



# Fit For Work?

## Musculoskeletal Disorders and the Danish Labour Market

Stephen Bevan  
Robin McGee  
Tatiana Quadrello



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## 1. Executive summary

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The global economic downturn is beginning to have an impact in Denmark. The consequences for the Danish labour market are becoming more serious, partly because of the speed with which unemployment has risen, with all its individual, social and economic ramifications. The health of Danish workers is also giving cause for concern. Almost one in five of the workforce is not healthy enough to drive the improvements in productivity which Denmark 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, 'stress' grabs the headlines because it accounts for 24 per cent of all working days lost each year in Denmark and it is a current priority for policy-makers. However, amid the understandable concern about 'stress' and the psychological well-being of the Danish workforce, one fact seems to have become obscured. The number of working days lost to 'stress' might be high, but at least the same number of working days are lost through musculoskeletal disorders (MSDs) such as back pain, arm or neck strains or diseases of the joints. Indeed, MSDs are, by some margin, the most commonly reported cause of work-related ill health in Denmark. The direct cost of MSDs at work in Denmark is estimated to be at least DKK 25bn.

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### **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 Danish 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 rheumatoid arthritis and spondyloarthritis (SpA), two 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.

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### **The Impact of MSDs on the Danish 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 Danish workers. Evidence suggests that:

- Just under half of the Danish population experiences back pain each year and about 20 per cent of Danish workers report work-related back pain. Up to 65 per cent of the adult population will suffer significant back pain at some time in their life. In the vast majority of patients with back pain no specific diagnosis is given.
- Over 15 per cent of Danish workers suffer from muscular pain in their neck, shoulders and upper limbs. Work-related upper-limb disorders (WRULDs) can affect the tendons, muscles, joints, blood vessels and, or, the nerves and may include pain, discomfort, numbness, and tingling sensations in the affected area.
- The Danish Rheumatology Patient's Organisation reports that 700,000 people in Denmark are affected by arthritic conditions and that 43 per cent of all long-term sickness in the Danish workforce is caused by rheumatic disease.
- At least 33,000 people in Denmark have rheumatoid arthritis (RA). It accounts for 30 per cent of GP consultations. It is estimated that almost a quarter of people with RA stop work within five years of diagnosis. This figure can rise to 40 per cent if the effects of related conditions such as depression, cardiac and respiratory complaints are taken into account. The total cost of RA to Danish society has been estimated at 619 million euros.
- Ankylosing spondylitis (AS) is a progressive and chronic rheumatic disorder that mainly affects the spine, but can also affect other joints, tendons and ligaments. Around 10,000 people in Denmark have AS, but it can take up to seven years to diagnose accurately after the onset of the condition. It is a condition which is most often diagnosed among men in their early twenties and, in the most serious cases, can severely curtail their working lives if it is not treated early.

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 MSD sufferers 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 individual MSD sufferers 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 workplace. 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 – especially good quality 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 Danish workers, and that the productive capacity of the Danish workforce will be adversely affected at a time when we need it to be on top form.

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**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.** 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. Early action, preferably in partnership between GPs, the patient and their employer, can help those with MSDs to keep their jobs and to achieve a balance between the individual's need for respite and their need to work. For some MSD patients quick and accurate diagnosis, early access to a consultant or to physiotherapy or to drug therapies can reduce the severity, impact or progression of the condition – a delay in diagnosis or treatment can make recovery, job retention or rehabilitation much more difficult. Once the economic upturn arrives – which it assuredly will – the Danish economy cannot afford for its recovery to be inhibited by a shortage of skilled, motivated and healthy workers.
- **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 managers to give them useful work to do that supports them on their journey back to full productive capacity. GPs have a particular role to play here. They need to ask more frequently whether planned and phased return to work, focusing on what tasks the individual can still perform, might aid recovery and rehabilitation.

- **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.
- **Assess the direct and indirect costs of MSDs.** We need some better measures to assess the social, economic and work impact of MSDs to allow government departments and agencies to assess and monitor both the clinical and labour market impact of MSDs in a more 'joined-up' way.

The evidence presented in this report illustrates that a large proportion of working age people in Denmark are, or will be, directly affected by musculoskeletal disorders (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 Danish 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 Denmark. 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** Denmark, like many developed western economies, is emerging from a long period of sustained economic and employment growth. Indeed, employment rates in Denmark grew to over 79 per cent during the late 1990's. Unemployment was 10.4 per cent in 1995, but fell to 5.5 per cent in 2000 (Global Policy Network, 2001). As employment rates grew during this period – bringing with it many social and consumption benefits – Denmark was understandably keen to place emphasis on the need to maximise the productivity of its workforce in order to extract the most economic benefit.

**Why is  
workforce  
health  
in Denmark  
important?**

Along with skills, training and qualifications, one of the most significant drivers of labour productivity is workforce health and well-being. Having a significant proportion of the working age population either temporarily or permanently unable to work through ill-health – even in a favourable economic climate – can reduce the aggregate level of labour productivity in an economy and damage the competitiveness and effectiveness of private and public sector employing organisations. Of course a significant burden of ill-health or chronic disease can also have a number of damaging social consequences.

**Table 2.1: Unemployment rates in Denmark (1990-2008)**

Year	Unemployment rate
1990	9.7 per cent
1995	10.4 per cent
2000	5.5 per cent
2008	7.2 per cent (December)

*Source: Global Policy Network, 2001; Eurostat 2009*

Now that economic growth is slowing, and that the buoyancy of the Danish labour market is diminishing – unemployment (Table 2.1) by the end of 2008 had risen to 7.2 per cent (Eurostat, 2009) – the imperative to maximise labour productivity and to ensure that the workforce is equipped to take full advantage of the up-turn in the economy has intensified still further. As unemployment starts to rise again, it will be important to ensure that those with illness or long-term conditions are not disproportionately affected and that measures to support those out of work pay particular attention to the needs of those with an incapacity or disability. This will be especially important if the Danish economy is to be 'fit for purpose' when the recession ends. This increase in unemployment has a number of important implications.

