Fit For Work?

Musculoskeletal Disorders and the Canadian Labour Market

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1. Executive summary

The health of Canadian workers has been a serious cause for concern for a number of years. With the economic downturn and rise of unemployment, addressing workforce health issues could reduce sickness absence, as well as improve productivity. The health of the workforce plays an important role in driving improved productivity which Canada needs to compete in an increasingly globalised, knowledge-based economy, particularly when the up-turn comes. There is 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.

Musculoskeletal disorders (MSDs), such as back pain, arm or neck strains or diseases of the joints, are a considerable cost to Canadian society with estimates suggesting upwards of $20 billion. While many in Canada understand the impact MSDs have on individuals, families, businesses and society, increased awareness, as well as actions to increase prevention and early intervention, could greatly reduce the burden of MSDs to Canada.

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 Canadian 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 (RA) and spondyloarthropathy (SpA) – specific conditions that are often progressive and increasingly incapacitating. We conducted a review of the recent academic and practitioner research on the relationship between these MSDs and labour market participation, and conducted interviews with acknowledged experts in this field.

The Impact of MSDs on the Canadian 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 a large proportion of the working population. Evidence suggests that:

- MSDs were the most costly disease group for Canadian women and third most costly disease group for Canadian men in 1998 – representing over $16 billion. Using 2005 prices, MSDs cost Canada over $20.6 billion. Occupations in Canada with higher than average rates of MSDs include sales or service, trades, transport or equipment operating, farming, forestry, fishing or mining, processing, manufacturing or utilities.

- One in eight Canadians reported having a chronic back problem and most Canadians report back pain at some point in their lifetime. Even with the high impact on the population, public beliefs about back pain differ from the scientific evidence available. In particular, Canadians think that resting until their pain is relieved is appropriate treatment. However, often times, staying active facilitates recovery.
- One in 10 Canadians were limited from their normal activities due to a repetitive strain injury (RSI), another term for WRULD, and the highest prevalence of RSIs is among the 30 to 49 age group.
- Arthritis and other rheumatic conditions affect almost four million Canadians and three out of five people with arthritis are younger than 65 years of age.
- About 215,000 people in Canada have RA. Arthritis associated lost productivity amounted to an average of $11,553 per person per year with over 40 per cent of this loss resulting from reduced performance while at work. Decreased hours of work and absenteeism accounted for just 12 per cent and 10 per cent of lost productivity, respectively. In total the costs associated with RA, in particular, were $12,352 per worker per year.
- The Arthritis Society (2007a) estimates that between 150,000 and 300,000 Canadians have AS. The mean annual cost of ankylosing spondylitis per patient is just over $9,000.

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 individuals with MSDs are also likely to have depression or anxiety problems related to their conditions. This can affect the severity of the condition, the ability of the individual to remain at work, the length of time they spend away from work and the ease with which they can be rehabilitated. Research suggests that a significant proportion of general practitioners (GPs), employers and even individuals with MSDs do not fully appreciate the impact of 'stress' on the severity of physical incapacity. The **biopsychosocial model** of health emphasises the interplay between the **biological** (eg disease, strain, joint damage), the **psychological** (eg disposition, anxiety, stress) 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 in the workplace. This model has not been 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 individuals (absence from work and disability) is strongly associated with psychosocial factors. Evidence suggests that work can help ameliorate the deterioration of many conditions and help recovery from MSDs. However, many GPs and employers mistakenly believe that people with MSD 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. This will affect the quality of working life of many Canadian workers, and that the productive capacity of the Canadian workforce will be adversely affected at a time when it needs to be in top form.

What can be done?

There are five main principles which employers, employees, GPs, occupational health professionals, 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 achieve a balance between the individuals' need for respite and their need to work. For some MSD patients early access 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 Canadian 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 mangers to give them useful work to do that supports them on their journey back to full productive capacity. Remember that the patient is also a worker.

- **Imaginative job design is the key to rehabilitation**. Managers can change the ways work is organised (including simple changes to working time arrangements) to help prevent MSDs getting worse and to help people with MSDs to 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 governmental bodies to assess and monitor both the clinical and labour market impact of MSDs.

The evidence presented in this report illustrates that a large proportion of working age people in Canada 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 Canada's industry, and it can draw heavily on the resources of both the health system and the benefits regime.

We have found no shortage of clinical, epidemiological, psychological and economic evidence and expert opinion on the nature, extent and consequences of the MSD problem in Canada. However, there still seems to be a lack of coherence or 'joined-up' thinking and action which focuses on the MSD **patient as worker**.

2. Introduction

2.1 Why is workforce health in Canada important?

Up until 2006, Canada's economy sustained a long period of economic and employment improvement with 14 years of steady job growth (Statistics Canada, 2007). Compared internationally in 2007, Canada's employment rate was relatively high at just under 65 per cent (Statistics Canada, 2007). From 1998 to 2003, Canada's gross domestic product (GDP) grew rapidly – faster than any other G7 country (Marchildon, 2005) – and in 2008 Canada's GDP was $1.6 trillion (GDP) (Statistics Canada, 2009b). As employment rates grew during this period, Canada was understandably keen to place emphasis on the need to maximise the productivity of its workforce in order to extract the most economic benefit.

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 have a number of damaging social consequences, as well.

Now that economic growth is slowing, and the buoyancy of the Canadian labour market is diminishing, 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 has started to rise again – in March 2009, the rate was 8.0 per cent (Statistics Canada, 2009c) – it will be important to ensure that those with illness or long-term conditions are not disproportionately affected. Measures to support those out of work must pay particular attention to the needs of people with an incapacity or disability. This will be especially important if the Canadian economy is to be 'fit for purpose' when the recession ends.

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

- In 2006, 5.4 per cent of the labour force was absent from work each week due to illness or disability, up from 3.8 per cent in 1997 (Akyeampong, 2007).
- In 2008, the average rate of absence due to illness or disability for full-time Canadian workers was 7.9 days. Alberta, Prince Edward Island, and Ontario had the lowest average rates of absenteeism at 6.1 days, 7.4 days and 7.4 days, respectively. Nova

Scotia and Quebec had the highest average rate at 9.7 days and 9.2 days, respectively. (Statistics Canada, 2009a).

- Over 22 per cent of Canadians report high levels of stress (Statistics Canada, 2008a).
- Almost 22 per cent of Canadians are current smokers and 48.5 per cent of Canadians are overweight or obese (Statistics Canada, 2008a).
- About 12 per cent of Canadians report pain or discomfort that prevents activities and over 31 per cent of Canadians report activity limitations sometimes or often (Statistics Canada, 2008a).
- 51 per cent of people with disabilities were employed in 2006, compared with 75 per cent of people without disabilities (Statistics Canada, 2008b).
- Four out of five people with disabilities indicate that full-time work is possible, as long as suitable workplace accommodations are made, and most want to work full-time (Canadian Abilities Foundation, 2004).
- Occupational injuries and diseases are estimated to cost over $13.5 billion per year (Logan and Reeder, 2007).
- In Quebec, new cases of musculoskeletal disorders (MSDs) cost nearly $130 million in salary compensation in 2004 (CSST, 2005 as cited in Perreault et al., 2008).
- WorkSafe BC received over 107,000 claims for back strains from 2000 to 2004, which accounted for over 25 per cent of all workers' compensation board claims (WorkSafeBC, 2009).
- WCB Alberta reported that back problems comprised over 33 per cent of disabling injury claims (Work Safe Alberta, 2008).
- In Ontario, MSDs account for over 40 per cent of all lost-time claims and 50 per cent of all lost-time days registered with the Workplace Safety and Insurance Board (Occupational Health and Safety Council of Ontario (OHSCO), 2007).

The good news is that in Canada time lost in the workplace to injuries has declined in recent years (Logan and Reeder, 2007). This is also evidenced in a decline in absence due to work-related injuries or illnesses in Ontario (Mustard et al., 2003) and a decline of lost-time claims to the lowest level since 1991 in Alberta (Work Safe Alberta, 2008). However, MSDs remain the number one cause of work-related lost-time claims and cost workplaces hundreds of millions of dollars from absenteeism and lost productivity (OHSCO, 2007). In fact total compensation payments for injured workers have grown steadily between 2001 and 2005 (Logan and Reeder, 2007). Considering the burden to Canadian society, MSDs were the most costly disease group for Canadian women and third most costly disease group for Canadian men in 1998 – representing over $16 billion (Stokes, Desjardins, and Perruccio, 2003). Additionally, MSDs are a leading cause of pain and physical disability (Perruccio, Power and Badley, 2007).

The dominance of MSDs as Canada's biggest workforce health problem warrants further investigation.

