remembered similar life experiences or acquired learning and conduct;
- affects and emotions which mean that:
 - the same object is not always treated in the same way at different times,
 - living things (people, animals, patients) and inert things (tools, objects) are apprehended in different ways.

A simple situation can be used to illustrate this complexity and show how no human movement at work is trivial let alone, as some would have it, a purely mechanistic response that confuses human and humanoid. How would you go about moving a heavy or bulky object from point A to point B? You will certainly weigh up the situation (what in ergonomist-speak is called “performing a risk assessment”) by:

- examining the object: hefting it, seeing whether it is hot or cold, if it is likely to injure you, cause you to lose balance, etc.;
- comparing starting point A with arrival point B;
- casting around in your memory for information on similar situations that you may have previously experienced.

After this cursory situation analysis, you will make a series of decisions which will also be affected by how you feel at the time – fit, suffering back pain, indigestion, headache, etc. – and how what you do changes the situation:

- putting protective gloves on or not;
- getting a lift truck or asking for help;
- sliding it along the floor;
- bending at the knees and working your back upright in a balanced position resulting from starting postures (grasping the object) and

arriving postures (setting the object down) and the influence of the load on the movements performed;

- avoiding or moving obstacles;
- listening to what is going on and checking whether the field of movement is clear or if there is a risk of knocking into something or being knocked into, etc.

The point of all this is to explain that movements, motion and postures are complex and are neither trivial nor mechanistic: they are meaningful. They are packed with history, memory and affects. Also, as we are unceasingly reminded, lifting should not be done with the back but with the legs, and above all with the brain, which has to act preventively to save the back from injury. Remember the instruction: “bend at the knees, don’t strain your back!”.

So, to stay consistent by keeping in mind this picture of the body as a single and indivisible unit: in lifting the object concerned:

- the hands have gripped it and collected tactile information;
- the sensory organs have been put on alert to collect visual, auditory and other information;
- the musculoskeletal system has directed these organs by leg and trunk, but also head and neck, motion to direct the eyes, ears and nostrils;
- the nervous system has analysed then decided on the parameters of the movement and action, the sum and substance of which is profoundly human and biological.

The purpose of these movements and motions is certainly to produce an expected effect and a performance, i.e., that of the biological system that we call biomechanical system effectiveness. But we would add two other senses to this first and commonplace one:

- the more human one of satisfaction in a job well done, the controlled movement that is still in the English-speaking tradition differentiated into “meaningfulness” and “skill”;
- the more physiological one of the harmless movement, that is not only effective but also respectful of the body and mind and their respective ways of working.

We take serious issue with the tendency to confine MSDs just to the region comprised of the “neck, shoulders and upper extremities” system. The approach to MSDs cannot be confined just to areas of the human body! “Salami slicing” or segmenting it by anatomical area makes for an absurd and inefficient approach to MSDs that is at odds with the functional unity of the human body as seen above.

To deny this physiological truth is to deny the essence of humaneness, and also men and women’s priceless and ineffable superiority over any artificial system, however sophisticated. The most recent scientific and technical advances are leading to a rediscovery of that superiority today. To still seek to deny these self-evident facts in the face of all this is to be bound by too-crude a conceptualisation of MSDs: it is a short-

sightedness that stops coherent ways from being devised to deliver the aim of stemming the work-related MSD epidemic.

To focus the approach to MSDs just on the lower back (manual handling of heavy loads) or upper extremities, neck, shoulders and eyes (computer screen work) makes for inefficient prevention: the key prevention principles blend multidisciplinary and worker participation together. To make a light-hearted point: so much is every aspect of the body involved in the workplace that brainworkers complain not of brainache but backache; conversely, job and machinery designers who fail to consult workers and omit the mental strains (sensory, motor, emotional and analytical) that make up human work, including so-called manual labour⁸; could arguably be said to be failing in their job.

A descriptive approach to MSDs

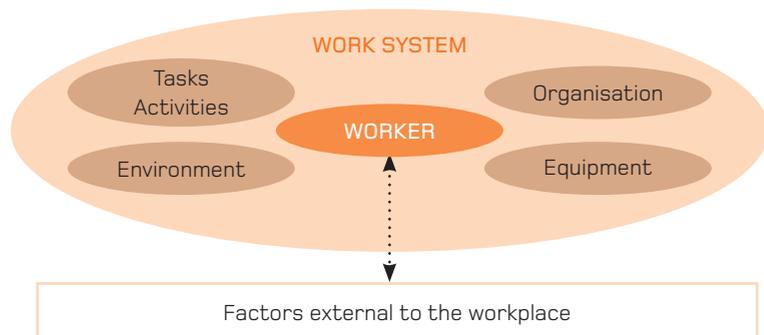
The only way to get a real grip on work-related MSDs is to approach working conditions in the round and factor in non-work determinants, even though no direct action can be taken on these from the work environment.

The schematic work system diagram below aims to clarify the causal relationships between working conditions and the appearance of MSDs by showing:

- the categories of risk factors (or probable causes) to target as a priority;
- the interdependence of these factors, some of which are exogenous;
- the limited scope of preventive activities at work which can only address factors found at work;
- the paramount need for an integrated preventive approach that works to eliminate pathogenic mechanisms and promote optimum working conditions.

⁸ On which, see: Rose, M., *The mind at work. Valuing the intelligence of the American worker*, New-York, Viking-Penguin Books, 2004, 249 p.

Figure 1 Understanding and tackling MSDs requires a rounded approach to working conditions

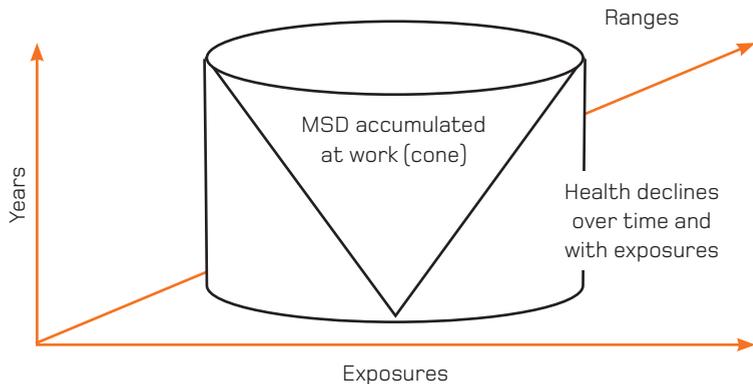


Source: ETUI-REHS

This schematic diagram is necessarily over-simplified, especially as regards a neglected aspect of health at work: the accumulation of harmful (toxic) effects over time. To make good this omission, a second three-dimensional diagram has been added in the form of a volume of which:

- the central, conical, inverted core represents the harmful accumulation of risk exposures over time in the woman or man who has worked in the workplace;
- the Y axis represents the timeline;
- the X axis is the exposures;
- the Z axis shows their range or quantity.

Figure 2 Damage to a worker's musculoskeletal health, by years and exposures



Source: ETUI-REHS

MSDs are seen to increase over time as the result of a threefold build-up of:

1. hazards present on successive workplaces;
2. work-related impairments of the musculoskeletal system;
3. natural ageing of human tissues.

The encroaching inverted cone represents the adverse effect of hazards and impairments that accumulate until health is completely worn away.

The cumulative effect of musculoskeletal hazards over time is multi-factorial: it results from unsuitable postures, repeated movements, excessively heavy loads, the lack of variety in work and movements, deficient physical or organisational conditions, etc. This cumulative effect is reflected in impairments and premature ageing of joints, for example, in the form of osteoarthritis of the knees in tilers or hotel chambermaids.

The build-up of hazards, depicted by this inverted cone that widens and therefore amplifies over time, also calls forth the following remarks:

- younger workers undergo more or greater exposures which are not necessarily followed by immediate pains;
- older workers, even as they grow less exposed to MSD risk factors, have more objective disorders (diagnosed MSDs) than the youngest workers and suffer more from them (number of complaints expressed);

- impaired functional capacities correlate with lowered thresholds of harmful exposures because physiological impairments (like joint damage) worsen the symptoms of pain, limit motion among other things, and if the warning signs of pain are disregarded, exponentially increase the initial damage.

Preventive health care professionals argue generally for continuous health monitoring linked to exposure monitoring, proactive prevention immediately risk exposures appear, and communication of data between preventive systems (school and occupational, or inter-occupational).

Probable risk factors or causes

To try and reduce the causal link in MSDs to organisational factors alone, in the same way as seeking to limit it to the biomechanical aspects of work alone, is counter-productive.

The immensely wide array of health problems bundled together under the blanket name “MSDs” demands a more forensic approach. The variability of injury mechanisms, injured structures and regions affected has just been described: the risk factors involved and different descriptions of the injury mechanisms concerned are at least equally numerous.

To simplify, it can be said that underlying any MSD is at least⁹ one biomechanical strain acting on body structures. This mechanical-type strain is not sufficiently explanatory of the appearance of all MSDs, however.

An investigation into the causes means looking beyond simplistic mechanical explanations like wear, fatigue or inflammation caused by forces, weights, postures, movements, vibrations that are described by a range, frequency or number.

⁹ Barring specific constitutional problems like degenerative disease, orthopaedic problems, etc.

Psychosocial factors at work

Simply pinpointing the “worst” work stressors does not fully explain how work and health are connected; working conditions and work organisation can also play into it where they promote – or conversely impede – the implementation of work strategies that protect health.

Epidemiological studies often refer to “psychosocial factors” in this connection, a concept assessed mainly by reference to the Karasek & Theorell model. This model highlights three components: psychological demands (mainly linked to task volume and complexity, and time pressures); job decision latitude

(comprising skill use and decision authority); and social support (defined by help and recognition from workmates and line superiors). Karasek hypothesizes that high psychological demands combined with low job decision latitude may increase the risk of developing a physical (cardiovascular disease, musculoskeletal problem) or mental (depression, psychological stress, burnout) health problem which are likely to be made worse by a lack of social support at work.

Source: Molinié, A., La santé au travail des salariés de plus de 50 ans, *Données sociales*, No. 13, 2006, p. 543-553

The work environment comprises non-mechanical risk factors like:

- **environment**: exposure to cold, glare, reflections, etc;
- **work organisation**: monotonous or repetitive work, no job control, etc;
- **equipment design**: accessibility, usability and comfort, adaptation to user, anthropometry, physiology of motion and set movements, etc;
- **psychosocial factors**: climate and culture, workplace relationships, social support, job satisfaction, etc.

This wide array of mechanical and other factors requires a forensic analysis of each work situation, which remains unique: where organisational factors may be preponderant in one case, mechanical factors may predominate in another! Whether repetitiveness is an organisational or biomechanical characteristic expressed in hertz or any other unit is for experts to debate, and will not be ventured on here. All that is important for prevention is to identify potentially hazardous strains in order to eliminate them, as prescribed by the excellent preventive mechanism laid down in the 1989 framework directive¹⁰.

