Fit For Work?

Musculoskeletal Disorders and the French Labour Market

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1. Executive summary

The economic downturn is hitting France hard. The consequences for the French labour market have been especially difficult, partly because of the speed with which unemployment has risen, with all its individual, social and economic ramifications. The health of French workers is also giving serious cause for concern. A high percentage of the workforce is not healthy enough to drive the improvements in productivity which France needs to compete in an increasingly globalised, knowledge-based economy when the up-turn comes. There is also overwhelming evidence that worklessness is, itself, bad for health and that job retention and rehabilitation back into work can positively affect physical health, psychological well-being and raise people out of poverty.

Of all the causes of work-related ill-health, musculoskeletal disorders (MSDs) such as back pain, arm or neck strains or diseases of the joints, accounted for more than 34,000 cases and were compensated for by the Caisse Nationale d'Assurance Maladie des Travailleurs Salariés in 2007. In the same year, more than 7 million days of work were lost through MSDs, causing a cost to society of more than 736 million euros. By the same token, chronic musculoskeletal conditions such as rheumatoid arthritis (RA) and spondyloarthropathies (SpAs) affect 2.6 per cent of patients with a long term disease. The cost to society of RA and ankylosing spondylitis (AS) – a subgroup of SpAs – has been estimated to be between 9,400 and 40,700 euros per patient per year (according to the severity of the condition) for RA, and 5,828 euros per patient per year for AS.

The 'Fit for Work?' project

This project, part of a wider programme of work across 24 European and other countries, has looked in some detail at the impact that MSDs have on the working lives of thousands of French workers, the adequacy of the treatment and support they receive, their experiences at work, the effect of their condition on their family and colleagues, and the human and financial costs involved. Specifically, we have looked at back pain, work-related upper limb disorders (WRULDs) – two groups of conditions which are usually characterised by non-specific and short episodes of pain and incapacity – and RA and SpAs, specific conditions that are often progressive and increasingly incapacitating. We conducted a review of the recent academic and practitioner research on the relationship between these MSDs and labour market participation, and conducted interviews with acknowledged experts in this field.

The Impact of MSDs on the French workforce

MSDs have a significant impact on people's ability to work; not only on an individual but an aggregate basis. Together, they affect the productivity and labour market participation of thousands of French workers. Evidence suggests that:

- About 22 per cent of French workers report work-related back pain; in general women experience back pain more often and more severely than men, and back pain has a strong impact on the working life of people in terms of early retirement and sick leave.
- Nearly a fifth of French workers experience muscular pain in their neck, shoulders and upper limbs. WRULDs are the first cause of occupational illness in France, and their prevalence increases with the increasing age of the workforce, and among blue collar workers.
- Prevalence of RA among the French population has been estimated to vary between 0.31 and 0.62 per cent. RA shortens life expectancy by around six to ten years, and more than one third of patients experience RA in its severe form. This causes an increased use of health care resources and early retirement in 34 per cent of cases thus increasing the burden of RA to individuals, their families and society.
- Prevalence of SpAs in France is reported to be 0.30 per cent. AS, the most studied subgroup of SpAs, has a prevalence of 0.1-0.2 per cent, with a 3:1 to 2:1 male:female ratio. Employment rate among French people with AS is 72 per cent, and AS accounts for six days of sick leave on average.

The effects of incapacity and pain from these and other MSDs can impact on several aspects of an individual's performance at work, including:

- Stamina;
- Cognitive capacity or concentration;
- Rationality/mood;
- Mobility;
- Agility.

It is becoming clearer that people with MSDs are also likely to have depression or anxiety problems related to their conditions. This can affect the severity of the condition, the ability of the individual to remain in work, the length of time they spend away from work and the ease with which they can be rehabilitated. Research suggests that a significant proportion of general practitioners (GPs), employers and even individuals with MSDs do not fully appreciate the impact of 'stress' on the severity of physical incapacity. The **biopsychosocial model** of health emphasises the interplay between the **biological** (eg disease, strain, joint damage), the **psychological** (eg disposition, anxiety) and the **social** (eg work demands, family support) and represents a helpful way of assessing the causes of some MSDs, of planning treatment and management and of approaching rehabilitation into the work-place. It is not being adopted as

widely as it should, however, because many GPs and employers find it difficult to look beyond the immediate physical symptoms.

Work can be both cause and cure. Whilst the physical conditions of work may cause or aggravate musculoskeletal symptoms, the impact or outcome on sufferers (absence from work and disability) is strongly associated with psychosocial factors. Evidence suggests that work can help ameliorate the deterioration of many conditions and help recovery from MSDs. However, many GPs and employers mistakenly believe that workers with MSDs must be 100 per cent well before any return to work can be contemplated.

Looking to the future, with prospects for an ageing workforce, a growth in obesity, a reduction in exercise and physical activity and overall fitness in the general population, it is likely that the incidence and effects of MSDs will intensify and worsen rather than improve in the medium-to-long term. We are concerned that this will affect the quality of working life of many French workers, and that the productive capacity of the French workforce will be adversely affected at a time when we need it to be on top form.

What can be done?

There are five main principles which GPs, employers, employees and the government should focus on if we are to improve the working lives of workers with MSDs.

- **Early intervention is essential**. Carefully consider the direct, indirect and total costs of MSDs to French society. The overwhelming evidence is that long periods away from work are usually bad for MSD patients – the longer they are away from work, the more difficult it is for them to return. Investing resources in prevention and early intervention will help to greatly reduce societal costs of these conditions. Ensure that availability and consumption of health care services is the same across all regions.
- **Focus on capacity not incapacity**. Employers and employees can ‘catastrophise’ MSDs, imagining their effects to be far more serious or insurmountable than is strictly the case. Most workers with MSDs can continue to make a great contribution at work if they are allowed to. They do not need to be 100 per cent fit to return to work – a little lateral thinking will allow mangers to give them useful work to do that supports them on their journey back to full productive capacity. For example, if GPs were asked to issue a ‘Fit Note’ rather than a ‘Sick Note’ then it would be clearer what the worker was still able to do at work. This approach is being introduced in the UK, and should be considered in France too.

- **Review the definition of MSDs in the current classification of occupational diseases beyond their current narrow focus**. In addition, formally ackowledge that many MSDs and other chronic conditions (such as RA, SpAs and multiple sclerosis) are not caused by work but may inhibit participation at work.
- **Imaginative job design is the key to rehabilitation**. Managers can change the ways work is organised (including simple changes to physical layout or to working time arrangements) to help prevent MSDs getting worse and to help people with MSDs to stay in, or return to, work. They need to do this in a way which preserves job quality, avoids excessive or damaging job demands and takes heed of ergonomic good practice.
- **Think beyond the physical symptoms**. Clinicians should bring to bear their understanding of the biopsychosocial model and the limitations of the biomedical model in their diagnosis and treatment of the patient and – most importantly – their assessment of the role that a job might play in helping someone to stay active and avoid isolation. GPs are ideally placed to identify the early presentation of many MSDs. Where appropriate, GPs should seek to refer patients to specialist teams as early as practicable, to enable management of the condition to begin.

The evidence presented in this report illustrates that a large proportion of working age people in France are, or will be, directly affected by musculoskeletal conditions (MSDs) in the coming years. This can have very significant social and economic consequences for these individuals and their families, it can impede the productive capacity of the total workforce and parts of French industry, and it can draw heavily on the resources of both the health system and the benefits regime.

We have found important clinical, epidemiological, psychological and economic evidence and expert opinion on the nature, extent and consequences of the MSD problem in France. However, there still seems to be a lack of coherence or 'joined-up' thinking and action which focuses on the MSD **patient as worker**. While the number of advocates of the biopsychosocial model as it applies to all MSDs is growing, we noted that some of those who can have most impact on fulfilling the labour market participation of workers with MSDs have yet to embrace its principles as fully as they might.

2. Introduction

2.1 Why is workforce health in France important?

The global financial crisis is not sparing the French economy, which is currently facing a deep recession. According to the OECD (2009), after a clear drop in the fourth quarter of 2008 economic activity will most likely continue to contract throughout this year. Recent figures from the Ministry of the Economy, Industry and Employment forecasts a global state budget deficit of about 52 billion euro in 2009; total expenditure comes to almost 278.5 billion euro, 44 billion of which is to manage public debt and 120 billion for the payroll. With a high level of expenditure in social protection (in 2006, total expenditure was equal to 31.1 per cent of the GDP[1]), high expenditure on health (in 2006, 11 per cent of the GDP[2]) and unemployment rate being as high as 7.8 per cent in 2008 (versus 7.0 per cent in EU27), the heath and wellbeing of French workforce plays a critical role in France's ability to recover.

Improving the health and wellbeing of the workforce means reducing health expenditure without compromising people's right of access to health care services and treatments as formulated by the European Charter of Patients' Rights.[3] It also means reducing social expenditure for compensating occupational illness, improving labour productivity, enhancing the competitiveness of private and public sector employing organisations, avoiding loss of employees' experience, and reducing costs in hiring and training new employees. Of course facilitating access to work for people affected by ill-health or chronic disease is a necessary and further requirement to provide new dynamism to a stagnant economy.

Available figures on the state of health of the French population show that:

- In 2006, out of an estimated active population of 19.9 million people, 75,000 people received a disability benefit. The main causes of invalidity were mental (28.1 per cent) and osteoarticular (23.8 per cent) diseases, and tumours (13.2 per cent).[4]
- In 1998-1999, 15 per cent of those with a disability were either unable to work, or had to leave work or had to modify the working conditions due to their disability.[5]
- The majority of unemployed disabled people are aged between 30 and 44 years (European Centre for Social Welfare, Policy and Research, 2008).
- A person with a chronic condition is four times more likely to be excluded by the labour market because of unemployment or disability.[6]

[1] http://epp.eurostat.ec.europa.eu/guip/introAction.do?profile=cpro&theme=eurind&lang=en
[2] http://ocde.p4.siteinternet.com/publications/doifiles/302009011P1T110.xls
[3] http://www.activecitizenship.net/images/stories/media/EuropeanCharter/carta_ing_def.pdf
[4] http://www.ameli.fr/fileadmin/user_upload/documents/Points_de_repere_n__16.pdf
[5] http://www.insee.fr
[6] See Footnote 4

- In 2006, more than 800,000 people received a disability allowance and more than 110,000 received an additional invalidity allowance.[7]
- Social protection benefits due to disability represented 6.6 per cent of total benefits in 2007, a proportion slightly higher than in 2006 and 2005 (6.5 per cent and 6.4 per cent respectively). Their share of GDP rose from 1.73 per cent in 1990 to 1.75 per cent in 2000 and 1.91 per cent in 2007 (Bourgeois and Duée, 2009).
- The percentage of people with chronic osteoarticular conditions such as rheumatoid arthritis (RA) and spondyloarthropathies (SpAs) who receive a disability benefit, increased from 10.1 per cent to 17.1 per cent after three and ten years respectively from onset of RA. For SpA, this percentage increases from 8 to 12.5 per cent.[8]
- In 2004, patients with RA and SpAs represented 2.6 per cent of all those with a long term disease (Affections de longue durée, ALD).[9]
- In 2006, 32.500 cases of musculoskeletal disorders (MSDs) were compensated[10] by the Caisse Nationale d'Assurance Maladie des Travailleurs Salariés (CNAMTS). In 2007, the number of compensations increased by 5.4 per cent reaching 34.280.[11]
- In 2006, more than 5 million working days were lost due to temporary incapacity caused by work-related MSDs (CNAMTS, 2006). In 2007, this number reached nearly 7.5 million causing a costs to society of more than 736 million euros.[12]
- In 2007, 4 per cent of the unemployed looking for a job declared that they had lost their previous job due to illness or invalidity.[13]
- 710 million euros of costs caused by MSDs were covered by contributions from businesses.[14]

These data depict a worrying scenario that suggests that more resources need to be invested in France in early detection, prevention and early intervention of MSDs. Adoption of these strategies is highly recommended not only protect those with illness and allow them to enjoy a full and productive working life, but also to reduce the economic burden of illness and disability benefits.

[7] http://www.insee.fr/fr/themes/tableau.asp?reg_id=0&ref_id=NATSOS04604
[8] See Footnote 4
[9] http://www.ameli.fr/fileadmin/user_upload/documents/pointreperen_1.pdf
[10] http://www.info-tms.fr/Les-chiffres-cles.html
[11] http://www.risquesprofessionnels.ameli.fr/atmp_media/TMS2007MPindemnisees.pdf
[12] http://www.risquesprofessionnels.ameli.fr/media/TMS2007BilanFinancier.pdf
[13] http://www.insee.fr/fr/themes/tableau.asp?reg_id=0&ref_id=NATCCF03305
[14] See Footnote 9

2.2 MSDs: The European context

In the European Union (EU) context, concern in the European Commission and among the social partners over the prevalence and impact of work-related MSDs has been growing for several years. Chronic musculoskeletal pain (CMP) is estimated to affect 100 million people in Europe (Veale, Woolf and Carr, 2008), MSDs affect more than 40 million workers in the EU and account for about half of all work-related disorders in EU countries (European Trade Union Institute (ETUI), 2007), representing an estimated cost to society of between 0.5 and 2.0 per cent of gross domestic product (GDP) (Cammarota, 2005). The fourth European Working Conditions Survey (EWCS) published by the European Foundation (Parent-Thirion, Fernandez Macias, Hurley and Vermeylen, 2005) has shown that 24.7 per cent of workers across the EU report experience backache and 22.8 per cent muscular pain. Indeed, the European Commission estimates that MSDs account for 49.9 per cent of all absences from work lasting three days or longer and for 60 per cent of permanent work incapacity. If the European, knowledge-based economy is to recover and compete against the US and the growing economies of Asia the health and productivity of the EU workforce must be a policy priority. This report looks at France in this wider EU context and assesses where France is doing well and where it has challenges to confront.

2.3 Objectives of the study

More specifically, this project has sought to address each of the following questions:

1. What is the impact of MSDs on employment and economic performance in France? How is this likely to change in the context of future demographic, workforce and lifestyle changes?
2. What is the relationship between work and MSDs? What impact do biological, psychological and social factors, including work-place factors, have on MSDs?
3. How well do employers, governmental bodies, general practitioners (GPs) and occupational health professionals understand and deal with MSDs as they relate to the work-place? How well equipped is the health sector to provide early intervention, rehabilitation and other support for people with these conditions?
4. What early interventions can policy-makers and employers deliver to ensure that those with MSDs a) retain their jobs b) maximise their quality of working life and their contribution to society and c) maintain access to (and routes back into) employment?

In addressing the objectives outlined above, we have used the following approaches:

1. Desk research: Here we have drawn on existing published research from the medical, occupational health and health economics literature. This has enabled us to draw

together the evidence on the nature, extent, impact and costs of MSDs to the French economy, to employers and to individuals. We have examined a range of MSDs to assess the extent to which their impact varies and where policy and practice has been both strong and weak in preventing and intervening.

2. Secondary data analysis: We have used data from domestic and European studies and surveys to examine the prevalence and costs of MSDs in the working age population in France.
3. Expert interviews: We have conducted interviews with experts in ergonomics and occupational health to identify the main areas of policy and practice which need to be addressed by policy-makers, health professionals and by employers.

In addition to the wider picture, to focus the research, we have chosen to concentrate on four categories or groups of MSDs. These are:

- Back pain;
- Work-related upper-limb disorders (WRULDs);
- Rheumatoid arthritis (RA);
- Spondyloarthropathy (SpA).

Back pain and the majority of WRULDs are categorised as non-specific and episodic conditions which may frequently be caused by, or be made worse by, work. They manifest themselves in disparate ways and may cause periods of intense discomfort and incapacity which may affect the ability of the individual worker to carry out their work. They may also abate for long periods. Many people with these conditions, such as back pain, never seek treatment and most recover on their own but the conditions can cause significant absence from work or lost productivity. Back pain and WRULDs are often included in the occupational health and safety guidelines and literature. Occupational health practitioners typically deal with these conditions.

On the other hand, RA and SpA are specific and progressive rheumatic diseases which are not caused by work, but may be made worse by work and are often handled by general practitioners and specialists, not within the occupational health arena. They are clinically diagnosed conditions that progress in a broadly predictable way, if untreated. They can have a significant impact on functional capacity at work and, in the long-term, participation in the labour market. Most people with these conditions require clinical interventions over a prolonged period of time and the management of these conditions for those of working age should involve the frequent and active participation of clinicians, employers and occupational health professionals.

Together, these MSDs illustrate the effects of conditions from which a large number of French workers may report at any one time. Improving our understanding of the effects of these conditions, how staying in work can be beneficial, and what might be done to alleviate their impact, can yield significant social and economic benefits.

2.4 A note on definition

In the absence of a consensus on a clinical definition of many MSDs, navigating the literature on their prevalence, incidence, diagnoses, epidemiology, treatment and cost to French society is a difficult task. The lack of standardisation and validation of the terminology and classification of MSDs is one of the reasons for the contradictory findings in the literature regarding the diagnosis, epidemiology, treatment and rehabilitation of these conditions (WHO Scientific Group, 2003). Some clinicians differentiate between 'musculoskeletal conditions' and 'musculoskeletal disorders'. The former refers to all clinical conditions affecting the musculoskeletal system and the latter, to borrow a definition from the ETUI (European Trades Union Institute, 2007), meaning 'any affliction of the musculoskeletal system that appears at work and causes discomfort, difficulty or pain when performing work'.

In France, recognition of occupational diseases (OD) is regulated by heading VI of book IV of the Social Security Code. In its article L. 461-1, it states explicitly: 'Presumed to be of occupational origin is any disease indicated in a table of occupational diseases and contracted under the conditions mentioned in this table.' These various tables enclosed as annexes to book IV of the Social Security Code therefore constitute a restrictive list of known occupational diseases - and are therefore the reference for defining pathologies arising as work-related MSDs. Currently, five tables cover MSDs:

- Table 57 collates 'Peri-articular disorders caused by certain movements and postures at work';
- Table 69 lists 'Disorders caused by vibrations and shocks transmitted by certain machine tools, tools and objects and by iterative impacts of the heel of the hand on fixed elements';
- Table 79 collates 'Disorders caused by chronic lesion of meniscus';
- Table 97 covers 'Chronic disorders of the vertebral column caused by bass and medium-frequency vibrations transmitted to the entire body';
- Table 98 lists 'Chronic disorders of the vertebral column caused by the manual handling of heavy loads'.