2.2 MSDs: The international context

Internationally, concern worldwide over the disability caused by musculoskeletal conditions (MSCs) was evidenced by the declaration of the years 2000 to 2010 as The Bone and Joint Decade. Throughout the decade progress has been made in raising awareness about MSCs. The United States (US) followed suit and declared the years 2002 to 2011 as the United States Bone and Joint Decade (United States Bone and Joint Burden, 2008). Over 107 million adults in the US reported MSCs and workers lost 12 days per year due to MSCs in 2005 (United States Bone and Joint Decade, 2008). Concern in the European Commission and among the social partners over the prevalence and impact of work-related MSDs also has been growing for several years. Chronic musculoskeletal pain (CMP) is estimated to affect 100 million people in Europe (Veale et al., 2008); MSDs affect more than 40 million workers in the European Union (EU) and account for about half of all work-related disorders in EU countries (European Trade Union Institute (ETUI), 2007), representing an estimated cost to society of between 0.5 and 2.0 per cent of gross domestic product (GDP) (Cammarota, 2005). The 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. This report looks at Canada in this wider international context and assesses where Canada is doing well and where it has challenges to confront.

2.3 Objectives of the study

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

1. What is the impact of MSDs on employment and economic performance in Canada? 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 bring together the evidence on the nature, extent, impact and costs of MSDs to the Canadian 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 international studies and surveys to examine the prevalence and costs of MSDs in the working age population in Canada.
3. Expert interviews: We have conducted nine interviews with experts across a number of disciplines (including occupational health, health economics and rheumatic disease) to identify the main areas of policy and practice which need to be addressed by policy-makers, health professionals and by employers.
4. 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.

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.

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. These 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 individuals 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, along with others, illustrate the effects of conditions which a large proportion of Canadian workers experience. 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. Some of the lessons learnt about these MSDs also may be applied to other conditions, such as osteoarthritis or pain in the lower extremities.

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 Canadian 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 (World Health Organisation (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’. Other terms often used in the Canadian literature are repetitive strain injury and musculoskeletal injuries.

Even within Canada, different surveillance systems and definitions are used to collect data related to MSDs. Health Canada, in 2004, listed all the available data sources from surveillance systems across Canada and found over 100 data sources of occupational diseases and injuries, including MSDs. One reason for the large number of surveillance systems is that individual provinces have their own surveillance systems, in addition to industry specific and disease specific systems.

The National Work Injuries Statistics Program (NWISP) from the Association of Workers’ Compensation Boards (AWCB) of Canada collates some of the information from the various provinces (Kendall, 2005). The database comprises information from all provincial workers’ compensation boards in Canada (AWCB, 2007). To standardise the codes, the NWISP and the provinces use the Canadian Standards Association (CSA) Z795 definitions of workplace injuries or disease and nature of disease classification. As of 2002, the WCB of British Columbia listed the following injuries from the CSA Z795 under MSDs (WCB Nature of Injury Codes, 2002):

- Musculoskeletal/connective tissues disease and disorder;
- Arthritis (Arthropaties and related disorders);
- Sciatica (not traumatic);
- Herniated disc;
- Radiculitis (not traumatic);
- Bursistis (not traumatic);
- Synovitis (not traumatic);
- Tendonitis (not traumatic);
- Tenosynovitis (not traumatic);
- Rotator cuff syndrome (not traumatic);
- Epicondylitis (not traumatic);
- Capsultis (not traumatic);
- Fibromyalgia, fibrositis, myofasciitis.

Two other groups, bone, nerves, spinal cord and muscle joints, list the following injuries related to MSDs (WCB Nature of Injury Codes, 2002):

- Dislocations;
- Spinal cord, traumatic injuries;
- Nerves, traumatic injuries;
- Muscles, tendons, joint, other injuries;
- Sprains, strains;
- Rotator cuff tear (traumatic).

Canada's official definition of MSDs for occupational disease surveillance is unusually wide and comprehensive compared to many other countries. This helps with within-country analysis, but still means that cross-country comparisons should be made with caution. Additionally provincial-level regulations and policies should be considered when making comparisons within Canada. Finally, these codes are mainly used by WSBs, which collect the data during the administration of programme requirements aimed at compensating and rehabilitating workers who have been injured on the job. Therefore they neglect workers whose MSD is not work-related, workers who have not received time-loss injury benefits due to the MSD (Canadian Centre for Occupational Health and Safety (CCOHS), 2006) and workers who do not report symptoms to their employers (Michaels, 2005).

2.5 Structure of the report

This report is structured as follows:

- Section 3 examines the extent of MSDs in Canada and the impact they have on productivity and attendance at work, on labour market participation and on the wider Canadian economy.
- Section 4 reviews the range of interventions, including vocational rehabilitation, 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 Canadian government.

3. Work and MSDs in Canada

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

1. The quality of the data on MSDs in Canada;
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 Canada.

We begin by looking at data quality.

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 Canada. However, Canadian data sources are significantly more numerous than in many other countries. A number of agencies and organisation provide information on MSDs in Canada furnishing evidence about the impact of MSDs on Canada's workforce. However, one problem with some of the data available in Canada for MSDs is that it is aggregate-level data. For example, surveys ask questions about arthritis and rheumatism in general, rather than about the specific conditions. With that said, Statistics Canada has included specific MSDs, including RA and SpA, as a module of the 2009 survey on living with chronic diseases, which will also ask questions about work limitations.

With the information that is currently available, a number of researchers have looked into the economic consequences of MSDs and their impact on the productivity of Canada's workers. Based on the available information, some of the economic consequences of MSDs have been identified. Seeing these consequences researchers and policymakers in Canada have begun to focused on interventions aimed at reducing the impact of MSDs.

However, as always, more data, and more systematic data collection across provinces could further improve the data quality picture, as well as provide stronger evidence of the effectiveness of interventions. Dr Cameron Mustard from the Institute for Work & Health highlights the need for good data, while also recognising the need to move forward with interventions in a briefing on the burden of work-related musculoskeletal disorders:

> *'Continuing efforts to accurately describe the burden of MSDs is important, but this should not distract us from implementing proven and promising practices to prevent MSDs or reduce disability.'*
>
> http://www.iwh.on.ca/fact-sheets

Continuing to improve data collection and reporting of MSDs remains important for a number of reasons:

- It is impossible 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.
- Poor data make it difficult to make a compelling case for action to Canadian employers or to Canadian policy-makers.
- The benefits of clinical, labour market or workplace interventions are made all the more difficult to quantify if there are no reliable or comprehensive data on the extent or impact of MSDs in the Canadian workforce.

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

What we also know is that by 2027 one in three Canadians is estimated to be over 55 years of age, and with this ageing workforce the risk of MSD prevalence will grow over the next 20 to 30 years (Statistics Canada, 2007). Couple increasing age with growing obesity rates in Canada, and it is likely that MSDs among the working age population will continue to require attention from policy-makers, employers and clinicians.

Experience from economies with older age distributions shows that the burden of MSDs can have significant economic and social consequences. Canada 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). The ageing Canadian population will further produce a shortage of labour and skilled workers. With fewer young people entering the workforce, a gap exists in the replacement of older workers. Maximising participation of Canadians with disabilities in the labour force can reduce the impending shortage (Williams, 2006).

3.2 The impact of MSDs on ability to work

The impact of MSDs on individuals and their ability to work varies significantly from person to person. 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. An Institute for Work & Health researcher, Dwayne Van Eerd, points out that MSD statistics often underestimated the problem because people continue to come into work and fail to report their symptoms, even if they may be less productive (Institute for Work & Health, 2005). Research from Canada shows that up to 30 per cent of workers with conditions such as RA are reluctant to disclose their condition to their colleagues and managers out of a fear of discrimination (Gignac, 2008) and about 22 per cent of workers do not tell their employers about their condition (Gignac et al., 2004).

MSDs, as outlined in Section 2, can be non-specific or specific. The effects of specific MSDs are discussed below with particular reference to RA and 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:

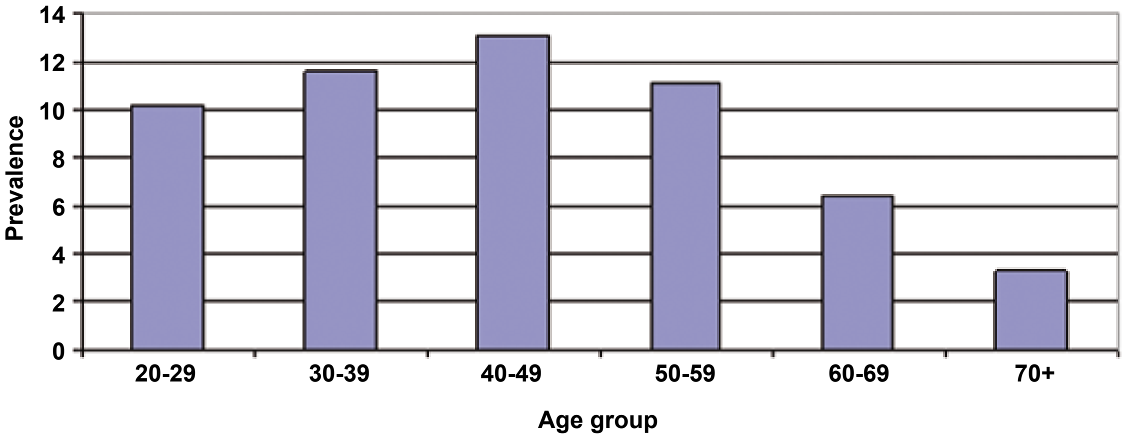
- Stamina and resilience;
- Cognitive capacity or concentration;
- Rationality/mood;
- Fatigue;
- Mobility;
- Agility.

