

Workforce diversity and musculoskeletal disorders: review of facts and figures and examples

European Risk Observatory
Report

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Table of contents

| | |
|--|-----|
| List of figures, tables and boxes | 2 |
| 1. Introduction | 5 |
| 1.1 Introducing the topic | 5 |
| 1.2 Objectives of the research project | 5 |
| 1.3 Methodological approach | 6 |
| 1.4 Structure of the report | 7 |
| 2. A conceptual framework on work-related MSDs | 8 |
| 2.1 Definition of MSDs | 8 |
| 2.2 A multidimensional model of MSDs | 8 |
| 2.3 Conclusion | 13 |
| 3. Workforce diversity and MSDs: a review of existing evidence | 14 |
| 3.1 Introduction | 14 |
| 3.2 Women workers | 14 |
| 3.3 Migrant workers | 35 |
| 3.4 LGBTI workers | 54 |
| 4. A qualitative view on the topic: results from fieldwork | 65 |
| 4.1 Introduction | 65 |
| 4.2 Women workers | 65 |
| 4.3 Migrant workers | 73 |
| 4.4 LGBTI workers | 83 |
| 5. Analysis of practices and policy initiatives | 91 |
| 5.1 Introduction | 91 |
| 5.2 Description of selected targeted policies and practices | 94 |
| 6. Conclusions and policy recommendations | 113 |
| 6.1 Main conclusions of the research | 113 |
| 6.2 Policy recommendations | 116 |
| 7. References | 120 |
| Annex A: Methodology | 129 |
| Annex B: Detailed results from regressions analysis | 144 |

List of figures, tables and boxes

| | |
|---|----|
| Table 1: Sectors and occupations with a relatively high risk of work-related MSDs | 12 |
| Table 2: Workers reporting exposure to physical risk factors at work, by gender, EU-28 (excluding Germany and the Netherlands) and Norway, 2013 (%) | 19 |
| Table 3: Workers reporting being exposed to physical risk factors at work, by country of birth, EU-28 and Norway, 2013 (%) | 43 |
| Table 4: LGBTI workers by health status, EU-28, 2020 (%) | 57 |

| | |
|---|-----|
| Table 5: Workers experiencing discrimination in the last 12 months because they are LGBTI, EU-28, 2020 (%) | 60 |
| Table 6: Main elements related to the analysed selected case studies | 92 |
| Table 7: Main objectives of the analysed selected case studies | 93 |
| Table A1: Inclusion/exclusion criteria..... | 129 |
| Table A2: Search terms | 130 |
| Table A3: International and national data sources identified | 132 |
| Table A4: List of references for policy case studies | 136 |
| Table A5: List of interviewed organisations for policy case studies..... | 138 |
| Table A6: List of interviewed organisations | 140 |
| Table A7: List of focus groups carried out | 142 |
| Table B1: Logistic regressions on the prevalence of four different aspects of mental health | 151 |
| Table B2: Logistic regressions on the prevalence of MSDs in the back..... | 153 |
| Table B3: Logistic regressions on the prevalence of MSDs in the upper limbs..... | 157 |
| Table B4: Logistic regressions on the prevalence of MSDs in the lower limbs | 161 |
| Table B5: Logistic regressions on having a (very) good general health | 168 |
| Figure 1: Theoretical framework of work-related MSDs | 9 |
| Figure 2: Workers' perceived general health, by gender, EU-28 (excluding Germany) and Iceland, 2014 (%) | 15 |
| Figure 3: Workers suffering from limitations in activities due to health problems, by intensity of limitation and gender, EU-28, Switzerland, Iceland and Norway, 2017 (%)..... | 16 |
| Figure 4: Workers absent (for one or more days) from work in the past 12 months because of health problems, by gender, EU-28 (excluding Germany) and Iceland, 2014 (%)..... | 16 |
| Figure 5: Workers reporting different musculoskeletal disorders in the past 12 months, by gender, EU-28, 2015 (%) | 17 |
| Figure 6: Workers reporting exposure to different physical risk factors at their work at least a quarter of the time, by gender, EU-28, 2015 (%) | 18 |
| Figure 7: Workers by main posture and level of physical effort, by gender and country of birth, EU-28, Switzerland, Iceland and Norway, 2017 (%)..... | 20 |
| Figure 8: Workers by physical effort level, by gender and age group, for EU-28 (excluding Germany) and Iceland, 2014 (%)..... | 21 |
| Figure 9: Workers reporting working at very high speed, by gender, EU-28, 2015 (%) | 22 |
| Figure 10: Workers reporting having enough time to get the job done, by gender, EU-28, 2015 (%)... | 22 |
| Figure 11: Workers by working time arrangements, by gender, EU-28, 2015 (%) | 23 |
| Figure 12: Workers reporting experiencing stress at work, by gender, EU-28, 2015 (%) | 24 |
| Figure 13: Workers reporting being subject to verbal abuse, humiliating behaviours, threats and unwanted sexual attention in the past month, by gender, EU-28, 2015 (%) | 25 |
| Figure 14: Workers reporting being subject to discrimination, bullying and (sexual) harassment in the past year, by gender, EU-28, 2015 (%) | 26 |
| Figure 15: Women workers reporting being subject to sexual harassment, physical aggression or fear of being hurt, by age group, EU-28, 2012 (%)..... | 27 |
| Figure 16: Workers by gender and sector (Statistical Classification of Economic Activities in the European Community, NACE, rev. 2), EU-28, 2018 (%)..... | 30 |

| | |
|--|----|
| Figure 17: Workers by gender and occupation (ISCO, 2008), EU-28, 2018 (%)..... | 32 |
| Figure 18: Workers' perceived general health, by country of birth, EU-28 (excluding Germany) and Iceland, 2014 (%)..... | 37 |
| Figure 19: Workers reporting different musculoskeletal disorders in the past 12 months, by country of birth, EU-28, 2015 (%) | 38 |
| Figure 20: Workers reporting experiencing stress at work, by country of birth, EU-28, 2015 (%)..... | 40 |
| Figure 21: Main posture and level of physical effort among workers, by country of birth, EU-28, Switzerland, Iceland and Norway, 2017 (%)..... | 41 |
| Figure 22: Workers reporting exposure to different physical risk factors at their work at least a quarter of the time, by country of birth, EU-28, 2015 (%) | 42 |
| Figure 23: Workers by working time arrangements, by country of birth, EU-28, 2015 (%) | 44 |
| Figure 24: Workers reporting being subject to discrimination, bullying and (sexual) harassment in the past year, by country of birth, EU-28, 2015 (%) | 45 |
| Figure 25: Workers reporting being subject to verbal abuse, humiliating behaviours, threats and unwanted sexual attention in the past month, by country of birth, EU-28, 2015 (%) | 46 |
| Figure 26: Workers who consider themselves overqualified for their current main job, by country of birth, EU-28 (excluding Germany and the Netherlands), 2014 (%)..... | 47 |
| Figure 27: Main reported obstacle to getting a job commensurate with their qualifications among workers reporting being overqualified for their current main job, by country of birth, EU-28 (excluding Germany and the Netherlands), 2014 (%) | 48 |
| Figure 28: Workers by country of birth and sector (Statistical Classification of Economic Activities in the European Community, NACE, rev. 2), EU-28, 2018 (%)..... | 50 |
| Figure 29: Workers by country of birth and occupation (ISCO, 2008), EU-28, 2018 (%) | 51 |
| Figure 30: Workers by country of birth and occupation levels (ISCO, 2008), EU-28, 2018 (%)..... | 52 |
| Figure 31: Ratio of the probability of various mental health disorders between LGB and non-LGB individuals in four OECD countries, 2008-2016 | 56 |
| Figure 32: Workers experiencing unequal treatment with respect to employment conditions or benefits (for example leave, pension, etc.) because of having a same-sex partner during the last 5 years, as a percentage of LGBTI workers with a same-sex partner, by LGBT subgroup, EU-28, 2012 (%) | 59 |
| Figure 33: Workers experiencing negative comments or conduct at work in the last 5 years due to being LGBT EU-28, 2012 (%)..... | 60 |
| Figure 34: Workers experiencing attacks or threats during the last 5 years, by LGBT subgroup, EU-28, 2012 (%) | 61 |
| Figure 35: Women workers reporting sexual harassment, physical aggression or unwanted sexual activities by a boss, colleague or client in the last 12 months, by self-reported sexual orientation, EU-28, 2012 (%) | 62 |
| Box 1: Examining the relation between discrimination, sexual harassment, physical violence and health | 28 |
| Box 2: Definition of migrant workers used in the context of this research | 35 |
| Box 3: The relationship between reporting MSDs and various sociodemographic variables | 39 |
| Box 4: Mediation in the relationship between country of birth and reporting of MSDs | 53 |
| Box 5: LGBTI population size and issues of measurement | 55 |
| Box 6: Experiences of discrimination in job search and employment among intersex workers | 62 |

1. Introduction

1.1 Introducing the topic

The European workforce is increasingly diverse. Several elements are at the heart of this diversity, including the growing presence of migrant, refugee and second-generation migrant workers, a higher presence of women in the labour market, a greater participation and visibility of lesbian, gay, bisexual, transgender and intersex (LGBTI) workers and an increase in disabled and older workers.

This growing workforce diversity is attracting the attention of both employers and legislators across Europe and beyond, who are increasingly shaping company policies and legislation to recognise such diversity as an asset, and to protect workers from discrimination and unfair and unequal treatment.

A number of employers seem increasingly convinced that diversity in their workforce can be an asset, rather than an issue, and that diversity management policies can attract the most talented individuals and can lead to improved decision-making, attract customers orientation and employee satisfaction, conferring also some level of competitive advantage on the company (McKinsey, 2015).

In addition, European and national legislators are developing legislation to effectively enforce equality, equal opportunities and anti-discrimination practices in different domains (i.e. access to the labour market and health services, equal treatment with regard to employment and working conditions or equal protection against occupational health and safety risks).

The International Labour Organization (ILO) in 1958 approved the Convention on Discrimination (Employment and Occupation) (Convention No 111), intended to remove 'any distinction, exclusion or preference made on the basis of race, colour, sex, religion, political opinion, national extraction or social origin, which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation'.

At EU level, several pieces of legislation have been introduced in this domain and transposed into national legislation, including Directive 2000/78/EC (the Employment Equality Directive), Directive 2006/54/EC and Council Directive 89/391/EEC on the safety and health of workers at work, which stresses that 'particularly sensitive risk groups must be protected against the dangers which specifically affect them'. In addition, the EU Occupational Safety and Health Strategic Framework 2014-2020 emphasises the important role that OSH policy can play in combating discrimination and promoting equal opportunities in EU policies.

Nevertheless, the existing evidence suggests that the specific groups of workers mentioned above still find it more difficult than other workers to access employment. If employed, they are more likely to be in jobs with poor working conditions and less rigorous poorer occupational safety and health (OSH) standards and they are more likely to experience exclusion and discrimination, resulting in increased psychological and physical health risks, including musculoskeletal health risks.

The Covid-19 pandemic has brought these issues to the fore. There have been several serious outbreaks among migrants workers in Europe, exacerbated by inadequate and unhygienic living and working conditions, with clear health consequences.

For these reasons, the European Union Agency for Safety and Health at Work (EU-OSHA) commissioned a study to investigate the extent to which workforce diversity is associated with poor working conditions and higher exposure to OSH risks, with a specific focus on musculoskeletal disorders (MSDs).

1.2 Objectives of the research project

The main objective of the research project whose findings are presented in this report was to investigate if and how specific characteristics of the workforce (namely gender, nationality, sexual orientation and gender identity, and age) are associated with a greater likelihood of being in a job with higher exposure to poor working conditions, OSH risks and health-related issues, with a specific focus on MSDs.

With reference to the three groups of workers within the scope of this research project (that is women workers, migrant workers and LGBTI workers), the specific objectives were to:

- increase knowledge and improve access to information related to working conditions and

health risks, specifically of MSDs;

- identify and analyse patterns of occupational segregation;
- identify the sectors and the occupations/jobs in which workers are more likely to be exposed to MSD risks and to suffer from MSDs, and to explore the reasons underlying this phenomenon;
- explore the relationship between psychosocial risks (including discrimination in the workplace) and the risk of MSDs;
- identify and provide information on existing policies or practices in EU Member States and at workplace level aimed at preventing MSDs among the groups of workers under analysis;
- provide information to support the development of resources for the Europe-wide Healthy Workplaces Campaign 2020-2022 on musculoskeletal disorders.

This research project is part of a major research programme carried out by EU-OSHA and focusing on work-related MSDs during the period 2018-2020. Its outputs will also contribute to the subsequent European Healthy Workplaces Campaign (HWC) 2020-2022 on MSDs, which is coordinated across the EU Member States by EU-OSHA.

1.3 Methodological approach

The methodological approach adopted for this project was a combination of desk research, collection and analysis of existing quantitative data and, finally, collection and analysis of primary data obtained by carrying out in-depth interviews and focus groups with selected stakeholders and workers from the three groups under scrutiny. In more detail, the methodological approach of the project consisted of the following (the detailed methodology is presented Annex A).

1.3.1 Review of the literature

A review of the literature on different research-relevant elements related to the three specific groups of workers was carried out. The results of this literature review are presented in Chapter 3, and the bibliographic references are presented at the end of the report.

1.3.2 Secondary data collection and analysis

To complement the literature review, existing data relating to the three groups of workers, from different European data sources, were subjected to advanced statistical analysis. The results of this secondary data collection are also presented in Chapter 3. More details on the analyses are presented in Annex B.