Figure 1 (see p. 15) shows the worker at the centre of the work system because he interacts with the exposures that the system comprises. This centrality makes the worker both particularly vulnerable to any exposure to risk factors, and an essential participant in prevention.

In a systemic approach, prevention is a three-legged stool:

- **participation**, for who better than workers, with their intimate daily knowledge of their tools, job, not to mention their own body, can perceive, note and explain at an earlier stage the precursor symptoms of what is happening in their musculoskeletal system? Neither the ergonomist, engineer, doctor, human resources director nor investor has this ability, for it is non-transferable;
- **multidisciplinarity**, because the issues are complex and as much about management as prevention: ergonomics, occupational medicine and psychology, the personnel, departments, investments, and design engineering concur rather than compete here;
- **comprehensiveness**, because only a holistic approach makes it possible first to identify then evaluate all the parameters of the work-related MSD risk: environment, job tasks and activities, organisation, equipment and their interactions.

- **Job task- and activity-related risk factors**

Job tasks are prescribed work, and activity is actual work, i.e., work as it is really done notwithstanding imponderables and contingencies or on the basis of informal criteria, etc. Activity must be looked at, but its defining qualities means this can only be done participatively. The aim must be to identify where shopfloor practice diverges from the decision makers' template. The findings of this examination must make it possible to get a grip on the probable causes of MSDs in the specific case, and at the same time remove other obstacles to the promotion and maintenance of healthier workplaces.

¹⁰ Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work.

- **Environmental risk factors**

Lighting, noise, thermal environments (heat, cold, moisture and air velocity), work station design, exposure to toxins, and cleanliness are the main environmental factors to be looked at.

For example, lighting that is unsuited to the activity may force the worker to adopt inappropriate postures or strain himself pointlessly and dangerously. Likewise, where work makes intense physical demands, poor air quality will materially impact both the capacity to do that work and health, because intense physical effort makes greater demands on the cardiovascular system which in turn increases the oxygen demand by muscles leading to increased respiration and a higher risk of toxin inhalation.

- **Work organisation-related risk factors**

This means looking at key factors of the work organisation, like control over space and time, ability to adjust the speed of work to the worker's abilities (rather than working to machine speed), repetitive and monotonous work, but also interactions and synergies between different jobs, alternating periods of rest and work, linkages between activities, etc. According to Jason Devereux and colleagues at the Robens Institute for Health Ergonomics (UK), task and duty allocation, role and mission clarity, choice of means, contacts with the public, lack of career-advancement opportunities and reorganisation are all stressors to be looked at in connection with preventing MSDs.

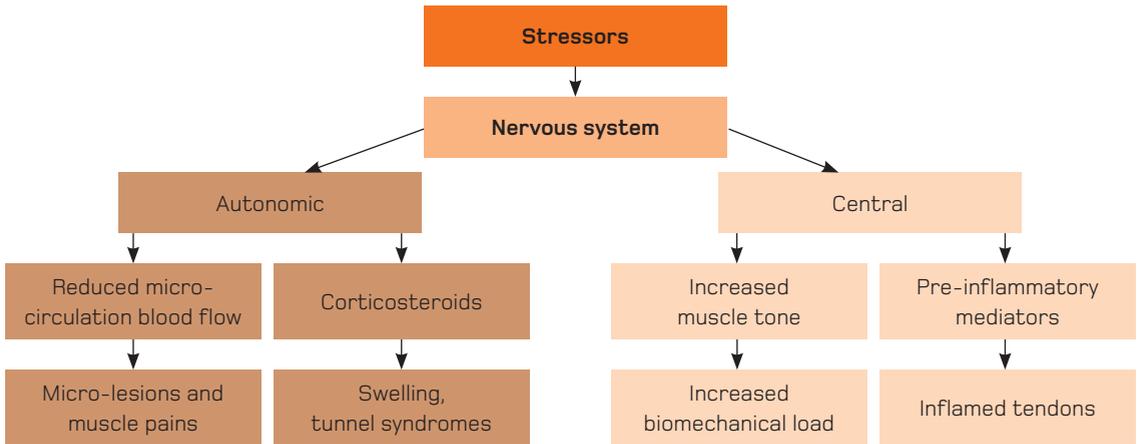
- **Work stress related risk factors**

Stressors create tensions that can result in a range of problems with control of motor activities. The main stressors involuntarily increase muscle tension, which negates the beneficial effects of microbreaks and changes of activities through which to alternate the strain placed on different groups of muscle fibres: the inhibition of this mechanism means that the fibres recruited by a physical workload can no longer contract then relax to recover; they receive aberrant stimuli which keep them in a state of permanent stress or make them more apt to be recruited before other muscle fibres which should have taken over from them to enable them to recover. For this reason, they have been called "Cinderella" fibres. The schematic diagram below gives a simplified depiction of how such nervous tension can impact onto different musculoskeletal system structures.

The so-called "Cinderella" fibre causal hypothesis¹¹ developed by Göran Hägg argues that certain fibres in a shoulder muscle – the trapezoid – appear always to be the first to contract and the last to relax regardless of how much recruited, whence the name "Cinderella fibres". This hypothesis may explain certain pains in the neck/shoulders complex where there is no observable physical strain, e.g., computer work.

¹¹ Hägg, G.M., *The Cinderella Hypothesis*, National Institute for Working Life, Department of Work and Health, Stockholm, 1991.

Figure 3 Stress and MSDs



Source: HESA Newsletter, ETUI-REHS, No. 29, March 2006, p. 17

- **Equipment-related risk factors**

Work tools and equipment, as well as equipment signals and controls must not only be risk-free for the worker but also enable him to do what they were designed for under good conditions and be usable for the specific job at hand. The equipment supplied therefore has to be appropriate for the prescribed job task and be adapted to the worker, taking into account differences between workers. It must make the work easier to perform, and respect the ways humans work in anthropometric, morphological, biomechanical, sensory and cognitive terms. These aspects of the interfacing between operators and production systems are one of the cornerstones of ergonomics.

- **Impact of personal factors**

A first category of personal factors like gender, age, the accumulated effects of MSDs, must be looked at in terms of adapting the work to the human being. The “design for all” approach should if possible be favoured, and where that is not feasible, e.g., because of a specific disability, adapted equipment must be provided. In theory, the approach involves adapting work tools to the least able, which of course enables the most able to use them with greater ease, relieving prevention professionals and investors from having to worry about ex post adaptation of work tools, which is always more complicated to carry out.

A second category of personal factors relates to MSD-risk activities and behaviours, e.g., sports, domestic tasks, hobbies, etc.

A few considerations:

- work that is highly monotonous or sedentary, offers too few changes of posture, or is unsatisfactory in terms of creativity and competitive spirit must be able to be compensated in non-working time by activities that offer distraction and allow physical, intellectual and social batteries to be recharged as the cement for developing the individual’s health and capacity for social interaction;

- work and social life in a highly organised society are defined to such a point that spaces of freedom to act and think are absolutely essential to maintain a healthy life;
- it is not readily clear how practical trade-offs can be effected in an array of risk factors of different origins, nor who could objectively ascertain the cause-effect relationship between work activities and non-work-related activities that may contribute to the same MSD symptoms;
- the sedentary lifestyles encouraged by our car- and media-bound (TV, Internet, etc.) societies must be tackled by physical activities which provide healthy relaxation and improved cardiovascular and musculoskeletal health (e.g., the beneficial effects on osteoporosis);
- the ratio of at-risk working time to leisure time is unequally balanced: the approximately 40-hour workweek repeated week in week out must be the target for prevention of MSDs.

The most exposed workers by sector and anatomical site

The prevalence of musculoskeletal system disorders is mainly measured for two anatomical regions: the lower back and the region formed by the neck and upper extremities. Workers in some sectors are more exposed than in others.

- **The back**

A very high proportion of the population is at risk of MSDs of the back, especially low back pain. There is a broad consensus in the literature on a lifetime prevalence of 80%: 8 in 10 people will experience an episode of low back pain during their life. The point therefore is to learn how to live with this risk which “written into man’s nature as a biped”.

Far from disturbing, these figures should actually be an inducement to:

- make jobs and activities accommodate this genetic weakness of the lumbar region as much as possible by systematically designing risk factors out of the work system;
- limit the development of backache at work by proactively tackling the likeliest risk factors, especially those identified and reported by users;
- inform workers and their superiors about the lower back risk and train them in screening for risk factors;
- limit the repetition of episodes of low back strain which become progressively more debilitating and potentially more permanently incapacitating for the worker with each recurrence of a painful episode;
- provide for an immediate interview with the local prevention professional or ergonomist when a painful episode is reported to identify and improve elimination of the causes;
- ensure a prompt return to work for victims, with preventive instructions, and a strategic re-design of job tasks, activities and the work station.

The most at-risk sectors and occupations are those involving manual handling of heavy loads. These activities are often those with the least job satisfaction and job decision latitude. Examples include the building trades,

the footwear and clothing industries, farming and fishing, the butchery trade, fish canning, continuous handling, highly repetitive work (on production, assembly, packing and sorting lines), patient and animal care, work at anthropometrically and organisationally poorly designed work stations, jobs involving prolonged standing work with nothing to sit or lean on.

- **Upper extremities, neck and shoulders**

This concerns all the activities presenting the typical risk factors extensively reported in the literature on which there is a current consensus, especially with combinations of the following risk factors:

- extreme deviation motions, i.e., generally up to 50% of the range of the joint motion concerned in relation to duration or frequency or both;
- motions repeated at a frequency higher than two to four motions per minute or with a cycle time shorter than 30 seconds;
- use of muscular strength (variable with the muscle or muscle groups concerned);
- hand-arm vibration.

The biomechanical risk factors are compounded by the other factors already listed, key among which are organisational constraints.

The sectors most affected are those mentioned in the previous section (back), plus a series of more recent occupations that involve ultra-light physical activities (e.g., interacting with different input tools like computer keyboards, mice, touch pads, etc.) that are also highly intellectually “loading”¹² in requiring the retrieval and processing of information for decision-making and the carrying-out of resulting actions which involve many physical linkages¹³ with the work tool (see Table 4).

The sectors most concerned are the computer industry and Net-economy, data entry (banking, insurance, buying and selling groups, catalogue sales, ticketing), transport, air, shipping, road and rail traffic control, industrial activity, process and surveillance monitoring.

¹² As opposed to “under-loading” where the worker is assigned to watching or monitoring job tasks that challenge his alertness where there are no stimuli, which is in itself a reverse but nevertheless significant form of mental strain.

¹³ Each of which involves a fixed posture determined not by the human being but by his environment, whence the risk of developing MSDs in the human part of these linkages or interfaces.

