ISSN: 1831-9343

European Agency for Safety and Health at Work

Work-related musculoskeletal disorders: from research to practice.

What can be learnt?

European Risk Observatory

Report

European Agency for Safety and Health at Work

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Title of EU-OSHA project: Review of research, policy and practice on prevention of work-related musculoskeletal disorders (MSDs)

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This report was commissioned by the European Agency for Safety and Health at Work (EU-OSHA). Its contents, including any opinions and/or conclusions expressed, are those of the authors alone and do not necessarily reflect the views of EU-OSHA.

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ISBN: 978-92-9479-357-7

doi:10.2802/118327

More information on the European Union is available on the Internet (http://europa.eu).

Cataloguing data can be found on the cover of this publication.

Luxembourg: Publications Office of the European Union, 2020

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Executive summary

Introduction

This report summarises the three components that constituted the research project 'Review of research, policy and practice on prevention of work-related musculoskeletal disorders (MSDs)'. The first component was an exploratory review that examined the reasons for the continuing high prevalence of MSDs in the European Union (EU) and identified gaps in prevention practice. The second was an extensive policy analysis, across EU countries and beyond, to gain a better understanding of the conditions under which strategies, policies and actions to address MSDs are most effective. The third component was field research carried out in six EU Member States to explore, through focus groups, what was happening at workplace level and, through interviews, the roles of various strategies and policies in MSD prevention.

The project was carried out because, despite many different strategies, campaigns and policy initiatives over the past 30 years, prevalence rates of MSDs across the EU are not reducing (although there have been relatively minor decreases in some countries). The current project focuses on:

- improving knowledge on new and emerging risks and trends in relation to factors that contribute to work-related MSDs and identifying the related challenges;
- identifying gaps in current strategies for tackling work-related MSDs, at both policy and workplace levels;
- investigating the effectiveness and quality of workplace interventions and risk assessment approaches;
- identifying new approaches for more effective MSD prevention.

Methods

Research questions were developed for the exploratory literature review and, from an initial scan of the literature, hypotheses were developed in relation to the continuing high prevalence of MSDs. Further literature identified through systematic searches was then examined to corroborate or refute each hypothesis. Data gaps were also identified as part of the review.

The policy analysis took a desk-based approach, reviewing a total of 142 initiatives shared by National Focal Points from across the EU together and a small number from further afield. From these initiatives, 25 were chosen for further analysis. Building on this analysis, six EU countries were then chosen for in-depth analyses of their policies and strategies; these countries were Austria, Belgium, France, Germany, Sweden and the United Kingdom[1].

The fieldwork had two aims. The first was to investigate what was happening in practice in each of the six countries selected for the policy review. This was explored through a series of focus groups with practitioners in each of the selected countries. The second aim was to identify success factors for and obstacles to policy implementation by interviewing policy developers and policy implementers.

An overarching analysis was carried out by synthesising the findings from the three project components to identify gaps in practice and policy actions. A validation workshop was then held with experts on MSDs, at which summaries of the outputs of the project were shared and discussed.

The exploratory literature review

One of the aims of the exploratory literature review was to improve our understanding of why the MSD prevalence rate continues to be high in the EU. Factors identified included the use of risk assessment processes with a disconnection between known MSDs risk factors and the range of factors evaluated.

[1] At the time of publication of this report, the United Kingdom is no longer a Member State of the European Union. Nevertheless, it was still part of the European Union when the research was carried out in 2017; therefore, henceforth in this report, the United Kingdom is referred to as a Member State.

In addition, the conventional risk assessment approach focuses on individual risks rather than considering the combined effects of multiple hazards.

Furthermore, although the strategic approach to MSDs adopted within the EU focuses on the prevention of risks, EU data sets collected since 2005 suggest that there has not been a reduction in exposure to physical risk factors. While work is changing, and the numbers employed in different sectors are changing, there appears to have been no immediate reduction in exposure to MSD risks across most sectors. Having an increasingly older workforce also impacts on prevalence, as older workers are more at risk of MSDs. There is a gap in the data on how to design workplaces so as not to exacerbate the MSD symptoms of these older workers, who are a vulnerable working group. Young workers also report high levels of MSDs before entering the workplace but, again, as a vulnerable group, consideration should be given to their specific needs once they are in the workforce. In addition, women are more likely to report MSDs than men and women report MSDs of different types from those reported by men. There is evidence to suggest that, within the same job, women may carry out different tasks from their male counterparts, so ensuring that risk assessment and prevention activities are carried out to evaluate all relevant tasks under each job title is essential.

New ways of working including technological changes in offices, manufacturing and construction can increase accessibility to work at all hours, and increase flexibility. However, research is not keeping pace with such changes and there is a lack of research in relation to the impact of new technologies such as smartphones, robots, cobots (collaborative robots) and exoskeletons.

New contractual arrangements are also being implemented in this new world of work. The impact of new, less formal working arrangements has resulted in concerns that there might be a loss of occupational safety and health (OSH) protection for individuals working in this way, as many would be considered self-employed. The growth in e-retail has also seen an increase in the numbers employed in jobs such as picking stock in warehouses and as delivery drivers, often accompanied by an increase in ‘paid per job’ contracts for individual workers, giving rise to concerns of fatigue, MSDs and stress. Work process changes and new technologies may reduce physical exposures but there is a lack of consideration of the human in the work system in many workplaces; this needs further research. A further issue is that an increasingly sedentary workforce brings new health concerns, about which only limited guidance is available.

While individual behaviours are also associated with MSDs, extensive discussion about who is responsible for an individual’s health is still ongoing. Workplace health promotion research in the context of MSDs is currently limited but one study has shown a decrease in the reporting of MSDs where health promotion is in place. However, some organisations fail to fully appreciate the inter-connectivity among MSD risks, and consider their own responsibility over what happens at work to be limited.

There remains a lack of intervention research that could be applied in workplaces and a lack of evaluations of any interventions. This does not help companies to recognise risk or implement effective prevention measures.

Evidence from the fieldwork

While the exploratory review focused on the evaluation of research, the fieldwork aimed to identify what was happening in practice.

One of the gaps identified was the lack of the completion of risk assessments by organisations. Feedback obtained as part of the field research estimated that the completion rate for MSD risk assessments was 50 %, although data from the second European Survey of Enterprises on New and Emerging Risks (ESENER-2) indicated that around 76 % of establishments reported carrying out risk assessments for MSD risk factors. The ESENER-3 study showed that reasons for the non-completion of risk assessments (general rather than MSD-specific risk assessments) included the risks already being known, no major problems identified and a lack of necessary expertise. What is unclear from these data are whether there are fewer hazards to assess in these establishments or whether there is a lack of knowledge of what to assess and how.

It was perceived that large organisations are more likely to carry out risk assessments, but the qualitative data suggest that even these organisations are not always compliant. Data show that small and medium-sized enterprises (SMEs) are less likely to have written risk assessments, which is thought to be due to them having fewer resources including expertise, managerial support and financial support.

The inadequacy of risk assessments was also identified as a gap, with the perception that they focused on only the risks identified in EU directives, rather than the wider range of recognised risks. While good practice from Sweden is reported, there is a general gap between research evidence and practice. In addition to the narrow focus of risk assessments, it was also noted in the field research that risk assessments are often carried out as an afterthought (when something goes wrong) rather than at the design stage of the work process. Considering this, in addition to the focus on risks that must be assessed' (generally physical risks), with little consideration given to diversity (gender or age, for example), it is perhaps not surprising that risk assessments are perceived as inadequate.

With regard to prevention practices, although there were notable exceptions, the main practices used by employers were generic manual handling training, job rotation and lifting aids. This highlights a large gap between evidence and practice, although good examples of multi-level practice were identified in two countries. It is necessary to move on from the assumption that training or job rotation will reduce risks, as neither approach tackles the underlying job or task design. Other solutions identified included self-selection among workers, recruitment of workers to fit the job and outsourcing activities, none of which deals with the underlying risks. While lifting aids were made available, these were not used regularly, which gives rise to the question of how they were implemented in the workplace. While there is some requirement for worker involvement in risk assessment and prevention activities, this is not always a legal requirement; however, it was perceived that worker involvement was beneficial. Taking a participatory approach involving workers can help to gain buy-in when developing solutions.

A lack of data was perceived to be a factor 'contributing to inadequate MSD prevention' at both workplace and national levels. The data that are collected do not inform prevention activities and such data are often not readily available. For example, health surveillance data could be used to inform changes in the workplace but these data are not always available to those involved in the process. Good OSH systems are required for the collection and use of relevant data.

A lack of evaluation of the impact of any interventions was also identified as a gap. It was found that evaluation rarely happened unless it was carried out as part of a research project. The dearth of intervention studies has hindered the development of a knowledge base of effective prevention practices. There is a growing body of research on the evaluation of impacts and new tools are available. Two countries (Germany and the United Kingdom) have planned future evaluations of current strategies but in many countries such evaluations are limited (or non-existent).

While the review identified that individual-level lifestyle factors are associated with MSD occurrence, the role of workplace health promotion in MSD prevention remains unclear and the extent of the employer's responsibility for an individual's health still needs to be explored, agreed on and discussed. There needs to be a linkage with OSH practice, as MSD risks are not limited to the workplace and the general health of the workforce can have a significant impact on susceptibility to MSD risks.

While work and workplaces are changing, there are concerns about 'invisible' workers, that is, those who are self-employed by parent companies as part of the gig economy (sometimes referred to as 'the bogus self-employed'). Their status needs to be evaluated to identify how OSH protection can be ensured. For new technologies, the focus appears to be more on the machine than on the human involved in the process, with a lack of evidence on the impact of the human-machine interface on those working with robots and automation.

The policy analysis

The aim of the policy analysis was to investigate the role and effectiveness of national policies, strategies and programmes to identify success factors for and obstacles to their implementation. The policy analysis identified a number of factors that influenced impact including prioritisation and resourcing. In this context, the need for political prioritisation to enable change to cascade down to the workplace was identified. Priorities other than MSD prevention being taken forward does appear to have an impact.

MSDs are a persistent problem and it must be acknowledged that national authorities face multiple demands with limited resources. It is clear that MSDs have not had the sustained attention they require, with many countries showing limited commitment and having no clear prevention strategy.

This and other projects give rise to serious questions about the adequacy of the provisions of the EU directives, yet national legislative requirements, largely shaped by these directives, are seen as a powerful driver in many countries. Sweden has recognised this and national legislation has been extended to include a wider range of MSD risks. Germany has also adopted additional strategic legislative provisions to support and reinforce MSD prevention. It must also be recognised that, without adequate enforcement, legislative change will not have an impact. It will be essential to ensure that the necessary inspection infrastructures and resources are in place, again requiring top-level commitment and prioritisation.

However, it should be acknowledged that some countries have adopted a sustained approach with linked initiatives and in doing so have demonstrated a clear recognition of the importance of MSDs and their prevention.

Many interventions have limited scope, for example they focus on specific sectors where the risks of MSDs are highest. Nevertheless, it should not be forgotten that MSDs occur across all sectors and it is essential that a wider focus is taken and that campaigns targeted at raising awareness have a wider reach.

Awareness-raising campaigns are a common type of intervention, but, while awareness raising is essential, it is not enough to motivate action. This may be due to a lack of resources (including financial resources, time and knowledge), and a number of initiatives attempt to address this. These initiatives have included those enabling access to expertise in risk assessment and the identification of solutions typically using the approach of working with employers and workers. Such initiatives will provide more sustainable solutions but still the concern that employers have over the cost of workplace changes still needs to be addressed.

A number of the initiatives have explored the provision of collaborative support and guidance from stakeholders and identified it as beneficial. The benefits of collaboration are particularly apparent in those countries with a long culture of support and collaboration. Additional actors and intermediaries can potentially play a role in identifying and preventing MSD risks, including insurers and compensation boards. Their involvement is seen as particularly effective when the role of insurers is set down in law.

Providers of help and support in different countries included government agencies (including inspectorates), insurance providers and occupational health providers. One key benefit identified was having support available at a local level. The training of providers involved in interventions was also seen as an important benefit in ensuring good levels of awareness among providers. Having multi-skilled teams supporting prevention initiatives was also seen as valuable in aiding success.

Vulnerable workers considered in the context of MSDs should include older workers, who, unlike younger workers, are not specifically protected by EU legislation. Other groups of workers (for example women workers and migrant workers) should also be considered. The key message is that such vulnerable workers and their needs have to be explicitly considered in any initiative. In addition, initiatives can be targeted to other types of groups, for example focusing on SMEs or sector-specific measures. Targeting can help to focus attention on those seen as having most need, but it also enables guidance and information to be tailored to specific audiences.

Gaining commitment from all actors within a target group can be difficult, for example persuading SMEs to sign up to the prevention process. However, commitment needs to extend to everyone including senior management, line managers and workers. Workers must also be committed to change. For example, if workplaces need to be designed to allow the implementation of patient-handling devices, organisational changes may be required because the devices take longer to use and workers need to commit to using the devices.

For the last two decades, there has been an extensive array of implementation strategies. Some of these have taken a piecemeal approach with a lack of coherence and no continuity between strategies.

Planning policy-level initiatives with an intervention logic or a theory of change and that include an evaluation is essential to find out what works.

Taking a wider approach to prevention recognises that MSDs are not caused only by the workplace. In some countries, this is driven by research that recognises the multifactorial nature of MSDs including the wider role of lifestyle and health behaviours. Widening the reach of interventions to include aspects of public health may promote the integration of individual health, physical risks and psychosocial risks in the prevention of MSDs.

While the role of prevention is recognised, there continues to be a principal focus on risk assessment. Associated with this is the perception that a whole series of different risk assessments is required, rather than the intended integration of risk assessments, which is understood to be the original concept underlying the 24 EU OSH directives. This belief is a large barrier for employers and may help to explain why many employers do not engage at all with the risk assessment process in their workplaces. While the prevention aspect is well established in the hierarchical approach to prevention (where prevention of risks at source takes priority), this message does not seem to be reaching the workplace. This may be due to a perception that workplace change is expensive and that training and job rotation are cheaper options and easier to implement. While such measures have a role to play when correctly applied, they do not remove risks. A longer term approach is needed that incorporates ergonomics into the design and engineering process, as this can reap long-term benefits.

Success factors, challenges and obstacles

Prioritising and resourcing have been identified as key actions to improve MSD prevention. A single approach cannot be prescribed because of differences between Member States' OSH infrastructures and practices.

Stakeholder involvement is also essential, and bringing together the different skills of the various stakeholders can help to develop a multidisciplinary and more holistic approach to risk assessment and prevention.

Incentives, which can be positive (access to expertise or funding for workplace changes) or negative (fines for non-compliance), may also play a role. Positive incentives appear to have more of an impact than negative measures in encouraging the engagement of companies.

A lack of planning of interventions has been a major challenge and, without a plan, a good evaluation is unlikely. There is a need for a more coherent approach to planning interventions including planning the implementation, the intervention, the intervention logic and the evaluation. Good examples of long-term approaches from Germany and the United Kingdom are presented in the report.

The continued focus on risk assessment needs to be challenged, and a preventive pathway needs to be more rigorously used, as invoked by legislation.