It should be noted that the Social Security Code concerns only employees from the non-agricultural private sector ('General Regime' of Social Security). For persons originating from

the agricultural regime, occupational diseases are defined in the tables enclosed as annexes to decree 55-806 of 17 June 1955 – Tables 39, 57 and 57bis echo Tables 57, 97 and 98 of the general regime. Public-sector employees are not covered by any of these regulations.

2.5 Structure of the report

This report is structured as follows:

- Section 3 examines the extent of MSDs in France and the impact they have on productivity and attendance at work, on labour market participation and on the wider French economy.
- Section 4 reviews the range of interventions, including vocational rehabilitation, which can improve job retention and labour market participation among those with MSDs.
- Section 5 sets out our recommendations for employers, employees, GPs, occupational health professionals and for the French government.
- Appendix 2 provides a benchmarking grid in which a number of indicators covering the labour market, the welfare system and the healthcare system are presented for each of the country involved in the Fit for Work project.

3. Work and MSDs in France

This section sets out what we know about the impact of MSDs on people of working age in France. It uses data, research and interview evidence from French sources where this is available, and paints a picture of the challenges faced by both current and future French workers, their families, their employers and, ultimately, state agencies. It looks at four main issues:

1. The inadequacy of the data on MSDs in France and the consequences of this;
2. The impact that MSDs have on people's ability to work;
3. The impact that work can have on MSDs;
4. The wider economic and social impact of MSDs in France.

We begin by looking at data quality.

3.1 The data context

The main sources of information concerning MSDs in France are the data produced every year by the national salaried workers' sickness insurance fund (CNAMTS). These data summarise the totality of occupational diseases declared on the basis of the tables mentioned in Section 2.4 (for employees of the non-agricultural private sector). However, the data published by the CNAMTS does not detail the entirety of this information table by table: data according to age, gender, occupation and duration of exposure aggregate the entirety of occupational diseases (all tables aggregated). The sectors of activity are grouped into nine general units (relatively heterogeneous) called CTN (Comités Techniques Nationaux or National Technical Committees), and the number of diseases with absence time, diseases with permanent invalidity, absence days (and decease) are provided table by table without details of location of pathologies.

Beyond these national descriptive data, the main source of knowledge on MSDs originates from epidemiological studies, along with working conditions and the SUMER (L'enquête Surveillance Medicalisée des Risques) survey whose objective is to describe working conditions that can affect workers' health by collecting data from both occupational clinicians and employees.

The knowledge of MSDs and the causal factors is based principally on two major epidemiological surveys. One was carried out in six regions (out of the 21 French regions) between 1991 and 1996 by the French National Institute for Studies and Medical Research (l'Institut National des Etudes et de la Recherche Médicale – INSERM) and ANACT on various sectors of activity and covered 1,755 salaried employees. In 2002 then, the French National Institute for Hygiene Monitoring (Institut National de la Veille Sanitaire - INVS) launched a pilot programme for one region (Pays-de-Loire) whose aim was to form an observatory body for work-related MSDs by:

- Describing the frequency and development of the main MSDs and the working conditions associated with them, their distribution per sector of activity and occupation, in the general population and in companies;
- Determining the proportion of MSDs that can be attributed to various types of occupational factors;
- Exploring the use of medical-administrative data (data from the CNAMTs) relating to MSDs for the purposes of epidemiological monitoring.

According to Eurogip (2007) France has seen a sharp increase in MSD cases in recent years. The increase in the number of recognitions in the 1990s is due not only to the increasing occurrence of MSDs but also to the raised awareness of the problems posed by these diseases. Following the three-year pilot study in the Pays de la Loire region, the Government has commissioned a national program for the epidemiological surveillance of MSDs that fits within the following objectives as specified by Health & Safety at Work Program for 2005-2009: reduction.of 20 per cent of the number of declared and recognized MSD, and reduction of 20 per cent compared to the prevalence estimated by the 2003 SUMER survey, of the number of workers subject to articular constraints more than 20 hours a week.

Although in France, MSDs are the leading cause of occupational disease,[15] the Fourth EWCS (Parent-Thirion et al., 2005) shows that compared to other EU member states, a relatively low proportion of the French workforce currently reports having regular backache or muscular pain. As long as better data are necessary, we can certainly say that with the aging ratio continuing to grow and the number of people overweight and obese (26.5 per cent and 10.5 per cent respectively in 2006 according to OECD's figures) increasing, the number of MSDs in France will rise dramatically. However, international evidence has showed that return-to-work policies can be effective in facilitating declining trends in occupational MSDs (European Foundation for the Improvement of Living and Working Conditions, 2007). Similarly, for chronic conditions, guaranteeing early intervention and access to treatment remains the most adequate strategy to enhance people' lives and reduce the social and economic burden of these conditions.

3.2 The impact of MSDs on ability to work

The impact of MSDs on individuals and their ability to work varies significantly from person to person. In 2007 figures from CNAMTS (2008) show that MSDs classified in Tables 57, 69, 97 and 98 accounted for 1,803 cases of permanent disability and 933,232 cases of temporary disability. However, these estimates do not include assessment of lost productivity whilst at work. MSDs can cause work-limiting pain and fatigue which many people feel unable to

[15] http://europa.eu/rapid/pressReleasesAction.do?reference=STAT/08/119

disclose. Research shows that up to 30 per cent of workers with conditions such as rheumatoid arthritis (RA) are reluctant to disclose their condition to their colleagues and managers out of a fear of discrimination (Gignac, Cao, Lacaille, Anis, and Badley 2008) and 22 per cent of workers do not tell their employers about their condition (Gignac et al., 2004).

MSDs, as outlined in Section 2, can be non-specific or specific. The effects of specific MSDs are discussed below with particular reference to RA and spondyloarthropaties (SpAs). Other, largely non-specific MSDs are described in relation to two main categories, back pain and work-related upper limb disorders. The effects of pain from MSDs can thus impact on the following aspects of one's performance at work:

- Stamina and resilience;
- Cognitive capacity or concentration;
- Rationality/mood;
- Fatigue;
- Mobility;
- Agility.

An MSD can also have effects on safety aspects of work. If concentration or movement is affected by the condition or associated pain then some aspects of work may become unsafe. It must also be noted that, following diagnosis, some treatments can have significant side effects which affect an individual's ability to perform. Where particular hazards such as heavy machinery or driving are involved then safety aspects of job performance will also be of concern.

3.2.1 Work-related upper limb disorders

WRULDs are MSDs affecting the upper part of the body caused or aggravated by work and the working environment. However, there is considerable debate about the definition and diagnostic criteria for WRULDs, which are also commonly referred to as 'sprains or strains', 'repetitive strain injuries or disorders', or 'cumulative trauma disorders'. Both specific and non-specific disorders and symptoms can be covered by this category. Van Eerd et al. (2003) identified 27 different classification systems for work related MSDs, of which no two were found to be alike. The fact that a single disorder is often described in different ways only amplifies the problem. Critically, Van Eerd et al. (2003) found that the different classification systems did not agree on which disorders should be included. This definitional problem makes it difficult to calculate the

number of people with WRULDs and to develop a common understanding of the associated risk factors.

Whilst no agreed classification exists there is a common consensus that symptoms of WRULDs can present in the tendons, muscles, joints, blood vessels and/or the nerves and may include pain, discomfort, numbness, and tingling sensations in the affected area. WRULDs can be specific and non-specific conditions (Aptel, Aublet-Cuvelier and Cnockaert 2002) and attempts at classification tend to focus either on the affected body area or on the cause. Examples of WRULDs by body part include the following:

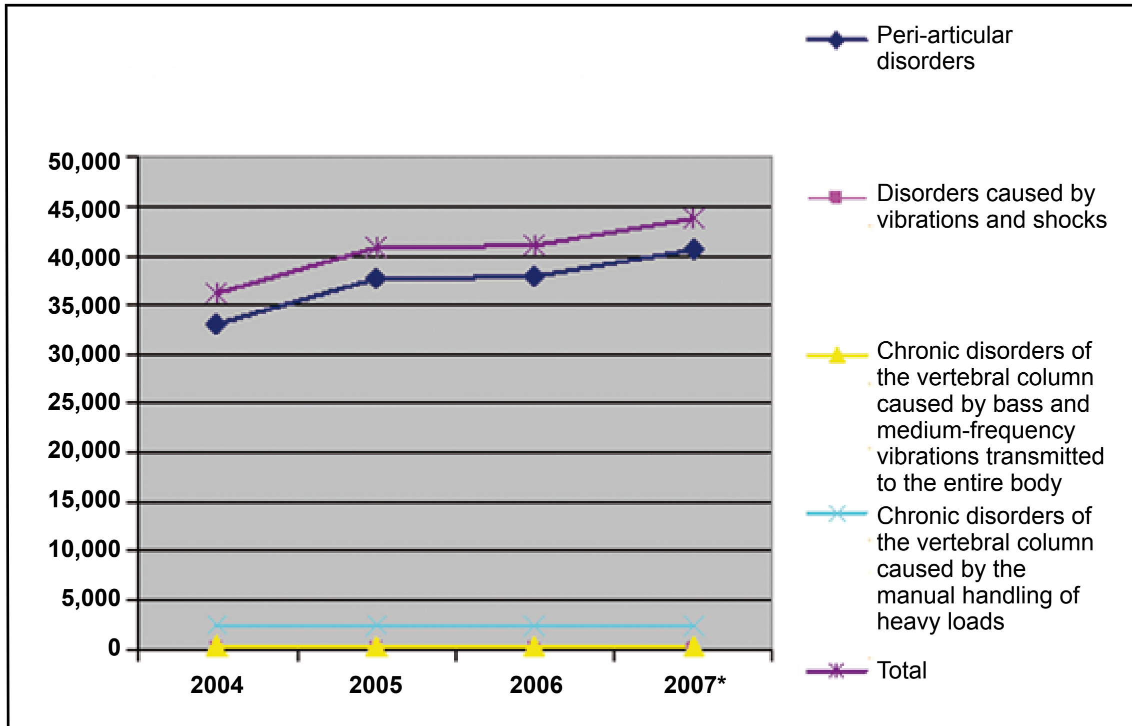
- Elbow: Epicondylitis (tennis or golfer's elbow);
- Hand, wrist and forearm: Carpal tunnel syndrome; repetitive strain injury (RSI), de Quervain's syndrome;
- Shoulder: Tendinitis of the shoulder;
- Neck: Neck pain.

Classification by occupational causes refers to actions such as vibration of the hand and arm, which can result in Raynaud's syndrome, for example. The breadth of the category of WRULDs means that almost all symptoms and impacts on work associated with MSDs are associated with WRULDs. Specific symptoms and impacts of MSDs are therefore discussed in more detail below with reference to back pain, RA and SpA conditions.

As shown in Figure 1 on the next page WRULDs represent the most reported and compensated MSDs in France.

A lot of research has focused on WRULDs. According to the fourth EWCS (Parent-Thirion et al., 2005), just under 19 per cent of French workers surveyed reported muscular pain in their neck, shoulders and upper limbs. National studies such as the one carried out by Cassou, Derriennic, Monfort, Norton and Touranchet (2002) suggest that in 1994 WRULDs accounted for 50 per cent of all occupational diseases in France. As far as chronic neck and shoulder pain (CNSP) are concerned, their prevalence among the 21,378 people interviewed in 1990 was 7.8 per cent among men and almost double among women. Psychosocial factors such as low job control and high job demand play a role in both the development and the disappearance of CNSP, as adverse working conditions and aging do. On the other hand, Chiron et al., (2008) point out that WRULDs are the first cause of occupational illness in France. Among the population sampled, they found that the number of workers with WRULDs increased with increasing age, and that

Figure 1: Number of MSDs cases reported and compensated by Social Security between 2004 and 2007



* Provisional

Source CNAMTS (2009)

blue-collar workers were the most affected followed by white collars. After the age of fifty, blue-collars' exposure to WRULDs risk factors was 77 per cent among men, and 72 per cent among women. Similarly, the epidemiological surveillance carried out since 2002 in the Pays de la Loire region by Roquelaure and his colleagues shows that among the 2,865 participants the prevalence of clinically diagnosed WRULDs was high (13 per cent of workers experienced at least one of the WRULDs under consideration). The most frequent disorder was rotator cuff syndrome followed by carpal tunnel syndrome and lateral epicondylitis respectively, and more than half of the workers were exposed to at least two risk factors of WRULDs. The prevalence of WRULDs increased with age and varied widely across economic sectors and occupations (Roquelaure et al., 2006).

A study on carpal tunnel syndrome (CTS) in the Maine and Loire area (Roquelaure et al., 2008) shows that the mean incidence rate of CTS per 1,000 person-years is higher among employed than unemployed (1.7 versus 0.8 in women and 0.6 versus 0.3 in men). Among the 1,168 participants, the excess risk of CTS was statistically significant for male and female blue-collar workers and female lower-grade white-collar workers.

3.2.2 Back pain

Back pain is a common complaint in France. The fourth EWCS (Parent-Thirion et al., 2005) shows that about 22 per cent of French workers report work-related back pain. In the vast majority of patients with back pain no specific diagnosis is given. National research among 1,289 people aged between 30 and 64 years shows that prevalence of chronic back pain is 7.9 per cent for men and 7.5 per cent for women (Leclerc, Chastang, Ozguler and Ravaud, 2006). The same research shows that despite having functional limitations, most people with back pain are employed in ordinary work, especially men (77.7 per cent in the general population). In their analysis of low back pain among workers from small companies in the Paris area, Alcouffe, Manillier, Brehier, Fabin and Faupin (1999) found that women experience back pain more often and more severely than men. As for the impact of low back pain on working life, Alcouffe et al. point out that 12 per cent of employees in the sample reduced their occupational activity, about 5 per cent had either a work station enhancement or changed work station, about 9 per cent stopped working, and about 8 per cent took sick leave.

Back pain is common, episodic, often recurrent and generally self-limiting. It is defined as recurrent if several episodes occur in one year for a duration of less than six months, acute if an episode lasts for less than six weeks, sub-acute (7-12 weeks) and chronic if it endures for over 12 weeks. Back pain is a recurrent problem for many people, although this does not necessitate that symptoms will worsen. For the majority of people pain will disappear of its own accord within four to six weeks. In a European study of people visiting their family doctors because of back pain, 65 per cent were free of symptoms within 12 weeks (van der Hoogen et al., 1998 in Bekkering et al., 2003). Recorded absence is greatest amongst the minority of individuals whose condition is chronic or recurrent. Most people who are affected by back pain either remain in work or return to work promptly. About 85 per cent of people with back pain take less than seven days off, yet this accounts for only half of the number of working days lost. The rest is accounted for by the 15 per cent who are absent for over one month (Bekkering et al., 2003).

It is important to recognize that there is a difference between having symptoms, care seeking, lost productivity and disability, and the factors that contribute to them (Burton, 2005). This means that whilst individuals may experience musculoskeletal pain (in their back, for example), it is not possible to predict their strategies for dealing with illness or injury (seeking medical attention for example), how it will affect their work performance, whether they will take time off work and whether, ultimately, they will become one of the very small minority who become permanently disabled by their condition. The important question is therefore why, when so many people experience back pain, does it have such an adverse effect on some and not others? There is a growing consensus that psychological influences are the differentiating factor as they are strongly associated with the progression of back pain from an acute to a chronic condition

that affects two to seven per cent of people (Burton, 2005), and to disability (Burton, 2005; Bekkering et al., 2003).

3.2.3 Rheumatoid arthritis

RA is an example of a specific MSD. It is a form of inflammatory arthritis with a prevalence of between 0.3 per cent and one per cent in most industrialised countries (WHO Scientific Group, 2003). Data on the prevalence of rheumatoid arthritis derive largely from studies performed in the USA and Europe. In France, several estimates on the prevalence of RA have been put forward. Guillemin, Saraux, Guggenbuhl, Roux, Fardellone, Le Bihan et al. (2005) report a prevalence of 0.31 per cent (0.51 among women and 0.09 among men); Lundkvist et al. (2008) report a prevalence equal to 0.45 per cent; and Saraux, Guedes, Allain, Devauchelle, Valls, Lamour, et al., (1999) report a prevalence of 0.62 per cent). The disease affects people of any age, although peak incidence is in the mid age range of the working age population, between the ages of 25 and 55 years. Epidemiological studies have shown that RA shortens life expectancy by around 6-10 years, and a study on French patients shows that the disease is active in 13 per cent of cases and severe in more than one third of cases (Sany, Bourgeois, Saraux, Durieux, Lafuma, Daurès et al., 2004).

In general, people with RA are reported to use health care resources more frequently and intensively than non-arthritic subjects. In France, RA causes a 30 per cent increment in the consumption of medication (covered in the proportion of 98 per cent by the French social security insurance system), and geographical variation in access and use of various health care services has been found among this group of patients (Girard, Guillemin, Novella, Valckenaere, Krzanowska, Vitry et al., 2002).

The exact cause of RA is unknown. Evidence suggests that it is an immune reaction, presenting as an inflammation affecting joints and other tissues. Risk factors include gender, family history of RA and specific leukocyte antigen (HLA) (WHO Scientifc Group, 2003). Whilst at an individual level the clinical course of RA is extremely variable, its features include pain, stiffness in the joints and tiredness, particularly in the morning or after periods of inactivity, weight loss and fever or flu-like symptoms. It affects the synovial joints, producing pain and eventual deformity and disability. The disease can progress very rapidly, causing swelling and damaging cartilage and bone around the joints. It can affect any joint in the body, but it is often the hands, feet and wrists that are affected. RA can also affect the heart, eyes, lungs, blood and skin.