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

A number of Canadian studies report figures about the prevalence and incidence of WRULDs. One study reports that just 5.5 per cent of Canadian workers have experienced muscular pain in their neck, shoulders and upper limbs (Cole, Ibrahim and Shannon, 2005). Of the 5.5 per cent reporting pain, 36.8 per cent report wrist or hand pain, 20.0 per cent report shoulder or upper arm pain and 14.8 per cent report elbow or lower arm pain (Cole et al., 2005). In Quebec, the prevalence of frequent neck pain among workers has been reported to be as high as 10.9 per cent for males and 18.4 per cent for females (Leroux, Dionne, Bourbonnais and Brisson, 2005) and in Ontario the annual incidence of neck pain ranged from 6 per 10,000 full time equivalents to 23 per 10,000 full time equivalents (Côte et al., 2008). Pain in the upper extremities is also frequently reported among workers from Quebec with 33.9 per cent of males and 34.6 per cent of females reporting some pain in their upper extremities during the past year; 19.7 percent of males and 22.3 per cent of females reported frequent pain in their upper extremities (Leroux et al., 2005). Figure 3.1 below provides the prevalence rate of repetitive strain injuries, another term used to describe WRULDs, by age in Canada in 2001.

Figure 3.1: Prevalence of repetitive strain injuries by age, 2001



Source: Tjepkema, 2003, 2000/2001 Canadian Community Health Survey

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’. Van Eerd, Beaton, Cole, Lucas, and Hogg-Johnson. (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. 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, as evidenced by the varying numbers above, and to develop a common understanding of the associated risk factors.

Whilst no agreed classification exists there is a common consensus that symptoms of WRULDs can present in the tendons, muscles, joints, blood vessels and/or the nerves and may include pain, discomfort, numbness, and tingling sensations in the affected area. WRULDs can be specific and non-specific conditions (Aptel, Aublet-Culelief 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

Back pain is a very common complaint in Canada, though good data on prevalence is not collected systematically. One survey reports that of working Canadians, one in eight have a chronic back problem that has been diagnosed by a health professional (Cole, Ibrahim, Shannon, Scott and Eyles, 2001). Among the working population in Quebec, Leroux et al. (2005) found that 28.9 per cent of males and 30.4 per cent of females reported frequent back pain; 36.5 per cent of males and 37.9 per cent of females reported some back pain in the past year. The rate is even higher among male employees in an industrial setting with 60 per cent reporting low back pain during some point in their lifetime (Lee, Helewa, Goldsmith, Smythe and Stitt, 2001). At the general population-level, most Canadians report a lifetime prevalence of back pain and just over 34 per cent report pain in the past week (Gross et al., 2006). In the vast majority of patients with back pain no specific diagnosis is given.

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 back 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 as cited in Bekkering et al., 2003). Recorded absence is greatest amongst the minority of people with back pain 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). In Canada, of people reporting back pain over 12 per cent took time off work when they experienced their last back pain episode (Gross et al., 2006).

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 factors are the differentiating reason 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). Another contributing factor may be a misunderstanding about back pain among workers. In Canada, public beliefs about back pain differ from the scientific evidence available. In particular, Canadians think that resting until their pain is relieved is appropriate treatment (Gross et al., 2006). Correcting these beliefs is important first step in reducing productivity losses related to back pain.

3.2.3 Rheumatoid arthritis

Over four million Canadians are affected by arthritis and rheumatism, most of whom are between the ages of 20 and 64 (Alliance for the Canadian Arthritis Program (ACAP), 2006; Health Canada, 2003). Projections expect that over six million Canadians will have arthritis and rheumatism by 2026 (Health Canada, 2003). The provinces of Nova Scotia and Saskatchewan tend to report higher rates of arthritis and rheumatism, whereas Quebec consistently reports lower rates (Wang and Badley, 2003). Among the aboriginal population prevalence rates are higher compared to the general population (Cañizares, Power, Perruccio and Badley, 2008). In response to figures from Statistics Canada (Hatherly, 2008) Dr. Dianne Mosher states that genetics may play a role in these higher prevalence rates for the aboriginal population.

RA is an example of a specific MSD. It is a form of inflammatory arthritis with a prevalence of between 0.3 per cent to 1.0 per cent in most industrialised countries (WHO Scientific Group, 2003). Data on the prevalence of RA derive largely from studies performed in the USA and Europe. One recent estimate is that there are 215,000 people with RA in Canada (Lundkvist, Köstang, and Kobelt, 2008). The Arthritis Society (2007b) provides slightly higher estimates that about 300,000 Canadians have RA, and Health Canada (2003) reports that RA can affect up to one per cent of the population. 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 the 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 individuals with RA 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 individuals with RA in the previous year, for an average (median) of 39 days (Burton, Morrison, Maclean, and Ruderman, 2006). Canadians with limitations at work due to RA report higher levels of disease activity, pain and fatigue (Backman, Kennedy, Chalmer, and Singer, 2004).

Not only do Canadians with arthritis, including osteoarthritis and RA, have lower participation rates in the labour force (Badley and Wang, 2001), but of those working, 11 per cent think that they would leave their job sometime during the next year due to their condition (Gignac et al., 2004). 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.

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).

A recent review on the extent of SpAs across various international populations concludes that the prevalence has long been underestimated and may have a similar prevalence rate to RA (Akkoc, 2008).

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). Between 150,000 and 300,000 Canadians have AS (The Arthritis Society, 2007a), which affects as many as one per cent of Canadian adults (Health Canada, 2003). The 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. Accurate diagnosis can often be delayed – research suggests an average of seven years between disease onset and diagnosis (Sieper, Braun, Rudwaleit, Boonen and Zink, 2002) – as the early symptoms are frequently mistaken for sports injuries. In women, it commonly affects the pelvis, hips, knees, wrists and ankles. The spine is generally less severely affected in women. 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 and from men to women (Dagfinrud et al., 2004). Approximately half are severely affected whilst others report very few symptoms; women are supposed to have a later age of onset, milder disease course, longer asymptomatic periods but more extraspinal involvement. AS is generally considered to be a disease in which many individuals 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 the physical health related quality of life of people with RA (Chorus, Miedema, Boonen and van der Linden, 2003) and AS was positively influenced by work (Chorus et al., 2003; Gordeev et al., 2009). Chorus et al.'s conclusion was that work '*might be an important factor in positively influencing patients' perception of their physical performance*'. This finding concurs with Waddell and Burton (2006a) that, overall, good quality work has health and recuperative benefits for workers. The extent to which the 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 1.0 per cent of the general population (Wallenius et al., 2008) and between 10 and 20 per cent of individuals with psoriasis. In the US, the incidence of PsA has risen over the past 30 years – the reasons for which are unknown – with an incidence of 7.2 per 100,000 and a prevalence of 158 per 100,000 in 2000 (Wilson et al., 2009). No Canadian data on the prevalence of PsA were found.

When joints are inflamed they become tender, swollen and painful on movement. The joints are typically stiff after resting, early in the morning or while resting in the evening. Tissues such as ligaments, tendons around the joints may also be involved. Inflammation of tendons or muscles (such as tennis elbow and pain around the heel) are also features in those with psoriatic arthropathy. In approximately 80 per cent of cases the arthritis develops after the appearance of psoriasis. Men and women are considered to be equally affected, and comparative studies have showed that patients with PsA have a burden of illness which is comparable to that of patients with RA or AS (Wallenius et al., 2008).

There are several features that distinguish PsA from other forms of arthritis: One pattern of inflammation is usually in the end of finger joints. Another pattern is involvement of the joints of the spine and sacroiliac joints which is called spondylitis (similar to ankylosing spondylitis). 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 psoriatic arthritis from rheumatoid arthritis. 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, and people with PsA 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) with patients losing about three years from their life expectancy due to PsA (Ali, Tom, Schentag, Farewell and Gladman, 2007). However, the mortality rate has improved in recent years, which may be due to better treatment and recognition (Ali et al., 2007).

3.3 The impact of the workplace on MSDs

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

One area of concern in Canada is the growth of obesity – a risk factor for bone and joint conditions (as well as cardiovascular disease and diabetes). The latest data suggests that Canadian males have the third highest obesity rate compared with other countries (Hamilton, 2006). A recent Statistics Canada report shows that obesity among workers increased to 15.7 per cent in 2005 compared with 12.5 per cent in 2001 (Park, 2009). Table 3.1 below summarises the intrinsic risk factors for non-specific MSDs.