In the context of OSH, the emphasis is changing from a focus on safety to one that recognises the importance of health issues. In this study, one of the aims was to improve understanding of the long-term impacts of MSDs including the risk of disability in later life. These impacts are not well understood, resulting in a lack of good-quality evidence with which to inform policy.

Inspection and enforcement were seen as strong weapons in MSD prevention, but this finding comes at a time when the numbers of inspectors are perceived to be decreasing as is the likelihood of an inspection. Focused inspection activity may offset this reduction in numbers, but it is unclear what the impact of this would be on sectors that are not perceived as high risk but nevertheless have a significant prevalence of MSDs.

Ergonomics is widely recognised as playing a key role in MSD prevention, in relation to both risk assessment and developing solutions. While in some countries ergonomists are at times a part of core prevention teams, this is not always the case. The focus is not on keeping ergonomics for ergonomists but ensuring that ergonomics knowledge and awareness are shared among relevant stakeholders and, potentially, workers.

Legislation was discussed in both the policy interviews and the focus groups, and there is concern that the legislation is outdated. However, there is nothing to prevent Members States from extending their national legislation as has happened in Sweden. Further discussions on legislation need to include the issue of protecting the workers who have more precarious contracts.

What new approaches might be helpful in MSD prevention?

Policy actions

A number of policy-level actions were identified as part of this project, including:

- top-level commitment and resourcing;
- collaboration among social partners and other stakeholders;
- incentivise positively;
- coherent planning and integration;
- adopt a wider perspective;
- provide continuity;
- promote the preventive approach;
- strengthen the role of ergonomics and ergonomics teaching.

Actions for intermediaries

A number of actions for intermediaries were also identified from the project, including:

- encourage a broader perspective for risk assessments to include additional risks;
- encourage the collection and use of data to enable an evidence-based approach;
- promote and encourage the active use of worker participation in risk assessments and prevention activities;
- improve the consideration of diversity in risk assessment by taking vulnerable workers into account, for example older workers;
- ensure that any materials used to communicate risks and prevention messages are readable and understandable.

Conclusions

The ‘Review of research, policy and practice on prevention of work-related musculoskeletal disorders (MSDs)’ project aimed to address the question ‘Why do we still have a problem with MSDs in the workplace?’ The review has identified a number of gaps both at policy level and in implementing policies in the workplace. These are listed below:

- shortcomings in the legislative framework, which does not cover all known risks for MSDs;
- failure to engage with the risk assessment and prevention process;
- the challenges for SMEs and their failure to engage (but it should not be assumed that failure to engage is only within SMEs);
- failure to fully appreciate the nature and extent of relevant risks because of a narrow focus on risks;
- a lack of understanding of how best to prevent MSD risks and move from a focus on job rotation and training to a focus on work design;
- the need to make cost-benefit messages more accessible;
- the need to incorporate ergonomics and the consideration of potential MSD risks into the design of work systems (workplaces, work equipment, work practices, etc.);
- the need to take a long-term view; there is a clear perception that prevention at source provides the best solution.

This project has identified a number of gaps at both policy level and workplace level, which to be filled will require a cohesive approach involving different stakeholders. The lack of good-quality data has impacts at both workplace and policy levels. The focus on risk assessment needs to change and this will require commitment from the top; sharing good practice would help all involved. There appears to be a lack of understanding of the role of ergonomics and work design in prevention. This needs to be improved and ergonomics knowledge shared with stakeholders including designers, engineers and others involved in prevention activities.

Recommendations

Recommendations from this project include the following:

- The legislative milieu (at EU level and/or national level) should be explored to better understand its shortcomings and identify effective ways of rectifying these.
- At national level, it will be important to understand why:
    - many employers (especially but not exclusively among SMEs) fail to engage with the risk prevention process;
    - the focus of many employers remains on risk assessment and the assessment of a limited number of risks.
- As a corollary, ways to broaden the scope of these risk assessments should be identified to incorporate a wider range of risks and to ensure that gender, age and other potential causes of vulnerability are taken into account.
- Further guidance should be provided to employers with respect to practicable and effective risk prevention measures, preferably industry-specific materials to enhance acceptability.
- The systematic planning and implementation of policy initiatives should be ensured, including the formal impact evaluation of any interventions.
- Risk assessment tools should be updated to include all recognised risks and researchers and practitioners should be supported to identify means of evaluating cumulative risks.
- The focus on risk assessment should be changed to a focus on risk assessment and prevention activities in workplaces; sharing good practice examples may promote this.
- The range of prevention activities should be broadened to focus on work design and ergonomics as a means of removing risks at source, taking a systems approach to prevention and job design.
- All organisations, especially SMEs, should be supported in prevention activities and incentives for this, such as free advice or funding for solutions, should be considered.
- Workers should be involved in risk assessment and prevention activities to increase the relevance of assessments and improve acceptance of any prevention activities identified.
- Usable and useful data collection tools should be designed to enable evaluations at national and organisational levels that can inform evaluations at policy level and interventions at workplace level. Organisations may need support and guidance to do this.
- Ergonomics knowledge should be kept up to date and adequate for ergonomists and others tasked with applying ergonomics knowledge in the workplace.

1. Rationale of the project

1.1 Introduction

This project, 'Review of research, policy and practice on prevention of work-related musculoskeletal disorders (MSDs)', was commissioned in 2018 by EU-OSHA as part of its multiannual research activity on the prevention of work-related musculoskeletal disorders.

This chapter provides an introduction to this project, which was carried out between 2018 and 2019. It consisted of three separate but related research components reviewing research, policy and practice. This report draws together the main findings of those studies and reflects on them in relation to additional knowledge of MSD prevention in the European Union (EU) and implications for future research.

The first element was an exploratory review that aimed to examine the reasons behind the continuing high prevalence of work-related MSDs across the EU, as well as to identify gaps in MSD prevention knowledge and activities (EU-OSHA, 2020a). The second component involved an extensive analysis of policy across selected EU countries that provided information on national policies and initiatives and was intended to gain a better understanding of the conditions under which strategies, policies and actions to address MSDs are most effective (EU-OSHA, 2020b). The third component was a field research carried out in six EU Member States. The field research had two aims: first to explore what happens in practice in the workplace using focus groups and interviews; and second to examine the roles of various strategies and policies through interviews with policy developers and policy implementers.

Within this chapter, the rationale for the project is outlined including the background to the project and its coverage. From this, the analytical approaches taken within the project are described and details provided of how each project component has been interlinked and built on to provide the basis for this final analysis report. Finally, an outline is presented of how the remainder of the report has been constructed to present an analysis of the overall findings of the project.

1.2 Why a project on MSD prevention?

Background to MSDs and their continuing high prevalence

Why another project on the prevention of MSDs? Numerous strategies, campaigns and policy initiatives over the last 30 years have aimed to prevent MSDs. However, when MSD prevalence data are examined (collected at EU level from two Labour Force Surveys (LFSs) conducted in 2007 and 2013), it can be seen that there was a general increase in prevalence across the 28 Member States of the EU (EU-28), from 54.2 % to 60.1%, between 2007 and 2013.

Table 1 presents the prevalence data from each of the EU Member States in 2007 and 2012 for work-related MSDs, with figures in red denoting an increase. It can be seen from this table that the overall increase in MSD prevalence is not consistent in all Member States, with some showing little change and others a decrease.

Table 1 Workers reporting MSDs in the EU-28, 2007 and 2012

Member State(s)	2007 (%)	2013 (%)	Difference (% points)
European Union (current composition)	54.2	60.1	+5.9
Belgium	57.5	56.7	-0.8
Bulgaria	37.3	42.8	+5.5
Czechia	44.5	69.7	+25.2
Denmark	59.0	57.9	-1.1
Germany (until 1990 former territory of the FRG)	74.9	64.5	-10.4
Estonia	54.7	66.0	+11.3
Ireland	55.2	49.2	-6.0
Greece	54.7	59.3	+4.6
Spain	62.1	62.3	+0.2
France	47.3	57.7	+10.4
Croatia	55.1	54.8	-0.3
Italy	49.7	59.2	+9.5
Cyprus	56.4	68.7	+12.3
Latvia	61.6	54.1	-7.5
Lithuania	44.0	61.4	+17.4
Luxembourg	62.2	40.4	-21.8
Hungary	61.5	44.2	-17.3
Malta	56.7	64.9	+8.2
Netherlands	56.2	:	-
Austria	66.3	66.6	+0.3
Poland	63.2	69.2	+6.0
Portugal	55.3	51.8	-3.5
Romania	39.7	42.6	+2.9
Slovenia	58.2	57.1	-1.1

Member State(s)	2007 (%)	2013 (%)	Difference (% points)
Slovakia	61.0	65.7	+4.7
Finland	67.8	70.3	+2.5
Sweden	58.7	53.1	-5.6
United Kingdom	50.5	40.5	-10.0

Source: Eurostat, Labour Force Survey ad-hoc module

The overall prevalence of work-related MSDs over this period has not decreased despite the various strategies and policies adopted for MSD prevention over many years. For example, in 2007, EU-OSHA ran the campaign 'Lighten the load', which sought to promote an integrated management approach to work-related MSDs. This campaign emphasised that employers, employees and government should work together to tackle MSDs and help to maximise the retention of workers with MSDs. The current project aims to provide information for the next EU-OSHA campaign, which will begin in 2020 (and will focus on the prevention of MSDs), by:

- improving knowledge on new and emerging risks and trends in relation to factors that contribute to work-related MSDs and to identify the related challenges;
- identifying gaps in current strategies for tackling work-related MSDs, at both policy and workplace levels;
- investigating the effectiveness and quality of workplace interventions and risk assessment approaches;
- identifying new approaches for more effective MSD prevention.

Context of the project

Definition of MSDs

Musculoskeletal disorders — or MSDs — is an umbrella term used to describe pain and discomfort in the muscles of the body, in this context focused on the back and the upper and lower limbs. For the purpose of this project, the following definition is used:

'work-related MSDs are defined as impairments of bodily structures such as muscles, joints, tendons, ligaments, nerves, bones or a localised blood circulation system that are caused or aggravated primarily by the performance of work and by the effects of the immediate environment where the work is carried out' (EU-OSHA, 2008).

International and European contexts

Different practices and policies are in place in different countries in relation to MSDs, both within the EU and in non-EU countries. Therefore, it was decided that it was important to identify what works and is helpful in managing MSDs in EU and non-EU countries and also to analyse the context in which practices and policies are implemented. Within the three separate studies of this project, international literature and international policies were drawn on to help develop the exploratory review and policy evidence. The European context was determined through the field research component and this has helped to gauge whether or not the ideas suggested for prevention would be possible in practice.

1.3 Methods

Framing the research questions

The aim of an exploratory literature review is to examine a topic, identify hypotheses and explore the findings of the research identified. Within this project, the aim of the exploratory review was to identify the reasons for the continuing high prevalence of work-related MSDs and also to consider this prevalence in relation to changes in the world of work including demographics, individual risk factors, psychosocial risks, gender differences and age (EU-OSHA, 2020a). To this extent, the literature search focused on identifying research papers that examined prevalence rates of MSDs. Many of the papers identified reported a continuing high prevalence of MSDs. From each of the papers identified for inclusion, the authors' hypotheses for this continuing high prevalence of MSDs were collated. In total, 12 hypotheses were identified. For these 12 hypotheses, further focused searching was carried out with the aim of corroborating or refuting them, based on the current level of knowledge. Data gaps for MSD prevention were also examined within the research arena.

The policy analysis

The aim of the policy analysis was to gain a more complete understanding of the occupational safety and health (OSH) challenges of tackling work-related MSDs (EU-OSHA, 2020c). The analysis was intended to provide a better understanding of the conditions under which strategies, policies and actions to address MSDs are most effective. To achieve this, a range of strategies and initiatives used by stakeholders, including regulators and regulatory agencies, social partners, professional bodies and preventive services, were identified. A total of 142 initiatives were identified by the National Focal Points (2). From these, 22 EU initiatives were selected that fitted with the inclusion criteria. An additional three initiatives, from Canada, the United States and Australia, were added to these and short reports were prepared on each of the 25 initiatives.

Based on these, and the larger data set of 142 initiatives, six EU countries were then chosen for in-depth analysis. The selection was based on the approaches being taken, such as having a more systematic approach, using a variety of policy instruments and being more active than other countries in MSD prevention. It should be noted that this selection was constrained by the limitations of the national material provided and was not intended to offer comprehensive geographical coverage. The six countries chosen were Austria, Belgium, France, Germany, Sweden and the United Kingdom.

Field research

The field research component of the project had two aims. The primary aim was to find out what was happening in practice in the six countries chosen for the in-depth policy analysis. This was achieved by conducting focus groups with intermediaries in each of the six countries. Attendees at these included labour inspectors, occupational physicians, safety practitioners and ergonomists, all of whom were involved in MSD prevention. The secondary aim was to investigate the role and effectiveness of the policy instruments that had been examined as part of the six policy reports and to identify success factors for and barriers to their implementation. This was achieved through interviews with policy developers and policy implementers.

Overarching analysis

The overarching analysis in this report is based on the findings of the reports from the three project components, which are discussed in relation to current knowledge and research. This analysis has been conducted in the context of demographic change in the workforce and new ways of working including new technologies and new contractual relationships, each of which is likely to have an impact on MSD

[2] Nominated by each government as EU-OSHA's official representative in that country, the focal points are typically the competent national authority for safety and health at work and are primary contributors to the implementation of EU-OSHA's work programmes.

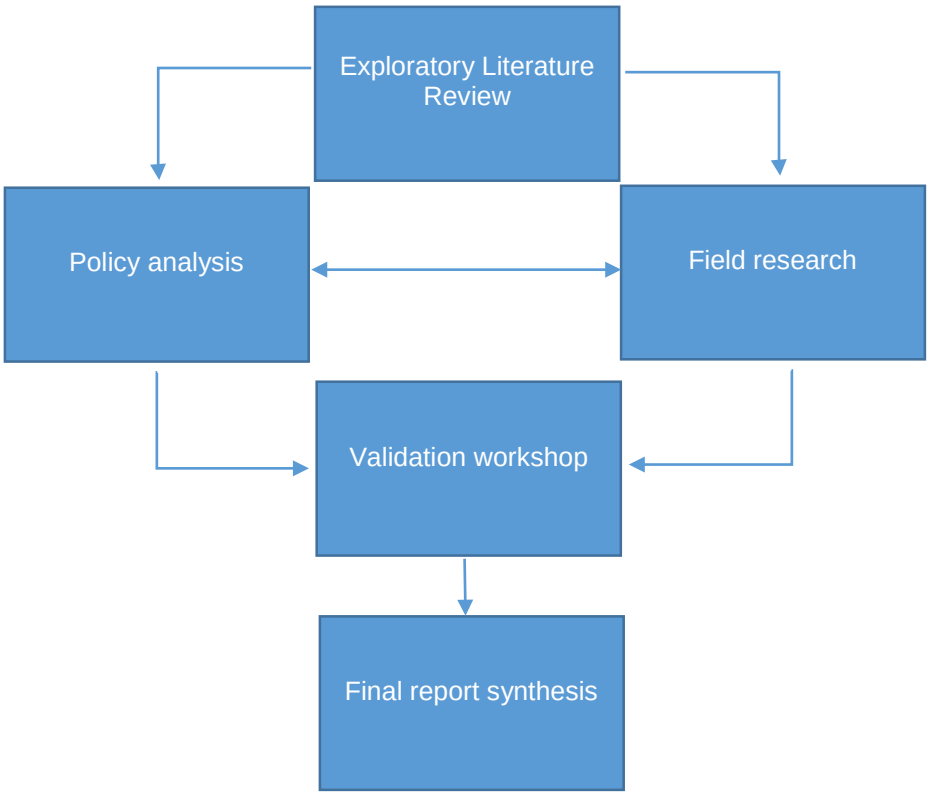
prevalence. Furthermore, the legislation and policy environment has also been considered in relation to policy endeavours in each of the six countries.