The course of RA varies, meaning that it can go from a mild and even self-limiting form of the disease, to being severe and destructive within a short time (Young et al., 2000). RA is usually chronic (persistent) and people with the condition often have ‘flares’ of intense pain frequently

associated with fatigue, although the reason for these is not known. In effect, 'flares' mean that one day someone will be able to perform their duties and the next they cannot. This can be difficult for colleagues and managers to comprehend, and can make planning workloads challenging. Managing these 'flares' in employment requires close communication and understanding between employees and employers.

The effects of the disease can therefore make it difficult to complete every day tasks, often forcing many people to give up work. Work capacity is affected in most individuals within five years from initial diagnosis (WHO Scientific Group, 2003). One review of work productivity loss due to RA estimated that work loss was experienced by 36-85 per cent of people with RA in the previous year, for an average (median) of 39 days (Burton, Morrison, Maclean and Ruderman, 2006). Young et al. (2002) reported that 22 per cent of those diagnosed with RA stopped work at five years because of their RA. In France, Kobelt, Woronoff, Richard, Peeters and Sany (2008) report that 34 per cent of people under 60 years take early retirement due to RA and of those who reported a score of 2 or higher on the Health Assessment Questionnaire (HAQ), only 15 per cent worked. However, in some cases the condition itself is not the main or only cause of having to leave work. Indeed Young et al. (2002) found a further group of respondents who stopped work due to a combination of RA and other personal factors, giving an estimate of 40 per cent of those with RA withdrawing from the workforce because of their condition.

3.2.4 Spondyloarthropathies

Spondyloarthropathies (SpA) represent a family of chronic inflammatory conditions which include:

- Ankylosing spondylitis (AS);
- Reactive arthritis (ReA)/ Reiter syndrome (RS);
- Psoriatic arthritis (PsA);
- Spondyloarthropathy associated with inflammatory bowel disease (IBD);
- Undifferentiated spondyloarthropathy (USpA).

Recent research on the prevalence of SpAs across the European population concludes that the prevalence has long been underestimated and may have a similar prevalence rate to RA (Akkoc, 2008). Saraux, Guillemin, Guggenbuhl, Roux, Fardellone, Le Bihan et al. (2005) report a prevalence of SpAs in France of 0.30 per cent.

Ankylosing spondylitis (AS) is a specific progressive and chronic rheumatic disorder that mainly affects the spine, but can also affect other joints, tendons and ligaments. Its prevalence in the general population is most commonly reported to be 0.1 to 0.2 per cent, with a 3:1 to 2:1

male: female ratio (Dagfinrud, Mengshoel, Hagen, Loge and Kvien, 2004). First diagnosis is often made when people are in their teens and early twenties (the mean age of onset is 26). Research suggests that there is a strong genetic component to the cause of AS. Although anyone can get AS, it affects men, women and children in slightly different ways (Dagfinrud et al., 2004). In men, the pelvis and spine are more commonly affected, as well as the chest wall, hips, shoulders and feet. Women are supposed to have a later age of onset, milder disease course, longer asymptomatic periods but more extraspinal involvement. Accurate diagnosis can often be delayed since the early symptoms are frequently mistaken for sports injuries. Sieper, Braun, Rudwaleit, Boonen and Zink (2002) suggest an average of seven years between disease onset and diagnosis. Typical AS symptoms include pain (particularly in the early morning); weight loss, particularly in the early stages; fatigue; fever and night sweats and improvement after exercise. Again, as with RA, the temporal aspects of the disease require good management to ensure that individuals can perform their job but do not make work impossible.

Approximately half are severely affected whilst others report very few symptoms. AS is generally considered to be a disease in which many individuals can maintain relatively good functional capacity (Chorus, Boonen, Miedema and van der Linden, 2002), yet reported unemployment rates are three times higher among people with AS than in the general population (Boonen et al., 2001). A comparative study between the Netherlands, France and Belgium (Boonen, van der Heijde, Landewé, Spoorenberg, Schouten, Rutten-van Mölken et al. (2002) found that employment rate among people with AS was equal to 72 per cent in France and Belgium and much lower in the Netherlands (55 per cent). Similarly, the mean number of days of sick leave because of AS was highest in the Netherlands, followed by Belgium and France (19, 9 and 6 days respectively).

Recent research has provided evidence that physical health related quality of life of people with RA (Chorus, Miedema, Boonen and van der Linden, 2003) and AS (Gordeev et al., 2009) was positively influenced by work. Chorus et al.'s conclusion was that work '*might be an important factor in positively influencing patients' perception of their physical performance*'. This finding concurs with Waddell and Burton (2006a) that, overall, good quality work has health and recuperative benefits for workers. The extent to which the work-place can have a positive or negative effect on development of MSDs is discussed below.

Psoriatic arthritis (PsA) is a form of joint inflammation affecting between 0.2 and 1.0 per cent of the general population (Wallenius et al., 2008) and between 10 and 20 per cent of individuals with psoriasis. No French data on PsA were found. When joints are inflamed they become tender, swollen and painful on movement. The joints are typically stiff after resting, early in the morning or while resting in the evening. Tissues such as ligaments, tendons around the joints

may also be involved. Inflammation of tendons or muscles (such as tennis elbow and pain around the heel) are also features in those with psoriatic arthropathy. In approximately 80 per cent of cases the arthritis develops after the appearance of psoriasis. Men and women are considered to be equally affected, and comparative studies have showed that patients with PsA have a burden of illness which is comparable to that of patients with RA or AS (Wallenius et al., 2008).

There are several features that distinguish PsA from other forms of arthritis: one pattern of inflammation is usually in the end of finger joints. Another pattern is involvement of the joints of the spine and sacroiliac joints which is called spondylitis (similar to AS). Neck pain and stiffness can occur or an entire toe or finger can become swollen or inflamed (dactylitis). There can also be a tendency for joints to stiffen up and sometimes to fuse together. Importantly the absence of rheumatoid factor in the blood helps distinguish PsA from RA. It is usual for the condition to develop in the teenage years. In women there may be an increased incidence following pregnancy or the menopause. As PsA affects both the skin and the joints, this has a negative impact on the quality of life of people with PsA due to emotional problems, in fact, they may experience more pain and role limitations than patients with RA (Husted, Gladman, Farewell and Cook, 2001). A higher level of mortality compared to the general population has also been reported among people with PsA (Wallenius et al., 2008).

3.3 The impact of the work-place on MSDs

The risk factors for MSDs are wide ranging. Whilst there is broad consensus among experts that work is a risk factor for MSDs, non-work activities such as sport and housework can contribute to musculoskeletal strain. Some studies, for example, have noted that a higher prevalence of musculoskeletal pain among working women may be linked to the fact that women are responsible for doing the majority of housework (Punnett and Wegman, 2004). Intrinsic risk factors also have a part to play in the onset and deterioration of MSDs. Some intrinsic factors can be altered, others, such as genetic predisposition, cannot.

One area of concern in France is the aging of the population. Recent population projections from Eurostat show that by 2035 nearly a quarter of French population will be over 65 and more than 8 per cent will be over 80 years old.

Table1 summarises the intrinsic risk factors for non-specific MSDs.

Table 1: Summary of intrinsic risk factors for non-specific MSDs

Intrinsic factors
• Obesity, height • Spinal abnormalities • Genetic predisposition • Pregnancy • Psychosocial stress: self-perception • Health beliefs: locus of control, self-efficacy, perception of disability and expectation • Family stress • Psychological stress: somatisation, anxiety and depression • Ageing

Source Adapted from WHO Scientific Group (2003)

In terms of evidence and risk factors for the impact of work on MSDs a distinction needs to be made between 'work-related' disorders and 'occupational' disorders (Punnett and Wegman 2004). Certain MSDs are recognized as occupational diseases by some European governments, such as wrist tenosynovitis, epicondylitis of the elbow, Raynauld's syndrome or vibration white finger and carpal tunnel syndrome (Eurostat, 2004). As such, the fact that work can cause and contribute to these conditions is widely recognized and the use of assessments of work-place risk to reduce the incidence of these conditions is well established.

It is clear that work is not the cause of rheumatic diseases such as RA and SpAs, though there is evidence that physical work demands, lack of support, self-stigma and lack of flexibility over working time can each make job retention or return to work more difficult (der Temple and van der Linden, 2001; Gignac et al., 2004).

The evidence linking other non-occupational MSDs and work is not conclusive and attributing cause and effect between specific aspects of work and particular parts of the body is difficult. However, many of the established risk factors that may contribute to the development of non-specific MSDs can be encountered at work; even if work does not cause a condition it may have an impact on it. Moreover, if we consider risk factors beyond the physical, then the impact of the work-place on MSDs is likely to be much greater.

The most frequently cited risk factors for MSDs encountered in the work-place include the following:

- Rapid work pace and repetitive motion patterns;
- Heavy lifting and forceful manual exertions;
- Non-neutral body postures (dynamic or static), frequent bending and twisting;
- Mechanical pressure concentrations;
- Segmental or whole body vibrations;
- Local or whole-body exposure to cold;
- Insufficient recovery time (Punnett and Wegman, 2004).

MSDs affect employees in all kinds of industries and occupations, although some are more high risk than others, and certain occupations are associated with strain on specific parts of the musculoskeletal system.

Many jobs involve activities that can constitute a risk factor for MSDs. According to the EWCS, 17 per cent of European workers report being exposed to vibrations from hand tools or machinery for at least half of their working time, 33 per cent are exposed to painful or tiring positions for the same period, 23 per cent to carrying or moving heavy loads, 46 per cent to repeated hand or arm movements and 31 per cent work with a computer (Parent-Thirion et al., 2005).

Much of the attention that employers pay to the issue of MSDs and the impact of the work-place on their onset or deterioration is driven by a concern to avoid or limit litigation and ensure that they are fulfilling their duty of care, by performing workstation assessments and giving guidance on manual handling, for example. However, this neglects a wider issue that other work associated factors can also contribute to MSDs. These aspects are often missed out in the literature and advice on dealing with health and safety. Even where ‘stress’ is mentioned, the connection between psychosocial factors and physical conditions is omitted, reinforcing the primary focus on safety.

Generally there is an increased risk of injury when any of the physical risk factors mentioned above are combined, or adverse psychosocial factors, personal or occupational are present (Devereux, Rydstedt, Kelly, Weston and Buckle, 2004). Psychological and organisational factors can also combine with physical factors to influence the probability of an individual leaving work prematurely. Research on low back pain shows that an employee’s belief that

work itself produces pain precedes sickness behaviour and is a risk factor for chronic work disability (Werner, Lærum, Wormgoor, Lindh and Indhal, 2007, Lefevre-Colau, Fayad, Rannou, Fermanian, Coriat, Mace et al., 2009). Sokka and Pincus (2001) reviewed 15 studies and showed that physically demanding work, a lack of autonomy, higher levels of pain, lower functional status and lower educational levels were predictors of someone with RA leaving work early. The evidence from Sokka and Pincus (2001) highlights that it is not only the physical elements of work that can influence someone's functional work capacity and likelihood of staying in the labour market. We must also consider the psychosocial and organisational factors of work.

Psychosocial and organisational factors associated with MSDs include:

- Rapid work pace or intensified workload;
- Perceived monotonous work;
- Low job satisfaction;
- Low decision latitude/ low job control;
- Low social support;
- Job stress.

Job stress is a broad term and can result from a variety of sources such as high job demands, or a mismatch between skills and job requirements. In addition stress can result from abuse or violence at work, as well as discrimination.

Again, it is important to recognize the connection between the psychological and the physical. While job stress, including violence and discrimination at work, might lead to lost productivity due to stress or common mental health problems, it may also lead to MSDs caused by tension or strain. An increased probability of experiencing a high level of pain has also been associated with low social support, low social anchorage or low social participation (Katz, 2002). 'Good work' and the provision of high quality jobs is therefore crucial (Coats and Max, 2005, Coats and Lehki, 2008).

3.4 The wider economic and social impact of MSDs

The effect that MSDs can have on an individuals' ability to work and the time they may require to be absent from work means that MSDs have significant associated costs to the individual, the family, the employer and the wider economy. Calculating the exact costs is not straightforward (Lundkvist et al., 2008). Several factors need to be considered and obtaining accurate, reliable and consistent figures is almost impossible. In France, evaluations of the direct or indirect cost of non specific MSDs are not easy to find. Social Security bodies take account of the effects of MSDs in terms of employment incapacity rates and number of absence days. However, existing

figures on the economic impact of specific MSDs based on conservative approximations show that MSDs are a significant economic burden to France.

To calculate the cost of MSDs (or any illness) the following factors must be estimated:

- **Direct costs** including medical expenditure, such as the cost of prevention, detection, treatment, rehabilitation, long-term care and ongoing medical and private expenditure. They are often further separated into medical costs occurring in the health care sector and non-medical costs occurring in other sectors (Lundkvist et al., 2008).
- **Indirect costs** including lost work output attributable to a reduced capacity for activity, such as lost productivity, lost earnings, lost opportunities for family members, lost earnings of family members and lost tax revenue.
- **Intangible costs** including psychosocial burden resulting in reduced quality of life, such as job stress, economic stress, family stress and suffering (WHO Scientific Group, 2003).

These costs vary considerably depending on the condition, on the severity of the symptoms, and whether these cause short or long term absence or disability. Moreover, they vary depending on the particular methods used to calculate the costs. Some factors which affect the calculations include the following:

- Severity of patient's conditions;
- Mix of patient demographics in a study;
- Calculation method for productivity;
- Definitions of work disability;
- The treatment costs or outcomes due to treatments (the year costs were calculated is also a factor not least because treatment processes can change);
- Change in health care financing systems;
- Incidence or prevalence based estimates of costs.

Intangible costs are rarely included in cost calculations as it is almost impossible to properly express the intangible costs in monetary terms (Sieper et al., 2002). However, the evaluation of intangible costs gives useful information regarding the price paid by people with MSDs in terms of quality of life (QoL), and QoL measures should be used as further indicators to measure the effectiveness of interventions (Leardini, Salaffi, Montanelli, Gerzeli and Canesi, 2002).

Presently two measures widely used are:

1. **Disability adjusted life years (DALYs)**. This is a measure of the overall disease burden which attempts to tally the complete burden that a particular disease exacts. Key elements include the age at which disease or disability occurs, how long its effects linger, and its impact on quality of life. One DALY, therefore, is equal to one year of healthy life lost. For example, RA accounted for 0.81 per cent of all DALYs lost in France (Lundkvist et al., 2008).
2. **Quality adjusted life years (QALYs)**. The QALY is also a measure of disease burden, including both the quality and the quantity of life lived. It is used in assessing the value for money of medical interventions and is based on the number of years of life that would be added by these interventions. A QALY gives a measure of how many extra months or years of life of a reasonable quality a person might gain as a result of treatment and helps in the assessment of the cost-utility of this treatment.

Both measures are the subject of debate, but have become accepted as helpful in making comparative judgements across medical conditions and internationally.

3.4.1 Direct costs

As mentioned above, cost-of-illness estimates require input from a number of different factors, and great variation is found across different studies. For low back pain (LBP), the most significant direct costs are related to physical therapy, inpatient services, drugs and primary care (Dagenais, Caro and Haldeman, 2008). Nachemson Waddell and Norlund (2000) calculated that some 80 per cent of health care costs are generated by the 10 per cent of those with chronic pain and disability. For RA, although direct health care costs have been relatively small in the past (Lundkvist et al., 2008), a number of studies indicate that direct costs increase as functional capacity decreases – making functional capacity a major cost driver (Huscher, Merkesdal, Thiele, Schneider and Zink, 2006; Kobelt, 2007; Leardini et al., 2002).

Several studies have quantified the direct costs of RA in France. Lundkvist et al. (2008) estimate the direct costs, excluding drugs, is equal to 7,425 euro per patient per year. Kobelt et al. (2008) estimate direct health care costs to be 11,757 euro in the societal perspective and 9,216 euro in the perspective of the national health insurance. In addition, direct non-medical costs (including informal care) were 4,857 euro and 136 euro respectively. Rat and Boissier (2004) report an estimate varying between 1,812 and 11,792 per patient per year; Flipon, Brazier, Clavel, Bourmier, Gayet, Le Loët et al. (2009) in their study on a population with inflammatory arthritis for about three years, estimate the total annual direct cost to be equal to 4,137 euro per patient for RA (this cost increases by about 1,000 euro after 10 years of disease), 3,254 euro per patient for psoriatic arthritis and 4,165 euro per patient for ankylosing spondylitis. Boonen, van der Heijde, Landewé, Guillemin, Rutten-van Mölken, Dougados et al. (2003) estimate

mean annual societal direct cost of ankylosing spondylitis to be equal to 2,640 euro per patient. The societal costs are significantly higher than annual direct costs from a financial perspective (equal to 1,402 euro per patient).

Direct costs, compared to indirect costs, usually represent a minority of the total costs (Dagenais et al., 2008; Kavanaugh, 2005; Kobelt, 2007; Lundkvist et al., 2008). However, for RA, large cross-country variations of estimates of direct costs are found in the literature due to the different uptake of particular treatments in different countries (Lundkvist et al., 2008).

Table 2 on the next page shows some of the specific direct costs associated with musculoskeletal conditions (MSCs) in general, and RA and low back pain in particular, as found in the literature (Woolf, 2004 as cited in The Bone and Joint Decade, 2005; Kavanaugh, 2005; Dagenais et al., 2008).

In France calculations of the costs of treatment tend to evaluate the clinical costs and benefits of treatments. The wider impact of people with MSDs remaining in work or returning to work early extends to the biopsychosocial and economic effects to the individual of being in work and to the reduced costs to the French National Health Insurance and other government departments. Taking a wider joined-up approach to an analysis of costs of treatments for illness in general and MSDs in particular may provide a different and perhaps more realistic assessment of the costs and benefits of treatments.