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

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

Source: adapted from WHO Scientific Group, 2003

In terms of evidence and risk factors for the impact of work on MSDs a distinction needs to be made between 'work-related' disorders and 'occupational' disorders (Punnett and Wegman, 2004). Certain MSDs are recognised as occupational diseases by some international governments, such as wrist tenosynovitis, epicondylitis of the elbow, Raynaud's syndrome or vibration white finger and carpal tunnel syndrome (Eurostat, 2004). The majority of RSIs in Canada derive from work-related activities (Tjempka, 2003). As such, the fact that work 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 SpA, 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 Tempel and van der Linden, 2001; Gignac, 2005; Gignac et al., 2004).

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. Occupations in Canada with higher than average rates of MSDs include sales or service, trades, transport or equipment operating, farming, forestry, fishing or mining, processing, manufacturing or utilities (Tjepkema, 2003).

Many jobs involve activities that can constitute a risk factor for MSDs. According to the European Working Conditions Survey, 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, Fernández Macías, Hurley and Vermeylen, 2007).

Males in jobs with frequent vibration and high psychological distress report higher levels of neck and back pain (Leroux et al., 2005). In a review looking at the psychosocial factors related to back pain, researchers found evidence to suggest that low workplace social support, low job satisfaction, and job design were risk factors for back pain (Hoogendoorn, van Poppel, Bongers, Koes and Bouter, 2000). In Canada, Kerr et al. (2001) reported that among automobile factory workers physical factors of work, such as exposure to peak hand loading, peak lumbar shear force, and cumulative lumbar disc compression, as well as psychosocial factors and higher levels of exertion at work, were identified as risk factors for low back pain.

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. They want to 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, as well as individual factors. 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, Kelley, 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). 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 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.

Similar findings have been reported in Canadian studies with workers reporting more arthritis symptoms in jobs with higher demand and lower levels of control (Lacaille, White, Backman and Gignac 2007). Individuals with arthritis may experience ‘spillover’ where stress from their job increases the level of stress related to dealing with and managing arthritis, and vice versa (Gignac, Sutton and Badley, 2006). As another example, Canadian workers in jobs with higher levels of job strain associated with reduced levels of decision making and high psychological demand report more symptoms related to neck and shoulder pain (Leroux, Brisson and

Montreuil, 2006). Further evidence suggests that fear about returning to work after receiving disability benefits is higher among people with MSCs in jobs with high physical and psychosocial work loads (Lötters, Franche, Hogg-Johnson, Burdorf and Pole, 2006). One interviewee from Canada reiterated the importance of job design, as well as the role of supervisors in dealing with MSDs in the workplace. A further comment was that many of the issues involving changes to the workplace may also improve outcomes for other health conditions, such as cardiovascular disease and mental health problems. Therefore, we must 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, violence at work or discrimination. People with specific MSDs may not disclose their condition due to fear of discrimination. The invisibility of MSDs may cause further feelings of discrimination. One respondent in a study by Lacaille et al. (2007) describes her experience of dealing with arthritis and her feelings about her co-workers' support.

> *'And I don't think they understand the tiredness aspect of it because you look fine. You look well, and that is part of the problem at work and everywhere. People look at me and – I am sure they are thinking: What is she complaining about? She looks fine, she's not sick.'*
>
> Source: Lacaille et al., 2007, pg. 1274

Again, another interviewee mentioned that 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).

3.4 The wider economic and social impact of MSDs

The effect that MSDs can have on an peoples' ability to work and the time they may require to be absent from work means that MSDs have significant associated costs to the individual, the family, the employer and the wider economy. Calculating the exact costs is not straightforward (Lundkvist et al., 2008). Several factors need to be considered and obtaining accurate, reliable and consistent figures is almost impossible. However, existing figures on the economic impact of MSDs based on conservative approximations show that MSDs are a significant economic burden to Canada.

To calculate the cost of MSDs (or any illness) the following factors must be estimated (WHO Scientific Group, 2003):

- **Direct costs** including medical expenditure, such as the cost of prevention, detection, treatment, rehabilitation, long-term care and ongoing medical and private expenditure. These 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 the 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 that the costs were calculated is also a factor for a number of reasons – treatment processes can change, for example);
- 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 and quality of life measures should be used as further indicators to measure the effectiveness of interventions (Leardini, Salaffi, Montanelli, Gerzeli and 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 0.86 per cent of all DALYs lost in Canada or 101 DALYs per 100,000 population were lost due to RA (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). Furthermore, Nachemson, Waddell and Norlund (2000) calculated that some 80 per cent of healthcare costs are generated by the 10 per cent of individuals with chronic pain and disability. For RA, a number of studies indicate that direct costs increase as functional capacity decreases – making functional capacity a major cost driver (Huscher, Merkesdal, Theile, Schneider and Zink, 2006; Kobelt, 2007).

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

Table 3.2 shows some of the specific direct costs associated with musculoskeletal conditions in general, and RA and low back pain in particular as found in the literature (Woolf, 2004 as cited in The Bone and Joint Decade, 2005; Kavanaugh, 2005; Dagenais et al., 2008).

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

	MSCs	RA	Low back pain
Healthcare costs	Physician visits	Physician visits	Physician visits
		Other health professional 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)	Hospitalisations (related to RA or its treatment): orthopaedic surgery, extended care / rehabilitation facilities	
	Non acute hospital facilities		
Personal costs	Transportation		
	Patient time		
	Carer time		
Other disease related costs	Home healthcare services		Mental health services
	Environmental adaptations		
	Medical equipment		
	Non-medical practitioner, alternative therapy		

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

Calculations of the costs of treatment tend to evaluate the clinical costs and benefits of treatments. People with MSDs use more healthcare services compared to healthy people, and, as expected, those with more disabling conditions report even greater healthcare use (Lim, Jacobs and Klarenback, 2006). More specifically, MSDs are the second most common reason for visiting a GP in Canada – almost 25 per cent of Canadians visited their physician for MSDs (Power, Perruccio, Desmeules, Lagace and Badley, 2006). 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 human resources development department and other government departments. Taking a wider joined-up approach to an analysis of costs of treatments for illness in general and MSDs in particular may provide a different and perhaps more realistic assessment of the costs and benefits of treatments.

3.4.2 Indirect costs

There are two main types of indirect 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. 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. Self-report surveys ask individual employees to complete the survey with respect to a particular reference time, such as, the previous two to four weeks (for example, the Labour Force Survey). 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.

One Canadian study by Li, Gignac and Anis (2006) investigated lost productivity whilst at work associated with osteoarthritis and RA. Arthritis associated lost productivity amounted to an average of $11,553 per person per year with over 40 per cent of this loss resulting from reduced performance whilst at work. Decreased hours of work and absenteeism accounted for just 12 per cent and 10 per cent of lost productivity, respectively. In total the costs associated with RA, were $12,352 per worker per year, about $1,500 higher than the costs associated with osteoarthritis (Li et al., 2006).

In the US, research looking at the most expensive medical conditions finds that inflammatory conditions and back problems ranked in the top ten most costly (Druss, Marcus, Oflson and Pincus, 2002). For inflammatory diseases, 16.8 million people in the US are estimated to be diagnosed with the conditions, costing 15.9 billion US dollars and losing 67 million days of work due to the conditions (Druss et al., 2002). For the 13.2 million people reporting back problems, the national cost was 12.2 billion with a loss of 83 million work days – the highest compared to other conditions investigated (Druss et al., 2002).

However, these figures still underestimate the true cost of conditions such as MSDs. Most individuals 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). Significant costs are associated with lost productivity where people remain at work but in pain or distress while awaiting intervention or workplace adjustments. Additional indirect costs are associated with early retirement among people with MSDs (Dagenais et al., 2008; Alavinia and Burdorf, 2008). 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). In addition to family members, some people hire extra household help for additional assistance (Kavanaugh, 2005) and elect to use informal care. Although informal care is difficult to identify, quantify and value (what is considered 'informal care' by some people may be considered 'normal' by others), Lundkvist et al. (2008) estimated that for RA the annual cost of informal care among the general population in Canada was 2,891 euros ($4,618.88, April 2009 exchange rates) per patients – slightly higher than the European average of 2,562 euros ($4,093.25, April 2009 exchange rates) per patient. This figure varies greatly according to the services provided by the healthcare or social systems and the characteristics of the labour market in each country.

3.4.3 Total costs

The cost calculations for MSDs in general provide relatively good estimations of the costs of non-specific MSDs given that non-specific MSDs constitute the vast majority of cases. 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 healthcare system (Cooper, 2000). The cost of AS to society is less well established (Chorus et al., 2002). However, Kobelt et al. (2006) estimated that in Canada the mean annual cost of AS per patient was $9,008. For patients with higher disease activity and lower levels of physical functioning, the costs were even greater. Direct costs comprised 28.9 per cent of the total cost and lost work capacity represented 38.0 per cent of the costs. These costs are lower compared with European countries, but similar to the costs estimated in the US (Kobelt, Andlin-Sobocki and Maksymowych, 2006).