A validation workshop for the project was held, where summary results from the different parts (research, policy and practice) of the project were shared and discussed with a group of experts in MSD prevention. This allowed the project findings to be discussed, and the outputs of these discussions have informed the further material presented in the discussion section of this report.

1.4 Structure of the report

Figure 1 presents the different parts of the project and shows how each part is linked to or fed into the next. First, the exploratory literature review fed into the methods used for the policy analysis and field research. The first section of the report discusses the findings of the exploratory review in the context of the field research. The policy analysis involved desk research and interviews with policy-makers and policy implementers. The fieldwork was carried out through focus groups in each of the six countries. Any data obtained from either of these two components (policy or field research) that were relevant to the different tasks, for example focus groups raising policy topics or interviews discussing workplace practice, were shared. Summary results were shared with a group of MSD experts in a validation workshop. This feeds into the discussion in this report.

Figure 1 Project components



Source: Authors' elaboration

2. The exploratory literature review

2.1 Findings

One of the aims of the review was to improve our understanding of why MSDs continue to be highly prevalent and of the gaps in risk assessment and prevention practices. This section discusses the findings of the review in relation to research findings and other data sources including the European Survey of Enterprises on New and Emerging Risks (ESENER) and the European Working Conditions Survey (EWCS).

Risk assessment

There are known risk factors for MSDs. These include physical work (high physical demands, highly repetitive work, requirements to use high levels of force, and poor and awkward postures), psychosocial risks (high job demands, burnout, low levels of social support, low levels of job control and work-life conflict) and individual lifestyle factors that impact on the likelihood of developing MSDs (low levels of physical activity, high body mass index (BMI) and smoking). Few of these factors are actually evaluated as part of the risk assessment process. Rather, there is a focus on a limited range of poorly characterised risk factors that have been identified using tools that themselves have rarely been fully evaluated (Wells, 2009). This was corroborated by MacDonald & Oakman (2015), who highlighted that the conventional approach is to focus on individual physical risks, rather than taking a more holistic approach to managing the combined effects of multiple hazards, including both physical and psychosocial risks.

This conventional method of risk assessment may have come about because of the focus on the aetiology of MSDs and how the damage has occurred as a means of prevention, rather than on carrying out large-scale studies that examine the wider epidemiology of MSDs across the workforce (Wells, 2009). However, the lack of good interventional research or sharing knowledge about organisations that are making positive changes does not help to inform change within the workplace.

What risks are individuals exposed to at work?

The review also highlighted that there has not been a reduction in exposure to physical risk factors across the EU in recent years. An examination of data from the EWCS shows only a minimal change over the period between 2005 and 2015 (see Table 2).

Table 2 Proportion of workers across the EU-28 exposed for a quarter of their working time or more to MSD risk factors in 2005, 2010 and 2015

Factor	2005 (%)	2010 (%)	2015 (%)
Tiring or painful positions	46	46	43
Lifting or moving people	8	9	10
Carrying or moving heavy loads	35	34	32
Repetitive hand or arm movements	62	63	61

Source: EWCS 2005-2015 - Eurofound, 2017

Data collected as part of ESENER-2 and ESENER-3 show that there was no reduction in the percentage of organisations reporting exposures to different risk factors in the five years between 2014 and 2019 (see Table 3).

Table 3 ESENER-2 and -3 data on exposure to MSD risk factors

Risk factor	2014 (%)	2019 (%)
Lifting or moving people or heavy loads	47.0	55.8
Repetitive hand or arm movements	51.9	65.0
Tiring or painful positions (including sedentary work)	55.8	
Sedentary work		59.0
Pressure due to time constraints	42.5	44.0

Source: https://osha.europa.eu/en/european-survey-enterprises-new-and-emerging-risks-esener

While suppositions have been made about how work is changing and how the distribution of the workforce across sectors is changing, it appears that the overall exposure to MSD hazards is not reducing in any sector. MSD reporting has always been high in some traditional sectors including agriculture and construction. However, 2014 EU data show that nearly half the working population in the EU were working in wholesale and retail trade, transport, accommodation and food services, and public administration, defence, education, human health and social work activities. Many of these sectors are known for activities that expose workers to MSD-relevant risks, for example patient handling (in health care) and working in awkward and static postures, and exposures to vibration and cold (in retail).

Demographic change

There have been a number of demographic changes in the EU labour market including an extension of the working life, which has increased the number of older workers (over 50 years), and more women in the workplace. Older workers, women workers and young workers are all defined as vulnerable workers. The research evidence emphasises that, as you get older, you are more at risk of an MSD, so prevention has to be implemented throughout the life course. This has become especially important, as younger workers entering the workforce are also reporting high levels of MSDs. Evidence on how best to support older workers in relation to MSD prevention remains one of the current research gaps, especially as work can exacerbate any existing MSD symptoms. Research in relation to younger workers and the prevention of MSDs still needs to be carried out, and prevention activities may need to start during school age.

Sex and gender

Eurostat data used in the review indicate that men generally report more MSD symptoms than women overall, with men being more likely to report back injuries and women being more likely to report neck, shoulder, arm or hand injuries. However, these data are taken from the European LFS, which is a self-reported survey by design, and so are perhaps not as reliable in terms of MSD descriptions as data that are based on medical diagnoses. Other research sources suggest that being a woman increases the risk of having an MSD (Andorsen et al., 2014; Collins & O'Sullivan, 2010). It is still unclear whether or not this is down to sex differences, such as different physiological responses to the same exposures. For example, when examining posture-related risks, women report the same exposures as men (Eurofound, 2017) but higher levels of MSDs. Gender has an impact on vertical and horizontal segregation in the workplace. For example, more women are employed in health and social care; therefore, they are more likely to be exposed to patient handling. With regard to vertical segregation, more women are employed in lower paid job roles that are associated with a higher exposure to MSD risks (EU-OSHA, 2016b). Assumptions are still made about the roles that men and women perform at work, including assumptions that men do the 'heavy work' even though research studies indicate that women are under a higher postural load, for example while crouching in cleaning roles, and a higher muscular load, such as when painting (EU-OSHA, 2016b). This emphasises the importance of risk

assessing actual work tasks rather than job titles, as work tasks can vary within the same job title, depending on who is carrying out the actual tasks. Assumptions should not be made about who is exposed to the greatest risks without proper risk assessment of work tasks.

New ways of working

Work and the ways in which people work are constantly evolving because of changes in technology, influencing production, or changes in the way that individuals are contracted to work. Starting with the former, digitalisation has had an impact on the way the majority of individuals work, whether that is by enabling people to stay in contact with the workplace for longer hours or by providing the opportunity to work more flexibly from a variety of locations. Work practices are affected not only by the equipment to which individuals now have access (including computers, laptops, tablets and smartphones), but also by the length of time that the equipment is used. As an example, research studies have shown that neck flexion and neck and shoulder pain have increased among those using smartphones (Eitivipart et al., 2018 Gustafsson et al., 2017). However, few long-term studies have been carried out examining the impact of using new information and communications technology (ICT) equipment such as smartphones and tablets despite the high number of businesses deploying such technology (estimated to be 69 % across the EU) (3). There appears to be a lack of evidence-based advice given to individuals using such technology, and research still has to catch up to fully understand the potential health impacts.

Different contracts and employer-worker relationships are also developing in the new world of work. EU-OSHA (2017) examined online platform working, in relation to which individuals are often regarded as self-employed. There are concerns that the informal basis of this work is resulting in a loss of OSH protection for these workers, as is also seen in groups of temporary or agency workers. Online platform working for those working through mobile applications, such as delivery workers or drivers, also distances workers from their employer, so consideration is needed of how this distancing can be managed to ensure OSH protection.

The growth in e-retail is continuing and, as with the examples above, this is having the impact of introducing new working tasks including stock picking in warehouses and delivery driving under time pressure (EU-OSHA, 2018a). While automation has increased in some of the larger organisations fulfilling these tasks, this has not always been introduced with the human in mind and agency workers are often used, again resulting in changes to contractual arrangements and the potential for a loss of OSH protection. Moreover, timing the picking of products creates additional physical and psychosocial stresses for the worker, and using ‘pay per drop’ delivery drivers gives rise to concerns as this job is being increasingly monitored by employers because of their delivery agreements with customers; again, this is a source of fatigue, musculoskeletal discomfort and stress.

Work processes are also constantly evolving including the implementation of lean manufacturing (producing products by taking a just-in-time approach to their components), which, without good ergonomics, is likely to increase the risk of MSDs. A similar approach appears to be being taken where automation and robots are being introduced into the workplace and the focus is on the technology and not on how the human interacts with the technology (EU-OSHA, 2015). The healthcare environment has seen a shift from patient handling towards ‘no-lifting’ policies, where patients are either moved using lifting aids or sliding; this has resulted in more problems in the shoulder and neck being reported (Davis & Kotowski, 2015).

Sedentary work continues to increase and it is estimated that an office worker can spend 80,000 hours of their working life sitting (EU-OSHA, 2016a). While the health impacts of sedentary working are now better understood, including in relation to MSDs and other non-communicable diseases, there is still limited advice available on how to reduce sitting time. From an ergonomics perspective, this is not helped by the fact that, traditionally, ergonomics advice has been to set maximal standards for physical work tasks rather than to design work so that it allows movement. As Straker & Mathiassen (2009) pointed out, there is a need for a paradigm shift to increase movement within the workplace. While the US National Institute for Occupational Safety and Health (NIOSH, 2017) has produced guidance on the

[3] Digital economy & society in the EU 2017 https://ec.europa.eu/eurostat/cache/infographs/ict/bloc-1a.html

health impacts of sedentary work, there is a need to focus on how the ergonomics community can design work that enables movement.

What does the individual bring to work and can workplace health promotion help?

Some individual health behaviours have also been associated with increased reporting of MSDs. These include having a high BMI, a lack of physical activity and smoking. While these are individual-level factors, the workplace can have an influence on them through workplace health promotion. However, only one study was identified in which MSDs were examined as an outcome. This study, by Fahgri & Momeni (2014), found that a workplace-based weight management programme did result in reduced reporting of MSDs. There are still only very few examples of this type of programme, which specifically have MSDs as an outcome measure.

Interventional research and good practice examples

The largest gaps in MSD prevention knowledge and practice are the lack of good-quality interventional research and the lack of sharing good practice. Furthermore, Yazdani & Wells (2018) have identified the lack of evaluation of prevention programmes as another barrier. This lack of evidence does not help companies to appreciate the need to recognise risk or implement change.

2.2 Gaps — evidence versus practice

While the exploratory review provided a view of what existing research can tell us about MSD prevention, the field research allowed us to evaluate what is happening in practice in the workplace. It should be noted again that this was evaluated in only the six countries selected, and not across all EU Member States, although this selection did enable the exploration of a variety of approaches.

Risk assessment

One of the main issues in the context of MSD risk assessments is that such assessments are not completed by all organisations, with a 50 % completion rate estimated from the fieldwork. When examining ESENER-3 data (EU-OSHA 2019), it was found that 77 % of establishments interviewed carried out regular risk assessments; however, data on how many establishments are carrying out risk assessments for MSD hazards are not currently available. The 2014 ESENER data (ESENER-2) show that 77.2 % of those surveyed reported carrying out risk assessments and 75.7 % of establishments reported carrying out risk assessments for working postures, physical working demands and repetitive movements (EU-OSHA, 2016c).

ESENER-3 also examined the reasons why establishments (23 % of those surveyed) did not complete risk assessments. Responses included the following: the hazards and risks were already known (83 %), there were no major problems (80 %), there was a lack of necessary expertise (30 %) and the procedure was too burdensome (20 %) (EU-OSHA, 2019). What is not clear from these data is whether there were fewer hazards to assess in the enterprises that did not carry out risk assessments or whether there was a lack of knowledge of what to assess and how to assess it. Conversely, the main reasons for carrying out risk assessments were to fulfil legal obligations (88 %), to meet the expectations of employees and their representatives (80 %) and to avoid fines from the labour inspectorate (80 %) (EU-OSHA, 2019).

While it was perceived that large organisations are more likely to carry out risk assessments, the field data suggest that even large organisations are not always compliant. EU-OSHA (2018b), in their study of OSH in micro and small-sized enterprises (MSEs), found that the rate of completion of written risk assessments and OSH policy documents was generally low in MSEs and, where written risk assessments existed, they were produced in response to a legislative requirement rather than as an OSH management tool. It was perceived in the MSE project that smaller firms had fewer resources at their disposal (including expertise, managerial support and financial support for OSH) than larger firms and were thus more vulnerable in relation to OSH. However, relatively high-risk sectors, including construction and transport, were found to have more formalised and systematic approaches to OSH.

As well as considering whether or not risk assessments are carried out, it is also important to determine what risks are being assessed as part of these assessments. The fieldwork data corroborated previous evidence to suggest that, generally, only risks identified within EU directives are assessed and other known risks (including poor and awkward postures, repetitive tasks or psychosocial risks) are not included in the MSD risk assessment process. However, some evidence of good practice was found during the field research, including the extension of risk assessments in Sweden to include additional risk factors such as repetitive work and poor postures. It is clear that, generally, the focus, in relation to the risk factors assessed, is on compliance rather than on extending the breadth of risk assessments to include other acknowledged risk factors. It is not clear whether the driver for this is related to the transposition of prescriptive factors in the EU directives into national legislation or whether there is an unwillingness among Member States to go beyond the requirements of the directives in national legislation

The inadequacy of risk assessments was also discussed during the fieldwork and a number of issues were raised. These included the fact that risk assessments are seen as an afterthought when something has gone wrong, rather than being used at the design stage of any work process or work task. While being simple to use is important, risk assessments should cover the multiple tasks that people generally carry out in a work environment, rather than be focused on only individual tasks. There is no way to evaluate the cumulative impact of exposure to different MSD risks during the working day. It is evident that there is a need to use multi-level risk assessments to evaluate work processes during the design stage and to work with production engineers to design better work systems. There is an opportunity for the research community to work with practitioners to develop more comprehensive risk assessment tools or linkages between existing tools including in relation to physical and psychosocial risks.

Tools used in practice for risk assessment were identified through the field research. While this provided a comprehensive list, the tools used are naturally designed to focus on risk assessment, which then becomes the end point of the risk management process. This is further discussed in the next section. Demonstrating the use of tools through working examples provides the opportunity to share good practice and enable the next step in the prevention process to be taken.

The fieldwork also verified that there is limited consideration of diversity in risk assessment within the countries studied. While there is some consideration of women in relation to manual handling, this is not extended to other diversity issues such as age or physical abilities. It may be that individualised risk assessments should be implemented to help risk assessors understand vulnerabilities within the workforce. However, this must be carried out without stigmatising any particular group or groups of workers or transferring risks to other groups (such as giving heavier work to younger workers). As noted above, there is a gap in knowledge about the best ways of supporting older workers to continue working, and so using an individualised assessment with additional guidance may help this assessment process.