Table 4 Examples of body–work system linkages

Body region	Linkage – Interface	Effect	Regions at risk
Eyes	Screen Keyboard Desk	Posture determined by linkage(s) and distances: eye-screen; trunk-task; seating, etc.	Head Neck Trunk
Fingers	Keyboard Desk		Arm Forearm
Hand	Mouse Desk		Wrists Hand
Back Pelvis	Seat		Lumbar region Thighs
Lower limbs	Floor Foot rest		Legs Ankles Veins (varices, oedemas)

Source: ETUI-REHS

3. Human, economic and societal impacts

There is little value in inquiring into the impacts of MSDs or attempting a cost-breakdown by nature. But the apparent current lack of awareness about this limitless waste of human and financial resources and the unsuccessful use of spurious means of addressing the epidemic of work-related MSDs have persuaded us to make this one of the central chapters in order to try and focus energies and skills on:

- correcting grossly misguided approaches to and understanding of MSDs, whose human and economic consequences have barely begun to be measured;
- shaking up the decision-makers who stop short at vague assessments of causal links and endless discussions of their relevance instead of taking concrete steps to tackle MSDs;
- supporting the motivation and enthusiasm of interdisciplinary teams that act in synergy on the front line beyond the requirements of fragmented regulations of no proven effectiveness.

Different approaches can be taken to investigating the impacts of MSDs: epidemiological – inquiring into the occurrence and spread of disease processes; economic – attempting to calculate the financial costs for the economic entities affected (the individual, the firm, the community and its insurance systems); estimating other costs like distress, work disability, loss of skills, early retirement, etc.

This chapter will try to assess these impacts from different angles, looking first at the human and financial costs borne by victims of work-related MSDs and then the costs to business and society. The proposed assessments are based on epidemiological research into MSDs and macro-economic studies.

Human impacts

The impacts on people of MSDs are generally severe, being highly painful and hence highly debilitating, potentially resulting in unfitnes for work, and even having to stop work altogether. This results in incalculable losses of knowledge and skills for society, and higher costs in incapacity benefits.

The World Health Organisation (WHO) describes musculoskeletal conditions as characterised by pains and loss of physical function¹⁴.

¹⁴ See: *European Actions Towards Better Musculoskeletal Health. A Guide to the Prevention and Treatment of Musculoskeletal Conditions for the Healthcare Practitioner and Policy Maker, A Bone and Joint Decade Report 2005*, 40 p.

Pain is the main symptom among osteoarthritis sufferers and the main cause of disabilities. MSDs cause more functional limitations in the adult population than any other group of disorders. The pain and physical incapacity attendant on MSDs also affects social functions and mental health, further reducing the quality of life of the patients – in this case, the workers – affected.

Osteoarthritis is most common in the weight-bearing joints (so called because they bear the body weight), chiefly knees, then hips. Strenuous physical work is one of the main occupational risk factors.

Low back pain is a major health problem with socioeconomic impacts in western countries. Most episodes of low back pain last about a fortnight, but 20-44% of affected workers will have recurrent episodes within a year, rising to lifetime recurrences in up to 85%. Decisive occupational risk factors include heavy work, handling operations, bending, twisting, pulling and pushing, but also high psychological demands¹⁵ and job dissatisfaction. Most workers return to work within one week, and 90% within two months but less than 50% of those who have not resumed work after six months will return to work.

Along with mental disorders and cardiovascular diseases, MSDs are among the main reasons for early retirement. The coming years can be expected to bring a considerable increase in the individual and societal impacts of MSDs.

Based on these observations, MSDs can be said to incur major human costs, expressed in:

- joint pains;
- partial or total, temporary or permanent disabilities;
- inability to perform some or all work-related tasks and activities, as well as tasks of private life and in society;
- psychological tensions closely linked to these disabilities and inability to achieve normal “biomechanical” performances¹⁶ at work and in private life;
- having to stop work for health care;
- lost quality of life;
- impaired autonomy;
- generally, impairments of people’s physical, intellectual, social, sensory integrity, etc.

¹⁵ High psychological demands are most often described as little scope for decisions combined with a high workload and lack of social support (Job Strain, Karasek model, see box p. 17).

¹⁶ i.e., motions, their angular velocity, precision, repetition without pain, address, movement sensitivity, coordination of complex motions and inter-operator coordination, etc. And, conversely, the tensions that result from incidents.

Impacts on workers’ working life

The cost to joints, especially pain on movement, pressure or muscle tensioning, is seen in the form of impairments in motion, leaning, grasping and other functions. The tissue damage underlying these problems results in partial or total, temporary or permanent incapacity to work normally.

There are many hard-to-bear collateral effects to incapacity for work, like a reduced or complete inability to perform a wide range of everyday living activities and movements, like housework, parenting or civic duties, the burden of which will fall on society as a whole.

In the work sphere proper, these include:

- temporary or permanent loss of job with a corresponding loss of means of livelihood:
 - unemployment during temporary losses of working capacity,
 - early pension for a worker unable to be redeployed or reassigned due to inability to work normally any longer, e.g., due to age or a joint injuring event,
 - pensioned due to permanent loss of working capacity;
- conflicts with the employer over a disputed causal link or mistrust of him;
- administrative constraints from disputes with social security, etc.

Economic impacts

The financial costs can be considered from three different angles: individual financial costs from incapacities, costs to business, and costs borne by society. Each category of costs – individual, business or societal – can be broken down into direct and indirect costs.

- **Financial costs to the individual**

The main financial costs to the individual are:

- loss of some or all means of livelihood from the inability to engage in paid work;
- unemployment or sickness benefits below normal pay;
- forced early retirement, also accompanied by a loss of disposable income;
- loss of ability to commit funds in view of a foreseeable career progression;
- purchasing power eroded by the need to pay for care and/or rehabilitation, including treatment fees, purchase of medicines, orthopaedic and prosthetic appliances, travel, etc.;
- costs related to irreducible disabilities that require assistive and adaptive aids or adaptations to the home related to the loss of autonomy;
- legal and administrative fees, etc.

- **Costs to business**

Most European firms have little awareness of the real cost of MSDs that results from exposures to the risk factors they create by their business activity or engineering, design, task allocation and other mistakes.

This lack of knowledge, largely due to the system of third parties footing the bill for the harmful effects of work, helps blur the scoreboards of the real cost of MSDs. If these “lesser known” costs are borne by society and taxpayers, why should those chiefly responsible for MSDs bother about them?

This very short-termism typifies the present era, where adaptability and globalised competition induce the least professional or robust businesses to shut out problems that the former refuse to see or deal with, and the latter leave to the charge of others. So, law-abiding firms and workers who follow good practice suffer for and bear the production risks of the least law-abiding or robust who put the existing socialisation

of risks mechanisms to legal but nevertheless unintended use, leaving them free to criticise the misuse of public funds.

Recent research suggests that 30 to 50% of production quality failings can be put down to poor ergonomics. This surely offers lines of inquiry for investors who are also concerned about their workforce¹⁷.

The direct cost approach to MSDs is essential but insufficient because the indirect costs, caused by organisational impairments – cost of absences, cost of employee turn-over, cost of dealing with complaints and unsuitability – also have to be factored into the equation.

In the second phase of its social partner consultation on MSDs, the Commission notes that “Musculoskeletal disorders account for the highest number of absences (49.9% of all absences of more than three days) and of permanent incapacity for work (60%)¹⁸.”

MSDs from occupational risks were to blame for an estimated 45% of lost working days in the Netherlands¹⁹ in 2003.

Beyond these direct and indirect costs, firms have to assess the consequences of MSDs for production quality, company image, and the scheduling of projects endangered by damage to the workforce and management-worker relations.

In his paper on the economy and MSDs to the 1st French-speaking Congress on MSDs in Nancy in 2005, Philippe Askenazy wondered about the United States’ bellwether role: “The United States has been ahead of the curve in several of these areas, not least the benefits of nurturing corporate image through measures to promote workers’ welfare and health. Many economic incentives have been brought in the United States in the last decade: naming and shaming dangerous firms, trade union action, reform of the health and safety enforcement authority, soaring insurance premiums, etc. The outcome has been improvements in all health and safety indicators: a 40% drop in work accidents, workplace absences and reported MSDs, more rapid returns to work. Can we place credibility on these rosy figures? Is the fall in reporting not more likely due to tighter recognition requirements or having employer-designated doctors? A clear answer is emerging for work accidents...”

• Costs to society

MSDs account for about half of all work-related disorders in EU countries, representing an estimated societal cost of 2.6% to 3.8% of gross national product (GNP). The economic burden of low back pain was estimated in the Netherlands in 1991 (short-term indirect costs) at 2.8% of GDP. For the USA, in 1998, the annual cost of lost work time associated with chronic low back pain was US\$1,230 per male and US\$773 per female, amounting to an annual productivity loss of US\$28 billion. For the UK, in 1998, the direct costs were estimated to be £1.6 billion, and overall costs between £6.6 and £12.3 billion²⁰.

Up to 6 million injuries a year were being recorded in workplaces in the United States²¹ in 2002, costing over US\$60 billion in lost wages, health spending, and legal fees according to the AAOS (American Association of Orthopaedic Surgeons). Most of these injuries are the result of overloading, repetitive movements and falls at work.

¹⁷ Neumann, W.P., *Production ergonomic*, Doctoral Thesis 2004, Lund University, Sweden.

¹⁸ http://ec.europa.eu/employment_social/social_dialogue/docs/musculoskeletaldisorders2_en.pdf.

¹⁹ http://ec.europa.eu/employment_social/work_conditions/docs/zwinkels_en.pdf.

²⁰ Atun, R., Guro-Urganci, I., *Health expenditure: an ‘investment’ rather than a cost?*, International Economics Programme, WP 05/01, Chatham House, July 2005, 15 p. See: www.chathamhouse.org.uk/pdf/research/ie/WPhealth.pdf.

²¹ See: www.aaos.org/wordhtml/press.htm.

Table 5 Domains of health economic impact relevant to musculoskeletal conditions

Category	Domains	How to identify costs
Direct costs		
Health care costs		
Outpatients costs	Visits to physicians (primary care and specialist)	Hospital or insurer activity data of visits
	Outpatient surgery	
	Emergency room	
	Rehabilitation service utilisation (physiotherapist, occupational therapist, social worker, etc.)	
	Medication (prescription and non-prescription)	Pharmacy records
	Diagnostic / therapeutic procedures and tests	Radiology activity, Laboratory tests
	Devices and aids	Provision of equipment
Inpatient costs	Acute hospital facilities (without surgery)	Hospital or insurer activity data of admissions, lengths of stay, procedures
	Acute hospital facilities (with surgery)	
	Non acute hospital facilities	Rehabilitation activity Nursing home activity
Personal costs	Transportation	Transportation distance, frequency, methods
	Patient time	Time spent in healthcare
	Carer time	Time spent giving care
Other disease related costs	Home health care services	Home health care activity
	Environmental adaptations	Home, work and transportation adaptations
	Medical equipment (non-prescription)	Equipment provision
	Non-medical practitioner, alternative therapy	Therapist activity
Indirect costs		
Change of living status	Nursing home or residential home	Nursing and residential home activity
	Home care services	Formal and informal home care activity
Productivity costs	Loss of productivity in employed patients or their carers Opportunity costs – reduced employability at present or higher level	Sick leave, lost wages, work disability benefits, number no longer working, disabilities leading to impaired housekeeping or activities of daily living, loss of productivity
Out of pocket	Out of pocket expenses	Survey
Intangible costs		
	Deterioration in quality of life of patient, family, carers, friends	Difficult to quantify

Source: *European actions towards better musculoskeletal health*, 2005

In Europe, one in five of all adults in Europe are under long-term treatment for rheumatism or arthritis, while 15-20% of primary care consultations relate to musculoskeletal problems²².