1.3.3 Primary data collection and analysis

Representatives of 30 relevant stakeholder organisations at international, EU and national level were interviewed, in accordance with a predefined topic guide. Subsequently, six focus groups with participation of target group workers were organised and held, in order to complement the results of the previous interviews. Some of these interviews with relevant stakeholder organisations and all six focus groups were held in the EU Member States of Denmark, Hungary, Germany, the Netherlands and Spain. The list of interviewed stakeholders and the details of the focus groups are presented in Annex A. The results of these activities are presented in Chapter 4.

1.3.4 Policy case studies

Nine case studies of relevant policy interventions and practices to improve working conditions and/ or to prevent MSDs or other health issues among the three groups of workers under scrutiny were analysed. For this purpose, desk research was complemented with in-depth qualitative interviews with stakeholders involved in the selected case studies. These case studies are presented in Chapter 5 of this report.

1.3.5 Validation workshop

Finally, the findings of the study were discussed and validated with a number of experts in the research topic in three separate webinars (which took place on 29 and 30 June 2020), one for each of the groups under study. A list of participant experts is provided in Annex A.

1.4 Structure of the report

The report is structured in six main chapters, including this introductory chapter, supplemented by two annexes.

Chapter 2 presents the conceptual framework adopted for this study, illustrating the causes and consequences of work-related MSDs.

Chapter 3 presents the findings from the literature review and statistical data analysis for each of the three groups studied.

Chapter 4 presents findings from the qualitative results collected from the interviews and focus groups conducted with relevant experts and selected workers, also disaggregated by workers' group.

Chapter 5 provides a description of nine case studies of relevant policy interventions and practices intended to improve working conditions and/or prevent MSDs and aimed at the three groups of workers.

Chapter 6 presents the overall conclusions and policy recommendations stemming from the study.

Annex A provides a detailed description of the project methodology.

Annex B reports the findings of regression analyses conducted on existing statistical datasets.

2. A conceptual framework on work-related MSDs

2.1 Definition of MSDs

Musculoskeletal disorders (MSDs) can be defined as impairments of body tissues such as muscles, joints, tendons, ligaments, nerves, cartilage and bones and of the local blood circulation (EU-OSHA, 2007a).¹ If these MSDs are caused or aggravated primarily by work and by the effects of the immediate environment in which work is carried out, they are referred to as *work-related MSDs*.

Existing data suggest that MSDs are one of the most common work-related health problems in Europe, with important consequences for workers, businesses and society at large, including high levels of sickness absence, reduced productivity and an increase in the financial burden of social welfare systems.

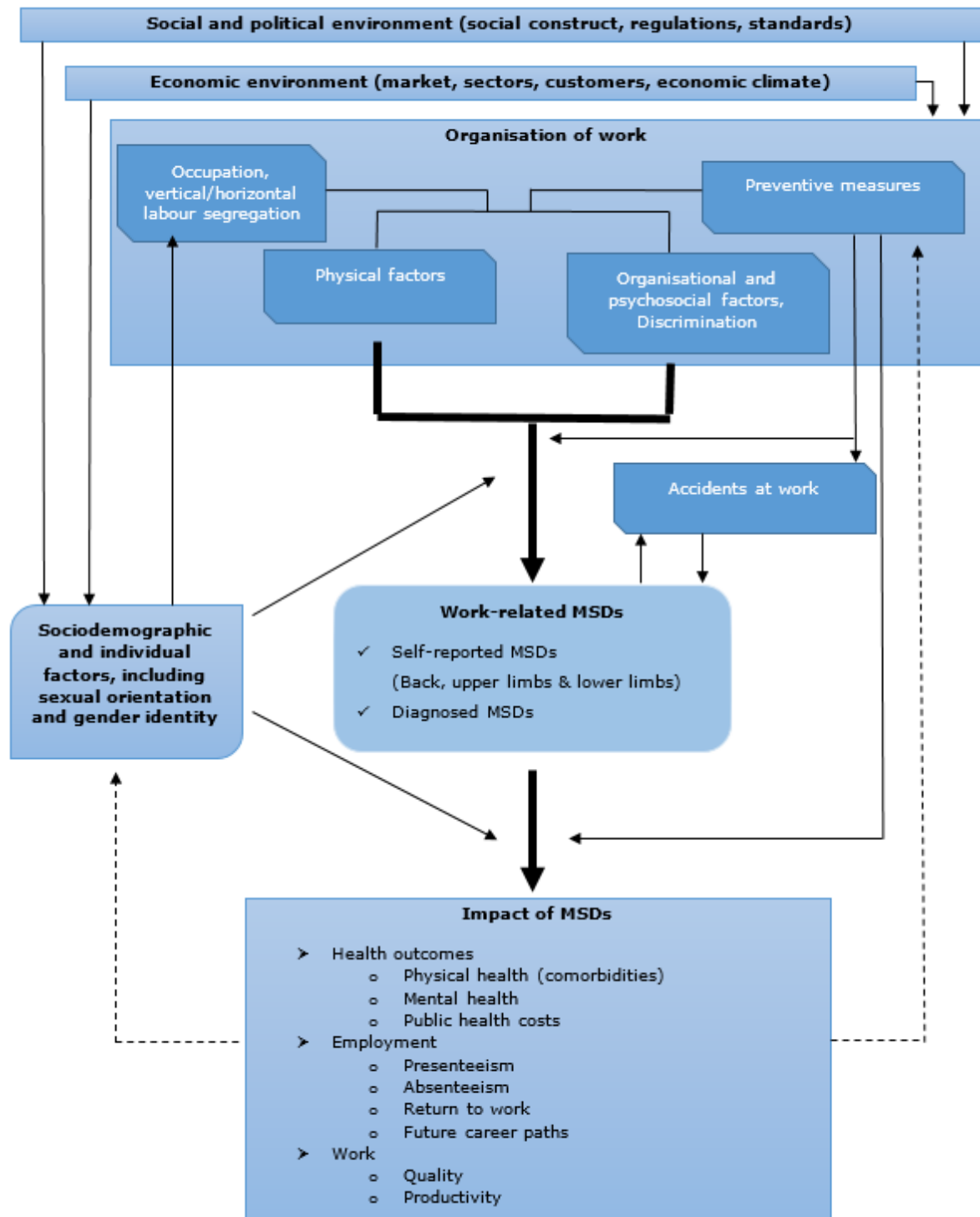
Most work-related MSDs are cumulative disorders (also known as chronic MSDs) resulting from repeated exposure to high- or low-intensity risks over a long period of time. Other causes of work-related MSDs include acute traumas (for instance fractures) resulting from an accident.

2.2 A multidimensional model of MSDs

Work-related MSDs can be caused by many different risk factors — alone or combined — and may have many different consequences for the worker. Based on previous research (see, for instance, Roquelaure, 2018), a recent EU-OSHA project on MSDs (EU-OSHA, 2019) has developed a conceptual model of the interrelationships between risk factors, MSDs and their impacts, which is presented graphically in Figure 1.

¹ For a further description of the term MSDs and its multiple dimensions, see EU-OSHA (2019).

Figure 1: Theoretical framework of work-related MSDs



Source: EU-OSHA (2019), adapted for this project.

According to this conceptual model, MSDs are associated with several types of risk factors, including sociodemographic and individual factors, physical risk factors, organisational and psychosocial risk factors, and occupation and employment-related risk factors.

2.2.1 Sociodemographic and individual factors

Several sociodemographic factors are related to the prevalence of MSDs, particularly gender, age, country of birth and level of education.

In the case of gender, several studies have shown that women are more at risk of some types of MSDs, such as carpal tunnel syndrome (Eltayeb et al., 2007; Andorsen et al., 2014). There is also evidence that migrant workers are disproportionately affected by MSDs, as well as other negative health outcomes such as infectious diseases and accidents and injuries (EU-OSHA, 2007b; Mladovsky, 2007; Scholz, 2016).

In addition, the prevalence of MSDs seems to vary with age, with older workers more likely than younger workers to be affected (Okunribido and Wynn, 2010; Yeomans, 2011), and this is particularly true of chronic MSDs. Other individual factors can also have a major impact on the likelihood of developing MSDs, including lifestyle (for example diet and exercise and smoking and alcohol consumption) and body mass index (BMI) (see Nilsen et al., 2011; Viester et al., 2013).

Given the goal of this study, it is worth considering the possible impact of individuals' sexual orientation and gender identity on health outcomes in general and MSDs in particular. The existing evidence suggests that LGBTI workers suffer exclusion, discrimination, stigmatisation, lack of support and harassment, and occasionally even violence, because of their sexual orientation or gender identity, both in the workplace and outside it (Pillay, 2011). Indeed, the prevailing social bias towards a gender binary classification (male, female) and opposite-gender relationships (man/woman) marginalises and excludes all non-heteronormative sexual and gender identities (Müller, 2016). In fact, the impact of psychosocial risk factors, such as the negative experiences of exclusion and discrimination, on the health of LGBTI workers is relatively well documented, particularly in terms of mental health (Mayer et al., 2008; Sears and Mallory, 2014, pp. 1-19; Pega and Veale, 2015; García Johnson and Otto, 2019, p. 4). Chan (2016) argues that discrimination leads many LGBTI workers not to be open about their sexual preferences or gender identity at work (so-called 'concealment'), a situation that is mentally stressful and can induce other health issues, including MSDs, which are frequently associated with psychosocial risk.

2.2.2 Physical risk factors

Physical risk factors at work are physical working conditions that may increase the risk of developing MSDs (in the back, upper limbs and/or lower limbs). Physical risk factors include both job hazards and posture-related risks. Examples of the former include the vibration of machinery or tools, being exposed to low temperatures and poor workstation or tool design, whereas examples of the latter include working in awkward positions (such as working in tiring and painful positions), lifting/carrying/moving people or heavy loads, repetitive hand or arm movements, sitting, standing, kneeling or squatting for long periods, and prolonged computer work (EU-OSHA, 2019).

2.2.3 Organisational and psychosocial risk factors

Organisational and psychosocial risk factors are related to the way in which work is designed, organised and managed, as well as to the economic and social context of work, and mostly relate to individual subjective perceptions and coping strategies. These risk factors usually have an emotional dimension and can potentially cause physical or psychological health problems, including MSDs (van den Heuvel, 2017).

Examples of organisational risk factors that can lead to the development of MSDs include working under time pressure, lack of time to recover, working time arrangements (long hours, working at night or at weekends, shift working), lack of leeway and control over the work, low autonomy, lack of appropriate resources for doing the work, poor contractual arrangements, lack of career prospects and job insecurity (e.g. short-term contractual arrangements).

Examples of psychosocial risk factors include heavy mental load, lack of support from managers and colleagues, lack of recognition for the work done, harassment practices (sexual or verbal) and discrimination practices stemming either from the way work is organised ('formal discrimination') or from

behaviours of co-workers ('interpersonal discrimination'), all of which can result in anxiety, fatigue, sleeping problems and job-related stress (Dhanani et al., 2018).²

Several studies have shown a link between harassment and bullying practices and health outcomes including chronic pain, sick leave, poor mental health and other conditions (Kishi et al., 2002, p. 105; Speedy, 2006; Theorell et al., 2014, p. 78; European Parliament, 2018; Naezer et al., 2019). The recent EU-OSHA study already mentioned (EU-OSHA, 2019) also concluded that organisational and psychosocial risk factors, are strongly associated with at least two of the three identified MSD types (backache; muscle pain in the shoulders, neck and/or upper limbs; and muscle pain in the lower limbs). Anxiety, overall fatigue, sleeping problems, low level of mental well-being, being subjected to verbal abuse at work, being subjected to unwanted sexual attention at work, feeling energised, having enough time to get the job done and knowing what is expected at work are all significantly related to three types of MSDs (EU-OSHA, 2019).

Workplace discrimination can be defined as the perception that a worker has experienced unfair or negative treatment based on membership of a particular social group (Chung, 2001). According to Dhanani et al. (2018), it is the individual's perception of workplace discrimination that matters, in that discrimination has the power to influence individual outcomes (for instance in terms of health) only when the individual is aware of a discriminatory action or event.

Workplace discrimination is intimately linked to the concept of justice, in the sense that discriminatory workplace behaviours violate perceptions of justice in a variety of domains, such as distribution (e.g. rewards not being allocated equally to minority and majority employees), procedures (e.g. bias against certain individuals being present during decision-making processes) or personal interactions (e.g. minority employees being treated disrespectfully by decision-makers) (Ambrose and Schminke, 2009).

It is possible to make a distinction between 'formal' and 'interpersonal' discrimination. Formal discrimination manifests itself in job-related decisions such as hiring, promotion and compensation (also related to organisational risk factors), whereas interpersonal discrimination is manifested not directly in job-related decisions but in negative verbal and non-verbal behaviours that occur in everyday workplace social interactions (examples may include acts of avoidance, refusal to make eye contact, an unwillingness to provide assistance or unfriendly communication) (Dhanani et al., 2018). Other authors distinguish between 'subtle' and 'overt' forms of discrimination, with 'subtle' forms of discrimination more difficult to detect, address and remediate and, therefore, particularly threatening to affected workers and individuals (Jones et al., 2017). According to these same authors, 'subtle' discrimination is much more pervasive in the modern workplace than 'overt' forms of discrimination because strong contemporary norms protect and promote egalitarianism.

There is a vast literature showing the negative consequences of discrimination (whether work based or not) on the mental and physical health of those who suffer it (see, for instance, Schmitt et al., 2014; Jang et al., 2019). It is known, for example, that perceived discrimination at work results in added job stress, negative job attitudes and reduced mental and physical health (Sonnentag and Frese, 2003; Herscovis and Barling, 2010). For instance, a Spanish research project (ITSAL) suggests that workplace-related discrimination is associated with poor mental health and the worsening of self-rated health (Agudelo-Suárez et al., 2011). In addition, some authors suggest that discrimination is detrimental not only to those who experience it personally but also to those who may observe it, particularly in work settings (Dhanani et al., 2018).