Traditional thinking and role stereotyping were also acknowledged as problems on the basis of the field research. This arose from examples of assumptions being made during the risk assessment process as to who is most at risk and only those risks being assessed, for example the assumption that men carry out heavier lifting tasks than women. It was then discovered, after risk assessment, that women workers were doing more repetitive work and were therefore more at risk of injury. This emphasises the need to avoid making assumptions about who is at risk and ensure that all workers exposed to MSD hazards have their work tasks risk assessed. The use of gender mainstreaming helps to address these issues at policy level and cascading this to organisational level and OSH practices would be beneficial.

- **Prevention of MSDs**

A further gap identified by the research and corroborated by the field research was the inadequacies of commonly adopted prevention practices. Prevention practices identified as being undertaken included generic manual handling training, job rotation and procuring lifting aids. While the review highlighted the lack of evidence to support the effectiveness of generic manual handling training or job rotation, these are still the main means used by employers to prevent MSDs. It is not clear whether this is because evidence is not being applied or implemented in practice or because the use of these prevention methods is seen as cost-effective, having a quick impact.

If a lack of knowledge of how to prevent MSDs is an issue, this emphasises the evidence gap between research and practice. While examples of good practice, from risk assessment to prevention, were identified from the field research (in Germany and Sweden), these do not seem to be applied in all Member States. We need to understand why this gap exists between research and practice and the influences that have been applied. Is it because of the continued focus on compliance rather than enough consideration being given to the risk factors known to be associated with MSDs?

As discussed earlier in this report, there is a need to consider the design of risk assessment tools, to encourage the user to think about prevention and changes in the workplace. These solutions need to involve more than simply providing training or job rotation. There is a need to refocus prevention activities on ergonomics and work design. This highlights the need for the greater involvement of ergonomists in prevention activities. However, ergonomists should not work in isolation but should work with others, such as production engineers, OSH professionals and occupational psychologists. Taking a more holistic approach offers the opportunity to fully understand the impact of work on the human and their exposure to both physical and psychosocial risks.

A number of problem-solving approaches (for example outsourcing and self-selection) used by organisations were also highlighted by the field research. A common theme among these was that they required people to fit the job rather than vice versa. This goes against the basic tenets of ergonomics, according to which work should be designed to fit the person. In no way do outsourcing or self-selection improve prevention activities, as they either move the risk to others outside the immediate workplace or concentrate the risk on those that self-select within the workplace.

The use of lifting and handling aids in the workplace is a further prevention measure that is beset by problems. These problems include staff not having time to use the aids and there being a perception within healthcare that patients do not like aids being used. Examples were provided in the field research that show that educating patients about why the lifting and handling aids are used can help to improve acceptance and uptake. When new devices (for example lifting aids) are introduced into working environments, it is likely that learning time will be required as part of the adoption process, so this should be acknowledged and factored in by those involved in management. There is still a need to address the reasons for workers not using safe systems of work, that is, determining whether it is due to time pressure or to other factors in the workplace.

On the topic of worker involvement in risk assessment and prevention activities, while this was seen as positive within the field research, it was not always reported to happen in practice. ESENER-3 data show that 80 % of establishments reported involving employees in the design and implementation of any OSH measures (EU-OSHA, 2019). It should be noted that these data relate to all OSH measures and are not restricted to MSD prevention measures. Within ergonomics, the use of a participatory approach has been recognised as an important way of identifying exposure to hazards and finding out how work is actually done rather than how it is described. Taking the participatory approach enables ergonomists to engage with the worker to help identify problems and understand how the work is carried out. This is not just to identify hazards, but also to discuss potential solutions with the workforce. Gaining buy-in to new ways of working can help to facilitate change.

Data

In relation to MSDs, the focus groups did agree that there is a lack of data at workplace and national levels that are useful in relation to identifying and preventing MSDs. While focus group participants acknowledged that data are collected at organisational level to measure sickness absence or numbers of injuries, the data collection tools used were reported not to be designed to focus on MSDs. In relation to MSDs, information is needed on both the impacts of injury and the impacts of cumulative exposures. During the fieldwork, a number of barriers to using data were also identified, as data are often held in silos, such as human resources or safety departments, and are unlikely to be shared because of confidentiality concerns. Therefore, it is important to consider how data that are useful in MSD prevention can be designed and collected. It is clear that traditional routes are not effective, so extending the OSH data system by using a tool such as the Nordic Musculoskeletal Questionnaire to include data on pain and discomfort felt by workers, which could be a potential precursor to physical damage, may be helpful.

Evaluation of impact

The evaluation of the impact of prevention activities is also an area that both the fieldwork evidence and the exploratory review found to be lacking, unless the intervention was part of a research project. There have to be questions asked about why prevention activities are not evaluated, and whether this is because those implementing change are not aware of the need for evaluations or because many organisations do not allow time for evaluations. For example, when external consultants are brought in, time may not be allocated for them to return to assess the results of any changes implemented.

The body of research on evaluation of impact is constantly growing, and different tools are available for specialists and non-specialists to use. The field research did highlight innovative approaches within two of the countries (Germany and the United Kingdom). These approaches included built-in evaluations of proposed actions for MSD prevention. An important feature of these planned evaluations is that they were built into the design of the project and were therefore based on pre-implementation data and information, rather than on only post-implementation data.

Stakeholders

Several stakeholders in the risk management process were identified from the fieldwork research including employers, owner-managers, occupational physicians, safety engineers, occupational psychologists, ergonomists and labour inspectors. Labour inspectors are an essential part of compliance assessment and in most countries also provide advice (although this is sometimes subject to a charge to the employer). However, concerns were raised regarding the recent reduction in the numbers of labour inspectors, making the likelihood of a compliance assessment lower, with correspondingly less time available for providing advice. A report on the ESENER-3 findings confirms this reduction in labour inspections, with 41 % of establishments reporting that, in the preceding 3 years, they had received a visit compared with 49 % reporting a visit in the 2014 survey (EU-OSHA, 2019); however, it should be noted that the ESENER data are based on general OSH data rather than data focused on MSDs. The reduction in the numbers of labour inspectors or the number of inspection activities does not help to support risk assessment and prevention activities.

As a result of the variety of OSH systems in place, different stakeholders have different roles in MSD risk assessment and prevention activities. For example, occupational physicians lead activities in some countries, while internal OSH advisors manage assessments by external consultants in others. What is clear is that each of the stakeholders involved must have some basic understanding of ergonomics to be able to both assess risks comprehensively and develop prevention activities to reduce MSD prevalence.

Providers of help and support

Many providers of help and support were identified across the range of interventions, including government agencies (including inspectorates), insurance providers and occupational health providers. The availability of support locally was identified as a key benefit. In several instances, the local nature of support, from whatever source, was acknowledged as a strength of the campaign being investigated (as well as the expertise and experience of those providers). However, national projects can make considerable demands on available resources, and the training of providers to ensure that they are able to provide appropriate support and guidance was seen as essential. A number of interventions included relevant training to ensure a sufficient standard of awareness among providers. For example, in Sweden, gender awareness training of inspectors was included as part of an ongoing (and extended) series of strategic projects on this issue. In some instances, in other countries, comments were made that the standard of advice and guidance provided could be uneven, where appropriate training had not been undertaken.

Some countries, including France and Belgium, have recognised the benefits of using multi-skilled teams in supporting MSD prevention initiatives. This has enabled the development of strategic networks that can provide the necessary expertise to employers. Again, such an approach will require funding and, in the examples mentioned, compensation and prevention insurance systems have been integrated to provide that funding.

Workplace health promotion

While the exploratory review identified lifestyle factors that were associated with MSD occurrences (for example obesity, smoking and low levels of physical activity), the role of workplace health promotion in the context of MSDs is still being discussed. This includes discussion about whether or not the employer is responsible for an individual's health. There are pockets of good practice being implemented, where workplace health promotion has been implemented with successful outcomes in terms of increasing physical activity or weight loss. However, this may not have immediate effects on MSD occurrence, especially if other risks are not prevented and workers continue to be exposed to these risks.

New ways of working

While the exploratory review examined new ways of working, discussions on this were also held as part of the field research. From these discussions, two issues emerged.

First, there have been changes in contractual arrangements so that workers are now being considered self-employed, rather than employed by a parent company. While it is recognised that temporary and agency workers are more at risk of injury, the same could be said for those employed as 'gig' workers or online platform workers. These people become invisible and can lose access to OSH protection and relevant training. Their status needs to be evaluated to ensure that responsibility for OSH is maintained in some form to ensure that they are protected.

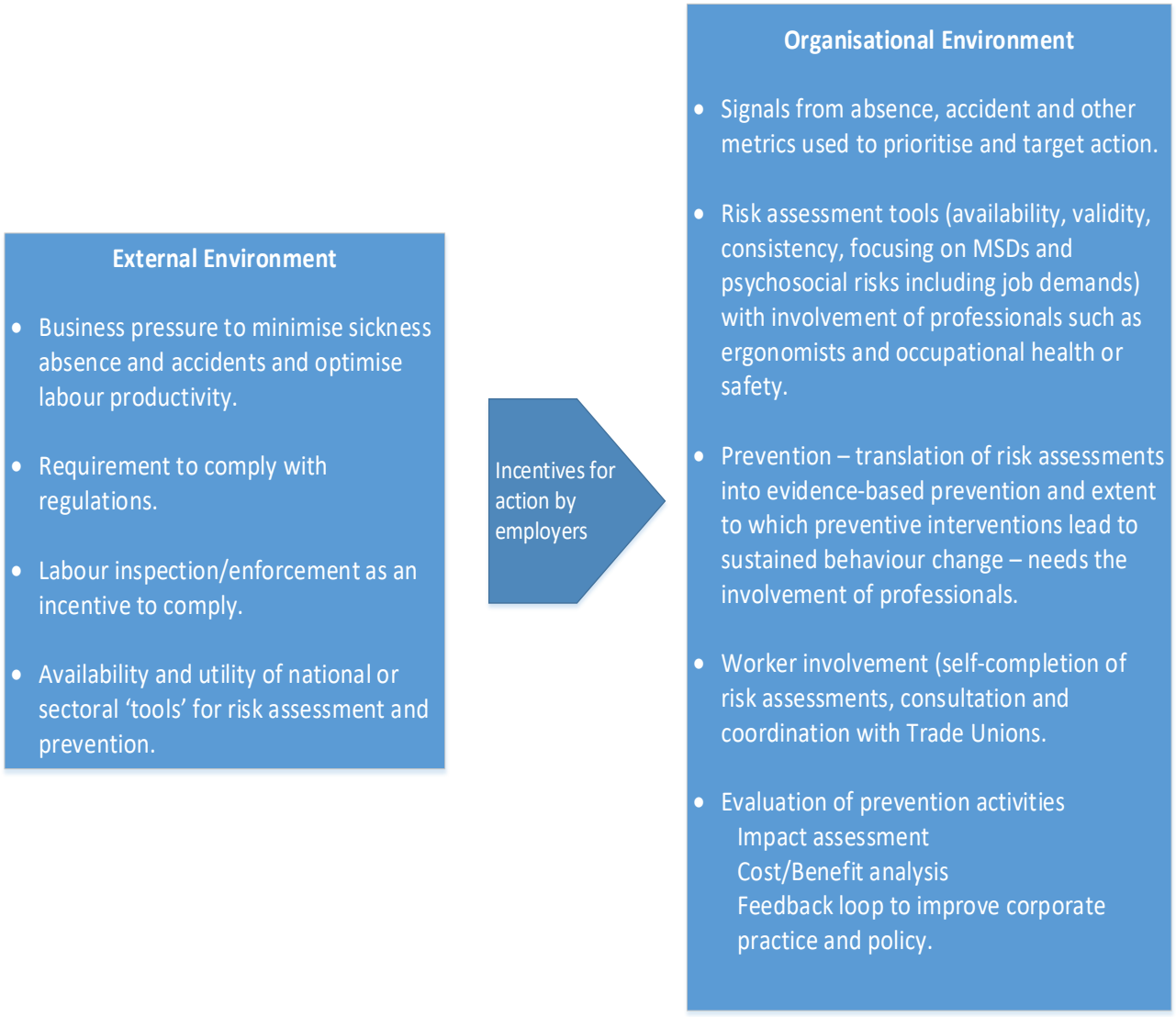
Second, new processes or new technologies are being introduced into the workplace. The focus is often on the process rather than the human in the process. There is a need for research to catch up and keep pace with practice, especially in relation to the safe use of autonomous robots and to understanding the health impacts that exoskeletons may have on the musculoskeletal system. National implementation of the Work Equipment Directive ([4]) may be of help in ensuring that equipment is usable and fit for purpose.

The MSD landscape

The results from the exploratory review and the field research have helped to identify what is needed in an ideal situation within the MSD landscape. This is described in Figure 2. This helps highlight where the gaps are in the current landscape. The following chapter of this report discusses the external environment and what the policy-level implications are for MSD prevention.

[4] Council Directive of 30 November 1989 concerning the minimum safety and health requirements for the workplace (89/654/EEC) (the Workplace Directive).

Figure 2 The MSD landscape



Source: Authors' elaboration

3. The policy analysis

3.1 Possible absence of EU and national prioritisation

Successful intervention policies and strategies need to come from the top, with effective actions and support from government down. At an EU level, the European Pillar of Social Rights includes provisions addressing OSH: 'Workers have the right to a high level of protection of their health and safety at work' (10a). This demonstrates a high-level political commitment to this issue. However, workplace safety and health have to compete with many other issues (some of which might be seen as conflicting), meaning that it perhaps does not always attain the necessary level of political priority. Given the financial and social drain on resources generated by MSDs, attention to their prevention arguably needs to be moved higher up the EU's political agenda and assigned greater priority.

Nationally, although all Member States have demonstrated a political commitment to addressing MSDs through the implementation of national legislation equivalent to the relevant EU directives, it appears that tackling MSDs has not necessarily been made a high priority at national level. An appraisal of the over 140 initiatives listed by the national FOPs identified marked variation in the extent of policy initiatives undertaken. FOPs from 6 of the 28 participating Member States had no specific policy-level MSD prevention activities to report and three others reported only legislation, a policy document or a strategy document. A further Member State reported only guidance material relating to the two main EU directives, with no specific strategic actions planned to reinforce this. In other cases, where a number of initiatives were listed, there was little to indicate any coordination or continuity between actions, reducing the likelihood of their long-term impact. Thus, it appeared that more than a third of Member States had not considered MSDs a sufficiently high priority for meaningful preventive action at a national level.

Of the remainder, several demonstrated a rather narrow approach (for example relying solely on inspections by labour inspectors); displayed little indication of translating legislation and policies into concrete action; or appeared to have a somewhat narrow focus on a limited number of sectors. Overall, although not always easy to judge on the limited information available, perhaps only half of the initiatives seemed to demonstrate a reasonably comprehensive strategic approach to the prevention of MSDs.