MSDs are also the main reason for early retirement on health grounds. In Germany, 26% of all early retirements are due to MSDs, according to the statistics collected by the European Agency for Safety and Health at Work.

The society-wide costs of MSDs are not assessed in share-of-GNP terms alone; the authors of the report *European Action Towards better Musculoskeletal Health* (*op. cit.*) show the relevant impacts of MSDs in areas of health economics in tabular form (see Table 5, p. 27). The table shows the extent to which the different areas of care provision and health care professionals are diverted away from other priority areas – neurology, cardiovascular, oncology, infections, etc. – because of musculoskeletal system diseases, the work-related share of which could be avoided.

I will close this chapter with a quote from Elisabeth Conne-Perréard²³, “Reported cases of MSDs and the attendant costs have soared everywhere. Most are low back pain, and a growing proportion of upper extremity MSDs, mostly related to repetitive movements. Cost structure studies show that MSDs account for up to a third of the costs of work-related illnesses. Different estimates suggest that up to 30% of MSDs could be avoided if the work-related risks were eliminated.”

²² *European Actions Towards Better Musculoskeletal Health*, *op. cit.*, p. 3.

²³ Conne-Perréard, E., et al., *Effets de conditions de travail défavorables sur la santé des travailleurs et leurs conséquences économiques*, Conférence romande et tessinoise des offices cantonaux de protection des travailleurs, Geneva, 2001.

4. European legislative instruments

Musculoskeletal disorders were high among the priorities of the European Strategy on health and safety 2002-2006 drawn up by the European Commission²⁴, announcing the planned adaptation of existing legislation on MSDs.

More specifically, the Commission vowed to publish a Communication on MSDs, which was meant to examine the causes and propose amendments or new legal provisions in fields in which coverage is still incomplete. In fact, at the start of 2007, when its action plan had expired, nothing had yet been done and no such Communication had been forthcoming.

All the Commission did in the period 2002-2006 was to issue a consultation of the European social partners²⁵ in November 2004 on protecting workers from MSDs. The Commission canvassed their opinion on how the gaps in national and Community laws should be plugged to halt the further spread of these work-related injuries.

The social partners reacted to the Commission document which asked among other things whether they thought Community legislation should be strengthened, or if they would prefer voluntary measures or a combination of binding and non-binding measures.

In its reply, the European Trade Union Confederation (ETUC) argued that the existing directives were not an adequate framework for dealing with musculoskeletal disorders, and that a directive was needed that addresses all the contributory factors in musculoskeletal disorders within an overall ergonomic approach to work situations. The ETUC called for a targeted on the primary prevention of MSDs by summarising specific elements of existing Community legislation, complemented as required to fill any gaps. Deeply disappointed at the EU's broken pledges of recent years, the European trade union movement hoped that the future Community strategy 2007-2012 would finally set objectives and a timetable of specific measures that would lead to results in tackling MSDs.

Sad to say, the European Commission's Communication published in February 2007 holds out no hopeful prospects, merely the vaguest of promises that "the Commission will continue its work, through the on-going consultations with the social partners, to find ways" in these areas.

²⁴ *Adapting to change in work and society: a new Community strategy on health and safety at work 2002-2006*, COM (2002) 118 final, Brussels, March 2002, p. 13.

²⁵ The European Trade Union Confederation (ETUC), the Union of Industries of the European Community (UNICE, now renamed BUSINESSEUROPE), the European Association of Craft Small and Medium-Sized Enterprises (UEAPME) and the European Centre of Enterprises with Public Participation (CEEP).

The word “directive”, previously used in the strategy for 2002-2006, no longer even features!

The second consultation on MSDs was sent out by the Commission to the social partners in March 2007. In this document, intended to elicit their opinion on the “content of a possible Community initiative to protect workers against MSDs”, the Commission:

- puts musculoskeletal disorders back in the contexts of the physiology of the locomotor system, the pathomechanics of the workplace and the contribution of non-mechanical risk factors – such as stress factors – which has now been scientifically demonstrated;
- reiterates the existence of legislative instruments;
- clearly recognises the lacunae in these instruments and their weaknesses, specifically referring to the Manual Handling of Loads Directive and the Display Screen Directive, which need to be fundamentally rewritten;
- recommends the additional use of other, non-legislative instruments to meet the intended objectives;
- confronts the Member States and companies with their responsibility to implement legislation.

In its response to this consultation (see Appendix 2, p. 50), the ETUC very clearly calls on the Commission to launch an initiative based on Article 138.3 of the Treaty establishing the European Community; it also demands that that initiative should take the form of a brand new anti-MSD directive based on the principles of prevention as described in Framework Directive 89/391/EEC on health and safety at work and incorporating the Manual Handling Directive and Display Screen Directive. The future anti-MSD directive should also set out to trigger specific initiatives designed to rule out MSDs risk factors right from the outset. The ETUC wants the future directive to provide for victims of proven MSDs to keep on working or be reintegrated into working life and be given compensation.

The existing legislative framework

The current specific framework – made up of Directives 89/654 (workplace), 89/655 and its modification 95/63 (work equipment), 90/269 (manual handling), 90/270 (display screen equipment – VDUs) and 2002/44 (vibrations) – is not entirely suitable and does not do enough to prevent musculoskeletal disorders. In this respect, the statistics speak for themselves, and the increase per country and the overall European trend highlight the problem even more clearly. The scale of the figures is ample proof of the failings of the existing measures and the absolute need to chart a strategy for tackling MSDs in all EU countries and branches of industry.

A strategic approach to MSDs cannot simply be limited to parts of the human body. An approach that deals with different anatomical zones (neck and shoulders, upper extremities, back or lower extremities) is not desirable. Such an approach goes against the primary mechanisms of prevention that follow comprehensive, multidisciplinary

and participative principles. Every aspect of the body is involved in the workplace, so much so, that non-manual workers complain of back pain and not “brain-ache”, while forgetting about the mental burdens of manual work could lead to very serious errors when devising duties.

The European preventive model

Currently, the foundations of the comprehensive, preventive approach are present in the existing directives which are good tools but unfortunately do not produce good results. The principles concerned must therefore be developed and improved. To do this, gaps in existing legislation must firstly be plugged, by adding to and improving the VDU and Manual Handling Directives, by supplementing these with a new directive on repetitive work and, if possible, by creating a new directive that would bring together the various legislative instruments.

Preventing risks to the locomotor system can only be achieved by forcing all companies to adopt the tried and tested primary strategies for eliminating dangers. These strategies are characterised by a comprehensive, multidisciplinary and participatory approach to problems related to musculoskeletal disorders. Failing that, the least robust or honest firms will be sorely tempted to shift the financial burden of their MSDs onto third firms and society as a whole through misuse of the social security system.

Existing and future tools, like the framework directive, the Manual Handling Directive, the VDU Directive and the future “anti-MSD” directive must be put into effective practice. That means creating relevant linkages between them (through a summary statement of the principles) coupled with a pragmatic approach usable on actual work stations. The scope of this pragmatic approach will necessarily be more effective if used early on at the design stage of work stations, work sites, machinery and tools, because this is the key moment when prevention is most efficient.

The modern ergonomic approach

All the aspects – ergonomics, work organisation, medical, psychosocial and toxicological aspects, industrial hygiene, safety – interact and are therefore of equal priority. This view is also in line with the principles of the framework directive (89/391) and those of modern ergonomics. The International Ergonomics Association (IEA)²⁶ defines ergonomics as the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance.

The IEA believes that ergonomics must promote a holistic approach in which considerations of physical, cognitive, social, organizational, environmental and other relevant factors are taken into account.

The approach we are calling for is not confined to the physical aspects of work, but also includes the other fundamentals of the work

²⁶ See: www.iea.cc.

situation like work organisation and psychosocial aspects²⁷, without separating these from the physical aspects.

It has been scientifically confirmed that MSDs result from exposure to mechanical factors but also that reducing biomechanical risks, although it may improve the situation, is not enough by itself to eradicate MSDs. A review of the epidemiologic literature published in 2002 concluded that high job stress and non-work-related stress reactions are consistently associated with upper extremity problems²⁸. A study of enlisted US marines with MSDs concluded that both biomechanical factors and specific work organization factors, particularly time pressure, needed to be considered in reducing musculoskeletal-related morbidity²⁹.

Other important questions will need to be tackled, such as gender issues. Many job tasks that cause damage to the locomotor system are mainly carried out by women, who are also often working a “double day” involving other musculoskeletal stresses. In some sectors – textile sector, food industry, hospitality industry, personal care, etc. – this situation is made all the more worrying for women since professional development is difficult to obtain.

Focus on primary prevention

A primary prevention focus is not reasonably possible unless existing Community legal provision is made more understandable and user-friendly³⁰ by being more consistent and summarised, filling in the gaps, and eliminating the imprecisions cited below.

• Summary of applicable directives

By this we mean maintaining the advances of existing legislation, but updating it and making it feasible for companies to implement. The future legislation must therefore coordinate existing directives, fill in gaps, eliminate imprecision in one complete text that is coherent and easy for all companies to apply.

• Gaps in existing provision

Some areas of the body are mentioned whilst others are not, like the upper extremities (hands, wrists, elbows, shoulders) and lower extremities (feet, ankles, knees, hips). But the human body in the workplace is a single interconnected entity, in which all the individual parts work together:

- upper extremities do not seem to be covered at all: a directive on manual handling that does not mention either hands or fingers is therefore an incomplete directive;
- lower extremities are addressed indirectly: they are never referred to directly yet slips, falls or trips and numerous other injuries to the trunk are due to sudden strains which directly involve the lower extremities;
- characteristics of movements, postures, forces and user interfaces are potential causes of MSDs that are not covered methodically:
 - movements (range, precision, repetition, rhythm and duration of exposure),

²⁷ Aspects that are “loading” for workers: cognitive load relating to the choices to be made and solutions to be implemented, emotional load, social load and sensory load in the occupations where much of the information to be processed is collected by the sensory organs.

²⁸ Bongers, P.R., et al., Are psychosocial factors, risk factors for symptoms and signs of the shoulder, elbow or hand/wrist?, *American Journal of Industrial Medicine*, 41, 2002, p. 315-342.

²⁹ Huang, G.D., et al., Individual and combined impacts of biomechanical and work organization factors in work-related musculoskeletal symptoms, *American Journal of Industrial Medicine*, 43, 2003, p. 495-506.

³⁰ User-friendliness is the property of tools and instruments that are designed to be easy for users to use.