First, the competitiveness of the Danish economy has been – and will be – substantially driven by the skills, experience and knowledge of its workforce. Indeed Denmark has been making good progress towards becoming a ‘knowledge economy’ as envisaged by the EU’s 2000 Lisbon Strategy (Lisbon European Council, 2000). In 2002 Denmark’s ‘knowledge’ industries accounted for 20 per cent of its economy’s gross added value, and in 2005, 49 per cent of the Danish workforce were classified as knowledge workers – the second highest proportion in the OECD (Brinkley, 2006). The risk is that unemployment will drain the Danish economy of the much-needed skills and knowledge it needs and makes the longer-term vision of the ‘knowledge economy’ more difficult to attain and sustain.

Second, unemployment and job loss have serious financial and health consequences for individuals. Studies have shown widespread deterioration in aspects of physical and mental well-being among those who lose their jobs which can persist for many months (Armstrong, 2006; Brinkley et al, 2008).

Third, it is essential that job loss is not concentrated in the most vulnerable parts of the workforce, especially among those with a disability or with a long-term or chronic health condition. Finding ways of improving job retention for these workers is vital as we know that, once they become detached from the labour market, their chances of finding meaningful work again are severely damaged.

Fourth, once the upturn arrives – which it assuredly will – the Danish economy cannot afford for its recovery to be inhibited by a shortage of skilled, motivated and healthy workers. It is on this last point which much of this report focuses.

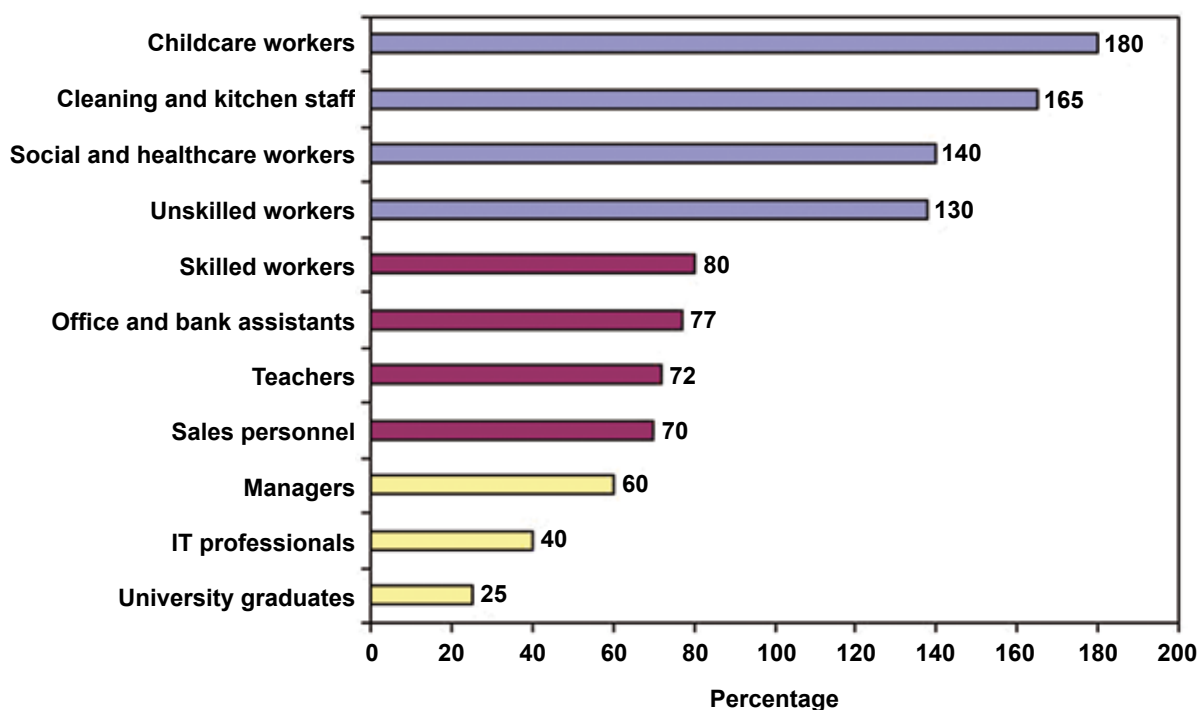
Despite the benign economic conditions of recent years, the health and well-being of parts of the Danish workforce has given cause for concern for some time, and these concerns will continue in the light of both the economic downturn and of the ageing of the Danish workforce. A number of other indicators suggest that workforce health will remain an important priority for policy-makers and employers for the foreseeable future:

- Sickness absence from work is concentrated in a relatively small proportion of Danish workers, indeed, only 20 per cent of the Danish workforce account for 80 per cent of the total annual sickness absence recorded each year, (Danish National Centre for Social Research, 2008).

- Danish women have a 36 per cent higher risk of experiencing long-term sickness absence – totaling more than eight weeks a year – than men. Workers aged 30–59 years have a higher risk of long-term sickness absence than those aged 18–29 years and those aged 60 years or older, (Danish National Centre for Social Research, 2008).
- There are notable occupational differences in sick leave in Denmark (Figure 2.1), with childcare workers and kitchen and cleaning staff among those with the highest rates of work-incapacity, and managers and IT professionals among the lowest (NFA, 2007).
- Around 11 per cent –12 per cent of the Danish workforce are absent from work due to illness for more than two weeks a year. Among these workers, the average period of absence is 6.5 weeks. Factors that may influence the length of absence include: educational level, company size and whether a worker is employed in the public or private sector. Furthermore, older people and women are absent from work for longer than young people and men (NFA, 2007).
- A range of work-related physical factors have been shown to increase the risk of work incapacity. These include lifting, working with the neck twisted or the back bent. These factors appear to affect women and men differently (Figure 2.2), (NFA, 2007).
- According to a survey of by the National Institute of Public Health, more than half of the adult Danish population (2.5m) has had pain or problems in the muscles or joints in two weeks prior to the survey (SIF, 2005).
- Musculoskeletal disorders (MSDs) constitute 25 per cent of the long-term sick-listed persons, whereas mental disorders constitute 24 per cent. Over 700,000 adults in Denmark report having a long-standing musculoskeletal disorder (SIF, 2005).
- Almost 18 per cent of all family doctor consultations for men aged 18-39 relate to musculoskeletal disorders whereas only 10 per cent of the women's consultations are related to this disorder, (Audit Project Odense, 2005).
- Patients with diseases of the bones, muscles and connective tissue thus constitute 12 per cent of out-patient visits, 5 per cent of hospital discharges and 6 per cent of the bed-days in the hospital services, (The National Patient Registry 2005).
- The direct costs of MSDs to Danish society have been estimated to be DKK 25bn (Sørensen, 2005).