3.2 Shortcomings of the EU legislative framework (and national legislative frameworks)

All Member States have incorporated the provisions of the relevant EU OSH directives into their national legislation and policies. However, as reported in an evaluation of the impact of those directives (DG Employment, 2015), other than the implementation of the provisions of the directives, few Member States have included additional requirements. Where they have done so, these additional requirements usually relate to the scope or extent of application of the provisions (for example in defining those workers covered by the provisions) rather than supplementing the provisions themselves. Exceptions to this, identified during the current project, are Sweden, where additional legislation has been introduced to extend the scope of the MSD risks that have to be addressed, and Germany, where legislative provisions have been made in relation to other services of relevance. Although several countries have recently introduced legislation to address psychosocial risks (increasingly being recognised as risk factors for MSDs), such legislation is frequently treated as a separate entity, with only isolated recognition of the relationship between physical and psychosocial risks.

One theme to emerge from a number of the focus groups and interviews was the need for an effective legislative framework. Although all EU Member States had implemented the provisions of the two main OSH directives relating to MSD prevention (the Manual Handling and Display Screen Equipment (DSE)

Directives[5]), several commentators (both during the project and in other contexts) have suggested that these are inadequate, both in their coverage and, to some extent, in their approach.

With regard to their coverage, these directives are seen as inadequate in that they do not provide a legislative framework that covers all MSD risks. In relation to the approach adopted, some existing material (within the DSE Directive in particular) is widely recognised as outdated. Findings from this study reinforce those from earlier studies (such as the *ex post* evaluation of the 24 EU OSH directives and the subsequent REFIT report from the Commission[6]) suggesting a need for changes to and improvements in this legislative framework. These EU-level developments were placed 'on hold' pending the reviews/evaluations of the directives, which have now taken place. The findings from the current project should provide additional support for the argument that such debates should be re-opened.

Such debates should include a discussion of the extent to which various vulnerable groups are accommodated within the protective framework. For example, although specific protection is provided to younger workers, growing demographic change towards an older workforce means that there is a need for a debate about what, if any, additional protection might be needed for older workers.

Legislative requirements are seen as a powerful driver in many countries and such improvements are likely to support the value of this drive going forwards. It is understood from the focus groups that the Belgian legislature had been looking into developing more comprehensive legislation on MSD risks but that such action was halted when similar discussions at EU level were shelved. Although the directives provide for 'minimum requirements' and the potential therefore exists for Member States to unilaterally adopt national legislation to widen that coverage, there appears to be a reluctance to 'step out of line', with some evidence (for example from Belgium) that national legislators tend to look to the EU for a lead on this issue.

As noted above, an issue that needs to be addressed is the role of psychosocial risks in the causation of MSDs. There is growing recognition of the role of psychosocial risks in the workplace in relation to mental health and well-being, and several Member States have adopted legislation to address these risks (at least in relation to specific risks such as bullying and harassment). However, there is a tendency for such risks to become 'compartmentalised' and to be regarded (and addressed) separately from MSD risks. With the exception of Sweden, no country appears to have recognised the relationship between psychosocial risks and MSDs in their legislative provisions.

3.3 Enforcing the legislative framework

The national approaches and initiatives listed by the FOPs, and explored in more detail in some countries as part of this project, can be seen as part of an overall spectrum of action. Taking legislation as the starting point, measures to enforce that legislation (through national inspectorates) play a key role, supplemented by actions aimed at raising awareness of legal obligations and providing information and education vehicles for doing so.

One of the first challenges to address is, as suggested by a number of countries, the fact that a significant minority of employers (possibly as many as 50 % in some Member States) are failing to engage with the risk assessment process at all and are therefore not complying with existing legislative requirements (and failing to address MSD risks as part of this).

There is considerable support at national level for a strong role for national inspectorates, with inspection campaigns by national inspectorates featuring strongly among the initiatives taken, bolstered by a Senior Labour Inspectors' Committee (SLIC) campaign on MSDs during the period covered. However, this support was tempered by widespread concerns in a number of Member States that their inspecting body was inadequately resourced, reducing the value of inspections as a means of encouraging compliance. In at least one Member State, it was suggested that many employers regarded having a visit from an inspector so unlikely that is was not a risk worth contemplating.

[5] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52004DC0062
[6] http://ec.europa.eu/social/BlobServlet?docId=16875&langId=en

However, national inspectorates have often adopted approaches to mitigate the impact of dwindling resources (through an approach focused on targeting inspections — in some instances including a specific focus on MSD risks), so there is a widely held view that inspection is a potentially powerful tool that should be properly resourced.

3.4 Taking a sustained strategic approach

EU strategies

EU OSH strategies provide a sustained focus on MSD risk, providing a consistent common background for national initiatives. Strategies for 2002-2006[7] and 2007-2012[8] had an explicit focus on MSDs, establishing a coherent background for the period preceding the 10-year time frame adopted for the present project. Although MSDs are not explicitly addressed in the most recent strategy document (2014-2020)[9], this strategy does encourage a particular focus on micro businesses and SMEs, sectors of industry that have been widely recognised as presenting considerable challenges for OSH risk prevention in general.

While it is widely acknowledged that MSDs are a persistent problem and appear to have been resistant to previous interventions to reduce their incidence over many years, it must be acknowledged that national authorities face multiple demands with limited resources. However, it appears that MSDs have not been given the sustained attention or priority that they require considering their financial and social impacts. This does vary across Member States, with some taking little or no action and showing limited commitment and others adopting a sustained approach with linked initiatives over a period of years.

National strategies

As noted above, the material provided by the FOPs from some Member States suggests a lack of coherence and continuity. Earlier studies have confirmed that all Member States have adopted a general OSH strategy and several of these were alluded to in FOP returns. However, the fact that, in some instances, a general national OSH strategy was the only material cited further indicates a certain lack of commitment in these countries to adopting measures that implement the aims of these strategies.

3.5 Strategic national policies to raise awareness

While many experts and others acknowledge the value of inspection campaigns, these campaigns often have a limited focus and, because of resource limitations, fail to reach the majority of employers. Many of the Member States have developed a comprehensive strategy addressing all stages of the risk prevention cycle. This includes raising awareness of:

- the need to conduct risk assessments;
- what such assessments should include;
- approaches to risk prevention or reduction.

Although concentrating on those sectors where the risk of MSDs is highest is understandable, it should be recognised that MSDs are a significant problem across all sectors (although their impact in preventing a worker from being able to work might not be as great across all sectors). For this reason, adopting a wide focus is essential. Campaigns targeted at raising awareness generally, often accompanied by extensive advisory material on identifying and reducing MSD risks, will therefore tend to have a wider reach than those aimed at a particular sector. Somewhat paradoxically, however, experience has shown such material to be of most value if it is contextualised, that is, if risks and solutions are presented within a sectoral (or possibly sub-sectoral) framework. Although the underlying messages regarding the risks

[7] Communication from the Commission: Adapting to change in work and society: a new Community strategy on health and safety at work 2002-2006 (COM(2002) 118 final).

[8] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions — Improving quality and productivity at work: Community strategy 2007-2012 on health and safety at work (COM(2007) 62 final).

[9] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on an EU Strategic Framework on Health and Safety at Work 2014-2020 (COM(2014) 332 final).

remain the same, strategies that seek to tailor those messages to different sectors, contextualising them to different types of work, will make them more accessible and relevant to employers (and workers) in each sector. As such, they are more likely to be successful in informing, guiding and raising awareness. This is even more the case in respect of risk reduction solutions, in relation to which employers need to be convinced that any solution proposed will be effective in practice for 'their' type of work to implement it.

3.6 Support and incentives

Although raising awareness is vital, some evidence suggests that it is often not sufficient to motivate employers to take action. Evidence and expert opinions suggest that employers, especially those in SMEs, lack the necessary resources (including financial, time and knowledge) to take action. A number of strategic initiatives have recognised this problem and sought to address it in a variety of ways. This has included providing expertise in assessing risks; support in identifying solutions; and, in some cases, financial support for the implementation of those solutions. Approaches should be commended that involve working positively with employers (and, importantly, workers), helping them to develop the necessary skills and knowledge in-house rather than 'imposing' solutions. Such strategies will help to provide solutions that are both viable and acceptable to all parties as well as providing greater continuity. It is interesting to note that, despite a number of initiatives in recent years to promote the cost-effectiveness of such actions, both at EU level and nationally, a clear message that emerged during a number of focus group discussions was that employers tend to regard design solutions aimed at removing MSD risks at source too disruptive and expensive to implement, failing to recognise the longer term benefits of such actions.

Negative incentives such as penalising employers for failing to take action have been used, and remain a potential 'weapon'. They might indeed be deemed to be valuable or even necessary at times. However, they are unlikely to be conducive to the development of a positive collaborative partnership and might encourage employers to deny fault and, therefore, counter-productively, serve as a barrier to change. Evidence from return visits carried out as part of some of the inspection campaigns in some countries, where a sizable proportion of the companies visited had not taken the recommended action, suggests that, in those countries as least, such negative incentives might not have the persuasive power anticipated. On balance, it seems that working positively to change perceptions, attitudes and behaviour is more likely to have a beneficial impact in the longer term.

Collaboration between social partners and other stakeholders

Multifactorial problems such as MSDs require a consistent coordinated approach involving many different stakeholders and partners, cascading down from government to workplace. Examples of such coordinated approaches include those adopted in the United Kingdom, where consultative processes are used to involve employers, workers, industry groups, etc., in the development of new strategies and in the adoption of policies and initiatives for the implementation of those strategies.

Such collaborative working and its benefits are particularly clear in those countries with a long-standing culture of social dialogue, which helps to foster support and collaboration between stakeholders, with strategies that build on such collaboration for the benefit of everyone. For example, the systematic collaboration enshrined within the German approach provides for cooperation and communication between partners through the National Occupational Safety Conference (NAK) and the ongoing Joint German Occupational Safety and Health Strategy (GDA).

Tangible support can take many forms at many different levels, and learning and acquiring knowledge from peer groups can often be a valuable source of such support. A number of the initiatives explored involved, at least in part, the provision of collaborative support and guidance from stakeholders such as industry groups, and there are numerous examples of national groups working to share knowledge and provide support for MSD prevention initiatives. This is particularly apparent in sectors such as construction and health care where MSDs are recognised as a major concern. Such strategies complement the need (referred to earlier) to tailor messages to suit the industry. There are clear benefits of partners within an industry sharing OSH knowledge. In some countries, harnessing the OSH

knowledge and resources in larger companies to support smaller companies in the same sector provides a strong example of collaboration and cooperation.

Many actors and intermediaries can potentially play a role in identifying and preventing MSD risks. For example, in some countries, national policies and strategies provide for a strong role for insurance providers, the role of which has diversified from insuring and compensating those who sustain injuries to helping employers to reduce the risk of such injuries occurring. Such approaches seem particularly strong in those countries where the role and function (and the financial basis) of these insurers are enshrined in law.

Targeting measures

There is growing awareness across the EU of the need to consider vulnerable workers in respect of OSH risks. This has included a recognition of older workers, who have no specific protection in EU legislation unlike younger workers. Therefore, in addition to considering any need for legislative change at an EU or national level (see section 3.2), there is a need for strategic approaches to consider the specific needs of vulnerable groups of workers. Vulnerable groups include women workers. In Sweden, actions have focused on work sectors with a higher predominance of women such as health care. Migrant workers may also be more likely to work part time' -time roles and lack access to training. Ensuring vulnerable workers are addressed in any initiative is essential and it is noteworthy that Sweden has extended the thinking behind the 'Women's Work Environment' strategic approach to encompass working in sectors where such vulnerable workers predominate. By taking a targeted approach to intervention, Sweden has focused on gender, allowing materials to be tailored, the easier identification of cooperation partners and the identification of the underlying causes of the problems.

Other approaches to targeting are apparent in some of the other strategic initiatives reported on. As noted above, sector-specific interventions such as those in the construction and healthcare sectors were identified in a number of countries, as were interventions aimed specifically at SMEs.

Sector-specific measures can encompass the full range of material, for example not only tailoring guidance on risk assessment to risks commonly encountered in that sector but also ensuring that ideas and suggestions for risk prevention are seen as relevant and valid. In this case, recipients of the advice and guidance are more likely to be receptive and (therefore) more likely to take the appropriate action.

As well as focusing attention on those seen as having most need, or having particular problems, such targeting also enables guidance and other material to be tailored to the target audience enabling it to be seen as more relevant and applicable.

Commitment

One of the many challenges facing those charged with developing and applying strategic approaches to MSD prevention lies in gaining commitment from all players within the target group (or groups). Policy-level strategic actions and initiatives can help promote that commitment. As noted earlier, the lack of any significant policy-level actions in some Member States suggests a lack of commitment at national level to addressing MSDs (although it is possible that this absence reflects different national priorities). National strategic approaches can help to encourage and endorse commitment at, for example, sectoral level, as well as among individual employers. An example of this can be seen from the current UK strategy, where one approach adopted is to encourage employers to 'sign up' to commit to a particular programme or course of action aimed at enhancing workplace safety and health in general or a specific aspect of it — such as MSD prevention.

Previously identified factors have pointed to the difficulties in persuading SMEs to, for example, sign up to the risk assessment and prevention process. However, the need for (and benefits of) commitment extend to all parties. For example, the introduction of design changes intended to reduce MSD risks will need commitment from senior management to sanction the cost (with a possible short-term impact on production, etc.) while such changes are introduced. At the grass-roots level, workers must also be committed to the need for change, and to accepting the measures advocated. Again, national policy-level initiatives can help to foster such commitment.

The need for commitment throughout an organisation is exemplified by attempts to introduce patient handling devices as an alternative to the manual handling of patients. Where possible, workplaces need to be designed to accommodate the use of such devices. This requires commitment at the organisational level at least and possibly higher level commitment (especially in those Member States where such provision is centralised, such as in the NHS in the United Kingdom) to ensure that such thinking is part of the planning and design process.

Where that is not possible (for example in domestic dwellings), devices need to be designed (and then selected) to maximise their utility. Commitment to organisational changes (for example to work schedules) might also be required to accommodate the fact that using such devices might be than manual handling. As a third strand, workers also need to commit to using the devices rather than relying on the argument that patients do not like them.

Coherence and evaluation

Information on an extensive array of implementation strategies is available from the past two decades, within the EU and beyond. What is clear from some of these strategies (in some countries) is that they failed to adopt a systematic approach, showing a lack of coherence (or continuity) in the messages being shared. This suggests a lack of learning from past initiatives in relation to implementation and evaluation. It was evident from many of the policy-level interventions that planning had not been thought through, there was no intervention logic or theory of change, and evaluation had not been built in. The challenge with MSDs is that, without this planning and integration of measures, there is no way to find out if they have had any effect. Without evaluation to find out what works (and what does not work), sequential interventions are developed without the benefit of learning from what has gone before.

3.7 Approaches to prevention

It is important to raise awareness of the fact that there is more to MSD risks in an occupational context than handling heavy loads (and the suggestions of widening the scope of the legislative framework is part of this). There is growing worldwide recognition of the need to adopt a more holistic approach to MSD prevention, not just focusing on the workplace but integrating health, education and public health approaches. Evidence for this can be seen in some Member States, with a move towards integrating occupational and public health planning. In some countries, this is driven by research-thinking that recognises the multifactorial nature of MSDs including the wider role of lifestyle and behaviour outside the work environment. In some instances, strategies have been adopted that have included promoting MSD messages to schools and colleges. Widening the reach of interventions to include aspects of public health may help with the increasing integration of MSD-related health issues and the development of a more holistic approach.