3.4.2 Indirect costs

There are two main types of indirect costs most commonly measured in association with ill health in employees. These are absence from work and what is termed ‘presenteeism’, or loss of productivity in an employee while they are at work with an illness or incapacity. Presenteeism is extremely difficult to measure and there are no French data on presenteeism costs, rather it is measured on a case by case basis in individual studies. As a result, most estimates of indirect costs are based on absence data. However, it is worth noting some of the limitations of data collected on absence from work. The recording of sickness absence is rarely accurate. Each method has limitations, for example with the self-reported surveys, employees might report sickness on days when they were not due to work anyway. With employer surveys the responses are limited by the quality of the absence records employers keep (for example, employees do not always record absence accurately or categories for recording causes are not adequate). Employer surveys are also subject to response biases where only organisations with good methods to measure absence are likely to be able to respond quickly to the survey request. In all cases records and reports are subject to biases. Managers, for instance, tend to underreport their own absence.

Table 2: Direct costs associated with MSDs, RA, and low back pain

	MSDs	RA	Low back pain
Health care costs	Physician visits Outpatient surgery Emergency room Rehabilitation service utilisation (physiotherapist, occupational therapist, social worker) Medications Diagnostic/therapeutic procedures and tests Devices and aids Acute hospital facilities (with and without surgery) Non acute hospital facilities	Physician visits Other health professional visits Outpatient surgery Emergency room Medications (including administration costs) Imaging Laboratory monitoring Toxicity (diagnosis, treatment) Medical assist devices Hospitalisations (related to RA or its treatment): orthopaedic surgery, extended care / rehabilitation facilities	Physician visits Chiropractic visits Outpatient surgery Emergency room Physical therapy and rehabilitation service utilisation Complimentary and alternative medicine Medications Imaging
Personal costs	Transportation Patient time Carer time		
Other disease related costs	Home health care services Environmental adaptations Medical equipment Non-medical practitioner, alternative therapy		Mental health services

Source: Woolf, 2004 as cited in The Bone and Joint Decade 2005; Kavanaugh, 2005; Dagenais et al., 2008

Not only are indirect costs associated with sickness absence and presenteeism, but indirect costs are also associated with early retirement among people with MSDs (Dagenais et al., 2008; Alavinia and Burdorf, 2008). In the literature, high variation is found about early retirement rates

depending on the country, the year of the study and the sample included. However, in most studies it varies between 30 and 50 per cent (Lundkvist et al., 2008).
As for direct costs, several studies have reported indirect costs estimate of RA in France. Lundkvist et al. (2008) estimate indirect costs to be equal to 5,127 euro per patient per year. Kobelt et al. (2008) estimate productivity loss to be equal to 5,076 euro, of which indemnity payments cover 1,944 euro. Rat and Boissier (2004) estimate indirect costs varying between 1,260 and 37,994 euro per person per year, while Flipon et al. (2009) report loss of productivity equal to 7,217 euro per patient per year. As for AS, Boonen et al. (2002) applying the human capital approach[16] estimated indirect costs to be 3188 euro per patient per year.

However, indirect cost figures often underestimate the true cost of conditions such as MSDs. Most people with MSDs do not become disabled. In fact, whilst there is a relatively high background prevalence of MSDs, most people (even those with diagnosed conditions) continue to work (Waddell and Burton, 2006a). However, there are still potentially significant costs associated with lost productivity where people remain at work but in pain or distress while awaiting intervention or work-place adjustments. As discussed in the previous section, the indirect costs of ill health extend beyond lost productivity of the individual, often impacting on the labour participation of family members (Pugner, Scott, Holmes and Hieke, 2000). A further extension from work-related indirect costs, are additional costs associated with hiring household help (Kavanaugh, 2005) and the provision of informal care. Although informal care is difficult to identify, quantify and value (what is considered 'informal care' by some people may be considered 'normal' by others), Lundkvist et al. (2008), estimated that for RA the annual cost of informal care in Europe was equal to 2,562 euros per patient. This figure varies greatly according to the services provided by the health care or social systems and the characteristics of the labour market in each country. In France, Lundkvist et al. (2008) estimate informal care to be equal to 3,422 euro per person per year.

3.4.3 Total costs

Calculating the costs for specific MSDs is fraught with the same difficulties as for MSDs as a whole. The majority of studies estimating the economic burden of RA have provided cost estimates specific to the US population and health care system (Cooper, 2000). The cost of AS to society is less well established (Chorus et al., 2002). However, as discussed in the previous sections, cost of illness studies have been carried out in France particularly on RA and AS and figures show the economic burden of these conditions to society.

[16] The human capital approach includes productivity costs from the first until the last day of absence from work and productivity costs from the first day of work disability until the last day of work disability or legal age of retirement

Lundkvist et al. (2008) estimated that the total cost of treating RA patients in France was 21,908 euros per patient per year, or 6.2 million euros. These included medical costs, drug costs, non-medical costs, the costs of informal care and other indirect costs, but do not differentiate between those of working age and those above retirement age. These figures are higher, per patient, than those for other Western European countries. Kobelt et al. (2008) report a cost of RA to society that increases from 9,400 euro in mild diseases to 40,700 euro in severe disease, and to public payers from 6,000 euro to 19,000 euro. By adding the direct and indirect costs as reported in Boonen et al. (2003) and Boonen et al. (2002), we can estimate total cost of AS to society to be equal to 5,828 euro per patient per year.

As for non-specific MSDs, the only estimate of cost found refers to a study commissioned by the French national working conditions agency, ANACT, to the Institute of Corporate and Organisational Socioeconomics (ISEOR) with the objective of raising awareness among corporate decision-makers.[17] According to this study, the total cost of work-related MSDs was estimated to be between 6,800 euros and 11,200 euros per person affected each year. These high costs mount up due to frequent employee absenteeism and reduced productivity levels, often in the region of 7 per cent.

3.5 Summary

In this section we have considered the impact that MSDs have on a person's ability to work, both physically, as a result of the condition itself, and from the associated effects, such as loss of concentration from pain. We have also discussed the impact that the work-place can have on MSDs, both at onset and during the development of the conditions. Whilst there are many intrinsic risk factors for MSDs it is clear that the work-place has the potential to expose employees to other risk factors, both physical and psychosocial. Some of the well-established work-place risk factors are already recognized by many employers and assessed in order to minimise their impact, such as vibrations and workstation ergonomics. However, the impact of other work-place risk factors, such as job quality, are not as widely understood.

In order to address the productivity gap, to have a productive workforce across the entire range of the working age population (which covers an increasingly large age bracket) government and employers need to work together to ensure that people are fit to work. To achieve this it is important that all those involved – employers, clinicians, the government and employees – recognize that the physical, psychological and social factors associated with work have a significant impact upon an individual's fitness for work.

[17] http://www.eurofound.europa.eu/ewco/2004/02/FR0402NU03.htm

We have also highlighted that it is important to distinguish between risk factors for the onset of MSDs and risk factors for chronic illness and disability. Whilst the physical conditions of work may cause or aggravate musculoskeletal symptoms, the impact or outcome on individuals (absence from work and disability) is strongly associated with psychosocial factors (Waddell and Burton, 2006a). Evidence suggests that work can help ameliorate the deterioration of conditions (Breen, Langworthy and Bagust, 2005) and assist recovery from MSDs, where appropriate (Feuerstein, Shaw, Lincoln, Miller and Wood, 2003; Chorus et al., 2003). This has implications for the development of strategies and interventions to ensure that those with MSDs are enabled to enjoy full and productive working lives.

Finally, we have looked at the economic and social impact of MSDs and have discussed the direct, indirect and total costs of MSDs. Unfortunately, total costs estimates as found in the literature do not take into account the enormous intangible costs born by people with MSDs. This is due to the difficulty of expressing intangible costs in monetary terms. However, data for RA in particular, point out how direct and indirect costs increase with the progression of the disease. As a consequence, the development of strategies and interventions to stop this progression and ensure that those with MSDs are enabled to enjoy full and productive working lives appears necessary.

The next section discusses the role that early interventions can play to help people with MSDs remain in work and return to work quickly.

4. Interventions

The impact of MSDs, as we have seen, can be significant to the people living with them, to employers and to society as a whole. Their impact on the workforce has recently started to receive greater recognition. Whilst it is widely acknowledged that early intervention is an essential part of addressing the onset of MSDs and absence caused by these conditions, there is still some way to go before people with MSDs are given the best support possible to remain in work or return to work. Long waiting times for care, geographical variation in access and use of various health care services (Girard et al., 2002), certain employer's lack of capacity to deal with sickness, lack of employee awareness about conditions and their management, and mixed messages on the effectiveness of various methods of work-place interventions or return to work programmes are all barriers to making good and healthy work a reality for those with MSDs.

This section looks at the kinds of interventions which are most likely to help workers with MSDs to stay in work, to return to work, to remain productive, to derive health benefits from work and to continue to make a contribution to society. . In addition, Appendix 2 provides a wide number of indicators that may help to identify both enablers and barriers to early intervention in France and to compare France to countries with similar or different labour market, welfare and healthcare systems.

4.1 The case for early intervention

Ensuring that workers who have MSDs get access to the appropriate treatment and support as quickly as possible must be a top priority for employers and health care professionals. Epidemiological studies of employees whose absence is caused by low back pain have shown that the longer the sick leave, the more difficult it is to get the employee to return to work and the higher the economic cost (Frank et al., 1998; Meijer, Sluiter, Heyma, Sadiraj and Frings-Dresen, 2006). Sick leave has also been shown to have a negative psychological impact on employees (Meijer, Sluiter and Frings-Dresen, 2005). Early intervention is therefore crucial to individual recovery and self-management, and may contribute to reducing the number of working days lost and reduced productivity caused by MSDs (although the evidence on the cost-effectiveness of specific return to work programmes is inconclusive).

On the next page we report a French example of successful early intervention for people with RA as found in the literature (Mathieux, Marotte, Battistini, Sarrazin, Berthier and Miossec, 2009). As Flipon et al. (2009) indicate that lower grip strength of the dominant hand is a predictor of RA's subsequent economic impact, the study below shows how early intervention in the form of a early occupational therapy programme can help in reducing the social and economic burden of RA to society and people affected by it.

It is also in an employer's best interests to act early if they are to minimise the costs to the health of employees and to their business through absence. Based on a review of the available

Early occupational therapy programme increases hand grip strength at three months: results from a randomised, blind, controlled study in early rheumatoid arthritis

Aim: The goal of occupational therapy (OT) is to facilitate adjustments to lifestyle and to prevent function loss. This study evaluated the effects of an early OT programme in early rheumatoid arthritis (RA).

Methods: We conducted a randomised, blind, controlled trial enrolling 60 patients with early RA, divided into two groups. At baseline, Group One received the full information programme and Group Two received no information. In an extension phase, patients in Group Two received the full information programme at three months and were assessed at six months. The main outcomes were grip strength of hands (as objective assessment) and Health Assessment Questionnaire (HAQ) score (as subjective assessment).

Results: At three months, grip strength of the dominant and non-dominant hands increased more in Group One than in Group Two ($p = 0.021$ and 0.047 respectively). HAQ score decreased more in Group One than in Group Two ($p<0.001$). In the extension phase, changes in grip strength and HAQ score in Group Two were similar to those seen in Group One between baseline and three months.

Conclusions: This study comparing two schedules of OT programme showed that an early extended information programme improved hand function in patients with early RA.

evidence Breen et al. (2005) recommend that employees and employers should discuss and adjust work within the first week. If employees have concerns about their condition they should consult a health care professional and, following referral or diagnosis, advice and planned action, a review should be conducted within four weeks.

Coutarel (2004) suggests preventive strategies based on the notion of *room to manoeuvre* ('marge de manoeuvre'). ie the means and opportunities of action an employee has in a given production situation to influence and correct the work process. This gives the possibility for the individual to have control over the work situation and to use personal capacities.

According to Douillet et al. (2002) as cited in Daniellou (2005) 'expanding workers' discretion (…) becomes a key prevention priority: not just to reduce the physical and psychological stressors, but also as a way of recognizing the individual's creativity at work'. The organisational changes in order to prevent MSDs must therefore include all the concerned stakeholders.

Therefore, the room to manoeuvre approach calls for prevention strategies based on interventions at an early stage in the design of the work-place according to a participative method which can be labelled and stylized differently across a range of countries.

Job retention and return to work programmes are contingent on patients receiving appropriate medical care as quickly as possible. Yet the length of time that it takes to be seen by a medical professional is a complaint that is heard frequently from individuals and employers. Moreover, since GPs are the first point of call for people with MSDs and the signatory of sick notes, they have a vital role to play in ensuring that patients are able to manage their conditions, and are pivotal in either obstructing or facilitating an individual's return to work. However, in France, evidence shows that a high proportion of adults of working age with subacute low back pain have persistent pain three months later, and that physicians' beliefs influence their following guidelines on physical and occupational activities (Poiraudeau, Rannou, Le Henanff, Coudeyre, Rozenberg, Huas et al., 2006). As physicians' education is very heterogeneous in France, Poiraudeau et al. (2006) call for national standardized teaching programmes on back pain.

4.2 The social security regime for the sick and work disabled

It is clear that, in most EU member states, interventions made by the social security system can make a significant difference to citizens of working age with long-term, chronic or work-disabling conditions.

In France medical certification for sick leave is required. The sick leave benefit is paid from the fourth day onward and is 50 per cent of the mean gross wage during the first month and 66 per cent afterwards. The maximum duration of sick leave is one year, although in exceptional conditions, such as chronic diseases, sick leave can be as long as three years. During this period, the worker can be granted part-time work by of the Social Security Insurance. After one (or three) years of sick leave work disability (disability pension) can be allocated by a committee of expert doctors (designated by the Social Security Insurance and COTOREP, a Social Security Organisation committee) if the person can earn only 33 per cent or less of his/her income. When the person is considered to be unable to perform paid work, a disability benefit of 50 per cent of the former gross wage is granted (with a minimum and a maximum level and a supplement if others depend on this person) (Boonen et al., 2002).

The health system is dominated by solo-based, fee-for service private practice for ambulatory care and public hospitals for acute institutional care, among which patients are free to navigate and be reimbursed under the National Health Insurance (NHI). All residents are automatically enrolled with an insurance fund based on their occupational status. In addition, 90 per cent of the population subscribes to supplementary health insurance to cover other benefits not covered under NHI. Another distinguishing feature of the French health system is its proprietary

hospital sector, the largest in Europe, which is accessible to all insured patients. Finally, there are no gatekeepers regulating access to specialists and hospitals. Health insurance is compulsory; no one may opt out. Health insurance funds are not permitted to compete by lowering health insurance premiums or attempting to micromanage health care. For ambulatory care, all health insurance plans operate on the traditional indemnity model – reimbursement for services rendered. For inpatient hospital services, there are budgetary allocations as well as per diem reimbursements. The French indemnity model allows for direct payment by patients to physicians, coinsurance, and balance billing by roughly one third of physicians.

NHI forms an integral part of France's social security system, which is typically depicted – following an agrarian metaphor – as a set of three sprouting branches: (1) pensions, (2) family allowances, and (3) health insurance and work-place accident coverage. The first two are managed by a single national fund, while the third is run by three main NHI funds: those for salaried workers (Caisse Nationale d'Assurance Maladie des Travailleurs Salariés, or CNAMTS), for farmers and agricultural workers (Mutualité Sociale Agricole, or MSA), and for the independent professions (Caisse Nationale d'Assurance Maladie des Professions Indépendentes, or CANAM). In addition, there are 11 smaller funds for workers in specific occupations and their dependents, all of whom defend their 'rightfully earned' entitlements. All NHI funds are legally private organisations responsible for the provision of a public service. In practice, they are quasi-public organisations supervised by the government ministry that oversees French social security. The main NHI funds have a network of local and regional funds that cut reimbursement checks for health care providers, look out for fraud and abuse, and provide a range of customer services for their beneficiaries. French NHI covers services ranging from hospital care, outpatient services, prescription drugs (including homeopathic products), thermal cures in spas, nursing home care, cash benefits, and to a lesser extent, dental and vision care. Among the different NHI funds, there remain small differences in coverage. Smaller funds with older, higher-risk populations (eg farmers, agricultural workers and miners) are subsidised by the CNAMTS, as well as by the state, on grounds of what is termed 'demographic compensation'. Retirees and the unemployed are automatically covered by the funds corresponding to their occupational categories (Rodwin, 2003).

The French Health Insurance system ensures 100 per cent reimbursement of all the health care expenses borne by people with long term diseases (LTD) (30 conditions in total) with the exception of some treatments such as pedicure, osteopathy, and consultants fees in excess of the allowable rate. Since 1 Jan 2005, a one euro contribution is deducted from the refunds. During the spring of 2008 France held a debate on LTD. In order to save money, the Health Insurance fund had planned to reduce the financing rates for LTD health care. The project was confronted with strong disapproval from the population and was abandoned.

4.3 Condition-specific interventions

For those with specific musculoskeletal conditions, speedy referral to the appropriate specialist for investigation and treatment is usually vital. Those with MSDs can experience numerous problems associated with long term care, including long waits, failure to undertake a multidisciplinary approach, poor advice on pain management, and a lack of clear integrated pathways. Notwithstanding this, there are a number of condition-specific interventions which have been shown to be effective in improving job retention and return to work.

4.3.1 Rheumatoid arthritis

The importance of effective and early treatment of RA in reducing joint damage and disability is now widely acknowledged (Pugner et al., 2000). Since there is currently no 'cure' for RA, the focus of treatment is on controlling signs and symptoms, enabling the patient to manage their condition and improving quality of life. Medical treatments for RA are directed at suppressing one or other part of the joint damaging processes, the effectiveness of which has improved in recent years. Since it is well documented that the functional capabilities of RA patients will decline over time, it is critical that patients should be treated as quickly as possible with disease-modifying anti-rheumatic drugs (DMARDS) to control symptoms and disease progression (Scottish Intercollegiate Guidelines Network (SIGN), 2000). One study found that there is a 73 per cent risk of erosive damage in patients who wait over a year between symptom onset and referral to rheumatology clinics (Irvine, 1999 in Luqmani et al., 2006).