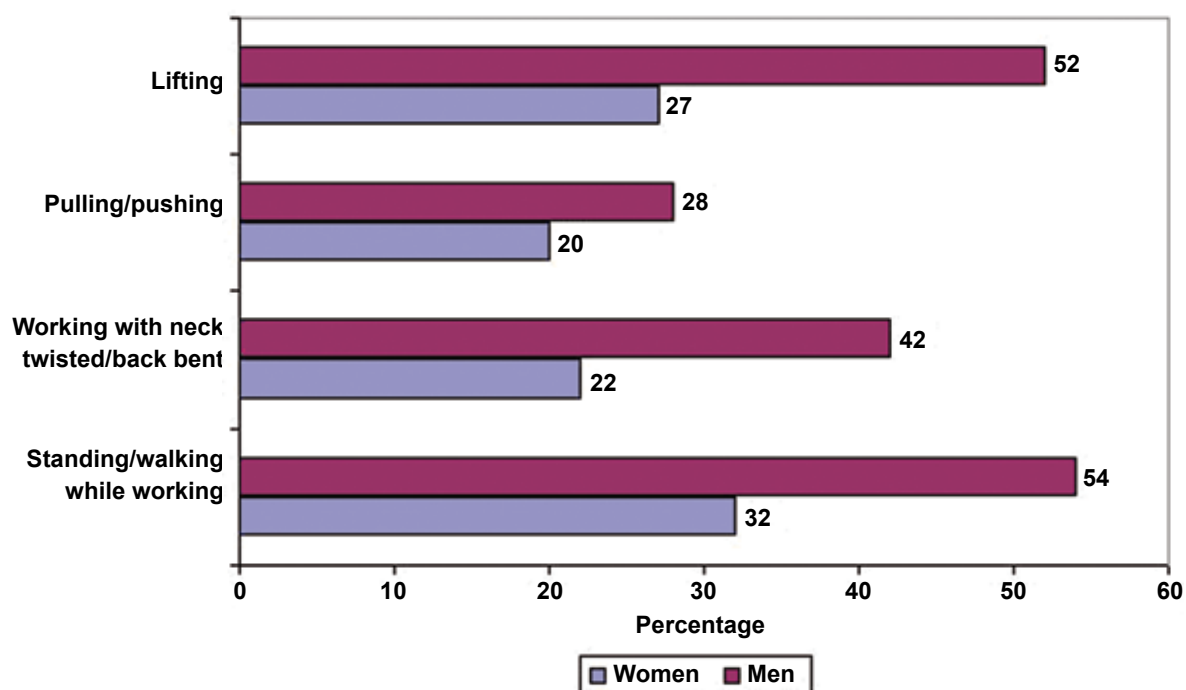
The data on MSDs are significant because the popular view has been that 'stress' and other common mental health problems such as depression and anxiety have been the dominant health issues facing the Danish workforce (Jane-Llopis and Anderson, 2005). Mental health clearly is an important and growing issue with over 250,000 Danish adults suffering from either mild or severe depression (and, as mentioned above, up to 24 per cent of sickness absence from work can be attributed to it). However, the significance of MSDs as Denmark's biggest workforce health problem warrants further investigation.

Figure 2.1: Risk of long-term sickness absence within different job categories (%)



Source: NFA, 2007

Figure 2.2: Physical factors increasing the risk of long-term sickness absence, by sex (%)



Source: NFA, 2007

**2.2** 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 2.6 and 3.8 per cent of gross national product (GNP). The fourth European Working Conditions Survey (EWCS) published by the European Foundation (Parent-Thirion, Fernandez Macias, Hurley, and Vermeylen, 2007) has shown that 24.7 per cent of workers across the EU 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 (EC, 2007). 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 Denmark in this wider EU context and assesses where Denmark is doing well and where it has challenges to confront.

- 2.3** More specifically, this project has sought to address each of the following questions:
- Objectives of the study**
1. What is the impact of MSDs on employment and economic performance in Denmark? 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 workplace 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 workplace? 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 Danish 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 Denmark.
3. Expert interviews: We have conducted interviews with experts across a number of disciplines (including occupational health, labour economics, rheumatic disease, and back pain) 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 GPs 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 proportion of Danish workers 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.

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**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 Danish 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 European Trades Union Institute (ETUI, 2007), meaning ‘any affliction of the musculoskeletal system that appears at work and causes discomfort, difficulty or pain when performing work’.

In Denmark, the National Board for Industrial Injuries includes the following MSDs on its register of occupational diseases:<sup>1</sup>

- Chronic low-back disease with pain;
- Chronic neck and shoulder pain;
- Tendovaginitis (inflammation of the synovial sheath);
- Degeneration in the rotator tendons of the shoulder joint;
- Carpal tunnel syndrome;
- Diseases of bones, joints, vessels, or nerves (white finger, neuropathy);
- Degenerative arthritis of elbow or wrist;
- Epicondylitis (tennis elbow and golf elbow);
- Shoulder tendinitis;
- Meniscus disease of knee joint;
- Inflammatory degeneration of knee bursa and other types of bursitis;
- Degenerative arthritis of the knee joint;
- Hip osteoarthritis.

Denmark’s official definition of MSDs is unusually wide and comprehensive compared to many other EU countries. This helps with inter-country analysis, but still means that cross-country comparisons should be made with caution.