- postures and extreme deviations,
 - forces involved and static work,
 - user interfaces (protection of contact areas);
 - psychophysiology shows that the agents causing stress in the workplace (stress factors) could explain the development of MSDs when combined with harmful mechanical factors. This aspect is not covered in existing directives either. Work organisation, psychosocial burdens, the degree of latitude and social support should at least be considered in the legislation;
 - directive 90/269/EEC (“manual handling of loads”) lists certain movements but does not cover frequent lateral bending and extension of the back. It does not cover dynamic aspects of job tasks, like the movements involved when lifting and setting down an object carried between two points or high risk handling of patients and animals;
 - directive 90/270/EEC (“VDUs”) does not take the height of the screen into consideration, but if a display screen does not correspond to the natural line of sight it can be a major cause of neck and back-ache.
- **Imprecision in the vocabulary used in the directives**

The VDU, Manual Handling and Work Equipment Directives use the term “ergonomic principles” without defining the criteria. This vocabulary can therefore only be used by the few specialists who are familiar with the criteria. These same directives do not provide any means of practically evaluating the concepts of repetition, weight or force used.

A common vocabulary used to define and standardise basic concepts such as “ergonomics”, and “repetition” must be included in the future directive. Several European standards have been issued addressing this matter. These standards were drawn up by the European Committee for Standardization (CEN), mandated by the EU under Machinery Directive 98/37. The planned European standards were published in the Official Journal and others are still being worked on. It would be truly absurd not to use these resources of Community consensus. The main aim of European legislation should be to combat the primary causes of MSDs more effectively in order to eliminate them as set out in framework directive 89/391/EC.

- **Recognition of occupational diseases**

To be effective, the proposed legal instrument should be accompanied by an initiative aiming to harmonise recognition of occupational diseases in the European Union. This would, in effect, be an important incentive for the implementation of more proactive prevention policies. Such a schedule is also an invaluable means for making intra- and inter-State comparisons to assess the performances and effectiveness of the instruments used.

Prevention strategies and action to combat the causes of MSDs must be able to be applied in specific situations and more generally and adapted to changes in work practices and technology. It must also be possible to implement them easily and in concrete terms in all types

of company and work situations, from the most simple to the most complex and, therefore, also in SMEs and very small firms of fewer than 10 workers (VSEs).

The corpus of legislation supplemented by user guidance, examples of good practices and a stocktaking of successful measures are the essential foundations of a trade union strategic plan of actions to combat MSDs.

5. Possibilities for a trade union action plan to combat MSDs

Concerted action on the causes by all participants

The only way to improve the situation is through continuing action against risk factors and work situations that result in MSDs. More research and studies on MSDs are crucial for scientists, but do little more to inform policy-makers. The causal link between work characteristics and the development of MSDs made through hundreds of published studies worldwide is so consistent, coherent and significant as to render further discussion of the plausibility of any particular etiologic factor unnecessary. The situation has been critical for years and is getting steadily worse: time is running out. Pointless delaying tactics about whether causes are more work- or lifestyle-related add nothing to the debate and even less to action on MSDs! The plain facts are that cohorts of workers have difficulty or cannot any longer do their assigned job tasks. These problems, whatever their origin, abound in workplaces. These MSD-related difficulties in performing work combine with risk factors already present – like repetition or lack of job control – to further impair workers' health, job satisfaction and the quality of their work.

Whatever else, the combination of work-related causes of MSD and the increasingly large share of MSD sufferers in the workforce is more than enough reason for serious concern.

This prevalence and these etiologic factors must be addressed through strategic plans that lay down specific, proactive preventive measures. Unfortunately, too many past measures have not worked, and even then the official figures underplay the situation due to under-reporting of MSDs. National registration systems reveal only the tip of the iceberg. Thankfully some – but regrettably too few – initiatives have helped bring down or stem the tide of MSDs. It is these more effective measures from which the European trade union movement should take its lead.

Finally, while primary prevention – i.e., tackling MSD risk factors at source – is essential, redeployment of the affected workers cannot be dismissed. They must be offered secondary (ex post adaptation of work stations, job task and activity requirements) and tertiary (work stations, job tasks and activities adapted in light of long-term effects and functional limitations) preventive measures, not least if the Lisbon macro-objectives are to be achieved³¹.

³¹ In Lisbon in March 2000, the European Union set itself the strategic goal for the next decade of “becoming the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion”.

A strategic plan of practical measures to be carried out, underpinned by a commitment to delivery without sparing either efforts or resources is absolutely vital. There is one big “if” related to the strategic nature of this plan: a failure to follow or implement it in full as the coherent whole that it is will render it useless, and rule out any improvement in the situation! In other words, the tidal wave of MSDs will continue to wreak havoc. There must be no mistake and especially no compromise on the contents of the proposed plan: it is deliberately called “strategic” because the aim is to wage all-out war on MSDs.

What works

The basic feature shared by all schemes that have been effective against the epidemic of MSDs seems to be a plan that consists of a joined-up set of tools and mechanisms based – as illustrated in the schematic diagram below – on standards, campaigns, implementation by all participants, inspection, and sanctions.



- **Standards**

These are reference documents for use by business and institutions, workers and their reps, governments and enforcement authorities, experts and consultants, engineers, ergonomists, doctors, psychologists and hygienists who deal with health and safety under contract from employers. They form a developing set of legislation and criteria to combat MSDs that also include practical proposals for implementing them.

Whenever risk factors cannot be avoided and a risk is present, backup measures must be taken to minimise the risk and monitor the exposed workers. This catalogue of risks and solutions varies with:

- the body areas at risk: back and pelvis, upper or lower extremities, neck and shoulders;
- sector of activity: construction, fishing and agriculture, hospitality industry, care, footwear and textiles, office work, etc.;
- organisational constraints: time, space, skill discretion, staffing level, qualifications, etc.;
- workloads: physical, mental, sensory, emotional.

The aim of this set of benchmarks is to deliver the plan's goal of cutting the number of MSDs by providing ways of identifying risk factors so that they can be eliminated or at least reduced. It does this in two stages: identifying hazards or risk factors, and estimating the risk – i.e., the probability of harm occurring and its severity.

If the MSD risk cannot be eliminated, it must be reduced as adequately as the state of the art and technology allows. Because it cannot be eliminated, a residual risk therefore remains which must also be addressed through at least three inseparable stages: applying preventive measures, coordinated information and training for at-risk workers and management, health surveillance for exposed workers.

- **Awareness-raising campaigns**

As these aim to build awareness of the collection of standards and good practices, they require maximum support and involvement by employers, workers, prevention professionals and health and safety enforcement officers. One limitation to this approach is the seeming lack of demand (not to say resistance) from one of the key players – employers – notwithstanding the high cost to business of MSDs.

Many players need to be engaged in the drive to prevent MSDs, including:

- at-risk workers;
- MSDs sufferers still working;
- MSDs sufferers no longer working (temporarily or permanently);
- prevention professionals responsible for educating in prevention, monitoring the health of at-risk workers, risk assessment, devising tailored solutions, monitoring the residual risk, etc.;
- health and safety enforcement officers tasked with enforcing compliance with standards but also facilitating their implementation;
- work system, machinery and tool designers;
- employers who expose workers to risk factors from job tasks, the work environment or work organisation.

The players to mobilise first are the European, national and industry networks of worker and employer organisations, groups of health and safety experts and health and safety enforcement officers. The Bilbao-based European Agency for Safety and Health at Work has a key role in spreading knowledge through its EU-wide network of focal points, which they in turn can cascade on nationally. The ETUI-REHS Health and Safety Department will be the primary organizer of the network of ETUC member union health and safety experts.

Although there is as yet no European network of health and safety enforcement officers, there is already an EU-level Senior Labour Inspectors Committee (SLIC). The key role that health and safety enforcement officers will have to play in the general approach to tackling MSDs makes it essential to train some of them up in identifying MSDs risk factors, evaluating solutions, and basic costing-out.

National organisations of prevention professionals (occupational doctors, hygienists, ergonomists or safety managers) and, for professions

that have one, European federations like the Federation of European Ergonomics Societies (FEES) for ergonomists³², should be used to cascade campaigns to combat MSDs.

• Implementation

This needs to be adapted to each situation (workplace, work station/job, sector of activity, etc.), but is also about ongoing and proactive identification of risk factors. Implementation must be done completely within the spirit of the 1989 framework directive, which puts elimination of risks first, and, only if that cannot be done, systematically looking for the least dangerous alternatives with the abiding focus on workers' health and safety.

In practical terms, this means that any business or institution must:

- take stock of the hazards³³ that workers are exposed to by the work set for them and/or the environment in which they have to do it;
- eliminate risks wherever possible (within the state of knowledge and the art);
- inform them about residual dangers;
- train workers in how to identify and deal with these hazards;
- protect workers (collective or individual means of protection, physical barriers);
- monitor and bear the consequences of exposure to these residual hazards;
- analyse the causes of anything that goes wrong, especially the causes of MSDs, with a view to eliminating or at least minimising them;
- systematically and continuously fine-tune risk management, exposure monitoring³⁴ and prevention systems so as to follow the order of priorities set by the framework directive and:
 - completely eliminate the risk of MSDs: this may often not be feasible,
 - eliminate as many risk factors or hazards as possible,
 - reduce exposures³⁵, etc.

³² www.feese-network.org.

³³ Which may have immediate or long-term consequences, and may be constraints or an absence of constraints (like a series of energy-sapping effects brought on by sedentary work) exerted directly or indirectly on the musculoskeletal system.

³⁴ At the same time keeping track of development in technology and the state of the art that would enable risks to be reduced.

³⁵ Various approaches are possible: decrease exposure duration by job rotation, decrease the range of exposures (repetitions, weights), provide more frequent rest periods (breaks and microbreaks), increase job control, increase the comfort of work (postures, temperatures), etc.

³⁶ A lapse of eight years between exposure to risk factors for carpal tunnel syndrome and its development is not unusual.

• Inspection

The effects of any intervention must be checked and variances from the aim corrected; this also applies to the outcomes of our tactics to combat MSDs: arguably, health and safety enforcement officers are best placed to carry out this kind of control.

But MSDs are supremely complex by nature and because of their multifarious origin. To be effective, therefore, inspection needs to develop new skills in identifying risk factors whose effects may not appear until long after exposure³⁶.

While we are not chiefly concerned here with what difficulties employers may have with risk prevention, the fact that most European firms are small-to-medium or even very small firms (SMEs and VSEs) cannot go ignored. By far most are non-unionised, lacking in preventive skills and have little assistance from external prevention professionals. The level of technical help from ergonomists, doctors and engineers is directly related to volume of business (done by the firm with its prevention consultant) or what is by definition a low workforce size.

But the niche economy in which SMEs and VSEs operate makes the difficulty of solving health and safety issues inversely proportional both to the volume of business done with the prevention professionals and workforce size. If inspectors simply give firms a good or bad report card but leave workers and managers to “muddle through” with their problems, little can be expected of it: the likelihood is that, left to their own devices, employer and employees will let things ride until the next inspection or an accident for which the bill may be picked up by third parties.

We therefore recommend an inspection that goes through three degrees, each tighter than the one before, the last of which is the sanction that the enforcement authority must be able to apply.