Clinical evidence is also growing which demonstrates that anti-TNF drug therapies can have a more powerful effect on RA than DMARDs, especially in improving job retention and work participation (Halpern, Cifaldi and Kvien, 2008). It seems that uptake of anti-TNF treatments in France is close to the European average (Jönsson, Kobelt and Smolen, 2008).

However, medical interventions in the form of drug therapy to control inflammation and disease progression, and surgery to redress structural damage are only part of managing the care of RA patients. Other important elements include patient education and empowerment, practical self-management to help deal with symptoms and specialist support to help live with the disease and its consequences. The effective management of RA has to involve not only the clinical team (including GPs, consultant rheumatologists, physiotherapists, occupational therapists, chiropodists, podiatrists, pharmacists, primary care nurses and orthopaedic surgeons), but the participation of the patient and, ideally, their employers. Social workers also have their role to play.

4.3.2 Spondyloarthropathies

Prompt referral to specialists for confirmation of diagnosis and the start of treatment is also essential for those with AS and other rheumatic conditions. Since (similarly to RA) there is

no cure for AS, the aim of therapeutic intervention is to reduce inflammation, control pain and stiffness, alleviate systemic symptoms such as fatigue, and to slow or stop the long-term progression of the disease. The prescription of non-steroidal anti-inflammatory drugs (NSAIDS) or anti-TNF drugs coupled with regular physiotherapy forms the current basis for the treatment of AS.

As AS typically affects relatively young people, its potential to disrupt or even curtail an individual's labour market participation may be significant. As we have discussed, there are important clinical, social and economic benefits to keeping these patients in work as long and consistently as possible. Depending on the severity of their condition, AS patients can benefit from work-place adjustments, flexible working arrangements, exercise regimes and physiotherapy (Boonen et al., 2001).

4.3.3 Non-specific MSDs

The primary focus of this report has been to examine the interventions and other factors which affect job retention, labour market participation and job quality among those with MSDs. As we have seen, there is evidence that physical impairment can represent a barrier to each of these aspects, but that many people – even those with serious and chronic incapacity – can and do lead full and fulfilling working lives. Since back pain and the majority of work-related upper limb disorders are not diseases to be cured and there is very limited evidence that prevention is possible, it has been argued that the focus of treatment should be on returning to the highest or desired level of activity and participation, and the prevention of chronic complaints and recurrences (Burton, 2005; Bekkering et al., 2003) rather than eradicating the cause of the problem or returning to normal function.

Whilst treatment to ease or relieve the symptoms of non-specific MSDs will always be a priority, medical intervention is not necessarily the only, or the best route to recovery or helping those with non-specific MSDs to manage their condition. In fact, for non-specific conditions, an individual's recovery and chances of returning to work can be adversely affected by 'over-medicalising' their condition. The limitations imposed by sick notes, statutory sick leave and formalised return to work programmes may serve to reinforce the 'illness' of the patient and can tie employers hands. Based on evidence that psychosocial factors are a determinant of chronicity and disability in those with back pain, there is a strong argument for re-conceptualising this condition and its treatment, which has important lessons for other types of non-specific musculoskeletal pain (Burton, 2005).

Waddell and Burton (2006b) summarise the challenge neatly in their work on vocational rehabilitation. They point out that, whilst many non-specific MSDs do not have clearly defined

clinical features and have a high prevalence among the working age population, most episodes resolve themselves and most people with these conditions remain at work or return to work very quickly. In their view, a focus on incapacity alone can be unhelpful:

> *'..the question is not what makes some people develop long-term incapacity, but* ***why do some people with common health problems not recover as expected?*** *It is now widely accepted that biopsychosocial factors contribute to the development and maintenance of chronic pain and disability. Crucially, they may also act as obstacles to recovery and return to work. The logic of rehabilitation then shifts from dealing with residual impairment to* ***addressing the biopsychosocial obstacles that delay or prevent expected recovery****.'* (Waddell and Burton, 2006b, p.7) [bold in original text]

The biopsychosocial model is an explanatory framework that recognizes the importance of psychological and social factors in determining how MSDs cope with their conditions. The following section provides a brief overview of the biopsychosocial model and outlines the implications that it has for the workforce.

4.4 The biopsychosocial model and work

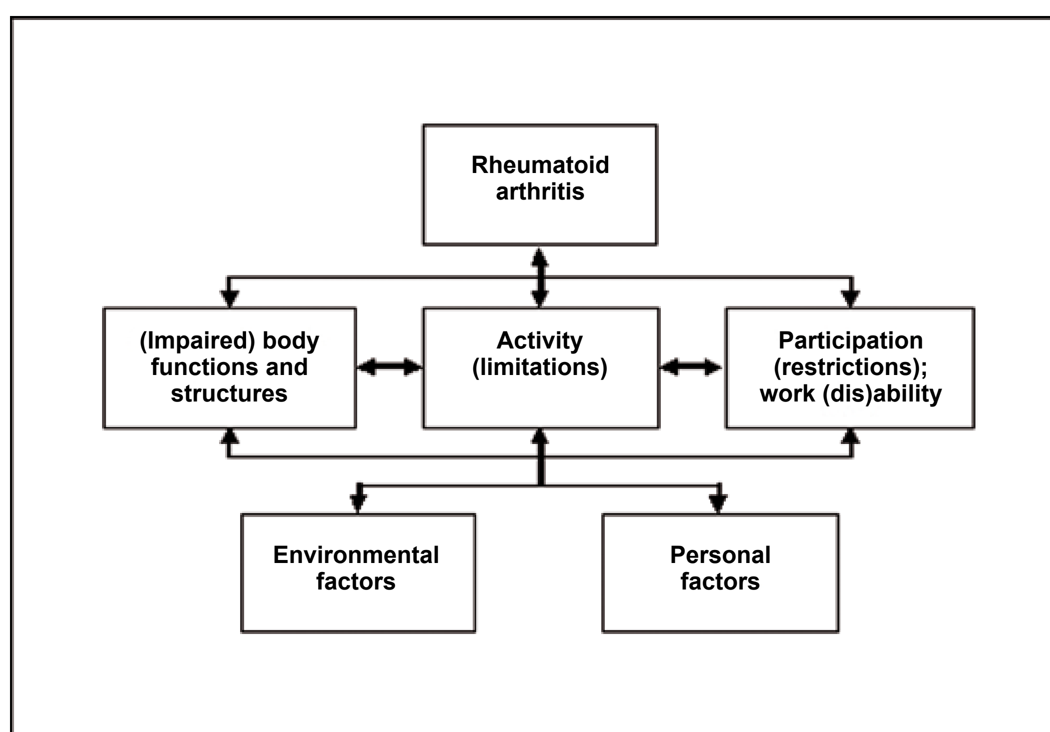
The biopsychosocial model advocates that clinicians, occupational health professionals and others should assess the interplay between the **biological** (eg disease, joint damage), the **psychological** (eg disposition, anxiety) and the **social** (eg work demands, family support). Clearly, the psychological disposition and behaviour of a patient can have a significant impact on the way a physical 'injury' (such as back pain) is approached by a patient. In some cases the patient risks entering a self-reinforcing cycle of incapacity, delayed recovery and even depression if their dominant response to pain is to 'catastrophise' it. Of course there may be many factors which affect an individual's disposition to 'catastrophise', including personality, previous medical history, levels of family support or job satisfaction (Sullivan and D'Eon, 1990). It is evident that the interaction of the biological, psychological and social dimensions can have a significant impact on the development, progression of, and rehabilitation from, a musculoskeletal condition.

Since it was first proposed in the late 1970s, a growing body of evidence has developed to support the biopsychosocial model. For example, research has demonstrated that job dissatisfaction can be an important predictor of speedy and successful return to work (Bigos, Battie and Spengler, 1992). On the issue of social support, studies have shown that limitations in functioning attributable to MSDs can stress family systems and lead to family conflicts if the patient is unable to perform normal family duties (Hamberg, Johansson, Lindgren and Westman, 1997; MacGregor, Brandes, Eikermann and Giammarco, 2004; Kemler and Furnée, 2002). On the other hand, an overly solicitous family (or, by extension, manager or colleague)

may reinforce MSD patient passivity and encourage the patient to adopt a 'disabled' role (Kerns, Haythornthwaite, Southwick and Giller, 1990; Block, Kremer and Gaylor, 1980).

De Croon et al. (2004) looked at the research on work disability among people with RA and concluded that psychosocial factors were often a better predictor of work disability than standard bio-medical factors. In Figure 2 below, the authors highlight how wider environmental and personal factors enhance the explanatory power of the *International Classification of Functioning, Disability and Health* (ICF) in the case of work disability and RA.

Figure 2: ICF model applied to work disability in RA



Source: de Croon et al., 2004

Some critics of the biopsychosocial model (McLaren, 2006) have focused on this last point, highlighting concerns that this approach may encourage or 'permit' helplessness in some patients or that, in other circumstances, it may alienate patients who feel that they are being told that their condition is 'all in the mind'. Clearly, care must be taken in the way that clinicians and others mitigate these risks, but the balance of the literature – and of the expert opinion offered during the course of our interviews – is strongly in support of the biopsychosocial model and its role in informing the management of MSDs in both clinical and occupational settings (Smyth, Stone, Hurewitz and Kaell, 1999; Carter, McNeil and Vowles, 2002; Zampolini, Bernardinello

and Tesio, 2007). Indeed, it forms the basis of the World Health Organisation's *International Classification of Functioning, Disability and Health* (ICF) which has been widely embraced as an authoritative guide for vocational rehabilitation (WHO Scientific Group, 2001).

As Waddell and Burton (2006b) have argued, the goals of the biomedical model are to relieve symptoms, whereas the goals of clinical management informed by the biopsychosocial model – especially in occupational settings – should be to control symptoms and to restore function. This suggests that employers contribute to the 'social' part of the biopsychosocial model and that their actions can make a difference to the outcome for individuals with MSDs.

4.5 The role of employers

4.5.1 Awareness of conditions and their management

Many employers remain unaware of the nature of MSDs, both in terms of the immediate impact on functional capacity at work and, where relevant, the manifestations and progression of the conditions. For example, employees with RA or SpA may be susceptible to periodic 'flares' of inflammation and severe pain followed by fatigue and possible depressed mood. Unless employers are aware that these symptoms are expected or 'typical', they can adopt an unhelpful or over-cautious approach to return to work.

Whilst the message about manual handling and work design may have got through to many employers, the fact that absence and even reduced work requirements can be counter-productive has yet to become common currency. Changing attitudes and raising awareness about the management of MSDs is an important part of reducing their burden to employers and society. However, it is not just employers that need to know more about MSDs and their treatment. One of the most persistent (and pernicious) myths about back pain, for example, is that bed rest is the best solution. Health promotion campaigns have been shown to be effective at getting the message across that experiencing pain does not necessarily mean that the condition has worsened or that being active is bad for you (Buchbinder, Jolley and Wyatt, 2001). This demonstrates that with sufficient commitment and investment from central government, campaigns of this scale can have an impact on public perceptions of common MSDs.

4.5.2 Intervention and adjustment of work demands

Not only has evidence shown that work is good for you but returning to modified work can help recovery (Feuerstein et al., 2003; van Duijn and Burdorf, 2008). Among occupational health specialists, the use of vocational rehabilitation has long been an accepted mechanism for ensuring that individuals with illness, injury or incapacity can return to work (even to perform adjusted work) as soon and as sustainably as possible. There have been concerns that rehabilitation is not well-integrated into mainstream clinical practice and that return to work

is not seen by a sufficient proportion of clinicians as a valued outcome for the patient (Frank and Chamberlain, 2006). It is also important to stress that vocational rehabilitation is not the preserve of professionals. In practice effective management is as, if not more important than formal rehabilitation.

Yet, employers, if they think about this at all, invariably consider the physical job demands which need to be met by an employee with an MSD. The biopsychosocial model requires that the mental demands of the work are also considered as part of the return to work process. There is a growing body of work which shows that adjusting a variety of work demands can support successful return to work among those with a range of MSDs (Schultz, Stowell, Feuerstein and Gatchel, 2007; de Croon et al., 2004; Feuerstein, Shaw, Nicholas and Huang, 2004; Chorus, Miedema, Wevers and van der Linden, 2001). The success with which both employee and employer can manage the process of re-adjustment during return to work can also depend on the beliefs that both parties have about the extent to which the work itself is (at least in part) caused by or related to the incapacity.

There are numerous types of work-based intervention for assisting those with MSDs, ranging from ergonomic adjustments to providing access to physiotherapy, modifying work programmes to cognitive behavioural therapy, or a combination of various strategies. Evidence on the success of these interventions at tackling non-specific MSDs is mixed (Meijer et al., 2005).[18] A systematic review of multidisciplinary treatments of patients with low back pain, for example, demonstrated that whilst the treatment improved function and decreased pain in individuals, it could not be demonstrated that this was linked to employees returning to work earlier than those who had not received it (Guzman et al., 2001). Whilst biomechanical or ergonomic factors may be related to the onset of back pain, evidence that interventions based on these principals will prevent re-occurrence or progression to chronicity is thin on the ground (Burton, 1997). In fact, it has proved virtually impossible to determine whether one treatment is significantly more effective than another (Ekberg, 1995). Even for specific conditions such as RA, the evidence for the effectiveness of vocational rehabilitation is slim (Backman, 2004; de Buck, Schoones, Allaire and Vliet Vlieland, 2004).[19]

There is nonetheless broad agreement on the principles for managing non-specific MSDs, particularly back pain, that are outlined in Box 1 on the next page. This includes advice and a number of relatively simple measures for employees and employers to follow on how to deal with back pain.

[18] Findings from an evaluation of the effectiveness of return-to-work treatment programmes were inconsistent
[19] Backman, 2004 found only six studies for the period 1980 to 2001

Box 1: Principles of managing non-specific MSDs

- Early treatment should be sought for back pain.
- Most back pain is not due to a serious condition.
- Simple back pain should be treated with basic pain killers and mobilisation.
- It is important to keep active both to prevent and to treat back pain.
- Getting back to work quickly helps prevent chronic back pain.
- Adopt the correct posture while working.
- All work-place equipment should be adjustable.
- Take breaks from repetitive or prolonged tasks or postures.
- Avoid manual handling and use lifting equipment where possible.
- Clear information should be provided to employees about back care.
- Health and safety policies should be implemented to cover all aspects of day-to-day work and should be reviewed regularly.

Source Health and Safety Executive (HSE), 1999

This requires employers to think beyond their statutory duty to address health and safety risks, and to recognize that sickness absence management, effective return to work programmes and rehabilitation are, at bottom, principles for effective management (Waddell and Burton, 2006b). Much is dependent on raising awareness about how to manage the symptoms of MSDs amongst employees and their managers, and ensuring that the latter have the skills and confidence to support employees in work. In France, the culture around the work-place needs to improve. Employees do not receive enough social support, are not involved in the organisational level of work (organisation of the productive process, training of employees, job rotation, etc), and perceive working conditions to be worsened in the past 15 years.[20] One of the expert we interviewed stated that 'without changing line managers' attitude towards their employees, there will be no prevention in France'

4.5.3 Line managers

What is clear is that the role of line managers in early intervention is crucial, both in work retention and rehabilitation. Yet many line managers feel ill-equipped to manage long-term absence and incapacity. They may find aspects of mental ill-health or chronic incapacity awkward and embarrassing to talk about or confront, and are concerned about challenging or asking for more information about GP sick notes, making home visits or telephoning staff at home for fear of being accused of harassment or falling foul of the law and landing themselves and their organisation in a tribunal. They are also ignorant of, or uncomfortable with, the idea of rehabilitation. Although the Employment Equality Act requires employers to make 'reasonable

[20] Expert interviews

accommodation' to support employees with long-term illness or injury, most line managers find job re-design difficult, irritating and disruptive.

Given that MSDs are one of the most common work-related health problem, and the importance of psychosocial factors in determining whether an employee remains in work or returns to it as soon as they can, managers need to have the skills to deal with staff who have them, or the costs to their organisation may be significant, particularly for small and medium enterprises. Small employers also have issues with employees with MSDs, as their absence from work can have, potentially, more impact on customer service, productivity and business performance.

4.5.4 Improved employer-clinician dialogue

On the face of it, many of the return to work challenges faced by employees with MSDs may be improved if there was an improved level of mutual understanding between employers and clinicians. As highlighted above, the clinical appreciation of most MSDs by employers can be cursory to say the least. It is often argued that most GPs, in their turn, have little or no appreciation of the vocational or occupational dimension of many MSDs. Medical students in France do not spend enough time learning about occupational health, whilst musculoskeletal training for GPs has been found lacking in many countries (Akesson, Dreinhofer and Woolf, 2003). Many GPs are making return to work judgements without a very clear view of the demands of the job, the extent to which adjustments to the job can be made or, indeed, whether swift and appropriate return to work might have positive psychological (and economic) benefits. Without this understanding of specific tasks undertaken by employees and the ability to adjust those tasks, GPs may feel that a return to work would exacerbate a condition unless an individual is 100 per cent fit.

For their part, employers will only very rarely challenge a GP's sick note, or ask for a second opinion on the potential for a beneficial return to work for a patient. The consequence of this mutual lack of understanding and resulting dearth of dialogue can often be that the MSD patient is left stranded in the middle, with no clear pathway back to work and, more importantly, no voice. A proactive, inclusive, multi-disciplinary, capability-focused approach to vocational rehabilitation, informed by the biopsychosocial model and delivered through case management is widely regarded as the most enlightened and effective approach to take in the majority of work-related MSD cases. Quite often both employers and GPs will focus on the aspects of the job which an MSD patient cannot currently perform, rather than on those which they can.

One of the attractions of the biopsychosocial model is that it 'joins up' the three core strands of the MSD patient's experience, and management of, their condition. It offers a comprehensive

framework with which to look at the diagnosis and treatment of a range of MSDs, especially when an important outcome for the individual is to stay in, or to return swiftly to, work.