2.2.4 Occupation and employment-related factors

The current literature suggests that workers in a number of specific sectors and occupations are more likely to be exposed to MSDs because of the type of tasks they carry out or the type of tools or machines they use to carry out such tasks (Table 1).

² It is worth stressing that anxiety, fatigue, sleeping problems and stress may count not only as psychosocial risk factors (because they are believed to increase the risk of MSDs), but also as health outcomes. Thus, high anxiety levels, overall fatigue and sleeping problems may increase the risk of developing MSDs, but it is also the case that MSDs may cause or worsen these health problems.

Table 1: Sectors and occupations with a relatively high risk of work-related MSDs

| Sectors (NACE Rev. 2) | Occupations (ISCO 08) |
|---|--|
| Agriculture, forestry and fishing | Skilled agricultural, forestry and fishery workers |
| Mining and quarrying | Plant and machine operators and assemblers |
| Manufacturing | Craft and related trades workers |
| Human health and social work activities | Elementary occupations |
| Construction | Service and sales workers |
| Transportation and storage | |

ISCO, International Standard Classification of Occupations.

Source: EU-OSHA (2019).

Some specific groups of workers are more likely to be employed in certain occupations and sectors, a phenomenon known as ‘segregation’ (Blackburn, 2009). In the case of some specific groups, these occupations and sectors are characterised by higher MSD risks. Different types of labour segregation are identified in the literature (e.g. EU-OSHA, 2016) but two main types are distinguished:

- *horizontal segregation*: workers belonging to some specific groups tend to work mostly in specific economic sectors; and
- *vertical segregation*: workers belonging to some specific groups are less likely than others to reach a particular grade or level in their organisation.

Vertical segregation is often associated with the desirability of certain occupations, as a result of which competition for jobs is greater and members of certain specific groups are more likely to be found in jobs lower in the hierarchy because of a lack of promotion opportunities and career mobility (Blackburn, 2009). Thus, hierarchical segregation in employment can affect the motivation of workers and their mental well-being, which may in turn affect MSD prevalence.

Finally, other employment-related elements such as temporary contracts and job insecurity can also be associated with stress symptoms and MSDs.

2.2.5 Other relevant factors

The conceptual model presented here identifies also a number of additional factors associated with the prevalence of MSDs, among which two can be highlighted.

Existence of preventative measures

Preventative measures implemented by companies to avoid or to limit their workers’ exposure to physical or organisational/psychosocial risk factors may protect workers from the development of MSDs (Roquelaure, 2018, p. 59).³

Social, regulatory and economic environment

Existing regulations in the area of working conditions and OSH, anti-discrimination/equal opportunities regulations, the level of access to the labour market for some specific groups (i.e. migrants), access to (public) health services and general population attitudes towards work may all affect work organisation, thus having an influence on the extent and effects of MSDs among the working population. Disparity in these environmental elements across countries may lead to variation in the prevalence of MSDs as well (Farioli et al., 2014).

³ Examples of these measures are presented in Chapter 5 and may include awareness-raising activities, further research on the topic, development of workplace risk assessment and prevention tools, training, consultancy and guidance activities, reinforcement of labour inspection activities, etc.

2.3 Conclusion

To conclude, a number of work-related (and non-work-related) risk factors might have an impact on workers' health and their likelihood of developing MSDs, and can also influence the severity, chronicity and further progression of MSDs.

Moreover, the relations between these risk factors and health outcomes can be complex and mutually reinforcing. For instance, a survey-based study found that sexual harassment, tense situations when dealing with clients, high quantitative demands and lack of prospects for promotion are all aggravating factors in the association between computer work and upper extremity discomfort (Nicolakakis et al., 2017).

The following chapters of this report aim to provide information on the extent to which the three different groups under scrutiny are exposed to physical, organisational and psychosocial risk factors and the impact of these risk factors on the prevalence of health problems in general and of MSDs in particular.

3. Workforce diversity and MSDs: a review of existing evidence

3.1 Introduction

This chapter presents findings from the literature review and the analysis of existing statistical data on the situation of the three analysed groups of workers in terms of exposure to poor working conditions and health-related issues, with a specific focus on MSDs.⁴

The chapter comprises three main sections, each focusing on one group of workers. Each section is divided into a number of subsections following a common structure. An introduction to the target group is followed by a presentation of the current evidence on the prevalence of general health problems and MSDs among that group.⁵ We then present evidence on the association between exposure to different physical, organisational and psychosocial risk factors and work-related MSDs. The fourth subsection reports the evidence on the possible relationship between exposure to these risk factors and employment segregation. The next subsection describes existing evidence on the effects of these physical, organisational and psychosocial risk factors on the prevalence of MSDs among the target group. Finally, each main section concludes with a summary of the main points presented in the preceding subsections.

3.2 Women workers

3.2.1 Introduction

Women account for slightly more than half of the EU population, but are less present among the employed population. Women's employment rate is lower than men's: in 2019, across the EU Member States, on average 64 % of women aged 15-64 years were employed, compared with 75 % of men in the same age group. This difference in the employment rate has decreased only very slowly over time (by just 2 percentage points in the period 2010-2019), such that gap persists both across the EU and within all EU Member States (Eurostat – Labour Force Survey database⁶).

In spite of this reduced participation in employment, women are more likely than men to report adverse work-related health outcomes, and the prevalence of MSDs is higher among women workers, as will be shown in this section. The analysis carried out on existing survey data and relevant scientific literature allows us to identify a range of risk factors that seem to be negatively associated with working women's health, and with musculoskeletal health in particular.

The findings show that a large proportion of women workers are exposed to several work-related physical risk factors, including the need to adopt awkward or difficult postures or to make repetitive movements of upper limbs, prolonged sitting or standing, prolonged use of computers or laptops, lifting people or walking around most of the time. Women are less likely than men to be required to carry out heavy physical work but more likely to have to lift or move people.

The findings also show that women are exposed to a range of psychosocial and organisational risks, including unwanted sexual attention, bullying, harassment, verbal abuse, threats, discrimination (specifically discrimination on grounds of gender), limited autonomy at work and lack of career opportunities. This situation frequently results in stress and associated health issues such as anxiety, fatigue and sleeping problems.

The analysis carried out showed that most of these risk factors are particularly associated with sectors and occupations in which women are more frequently employed, and that women are likely to be simultaneously exposed to several MSD-related physical and psychosocial risk factors. The analysis also revealed a relationship between a number of the risk factors identified and working women's musculoskeletal health.

⁴ For further details on the methodology, see Annex A.

⁵ The statistical data presented in this section relate mostly to the EU, including the United Kingdom (EU-28), as at the time of data collection and analysis for this report the United Kingdom was still an EU Member State.

⁶ See <https://ec.europa.eu/eurostat/data/database>

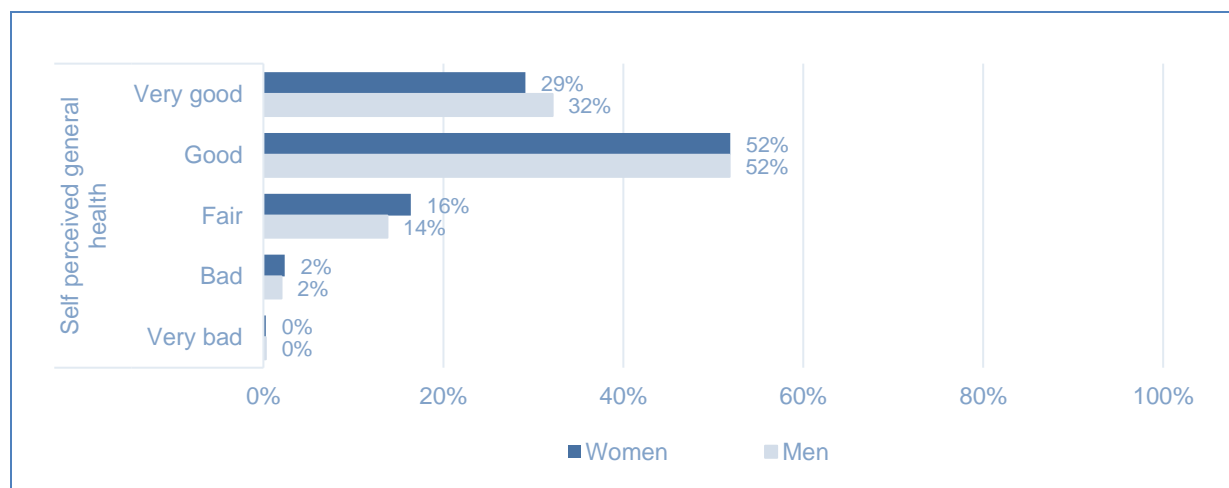
This remainder of this section is organised as follows. Section 3.2.2 focuses on the prevalence of general health and MSD-related problems among women workers in the EU. Exposure to physical, organisational and psychosocial risk factors is described in section 3.2.3, while the relationship between exposure to risk factors and employment segregation is examined in section 3.2.4. Section 3.2.5 discusses the effects of physical, organisational and psychosocial risk factors on the prevalence of MSDs among women workers, and, finally, section 3.2.6 summarises the main points of this section on women workers.

3.2.2 Prevalence of general health problems and MSDs

Information from national studies shows that, overall, women workers perceive their general health situation to be slightly worse than that of men workers. For example, Campos-Serna et al. (2013) found that women workers are more likely to report poor self-perceived physical and mental health. In addition, data from Denmark show that women in the Danish labour market are more likely than men to suffer from pain, of any kind, more often than once a week (37 % and 29 % respectively, data for 2018),⁷ while around 6 % of women workers in Denmark report that they are limited in their work because of pain (of any kind) and 12 % report having experienced a work-related disease within the last 12 months.

Data from the second wave of the European Health Interview Survey (EHIS) show that women workers in the EU are less likely than men to report very good health, and more likely to perceive their health as only fair (Figure 2).

Figure 2: Workers' perceived general health, by gender, EU-28 (excluding Germany) and Iceland, 2014 (%)



Note: workers include employees and the self-employed.

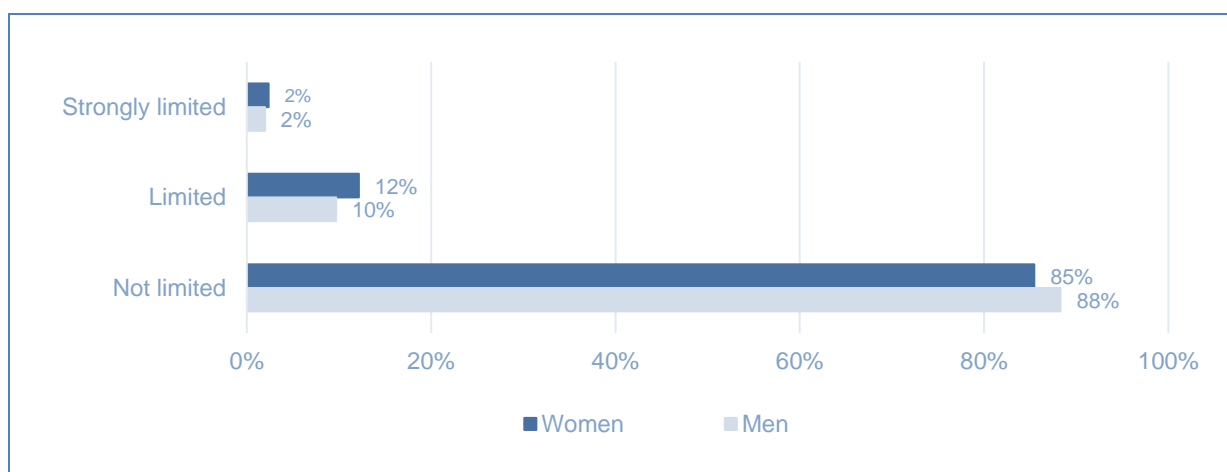
$N = 59,520$ (women); $N = 61,813$ (men).

Source: IKEI/Panteia based on the second wave of the EHIS conducted in 2013-2015.

Another indicator used to assess the health situation of women workers is the extent to which day-to-day activities are limited because of health problems (if at all). According to EU Statistics on Income and Living Conditions (EU-SILC), around 12 % of women workers report that their day-to-day activities are limited by their health problems, and 2 % report that they are greatly limited. Overall, women workers are slightly more likely than men to report being limited in their activities (Figure 3).

⁷ Information obtained from the database of the National Research Center for Work Environment (<https://arbejdsmiljodata.nfa.dk/>).

Figure 3: Workers suffering from limitations in activities due to health problems, by intensity of limitation and gender, EU-28, Switzerland, Iceland and Norway, 2017 (%)



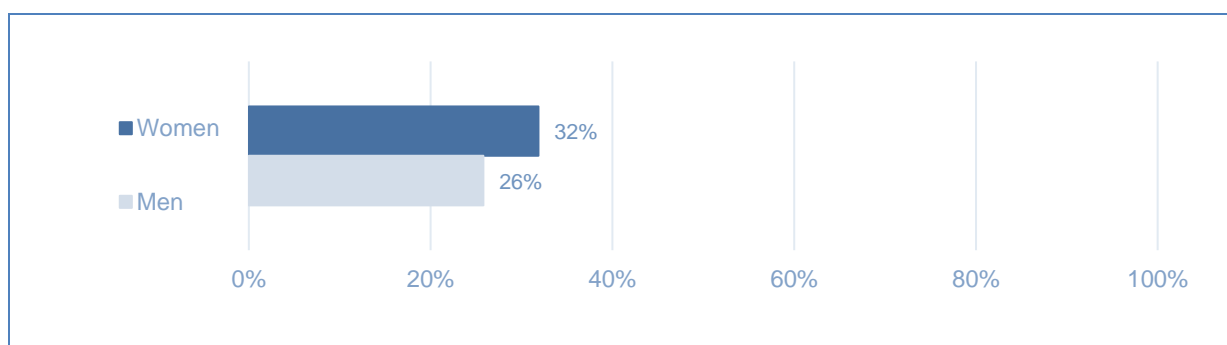
Note: workers include employees and the self-employed.