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<sup>1</sup> National board of industrial injuries. List of occupational diseases. PDF format. Available at: [http://www.ask.dk/graphics/Dokumenter/English/Guides/Efortegn\\_Feb\\_2009.pdf](http://www.ask.dk/graphics/Dokumenter/English/Guides/Efortegn_Feb_2009.pdf)

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**2.5**  
**Structure of  
the report**

This report is structured as follows:

- Section 3 examines the extent of MSDs in Denmark and the impact they have on productivity and attendance at work, on labour market participation and on the wider Danish economy.
- Section 4 reviews the range of interventions which can improve job retention, rehabilitation and labour market participation among those with MSDs.
- Section 5 sets out our recommendations for employers, employees, GPs, occupational health professionals and for the Danish 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 Denmark

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

1. The inadequacy of the data on MSDs in Denmark 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 Denmark.

We begin by looking at data quality.

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### 3.1 Building a picture of MSD prevalence

As in many countries, it is difficult to quantify precisely the extent and costs of MSDs in the working age population of Denmark, although Danish data sources are significantly more numerous than in many other EU member states. The French organisation, Eurogip, recently attempted to build up a statistical profile of MSDs in the EU, but found that Denmark (along with several other member states) had inadequate data or defined MSDs in different ways (Eurogip, 2007). The lack of clear and consistent data is a concern for a number of reasons:

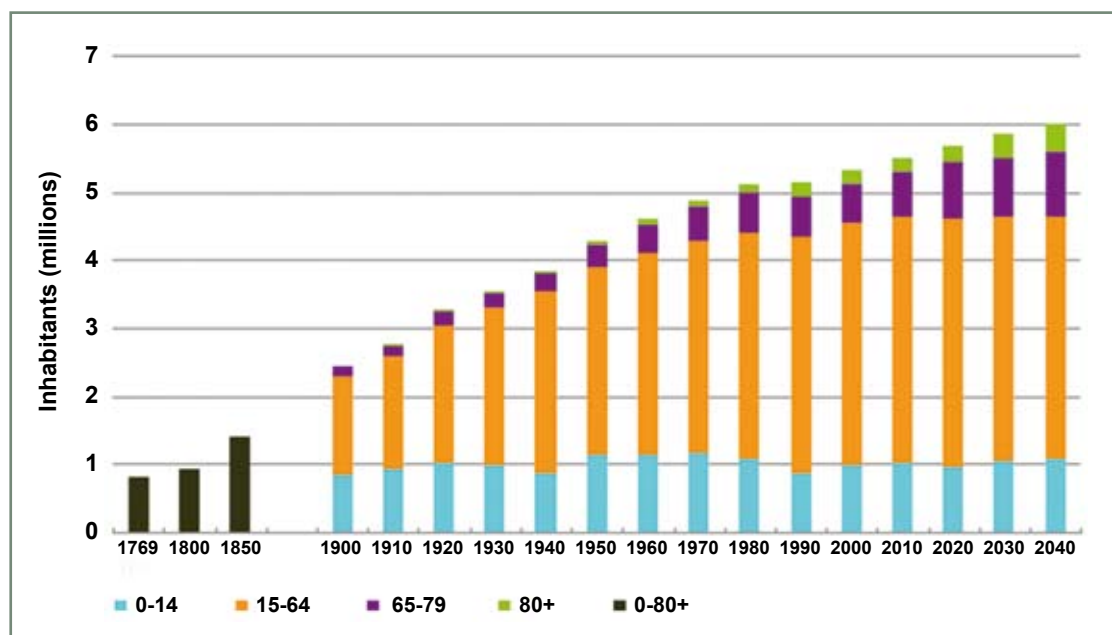
- It is difficult to be accurate about the economic consequences of MSDs, their productivity impact or their social costs to the nation, to its workers and to their families.
- If, as is likely, the prevalence of MSDs increases as the average age of the Danish workforce increases, the absence of good baseline data today makes forecasting the future impact of MSDs very difficult.
- Poor or incomplete data can make it difficult to make a compelling case for action to Danish employers or to Danish policy-makers.
- The benefits of clinical, labour market or workplace interventions are made all the more difficult to quantify (or justify) if the reliability or comprehensiveness of the data on the extent or impact of MSDs in the Danish workforce is in question.

Despite this, The Work Foundation is confident that there is sufficient evidence in Denmark to argue strongly for MSDs to be a policy priority in the coming years.

What we do know is that, compared with other EU member states, a relatively high proportion of the Danish workforce currently reports suffering from regular backache or muscular pain (European Foundation for the Improvement of Living and Working Conditions, 2007). This is unlikely to improve if recent population projections are accurate. Figure 3.1 illustrates that the

Danish working age population is forecast to remain broadly static in numerical terms until 2040 – although it reduces as a proportion of the total population. Combined with the increased risk of MSDs from growing obesity rates in Denmark (see paragraph 3.3, below), it is likely that MSDs among the working age population will continue to require attention from policy-makers, employers and clinicians.

**Figure 3.1: Population by age group in Denmark, 1900 to 2040**



Source: Danmarks Nationalbanken, 2000

Experience from economies with older age distributions shows that the burden of MSDs can have significant economic and social consequences. Denmark must stand ready to anticipate and manage the almost certain growth in the coming years of what some commentators have called ‘an ill-understood pandemic’ (ETUI, 2007).

**3.2**  
**The impact of**  
**MSDs on ability**  
**to work**

The impact of MSDs on the individuals and their ability to work varies significantly from person to person. Attempts to measure relative work disability differ according to methods of data collection, respondent selection and definitions of work disability. Work disability usually refers to cessation of employment, reduced working hours or claiming of disability benefits. These estimates rarely include estimations of lost productivity whilst at work.

MSDs can cause work-limiting pain and fatigue which many people feel unable to 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).

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 (SpA). 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.