However, there does appear to be reluctance among some involved in OSH to adopt a wider approach, as demonstrated by the responses given during the validation workshop to the following question: ‘what are we trying to prevent?’. Responses included (1) preventing MSD risks in the workplace; (2) preventing workers from getting MSDs; and (3) preventing workers from not being able to work because of their MSDs. It appears that perspectives on preventing MSD risks in the workplace are relatively narrow, with the perception that any approach will only achieve a single aim.

Limited focus

Even among the different initiatives identified, the focus continues to be more on risk assessment than on prevention measures. Associated with this is the perception, identified during the *ex post* evaluation of the EU OSH directives, that an extensive series of different risk assessments is required (rather than the intended integration of risk assessments understood to be the original concept underlying the 24 OSH directives starting with the Framework Directive — Directive 89/891/EEC[10]). This belief is a formidable barrier among employers and may explain why employers do not engage with the risk assessment process at all.

[10] https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A31989L0391

There is widespread recognition (among OSH experts at least) of the importance of the established OSH prevention hierarchy for all risk assessments. In this regard, prevention of risks at source takes precedence over measures such as training in specific techniques in an attempt to mitigate risk. MSD prevention should be no different and, although this message is promoted at a strategic level, it does not seem to be reaching the workplace. Although, as enshrined in the Framework Directive, workers should receive training in safety and health risks, the same directive also requires employers to give 'collective protective measures priority over individual protective measures'.

One reason for the message failing to reach workplaces is that employers may consider workplace change to be associated with expensive redesign such as automation. Experience in a variety of industries has shown that employers often fail to consider the viability of risk reduction measures, transferring their attention directly from the lack of the feasibility of automation to measures such as job rotation or manual handling training. Thus, although 'adequate safety and health training' is a legal requirement, there is considerable evidence going back over many years (Graveling et al., 1985 that training in manual handling techniques alone is unlikely to be effective in preventing MSDs. While such measures undoubtedly have a role to play when correctly applied, they do not remove or reduce the risks at source and, even when correctly and sustainably applied, are less likely to be effective.

From a longer term perspective, incorporating ergonomics input into the design and engineering process can prevent future problems, and a consideration of potential OSH risks (not just MSD risks) in the planning and design of new plants, production facilities, etc., can reap long-term benefits.

3.8 Success factors, challenges and barriers in relation to MSD prevention

Top-level recognition, prioritisation and resourcing have been identified in this study as key factors in improving MSD prevention. However, it is difficult to prescribe a single approach for this because of differences in the OSH infrastructures and cultures of different Member States. Prioritising and resourcing are seen as vital for success in the longer term.

There are a variety of stakeholders involved in MSD prevention, not just those traditionally thought of as having a role, such as occupational physicians and ergonomists. The different stakeholders have the different skills and knowledge required to develop a multidisciplinary and holistic approach. For example, some stakeholders bring knowledge of ergonomics and task design (for example ergonomists), while some bring knowledge of design considerations (for example design engineers) and psychosocial considerations (for example occupational psychologists). There is a need for collaboration among stakeholders, and this requires a collaborative working culture in which experts can work with those in the workplace. Policy-level strategies and initiatives can help to foster such approaches, and this project has identified examples of this occurring at national, sectoral and workplace levels. Using this approach, those in the workplace can contribute by sharing their experiences of how tasks and processes work in practice. The present study has identified that such an approach is enshrined within national policies requiring employers to seek appropriate expert advice if they do not have the necessary skills in-house.

The use of incentives was also discussed as part of the policy review. This included both negative incentives and positive incentives. There is a perception that businesses may regard workplace interventions as intrusive or expensive and fail to see the long-term benefits of improving workplaces and worker health. To influence and change this perception, information and education may not be enough, especially for SMEs. Support either in-kind or financial can provide the necessary incentive for organisations to implement workplace interventions, as opposed to using negative incentives such as fines. Examples included were those from France and Italy, where financial support for technical improvements to reduce MSD risks are available.

For some policy-level interventions, there appears to have been a lack of planning. For example, it appears that in so national interventions have been introduced in a piecemeal fashion with little or no consideration of what the impact will be when the intervention is implemented in individual workplaces, no applied intervention logic and no evaluation. This piecemeal approach does not help with assessing whether or not an intervention has been effective, either in individual workplaces or overall, and therefore reduces the level of learning and limits its application for future interventions. While raising awareness

and knowledge levels is important, this in itself is unlikely to have a positive effect on MSD prevalence. Incorporating this as part of a more coherent and planned approach is essential to enable learning from previous initiatives. The provision of intervention continuity is also important, that is, they should not just stop, they should develop and adapt over time. Examples of this were identified in the United Kingdom, with the 'Helping Great Britain Work Well' strategy, and in Sweden, with the extension of the 'Women's Work Environment' initiative. These initiatives build on previous campaigns or initiatives. For example, the UK 'Helping Great Britain Work Well' strategy was developed based on lessons learned from the United Kingdom's previous campaigns, and included planning and evaluation as part of a planned and coherent process. The Swedish initiative is a development of Sweden's broader government policy of 'mainstreaming'.

The policy analysis identified that there is still a focus on risk assessment, where risk assessors react to reports of illness or injury, rather than on adopting a preventive approach. Although assessments take place in the workplace, this focus on risk assessments is often promoted by strategic actions that focus on risk assessment rather than risk prevention. The legislation does encourage a preventive pathway , and not the current focus of limiting damage when an MSD arises that forms part of the strategic approach in some Member States. The preventive approach, which is required under legislation, needs to be more rigorously promoted in strategic interventions and adopted in the workplace.

Examples from the focus groups suggested wider changes, with national strategies moving from concentrating on safety (at the expense of health) towards a greater consideration of health issues, for example aimed at understanding the long-term impacts of MSDs, which may cause disabilities in later life adding to the associated impacts and costs. Current models of the cost of ill health highlight that this can often be many times greater than the cost of a one-off accident. Good-quality data are required to carry out such analyses, but such data are currently lacking.

Inspection and enforcement were highlighted as strong weapons in MSD prevention in all six countries. However, the perception from the field research was that the numbers of inspectors are reducing, thus reducing the likelihood of inspection and organisations' perceived need to make changes. While financial constraints may have led to a reduction in the resources available for conducting inspections in all six countries, focusing inspection activity on specific high-risk sectors or via campaigns could generally offset this reduction in resources. It is not yet clear what impact focused inspections in high-risk sectors has on reducing inspection in sectors not traditionally recognised as high risk.

Ergonomics is the scientific discipline concerned with the understanding of interactions between humans and other elements of a system. MSD risk factors are sometimes described as ergonomics risk factors. It is clear that ergonomics has a central role in MSD prevention both in identifying risk factors and in developing solutions. While ergonomists are embodied in the core prevention team in some countries, in other countries this is not the case and an 'ergonomist' may not be a regulated profession. However, the focus is not on keeping ergonomics for ergonomists, but on recognising that ergonomics knowledge and awareness are essential for those involved in design and engineering. In a number of countries, support is available for labour inspectors in relation to ergonomics training. Beyond professional groups, it has also been suggested that individual workers may benefit from suitable ergonomics awareness training as part of their education on MSD risks.

Legislation was discussed in the policy interviews and by the focus groups. It was identified that some have the perception that the legislation is outdated with regard to the risk factors evaluated and the various tools now in use by those working with computers. While some countries appear to operate within the general provision for risk assessment, others see the lack of prescription as a barrier. However, there is nothing to stop countries extending their national legislation, as demonstrated by Sweden, to cover additional risks including repetitive work and poor posture. These discussions on legislative changes need to be made at national level. Further discussions on legislation also need to include a review of how we can protect workers that are working under more precarious contracts such as those involved in online platform work and those who are described as self-employed.

4. What new approaches might be helpful in MSD prevention?

Drawing the themes together from the short reports, the in-depth country reports and data collected through the fieldwork, a number of policy actions were identified that have the potential to help in the prevention of MSDs. These were circulated and discussed at the validation workshop.

In discussing these actions, and the underlying concerns regarding policy approaches to OSH in different countries, one general point to emerge was the possible need to differentiate between policies and actions specific to MSDs and those of wider relevance. Subject-specific issues included the perceived need for legislative change and the development of MSD-specific guidance, while broader issues encompassed concerns such as the dwindling resources for OSH (in particular national inspectorates), a need for enhanced support for SMEs and the general absence of formal impact evaluations of OSH initiatives in general. In relation to this last point, the lack of reliable data (both at EU and national levels), on which to base evaluations of interventions aimed at preventing MSDs (or any other significant occupational health problems), was recognised.

4.1 Policy actions

Top-level commitment and resourcing

The complexity and multifactorial nature of MSDs means that they cannot easily be addressed by a single actor in the national occupational health infrastructure acting in isolation. To be successful, policies need commitment from all actors starting at the top. In the case of national activities, this might involve government/political commitment; however, with industry-specific initiatives this might not be the case. German national legislation promoting the ideal of the 'Healthy worker', together with regional centres for workplace health promotion, can be seen as a good example of such top-level commitment and successful integration of actions.

Commitment is unlikely to be effective without adequate resourcing and support to ensure follow through to action. Such resourcing does not necessarily entail direct financial support, but might involve support by making information and guidance more accessible (and more appropriate) to the target group. Examples of this include activities in a number of countries, including the Netherlands, to provide a battery of assessment and intervention resources.

Another good example of top-level commitment and resourcing identified was the funding of epidemiological studies (CONSTANCES and COSET) in France. This funding demonstrates both a long-term commitment and a recognition of the need, identified earlier, for better the collection of data and statistics.

Collaboration among stakeholders

Involvement in a process helps to obtain commitment to the process. Such involvement can be effective at high levels, with stakeholders co-developing intervention strategies, or at workplace level, where risk management should be a collaborative activity. As noted above, this needs to be in an appropriate cultural environment (as with the Norwegian 3-2-1 initiative referred to in Appendix B) and challenges can arise if national approaches or cultures are relatively adversarial.

Incentivise positively

Businesses can see workplace interventions as intrusive, invasive and disruptive. Although information and education are valuable, they are at times insufficient, especially among smaller businesses that lack in-house expertise. Thus, support and guidance either in-kind or financial can provide incentives.

Examples of such incentives include the assistance frameworks provided by initiatives such as TMS Pros in France and AUVAsicher in Austria, and direct funding support for intervention measures such as that provided by the Italian economic incentive programme. Another interesting example is that of

the Sustainable Physical Work Network developed in the Netherlands, which encourages employers to share knowledge, experience and best practice.

Coherent planning and integration

Too often, interventions have been carried out without due consideration of the intervention logic or a theory of change. Policy interventions need coherent planning and timing, with an exploration of the intervention logic. For example, publicity or promotional campaigns aimed at increasing awareness of MSDs might well achieve their stated aim but, as was indicated by a number of national focus groups at the fieldwork phase, although some groups of workers possess that awareness, they tend to see such MSDs as 'part of the job' and therefore the resultant uptake of measures designed to reduce or remove MSD risks is limited.

Furthermore, as discussed in the challenges section 3.8 above, taking an integrated approach by evaluating previous initiatives and applying the learning, as well as linking initiatives, may help to develop more holistic interventions.

Adopting a wider perspective

There is a widespread tendency to compartmentalise issues, especially in relation to the complexity of MSDs. First, as noted above, some countries have indicated particular problems with employers adopting a relatively narrow view. Thus, in France there seems to be a tendency to focus on the weights of loads (to the exclusion of other issues) because this is seen to be the focus of French legislation. Other countries, such as Belgium, have indicated that there is a tendency to address risks associated with manual handling (which are covered by specific prescriptive legislation), but to neglect other sources of MSD risks. It was further suggested that wider, more detailed legislative provisions (such as those discussed and then shelved in Belgium) would help to offset this by presenting employers with a wider perspective. Widening the perspective still further, it was noted that, with the possible exception of Sweden, legislative provisions take little account of the need to consider psychosocial as well as physical risks in respect of MSDs (although a growing number of countries do have legislative provisions that address psychosocial risks as a separate entity).

An additional factor adding to the complexity of MSD prevention is the necessity to recognise that MSD risks are not unique to the workplace and that dividing risks between work, home and leisure is artificial. MSD risks occur in all three areas and this is gradually becoming more widely recognised (for example in the Preventive Healthcare Act — Präventionsgesetz — in Germany; and the extension of MSD awareness campaigns to include not only the workplace but also schools and colleges exemplified by the 'Well-being at work in the federal truck' campaign in Belgium). The move to a broader approach where occupational and public health are considered a unified entity can be seen as a positive step, but this is not yet occurring in all Member States.

Provide continuity

Policy-level actions should not happen then just stop. They should be continually evaluated and refined and new actions developed based on learning from previous actions. The UK 'Helping Great Britain Work Well' strategy builds on the experience gained from previous campaigns and initiatives. In the same way, the Joint German Occupational Safety and Health Strategy, the GDA, is now in its third period, building on and developing from the first two periods. Both of these are examples of how to maximise intervention effectiveness and efficacy.

Promote a preventive approach

In some countries, there are well-established teams for addressing MSD risks at work (such as the regional teams implementing the TMS Pro initiative in France), but it is perceived that, in some cases, they act more often in responsive mode rather than in preventive mode, kicking in when a problem arises. MSD-related legislation encourages a preventive pathway and more effort should be made to encourage the implementation of such a pathway to prevent MSDs from occurring.

Strengthen the role of ergonomics and ergonomics teaching

The need for expertise in ergonomics has been highlighted by this analysis. Ergonomists are able to liaise with designers, engineers and others to develop solutions, and taking an ergonomic approach to risk identification and job redesign would be useful. It is important to recognise that the ergonomics discipline does not just concern itself with the physical hazards associated with the immediate workplace but adopts a 'systems' approach exploring the roles of work organisation and the wider organisational environment. It was apparent from some focus group discussions that some participants believed this not to be the case (at least in countries other than their own), although pan-European involvement in ergonomics and ergonomics standards shows that this is a misconception.

This is not to say that ergonomics should be the role solely of professional ergonomists. Experience has shown that other disciplines including design, engineering and psychology can benefit from ergonomics knowledge and awareness. As well as enabling professionals from those disciplines to apply ergonomics principles in their own work, such knowledge and awareness serve to facilitate communication between different disciplines. Some countries are understood to provide ergonomics training to their inspectors for example.

Beyond these professional groups, it has also been suggested that other groups (such as workers themselves) would benefit from suitable ergonomics awareness training and, in the United Kingdom for example, some employers are known to incorporate such training in their programmes to educate workers on MSD risks. There are indications that some countries are looking to take this concept further. For example, it was suggested in focus groups in Sweden that training in OSH should become compulsory for entrepreneurs establishing a new business (and that this would include relevant specific risks — which could include ergonomics risks — depending on the nature of the business).

4.2 Actions for intermediaries

The validation workshop also gave the research team an opportunity to discuss the findings of the project with experts in the field. The following section discusses these findings in relation to comments received during the validation workshop.

Encourage a broader perspective on risk assessments and prevention

It was widely recognised that there are shortcomings in the existing legislative framework, with a lack of prescriptive requirements beyond those applying to manual handling operations and DSE workstations. Debates continue at EU and national levels about the need for further legislation. However, it must be recognised that there is a generic legal requirement to assess risks within the Framework Directive (and within the national legislation implementing its provisions) that can be considered to cover these.