$N = 103,355$ (women); $N = 115,568$ (men).

Source: IKEI/Panteia based on the EU SILC, 2017. In the case of Switzerland and Iceland, the data are from 2016.

In 2014, 32 % of women workers in the EU reported that they were absent from work for one or more days in the past 12 months because of personal health problems. This proportion is higher than among men workers (Figure 4). This gender difference is confirmed by other studies (EU-OSHA, 2003; Laaksonen et al., 2010, p. 397).

Figure 4: Workers absent (for one or more days) from work in the past 12 months because of health problems, by gender, EU-28 (excluding Germany) and Iceland, 2014 (%)

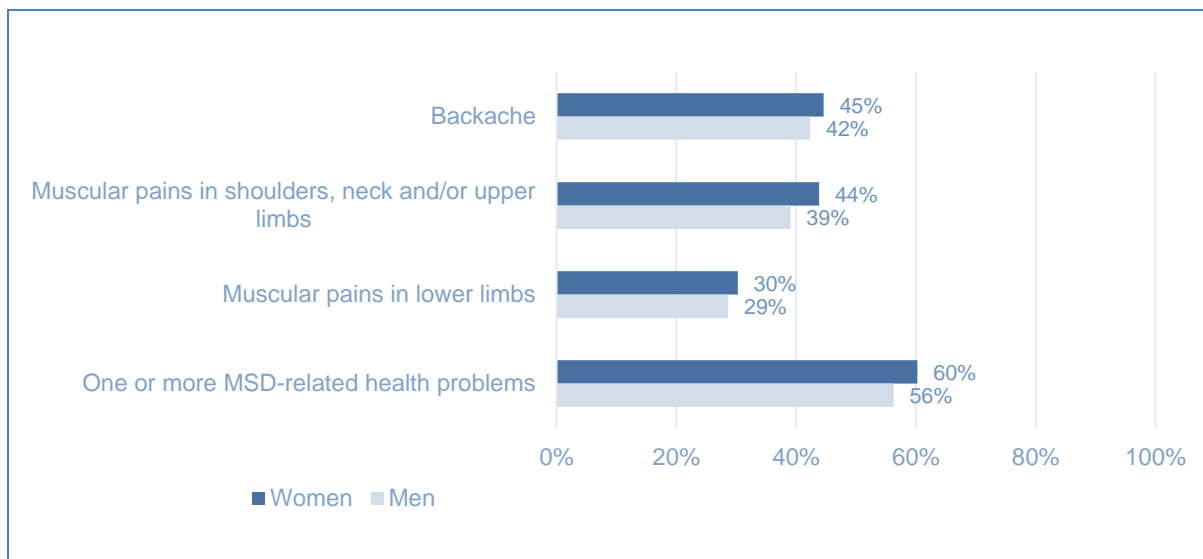


Note: workers include employees and the self-employed.

$N = 60,001$ (women); $N = 63,331$ (men).

Source: IKEI/Panteia based on the second wave of the EHIS conducted in 2013-2015.

Regarding the prevalence of MSDs, in 2015, 60 % of women workers in the EU reported one or more MSDs. The most reported ailment was backache (reported by 45 %), followed by muscle pains in the shoulders, neck and/or upper limbs (reported by 44 %) and muscle pains in the lower limbs (reported by 30 %). The prevalence of all types of MSDs is higher among women than among men (Figure 5).

Figure 5: Workers reporting different musculoskeletal disorders in the past 12 months, by gender, EU-28, 2015 (%)

$N = 31,612$.

Source: IKEI/Panteia based on the sixth (2015) wave of the European Working Conditions Survey. (EWCS).

This is in line with evidence from other sources reported in the relevant literature. In 2006, Wijnhoven et al. (2006) found that 45 % of Dutch women aged 25-64 years reported musculoskeletal pains, compared with 39 % of Dutch men in the same age range. The gender difference was most pronounced in the case of musculoskeletal complaints of the hip and wrist/hand, and less pronounced for musculoskeletal complaints of the lower back and knee. A French study of the risk factors for rotator cuff⁸ syndrome among the working population showed that the prevalence of this specific type of MSD was 8.5 % among women and 6.6 % among men (Roquelaure et al., 2011, p. 504). A higher prevalence rate among women was also reported by Andorsen et al. (2014), based on a Norwegian cohort study of chronic MSDs in the upper limbs, lower limbs and back, and by Eltayeb et al. (2007), based on a survey among Dutch office workers of MSDs of the neck and upper limbs. These studies show that women are at greater risk than men of certain MSDs, such as carpal tunnel syndrome.

3.2.3 Exposure to physical, organisational and psychosocial risk factors

As illustrated by the conceptual framework presented in Chapter 2, and supported by research and the existing literature, a number of risk factors related to the content of work and how it is organised and managed appear to explain, at least in part, the higher prevalence of MSDs among women workers. The risk factors associated with the organisation of work can be classified into three groups: physical, organisational and psychosocial. This section presents information regarding the extent to which women workers are exposed to these risk factors.

Physical risk factors

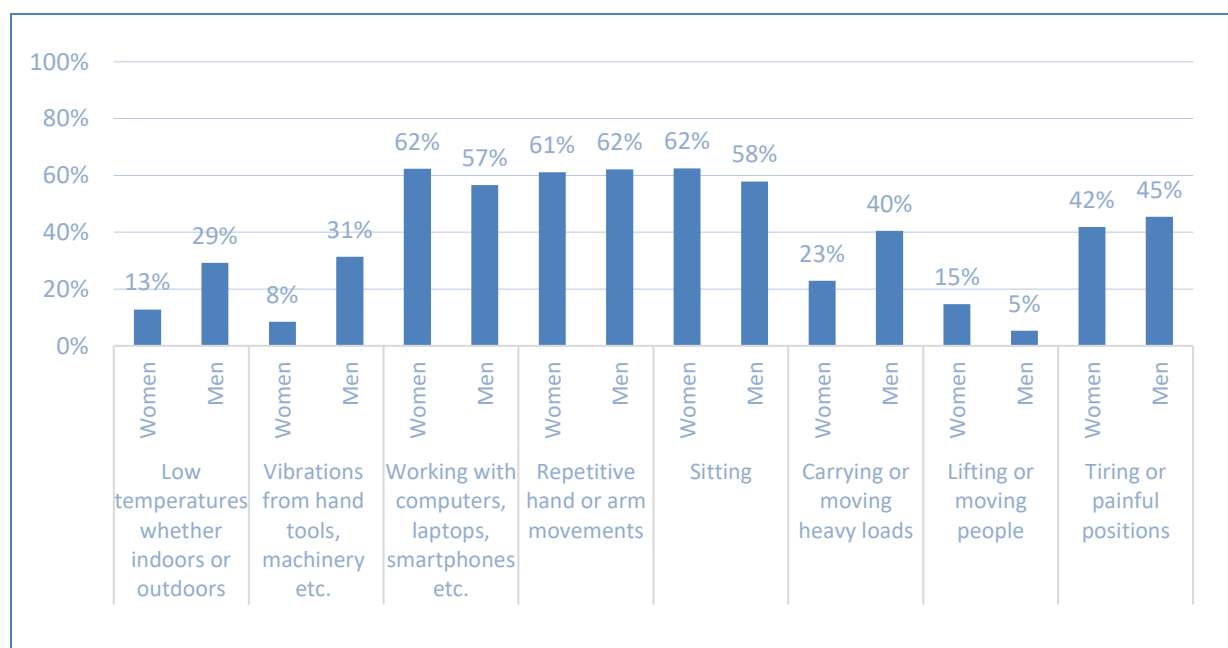
In 2015, across all the EU Member States, a significant proportion of women workers reported being employed in jobs involving one or more physical risk factors: 62 % reported prolonged (defined as more than a quarter of the time) sitting, 62 % prolonged use of computers and 61 % repetitive hand or arm movements (Figure 6). These figures are higher than, or in line with, those reported for men. In addition, approximately 42 % of women reported working in tiring or painful positions for at least a quarter of the time, although this physical risk factor appear to affect a slightly higher proportion of men. Finally,

⁸ The rotator cuff is made up of muscles and tendons that keep the ball (head) of the upper arm bone (humerus) in the shoulder socket.

around 15 % of women workers work in a job that involves lifting or moving people (compared with 5 % of men workers).

Conversely, other risk factors are reported less frequently by women than by men. Women are less likely than men to report being in jobs in which they are exposed to vibrations (8 % and 31 %, respectively) or low temperatures, whether indoors or outdoors (13 % and 29%, respectively), and/or which involve carrying or moving heavy loads (23 % and 40 %, respectively).

Figure 6: Workers reporting exposure to different physical risk factors at their work at least a quarter of the time, by gender, EU-28, 2015 (%)



Note: workers include employees and the self-employed who work at least 12 hours per week.

$N = 15,459$ to $15,488$ (women); $N = 15,076$ to $15,104$ (men). For all physical risk factors, the differences between male and women workers are statistically significant.

Source: IKEI/Panteia based on the sixth (2015) wave of the EWCS.

These results are in line with existing evidence showing that women workers are less exposed than men to physically demanding work such as carrying or moving heavy loads and to vibrations (EU-OSHA, 2013).

The finding that women are less often than men exposed to vibrations at work is also reported in other countries, such as New Zealand. In contrast, in New Zealand, women workers are more likely than men to report repetitive tasks, working at a very high speed and working in awkward or tiring positions (Eng et al., 2011, p. 889).

Data from the European Union Labour Force Survey (EU LFS) ad hoc module on organisational safety suggest that women are less likely to be exposed to a number of physical risk factors, but are more likely to be exposed to physical risk factors directly related to MSD prevalence (Table 2). Women are more likely to report (as the most important risk factor in their job) being frequently exposed to difficult postures or movements (16 %, compared with 13 % of men) or to work on activities involving strong visual concentration and therefore prolonged static postures (14 %, compared with 12 % of men). In contrast, women are slightly less likely than men to report handling of heavy loads and exposure to noise or strong vibration as physical risk factors in their job.

Table 2: Workers reporting exposure to physical risk factors at work, by gender, EU-28 (excluding Germany and the Netherlands) and Norway, 2013 (%)

| Risk factor | Women (%) | Men (%) | Total (%) |
|--|-----------|---------|-----------|
| Not exposed to any physical risk factors | 45 | 35% | 40% |
| Exposed to at least one physical risk factor, the most important one being | | | |
| Difficult work postures or work movements | 16 | 13 | 15 |
| Activities involving strong visual concentration | 14 | 12 | 13% |
| Handling of heavy loads | 10 | 11 | 11 |
| Risk of accidents | 6 | 15 | 11 |
| Chemicals, dust, fumes, smoke or gases | 4 | 9 | 7 |
| Noise or strong vibration | 4 | 5 | 5% |
| Total | 100 | 100 | 10 |

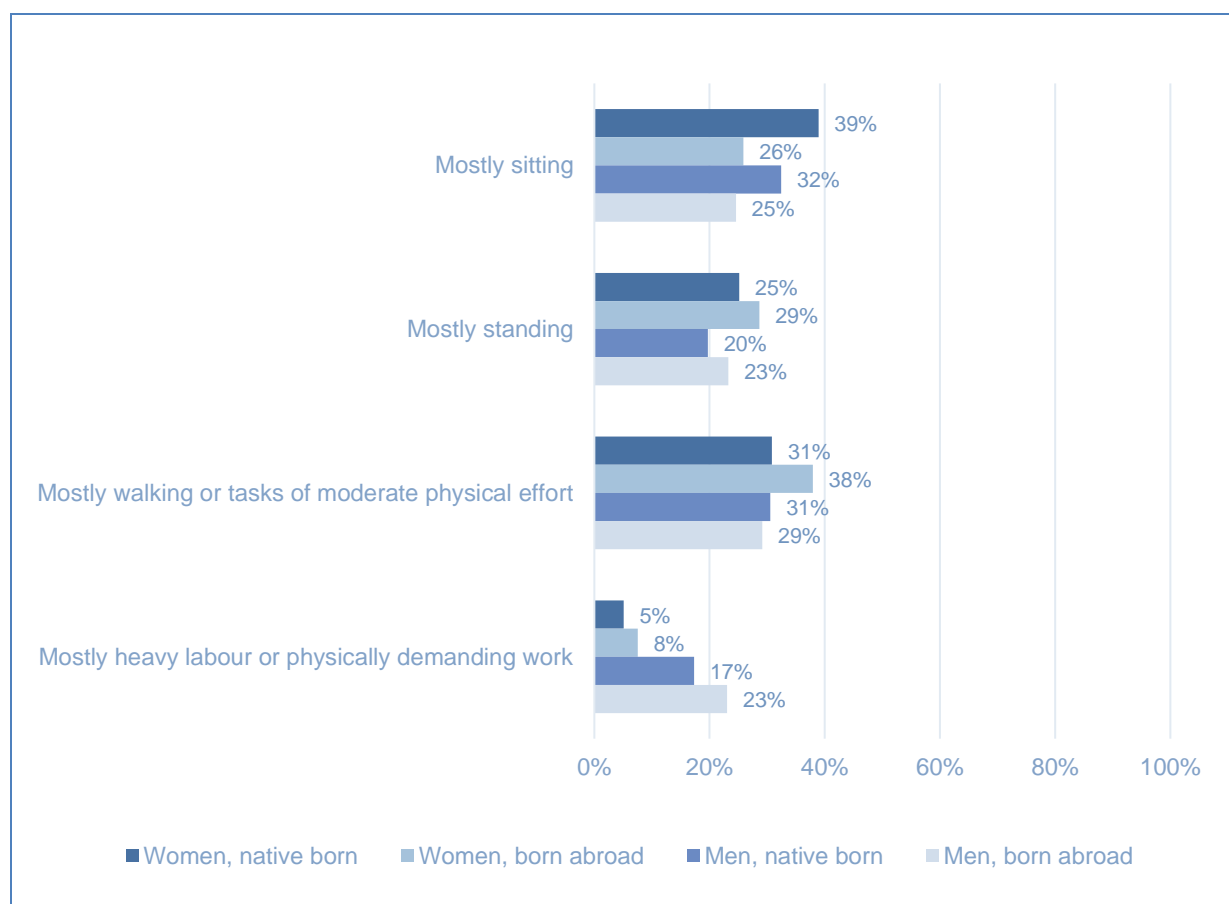
Note: workers include employees and the self-employed.