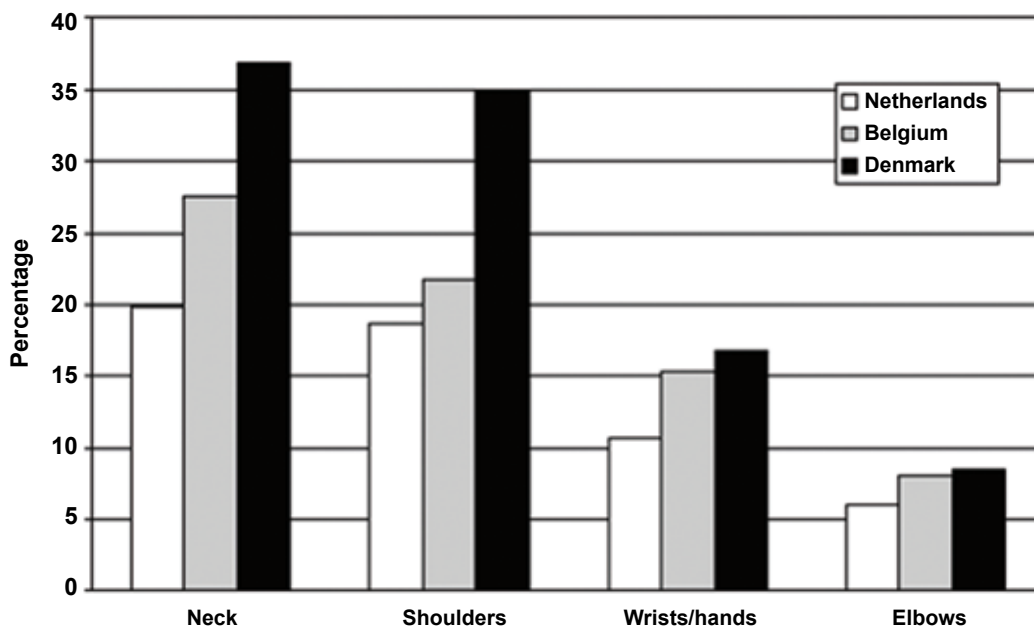
An MSD can also have effects on safety aspects of work. If concentration or movement is affected by the condition or associated pain then some aspects of work may become unsafe. It must also be noted that, following diagnosis, some treatments can have significant side effects which affect an individual's 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**

Just over 15 per cent of Danish workers – lower than the EU average – report that they have experienced muscular pain in their neck, shoulders and upper limbs which they attribute to their work (Parent-Thirion et al., 2007). Work-related neck and 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.

Figure 3.2 shows the prevalence of WRULDs in Denmark compared with Belgium and the Netherlands. It indicates that Danish workers are proportionately more likely to report WRULDs than in the comparator countries, with conditions affecting the shoulders representing the largest gap.

**Figure 3.2: Percentage prevalence of WRULDs in the last 12 months**



Source: Buckle and Devereux, 2002

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.

### 3.2.2 Back pain

Compared with other EU countries, prevalence of back pain is relatively low in Denmark, though recent good data on prevalence is not collected systematically. The fourth European Working Conditions Survey (Parent-Thirion et al., 2007) shows that 18.8 per cent of Danish workers report work-related back pain. In the vast majority of patients with back pain no specific diagnosis is given. A recent Danish National Institute of Public Health (SIF, 2007) study in Denmark showed that:

- 60-65 per cent of the population at one point in their life will have pain in the back and/or the lower back;
- 44-66 per cent of the population have had pain in the back/lower back during the previous year;
- 30 per cent of the population have had pain in the back/lower back during a 14 day period;
- 15 per cent of the population, meaning 670,000 people, said that they had a back pain illness at the time of the enquiry.

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 recognise 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

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. One recent estimate is that there are 36,000 people with RA in Denmark (Lundkvist, Kastäng, and Kobelt 2007). 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.

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 Scientific 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 (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. 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. It appears that, compared to other developed western economies, a higher proportion of people of working age with RA remain employed in Denmark while, by the same token, a higher proportion leave work because of their condition. In a recent 15-country study (Sokka et al., 2008) 36 per cent of people with RA were still working while 31 per cent were 'work disabled' because of RA.

### 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 frequency of SpAs across the European population concludes that the prevalence has long been underestimated and may have a similar incidence rate to RA (Akkoc, 2008). The Danish Rheumatology Patient's Organisation reports that about 700,000 people in Denmark are affected by arthritic conditions, and that 43 per cent of all long-term sickness in the Danish workforce is caused by rheumatic disease. They also estimate that 13 per cent of GP consultations involve muscular and rheumatic conditions.

**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 0.1-0.2 per cent, with a 3:1 to 2:1

male: female ratio (Dagfinrud, Mengshoel, Hagen, Loge and Kvien, 2004). The Danish Rheumatology Patient's Organisation estimates that 10,000 people suffer from AS in Denmark. 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 as 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.

As with most MSDs, particularly specific MSDs, the effects of AS vary greatly from individual to individual. Approximately half are severely affected whilst others report very few symptoms. AS is generally considered to be a disease in which 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).

Recent research has provided evidence that physical health related quality of life of RA (Chorus, Miedema, Boonen and van der Linden, 2003) and AS sufferers was positively influenced by work (Chorus et al., 2003; Gordeev et al., 2009). The authors' 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 workplace 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 per cent of the general population (Wallenius et al., 2008) and between 10 and 20 per cent of individuals with psoriasis. A Danish study in 2008 calculated a 0.15 per cent point prevalence rate of PsA (Pedersen et al., 2008). 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 shown 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).

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**3.3** 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 Denmark is the growth of obesity – a risk factor for bone and joint conditions (as well as cardio-vascular disease and diabetes). The latest data suggests that there are now in excess of 400,000 overweight and obese Danes – an increase of 75 per cent since 1987 (National Board of Health, 2003). In addition, obesity among Danish children tripled between 1972 and 1997. Table 3.1 summarises the intrinsic risk factors for non-specific MSDs.