Lundkvist et al. (2008) estimated that the total cost of treating RA patients in Canada was 10,459 euros ($16,710 at April 2009 exchange rates) per patient, or 2,249 million euros ($3,593 million at April 2009 exchange rates). These costs included medical costs, drug costs, non-medical costs, the costs of informal care and other indirect costs, but do not differentiate between those of working age and those above retirement age. The Canadian figures are lower, per patient, than those for western European countries. Another study, including workers and non-workers, provides a lower estimate of the total annual costs for RA, at approximately $9,300 with indirect costs comprising about 45 per cent of the total costs and direct cost comprising about 55 per cent (Maetzel et al., 2004). In total, Maetzel et al. (2004) provide a lower estimate with RA costing Canada just over $2 billion per year. From these figures, we can estimate that RA costs Canada somewhere between $2.0 and $3.6 billion per year.

Additional costs estimates indicate that the total cost of back pain in Canada is likely somewhere between $11 and $23 billion (Dionne et al., 2007). The large range for the back pain cost estimate is likely due to the variability in treatment seeking and sickness absence behaviours among people with back pain. Looking at MSDs as a whole, Patra et al. (2007) using estimates from 1998 data on cost adjusted to 2005 prices, figures that MSDs cost Canada in total about $20.6 billion with direct costs totalling $4.9 billion and indirect costs totalling $15.7 billion.

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 and explain some of the variability in the estimates.

3.5 Summary

In this section we have considered the impact that MSDs have on a person's ability to work, both physically, as a result of the condition itself, and from the associated effects, such as loss of concentration from pain. We have also discussed the impact that the 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 is not as widely understood.

In order to address the productivity gap, to have a productive workforce across the entire range of the working age population (which covers an increasingly large age bracket) government and employers need to work together to ensure that people are fit to work. To achieve this it is important that all those involved – employers, clinicians, the government and employees – 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, 2006b). 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.

MSDs have a significant impact on people's ability to work; not only on an individual basis but on aggregate they affect a large portion of the working population. Estimates suggest that MSDs are a significant cost to employees, employers and society as a whole. It is therefore important that we focus on what people are able to do to ensure that we retain as much of their productivity as possible both for the long term health of individuals and to reduce the negative economic impact of lost productivity.

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

4. Interventions

The impact of MSDs, as we have seen, can be significant to the people living with them, to employers and to society as a whole. Their impact on the workforce has recently started to receive greater recognition. Whilst it is widely acknowledged that early intervention is an essential part of addressing the onset of MSDs and absence caused by these conditions, there is still some way to go before people with MSDs are given the best support possible to remain in work or return to work. Long waiting times for care, 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.

Research by Wang, Badley and Gignac (2004) concludes that adequate provision of workplace accommodations, such as job redesign and flexible working hours, could improve the work participation rates in people with activity limitations. 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 Canada, and to compare Canada to countries with similar or different labour market, welfare and healthcare systems.

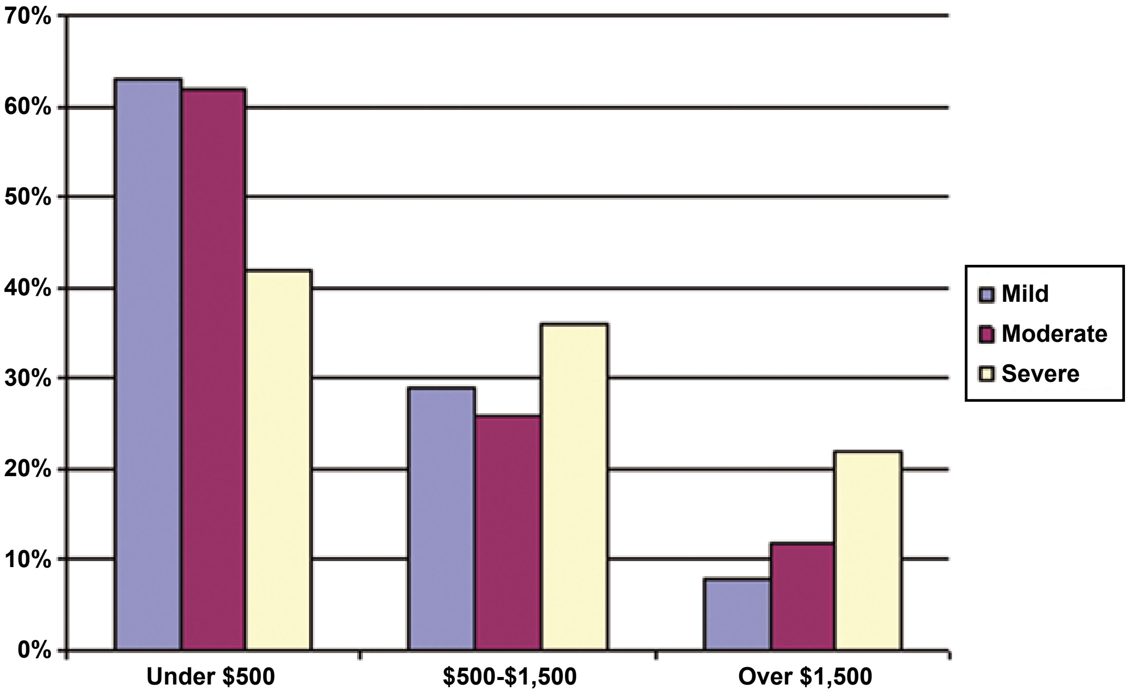
4.1 The case for early intervention

Ensuring that workers who have MSDs get access to the appropriate treatment and support as quickly as possible must be a top priority for employers and 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 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 individuals recovery and self-management, and may contribute to reducing the number of working days lost and reduced productivity caused by MSDs (although more evidence on the cost-effectiveness of specific return to work programmes is needed). A recent systematic review of interventions concluded that early contact with workers by the workplace, offers of work accommodations, communication between healthcare providers and workplaces, ergonomics work site visits, and coordinated return to work all improve outcomes for people with health problems (Tompa de Oliveira, Dolinschi and Irvin, 2008).

Some in Canada recognise the importance of early intervention and have designed programmes to address health problems that may cause work disability. With the growing recognition about the cost of MSDs, officials in British Columbia and Quebec have led the way in providing regulation around MSDs, whilst Ontario is close behind.[1] In fact, the OHSC of Ontario has recently begun a MSD prevention series (OHSCO, 2007). According to some published data on accommodations in the workplace for people with disabilities, workers in the provinces of Nova Scotia and Alberta report high rates of job redesigns to accommodate their needs, 82.5 per cent and 81.3 per cent, respectively, whereas the national average was 64.7 per cent (Statistics Canada, 2008b). Unfortunately, overall, in 2006 fewer workers reported receiving a job redesign compared to 2001 (Statistics Canada, 2008b).

According to the Canadian Abilities Foundation, the majority of accommodations for workers with disabilities cost less than $500 (Canadian Abilities Foundation, 2004). Figure 4.1 below illustrates the annual cost of workplace accommodations by severity of disability (Canadian Abilities Foundation, 2004).

Figure 4.1: Annual costs of workplace accommodation by severity of disability



Source: Canadian Abilities Foundation, 2004, pg. 3

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[1] Expert interview

The Institute for Work & Health's seven key principles – based on findings from the research – provides employers advice for encouraging return to work. The principles are highlighted in Box 1 below.

Box 1: Seven 'principles' for successful return to work

1. The workplace has a strong commitment to health and safety which is demonstrated by the behaviours of the workplace parties.
2. The employer makes an offer of modified work (also known as work accommodation) to injured/ill workers so they can return early and safely to work activities suitable to their abilities.
3. Return to work planners ensure that the plan supports the returning worker without disadvantaging co-workers and supervisors.
4. Supervisors are trained in work disability prevention and included in return to work planning.
5. The employer makes an early and considerate contact with injured/ill workers.
6. Someone has the responsibility to coordinate return to work.
7. Employers and healthcare providers communicate with each other about the workplace demands as needed, and with the worker's consent.

Source: Institute for Work & Health. (2007). Seven 'principles' for successful return to work. Retrieved 15 April 2009 from http://www.iwh.on.ca/files/seven_principles_rtw_2007.pdf

In response to chronic low back pain, researchers from Sherbrooke University Medical Hospital designed an intervention to encourage return to work. The intervention is described briefly in Box 2 on the next page.

It is in the employers 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 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.

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.

Box 2: The Sherbrooke model intervention

Aim: To reduce chronicity of back pain and as a result reduce costs associated with long term absence from back pain among workers in the manufacturing, services, and health care industries.

By investing early in targeted interventions of disability prevention costs associated with disability would decrease.

The Sherbrooke model intervention: The model included an occupational and clinical intervention. With most cases of back pain (about 70 per cent) resolving themselves within four weeks, this intervention targeted higher risk and more costly cases by trying to prevent prolonged absence and long term disability.

Therefore, after six weeks of absence from work, employees began the occupational intervention. This included visits to the workplace by an occupational health physician, as well as a visit from an ergonomist for a 'participatory ergonomic' intervention that included the injured worker, the supervisor, and management and union representatives. Employers decided whether or not to implement the job modifications recommended by the ergonomist.