This directive therefore provides a legislative basis for expert intermediaries to adopt a broader perspective (and to encourage employers and others to do the same) in assessing possible MSD risks. These should be extended to cover not just physical risks associated with workplace tasks involving repetitive actions or working in awkward postures, but also psychosocial risks.

Other key features include assessing what actually happens in the workplace, not what the employer thinks happens or what should happen according to standard operating procedures. This approach is enshrined within a technical report, EN 16710-1 'Feedback method — A method to understand how end users perform their work with machines', that was referred to during some of the focus groups.

Action: practitioners should extend risk assessment activities to link physical and psychosocial risks to examine the workplace systematically

A number of gaps were also identified in relation to prevention practices, with the feeling that there was a lack of evaluation after a change had been made. This meant that there were no assessments of whether risks had been reduced or behaviour had changed. Even when carrying out risk assessments and prevention measures, there is a continued need to complete the circle of prevention and evaluate the impact of any change, and ensure that new risks have not been created. It was noted that this does not always happen when external OSH advisors are used, as their time within an organisation is limited.

Good examples of extending the risk assessment process are provided by the APHIRM project in Australia, where a comprehensive risk assessment tool has been developed that assesses both physical and psychosocial risks, but also guides the user to prevention activities and how to prioritise workplace change (MacDonald & Oakman, 2015). Prioritisation is based on the level of risk and acceptability of change to the business. The need to make change was an output of the tool.

Box 1 describes the framework developed in Australia as part of the APHIRM project.

Box 1 A risk management framework that encompasses physical and psychosocial risks

Regulator

- Develop web-based tools that integrate MSD and mental health disorder risk assessments
- Promote educational programmes to highlight the impact of psychosocial hazards on workers' physical and mental health
- Develop and disseminate best practice case studies
- Promote consultation and participation in risk assessments

Organisations

- Ensure managers receive evidence-based training in how their actions can influence MSDs and mental health issues
- Reduce organisational silos by having risk management managed across OSH, HR and the workforce
- Ensure at-risk employees take part in the risk assessment process
- Develop open communication between senior management and the workforce

Researchers

- Ensure the language used in materials fits a range of literacy levels
- Develop simpler cost-benefit analysis approaches
- Implement and evaluate the risk management toolkit
- Ensure tools are readily available for the workforce

(Source: MacDonald & Oakman, 2015)

As noted above, the work of the APHIRM project covered aspects of risk prevention as well as risk assessment. In terms of prevention activities, the policy and field research identified a tendency among many employers to focus on measures such as providing generic manual handling training and introducing job rotation. There were widespread concerns that, with the exception of where experts were engaged in the risk prevention process, there was little focus on work design. This was corroborated by the validation workshop, with participants widely recognising that 'designing out' risks was preferred over measures such as job rotation or manual handling training.

Although a number of studies and publications have used a cost-benefit analysis approach to demonstrate the value of workplace design to prevent risks, this message appears to be failing to reach many employers, who appear to regard such approaches as disruptive (to production) and expensive. There appears to be a lack of knowledge of what workplace measures can be taken to reduce exposure to MSD hazards.

Thus, as well as a gap between current research knowledge and practice in relation to MSD risk assessment, there appears to be a similar gap in respect of MSD prevention measures. While sharing good practice examples may help to close this gap, workshop participants highlighted that, although

there are specific exceptions (where knowledge is shared within industrial sectors for example), this is not currently widely happening.

Action: policy-makers, researchers and practitioners should take an evidence-based approach to prevention and actively share good practice

Encourage the collection and use of data to promote an evidence-based approach to risk assessment and prevention

The use of data has been discussed at both policy level and intermediary level within the project. At policy level, it was acknowledged that there is a lack of national (and EU) prioritisation for MSD prevention. There is a feeling that this may be a result of the poor quality of the data available to help make arguments for policy action on MSDs. This shortcoming was reflected in the *ex post* evaluations of the Manual Handling and DSE Directives, in which it was not possible to say whether they were effective because of deficiencies in the data available.

At organisational level, there remains a gap in data collection. Two approaches were promoted to address this. The first is to seek ways of making data currently collected (such as sickness absence data or injury data) available to those engaged in identifying and preventing risks. This would enable them to make better-informed decisions (for example by enabling the development of a business case to justify any proposed changes).

However, because this may not inform the whole picture of MSD prevalence (as it identifies only those made ill or injured as a result), there also needs to be a method for identifying problems such as pain and discomfort within the workplace to provide earlier indications of potential MSDs. This could be achieved by using a tool such as the Nordic Musculoskeletal Questionnaire or another body mapping tool that enables an assessor, who does not need to be an expert, to identify those people likely to experience problems and work tasks associated with problems, and then develop solutions.

Other sources of data are available at organisational level including performance measures, engagement measures and cost-benefit analyses. While these have not been traditionally used in prevention, they have the potential to be useful tools in implementing and evaluating change.

Action: provide guidance for organisations on the collection and analysis of relevant data as part of an OSH system for prioritising actions and assessing their effect

Promote and encourage active worker participation in the risk assessment and prevention process

Although worker consultation is enshrined in legislation, it was recognised that the extent to which this occurs in a genuinely participative process was limited, and varied between countries. Active worker participation both in risk assessment and in the identification and introduction of preventive measures was seen as positive within the field research. Participatory ergonomics (involving workers) is a recognised method within the ergonomics community, although it is not clear how generally this is used. The participatory approach also helps to ensure that work is assessed as it is carried out in practice (as discussed above), and involving workers in assessment and solutions may also increase the acceptance and adoption of preventive measures.

The workshop participants also mentioned the concept of ‘job crafting’, in which workers take opportunities to customise their jobs. While problem-solving activities such as self-selection and worker selection were identified within the fieldwork, it was indicated that such measures did not remove exposure to any MSD hazards. There may be opportunities to link job crafting and prevention activities while ensuring that the changes suggested are still compliant with OSH legislation.

Action: increase worker participation in risk assessments and prevention activities

Give more consideration to the needs of vulnerable groups, especially older workers

Demographic change in the working population was evaluated as part of the field research and validation workshop. While it was agreed that older workers are more at risk of MSDs, it was also highlighted that younger workers often start work with pre-existing musculoskeletal problems. Concerns were also raised that the approach adopted by some employers, to give younger workers the most demanding jobs to 'protect' the older workers, exacerbated the problem.

Although individual workers who might be more at risk are required to be taken into account according to the legislative framework, it was widely felt that this does not happen in practice and that most risk assessments do not take individual differences into consideration. While it was accepted that some worker groups are more vulnerable than others, the means to take differences into account within risk assessment and prevention was not always considered obvious. There needs to be further discussion about risk assessment and prevention activities for vulnerable groups and whether or not the completion of individualised risk assessments without stigmatisation can become a reality.

Action: practitioners to gain better understanding of the increased risk of MSDs on vulnerable workers to enable more comprehensive risk assessment

Ensure that any materials used to communicate risks and risk prevention messages are readable and understandable

The language used in the context of MSDs was also seen as a barrier for many to understanding MSDs. The use of different acronyms such as MSK and RSI needs to be addressed to ensure a consistent recognition and understanding.

As well as this use of what might be regarded as 'MSD jargon', the increased mobility of the workforce and, in particular, the growth in numbers of migrant workers present further challenges in relation to language. There is a need for information, guidance, training and other materials to be available in a range of languages that meet local needs. Although isolated examples of this can be found (for example a factory in the United Kingdom where material was available in both English and Polish), such materials are not always generally available and the lack of such materials was highlighted as a problem during the validation workshop.

Furthermore, as well as ensuring that material is available in appropriate languages, it is important to ensure that the material reflects the educational (in particular reading) abilities of the workforce, with tools and guidance developed considering the intended end users.

Material that does not rely on language, such as the Napo film series developed by EU-OSHA, can help to overcome such barriers.

Action: policy-makers, researchers and practitioners to ensure the consistent use of readily understandable language around MSDs

5. Conclusions

The 'Review of research, policy and practice on prevention of work-related musculoskeletal disorders (MSDs)' research project can be seen as being aimed at addressing the question 'Why do we still have a problem with MSDs in the workplace?' The review conducted has identified a number of gaps both at policy level and in implementing policies in the workplace.

5.1 Shortcomings in the legislative framework

The current legislative frameworks in most Member States essentially reflect the legislation embodied in the EU OSH directives, most notably the Framework Directive and two specific directives on manual handling and DSE in workplaces. Although there are isolated exceptions (for example Sweden), few Member States have extended their legislation beyond the minimum standards required by these EU instruments. It is however widely recognised that there are deficiencies in this legislation in terms of both the extent of the MSD risks covered (for example additional physical risks such as adverse working postures, static loading, etc., as well as psychosocial risks) and, more specifically, the measures promoted being out of step with modern technologies. It appears therefore that there is a need for debate and discussion at either EU or national level (or both) to examine these deficiencies and agree on ways of addressing them.

5.2 Failure to engage with the risk assessment and prevention process

Even within the constraints of the existing legislative framework, there are indications that many employers fail to engage with the risk assessment and prevention process. It is not clear to what extent this is specific to MSDs or if it extends to other OSH risks. Clearly, rectifying any shortcomings in legislation will not address this issue and measures are needed to address this. The reasons for this non-participation are believed to be manifold and include a lack of awareness of the need to do so; and a lack of motivation, possibly due to failing to perceive activities as risky or adopting a fatalistic attitude that perceives such risks as inevitable or 'part of the job' and therefore not amenable to change. It should be noted that such perceptions also cascade down to the workforce, providing a further barrier to effective action.

5.3 The challenges for SMEs

As part of this problem, there are widespread beliefs that SMEs face particular challenges. However, although this is undoubtedly correct, it should not be assumed that failure to engage is limited to SMEs, and therefore any actions taken to improve engagement should not be limited to that group of employers.

5.4 Failure to fully appreciate the nature and extent of relevant risks

The deficiencies in the legislative framework appear to mean that employers, even those that do engage with the risk assessment and prevention process, fail to appreciate the extent of risks involved, adopting a narrow focus that reflects these deficiencies. As a result, not all risks are being assessed.

As a further challenge, although many risks are recognised at a generic level, they are not necessarily fully understood. Deficiencies in research knowledge mean, for example, that although 'repetitive work' is seen as inherently risky it is difficult to identify with any precision when the repetition of an action becomes too repetitive. Even among OSH professionals (accustomed to for example working with exposure limits for a range of chemical and physical agents), this lack of specificity makes the assessment process challenging in respect of risks due to poor ergonomics.

As part of addressing this lack of awareness and understanding, there is a need to promote a better understanding of the needs of vulnerable groups, whether that vulnerability is attributable to gender, age, ethnicity or another reason, to make risk assessments more inclusive.

5.5 A lack of understanding of how best to prevent MSD risks

Even once the risks associated with a task have been assessed, further challenges remain in relation to identifying the most effective preventive measures. There is a belief that those measures most likely to be most effective (for example redesigning work or the workplace) are less easy to adopt, and expert evidence suggests that employers often adopt what are seen as 'easier' solutions such as providing training in manual handling techniques. Lifting a 100-kg patient for example presents a risk of injury no matter how good the technique adopted and using a mechanical aid provides a more effective solution than manual handling. Nevertheless, patient lifting techniques are widely taught and relied upon as the primary risk prevention measure.

5.6 The need to make cost-benefit messages more accessible

Associated with the uncertainty over the most effective risk prevention measures is evidence from the project that cost-benefit messages are not getting through to employers. Suggestions that workplace design interventions are disruptive and costly were widespread, despite extensive campaigns at EU level and nationally in many Member States to counter this view. Measures such as sharing good practice and experiences over 'what works' help to counteract this problem; there were many examples, especially at sectoral level, of such approaches being taken.

5.7 The need to incorporate ergonomics and the consideration of potential MSD risks into the design of work systems (workplaces, work equipment, work practices, etc.) and take a long-term view

There is a clear perception that prevention at source provides the best solution in the long term and, as part of this, the potential benefits of increasing knowledge and awareness of ergonomics and ergonomics design principles among those engaged in the work design process are recognised. This will involve taking a systems approach to work and task design that incorporates the evaluation of both physical and psychosocial risks as an integral part of the design process. Ergonomics knowledge does not currently appear to be widely transferred to relevant groups including designers, engineers and others involved in designing or procuring new equipment or work systems. There is a need to improve ergonomics education for those that are involved in this process, to help them take a broader approach to risk prevention.

6. Recommendations

Recommendations from this project include the following:

1. The legislative milieu (at EU and/or national level(s)) should be explored to better understand its shortcomings and identify effective ways of rectifying these.
2. At national level, it will be important to understand why:

   - many employers (especially but not exclusively among SMEs) fail to engage with the risk prevention process;
   - the focus of many employers remains on risk assessment and the assessment of a limited number of risks.

3. As a corollary, ways should be identified to broaden the scope of risk assessments to incorporate a wider range of risks and ensure that gender, age and other potential causes of vulnerability are taken into account.
4. Further guidance should be provided to employers with respect to practicable and effective risk prevention measures, preferably industry-specific material to enhance their acceptability.
5. The systematic planning and implementation of policy initiatives should be ensured, including formal impact evaluations of any interventions.
6. Risk assessment tools should be updated to include all recognised risks and researchers and practitioners should work to identify means of evaluating cumulative risks.
7. The focus on risk assessment should be changed to a focus on risk assessment and prevention activities in workplaces; sharing good practice examples may promote this.
8. The range of prevention activities should be broadened to focus on work design and ergonomics as a means of removing risk at source, taking a systems approach to prevention and job design.
9. All organisations and especially SMEs should be supported with prevention activities and incentives to do this should be considered, such as free advice or funding for solutions.
10. Workers should be involved in risk assessment and prevention activities to increase the relevance of those assessments and improve acceptance of any prevention activities identified.
11. Usable and useful data collection tools should be designed that aid evaluation at national and organisational levels and that can inform evaluations at policy level and interventions at workplace level. Organisations may need support and guidance to do this.
12. Ergonomics knowledge should remain up to date and adequate for ergonomists and others tasked with applying ergonomics knowledge in the workplace.

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Appendix A Data collected from each of the focal points

Using this questionnaire, national focal points were asked, first, to provide information that expressly and principally referred to MSDs and, subsequently, to provide additional information that also (but not exclusively) referred to (or included a component related to) MSDs.

A standard template was provided for listing up to 10 relevant major policy-level initiatives in the area of work-related MSDs that had been carried out in each country. A time frame was indicated of the last 8 years (from 2010 onwards), and the focal points were asked to present not only OSH initiatives but also public health initiatives with an OSH component.

By way of guidance, the following categories of initiative were listed:

- legislation included in OSH strategy or action plans;
- programmes;
- major research projects or guidance;
- campaigns;
- targeted inspections or other initiatives by the labour inspectorate, or social partner initiatives;
- support schemes for micro and small enterprises;
- initiatives by insurance providers.

The template provided for information to be entered under a series of standardised headings:

- title of initiative;
- type of information available;
- organisation(s) involved;
  target groups/beneficiaries (i.e. specific groups of workers, employers);
- URL for further information, if available;
- brief description (i.e. bullet points of some key features);
- additional attachments — PDF reports, etc. — if available;
- comments.