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 recognised as occupational diseases by some European governments, such as wrist tenosynovitis, epicondylitis of the elbow, Raynaud’s syndrome or vibration white finger and carpal tunnel syndrome (Eurostat, 2004). As such, the fact that work

**Table 3.1: Summary of intrinsic risk factors for non-specific MSDs**

Intrinsic factors
<ul style="list-style-type: none"> <li>• Obesity, height</li> <li>• Spinal abnormalities</li> <li>• Genetic predisposition</li> <li>• Pregnancy</li> <li>• Psychosocial stress: self-perception</li> <li>• Health beliefs: locus of control, self-efficacy, perception of disability and expectation</li> <li>• Family stress</li> <li>• Psychological stress: somatisation, anxiety and depression</li> <li>• Ageing</li> </ul>

*Source: adapted from WHO, 2003*

can cause and contribute to these conditions is widely recognised and the use of assessments of workplace 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 musculoskeletal conditions can be encountered at work; even if work does not cause a condition it may aggravate it. Moreover, if we consider risk factors beyond the physical, then the impact of the workplace on MSDs is likely to be much greater.

The link between most non-specific MSDs, such as low back pain, and work is well evidenced, and there are some job demands that are frequently cited as risk factors for MSDs including 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. Danish data presenting occupational differences in MSD-related absence was presented in Figure 2.1 in Section 2.

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 workplace 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). For example, 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.

Again, it is important to recognise 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).

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### **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, their 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. However, existing figures on the economic impact of MSDs based on conservative approximations show that MSDs are a significant economic burden to Denmark.

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 healthcare 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 & Canesi, 2002). Two measures now in more common use 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, rheumatoid arthritis accounted for 0.78 per cent of all DALYs lost in Denmark (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, the most significant direct costs are related to physical therapy, inpatient services, pharmaceuticals, and primary care (Dagenais, Caro and Haldeman, 2008). Nachemson, Waddell and Norlund (2000) calculated that some 80 per cent of healthcare costs are generated by the 10 per cent of those with chronic back 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).

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-countries 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 3.2 shows some of the specific direct costs associated with musculoskeletal conditions in general, and rheumatoid arthritis 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).

**Table 3.2 Direct costs associated with MSCs, RA, and low back pain**

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

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 Ministry of the Interior and Social Welfare and other government ministries. Taking a wider joined-up approach to an analysis of costs and benefits 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 cost 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 Danish 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. Different organisations have different ways of recording absence: in some cases employees complete records themselves, in other cases managers must record the absence for them. Employer surveys require HR professionals to complete the survey about their organisation from their records, though we found no recent Danish examples. Self-report surveys ask individual employees to complete the survey with respect to a particular reference time, for example, the previous two to four weeks. 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.

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).

However, these figures still 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 workplace 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). 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 is equal to 2,562 euros per patient. In Denmark, the number was 4,324 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.

### 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). Findings across countries with respect to work disability rates are generally not directly comparable given the differences in working terms and conditions, such as the length and conditions of statutory sick pay (Sieper et al., 2002).

Lundkvist et al. (2008) estimated that the total cost of treating RA patients in Denmark was 17,280 euros per patient, or 619 million euros. These costs include 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 slightly higher, per patient, than those for other western European countries.

The limitations of data collection outlined above highlight some of the difficulties encountered in trying to cost the impact of MSDs for employers and society.

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**3.5** 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 workplace 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 workplace has the potential to expose employees to other risk factors, both physical and psychosocial. Some of the well-established workplace risk factors are already recognised by many employers and assessed in order to minimise their impact, such as vibrations and workstation ergonomics. However, the impact of other workplace risk factors, such as job quality, are not as widely understood.

### Summary

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

– recognise that the physical, psychological and social factors associated with work have a significant impact upon an individual's fitness for work.

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.

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

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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, 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 workplace 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 Denmark, and to compare Denmark to countries with similar or different labour market, welfare and healthcare systems.

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### 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 healthcare 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).

Box 1 on the next page shows one example of a targeted work-related early intervention in Denmark known as coordinated and tailored work rehabilitation (CTWR).

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 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 healthcare professional and, following referral or diagnosis, advice and planned action, a review should be conducted within four weeks.

**Box 1: Denmark – Coordinated and tailored work rehabilitation****Background**

In Denmark, the magnitude and impact of work disability on the individual worker and society has prompted the development of a new 'coordinated and tailored work rehabilitation' (CTWR) approach. The aim of this project was to compare the effects of CTWR with conventional case management (CCM) on return-to-work (RTW) of workers on sick leave due to musculoskeletal disorders (MSDs).

**Approach**

The study was a randomised controlled trial with economic evaluation undertaken with workers on sick leave for 4-12 weeks due to MSDs. CTWR consists of a work disability screening by an interdisciplinary team followed by the collaborative development of a RTW plan. The primary outcome variable was registered cumulative sickness absence hours during 12 months follow-up. Secondary outcomes were work status as well as pain intensity and functional disability, measured at baseline, three and twelve months follow-up. The economic evaluation (intervention costs, productivity loss, and health care utilisation costs) was based on administrative data derived from national registries.

**Results**

For the time intervals 0-6 months, 6-12 months, and the entire follow-up period, the number of sickness absence hours was significantly lower in the CTWR group compared to the control group. The total costs saved in CTWR participants compared to controls were estimated at US \$1,366 per person at 6 months follow-up and US \$10,666 per person at 12 months follow-up.

**Conclusions**

Workers on sick leave for 4-12 weeks due to MSD who underwent 'CTWR' by an interdisciplinary team had fewer sickness absence hours than controls. The economic evaluation showed that, in terms of productivity loss, CTWR seems to represent a cost saving for society.

*Source: Bültmann et al., 2009*

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 most 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.

**4.2** 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. The Danish system of social protection against injury, sickness and unemployment was introduced between 1891 and 1907. It included mainly statutory rights rather than means-tested, social assistance benefits which remained at the discretion of local government (Municipalities). The Danish sickness benefit program covers wage earners, self-employed, and people receiving unemployment insurance benefit. The program replaces wages up to a ceiling cap that equals the maximum unemployment benefit. Often employers top up benefits to replace the full wage level. Work-disabled individuals can normally receive sickness benefit for up to one year within a period of 18 months.