The clinical rehabilitation intervention began after eight weeks of absence and included a clinical examination by a back pain medical specialist and participation in a back school. If improvements had not occurred by 12 weeks the worker participated in a multidisciplinary work rehabilitation intervention with the aim of progressive return to work through fitness development and cognitive behavioural approaches. Health care providers encouraged early return to normal activity.

Outcomes: The average number of days on full disability benefits was highest among people who received standard care (418.3 days) compared with the lowest average in the Sherbrooke model (125.6 days). All of the intervention groups reduced costs compared with standard care. Workers participating in the Sherbrooke model intervention returned to work more than twice as fast as those in individual care. The table below provides the cost details per worker for the interventions compared with standard care.

	1 year follow-up	**5.4 years follow-up**	**Total costs**	**Cost benefit**
Standard care	$7,133	$16,384	$23,517	$0
Clinical care	$6,458	$ 3,586	$10,045	$16,176
Occupational care	$6,529	$ 6,291	$12,820	$16,827
Sherbrooke model	$6,515	$ 545	$ 7,060	**$18,585**

Source: Loisel et al. 2002

As the data indicate, the Sherbrooke model, which combined the clinical and occupational intervention, was most cost-beneficial and improved outcomes for workers.

For more information:

Loisel, P., Abenhaim, L, Durand, P., Esdaile, J., Suissa, S., Gosselin, L., et al. (1997). A population-based, randomised clinical trial on back pain management. Spine, 22 (24), 2911-2918.

Loisel, P., Durand, P., Abenhaim, L., Gosselin, L., Simard, R., Turcotte, J., et al. (1994). Management of occupational back pain: the Sherbrooke model. Results of a pilot and feasibility study. Occupational and Environmental Medicine, 51, 597-602.

Loisel, P., Lemaire, J., Poitras, S., Durand, M-J., Champagne, F., Stock, S., et al. (2002). Cost-benefit and cost-effectiveness analysis of a disability prevention model for back pain management: a six year follow up study. Occupational and Environmental Medicine, 59, 807-815.

In Canada, workers experience long waiting times to see a specialist about rheumatic diseases (Badley, Veniot, Ansari and MacKay, 2008). More specifically in Ontario, likely inflammatory patients waited over three and a half weeks to see a rheumatologist and non-urgent referrals waited 13 and a half weeks. Wait times varied significantly throughout the province with the longest mean reported wait time being 12 weeks for individuals with likely inflammatory arthritis (Badley et al., 2008). In large measure, these seem to be due to a shortage of rheumatologists, with particular respect to rural disparities, which means that, even in cases where GPs make an initial and sometimes early diagnosis, their patients have to wait for a specialist appointment. Clearly, disease progression during this time can still occur and, in some cases, affect the work disability and psychological well-being of the patient. With a 64 per cent required increase in rheumatologists by 2026 and a third of the rheumatologist workforce retiring within the next 10 years, wait times may only become longer in the coming years, unless more rheumatologists enter the workforce (Badley et al., 2008). As a way to address this problem, The Arthritis Society in Canada has conducted a programme entitled ‘Getting a grip on arthritis’ for GPs, which is described briefly in Box 3 below.

Box 3: Getting a grip on arthritis project

Aim: To improve diagnosis and treatment of arthritis in primary care.

Procedure: GPs attended a two-day workshop, received follow-up reinforcement activities and a toolkit based on 10 arthritis best practices. The content of the programme was based on published guidelines. The GPs learned about the importance of early referral to a specialist for people with more severe arthritis.

Outcomes: Management of arthritis by GPs improved. The program received funding from Health Canada’s Primary Health Care Transition Fund for implementation across Canada. Over 800 health care providers have attended the 30 workshops that have been held. Depending on the outcome, which is currently being evaluated, the model may serve as a template for improved diagnoses and management of other chronic diseases.

Sources:

Glazier, R.H., Badley, E.M., Lineker, S.C., Wilkins, A.L., Bell, M.J. (2005). Getting a grip on arthritis: an educational intervention for the diagnosis and treatment of arthritis in primary care. Journal of Rheumatology, 32(1), 137-142.

The Arthritis Society. (2008). Getting a grip on arthritis project. Retrieved 15 April 2009 from http://www.arthritis.ca/local%20programs/ca/publications%20and%20resources/gettingagrip/default.asp?s=1

4.2 The social security regime for the work disabled

It is clear that, in most countries, 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.

Canada's disability benefit system is characterised as a dual benefit system, where labour force participants contribute to the system and means-tests provide insurance for those not qualifying for income protection from labour force participation. In Canada five sources of benefits provide protection from labour market earning losses due to disability, which are listed below (Mustard, Dickie and Chan, 2007).

1. Federal Canada Pension Plan's disability benefit programme;
2. Provincial workers' compensation agencies;
3. Provincial social assistance programs;
4. Employment-based long-term disability plans;
5. Automobile insurance.

Each source operates under different definitions of disability, conditions for eligibility, duration of entitlement, and incentives to encourage return to work. Due to these disparities, the system is fragmented and hard to navigate. The range of annual disability benefits under social assistance across the provinces is $8,100 to $12,800, and in 2001 Canadians received a total of $12.7 billion in income security benefits (Mustard, Dickie and Chan, 2007). However, compared with the US and other OECD countries, Canada spends less on disability benefits (OECD, 2003). On the other hand, 27 per cent of the working-age population with disabilities are considered low-income compared with 14 per cent of the general population (Maytree, 2008).

Workers Compensation Boards (WCBs) provide coverage for occupational injuries only, whereas separate insurance systems (private and/or government) provide compensation for non-work-related conditions.[2] Temporary payments for lost income due to work-related injuries or illnesses are managed by the WCB in each province (Service Canada, 2007).

If workers become temporarily ill un-related to work they can apply for employment insurance (EI) benefits. To qualify for these the worker must have completed between 420 and 700 hours of insurable earnings in the previous 52 weeks and have a single medical certificate filled out by a physician (Service Canada, 2009b). Eligible applicants receive 55 per cent of their weekly

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[2] Expert interview

earnings up to $447 (Service Canada, 2009b). Applicants must wait two weeks before the benefits start.

Workers with severe and long-term disabilities that will preclude returning to any type of work before retirement can apply for disability benefits through the Canadian Pension Plan Disability (CPP-D). Eligibility for CPP-D requires a medical assessment. Additionally, the applicant must have contributed to the CPP-D for four years during the previous six years. Once their application has succeeded, usually after a three to four month wait time, they receive on average $799.14 per month. In 2009, the maximum is $1,105.99 (Service Canada, 2009a).

According to a report by the Canadian Abilities Foundation (2004) disability benefits and supports provide a disincentive to joining the workforce. Both EI and CPP-D discourage the ill or disabled from supplementing their income with temporary or part-time work. Any money received through paid employment is deducted from EI disability benefits, dollar for dollar. Under CPP-D workers can only earn up to $4,400 annually before taxes without impacting their benefits (Maytree, 2008; Service Canada, 2008). After earning more than $4,400, Service Canada may provide some support to encourage regular return to work.

The Human Resources Development department provides the Disability Vocational Rehabilitation Program (Service Canada, 2008). This programme is designed to help people who receive a CPP-D benefit return to work. Likely candidates are those who are motivated to return to work and whose physicians agree that they can cope with a work-related rehabilitation program. The programme provides an individualised return to work rehabilitation plan for each participant. A rehabilitation specialist in the community works with the person and the CPP rehabilitation case manager to develop the plan. If the individual finds a job, the CPP-D benefit will continue for the first three months after work begins. If the disability recurs or the individual decides work is not helping, the benefits are automatically reinstated for up to two years (Service Canada, 2008). A fast track reapplication process is also available for up to five years after benefits stop (Service Canada, 2008).

The individual provinces also provide interventions for return to work through their WCBs. In one interview we learned about a recently introduced return to work programme by the WSIB in Ontario. Using return to work coordinators, ergonomists, and healthcare professional the programme seeks to make contact with workers early on in the recovery process to provide them with the support they need to return to work quicker. The return to work coordinator facilitates the communication between all the stakeholders, including the worker and the employer. The evidence-based programme supports recovery in the workplace through graduated plans and workplace adjustments.

The promotion of swift return to work through various interventions offered at the provincial and federal level has the potential to decrease the number of workers with MSDs on long-term disability benefits.

4.3 Condition-specific interventions

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

4.3.1 Rheumatoid arthritis

The importance of effective and early treatment of RA in reducing joint damage and disability is now widely acknowledged (Pugner et al., 2000). Since there is currently no ‘cure’ for RA, the focus of treatment is on controlling signs and symptoms, enabling patients 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 (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 as cited 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 for improving job retention and work participation (Halpern, 2008). One clinical trial in Canada found that people who were given adalimumab decreased absenteeism related to RA by half a day per two weeks (Zhang et al., 2006). Every two weeks, a total of $82.18 was saved due to reductions in absenteeism, presenteeism and unpaid work costs (Zhang et al., 2006). It seems that, in Canada, people with RA who can benefit from anti-TNF drug therapies may not be able to gain ready access to them even after they have been seen by a specialist (Edworthy et al., 2008). Furthermore, disparities in access among the provinces have been identified (Health Canada, 2003).