The first degree is advice and help in finding a solution. Problem identification also forms part of a preventive approach that is wholly proactive by definition and focused tightly on an ongoing elimination of risk factors. This makes one key role of inspection that of supporting training for workers and businessmen organised by other authorities, starting with education activities targeted on “problem” firms and institutions, sectors or jobs, to explain:

- the causal relationships between risk factors and MSDs;
- ways of identifying these factors;
- the 1989 framework directive’s preventive strategy;
- possible ways of eliminating risk factors or reducing risks, which requires a sound knowledge of the workplace and a good address book.

The second degree is standards enforcement. This also includes giving targeted advice as mentioned above; this is done only in firms found to be flouting standards in the first degree inspection. The third degree of inspection is sanctions, explained in more detail below.

- **Sanctions**

Employers who have received the help and follow-up mentioned above but ignored it or continued offending must have costly, binding sanctions imposed on them. Employers who persist with working conditions that are harmful to workers’ musculoskeletal systems among other things put workers’ health and safety at risk. In other words, they take on themselves the right to penalise workers directly and society as a whole indirectly. It is society, including employers who follow the prevention principles, that ultimately foots the bill for this anti-social and unacceptable misconduct through financing a series of indirect costs.

Essential trade union action

Trade unions have a role all through the implementation of this strategic plan for tackling MSDs. Workers and worker reps are central to prevention at all stages of its development, both as proactive participants in prevention, but also as targets of the lack or failings of prevention. Not all risk factors can be eradicated; unearthing, evaluating, eliminating or lessening them will take time. There will always be a cohort of affected workers of some size. This is why, pending more or less long-term outcomes, the

implementation of any action plan to combat MSDs must focus tightly on three types of key flanking measures: worker participation, ongoing impact assessment of the plan, keeping workers affected by MSDs in and getting them back to work.

- **Worker participation**

Participation by workers in health and safety at work is a requirement of the 1989 framework directive. It has become a human and economic imperative and is not the same as consultation of workers. It can be defined as, “Workers and management collaborating directly and actively on a basis of equality in the life of the undertaking, with sufficient information and ability to establish and maintain optimum conditions of health, safety and well-being for employees and technical and economic health for the undertaking”³⁷. This definition, which emphasises the central role of workers in maintaining their own health and well-being, could be usefully expanded by adding that they are also the only real experts in their MSDs because they alone experience them daily through pain, difficulties and obstacles to be overcome that are imprinted in their musculoskeletal system. But they cannot always describe, identify or associate them specifically with the characteristics of their work: this is why the preventive approach must be not only participative but also comprehensive or integrated and multidisciplinary.

- **Ongoing impact assessment of the plan**

The plan for tackling MSDs is a conceptual model that is expected to deliver future results but is nevertheless based on generalised past realities (like epidemiological observations): these inferences therefore double the risk of not fully delivering the aims set. To have every opportunity of succeeding, the plan to combat MSDs must be adjustable to the realities and circumstances of the time and place where it is implemented; it must be evaluated, and the actions must be continuously re-adjusted to the outcomes.

- **Retention at and return to work of affected workers**

It is essential that workers affected by MSDs be kept in and got back to work. This publication is no place to focus on the developmental qualities of work, the economic and social needs of workers to keep working, or even the demographic imperatives, which have been extensively described by the ETUC and the European authorities³⁸.

What seems more relevant is to offer some suggestions as to how to do it. Canadian experts have produced guidance for an approach based on the finding extensively reported in the research literature that prolonged inactivity holds back the worker’s recovery process and that the probability of returning to work diminishes with the increasing length of the absence³⁹. This makes a strong case for keeping on working. The approach also relies very heavily on screening for risk factors and ergonomically designed work, on which there is a wide consensus among prevention professionals.

³⁷ Taken from the “Sobane” strategy for the prevention of occupational health risks devised by Professor Jacques Malchaire of the Catholic University of Leuven (Belgium). See: www.sobane.be/fr/frame.html

³⁸ See the European Green Paper *Confronting demographic change: a new solidarity between the generations* (downloadable from http://ec.europa.eu/employment_social/news/2005/mar/comm2005-94_en.pdf) and the ETUC resolution on the matter (www.etuc.org/a/1430).

³⁹ Stock, S., et al., *Work-related Musculoskeletal Disorders – Guide and Tools for Modified Work*, IRSST, 2005. www.santepub-mtl.qc.ca.

Women and MSDs: a campaign in the Spanish tourist industry

The hospitality industry employs 50,000 workers in the Balearic Islands, 52% of them women. This accounts for 17% of the employed workforce. Productivity demands in the hospitality industry have been rising sharply for ten years or more at the cost of working conditions, reflected in rising accident and sickness tolls.

With MSDs reaching “epidemic” levels in this sector, the Confederation of Workers’ Committees mounted a training and information campaign eight years ago, in which room cleaning staff were very closely involved.

The vast majority of these staff are women, and are particularly affected by MSDs (low back pain, upper and lower limb MSDs, etc.) often with associated psychological problems leading to many days’ lost work.

The trade union training also brought to light these women’s concerns about their doctors’ reflex responses of prescribing painkillers, a few anti-inflammatories, two or three days off, then back to work.

It also gave them a chance to share their problems, and help free them from the isolation and loneliness

which typifies their work. This enabled them to realise that their problems clearly had nothing to do with hormones or age, as doctors often tended to suggest, but were directly work- and work organisation-related.

The health impacts of organisational factors in the hospitality industry are clear from just some of the complaints: 22 rooms per worker to be cleaned, no breaks, casual jobs, no ergonomic design requirements (furniture designed with foreign customers in mind, poorly-designed work equipment, etc.).

“The information collected from workers and the cost of sickness gave us ammunition to prove the need for a proper, across-the-board evaluation of working conditions. This provided the basis for preventive action (...) We are keeping on at the preventive services to use the data supplied by workers. We are keeping up pressure on the employer to recruit prevention personnel”, concludes the campaign officer.

Taken from the special report “Women, work and health” published in *TUTB Newsletter* No. 13, March 2000, p. 23. Downloadable from <http://hesa.etui-rehs.org> > Newsletter.

Finally, the approach proposes a structured, four-stage approach towards returning to normal work:

- identification of the affected body part;
- task selection or modification;
- evaluation of the selected tasks: estimate of the physical demands using a checklist form and task assignment;
- periodic follow-up and evaluation of home confinement until such time as the worker can resume normal work fully or with restrictions.

The authors offer practical ways of adapting work (working methods, job task reorganisation, working hours, adaptations to tools and equipment), but also emphasise the need for worthwhile and productive tasks.

Clearly, the success of such a retention and return scheme depends on a series of conditions, and these are set down in a work programme managed by a committee by reference to the worker’s and employer’s needs, and especially human resource management, company and external prevention professionals, the workers and their representatives.

6. Conclusions

The fourth European study on living and working conditions has produced depressing findings: they suggest that little or nothing has been done in the past 20 years to prevent MSDs, which remain “the most often reported health symptoms” of European workers.

But we know full well that directives are in place and have been implemented into national law in most Member States, that campaigns focused on MSDs and backache have been run in different countries involving occupational health services and health and safety inspectors, and that some employers have tried to reduce job tasks likely to produce MSDs.

So what has gone wrong? Have all these resources been poured down the drain? Why so much pain and so few good results?

The causal relationship between biomechanical strains and musculoskeletal system disorders is now well-known and extensively reported in many highly-reputed independent scientific peer-reviewed publications. The European preventive strategy based on the 1989 framework directive can no longer go ignored for it is a sensible and efficient edict: first, identify and eliminate the risk factors. If that is not possible, reduce the effects as far as possible in the light of the state of knowledge and the means available.

The scientific literature bears out and explains what workers already know from daily experience and what has been written in pain since the dawn of time in the memory of their aching joints and muscles. No sliver of a doubt now remains about the harmful effects of unceasingly repeated motions, or postures and motions at the extreme limits of ranges of motion, disregard for natural patterns of motion in the interface between the human being and a machine where no axis is ever wholly in line with physiology, the loads placed on joints during manual handling operations that involve lifting, holding, pushing or pulling, etc. It is well-known that the jobs most exposed to these physical strains are also those in which they accumulate and are compounded by other external stresses like atmospheric constraints, hygiene and public health standards. These result in impaired health for operators compelled to work in cold temperatures, for example, to meet HACCP-type standards (cold chain) or in dangerous and unhealthy conditions sorting the tons of waste and unnecessary packaging produced by society.

On top of all that, we are now discovering that workers with no exposure to biomechanical risks have also developed MSDs. Seated in a purpose-designed, climate-controlled environment and using increasingly sophisticated computers, and underexposed to biomechanical risk factors, these workers are all-but completely stationary. Taken together with the preceding observations, this suggests that the laws of the living are often U-shaped, possibly a bell curve, with a neutral zone between the endpoints where things are more or less in balance, and where either side of a maximum and minimum, things are utterly out of kilter. This reinforces the earlier claim about the central tenet of the ergonomic approach: that the work situation must be looked in the round. Not just the mechanical aspects, but also other kinds of workload – be it organisational, mental, social, emotional or other – must be taken into account as all these factors can induce work-related stress. And work-related stress in turn can bring on MSDs, as has been extensively described and reported in the scientific literature.

Is it all too complex? Unmanageable? Absolutely not. Society is extraordinarily complex, so too are the technologies used and work systems. Is it surprising, therefore, that human beings should react in tune with the new constraints and fast-paced changes that they themselves impose on their own universe as instigator (fairly uncommon), or that are imposed to them as operator?

The social, political and economic actors must join forces in a merciless tactical war on the risk factors of MSDs to tackle what is now a recognised pandemic. Putting things off is no longer an option: the businesses that care least about the work environment, and are the biggest creators of MSD victims in the European Union, rake in unacceptable profits at the expense of afflicted workers and firms that observe the law by making the necessary investments in risk factor filtering, human resources and equipment to lighten workloads. These uncaring firms leave society as a whole to foot the bill for their negligence in the form of pain, overcrowding of care and surgical units that have other more pressing concerns than the by-products of inadmissible practices. We argue that pain and suffering are no part of work, which must remain a means for achieving personal well-being and development.

It is European society as a whole that pays the cost of work incapacities, the resulting unemployment benefits, and the unacceptable waste for a Europe that aims to be the most dynamic area in the world. The demographic challenge is steadily forcing us to keep working well beyond the age of 60. So these workers must remain mobile and active, productive and inventive. Unlimited attention is needed to keep a living organism subjected to so many exposures of varying degrees of danger over 40 or more years of working life in peak condition – i.e., healthy! The intrinsic value of each individual who contributes to so developing society is immeasurable: how, then, can some still have the audacity to doubt it to the point of disregarding their workers' health in favour of spending on programmes of preventive maintenance for machinery that can run for months without being serviced or re-jigged?