4.6 Summary

This section has outlined the case for early intervention, first and foremost to benefit the health of those with MSDs, but also to ensure that they remain productive members of the workforce. We have presented an example of early intervention for people with RA, and tried to demonstrate that intervention should ideally begin before those experiencing musculoskeletal pain visit their GP and extend beyond the signing of a sick note. The biopsychosocial model clearly illustrates the need for a more comprehensive understanding of the factors that contribute to the development of non-specific MSDs, taking into account individual or psychological factors as well as the social milieu in which individuals live their lives, in which work plays a large part. To achieve this, employers, employees and clinicians need to talk to one another more effectively. Whilst this is challenging, and undoubtedly not common practice today, the costs of not addressing this problem were highlighted in this chapter.

5. Conclusions and recommendations

Work is, unambiguously, good for our health (Coats and Max, 2005; Waddell and Burton, 2006a). It provides us with income, generates social capital and gives us purpose and meaning. Even when unwell or injured, remaining in work – at least in some capacity – is often better for recovery than long periods away from work. If France's workforce is to be productive and competitive in the global economy, and if the quality of their working lives is to be enhanced, it is important that a high proportion of the workforce is, as far as possible, fit for work.

The evidence presented in this report illustrates that a large proportion of working age people in France are, or will be, directly affected by (MSDs). This can have very significant social and economic consequences for these individuals and their families, it can impede the productive capacity of the total workforce and parts of French industry and it can draw heavily on the resources of both the health service and the benefits regime.

Although data collection needs to be improved, as in many countries, there is enough clinical, epidemiological, psychological and economic evidence of the extent and consequences of MSDs in France. However, there seems to be a lack of coherence or 'joined-up' thinking and action by government, clinicians and employers which focuses on the MSD **patient as worker**. While the numbers advocating the application of the biopsychosocial model to MSDs are growing, we noted that some of those who can have most impact on fulfilling the labour market participation of workers with MSDs have yet to embrace its principles as fully as they might.

The Work Foundation has a number of recommendations for several interested parties in this field. Our intention is to encourage some of the key players to recognize that more can be done to ensure that continued active participation in the labour market is almost always a strongly positive force for health, fulfilment and for prosperity.

5.1 Recommendations for employers

- Managerial awareness-raising and training must include a health and well-being component. Managers are in the front line of staff absence and are in a good position to spot the early warning signs of a problem and to help rehabilitate employees after a period away from work. Despite the current focus on 'stress', managers in French organisations need to be aware that MSDs can be even more of a problem for their staff and for the whole organisation.
- Imaginative job design will assist rehabilitation. Managers can change the ways work is organised (including simple changes to working time arrangements) to help prevent MSDs getting worse and to help people with MSDs to return to work. They need to do this in a way which preserves job quality, avoids excessive or damaging job demands and takes heed of ergonomic good practice.

- Challenge GPs. If sick notes from GPs are not providing a clear enough indication of the nature of the health problem an employee has, and its impact on their capacity to work, employers should challenge and clarify the GP's assessment, if only to help understand which tasks the employee can still perform, or what support they might need to return to work.
- Intervene early. Employers should always take action sooner rather than later because caution and delay can only make matters worse. As long as they behave compassionately and make decisions based on evidence and on expert opinion, early intervention cannot be construed as harassment and can often hasten recovery or rehabilitation.
- Use occupational health advice. Vocational rehabilitation carefully organised and tailored to the individual, can make a real difference to return to work, productivity, morale and sustainability of performance. Involve occupational health professionals as early as possible.
- Beyond legal compliance. Try to avoid a 'risk management' mentality when dealing with an employee with an MSD, this can often lead to delay and ambiguity. In almost all cases, the employee is better off at work.
- Use the biopsychosocial framework. Thinking about the physical symptoms of the MSD without considering the psychological and social dimensions can mean that the work-related *causes* of an MSD, or the work-related *benefits* of rehabilitation can be underestimated.
- Focus on capacity not incapacity. Employers can catastrophise too! Most workers with MSDs can continue to make a great contribution at work if they are allowed to. They do not need to be 100 per cent fit to return to work, and a little lateral thinking will allow you to give them useful work to do which will support them on their journey back to full productive capacity.

5.2 Recommendations for employees

- Focus on capacity not incapacity. It's natural to be anxious or even guilty about the parts of your job which you may find difficult to perform because of your MSD. But you still have much to contribute and you should play to your strengths. Your specialist knowledge and experience doesn't disappear just because you are suffering pain, discomfort or mobility problems, you can still contribute in many ways. Work with your managers and your colleagues to find out how you can maximise your impact at work within the constraints of your condition. Be open with them and they should respond better.

- Talk early. Your line manager, despite what he or she might tell you, is not a mind-reader. If your MSD is causing you difficulty or you anticipate a period when you will need to adjust your working time, talk to your manager so that you can both plan what to do about it. The earlier the better as managers don't like last minute surprises, but they can usually find a solution to most problems if they have some notice. You might also find it useful to talk to your union representative, your HR manager or someone in occupational health. Don't delay.
- Play an active part in the management of your condition. Your MSD is bound to get you down sometimes and you will feel like it's controlling your life at home and at work. But you don't need to be a passive victim of pain or immobility. Find out more about your condition, watch for patterns in pain or fatigue and learn how you can minimise its impact on your functioning and your mood. This can sometimes be very hard to do, but persevere: people who play an active part in the management of their condition tend to get back to work more quickly.
- Know your rights. As both a patient and as a worker you should know what support and advice you are entitled to. If you are a trade union member, your union should be able to guide you on much of this.
- Family involvement in job retention and rehabilitation. Your family and friends are important sources of support. They may not realise that staying in or returning to work is both possible and desirable. You need to help them to help you by getting them involved in your rehabilitation at work. Even small adjustments to working time or travel to work arrangements can make the world of difference.

5.3 Recommendations for GPs

- Identify where job retention or early return to work is *good* for the patient. It is easy to assume that work is unambiguously bad for your patient, especially if you suspect that aspects of their job make their symptoms worse. Consider carefully whether, with some adjustments, you can recommend staying at work on lighter duties or with adjusted hours might still be a better option than a prolonged absence from work.
- Think beyond the physical symptoms. Bring to bear your understanding of the biopsychosocial model and the limitations of the biomedical model in your diagnosis of the patient and – most importantly – your assessment of the role that their job might play in helping them stay active and avoid isolation. As a GP you are ideally placed to identify the early presentation of many MSDs. Where appropriate, you should seek to refer patients to specialist teams as early as practicable, to enable management of the condition to begin.

- Avoid catastrophising. A patient can hold a very negative view of the impact and likely progression of their condition if the way that clinicians present it focuses on incapacity rather than capacity.
- Encourage self-management. Try to ensure that the patient can adopt strategies to manage aspects of their own condition, especially if they are staying in or returning to work. A feeling of empowerment and control will help their mood and ensure that they can keep on top of important aspects of their incapacity while at work.
- Early intervention. The evidence suggests that long periods away from work are usually bad for MSD patients. The longer they are away from work, the more difficult it is to return. Early action, preferably in partnership with the patient and their employer, can help achieve a balance between the individual's need for respite and their need to work.

5.4 Recommendations for occupational health professionals

- Think beyond the physical symptoms. More importantly, ensure employers, employees and GPs fully appreciate how this multi-factor perspective can contribute to constructive, active, participative and sustainable rehabilitation. Shape your interventions and advice around the three domains of the biopsychosocial model and help employers see how small work-place adjustments can bring wider benefits than just compliance with the Employment Equalities Act.
- Early intervention. Occupational health professionals, above all others, understand the benefits of early interventions with MSDs. They must play a proactive part in mediating between employer and employee, or employer and GP, to ensure that the patient can use return to work as a positive part of the way they learn to manage their condition and maintain their sense of self-worth and self esteem.
- Encourage self-management. Working with the employee, their colleagues and their manager, help the individual to find strategies to manage their own condition. This will enable them to make their own decisions about their working arrangements.
- Support managers with job design interventions. Making changes to work demands under the Employment Equalities Act is often seen by managers as a way of complying with the law. Helping managers to look at job redesign as a more constructive way of meeting the needs of a patient/worker with an MSD and meeting changing customer demands can help them to see the business benefits of more flexible working arrangements.

5.5 Recommendations for government

- Take seriously the existing evidence that the proportion of the French workforce with MSDs is likely to grow over the next few decades. While France has relatively low prevalence today – compared with the rest of the EU – this situation will not last. France has the benefit of learning from good practice elsewhere and the government should act now to put such measures in place.

- Carefully consider the direct, indirect and total costs of MSDs to French society. Investing resources in prevention and early intervention will help to greatly reduce societal costs of these conditions.
- Encourage surveillance and prevention programs at company level.
- Ensure that availability and consumption of health care services are the same across different regions.
- Review the extent of collaborative working between government departments in order to set up a national service framework for the treatment of people with MSDs. This framework should enshrine the principle that job retention or return to work are legitimate clinical outcomes.
- Review the definitions of MSDs in the current classification of occupational diseases beyond their current narrow focus. In addition, formally acknowledge that many MSDs and other chronic conditions (such as rheumatic diseases and multiple sclerosis) are not caused by work, but may inhibit participation at work.
- Help make GPs and consultants more effective in handling occupational health issues. This will require an input into medical training and national education campaigns for practicing professionals.
- Bring forward proposals to replace the current system of sickness certificates with a UK-style ‘Fit Note’ which encourages GPs to indicate what a worker is still capable of performing. This would help other health care professionals and employers to plan return to work and to make appropriate adjustments to job demands and/or working time.

References

Akesson, K., Dreinhofer, K. & Woolf, A. D. (2003). Improved education in musculoskeletal disorders is necessary for all doctors. **Bulletin of the World Health Organisation**, 81, 677-683

Akkoc, N. (2008). Are spondyloarthropaties as common as rheumatoid arthritis worldwide? A review. **Current Rheumatology Reports**, 10, 371-378

Alavinia, S. M. & Burdorf, A. (2008). Unemployment and retirement and ill-health: a cross-sectional analysis across European countries. **International Archives of Occupational and Environmental Health**, 82, 39-45

Alcouffe, J., Manillier, P., Brehier, M., Fabin, C. & Faupin, F. (1999). Analysis by sex of low back pain among workers from small companies in the Paris area: severity and occupational consequences. **Occupational and Environmental Medicine**, 56, 696-701

Aptel, M., Aublet-Cuvelier, A. & Cnockaert, J. C. (2002). Work-related musculoskeletal disorders of the upper limb, **Joint Bone Spine**, 69 (6), 546-555

Backman, C. L. (2004). Employment and work disability in rheumatoid arthritis. **Current Opinion in Rheumatology**, 16, 148-152

Bekkering, G., Henriks, H., Koes, B., Oostendorp, R., Ostelo, R., Thomassen, J. & Van Tulder, M. (2003). Dutch Physiotherapy Guidelines for Low Back Pain. **Physiotherapy**, 89 (2), 82-96

Bigos, S. J., Battie, M. C. & Spengler, D. M. (1992). A longitudinal, prospective study of industrial back injury reporting. **Clinical Orthopaedic Related Research**, 279, 21-34

Block, A. R., Kremer, E. F. & Gaylor, M. (1980). Behavioral treatment of chronic pain: the spouse as a discriminative cue for pain behaviour. **Pain**, 9 (2), 243-252

Boonen, A., Chorus, A., Miedema, H., van der Heijde, Landewé, D. R., Schouten, H. et al. (2001). Withdrawal from labour force due to work disability in patients with ankylosing spondylitis. **Annals of the Rheumatic Diseases,** 60, 1033–1039

Boonen, A., van der Heijde, D., Landewé, R., Guillemin, F., Rutten-van Mölken, M., Dougados, M. et al. (2003). Direct costs of ankylosing spondylitis and its determinants: an analysis among three European countries. **Annals of the Rheumatic Diseases**, 62, 732-740

Boonen, A., van der Heijde, D., Landewé, R., Spoorenberg, A., Schouten, H., Rutten-van Mölken, M. et al. (2002). Work status and productivity costs due to ankylosing spondylitis: comparison of three European countries. **Annals of the Rheumatic Diseases**, 61, 429-437

Bourgeois, A. & Duée, M. (2009). Le Compte social du handicap en 2007. **Études et Résultats**, n. 677, fevrier. Retrieved on 30 April 2009 from http://www.sante.gouv.fr/drees/etude-resultat/er-pdf/er677.pdf

Breen, A., Langworthy, J. & Bagust, J. (2005). Improved early pain management for musculoskeletal disorders. **HSE Research report**, 399 London: Health and Safety Executive

Buchbinder, R., Jolley, D. & Wyatt, M. (2001). Population based intervention to change back pain beliefs and disability: three part evaluation. **British Medical Journal**, 322, 1516-1520

Burton, A. K. (1997). Back injury and work loss. Biomechanical and psychosocial influences. **Spine**, 22, 2575-2580

Burton, A. K. (2005). How to prevent low back pain, **Best Practice and Research in Clinical Rheumatology**, 19 (4), 541-555

Burton, W., Morrison, A., Maclean., R. & Ruderman, E. (2006). Systematic review of studies of productivity loss due to rheumatoid arthritis. **Occupational Medicine**, 56, 18-27

Cammarota, A. (2005). The Commission's initiative on MSDs: Recent developments in social partner consultation at the European level. Presentation to the Conference on MSDs – A challenge for the telecommunications industry. Lisbon, 20-21 October

Carter, L. E., McNeil, D. W. & Vowles, K. E. (2002). Effects of emotion on pain reports, tolerance and physiology. **Pain Research Management**, 7 (1), 21-30

Cassou, B., Derriennic, F., Monfort, C., Norton, J. & Touranchet, A. (2002). Chronic neck and shoulder pain, age and working conditions: longitudinal results from a large random sample in France. **Occupational and Environmental Medicine**, 59, 537-544

Chiron, E., Roquelaure, Y., HA, C., Touranchet, A., Chotard, A., Bidron, P. et al. (2008). MSDs and job security of employees aged 50 years and over: a challenge for occupational health and public health. **Sante Publique**, May-June; 20(3), 19-28

Chorus, A. M. J., Miedema, H. S., Wevers, C. W. J. & van der Linden, S. (2001). Work factors and behavioural coping in relation to withdrawal from the labour force in patients with rheumatoid arthritis. **Annals of the Rheumatic Diseases**, 60, 1025-1032

Chorus, A. M. J., Boonen, A., Miedema, H. S. & van der Linden, S. (2002). Employment perspectives of patients with ankylosing spondylitis. **Annals of the Rheumatic Diseases**, 61, 693-699

Chorus, A. M. J., Miedema, H. S., Boonen, A. & van der Linden, S. (2003). Quality of life and work in patients with rheumatoid arthritis and ankylosing spondylitis of working age. **Annals of the Rheumatic Diseases**, 62, 1178-1184

CNAMTS (2006). **Statistiques technologiques des maladies professionnelles, Annee 2006. Resultats ventiles par CTN**. Retrieved on 30 April 2009, from http://www.risquesprofessionnels.ameli.fr/atmp_media/STATS%20TECHNO%20MP%202006%20PAR%20CTN.pdf

CNAMTS (2009). **Dénombrement des maladies professionelles déclarées et reconnues par le régime général de 2004 à 2007**. Retrieved on 29 April 2009 from http://www.risquesprofessionnels.ameli.fr/atmp_media/2009-MALADIES_PROFESSIONNELLES_DECLAREES_ET_RECONNUES_2004-2007.pdf

Coats, D. & Lehki, R. (2008). **'Good Work': Job Quality in a Changing Economy**. London: The Work Foundation

Coats, D. & Max, C. (2005). **Healthy Work, productive work-places: why the UK needs more good jobs.** London: The Work Foundation

Cooper, N. (2000). Economic burden of rheumatoid arthritis: a systematic review. **Rheumatology,** 39 (1), 28-33

Coutarel, F., (2004). La prevention des troubles musculo-squelettiques en conception: quelles marges de manoeuvre pour le dèploiment de l'activitè?. Coll. **Thèses et Mèmoires**. Universitè Victor Segalen Bordeaux 2 – ISPED, Laboratoire d'Ergonomie des Systèmes Complexes

Dagenais, S., Caro, J. & Haldeman, S. (2008). A systematic review of low back pain cost of illness studies in the United States and internationally. **The Spine Journal**, 8, 8-20

Dagfinrud, H., Mengshoel, A. M., Hagen, K. B., Loge, J. H. & Kvien, T. K. (2004). Health status of patients with ankylosing spondylitis: a comparison with the general population. **Annals of the Rheumatic Diseases**, 63, 1605-1610

Daniellou, F. (2005). TMS et **modèles d'organisation du travail et de la production**. Presented at the '1.er congrés francophone sur les TMS du membre supèrieur', Nancy, 30-21 May 2005

de Buck, P., Schoones, J. W., Allaire, S. H. & Vliet Vlieland, T. P. M. (2002). Vocational rehabiliation in patients with chronic rehumatoid diseases: A systematic literature review. **Seminars in Arhtirits and Rheumatism**, 32 (3), 196-203

de Croon, E. M., Sluiter, J. K., Nijssen, T. F., Dijkmans, B. A. C., Lankhorst, G. J. & Frings-Dresen, M. H. W. (2004). Predictive factors of work disability in rheumatoid arthritis: a systematic literature review. **Annals of the Rheumatic Diseases**, 63, 1362-1367

der Tempel, H. & van der Linden, S. (2001). Withdrawal from labour force due to work disability in patients with ankylosing spondylitis. **Annals of the Rheumatic Diseases**, 60, 1033-1039

Devereux, J., Rydstedt, L., Kelly, V., Weston, P. & Buckle, P. (2004). The role of work stress and psychological factors in the development of musculoskeletal disorders. **Health and Safety Executive Research Report**, 273, London: Health & Safety Executive

Ekberg, K. (1995). Work-place changes in successful rehabilitation, **Journal of Occupational Rehabilitation**, 5, 253–269

EUROGIP. (2007). **Musculoskeletal disorders in Europe: Definitions and statistics**. Retrieved 15 April 2009 from http://www.eurogip.fr/docs/TMS_07-Eurogip-25-EN.pdf