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, rheumatologists, physiotherapists, occupational therapists, chiropodists, podiatrists, pharmacists, primary care nurses and orthopaedic surgeons), but the participation of the patient and, ideally, their employers. Social workers also have their role to play.

One newly developed intervention, entitled ‘Employment and arthritis: Making it work’ seeks to reduce the impact of arthritis on working life by providing group sessions on self-management (Lacaille et al., 2008). In a pilot study of inflammatory arthritis patients, mainly with RA, participants attended five group sessions lasting three hours each to discuss work-related topics and self-management techniques. An ergonomic assessment and job accommodations were recommended, as well as information on communication skills and disease management. The programme received positive feedback from attendees, particularly for increasing self-awareness and empowerment for dealing with RA. All participants indicated that the programme changed the way they managed their arthritis by teaching them skills for dealing with time management to address fatigue, relaxation techniques to reduce stress, and communication skills to deal with needs in the workplace. Further research on this intervention is required – particularly scaling it up to more workers (Lacaille et al., 2008).

4.3.2 Spondyloarthropathies

Prompt referral to specialists for confirmation of diagnosis and the start of treatment is also essential for those with AS and other rheumatic conditions. Since (similarly to RA) there is no cure for AS, the aim of therapeutic intervention is to reduce inflammation, control pain and stiffness, alleviate systemic symptoms such as fatigue, and to slow or stop the long-term progression of the disease. The prescription of non-steroidal anti-inflammatory drugs (NSAIDS) or anti-TNF drugs coupled with regular physiotherapy forms the current basis for the treatment of AS.

As AS typically affects relatively young people, its potential to disrupt or even curtail an individual’s labour market participation may be significant. As we have discussed, there are important clinical, social and economic benefits to keeping these patients in work as long and consistently as possible. Depending on the severity of their condition, AS patients can benefit from 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, 2003) rather than eradicating the cause of the problem or returning to normal function. Research by Franche et al. (2007) finds that return to work interventions aimed at reducing work absence duration should include work accommodations, healthcare provider advice to the workplace, and ergonomic visits as critical steps in encouraging return to work. However, according to one interview, awareness about the re-occurrence of problems, particularly upper-limb disorders, needs to be taken into account. When designing return to work interventions addressing the possibility of re-occurrences may improve overall management of MSDs.

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' the condition. The limitations imposed by sick notes, statutory sick leave and formalised return to work programmes may serve to reinforce the 'illness' of the patient and can tie employers hands. Based on evidence that psychosocial factors are a determinant of chronicity and disability in those with back pain, there is a strong argument for re-conceptualising this condition and its treatment, which has important lessons for other types of non-specific musculoskeletal pain (Burton, 2005). Interestingly, Canadians who were not satisfied in the response from their GP about their back pain were less likely to have their work affected by back pain, which could have been due to a lack of 'catastrophising' influencing their behaviour (Dionne et al., 2007).

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 those with 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.

As with other chronic diseases, higher levels of mental health problems are often reported among people with MSDs. In Canada, 5.0 per cent of people with arthritis or rheumatism report major depression as do 6.2 per cent of people with back pain (Patten, Williams and Wang, 2006). In contrast, only 2.4 per cent of people without a chronic condition report major depression (Patten et al., 2006). Other research, among a small cohort of individuals with MSCs, finds that individuals with depressive symptoms had prolonged amounts of sick leave (Lötters et al., 2006). A number of researchers, as well as interviewees, call for increased levels of awareness on the interaction of psychological well-being and MSDs (Li et al., 2006; Bultmann et al., 2007; Leroux et al., 2005).

Work-related stress also impacts work outcomes among people with long-term health issues. More specifically, Canadians with long-term health problems in jobs with high levels of strain and high self-perceived work stress had reduced levels of activity at work due to their health condition (Park, 2007). Similarly, job insecurity influences activity levels for individuals with long-term health problems (Park, 2007). With psychological and social dimensions affecting productivity, absence rates and return to work rates for workers with MSDs and other health conditions, a greater understanding of the relationship is warranted.

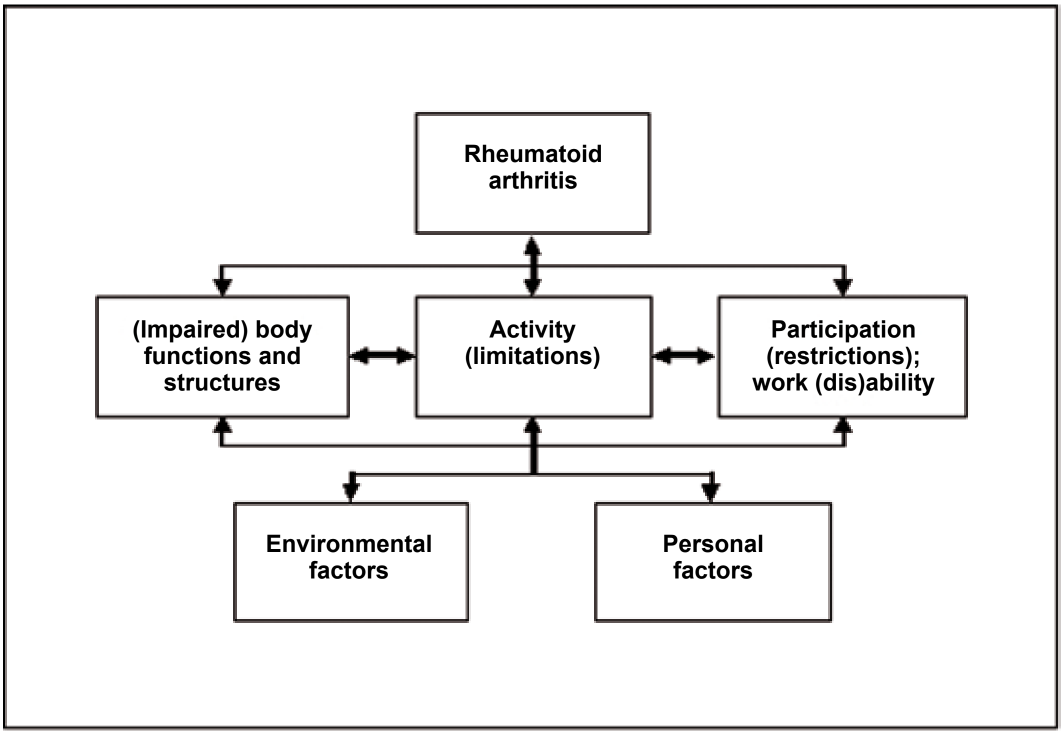
Since it was first proposed in the late 1970s, a growing body of evidence has developed to support the biopsychosocial model. For example, research has demonstrated that job dissatisfaction can be an important predictor of speedy and successful return to work (Bigos et al., 1992). On the issue of social 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, Fikermann 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, Haythorthwaite, Southwick and Giller, 1990; Block, Kremer and Gaylor, 1980).

De Croon et al. (2004) looked at the research on work disability among people with RA and concluded that psychosocial factors were often a better predictor of work disability than standard bio-medical factors. In Figure 4.2 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 the concerns that this approach may encourage or 'permit' helplessness in some patients or that, in other circumstances, it may alienate patients who feel that they are being told that their condition is 'all in the mind'. Clearly care must be taken in the way that clinicians and others mitigate these risks, but the balance of the literature – and of the expert opinion offered during the course of our interviews – is strongly in support of the biopsychosocial model and its role in informing the management of MSDs in both clinical and occupational settings (Smyth, Stone, Hurewitz and Kaell, 1999; Carter, McNeil and Vowles, 2002; Zampolini, Bernardinello and Tesio, 2007). Indeed, it forms the basis of the World Health Organisation's *International Classification of Functioning, Disability and Health* (ICF) which has been widely embraced as an authoritative guide for vocational rehabilitation (WHO Scientific Group, 2001).

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

Figure 4.2: ICF model applied to work disability in RA



Source: de Croon et al., 2004

4.5 The role of employers

4.5.1 Awareness of conditions and their management

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

Whilst the message about manual handling and work design may have gotten 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. As mentioned earlier, Canadians buy into this myth. 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 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, Feuerstien and Gatchel, 2007; de Croon et al., 2004; Feuerstein, Shaw, Nicholas and Huang, 2004; Chorus, Miedema, Wevers and van der Linden, 2001). The success with which both employee and employer can manage the process of re-adjustment during return to work can also depend on the beliefs that both parties have about the extent to which the work itself is (at least in part) caused by or related to the incapacity.