N = 186,371 (women); *N* = 209,541 (men).

Source: Ikei/Panteia based on the EU LFS ad hoc module on occupational safety and health (2013). No microdata available for Germany and the Netherlands.

Data from the EU-SILC also confirm that women workers are less often involved in heavy labour or physically demanding work but are more frequently exposed to other MSD-related physical risks such as prolonged sitting, prolonged standing or moderate physical effort (Figure 7). The data available also allow us to differentiate between native-born and migrant women. Women are more likely than men to work in jobs involving prolonged sitting, especially native-born women, who are more likely to work in office-based jobs. In contrast, among women working in jobs involving prolonged standing, a higher proportion are migrant women, who are also more likely to work in a job involving walking or moderate physical effort. Section 3.2 of this report focuses more in detail on migrant workers and MSDs.

Figure 7: Workers by main posture and level of physical effort, by gender and country of birth, EU-28, Switzerland, Iceland and Norway, 2017 (%)



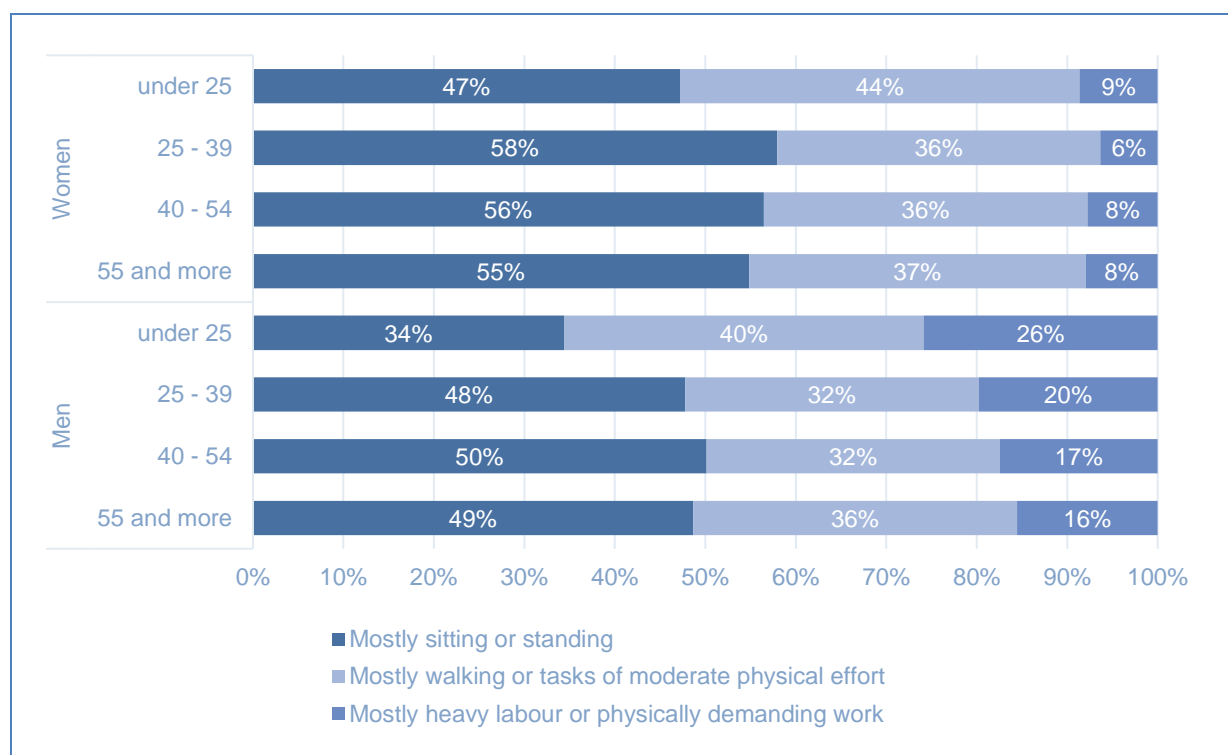
Note: workers include employees and the self-employed.

$N = 87,373$ (women, native born); $N = 9,787$ (women, born abroad); $N = 99,508$ (men, native born); $N = 9,954$ (men, born abroad).

Source: IKEI/Panteia based on the EU-SILC (2017). In the case of Switzerland and Iceland, data are from 2016.

The physical effort level of workers is also related to age. Among women workers, age-related differences in physical effort are restricted to differences between the youngest age group and the rest: the proportion of women who describe their physical effort at work as 'mostly walking or tasks of moderate physical effort' falls from 44 % for the youngest age group to 36 % and 37 % for the two older age groups (40-54 years and over 55 years, respectively). The proportion of women involved in heavy labour or physically demanding work does not vary systematically with age (Figure 8).

Figure 8: Workers by physical effort level, by gender and age group, for EU-28 (excluding Germany) and Iceland, 2014 (%)



Note: workers include employees and the self-employed.

N = 54,605 (women); N = 55,754 (men).

Source: IKEI/Panteia based on the second wave of the EHIS conducted in 2013-2015.

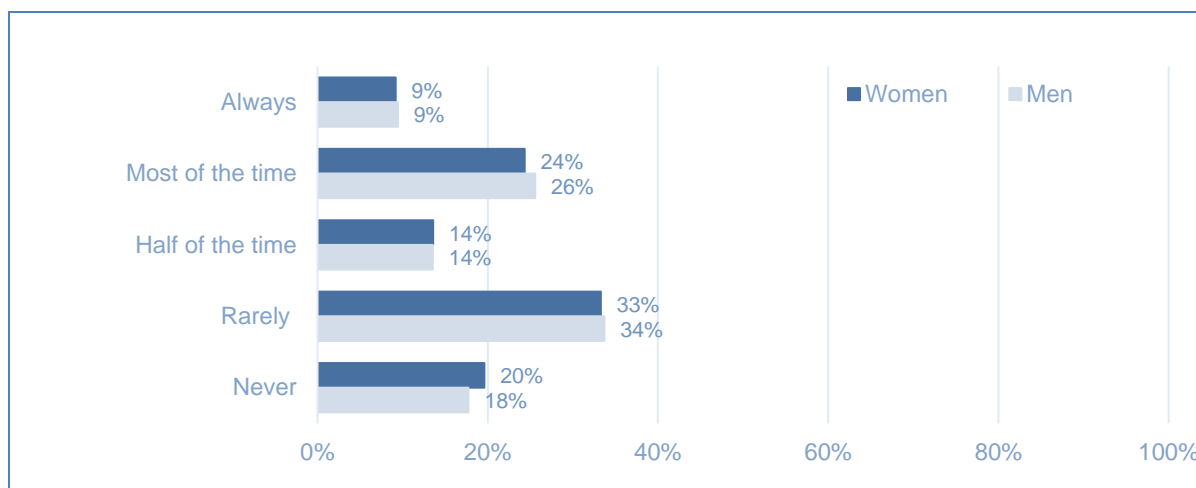
The higher exposure of women to the specific physical risk factors described in this section appears to be mostly related to the type of jobs and the sectors in which they are employed, and sometimes to the tasks assigned to them. This aspect will be further discussed in section 3.2.4.

Organisational and psychosocial risk factors

As indicated in the conceptual framework presented in Chapter 2 of this report, in addition to physical risk factors, certain organisational and psychosocial risk factors present a higher risk of suffering MSD-related problems.

Firstly, regarding organisational risk factors as identified in the relevant literature, working at very high speed increases the risk of reporting MSDs in the upper limbs (EU-OSHA, 2019). The available data from the European Working Conditions Survey (EWCS) show that, in the EU, almost one third of all women have to work at a very high speed always or most of the time, with an additional 14 % doing so half of the time (Figure 9).

Figure 9: Workers reporting working at very high speed, by gender, EU-28, 2015 (%)



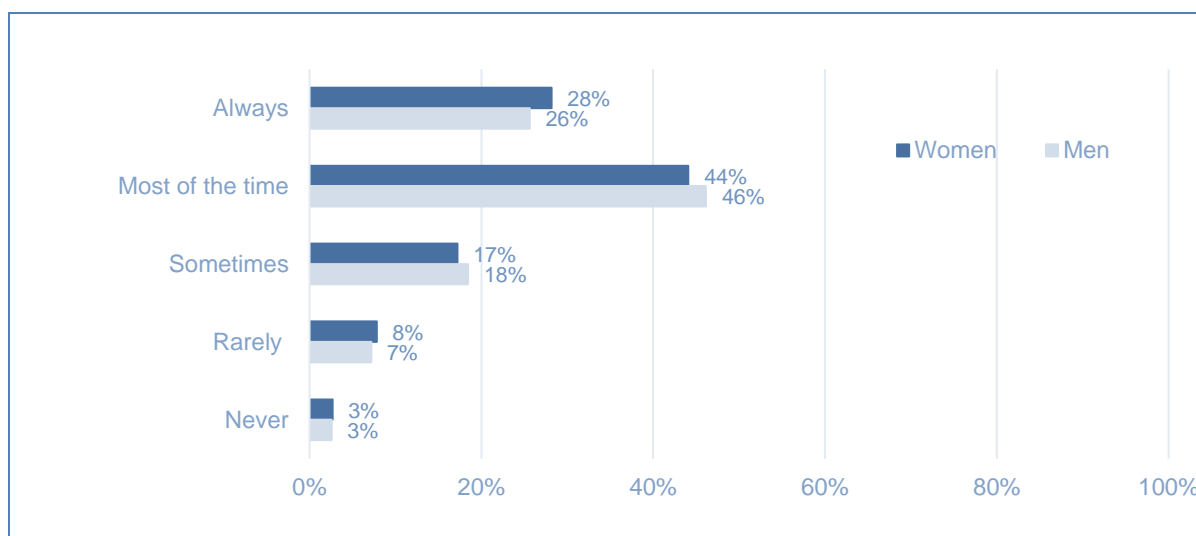
Note: workers include employees and the self-employed who work at least 12 hours per week.

N = 15,445 (women); N = 15,067 (men).

Source: IKEI/Panteia based on the sixth (2015) wave of the EWCS.

An additional organisational risk factor related to MSD prevalence (EU-OSHA, 2019) is not having enough time to get the job done. Although 72 % of women workers report that they have enough time to get the job done most or all of their time, 11 % report that this is rarely or never the case (Figure 10), with small differences compared with men.

Figure 10: Workers reporting having enough time to get the job done, by gender, EU-28, 2015 (%)

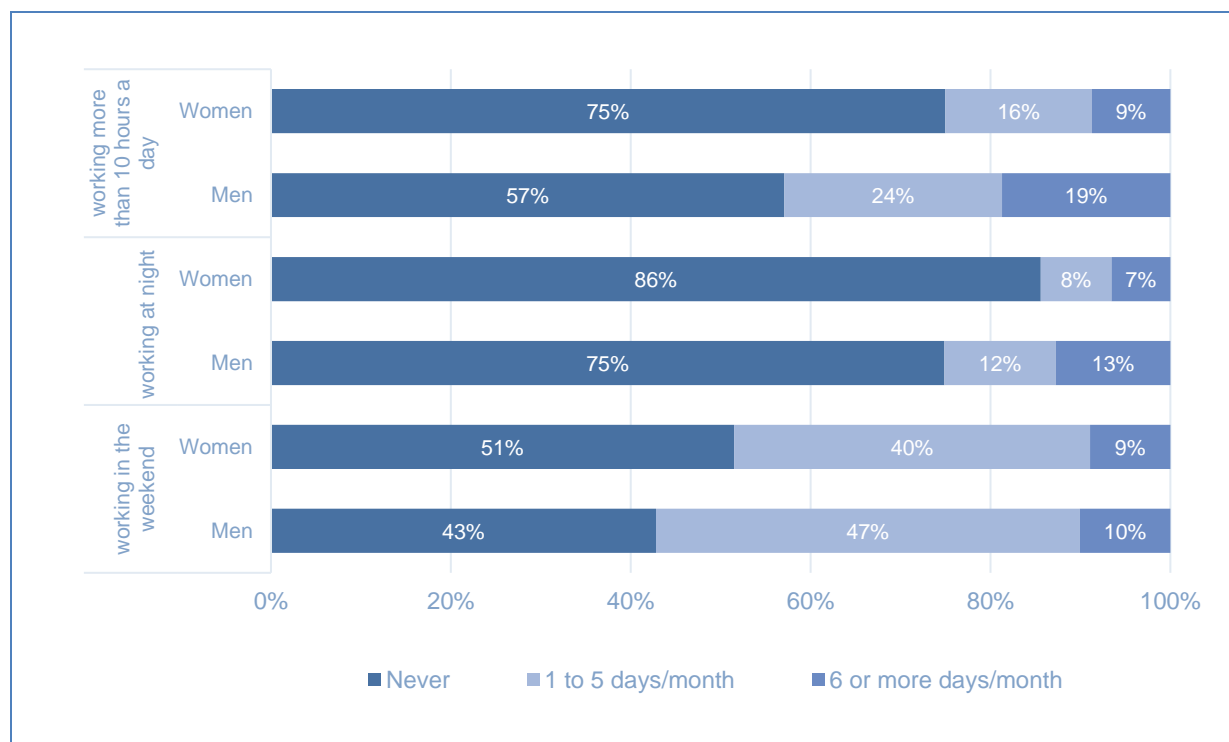


Note: workers include employees and the self-employed who work at least 12 hours per week.