Appendix B Short summary of 25 policy initiatives

Austria: HORECA (Hotel, Restaurant, Catering**).** Between August 2011 and January 2012, 112 hotels and 85 hospitality enterprises were visited by labour inspectors. The visits revealed a greater need for guidance among hospitality enterprises without accommodation. For this reason, 187 hospitality enterprises without accommodation were visited during the second control phase, between February and November 2012. Of these, 81 had already been visited during the first phase; for these, visits focused on examining whether or not deficiencies identified in the first phase had been removed. For the remaining 103 enterprises, which were visited for the first time, the inspections focused on comparing their occupational safety with those that had already been inspected.
Austria: AUVAsicher. 'AUVAsicher' is a prevention model initiated by AUVA (the Austrian Workers' Compensation Board) as a long-term assistance programme for SMEs. AUVA provides assistance to SMEs through 'AUVAsicher' prevention centres in every federal state. Safety experts visit companies and inform and advise them on safety solutions. These experts are preventive specialists in their own right, but also operate under contract with AUVAsicher to provide this service. The initiative summarised here aimed to prevent MSDs in SMEs. It was carried out in 2009-10 as part of the regular preventive services provided through AUVAsicher and included various elements such as introducing preventive concepts, workshops and presentations. There were consultations including on MSD prevention concepts. The consultations targeted those persons in SMEs involved in worker protection, for example certain employees and employers, worker representatives and safety advisors.
Belgium: When a Worker Suffers. The Belgian Federal Ministry of Labour launched this campaign on the prevention of MSDs in November 2015 with the theme of MSDs at work. The campaign was promoted through a website, brochures and outreach, and the ministry commissioned a communications company to develop the concept and the website. The website contains information divided into coloured cards. Red cards provide information on the consequences of MSDs, orange cards provide information on their causes, green cards provide information on solutions and blue cards provide information on tools. Each card presents a key message and contains hyperlinks to more information. The communications company designed the cards to be easily understood by the general public. As part of this outreach element of the project, use was made of the federal truck (a resource used by the ministry to promote different OSH themes on an annual basis). Through this truck, the campaign reached 72 groups, including 55 group of students and 17 groups of teachers. At least 1,320 people boarded the truck and at least 74 hours of awareness-raising talks were delivered.
Belgium: Intervention Typology & MSD Prevention Guidance. This research study aimed to understand the extent of MSD prevention services in companies and promote their use. The research scope also included psychosocial risks in the workplace. Based on the study results, guidelines for the prevention of MSDs at work was compiled and published.
Denmark: Job & Body Campaign. The Danish Working Environment Information Centre developed the Job & Body Campaign during the period 2011 to 2015 in cooperation with researchers from the National Research Centre for the Working Environment. The strategies used to disseminate campaign information were planned in cooperation with employers' associations and trade union organisations. The campaign used a variety of networking activities, workplace visits and a mass media campaign to increase awareness of musculoskeletal pain and work among public-sector employees in Denmark, with the ultimate aim of promoting a balance between demands at work, physical activity, the capacity of the body and overall physical well-being.
Denmark: Labour inspections. In 2011, the Danish government (Denmark's Liberal Party and the Conservative People's Party), the Social Democratic Party, the Danish People's Party and the Social Liberal Party agreed on an ambitious strategy addressing the working environment up to 2020. Companies in some specific industries have been subject to enhanced risk-based inspections.

The strategy is an integral government strategy, of which social partners have an element of co-ownership through their involvement in the preparatory discussions and the implementation of the initiatives.
Denmark: Bricklayers. Research showed that the high level of low back pain among bricklayers was due to very low or high working postures. This Danish initiative aimed to reduce the height of work from 1.5 metres to 1 metre during bricklaying by lifting the scaffold.. Reducing the height of work in this way is considered to have enabled a major reduction in work using high or low postures and likely to help prevent lower back pain and other MSDs. Policy programmes will be evaluated in 2020 in relation to changes in accident rates, sick leave, turnover, cost of health care and key indicators of OSH activities. A critical element of this project was that it was conceived, developed and introduced on the basis of an agreement between social partners, thus helping to ensure its implementation.
France: COSET. COSET (Cohortes pour la surveillance épidémiologique en lien avec le travail) is a research programme for monitoring work-related ill health. It is a major national-level research programme that monitors the health of active people in France over several years. It monitors developments in the health and careers of workers using two social security platforms. It is the first large-scale and national-level programme for monitoring people's health at work in France and aims to study the whole of the active population, regardless of sector, age or employment status. It will also continue to monitor participants' health after retirement, to measure long-term health effects. It is hoped that this research will provide better data on the factors causing or contributing to MSDs in the workplace.
France: TMS (troubles musculo-squelettiques) Pros and assistance of regional coordinators. TMS Pros is a national-level prevention programme that aims to guide businesses in creating personalised MSD prevention strategies. The programme was set up in 2014 by the professional risk department of the French social security service. It targeted 8,000 companies in total, which represented about one third of the number of businesses with an employee who had taken MSD-related leave in the 3 years prior to 2014. The first phase of the programme ran from 2014 to 2017, with a second phase planned for 2019 to 2022. The second phase will target an additional 8,000 companies with a focus on the care work sector.
Germany: Love your Back. This campaign was focused on work-related back load and it targeted both schools and workplaces. It was introduced in January 2013 by the German Social Accident Insurance organisation and ran until 2015. The initiative consisted of awareness-raising activities, and providing training and information about MSDs due to physical loads, aiming to reduce back load (both at work and in schools). It also targeted other risk factors for back pain, including a lack of exercise, and psychosocial risks. The campaign sought to raise awareness and create change in workplace practices and in the behaviour of individuals in companies and schools, thereby preventing work-related back injuries.
Germany: Prevention Makes you Strong. This action plan was introduced in 2013 and ran until 2018. It was part of the work programme of the Joint German Occupational Safety and Health Strategy (Gemeinsame Deutsche Arbeitsschutzstrategie — GDA). The initiative aimed to encourage changes with regard to three large target groups: (1) entrepreneurs/enterprises and businesses/business multipliers and counsellors, with a focus on SMEs; (2) employees and insured persons; and (3) researchers and research institutes. A preliminary risk analysis identified high-risk sectors as well as the main target groups and occupational activities that were to be the focus of the initiative. The initiative had the general goals of improving the prevention culture in enterprises and businesses and increasing health literacy on the prevention of MSDs among employees and insured persons.
Germany: Legislation — the Preventive Healthcare Act of 2015 (Präventionsgesetz). In 2015, Germany passed this act to strengthen health promotion and preventive health care. It promotes a 'healthy worker' ideal, where the focus is on promoting the whole health of workers rather than simply

the prevention of illness. The act also promoted a strategy that includes recommendations and goals relating to health promotion and prevention for different target groups; these will be monitored and reported on every 4 years.
Italy: Incentive programme. This initiative consists of providing economic incentives to enterprises to put in place projects that aim to improve safety and health at work. It includes projects that specifically support the improvement of the conditions of workers with regard to the manual handling of loads, thereby reducing an important risk factor for MSDs. This is an Italian national programme and has been running since 2010. It is administered by the regions, which are involved in the procedure of selecting projects from interested enterprises and in the transfer of funds.
Netherlands: SME support. This initiative supported Dutch OSH professionals and prevention officers in companies to carry out risk assessments in their organisations. A sub-programme on physical work load formed part of a national societal research and communication programme on working conditions. Free risk assessment tools were developed under the programme to assess the risks of physical work load and help users to identify follow-up steps to determine the underlying risk factors. The aim of the initiative was to assess risks in order to prevent musculoskeletal complaints and to promote sustained healthy, productive work within organisations. It was introduced in 2007 as a result of the lack of methods to determine the risks of MSDs in the Netherlands. In 2009, the Ministry of Social Affairs and Employment asked the Netherlands Organization for Applied Scientific Research (TNO) to develop a tool for employers to use to determine the risks for MSDs and, in 2011, a complete set of assessment tools was made available to the public. These tools are easy to use and, most importantly, enable the user to perform a risk evaluation and propose risk reduction measures, as well as presenting the expected effects of these measures.
Netherlands: Sustainable Physical Work. This campaign involves bringing together organisations and companies that have an interest in tackling physically demanding work and would like to share their knowledge and experiences of their working methods and approaches. The exchange of knowledge and experiences is based on the ‘Pay it Forward’ principle. This means that organisations and companies share their knowledge and experience with colleagues free of charge and the baton is passed on to the next organisation. Since its founding in 2014, around 650 participants have been connected from various organisations and sectors. As a result of applying the pay-it-forward principle, this number is increasing.
Norway: 3-2-1 Together for a Good Working Environment. The project ‘3-2-1 Together for a Good Working Environment — 3 Parties, 2 Branches, 1 Goal’ was a collaboration between the Norwegian Labour Inspection Authority (Arbeidstilsynet), the Norwegian Labour and Welfare Organization (NAV), workers’ organisations and industry. It was initiated by the Ministry of Labour and Social Affairs in 2007 and completed in 2010. It focused on improving the working environment, reducing sick leave and increasing the retirement age in two chosen sectors: the meat and poultry industry; and nursing homes. In both sectors, MSDs account for the highest proportion of medical problems leading to early retirement and sick leave (with mental illnesses being the next largest category); thus, these issues were a particular focus for the project. The nursing home sector was of particular concern, as it typically employs women, who show higher rates of MSDs among relatively young people, as well as older workers.
Norway: Inspection project. The initiative involved comprehensive inspections among businesses employing almost 100,000 workers, to assess factors related to the prevention of MSDs. Overall, 4,194 inspections were carried between 2010 and 2012. The inspections were performed in sectors associated with a high risk of MSDs. These inspections led to several findings related to the effectiveness of the MSD prevention measures taken by employers. For example, only about 40 % of businesses had evaluated the risks of the work environment with respect to the prevention of MSDs, and companies that had taken measures often did not base these measures on risk assessment.

Spain: Health & Social Care Action. This action plan promoted the improvement of OSH conditions with the participation of social partners and regional governments, particularly in relation to the sectors, activities, groups and companies at greatest risk. It aimed to improve the working conditions of social care workers caring for dependent older people. Throughout 2009, site visits were conducted to study the working conditions in 22 care centres in the region, including public, private and social-private entities. These centres represented a variety of care approaches, including residencies and day-care centres for the elderly; centres for people living with disabilities; and centres offering care for the elderly at home. Prior to visits, interviews were held with technical experts in prevention, the delegated person for prevention in the occupational sector, and the person responsible for OSH in each care centre. Following this, 19 non-random visits were carried out in 2012 to obtain more information about the preventive measures adopted in the centres. These visits found that more than half of the centres had not assessed exposure to risks related to patient handling, that the participation of workers in risk assessments was very low, and that more than half of the centres had assessed physical risks only, omitting psychosocial risks entirely.

Spain: Saúde project (good practice guidelines for on-foot shellfish workers). Shellfish harvesting involves the extractive activity of gathering shellfish. More than 4,600 people in the Galicia Autonomous Community are employed in 'on-foot shellfish harvesting'. The project aimed to analyse the current health situation and risk factors affecting on-foot shellfish harvest workers (including risks relating to MSDs) to identify the needs of the workers and develop best practice guidelines to prevent MSDs among the population of on-foot shellfish harvesters in Galicia.

Sweden: Women's Work Environment. In 2011, the Swedish Government gave an assignment to the Swedish Work Environment Authority (SWEA) on the topic of the 'women's work environment'. The assignment encompassed developing a number of projects, which involved knowledge generation and the dissemination of that knowledge to key players to change working conditions. The intervention targeted municipalities and county councils. The assignment was carried out during the 2011 to 2014 period. In 2014, the Swedish Work Environment Authority received another assignment, to 'create and make accessible tools for risk assessment with a special focus on women's work environment'. The results after the first and second phases of project development suggest that ignorance and traditions are the greatest barriers to the change needed to ensure that men and women have the same prerequisites in working life. Another useful output was the identification of success factors in workplaces in the healthcare and social-care sectors.

Sweden: SWEA legislation on ergonomics. In 2012, SWEA (Arbeismiljö Verket) issued 'Provisions and general recommendations of the Swedish Work Environment Authority on ergonomics for the prevention of musculoskeletal disorders'. The provisions apply to every activity that may subject employees to loads or other work conditions that may have an adverse effect on the musculoskeletal system.

United Kingdom: Helping Great Britain Work Well. The strategy 'Helping Great Britain Work Well' was launched in 2016, to be in place for 5 years, until 2021. The strategy focuses on the prevention and treatment of all diseases related to work, with MSDs being a type of such diseases. The aim of the initiative is to raise awareness of the benefits of safety and health (including the prevention of MSDs). As part of this initiative, mass media platforms have been used, for instance LinkedIn groups have been established and a website dedicated to the strategy has been developed; this website had received 16,013 views. Within the strategy, the 'MSD Priority Plan' was developed and introduced. This has a series of stated 'outcomes and priorities' encompassing improvements in preventing and controlling exposure to MSDs; a shift in emphasis towards risk elimination/reduction through design; an increased regulatory profile; research and development in relation to new thinking on the risks and new, flexible ways of working; and cross-industry learning about 'what works'.

United States: NIOSH MSDs programme. In 2010, NIOSH put in place a major programme targeting the prevention of MSDs. The NIOSH Musculoskeletal Health Cross-Sector Program works with a range of partners from industry, labour and academia on an agenda that combines research and prevention to act in various sectors.
Australia: MSD risk assessment toolkit (Institute for Safety, Compensation and Recovery Research — ISCRR). The aim of this initiative was to investigate differences in MSD claim rates between different businesses by looking at workplace and employer characteristics. It was developed initially as a toolkit but a research team wanted to evaluate it further. The focus of the toolkit development was to include psychological characteristics that influence MSDs in addition to physical factors. The elderly care sector was selected because of the high prevalence of MSD claims in this sector. By applying the tools developed as part of the MSD toolkit to the different businesses, the project aimed to test the effectiveness of the tool against claims-related measures. The research offers several findings with implications for workplace practice.
Canada: Ontario MSD prevention guide. The Ontario Health and Safety Management System (OHSMS) developed an MSD Prevention Guideline and Toolbox in 2005-06, which proved to be an important resource for workplaces. In 2016, the University of Waterloo — Centre of Research Expertise for the Prevention of Musculoskeletal Disorders (CRE-MSD) undertook an evaluation, revision and testing of the original guideline and toolbox in a selection of workplaces, because MSDs were still a major cause of pain and disability among workers. The project was implemented over a 2-year period, from March 2016 to March 2018. As part of this project, best workplace practices for MSD prevention were identified, and surveys and multiple interviews were conducted to investigate workplace needs in terms of MSD prevention.

TE-RO-20-004-EN-N

The European Agency for Safety and Health at Work (EU-OSHA) contributes to making Europe a safer, healthier and more productive place to work. The Agency researches, develops, and distributes reliable, balanced, and impartial safety and health information and organises pan-European awareness raising campaigns. Set up by the European Union in 1994 and based in Bilbao, Spain, the Agency brings together representatives from the European Commission, Member State governments, employers' and workers' organisations, as well as leading experts in each of the EU Member States and beyond.

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