**The social security regime for the work disabled**

By law the municipalities are obliged to follow-up all cases within eight weeks after the first day of the sick leave. Thereafter, the municipality must perform follow-up assessments every fourth week in complicated cases and every eighth week in uncomplicated cases. The municipal caseworker must verify that the sick-listed individual is eligible to the benefit, ie has a work-limiting incapacity, and facilitate that the sick-listed individual returns to work as quickly as possible. The follow-up assessment must rely on updated medical, social, and vocational information, and it must take place in cooperation with the sick-listed individual and other relevant agents, such as the employer, medical experts, vocational rehabilitation institutions, unions, and labour market experts.

To promote a swift return to work, the caseworker can apply various vocational rehabilitation measures. These measures comprise job counselling, an assessment of work capacity, wage-subsidised job training, courses, educational measures, economic support to making workplace adjustments and graded return to work. If the sick-listed worker, despite medical treatment and vocational rehabilitation, is unable to return to ordinary employment, the municipality may refer the sick-listed individual to a permanently wage-subsidised job on special conditions, eg reduced working hours and special job tasks (fleksjob). To be eligible for a fleksjob, the sick-listed worker must have permanently reduced work capacity of at least 50 per cent. If the sick-listed individual cannot return to a fleksjob, the municipality may then award a disability benefit. In 2001 there were 13,000 people in a fleksjob, though this number had risen to 41,500 in 2006, (OECD, 2007).

**4.3** 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

**Condition-specific interventions**

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, in Denmark, people with RA who can benefit from anti-TNF drug therapies have, in general, been able to gain ready access to them once they get to see a consultant. However, some clinicians interviewed for this study were concerned that this access may be reduced during the economic downturn, with serious clinical and labour market consequences. In addition, there is some concern that there are not enough rheumatologists in Denmark to cope with demand, and that those currently practising spend a considerable time dealing with other MSDs than those caused by rheumatic diseases.

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 and 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 agents (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 workplace 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 on 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 recognises 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).

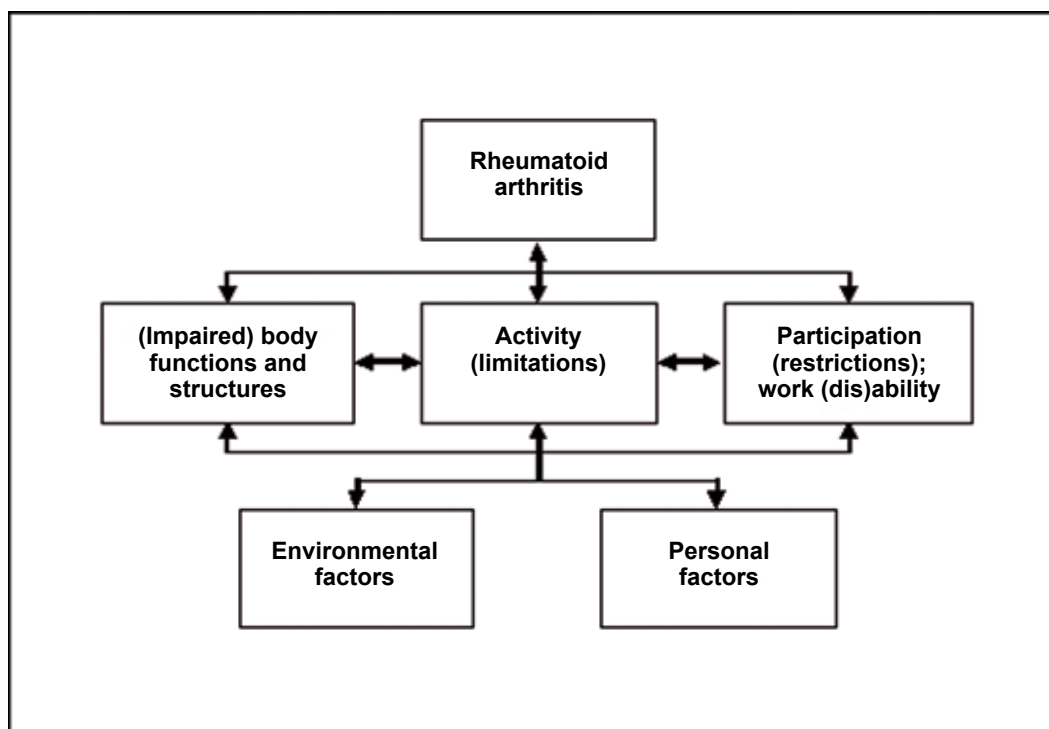
In a study of over 5,600 Danish workers Andersen et al., (2007) examined the impact of exposure to both physical and psychosocial workplace risks in relation to MSDs. The study confirmed that both had a demonstrable effect on the development of, and recovery from, MSDs. In particular, the study found that low job satisfaction predicted both neck and shoulder pain among Danish workers.

In addition, recent research by Danish and Swedish researchers (Ektor-Andersen et al., 2008) has examined the role of cognitive behavioural therapy (CBT) as an early intervention with workers who have long-term absence due to chronic pain. The results show a significant reduction in sickness absence and an improved return to work. The study also showed that the savings in social security benefits which accrued from these reductions paid for the cost of the intervention within the first year.

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 4.1 on the next page, 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.

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, 2001).

**Figure 4.1: ICF model applied to work disability in RA**



Source: de Croon et al., 2004

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 4.5.1 Awareness of conditions and their management

##### The role of employers

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, 2000). 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).<sup>2</sup> 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).