This page of Europe's economic history must be turned: we can no longer afford the luxury of putting matters off, it will not be acceptable to read again in five years' time that the toll of MSDs is still as high when others – the United States or Canada, for example – are reaping the first rewards of more proactive approaches.

What is needed, therefore, is a real declaration of war on the risk factors of MSDs, based on a five-stage approach in the form of a pyramid, whose base is a set of laws, standards and good practices, and whose apex is enforcement through sanctions (see preceding chapter). This final stage is one that should hopefully never be attained, for with good will, and a coordinated tactical deployment of the technical, scientific and human resources, the battles could be won on each front, be it mechanical, organisational or other.

Not to invest in prevention, not to join in this united front against MSDs, not to invest in well-being at work and the promotion of healthy workplaces is at once obscene, amoral, economically irresponsible and unacceptable in public health terms.

Organisations that flout the principles of corporate social responsibility⁴⁰, and those which despite receiving help and warnings refuse to follow the rules of existing good practice and law must be named, shamed and sanctioned. By contrast, firms that have made the search for original and inventive solutions a central point of management, and have involved workers, experts and health and safety inspectors in designing work systems should be celebrated and supported.

The issue of MSDs is such that it demands absolute priority now and an acceptance of shared responsibilities at all levels of European society.

⁴⁰ On which, see: [www.etuc.org/a/494?var_recherche="+RSE](http://www.etuc.org/a/494?var_recherche=).

Bibliography

General

- Rose, M., *The mind at work. Valuing the intelligence of the American worker*, Viking Penguin, 2004, 288 p.
- “Lighten the Load” campaign run by the European Agency for Safety and Health at Work, Bilbao, <http://ew2007.osha.europa.eu>.
- European Foundation for the Improvement of Living and Working Conditions, Dublin, www.eurofound.europa.eu/bysubject/index.htm. See also: 4th European Working Conditions Surveys (2005), www.eurofound.europa.eu/ewco/surveys/EWCS2005/index.htm.
- ILO Encyclopedia of Occupational Health and Safety (Part 1 – The Body – Musculoskeletal System), www.ilocis.org/en/contilo.html.
- Health & Safety Executive (HSE) campaign, www.hse.gov.uk/msd/index.htm?ebul=hsegen/19-feb-07&cr=2.
- European legal requirements relating to work-related musculoskeletal disorders (MSDs), <http://disability.osha.eu.int/publications/e-facts/efact11>.

Movements and motions

- Bourgeois, F., Hubault, F., Prévenir les TMS. De la biomécanique à la revalorisation du travail, l'analyse du geste dans toutes ses dimensions, @ctivités, revue électronique: www.activites.org/v2n1/bourgeois.pdf.
- Franchi, P., Polin, A., Bourgeois, F., L'organisation et les TMS : quels liens, quels moyens d'action ?, *Sécurité et Médecine du Travail*, n° 117, Paris, 1998, p. 20-24.
- Bourgeois, F., et al., *Troubles musculosquelettiques et travail : quand la santé interroge l'organisation*, ANACT, Lyon, 2000, 252 p.

Back

- NIOSH equation, guide, www.cdc.gov/niosh/94-110.html.
- Assessment tools, Washington State Department of Labor and Industries (resources site), www.lni.wa.gov/Safety/Topics/Ergonomics/Services-Resources/Tools/default.asp.
- European Guidelines for Prevention in Low Back Pain (November 2004), www.backpaineurope.org.

Lower extremities

- Blanchemaison, P., Les facteurs de risque veineux, www.phlebologie.com/fr/html/bref/2000/3-2000.html.
- Allaert, F.A., et al., Évaluation du retentissement social et économique des troubles d'origine veineuse, www.angiologie.fr/doc/retentissement.doc.
- Messing, K., et al., La souffrance inutile : la posture debout statique dans les emplois de service, *Travail, Genre et Sociétés*, n° 12, November 2004, 28 p. www.cinbiose.uqam.ca/depot_fichier/Publications/messing/souffrance%20inutile.pdf.
- Carolyn Neuhoff – Preventing Foot Pain in the Work Force, www.occupational-hazards.com/News/Article/36713/ArticleDraw.aspx.
- Cinbiose Research Center, University of Quebec, Montreal – Women's Health at Work and Musculoskeletal Disorders, www.cwhn.ca/resources/workplace/msd.html.

Upper extremities

- Malchaire, J., et al., Review of the factors associated with musculoskeletal problems in epidemiological studies, *International Archives of Occupational Environmental Health*, 2004, 74, p. 79-90, www.md.ucl.ac.be/hytr/new/Publications/resumes/review%20factors%20MSD%20JM.pdf.
- Kinderberg, U., et al., *Workrelated? Neck – shoulder – arm disorders. A help for non-medical professionals in occupational safety and health to identify possible workplace*, Report No. 2:2006, SALTSA.

Vibration

- EU Good Practice Guide, *Whole-Body Vibration*, 12 June 2006, 65 p. www.humanvibration.com/EU/VIBGUIDE/WBV%20Good%20practice%20Guide%20v6.7g%20English%20070606.pdf.
- EU Good Practice Guide, *Hand-Arm Vibration*, 12 June 2006, 61 p. www.humanvibration.com/EU/VIBGUIDE/HAV%20Good%20practice%20Guide%20v7.7%20English%20260506.pdf.

Demography, ageing workforce

- European Commission Employment, Social Affairs and Gender Equality site: http://ec.europa.eu/employment_social/emplweb/news/news_fr.cfm?id=183.
- *Les évolutions de la santé au cours de la vie professionnelle : altération, préservation, construction*, Actes du séminaire Vieillesse et Travail, CRÉAPT-EPHE, October 2005, 198 p.

Economic aspects

- Cost of absenteeism to Volvo (academic thesis in Swedish), www.handels.gu.se/epc/archive/00003354/01/03-04-14D.pdf.
- Conne-Perréard, E., et al., *Effets de conditions de travail défavorables sur la santé des travailleurs et leurs conséquences économiques*, Conférence romande et tessinoise des offices cantonaux de protection des travailleurs, Geneva, 2001.

- Zwinkels, W., Improvement of working Conditions. Methodology for cost-benefit analysis of occupational health and safety, Brussels, 20-21 November 2006, http://ec.europa.eu/employment_social/work_conditions/docs/zwinkels_en.pdf.
- Punnett, L., et al., Estimating the global burden of low back pain attributable to combined occupational exposures, www.who.int/quantifying_ehimpacts/global/5lowbackpain.pdf.
- Brenner, M.D., et al., "Flexible" Work Practices and Occupational Safety and Health: Exploring the Relationship Between Cumulative Trauma Disorders and Workplace Transformation, Political Economy Research Institute, University of Massachusetts, 2002.

Stress and MSD

- Devereux, J., et al., The role of stress and psychological factors in the development of musculoskeletal disorders, HSE books, 2004.
- "Job strain model" by Robert Karasek, www.workhealth.org/strain/briefintro.html.
- Larsman, P., On the relation between psychosocial work environment and musculoskeletal symptoms – A structural equation modelling approach, National Institute for Working Life, Sweden, Report No. 2006:2.
- Lindegård Andersson, A., Associations between working techniques, physical loads and psychosocial loads during vdu-work, National Institute for Working Life, Sweden, Report No. 2004:5.
- Wiholm, C., *Advanced Knowledge Work and Stress-related Symptoms*, Uppsala Universitet, 2006, 54 p. www.diva-portal.org/diva/getDocument?urn_nbn_se_uu_diva-6549-1__fulltext.pdf.

Gender and MSD

- "A call to action: Women's health at work & MSD": www.cwhn.ca/resources/workplace/msd.html.

Return to work

- Stock, S., et al., *Guide and tools for modified work* (in French only – title and summary in English), Direction de santé publique, Montreal, 2005.

Bibliographies, databases, meta-studies

- Waterloo University, Center of research for the prevention of MSD : http://cre-msd.uwaterloo.ca/kn_jarticles.html.
- Veiersted, K.B., et al., A critical review of evidence for a causal relationship between computer work and musculoskeletal disorders with physical findings of the neck and upper extremity, National Institute of Occupational Health, Oslo, January 2006.
- Denis, D., et al., Les pratiques d'intervention portant sur la prévention des TMS : un bilan critique de la littérature, Rapport IRSST, avril 2005. www.irsst.qc.ca.
- Crawford, J.O., et al., *The Prevention of MSDs within the Telecommunications sector. A Systematic Review of the Scientific Literature*, Institute of Occupational and Environmental Medicine, University of Birmingham, 91 p. www.msdonline.org/docs/pdf/The_Prevention_of_Musculoskeletal_Disorders.pdf.

Trade union publications and data

- ETUI-REHS, Health and Safety Department: <http://hesa.etui-rehs.org/uk> > Main topics > MSD.
- CSC (Belgium), *Troubles Musculosquelettiques. Mécanique fragile*, 89 p. http://csc-lg-h-w.csc-en-ligne.be/Services_en_ligne/Brochures/brochures_telecharger/telecharger.asp.
- FGTB (Belgium) : www.abvv.be/code/fr/fram012.htm (type TMS into the site search box to get the detailed report).
- SALTSA (Sweden), *Work-related? Neck, shoulder, arm disorders*, Report No. 2:2006, the National Institute for Working Life and Swedish Trade Unions in Co-operation.
- TUC (United Kingdom), *Back Strain, Manual Handling, Repetitive Strain Injuries*. www.tuc.org.uk/h_and_s/index.cfm?mins=264.
- AMICUS (United Kingdom), *Musculoskeletal Disorder, Repetitive Strain Injury, Upper Limb Disorder, Work-Related Upper Limb Disorder*. www.amicustheunion.org/Default.aspx?page=3884.
- Collaboration Euro-safe, universities and GWU (Malta), CGIL (Italy), GMB (GB) et al., *RSI. A Training Manual* (brochure) and *RSI. Raising Awareness through Education* (DVD), 2005.
- CGIL (Italy), *RSI among sewing machine operators. An Italian survey*, 2003.
- SIF (Sweden), *Så här förebygger du belastningsbesvär*, 2007. See also: https://www.sif.se/Templates/Article____279.aspx.
- ISTAS – CC.OO (Espagne), *Salud laboral – Esfuerzo físico y postural*: www.istas.net/web/index.asp?idpagina=196&Origen_Menu=cab_sl. *Prevención de lesiones músculo-esqueléticas de origen laboral – catálogo de soluciones prácticas*: www.istas.net/sl/rs/rso03.htm.
- EU Social Partners, *Telecom Industry* : www.msdonline.org