European Centre for Social Welfare, Policy and Research (2008). **The Labour Market Situation of People with Disabilities in EU25**. Retrieved on 1 May 2009 from http://www.euro.centre.org/data/1201610451_25081.pdf

European Foundation for the Improvement of Living and Working Conditions (Eurofound) (2007). **Managing Musculoskeletal Disorders**. Retrieved 15 April 2009 from http://www.eurofound.europa.eu/ewco/studies/tn0611018s/tn0611018s.htm

European Trade Union Institute (ETUI) (2007). **Musculoskeletal disorders: An ill-understood pandemic**. Brussels: ETUI

Eurostat (2004). **Occupational Diseases in Europe in 2001**. Statistics in Focus, 15/2004. Retrieved 20 April 2009 from http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-NK-04-015/EN/KS-NK-04-015-EN.PDF

Feuerstein, M., Shaw, W. S., Lincoln, A. E., Miller, V. I. & Wood, P. M. (2003). Clinical and work-place factors associated with a return to modified duty in work-related upper extremity disorders. **Pain**, 102, 51–61

Feuerstein, M., Shaw, W. S., Nicholas, R. A. & Huang, G. D. (2004). From confounders to suspected risk factors: psychosocial factors and work-related upper extremity disorders. **Journal of Electromyography and Kinesiology**, 14, 171-178

Flipon, E., Brazier, M., Clavel, G., Bourmier, P., Gayet, A., Le Loët, X. et al. (2009). Is it possible to identify early predictors of the future cost of chronic arthritis? The VERA project. **Fundamental and Clinical Pharmacology**, 23, 105-113

Frank, A. O. & Chamberlain, M. A. (2006). Rehabilitation: an integral part of clinical practice. **Occupational Medicine**, 56, 289-293

Frank, J., Sinclair, S., Hogg-Johnson, S., Shannon, H., Bombardier, C., Beaton, D., et al. (1998). Preventing disability from work-related low-back pain. New evidence gives new hope – if we can just get all the players onside. **Canadian Medical Association Journal**, 158(12):1625–31

Gignac, M., Cao, X., Lacaille, D., Anis, A. & Badley, E. (2008), Arthritis-related work transitions: A prospective analysis of reported productivity losses, work changes, and leaving the labour force, **Arthritis Care & Research**, 59 (12), 1805-1813

Gignac, M. A. M., Badley, E. M., Lacaille, D., Cott, C. C., Adam, P. & Anis, A. H. (2004). Managing arthritis and employment: Making arthritis-related work changes as a means of adaptation. **Arthritis & Rheumatism**, 51 (6), 909-916

Girard, F., Guillemin, F., Novella, J. L., Valckenaere, I., Krzanowska, K., Vitry, F. et al. (2002). Health-care use by rheumautoid arthritis patients compared with non-arthritic subjects. **Rheumatology**, 41, 167-175

Gordeev, V. S., Maksymowych, W. P., Evers, S. M., Ament, A., Schachna, L. & Boonen, A. (2009). The role of contextual factors on health-related quality of life in ankylosing spondylitis. **Annals of the Rheumatic Diseases**, published online 11 March 2009, doi:10.1136/ard.2008.100164

Guillemin, Saraux, Guggenbuhl, Roux, Fardellone, Le Bihan et al. (2005). Prevalence of rheumatoid arthritis in France: 2001. **Annals of the Rheumatic Diseases**, 64, 1427-1430. Published online first on 30 March 2005, doi 10.1136/ard.2004.029199

Guzman, J., Esmail, R., Karjalainen, K., Malmivaara, A., Irvin, E. & Bombardier, C. (2001). Multidisciplinary rehabilitation for chronic low back pain: systematic review. **British Medical Journal**, 322, 1511–1516

Halpern, M, T., Cifaldi, M. & Kvien, T. K. (2008). Impact of adalimumab on work participation in rheumatoid arthritis: comparison of an open-label extension study and a registry-based control group, **Annals of the Rheumatic Diseases**, published online 1 October 2008; doi:10.1136/ard.2008.092734

Hamberg, K., Johansson, E., Lindgren, G. & Westman, G. (1997). The impact of marital relationship on the rehabilitation process in a group of women with long-term musculoskeletal disorders. **Scandinavian Journal of Social Medicine**, 25 (1), 17-25

Health and Safety Executive (HSE) (1999) **The costs to Britain of work-place accidents and work-related ill health in 1995/96**. (2nd ed.). HSE Books

Huscher, D., Merkesdal, S., Thiele, K., Schneider, M. & Zink, A. (2006). Cost of illness in rheumatoid arthritis, ankylosing spondylitis, psoriatic arthritis and systemic lupus erythematosus in Germany. **Annals of the Rheumatic Diseases**, 65, 1175-1183

Husted, J. A., Gladman, D. D., Farewell, V. T. & Cook, R. J. (2001) Health-related quality of life of patients with psoriatic arthritis: a comparison with patients with rheumatoid arthritis. **Arthritis and Rheumatism**, 45, 151-158

Jönsson, B., Kobelt, G. & Smolen, J. (2008). The burden of rheumatoid arthritis and access to treatment: uptake of new therapies. **European Journal of Health Economics**, 8 (Suppl 2), 61–86

Katz, W. A. (2002). Musculoskeletal Pain and its socioeconomic implications. **Clinical Rheumatology, Supplement**, 1, 2–4

Kavanaugh, A. (2005). Health economics: implications for novel antirheumatic therapies. **Annals of the Rheumatic Diseases,** 64, 65-69

Kemler, M. A. & Furnée, C. A. (2002). The impact of chronic pain on life in the household. **Journal of Pain Symptom Management**, 23 (5), 433-441

Kerns, R. D., Haythornthwaite, J., Southwick, S. & Giller, E. L. (1990). The role of marital interaction in chronic pain and depressive symptom severity. **Journal of Psychosomatic Research**, 34(4), 401-408

Kobelt, G. (2007). Thoughts on health economics in rheumatoid arthritis. **Annals of the Rheumatic Diseases**, 66, 35-39

Kobelt, G., Woronoff, A. S., Richard, B., Peeters, P. & Sany, J. (2008). Disease status, costs and quality of life of patients with rheumatoid arthritis in France-the ECO-PR Study. **Joint, Bone, Spine**, 75(4), 408-415. Published online 2 May 2008 doi:10.1016/j.jbspin.2007.07.015

Leardini, G., Salaffi, F., Montanelli, R., Gerzeli, S. & Canesi, B. (2002). A multi-center cost-of-illness study on rheumatoid arthritis in Italy. **Clinical and Experimental Rheumatology**, 20, 505-515

Leclerc, A., Chastang, J. F., Ozguler, A. & Ravaud, J. F. (2006). Chronic back problems among persons 30 to 64 years old in France. **Spine**, 31(4), 479-484

Lefevre-Colau, M., Fayad, F., Rannou, F., Fermanian, J., Coriat, F., Mace, Y. et al. (2009). Frequency and interrelations of risk factors for chronic low back pain in a primary care setting. **PLoS ONE**, 4(3), e4874. Published online on 16 March 2009, doi:10.1371/journal.pone.0004874

Lundkvist, J., Kastang, F. & Kobelt, G. (2008). The burden of rheumatoid arthritis and access to treatment: health burden and costs. **European Journal of Health Economics,** 8 (Supple 2), 49-60

Luqmani, R., Hennell, S., Estrach, C., Birrell, F., Bosworth, A., Davenport, G., et al., (2006). On behalf of the British Society for Rheumatology and British Health Professionals in Rheumatology Standards. Guidelines and Audit Working Group British Society for Rheumatology and British Health Professionals in Rheumatology Guideline for the Management of Rheumatoid Arthritis (The first two years). **Rheumatology,** 45, 1167-1169

MacGregor, E. A., Brandes, J., Eikermann, A. & Giammarco, R. (2004). Impact of migraine on patients and their families: the Migraine and Zolmitriptan Evaluation (MAZE) survey – Phase III. **Current Medical Research Opinion**, 20 (7),1143-1150

Mathieux, R., Marotte, H., Battistini, L., Sarrazin, A., Berthier, M. & Miossec, P. (2009). Early occupational therapy programme increases hand grip strength at three months: results from a randomised, blind, controlled study in early rheumatoid arthritis. **Annals of the Rheumatic Diseases**, 68, 400-403

McLaren, N. (2006). Interactive dualism as a partial solution to the mind-brain problem for psychiatry. **Medical Hypotheses,** 66 (6),1165-73

Meijer, E., Sluiter, J. & Frings-Dresen, M. (2005). Evaluation of effective return-to-work treatment programs for sick-listed patients with non-specific musculoskeletal complaints: a systematic review. **International Archives of Occupational and Environmental Health**, 78 (7), 523-532

Meijer, E., Sluiter, J., Heyma, A., Sadiraj, K. & Frings-Dresen, M. (2006). Cost-effectiveness of multidisciplinary treatment in sick-listed patients with upper extremity musculoskeletal disorders: a randomised, controlled trial with one-year follow-up. **International Archives of Occupational and Environmental Health**, 79 (8), 654-664

Nachemson, A., Waddell, G. & Norlund A. (2000) Epidemiology of neck and low back pain. In Nachemson, A. & Jonsson E., (eds.) **Neck and Back Pain: The scientific evidence of causes, diagnosis and treatment**, 165-188. Philadelphia: Lippincott Williams & Wilkins

OECD (2009). Economic Survey of France 2009. Retrieved on 30 April 2009 from http://www.oecd.org/document/8/0,3343,en_2649_33733_42610376_1_1_1_1,00.html

Parent-Thirion, A., Fernández Macías, E., Hurley, J. & Vermeylen, G. (2007). **Fourth European Survey on Working Conditions**. Dublin: European Foundation for the Improvement of Living Standards

Poiraudeau, S., Rannou, F., Le Henanff, A., Coudeyre, E., Rozenberg, S., Huas, D. et al. (2006). Outcome of subacute low back pain : influence of patients' and rheumatologists' characteristics. **Rheumatology**, 45, 718-723

Pugner, K. M., Scott, D. I., Holmes, J. W. & Hieke, K. (2000). The costs of rheumatoid arthritis: an international long-term view. **Seminars in Arthritis and Rheumatism**, 29, 305-320

Punnett, L. & Wegman, D. (2004). Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. **Journal of Electromyography and Kinesiology**, 14 (1),13-23

Rat, A. & Boissier, M. (2004). Rheumatoid arthritis: direct and indirect costs. **Joint, Boint, Spine**, 71(6), 518-524

Rodwin, V. G. (2003). The Health Care System under French Health National Insurance: Lessons for Health Reform in the United States. **American Journal of Public Health**, 93(1), 31-37

Roquelaure, Y., Ha, C., Leclerc, A., Touranchet, A., Sauteron, M., Melchior, M. et al. (2006). Epidemiological surveillance of upper-extremity musculoskeletal disorders in the working population. **Arthritis & Rheumatism**, 55(5), 765-778

Roquelaure, Y., Ha, C., Pelier-Cady, M., Nicolas, G., Descatha, A., Leclerc, A. et al. (2008) Work increases the incidence of carpal tunnel syndrome in the general population. **Muscle & Nerve**, 37(4), 477 - 482. Published online on Jan 30, 2008, doi 10.1002/mus.20952

Sany, J., Bourgeois, P., Saraux, A., Durieux, S., Lafuma, A., Daurès, J. P. et al. (2004). Characteristics of patients with rheumatoid arthritis in France: a study of 1,109 patients managed by hospital based rheumatologists. **Annals of the Rheumatic Diseases**, 63, 1235-1240

Saraux, A., Guedes, C., Allain, J., Devauchelle, V., Valls, I., Lamour, A. et al. Prevalence of rheumatoid arthritis and spondyloarthropathy in Brittany, France. Societe de Rhumatologie de l'Ouest. **Journal of Rheumatology**, 26(12), 2622-2627

Saraux, A., Guillemin, F., Guggenbuhl, P., Roux, C. H., Fardellone, P., Le Bihan, E. et al. (2005). Prevalence of spondyloarthropathies in France: 2001. **Annals of the Rheumatic Diseases**, 64, 1431-1435

Schultz, I. Z., Stowell, A. W., Feuerstein, M. & Gatchel, R. J. (2007). Models of return to work for musculoskeletal disorders. **Journal of Occupational Rehabilitation**, 17 (2), 327-352

Scottish Intercollegiate Guidelines Network (SIGN) (2000). **Management of early rheumatoid arthritis**, SIGN publication 48. Edinburgh: Scottish Intercollegiate Guidelines Network

Sieper, J., Braun, J., Rudwaleit, M., Boonen, A. & Zink, A. (2002). Ankylosing spondylitis: an overview. **Annals of the Rheumatic Diseases**, 61 (Supplement III), 8-18

Smyth, M., Stone, A., Hurewitz, A. & Kaell, A. (1999). Effects of writing about stressful experiences on symptom reduction in patients with asthma or rheumatoid arthritis. **Journal of the American Medical Association**, 281, 1304-1309

Sokka, T., Häkkinen, A., Kautiainen, H., Maillefert, J. F., Toloza, S., Hansen, M., et al. (2008). Physical inactivity in patients with rheumatoid arthritis: Data from twenty-one countries in a cross-sectional, international study. **Arthritis & Rheumatism (Arthritis Care & Research)**, 59(1), 42-50

Sokka, T. & Pincus, T. (2001). Markers for work disability in rheumatoid arthritis. **Journal of Rheumatology**, 28, 1718-1722

Sullivan, M. J. & D'Eon, J. L. (1990). Relation between catastrophising and depression on chronic pain patients. **Journal of Abnormal Psychology**, 99, 260-263

The Bone & Joint Decade. (2005). **European Action Towards Better Musculoskeletal Health: A public health strategy to reduce the burden of musculoskeletal conditions**. Lund: The Bone & Joint Decade, Department of Orthopedics, University Hospital. Retrieved 15 April 2009 from http://ec.europa.eu/health/ph_projects/2000/promotion/fp_promotion_2000_frep_15_en.pdf

van Duijn, M. & Burdorf, A. (2008). Influence of modified work on recurrence of sick leave due to musculoskeletal complaints. **Journal of Rehabilitation Medicine**, 40, 576-581

Van Eerd, D., Beaton, D., Cole, D., Lucas, J., Hogg-Johnson, S. & Bombardier, C. (2003). Classification systems for upper-limb musculoskeletal disorders in workers: a review of the literature. **Journal of Clinical Epidemiology**, 56, 925–936

Veale, A., Woolf, A. & Carr, A. (2008), Chronic musculoskeletal pain and arthritis: Impact, attitudes and perceptions. **Irish Medical Journal**, July/August, 101 (7), 208-210

Waddell, G. & Burton, A. K., (2006a). **Is work good for your health and well-being?** London: Department for Work and Pensions

Waddell, G. & Burton, A. K. (2006b). Principles of rehabilitation for common health problems, in O'Donnell, M. **Rehabilitation: Keeping people in work**. Chief Medical Officer's Report 2006. Dorking, UnumProvident

Wallenius, M., Skomsvoll, J. F., Koldingsnes, W., Rødevand, E., Mikkelsen, K., Kaufmann, C. et al. (2008). Work disability and health-related quality of life in males and females with psoriatic arthritis. **Annals of the Rheumatic Diseases**, 68, 685-689

Werner, E. L., Lærum, E., Wormgoor, M. E., Lindh, E. & Indhal, A. (2007). Peer support in an occupational setting preventing LBP-related sick leave. **Occupational Medicine**. published online 4 October 2007, doi:10.1093/occmed/kqm094

WHO Scientific Group (2001). **International Classification of Functioning, Disability and Health**. Geneva: WHO. Retrieved from 15 April 2009 from http://www3.who.int/icf/icftemplate/cfm

WHO Scientific Group (2003). **The burden of musculoskeletal conditions at the start of the new millennium**. Geneva: WHO

Young, A., Dixey, J., Cox, N., Davis, P., Devlin, J., Emery, P., et al. (2000). How does functional disability in early rheumatoid arthritis (RA) affect patients and their lives? Results of five years of follow-up in 732 patients from the early RA study (ERAS). **Rheumatology**, 39, 603-611

Young, A., Dixey, J., Kulinskaya, E., Cox, N., Davies, P., Devlin, J., et al. (2002). Which patients stop working because of rheumatoid arthritis? Results of five years' follow up in 732 patients from the early RA study (ERAS). **Annals of the Rheumatic Diseases**, 61, 335-340

Zampolini, M., Bernadinello, M. & .Tesio, L. (2007). RTW in back conditions. **Disability and Rehabilitation**, 29 (17), 1377-1385

Appendix 1: Interviews and consultation with experts

We interviewed or consulted the following people during the course of our research and we are very grateful for the time each spent with us. We have taken their views into account in writing this report, though their participation in the study does not in any way imply endorsement of the report's conclusions.

Dr. Michel Aptel	Chief of the Effets Sanitaries Unit AFSSET
Prof. Fabien Coutarel	Department of Ergonomics IDC University
Prof. Yves Roquelaure	Department of Occupational Health and Ergonomics University Hospital Angers
Prof. Christian H. Roux	Department of Rheumatology University Hospital Nice

Appendix 2: Benchmarking grid

The Fit for Work Europe study has looked across 23 European countries plus Israel and Canada. This approach allows us to explore how far early intervention is implemented across Europe. It also enables us to see how far we may identify both enablers and barriers to early intervention given the different approaches to policies that affect the labour market, the welfare system and the health care system. To explore this we have looked widely at a number of indicators covering the:

- labour market;
- welfare system;
- health care system.

The data presented below come from various international data sources. We used 2005 data to allow for comparisons across countries for a number of different indicators. The data mainly come from the OECD. However, where OECD data was not available the data was supplemented with Eurostat data. We present a selection of indicators below.