There are numerous types of work-based intervention for assisting those with MSDs, ranging from ergonomic adjustments to providing access to physiotherapy, modifying work programmes to cognitive behavioural therapy or a combination of various strategies. Evidence on the success of these interventions at tackling non-specific MSDs is mixed (Meijer et al., 2005).[3] A systematic review of multidisciplinary treatments of patients with low back pain, for example, demonstrated that whilst the treatment improved function and decreased pain in individuals, it could not be demonstrated that this was linked to employees returning to work earlier than those who had not received it (Guzman et al., 2001). Whilst biomechanical or ergonomic factors may be related to the onset of back pain, evidence that interventions based on these principals

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[3] Findings from an evaluation of the effectiveness of return-to-work treatment programmes were inconsistent

will prevent re-occurrence or progression to chronicity is thin on the ground (Burton, 1997; van Eerd et al., 2006). In fact, it has proved virtually impossible to determine whether one treatment is significantly more effective than another (Ekberg, 1995). Most likely a combination of intervention pieces that also considers The Institute for Work & Health's seven principles for successful return to work will improve outcomes. 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).[4]

There is nonetheless broad agreement on the principles for managing non-specific MSDs, particularly back pain, that are outlined in Box 4. This includes advice and a number of relatively simple measures for employees and employers to follow on how to deal with back pain.

Box 4: 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 (HSE),2002 Initiative Evaluation Report: Back to Work

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

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[4] Backman, 2004 found only six studies for the period 1980 to 2001

absence and incapacity. They may find aspects of mental ill-health or chronic incapacity awkward and embarrassing to talk about or confront, and are concerned about challenging or asking for more information about GP sick notes, making home visits or telephoning staff at home for fear of being accused of harassment or falling foul of the law and landing themselves and their organisation in a tribunal. They are also ignorant of, or uncomfortable with, the idea of rehabilitation. Although the Employment Equality Act requires employers to make 'reasonable 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 psychosocial factors in determining whether employees remain in work or return 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 throughout the world, including Canada, spend a very small proportion of their time learning about occupational health, whilst musculoskeletal training for GPs has been found lacking (Akesson et al., 2003). In addition, many GPs feel uncomfortable or incompetent when asked to assess 'workability' (Arrelov, Alexanderson, Hagberg, Lofgren, Nilsson and Ponzer, 2007; Swartling, Hagberg, Alexanderson and Wahlstrom, 2007). However, without an 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.

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. Both sides of this argument were recently presented in an article by the Ontario Medical Association (OMA) – a lack of support for physicians from employers, and employers suspecting physicians to readily certify employee disabilities (OMA, 2009). To address the need for improved understanding, the OMA proposes a model for involvement of physicians in timely return to work programmes (OMA, 2009). 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, occupational health professionals and GPs will focus on the aspects of the job which an MSD patient cannot currently perform, rather than on those which they can. However, it seems that the focus on ability rather than disability has started to reach some stakeholders in Canada (OMA, 2009).

One of the attractions of the biopsychosocial model is that it ‘joins up’ the three core strands of the MSD patient’s experience, and management of, their condition. It offers a comprehensive framework with which to look at the diagnosis and treatment of a range of MSDs, especially when an important outcome for the individual is to stay in, or to return swiftly to, work.

4.6 Summary

This section has outlined the case for early intervention, first and foremost to benefit the health of those with MSDs, but also to ensure that they remain productive members of the workforce. 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 were highlighted earlier.

5. Conclusions and recommendations

Work is, unambiguously, good for our health. 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 Canada'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 Canada 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 Canadian industry and it can draw heavily on the resources of both the health service and the benefits regime.

There is no shortage of clinical, epidemiological, psychological and economic evidence on the nature, extent and consequences of the MSD problem in Canada. MSDs will affect a growing 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**.

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.

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. Managers in Canadian organisations need to be aware that MSDs can be even more of a problem for their staff and for the whole organisation. Be supportive of your employees.
- 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.

- 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 OH professionals as early as possible. Work with local WSB administrators on encouraging a quick, but safe return to work.
- 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. However, balance safety with return to work to avoid re-injury or increased disability.
- 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 employers to give them useful work to do which will support them on their journey back to full productive capacity.

5.2 Recommendations for employees

- Focus on capacity not incapacity. It's natural to be anxious or even guilty about the parts of your job which you may find difficult to perform because of your MSD. But you still have much to contribute and you should play to your strengths. Your specialist knowledge and experience doesn't disappear just because you are suffering pain, discomfort or mobility problems, you can still contribute in many ways. Work with your managers and your colleagues to find out how you can maximise your impact at work within the constraints of your condition. Be open with them and they should respond better.
- Talk early. Your line manager, despite what he or she might tell you, is not a mind-reader. If your MSD is causing you difficulty or you anticipate a period when you will need to adjust your working time, talk to your manager so that you can both plan what to do about it. The earlier the better as managers don't like last minute surprises, but

they can usually find a solution to most problems if they have some notice. You might also find it useful to talk to your union representative, your human resources manager or someone in occupational health. Don't delay.

- Play an active part in the management of your condition. Your MSD is bound to get you down sometimes and you will feel like it's controlling your life at home and at work. But you don't need to be a passive victim of pain or immobility. Find out more about your condition, watch for patterns in pain or fatigue and learn how you can minimise its impact on your functioning and your mood. This can sometimes be very hard to do, but persevere: people who play an active part in the management of their condition tend to get back to work more quickly.
- Know your rights. As both a patient and as a worker you should know what support and advice you are entitled to. If you are a trade union member, your union should be able to guide you on much of this.
- Family involvement in job retention and rehabilitation. Your family and friends are important sources of support. They may not realise that staying in or returning to work is both possible and desirable. You need to help them to help you by getting them involved in your rehabilitation at work. Even small adjustments to working time or travel to work arrangements can make the world of difference.

5.3 Recommendations for GPs

- Recognise that 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. Coordinate with other professionals to help patients return to 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.
- Consider additional training on issues related to MSDs, occupational health and return to work. One of the concerns you may feel about addressing the role work plays in patients' lives is that you have not received appropriate training on the issues affecting workers. By taking advantage of educational opportunities aimed at increasing awareness about working life, as well as MSDs, you may be more willing to take a proactive role in addressing this important issue.

- 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. Recognise your response influences workers' expectations about recovery and return to work. Support return to work opportunities and collaborate with return to work coordinators, when available.
- Encourage self-management. Try to ensure that the patient can adopt strategies to manage aspects of their own condition, especially if they are staying in or returning to work. A feeling of empowerment and control will help their mood and ensure that they can keep on top of important aspects of their incapacity while at work.
- Early intervention. The evidence suggests that long periods away from work are usually bad for MSD patients. The longer they are away from work, the more difficult it is to return. Early action, preferably in partnership with the patient and their employer, can help achieve a balance between the individual's need for respite and their need to work.

5.4 Recommendations for occupational health professionals

- Think beyond the physical symptoms. More importantly, ensure employers, employees and GPs fully appreciate how this multi-factor perspective can contribute to constructive, active, participative and sustainable rehabilitation. Shape your interventions and advice around the three domains of the biopsychosocial model and help employers see how small 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 Employment Equalities Act is often seen by managers as a way of complying with the law. Helping managers to look at job redesign as a more constructive way of meeting the needs of a patient/worker with an MSD and meeting changing customer demands can help them to see the business benefits of more flexible working arrangements.
- Understand that people with MSDs may be reluctant to disclose their condition to their employers. Help them weigh the pros and cons of disclosing their condition, as well as help them communicate with their employer.

5.5 Recommendations for government

- Take seriously the existing evidence that the proportion of the Canadian workforce with MSDs is likely to grow over the next few decades.
- Access to clinical expertise needs to improve. The apparent shortage of rheumatologists is affecting the ability of citizens of working age to get access to early interventions which may save their jobs. As one interviewee indicated, projections for workforce needs of medical professionals is already underway. Take advantage of the tools available to establish if Canada will have sufficient clinical staff (eg physiotherapists) to accommodate the projected growth in MSDs as the population, and the workforce, ages.
- Recognise the time constraints on health professional in providing advice on workplace accommodations and return to work recommendations. Addressing healthcare issues in the workplace requires coordination from a number of stakeholders. Consider how to streamline tackling these issues and joining up the various parties involved in reducing the social and economic cost of MSDs to Canadian society.
- 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.

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Appendix 1: Interviews and consultation with experts

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

Dr Elisabeth Badley	Head/Senior Scientist, Health Care & Outcomes Research, Toronto Western Research Institute
Dr Monique Gignac	Senior Scientist, Health Care & Outcomes Research, Toronto Western Research Institute
Linda Kelly	Director, Program Development, Workplace Safety and Insurance Board (WSIB)
Dr Cam Mustard	President & Senior Scientist, Institute for Work & Health; Professor, Public Health Sciences, University of Toronto
John Mutch	Manager, Case Management Development, Workplace Safety and Insurance Board (WSIB)
Dr Glen Roberts	VP Research and Development, Canadian Policy Research Network
Kathleen Walsh	Manager, Ergonomics Program Workplace Safety and Insurance Board (WSIB)
Joanne Webb	Director, Case Management Development Workplace Safety and Insurance Board (WSIB)
Dr Richard Wells	Director, CRE-MSD; Professor, Department of Kinesiology, University of Waterloo

Appendix 2: Benchmarking grid

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

- Labour market;
- Welfare system ;
- Health care system.

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

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

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

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

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

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

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

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

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

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

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