N = 15,397 (women); N = 15,000 (men).

Source: IKEI/Panteia based on the sixth (2015) wave of the EWCS.

In terms of working time arrangements, women workers are less likely than men workers to work at night or at the weekend or to work long hours (Figure 11). This gender difference might be partially explained by the fact that it is more difficult for women to work at night or at the weekend or to work long hours because of their higher involvement in domestic care and household activities (Eurofound, 2020, p. 43) and, related to this, the higher prevalence of part-time working among women.

Figure 11: Workers by working time arrangements, by gender, EU-28, 2015 (%)

Note: workers include employees and the self-employed who work at least 12 hours per week.

$N = 15,187$ to $15,403$ (women); $N = 14,629$ to $14,924$ (men). For all working conditions, the differences between men and women workers are statistically significant.

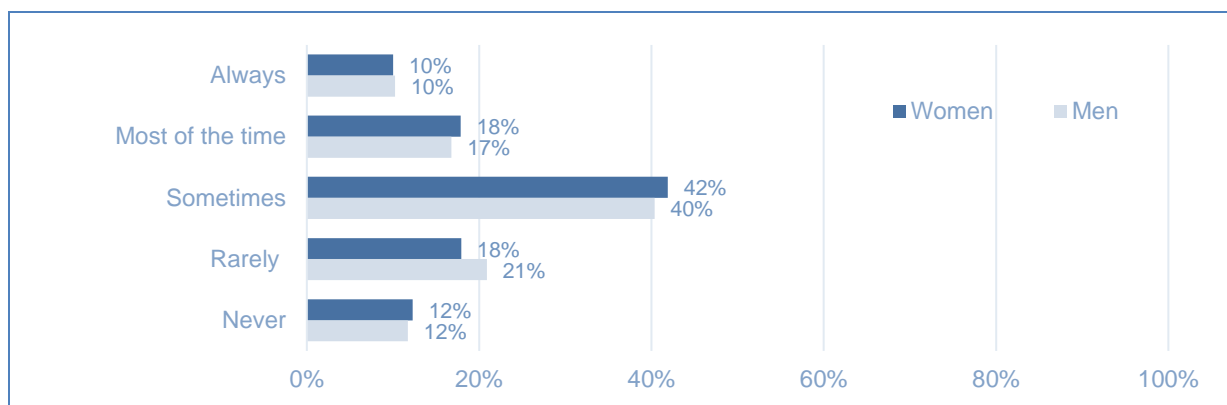
Source: IKEI/Panteia based on the sixth (2015) wave of the EWCS.

Women workers are usually overrepresented in atypical forms of employment, particularly temporary or marginal employment (such as mini-jobs or side jobs), as well as in part-time employment, as already mentioned. Interestingly, for most women, part-time work is 'involuntary', in the sense that they have no other option but to accept a part-time contract, even if they would like to work full time (Eurofound, 2016, 2020).

Regarding psychosocial risk factors, numerous studies argue that women are disproportionately exposed to these. For example, according to Fernandes and Pereira (2016) women workers face greater labour demands and report more stress symptoms than men performing similar functions and tasks. Theorell et al. (2016) found that women workers report higher levels of job strain. Other studies have found that women workers in Europe report higher exposure to several psychosocial risk factors (e.g. bullying, threats, violence, etc.) and experience symptoms of stress and depression more often than men workers, resulting in more mental health problems among women than among men workers (Kristen et al., 2015; Mastekaasa et al., 2000; Curtis et al., 2018).

According to the EWCS data, more than a quarter of all women workers experience stress in their work always or most of the time (Figure 12). In addition, women workers are more likely than men to report anxiety, overall fatigue and sleeping problems (EU-OSHA, 2019, pp. 130-131).

Figure 12: Workers reporting experiencing stress at work, by gender, EU-28, 2015 (%)



Note: workers include employees and the self-employed who work at least 12 hours per week.

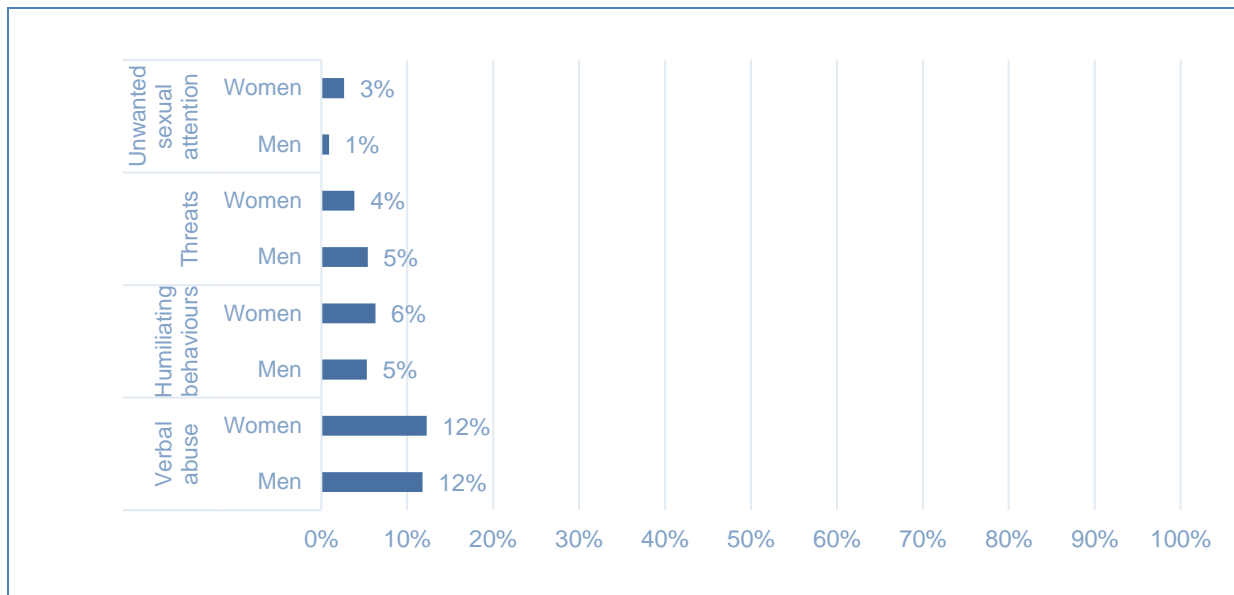
$N = 15,391$ (women); $N = 15,012$ (men).

Source: IKEI/Panteia based on the sixth (2015) wave of the EWCS.

Furthermore, there is extensive evidence of discrimination of women in the labour market (EU-OSHA, 2013; Eurofound, 2016). It is reported that women are more often than men subject to undesirable social behaviours such as verbal abuse, unwanted sexual attention, humiliating behaviour or threats, physical violence, sexual harassment and bullying/harassment (EU-OSHA, 2013; Rospenda et al., 2009; European Parliament, 2018; Eurofound, 2016). The effects of these behaviours on women are numerous – including loss of confidence, reduced self-esteem, depression, anxiety and irritability, as well as health issues (Campos-Serna et al., 2013) including MSDs.

Data from the EWCS show that the most common psychosocial risk factor experienced at work is verbal abuse. In 2015, 12 % of workers reported being subjected to verbal abuse in the past month. Other types of psychosocial risks are mentioned less often (Figure 13). Women are slightly more likely than men to report humiliating behaviours and unwanted sexual attention and less likely to report threats.

Figure 13: Workers reporting being subject to verbal abuse, humiliating behaviours, threats and unwanted sexual attention in the past month, by gender, EU-28, 2015 (%)



Note: workers include employees and the self-employed who work at least 12 hours per week.

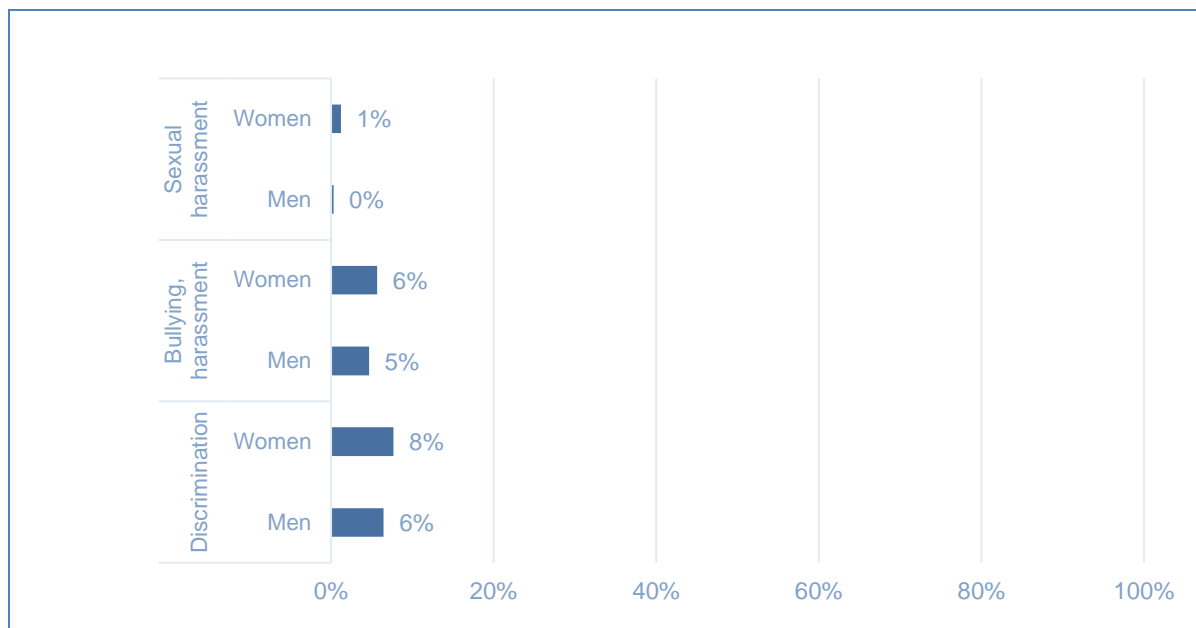
$N = 15,370$ to $15,463$ (women); $N = 15,011$ to $15,090$ (men). Except for verbal abuse, the differences in working conditions between male and women workers are statistically significant.

Source: IKEI/Panteia based on the sixth (2015) wave of the EWCS.

The EWCS data also record whether or not respondents believed they have experienced discrimination in the past year on seven different grounds: gender; age; sexual orientation; nationality; race, ethnic background or colour; religion; and disability. Overall, 7 % of workers reported feeling discriminated against on at least one of these grounds in the past year. Discrimination is reported more frequently by women than by men (8 % and 6%, respectively). The same holds for bullying and sexual harassment (

Figure 14).

Figure 14: Workers reporting being subject to discrimination, bullying and (sexual) harassment in the past year, by gender, EU-28, 2015 (%)



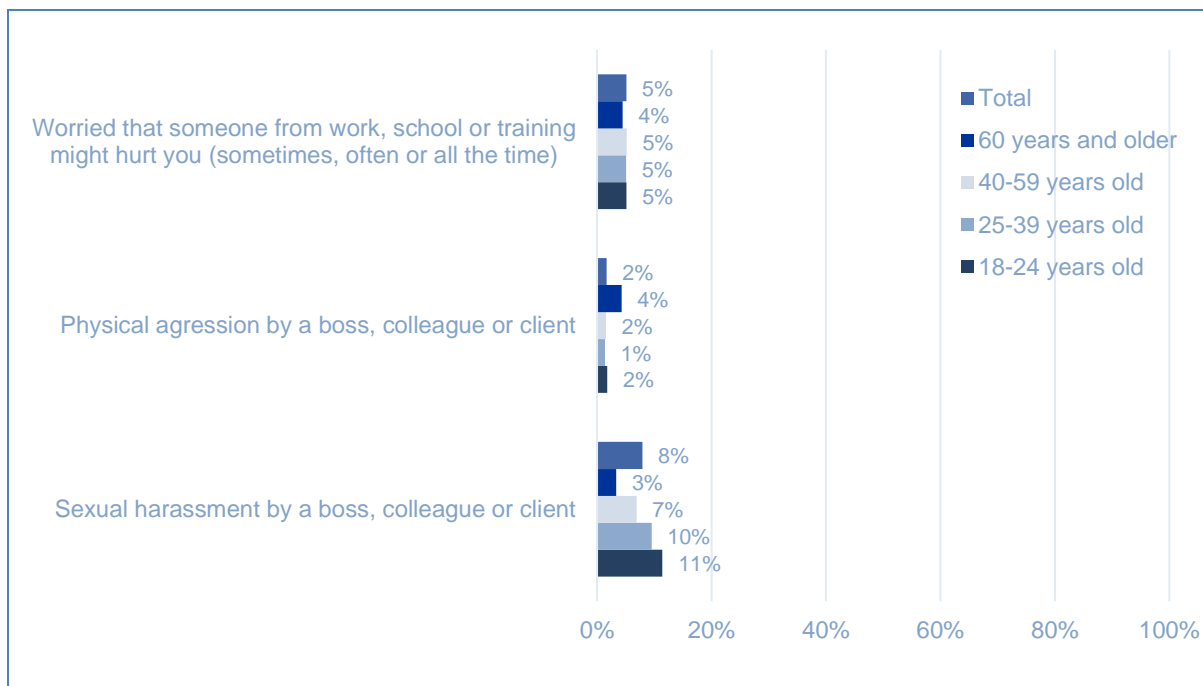
Note: workers include employees and self-employed who work at least 12 hours per week.