In a study of almost a thousand Danish workers with work-incapacity, a 'graded' return to work programme was designed in an attempt to help employees to minimise the time they spent away from the workplace (Høgelund et al., 2008). The programme allowed sick-listed workers to return to work on reduced working hours. When the worker's health improved, the working hours were gradually increased until the sick-listed worker was able to work regular working hours. During the period on reduced working hours, the participant received his or her normal hourly wage for the hours worked (eg 20 hours per week) and sickness benefit for the hours off work (eg 17 hours a week). The sick-listed worker was targeted to leave the program and return to regular working hours as quickly as possible. The programme had an 80 per cent success rate, with 20 per cent failing to return to regular working hours. Over a third (67 per cent) returned to their regular working hours after an average of 20 weeks. The evaluation data indicated that, compared to workers with work disability who did not participate in the graded return to work programme, participants had a 54 per cent higher probability of returning to regular working hours in each week of the programme.

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).<sup>3</sup>

There is nonetheless broad agreement on the principles for managing non-specific MSDs, particularly back pain, that are outlined in Box 2. This includes advice and a number of relatively simple measures for employees and employers to follow on how to deal with back pain.

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<sup>2</sup> Findings from an evaluation of the effectiveness of return-to-work treatment programmes were inconsistent

<sup>3</sup> Backman, 2004 found only six studies for the period 1980 to 2001

### **Box 2: 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 workplace 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 (1999)*

This requires employers to think beyond their statutory duty to address health and safety risks, and to recognise 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.

### **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 Active Employment Efforts Act requires employers to make 'reasonable 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 the most common work-related health problem, and the importance of psycho-social 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 Denmark spend a very small proportion of their time learning about occupational health, whilst musculoskeletal training for GPs has been found lacking (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.

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#### 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. However, it also demonstrates 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 are highlighted in this chapter.

## 5. Conclusions and recommendations

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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 Denmark'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 Denmark 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 Danish industry and it can draw heavily on the resources of both the health service and the benefits regime.

As in many countries, there is a disappointing shortage of clinical, epidemiological, psychological and economic evidence on the nature, extent and consequences of the MSD problem in Denmark, but we know enough to be able to conclude that MSDs will affect a significant proportion of the working age population in the coming years. 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 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.

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 recognise 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.

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### 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 Danish 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 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.
- 
- 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.

### 5.2

#### Recommendations for employees

- 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.

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### 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.

## Conclusions and recommendations

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- 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.

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### 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 workplace adjustments can bring wider benefits than just compliance with the Active Employment Efforts 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 Active Employment Efforts 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.

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### 5.5

#### Recommendations for government

- Help make GPs more effective in handling occupational health issues. This will require an input into GP training, through postgraduate medical education and training. In fact, we believe that medical training at all levels, from undergraduate to continuing professional development would benefit from inclusion of health and work issues, especially if the health of the working age population is set to deteriorate. Giving GP's access to specialist occupational health advice – perhaps a resource shared between GP surgeries within a location – might help GPs to make decisions about the degree of work disability among patients and how to manage return to work.

- GPs should be educated and supported to provide employers with information about the work capacity – rather than incapacity – of their patients. There are various ways of doing this. For example, the UK is planning to replace the current system of sickness certificates with an electronic ‘Fit Note’ which encourages GPs to indicate what a worker is still capable of performing. This is intended to help other healthcare professionals and employers to plan return to work and to make appropriate adjustments to job demands and/or working time. Denmark should consider its own approach to this issue.
- Access to clinical expertise needs to improve. The apparent shortage of consultant rheumatologists is affecting the ability of citizens of working age to get access to accurate diagnosis and early clinical and other interventions which may save their jobs. Similarly, the government should conduct some workforce planning in the medical workforce to establish if it will have sufficient clinical and other staff (eg physiotherapists) to accommodate any projected growth in MSDs as the population, and the workforce ages.
- Managing a phenomenon which is not being measured is very hard and can lead to the misdirection of effort and resources. The quality of data in Denmark on the health of its working age population is good compared with other European countries, but remains incomplete or slightly out of date – especially in the domain of costs and benefits. It is sometimes difficult to build up an accurate or comprehensive picture of levels of absence from work, work-related incapacity and its causes and the level of mental illness in the workforce. This represents an impediment to both evidence-based policy-making and to the pragmatic targeting of expertise and resources.

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## Appendix 1: Interviews and consultation with experts

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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.

Mr Sven-Peter Nygaard	Consultant Confederation of Danish Employers
Ms Marie Jakobsen	Political Consultant The Rheumatism Patient Organisation (Gigtforeningen)
Dr Schiottz-Christensen Berit	Chairwoman, The Danish Rheumatology Society (Dansk Reumatologisk Selskab)
Prof Johan Hviid Anderson	Occupational Medicine, Herning Hospital

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## Appendix 2: Benchmarking grid

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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.

## Appendix 2: Benchmarking grid

	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*	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*	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*	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*	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

## Appendix 2: Benchmarking grid

	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)

## Appendix 2: Benchmarking grid

	Sickness absence due to health reasons (%)	Average days absent <sup>1</sup>	DALYs MSDs (% of Total)		DALYs RA (% of Total)	Prevalence work-related backache (Working population)	Number of RA Patients (General population)	Physicians per 1,000	
			Male	Female				(Prevalence)	Rheumatologists*
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

## Appendix 2: Benchmarking grid

Variable	Definition – Provided by source	Source
<i>Labour indicators</i>		
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
<i>Labour indicators, continued</i>		
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

## Appendix 2: Benchmarking grid

Variable	Definition – Provided by Source	Source
<i>Welfare indicators</i>		
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
<i>Welfare indicators continued</i>		
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 <a href="http://ec.europa.eu/employment_social/missoc/db/public/compareTables.do?lang=en">http://ec.europa.eu/employment_social/missoc/db/public/compareTables.do?lang=en</a>

Appendix 2: Benchmarking grid

Variable	Definition – Provided by Source	Source
<i>Health outcomes</i>		
Average days absent due to health reasons	The median number of days absent because of health.	Parent-Thirion, Ferrández 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

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The Work Foundation

21 Palmer Street

London

SW1H 0AD

Telephone: 0207 976 3519

Email: [jtaylor@theworkfoundation.com](mailto:jtaylor@theworkfoundation.com)

Website: [www.theworkfoundation.com](http://www.theworkfoundation.com)

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