	GDP per capita in PPP	Percentage of the population working age	Unemployment rate (%)		Long term unemployment rate, % of unemployed	Average age of withdrawal from the labour market		Labour productivity per hour worked, GDP in PPS	Hourly labour costs
			Male	Female		Male	Female		
Romania	$33,496	67.7	4.9	5.5	23.3	59.1	58.1	100.2	€26.23
Belgium	$32,063	65.6	7.7	9.5	51.6	59.3	58.1	123.4	€30.73
Canada	$35,002	69.3	7.0	6.5	9.6	63.3	61.5	-	-
Spain	-	66.9*	-	-	58.4*	60.5*		-	-
Czech Republic	$20,366	71.0	6.5	9.8	53.6	61.5	58.4	51.7	€6.63
Denmark	$33,196	66.1	4.4	5.3	25.9	64.1	61.4	101.6	€31.98
Finland	$30,695	66.7	8.2	8.6	24.9	60.5	60.1	94.9	€26.70
France	$29,759	65.1	8.4	10.2	41.4	58.6	59.4	116.2	€29.29
Germany	$31,380	66.9	11.2	10.0	54.1	61.6	60.7	113.0	€27.20
Greece	$24,928	67.3	6.2	15.3	53.7	62.4	61.2	71.2	-
Ireland	$38,693	68.3	4.6	4.0	34.3	65.2	65.3	105.9	-
Israel	$23,207	-	6.2	10.0	52.2	-	-	-	-
Italy	$28,122	66.5	9.5	32.5	32.5	60.4	60.9	90.4	€21.39
Lithuania	-	67.8*	8.2*	8.3*	52.5*	60.0*		43.1	€3.56
Netherlands	$35,111	67.5	4.4	5.0	40.1	60.3	60.5	121.2	€27.41
Norway	$47,319	65.6	4.8	4.4	9.5	63.3	61.8	159.3	-
Portugal	$20,656	67.4	6.8	8.7	48.6	66.2	66.0	54.4	€10.60
Romania	-	69.4*	7.8*	6.4*	56.3*	63.0*		28.8	€2.33
Slovakia	$16,175	71.5	15.5	17.3	68.1	59.2	55.5	57.5	€4.80
Slovenia	$23,456	70.2*	6.2	7.1	49.2	58.5*		62.8	€10.76
Spain	$27,377	68.8	7.1	12.2	32.6	61.2	63.6	89.9	€15.22
Sweden	$32,298	65.3	7.3	7.3	18.9	65.4	62.5	101.6	€31.55
Switzerland	$35,839	68.0	3.9	5.1	39.0	65.3	64.9	92.3	€32.82
Turkey	$10,841	65.7	10.2	10.1	39.6	64.5	63.8	-	-
UK	$32,695	66.0	5.2	4.3	22.4	63.2	61.4	91.9	€24.47
OECD	$26,849	-	8.3	9.6	45.9	-	-	-	-
EU-27*	-	67.0	-	-	-	-	-	88.3	€20.47

*Sources: GDP per capita in PPP; Unemployment rate; Long-term unemployment rate: OECD, 2009b; *Eurostat, 2009; Working age population: OECD, 2009a; Average age of withdrawal, 2000-2005: OECD, 2009d, *Eurostat, 2009; Labour productivity per hour worked, GDP in PPS: Eurostat, 2009b; Hourly labour costs: Eurostat, 2009a*

	Public social expenditure (% GDP)	Public expenditure on health (% GDP)	% spent of benefits spent on*:			Generosity of the welfare system	Social protection system interventions
			Sickness/Health care	Disability	Unemployment		
Romania	27.2	7.9	25.5	8.6	5.8	5.46	2
Belgium	26.4	7.4	27.1	7.0	12.2	4.38	2
Canada	16.5	6.9	-	-	-	3.52	-
Spain	-	-	-	-	-	-	-
Czech Republic	19.5	6.3	35.3	7.8	3.6	5.15	2
Denmark	26.9	7.9	20.7	14.4	8.6	5.40	2
Finland	26.1	6.2	25.9	12.9	9.3	2.60	3
France	29.2	8.9	29.8	5.9	7.5	5.24	3
Germany	26.7	8.2	28.4	6.2	7.0	6.11	2
Greece	20.5	5.6	27.8	4.9	5.1	-	1
Ireland	16.7	6.5	40.9	5.3	7.5	-	3
Israel	-	-	-	-	-	-	-
Italy	25.0	6.8	26.7	6.0	2.0	-	2
Lithuania	-	-	30.3	10.4	1.8	-	2
Netherlands	20.9	6.0	30.7	9.7	6.1	3.40	3
Norway	21.6	7.6	32.0	19.1	2.7	-	3
Portugal	-	7.3	30.1	10.0	5.8	4.75	1
Romania	-	-	36.2	6.8	3.2	-	-
Slovakia	16.6	5.3	29.6	8.1	3.4	5.00	2
Slovenia	-	6.1	32.3	8.5	3.3	-	2
Spain	21.2	5.8	30.9	7.5	12.3	4.75	2
Sweden	29.4	7.5	25.9	15.0	6.1	6.73	2
Switzerland	20.3	6.8	26.4	12.7	4.4	5.09	2
Turkey	13.7	4.1	-	-	-	-	-
UK	21.3	7.1	30.9	8.9	2.6	3.87	3
OECD	20.5	6.5	-	-	-	-	-
EU-27	-	-	28.8	7.6	6.0	-	-

Sources: Public social expenditure; Public expenditure on health: OECD, 2009d; % spent on disability benefits: Eurostat, 2009c; Generosity of the Welfare System: Osterkamp and Rohn, 2007 (higher score = more generous); Social protection system intervention ratings (1 = limited interventions to 3 = advanced interventions available)

	Sickness absence due to health reasons (%)	Average days absent'	DALYs MSDs (% of Total)		DALYs RA (% of Total)	Prevalence work-related backache (Working population)	Number of RA Patients (General population)	Physicians per 1,000 population	
			Male	Female			(Prevalence)	Rheumatologists*	GPs
Romania	20.6	3.4	3.3	5.4	0.86	23.9	55,000 (0.67)	0.024	1.47
Belgium	28.8	7.0	3.1	5.1	0.78	19.4	69,000 (0.66)	-	2.08
Canada	-	-	-	-	0.86	-	215,000 (0.66)	0.014	1.03
Spain	19.3	9.4	2.3	4.5	-	41.7	-	-	-
Czech Republic	28.2	5.5	-	-	0.69	22.8	68,000 (0.66)	0.014	0.73
Denmark	32.8	6.6	3.1	4.7	0.78	18.8	36,000 (0.66)	-	0.77
Finland	44.6	8.5	3.1	5.5	0.88	26.1	35,000 (0.67)	0.020	0.72
France	19.1	5.5	3.1	5.4	0.81	21.6	283,000 (0.45)	0.036	1.66
Germany	28.0	3.5	3.3	5.5	0.83	18.8	544,000 (0.66)	0.015	1.46
Greece	14.0	2.8	3.1	5.5	0.78	47.0	50,000 (0.45)	0.025	0.29
Ireland	21.1	3.9	2.7	4.6	0.77	14.4	28,000 (0.67)	0.011	0.51
Israel	-	-			-	-		0.014	-
Italy	25.1	3.8	3.5	6.0	0.91	24.3	264,000 (0.45)	0.029	0.94
Lithuania	21.1	4.3	2.8	6.6	0.79	37.8	22,000 (0.65)	0.024	-
Netherlands	33.7	8.6	3.6	5.2	0.87	13.9	108,000 (0.66)	0.014	0.46
Norway	27.2	7.1	3.5	5.3	0.89	22.6	31,000 (0.67)	0.044	0.81
Portugal	13.4	8.6	2.5	5.1	0.72	30.8	70,000 (0.66)	0.009	1.68
Romania	11.1	2.0	3.2	5.9	0.76	42.4	143,000 (0.66)	0.013	-
Slovakia	22.9	5.2	3.6	7.3	0.93	38.9	36,000 (0.67)	0.017	-
Slovenia	28.2	8.7	2.7	4.9	0.72	46.2	13,000 (0.65)	0.012	-
Spain	14.2	3.6	3.1	6.0	0.83	29.1	197,000 (0.45)	0.018	0.85
Sweden	28.1	-	3.9	5.9	0.97	27.9	60,000 (0.66)	0.029	0.59
Switzerland	19.2	4.0	3.9	6.2	0.96	18.1	49,000 (0.66)	0.055	0.52
Turkey	18.6	4.8	-	-	0.84	34.7	482,000 (0.66)	0.002	0.74
UK	22.6	3.7	3.2	4.9	0.81	10.8	399,000 (0.66)	0.015	0.71
EU-27	22.3	4.6	3.2	5.5	-	25.6	-	-	-
Europe	-	-	-	-	0.84	-	2,962,000	-	-

Sources: Sickness absence due to health reasons; prevalence work-related backache: EWCS 2005; Parent-Thirion et al., 2007 DALYs MSDs: WHO 2006, 2007; DALYs RA, Prevalence RA: Lundkvist et al. 2008; Rheumatologists per 1,000 population: various sources and years; GPs per 1,000: OECD, 2009c*

Variable	Definition – Provided by source	Source
Labour indicators		
GDP per capita in PPP 2005	Gross domestic product is an aggregate measure of production equal to the sum of the gross value added of all resident institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs). The sum of the final uses of goods and services (all uses except intermediate consumption) measured in purchasers' prices, less the value of imports of goods and services, or the sum of primary incomes distributed by resident producer units.	OECD, 2009b; Data starred (*) in the table come from Eurostat, 2009
Working age population, % 2005	Share of total population between the ages of 15 and 64, inclusive.	OECD, 2009a
Unemployment rate by gender 2005	Unemployed persons are defined as those who report that they are without work, that they are available for work and that they have taken active steps to find work in the last four weeks. The ILO Guidelines specify what actions count as active steps to find work and these include answering vacancy notices, visiting factories, construction sites and other places of work, and placing advertisements in the press as well as registering with labour offices. The unemployment rate is defined as the number of unemployed persons as a percentage of the labour force, where the latter consists of the unemployed plus those in employment, which are defined as persons who have worked for one hour or more in the last week.	OECD, 2009b
Long-term unemployment – Annual averages by gender (%) 2005	Long-term unemployment is conventionally defined either as those unemployed for six months or more or, as here, those unemployed for 12 months or more. The ratios calculated here show the proportion of these long-term unemployed among all unemployed.	OECD, 2009b

Variable	Definition – Provided by Source	Source
Labour indicators, continued		
Average age of withdrawal from the labour market – retirement 2005	Retirement is associated with cessation of work and receipt of a pension. Actual retirement ages are difficult to measure directly without internationally comparable longitudinal data, so international comparisons must rely on indirect measures from cross-sectional data. Indirect measures regard persons above a specified age as 'retired' if they are not in the labour force at the time of the survey (average age at labour force exit). Net movements into retirement are proxied by the changes over time in the proportion of the older population not in the labour force. This indirect measure is used in ongoing OECD reviews of older workers. It measures the average effective age of retirement. The official age of retirement is also complex to pin down, especially when retirement is based on fixed years of pension contribution.	OECD, 2009d; Data starred (*) in the table come from Eurostat, 2009
Labour productivity per hour worked – GDP in PPS	Gross domestic product (GDP) is a measure for the economic activity in an economy. It is defined as the value of all goods and services produced less the value of any goods or services used in their creation. GDP per hour worked is intended to give a picture of the productivity of national economies expressed in relation to the European Union (EU-15) average. If the index of a country is higher than 100, this country level of GDP per hour worked is higher than the EU average and vice versa. Basic figures are expressed in PPS, ie a common currency that eliminates the differences in price levels between countries allowing meaningful volume comparisons of GDP between countries. Expressing productivity per hour worked will eliminate differences in the full-time/part-time composition of the workforce.	Eurostat, 2009b
Hourly labour costs 2005	Average hourly labour costs, defined as total labour costs divided by the corresponding number of hours worked.	Eurostat, 2009a

Variable	Definition – Provided by Source	Source
Welfare indicators		
Public social expenditure (% of GDP) 2005	Social expenditure is classified as public when general government (ie central administration, local governments and social security institutions) controls the financial flows.	OECD, 2009d
Public expenditure on health care 2005	Public expenditure on health refers to expenditure on health care incurred by public funds. Public funds are state, regional and local government bodies and social security schemes. Public capital formation on health includes publicly financed investment in health facilities plus capital transfers to the private sector for hospital construction and equipment. Public funds correspond to HF.1 in the ICHA-HF classification of health care financing.	OECD, 2009d
Sickness/health care benefits – % of total benefits 2005	Expenditure on social protection contain: social benefits, which consist of transfers, in cash or in kind, to households and individuals to relieve them of the burden of a defined set of risks or needs; administration costs, which represent the costs charged to the scheme for its management and administration; other expenditure, which consists of miscellaneous expenditure by social protection schemes (payment of property income and other).	Eurostat, 2009c
Disability – Social benefits by function – % of total benefits 2005	Same as above.	Eurostat, 2009c
Unemployment – Social benefits by function – % of total benefits 2005	Same as above.	Eurostat, 2009c

Variable	Definition – Provided by Source	Source
Welfare indicators continued		
O&R generosity index	Seven different measures of generosity were combined to construct a single measure of generosity that ranges from between zero and seven, where seven indicates the highest level of generosity. The seven variables include waiting period, self-certification, total maximum duration of payment, employer maximum duration of payment, employer amount of payment, sickness fund amount of payment and external proof.	Osterkamp, and Rohn, 2007
Social protection system interventions	The Mutual Information System on Social Protection (MISSOC) database provides a description of the social protection systems for each European country and allows for comparison between systems. Three independent reviewers reviewed the summary descriptions of the social protection topics geared toward benefits for invalidity and employment injuries and occupational diseases. The systems were scored from one to three with one meaning very limited regulations in place that could contribute to early intervention and three meaning advanced regulations in place that could contribute to early intervention.	Ratings by independent reviewers. Data from MISSOC (2009). Comparative tables on social protection – January 2005. Retrieved 27 July 2009 from http://ec.europa.eu/employment_social/missoc/db/public/compareTables.do?lang=en

Variable	Definition – Provided by Source	Source
Health outcomes		
Average days absent due to health reasons	The median number of days absent because of health.	Parent-Thirion, Fernández Macías, Hurley and Vermeylen, 2007
% sickness absence due to health reasons 2005	% reporting absence caused by ill-health.	EWCS, 2005
DALYs – MSDs, male and female	Disability adjusted life years (DALYs) are frequently used to assess the burden of disease. The WHO's definition of DALY – 'combines in one measure the time lived with disability and the time lost owing to premature mortality. One DALY can be thought of as one lost year of healthy life.'	WHO, 2006, 2007)
DALYs – RA	DALYs are frequently used to assess the burden of disease. The WHO's definition of DALY – 'combines in one measure the time lived with disability and the time lost owing to premature mortality. One DALY can be thought of as one lost year of healthy life.'	Lundkvist, Kastäng and Kobelt, 2008
Prevalence – Backache 2005	% reporting work-related backache in the EWCS.	EWCS, 2005
Number of people with RA	Estimated number of people with RA. The percentage is calculated from the number of people with RA divided by the population numbers listed in the article.	Lundkvist, Kastäng and Kobelt, 2008
Practicing rheumatologists, density per 1,000 population	Number of practising rheumatologists per 1,000 population. The definition that was used to derive the ratio for rheumatologists may differ by country depending on the source, which makes comparability difficult.	Various sources
Practicing general practitioners (GPs), density per 1,000 population 2005	Number of practicing GPs per 1,000 population.	OECD, 2009c

References

Eurostat. (2009a). **Hourly labour costs – EUR**. Retrieved on 4 June 2009 from http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tps00173&plugin=1

Eurostat. (2009b). **Labour productivity per hour worked, GDP in PPS**. Retrieved on 4 June 2009 from http://epp.eurostat.ec.europa.eu/tgm/download.do;jsessionid=9ea7974b30e89c4d0a99af7e42a9b710fb960bc43c29.e34SbxiOchiKc40LbNmLahiKaNyMe0?tab=table&plugin=0&language=en&pcode=tsieb040

Eurostat. (2009c). **Social benefits by function – (per cent of total benefits)**. Retrieved on 4 June 2009 from http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tps00106&plugin=1

EWCS – fourth edition. (2005). [Data file]. Dublin, Ireland: European Foundation for the Improvement of Living and Working Conditions

Lundkvist, J., Kastäng, F. & Kobelt, G. (2008). The burden of rheumatoid arthritis and access to treatment: health burden and costs. **European Journal of Health Economics**, 8(Supple 2), 49-60

OECD (2009a). **Annual Labour Force Statistics: Population 15-64 as per cent of population**. Retrieved on 15 July 2009 from http://stats.oecd.org/Index.aspx

OECD (2009b). **OECD Fact book 2009: Economic, Environmental and Social Statistics**. Retrieved on 15 July 2009 from http://www.sourceoecd.org/rpsv/factbook2009/index.htm

OECD. (2009c). **OECD Health Data 2008 – Selected Data**. Retrieved on 4 June 2009 from http://www.ecosante.fr/index2.php?base=OCDE&langh=ENG&langs=ENG

OECD (2009d). OECD **Society at a Glance**. Retrieved on 15 July 2009 from http://oberon.sourceoecd.org/vl=646290/cl=23/nw=1/rpsv/societyataglance2009/index.htm

Osterkamp, R. & Rohn, O. (2007). Being on sick leave: Possible explanations for differences of sick-leave days across countries. **CESifo Economic Studies**, 53, 91-114

Parent-Thirion, A., Fernández Macías, E., Hurley, J. & Vermeylen, G. (2007). **Fourth European Survey on Working Conditions**. Dublin: European Foundation for the Improvement of Living Standards.

Royal College of Physicians. (2008). **Consultant Physicians Working for Patients, The duties, responsibilities and practice of physicians**. 4th edition. London: The Royal College of Physicians. Retrieved on 9 June 2009 from http://www.rcplondon.ac.uk/pubs/contents/03560858-60e3-44c3-87eb-716a6d1d696c.pdf

WHO. (2006/7). **Highlights on health**. Geneva: WHO

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