$N = 15,432$ to $15,461$ (women); $N = 15,070$ to $15,091$ (men). For all working conditions, the differences between men and women are statistically significant.

Source: IKEI/Panteia based on the sixth (2015) wave of the EWCS.

Among respondents to the European Union Agency for Fundamental Rights survey on women's well-being and safety, carried out in 2012 (FRA, 2013), 8 % reported sexual harassment at the workplace (the proportion was higher among younger women), 2 % reported physical aggression (4 % among older women) and 5 % reported fear of being hurt (see Figure 15).

Figure 15: Women workers reporting being subject to sexual harassment, physical aggression or fear of being hurt, by age group, EU-28, 2012 (%)



Note: workers include employees and self-employed.

$N = 20,468$ (sexual harassment and physical aggression); $N = 20,336$ (worried about getting hurt).

Source: IKEI/Panteia based on the FRA survey on women's well-being and safety in Europe (FRA, 2012).

These psychosocial risk factors at work may be associated with several health outcomes, including MSDs, as reported in the conceptual framework presented in Chapter 2. In this regard, regression analyses on the FRA data find support for these relationships. Women workers who report being subject to discrimination or sexual harassment at work are on average less likely to report very good health than women workers who do not report being exposed to such psychosocial risk. These relations are corrected for differences between countries and occupations, and for different worker characteristics such as age, citizenship and educational level (

Box 1).

Box 1: Examining the relation between discrimination, sexual harassment, physical violence and health⁹

Many studies have reported negative effects of discrimination on workers' health. For this study, this relationship has been examined using data from the FRA survey on women's well-being and safety in Europe. The survey included questions on the general health of workers and whether they had experienced discrimination, sexual harassment and/or physical violence. The main variables of interest are:

- *General health.* Respondents described their general health on a five-point scale (very good, good, fair, bad, very bad), and the responses were then aggregated into a binary variable that described respondents' health as 'very good' (which applied to 33 % of respondents) or 'less than very good' (67 % of respondents).
- *Discrimination at work for being a woman.* A dummy variable indicated if the respondent was discriminated against at work because of being a woman during the past 12 months.
- *Sexual harassment at work.* A dummy variable recorded if a respondent had, in the past 12 months, experienced various kinds of sexual harassment by a boss, colleague or client (such as unwelcome touching, hugging or kissing; inappropriate staring or leering; hearing sexually suggestive comments or jokes; receiving sexually explicit pictures, photos or gifts; experiencing intrusive comments about physical appearance; or receiving unwanted sexually explicit emails or SMS messages).
- *Physical aggression at work.* A dummy variable recorded if a respondent had, during the past 12 months, experienced different kinds of physical aggression by a boss, colleague or client (such as threats of physical harm; pushing or shoving; slapping; hair pulling or grabbing; or being forced into sexual intercourse by being held down or hurt in some way).

Analyses were carried out for this EU-OSHA research project to determine if the perception of being in very good health is related to reporting discrimination, sexual harassment and physical violence at work. Analyses were carried out on the subsample of all women workers aged ≥ 18 years residing in an EU Member State. This subsample contained 20,513 respondents.

As a first step, a regression model was estimated to establish the relation between having very good health (or not) and several standard sociodemographic variables: country, occupation, age and educational level. It also included citizenship and sexual orientation. The results showed that among women workers the prevalence of good health varies among countries and occupations, that younger women workers are more likely than older women workers to report very good health, and that better-educated women workers are more likely than those with less education to report very good health. Citizenship and sexual orientation do not seem to significantly influence the dependent variable in this regression model, as the other independent variables have a stronger effect.

⁹ Details of these analyses can be found in Annex B on regression analysis on FRA data.

In the next step, the indicators of perceived discrimination at work (for being a woman), sexual harassment at work and physical violence at work were added to the regression model. The results showed that women workers who report being subject to discrimination at work (for being a woman) and sexual harassment at work are less likely to report very good health. These relations are independent of country, occupation, age, educational level, citizenship and sexual orientation, because these variables were also included in the model. Whether or not women workers report very good health does not seem to be related to physical violence at work.

3.2.4 Employment segregation patterns

The previous section has shown clear differences in the extent to which women workers are exposed to several risk factors. These differences may be the result of gender segregation, in terms of both sectors (horizontal segregation) and occupations (vertical segregation), as revealed by the conceptual framework underlying this report.

Sectoral segregation

Current evidence shows that some sectors employ a higher proportion of women than men, and that this has changed little over the last 15 years. Thus, women seem to be particularly present in health and education, real estate, hotels and restaurants, and other service sectors, such as cleaning (Eurofound, 2020). These findings are confirmed by other data from the EU LFS 2018. Thus, in four sectors, about two-thirds or more of all employees are women: other service activities (65 %); education (72 %); human health and social work activities (78 %); and activities of households as employers (88 %). In many others, women account for around half of all employees. In contrast, in five sectors, fewer than a quarter of all employees are women: electricity, gas, steam and air conditioning supply (23 %); water supply (21 %); transport and storage (21 %); mining and quarrying (14 %); and construction (9 %) (Figure 16).

Occupational segregation

Furthermore, women are particularly present in some specific occupations, for example clerical support, service and sales and, to a lesser extent, in professional and elementary roles in women-dominated jobs. More detailed data from the EU LFS 2018 show that women account for two-thirds or more of 10 types of workers (Figure 17): personal care workers (89 %); cleaners and helpers (84 %); general and keyboard clerks (77 %); health associate professionals (75 %); teaching professionals, health professionals and customer services clerks (72 % each); food preparation assistants (67 %); and, finally, other clerical support workers and sales workers (65 % each). It is worth stressing that some of these occupations are associated with a relatively high risk of work-related MSDs, as discussed in Chapter 2 of this report.

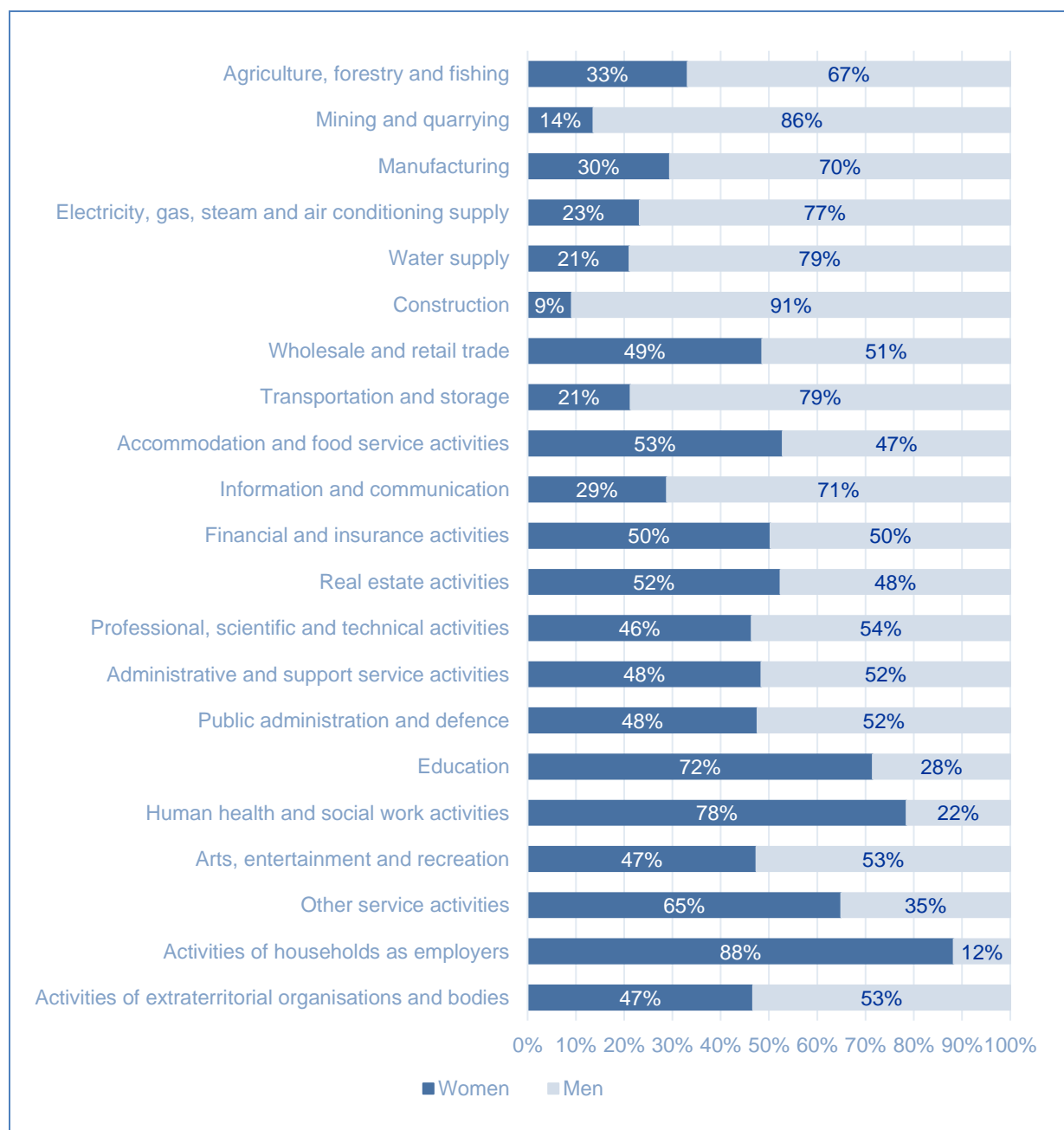
In contrast, managers and skilled agricultural workers, as well as plant and machine operators and craft and related trades workers, are mainly men (Eurofound, 2020). In this regard, several studies have shown that women workers have fewer opportunities than men to access well-paid managerial positions, resulting in lower salary levels among women workers (Eurofound, 2016). This is the so-called 'glass ceiling' phenomenon, whereby women manage to do quite well in the labour market up to a certain point, beyond which there is, effectively, a limit on their prospects (Albrecht et al., 2003).

Numerous other studies show that, although the proportion of workers with a woman manager is increasing, the proportion of women workers with a supervisory role (12 %) is still little more than half the proportion of men (20 %). In addition, women more frequently than men report that they have limited promotion and career opportunities (Eurofound, 2016). As already mentioned in Chapter 2, this hierarchical segregation in employment can affect the motivation of workers and their mental well-being, which may in turn affect the prevalence of MSDs.

Finally, it is important to note that several authors have suggested that, even within the same occupation, work content and tasks vary considerably according to gender. For instance, Messing et al. (1994) have concluded that women and men with the same job title do not perform the same tasks, leading to different physical and psychosocial risk exposures. In addition, a recent study among food

servers found that work activity varied by gender, with women more likely than men to perform more housekeeping tasks, exposing them to a different set of risks (Laperrière et al., 2017).

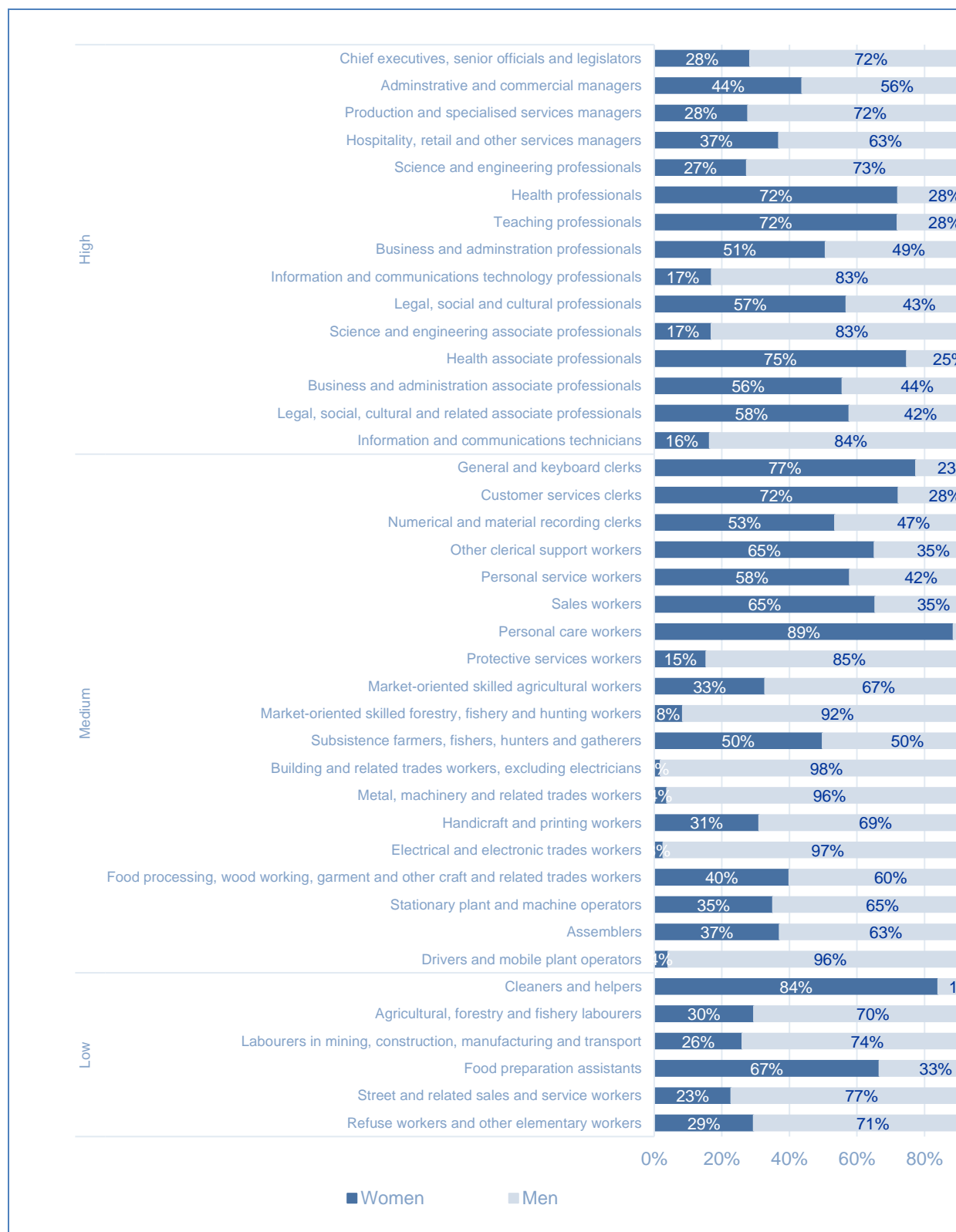
Figure 16: Workers by gender and sector (Statistical Classification of Economic Activities in the European Community, NACE, rev. 2), EU-28, 2018 (%)



Note: workers include employees and the self-employed.