Appendices

Appendix 1

MSDs typified by anatomical structure or type of injury

	Tendon-related disorders	Nerve-related disorders	Muscle-related disorders
Neck	<ul style="list-style-type: none"> • Tendinitis, peritendinitis, tenosynovitis, synovitis 	<ul style="list-style-type: none"> • Tunnel/canal syndromes: <ul style="list-style-type: none"> - carpal tunnel - cubital tunnel - Guyon canal - radial tunnel 	<ul style="list-style-type: none"> • Tension neck syndrome • Muscle sprain and strain • Myalgia, myositis
Shoulders	<ul style="list-style-type: none"> • Epicondylitis 	<ul style="list-style-type: none"> • Pronator teres syndrome 	
Upper extremities	<ul style="list-style-type: none"> • De Quervain's disease • Dupuytren's contracture • Trigger finger • Ganglion cyst 	<ul style="list-style-type: none"> • Thoracic outlet syndrome • Cervical syndrome • Digital neuritis • Neuralgia 	
Trunk			
Thoracolumbar spine	<ul style="list-style-type: none"> • Tendinitis, peritendinitis, tenosynovitis, synovitis 	<ul style="list-style-type: none"> • Neuralgia • Sciatica 	<ul style="list-style-type: none"> • Muscle sprain and strain • Myalgia, myositis
Lower extremities	<ul style="list-style-type: none"> • Tendinitis, peritendinitis, tenosynovitis, synovitis 	<ul style="list-style-type: none"> • Tarsal tunnel syndrome (foot) • Morton's metatarsalgia (tiler, electrician) 	<ul style="list-style-type: none"> • Muscle sprain and strain • Myalgia, myositis

	Circulatory/vascular-type disorders	Joint-related disorders	Bursa-related disorders
Neck			
Shoulders	<ul style="list-style-type: none"> • Hypothenar hammer syndrome 	<ul style="list-style-type: none"> • Osteoarthritis 	<ul style="list-style-type: none"> • Bursitis
Upper extremities	<ul style="list-style-type: none"> • Raynaud's syndrome 		
Trunk			
Thoracolumbar spine		<ul style="list-style-type: none"> • Osteoarthritis 	
Lower extremities	<ul style="list-style-type: none"> • Varicose veins 	<ul style="list-style-type: none"> • Osteoarthritis 	

Source: Peter Buckle and Jason Devereux categorised upper limb and neck MSD by type of disorder in a table, reproduced here slightly modified and with thoracolumbar spine and lower extremity disorders included. See: Buckle, P., *et al.*, *Work-related Neck and Upper Limb Musculoskeletal Disorders*, European Agency for Safety and Health at Work, 1999. <http://agency.osha.eu.int/publications/reports/201/en/index.htm>

Appendix 2

ETUC's response to proposals made in the second stage of the consultation with social partners on work-related musculoskeletal disorders

1. Introduction

ETUC shares the European Commission's opinion that the many initiatives concerning musculoskeletal disorders (MSDs) taken since the 1980s have been short on results and that such medical conditions are steadily becoming more frequent.

The Commission's document:

- puts musculoskeletal disorders back in the contexts of the physiology of the locomotor system, the pathomechanics of the workplace and the contribution of non-mechanical risk factors – such as stress factors – which has now been scientifically demonstrated;
- reiterates the existence of legislative instruments;
- clearly recognises the lacunae in these instruments and their weaknesses, specifically referring to the Manual Handling of Loads Directive and the Display Screen Directive, which need to be fundamentally rewritten;
- thus highlights the inadequacy of these two directives;
- recommends the additional use of other, non-legislative instruments to meet the intended objectives;
- confronts the Member States and companies with their responsibility to implement legislation.

In response, ETUC unequivocally reiterates its demand for a directive aimed at preventing MSDs, because it maintains that MSDs are the most common health-related problem reported by staff and the main reason for absenteeism and compensation payable by the Member States, and also points out that statutory measures have led to progress in the area of accidents at work. Future negotiations will only be possible if they are based on the new “anti-MSDs” directive.

2. Content

For the Member States and companies, the directive demanded by ETUC will serve as an instrument aimed exclusively at triggering actions designed to combat MSDs. To achieve this, the directive in question will:

- specifically focus on MSDs, complementing but not replicating the instruments already in place;
- be consistent with the central objective of reducing the incidence of MSDs in Europe;
- be consistent with prevention of MSDs, from the design of working instruments and systems to their daily use, via the rigorous application and monitoring of the ergonomics principles;
- be based on the existing preventive mechanisms and reference frameworks provided by:
 - the Framework Directive 89/391,

- the annexes to Directives 90/269 and 90/270, referred to below as the Manual Handling Directive and Display Screen Directive;
- be binding with respect to screening the risk of MSDs, which provides a solid basis for working towards the systematic elimination of risk factors;
- be binding with respect to reducing the risk of MSDs if the systematic elimination of risk factors cannot be achieved;
- be binding with regard to keeping victims in work or reintegrating them into the labour market and providing compensation for the harm or injury caused;
- be rigorous in terms of recording MSDs and their epidemiological follow-up.

The new directive must result from blending together and elaborating existing instruments, especially the Manual Handling Directive and Display Screen Directive, though it will have to go beyond codifying these two documents. ETUC has already highlighted the lacunae and imprecisions in these documents. Nonetheless, those same documents do include mechanisms that ought not to be ignored, which is why the new directive could take the form of:

- an anti-MSD framework that would cover the principles to apply bearing in mind the risk of MSDs, eliminate the exposed lacunae, clarify the objectives and ensure the rigorous epidemiological follow-up of MSDs in the European Union; and
- annexes that would include the Manual Handling Directive and Display Screen Directive, among other documents.

The anti-MSD directive must benefit from the enrichment of existing documents. At the same time, their usability needs to be improved by avoiding ambiguities and imprecisions.

ETUC emphasises the need for consistent simplification in the approach to be taken within a **framework designed to cover all work situations** that are potentially dangerous.

Risk factors to consider

Biomechanical aspects are not the only MSD risk factors, so only bearing them in mind may prompt numerous errors in assessing the risk and thus lead to inappropriate strategies to implement with a view to the primary prevention of MSDs and the redesigning of workspaces, environments and also tasks associated with MSDs.

The biomechanical work-related parameters and their undesirable effects are a result of the work to be done and its context, i.e. the work that is required and actually done and the environment provided for its completion (tools and equipment, methods, work organisation and other working conditions).

For ergonomists, the discrepancies between **the work required and the work actually done create tensions** that reflect some basic dysfunctions that are often an underlying cause of MSDs. This is why it is essential for the various parties involved to screen these tensions or

contradictions, which are sometimes subtle but can have severe consequences. A comprehensive, no-holds-barred evaluation of all the risk factors including those imposed by work organisation is also crucial.

- **Main categories of biomechanical factors**

There are four known, identified biomechanical factors, which call for a systematic approach. They are characterised by magnitude and amplitude (e.g. the number of kilos or degrees of the angle involved), the number of repetitions and the duration of a worker's exposure to the constraint. Vibrations are already covered by their own specific directive. The screening of risk factors will always accompany an attempt to eliminate them. If risk factors cannot be eliminated altogether, it is vital to cut them out or curb their effects as far as possible and to accompany such efforts with a raft of other measures (information, training, re-evaluation, and so on). The table below sums up the biomechanical factors¹ and characteristics that need to be studied.

	Amplitude/Magnitude	Repetitiveness	Duration
Force Posture Movement Vibration	Force applied or undergone, angular amplitude (range), velocity, acceleration	Frequency of exposure to constraint(s)	Duration of exposure to constraint(s)

- **Other key factors**

- The impact of mechanical factors on living tissue – in this case human tissue – affects people in the workplace: their anthropometric characteristics vary because the European Union supports freedom of movement and labour and human activities are becoming more and more susceptible to globalisation.
- There is a broad scientific consensus^{2,3} shared also by other social partners⁴ that biomechanical constraints cause MSDs but that they are no longer sufficient by themselves to account for MSDs in the workplace. It is absolutely essential to investigate other constraints in the workplace if we are to make an effective contribution towards reducing the risk by attacking the probable causes:

- work content;
- work organisation;
- physical environment;
- psychosocial environment;
- sensory and emotional constraints.

ETUC, like the scientific community, cannot dodge these issues, so it is reiterating their importance and warning the Commission and the other social partners about the risks of omitting something that would inevitably result in the failure of the new measures.

Quantification

As indicated above, a number of simple parameters can be measured, and user-friendly screening charts have already been devised. These should

¹ Postures are static; movements are dynamic; the extreme angles involved in certain movements cause many problems.

² P. Larsing, On the relation between psychosocial work environment and musculoskeletal symptoms, Göteborg University, Department of Psychology.

³ W. Marras, State-of-the-art research perspectives on musculoskeletal disorder causation and control: the need for an intergraded understanding of risk, *Journal of Electromyography and Kinesiology* 14 (2004) 1–5.

⁴ P. Levy (UNICE) http://osha.europa.eu/publications/conference/20001127/index_7.htm.

be included in an annex to the directive, as should the texts of the old Manual Handling Directive and Display Screen Directive. The new directive shall foresee the specification of limit values for measurable factors.

Complementary measures

If risk factors cannot be eliminated, the directive will impose measures that aim to reduce the risk to a minimum, which will always need to be accompanied by complementary measures, such as information and training for staff, ways of protecting and monitoring the health of the exposed workers and regular updates on the risk situation in line with the latest findings.

In order to ensure an effective control of MSDs, additional measures with the aim of training employers and managers are necessary.

Measures to provide for

Description of tasks (activities)



Description of constraints and their physiological costs



Evaluation of the risk of MSDs based on work-related constraints



Taking measures in stages: investigation – action

Reference frameworks

- **Statutory**

All directives including the future anti-MSD directive created by merging and improving the Manual Handling Directive and Display Screen Directive, the Vibrations Directive and the Framework Directive on health and safety at work.

- **Non-statutory**

Guides and other means of conveying the statutory reference framework in an attractive, user-friendly format. Possible examples include general or sector-specific documents for use by all stakeholders, or more specifically for workers and very small businesses or for health and safety officers and inspectors.

3. Conclusion

ETUC's response is very clear. Firstly, we are calling on the Commission to launch an initiative based on Article 138 paragraph 3 of the Treaty establishing the European Community. Secondly, we are demanding that this initiative take the form of a brand new anti-MSD directive based on the principles of prevention as described in Framework Directive 89/391/EEC on health and safety at work and incorporating the Manual Handling Directive and Display Screen Directive. The future anti-MSD directive will set out to trigger specific initiatives designed to rule out MSD risk factors right from the outset. The directive must provide for victims of MSDs to keep on working or be reintegrated into working life and be given compensation.

Until the anti-MSD directive demanded has come into effect ETUC does not wish to commit itself to negotiations with the other social partners on the basis of Article 139 of the Treaty establishing the European Community.

At the same time, ETUC would like to see the Commission's initiative be complemented by instruments that enable the MSD epidemic in Europe to be recorded and monitored. Naturally, this will necessitate an unambiguous definition of MSDs in the future directive.

3 May 2007

© European Trade Union Institute
for Research, Education, **Health and Safety**, aisbl
2007

ISBN: 978-2-87452-100-3

D/2007/10.574/29

Graphic design: Coast

Printed in Belgium

Cover photo: © Savvas Lazaridis, lazaridis@ath.forthnet.gr



The ETUI-REHS is financially supported by the European Community.
The European Community is not responsible for any use made of
the information contained in this publication.