The number of valid observations per sector ranges from $N = 1,147$ (activities of extraterritorial organisations and bodies) to $N = 218,085$ (manufacturing).

Source: IKEI/Panteia based on the EU LFS 2018.

Figure 17: Workers by gender and occupation (ISCO, 2008), EU-28, 2018 (%)


Note: workers include employees and the self-employed.

The number of valid observations per sector ranges from $N = 1,157$ (subsistence farmers, fishers, hunters and gatherers) to $N = 102,631$ (sales workers).

Source: IKEI/Panteia based on the EU LFS 2018.

Occupational segregation has an impact on working conditions for women workers: several authors have argued that a high degree of client/student/patient contact (which is common in some women-dominated occupations such as teaching and social care) increases the risk of affective and stress-related disorders (Weiclaw et al., 2006, p. 317; Nicolakakis et al., 2017).

Moreover, women are overrepresented in occupations associated with exposure to more than one risk factor for MSDs, for example static postures, prolonged sitting and standing (EU-OSHA, 2013) or highly repetitive and hand-intensive tasks (Swedish Work Environment Authority, 2017). As explained above, these risk factors contribute to a higher prevalence of MSDs among women workers.

A meta-analysis by Bernal et al. (2014) found several relationships between organisational and psychosocial risk factors and MSD prevalence among nurses and nursing assistants:

- A combination of high psychosocial demands and low levels of job control was associated with higher prevalence rates of low back pain and knee pain.
- An imbalance between effort and reward was associated with higher prevalence rates of MSDs at any anatomical site.
- Low levels of social support were associated with higher prevalence rates of back pain.

Similarly, Hurtado et al. (2012) reported that, in the United States, nurses are subject to a combination of high psychosocial demands and low levels of job control, which can be associated to a higher prevalence of MSDs.

3.2.5 Exposure to risks and prevalence of MSDs

Gender differences in the prevalence of MSDs can occur for a number of reasons. Several studies have provided evidence that sectoral/occupational segregation by gender (as well as task segregation within the same jobs, as previously suggested) is one reason for the relatively high prevalence of MSDs among women workers. For example, Laaksonen et al. (2010) suggested that a higher level of sick leave among women workers than among men could be largely explained by differences in occupation. For example, women dominate certain occupations associated with physical risk factors, such as teaching (which involves prolonged standing and walking) and nursing or care of older people (which involve lifting or moving people), as well as associated psychosocial risk factors such as high levels of stress and emotional demands (dealing with students or sick or elderly people), and this could account for the relatively high rates of sick leave in these occupations.

Other studies report a relatively high prevalence of MSDs among women irrespective of sector/occupation, in that, even among those working in the same occupation and/or sector, women are more likely than men to report musculoskeletal complaints (Hooftman et al., 2004, p. 261). For example, a tendency towards a higher prevalence of health problems among women has also been found in the construction industry (Umer et al., 2017, p. 140) and among teachers (Erick and Smith, 2011, p. 8). These findings suggest that the observed gender difference in MSD prevalence can be only partly explained by occupational and hierarchical segregation per se.

Similarly, a report by the European Parliament (2011) found gender differences in the prevalence of MSDs among both manual and non-manual workers. In addition, a systematic literature review by Elser et al. (2018) found that, among blue-collar workers, women reported worse health than their male colleagues and had an increased risk of MSDs and work-related injuries. In particular, women blue-collar workers were at increased risk of back pain, carpal tunnel syndrome and disorders of the hip and knee (Elser et al., 2018, p. 239). Furthermore, several studies have shown that women office workers are at higher risk of developing non-specific neck pain than male office workers (McLean et al., 2010, p. 570; Paksaichol et al., 2012, p. 613). Finally, a study of nurses found not only that, in general, nurses have high exposure to lower back pain (which is consistent with the fact that human health and social work activities is one of the five occupational sectors associated with a high risk of MSDs), but also that women nurses are more often exposed to these type of health problems than their male counterparts (Sun et al., 2016). However, other studies have suggested that physiological differences between women and men explain the higher prevalence of MSDs in women to only a small degree and

that gender differences are better explained by differences in exposure to several risks (Lewis and Mathiassen, 2013).

As regards gender differences in the relationship between workplace risks and the likelihood of developing and/or reporting MSDs, a Danish study found that women are more likely than men to develop long-term sickness patterns if exposed to several risk factors (including both physical and psychosocial work factors) (Lund et al., 2006, pp. 1-4). Other studies have explicitly examined whether the relationship between work-related risk factors and work-related health outcomes (including MSDs) is different for women and men workers. For example, Rivera-Torres et al. (2013) examined the presence of gender differences in the context of a model that relates the perceived risk of suffering an illness or having an accident in the workplace to aspects of job demands, control and support. Their analysis was based on a model that 'predicts that the highest job stress is experienced in environments characterised by high job demands and low job control', in addition to low levels of support (Rivera-Torres et al., 2013, p. 377). Job demands include both qualitative aspects (such as intellectual or emotional demands in the solution of a task) and quantitative aspects (such as time pressure, work overload and demands to work fast). Rivera-Torres et al. (2013) found that high levels of qualitative demand increase perceived health risks among women but not men workers.

The relation between shift work and health outcomes is also moderated by gender. For example, changing shifts patterns have a negative effect on the mental health of women and men workers (e.g. mental health and work injuries), but women's health is disproportionately more adversely affected (Bara and Arber, 2009, p. 365; Wong et al., 2014, p. 625).

Other examples of links between work-related risk factors and health outcomes are reported in the literature review by Hooftman et al. (2004). For example, women workers are less likely than men to develop back and neck complaints as a result of lifting and hand-arm vibrations, but have a higher risk than men of developing neck or shoulder complaints as a result of arm posture (Hooftman et al., 2004, p. 268).

A recent EU-OSHA study (EU-OSHA, 2019) found that the association of specific risk factors with prevalence of MSDs is different for women and men workers:

- The relationship between pace of work being under the direct control of the boss and back complaints is stronger for women workers than for men workers (p. 133).
- The relationship between carrying or moving heavy loads and complaints of the upper limbs is stronger for women workers than for men workers (p. 108).
- The relationship between prolonged sitting and lower limbs MSDs is stronger for women workers than for men workers (p. 111).

Last, but not least, gender-specific occupational safety risks for women can also be linked to reproductive functions (European Parliament, 2011). Some studies have examined the correlation between exposure to different risks and the implications for pregnant women. A Spanish literature review from 2010 found that exposure to MSDs risks, such as heavy lifting and bending movements, also increases the risk of preterm birth and spontaneous abortion among pregnant women (de Vicente and Díaz, 2010).

3.2.6 Summary

Women workers report not only poorer self-perceived physical and mental health but also higher levels of limitations in daily activities due to health problems and higher levels of absence from work due to health issues. MSDs are particularly prevalent among women workers, with backache the ailment most suffered by women workers, followed by muscle pain in the shoulders, neck and/or upper limbs and muscle pain in the lower limbs.

Women workers are less often involved in heavy labour or physically demanding work but they are more frequently exposed to other MSD-related physical risks including lifting, handling or moving (resisting) persons, repetitive movements at work, awkward, forced or tiring postures and prolonged static standing or sitting, all of which are often directly related to the prevalence of MSDs. The physical effort level of women workers is also related to age, with younger age groups being more likely to work in jobs

requiring physical effort. This higher exposure of women to these specific physical risk factors appears to be mostly related to the types of jobs and sectors in which women workers are most active.

Women workers are also exposed to several psychosocial and organisational risk factors, including higher levels of stress and job strain and adverse social behaviours (e.g. verbal abuse, unwanted sexual attention, humiliating behaviour or threats, physical violence, bullying/harassment practices, etc.). Women workers are also particularly affected by limited career opportunities (the so-called 'glass ceiling'), as well as lower salary levels, and are disproportionately represented in atypical forms of employment (including 'involuntary' part-time work).

Women workers are overrepresented in several specific occupations and sectors associated with a higher likelihood of exposure to physical, organisational and psychosocial risk factors linked with MSDs.

Finally, the analysis has allowed us to identify a relationship between a number of risk factors and women workers' musculoskeletal health. In particular, our research has shown that women subject to discrimination or sexual harassment at work are, on average, less likely to report good health than those not reporting exposure to this psychosocial risk.

The sectoral/occupational segregation that exists may also explain the relatively high prevalence of MSDs among women workers, although some studies suggest that women are more likely than men to report musculoskeletal complaints even when they work in the same occupation and/or sector. Moreover, women workers are more likely to develop musculoskeletal problems if they are simultaneously exposed to several risk factors (including both physical and psychosocial work factors). In addition, a specific regression analysis carried out in the framework of this research showed that women workers who report being subject to discrimination or sexual harassment at work are, on average, less likely to report good health status.

3.3 Migrant workers

3.3.1 Introduction

According to Eurostat data, in 2019 nearly 41.5 million people resident in the EU (8.1 % of the total EU population) were citizens of a country other than their country of residence. This group comprised 17.9 million individuals (3.5 %) from other EU Member States (exercising their free movement rights) and 23.6 million people (4.6 %) from third countries, that is countries outside the EU. Available data also show that the employment rate among those aged 15-64 born outside the EU was considerably lower than among the native-born population (58 % and 69.7 %, respectively), and also much lower also than the employment rate among people born in another EU Member State (74.6 %).

Box 2: Definition of migrant workers used in the context of this research

Within the context of this research, migrant workers are defined as workers born abroad, in contrast to native-born workers (defined as workers born in the country in which they are living). Interestingly, several of the available data sources used in this report allow us to further distinguish these groups of migrant and native workers. For instance, the EHIS and the EU LFS distinguish between migrant workers born in another EU Member State and those born outside the EU. Interestingly, the EWCS data also distinguish first-generation migrant workers (workers born outside their country of residence), second-generation migrant workers (that is, workers born in their country of residence, and therefore considered native-born workers, but with at least one parent born in another country) and native workers (defined as workers born in their country of residence and with both parents also born in that country). When relevant, data for these different subgroups are presented.

This section shows that migrant workers, particularly first-generation migrants, report poorer health outcomes and a higher prevalence of MSDs than native workers. Analysis of existing survey data and the relevant scientific literature shows that a range of risk factors seem to have a negative impact on migrant workers' health in general, and on musculoskeletal health in particular.

Thus, the evidence presented in this section shows that, compared with native workers, migrant workers are more frequently exposed to physical risk factors and environmental hazards at work, particularly vibrations, painful/awkward positions and the handling of heavy loads. The findings also show that migrant workers are more exposed than native workers to work-related organisational and psychosocial risk factors, including bullying/harassment practices, threats, verbal abuse, discrimination and poorer working conditions. The literature also identifies a number of additional factors affecting their health outcomes among migrants, for example a lack of knowledge of OSH standards and the local language and poorer access to local health services.

Furthermore, our analysis shows that migrant workers are overrepresented in some specific sectors and occupations characterised by a higher presence of MSD-related risk factors. Finally, the analysis allowed us to identify an association between a number of risk factors and migrant workers' musculoskeletal health.

This section is organised as follows. Section 3.3.2 focuses on the prevalence of general health problems and MSDs among migrant workers in the EU. Exposure to physical, organisational and psychosocial risk factors is discussed in section 3.3.3, while the association between exposure to certain risk factors and segregation in the labour market is discussed in section 3.3.4. The subsequent section, section 3.3.5, analyses the association between physical, organisational and psychosocial risk factors and the prevalence of MSDs among migrant workers. A summary of the main points and findings concludes this section on migrant workers.

3.3.2 Prevalence of general health problems and MSDs

According to the existing literature, migrant workers report, on average, poorer health and more work-related health problems than native workers (Moyce and Schenker, 2018; Sterud et al., 2018).

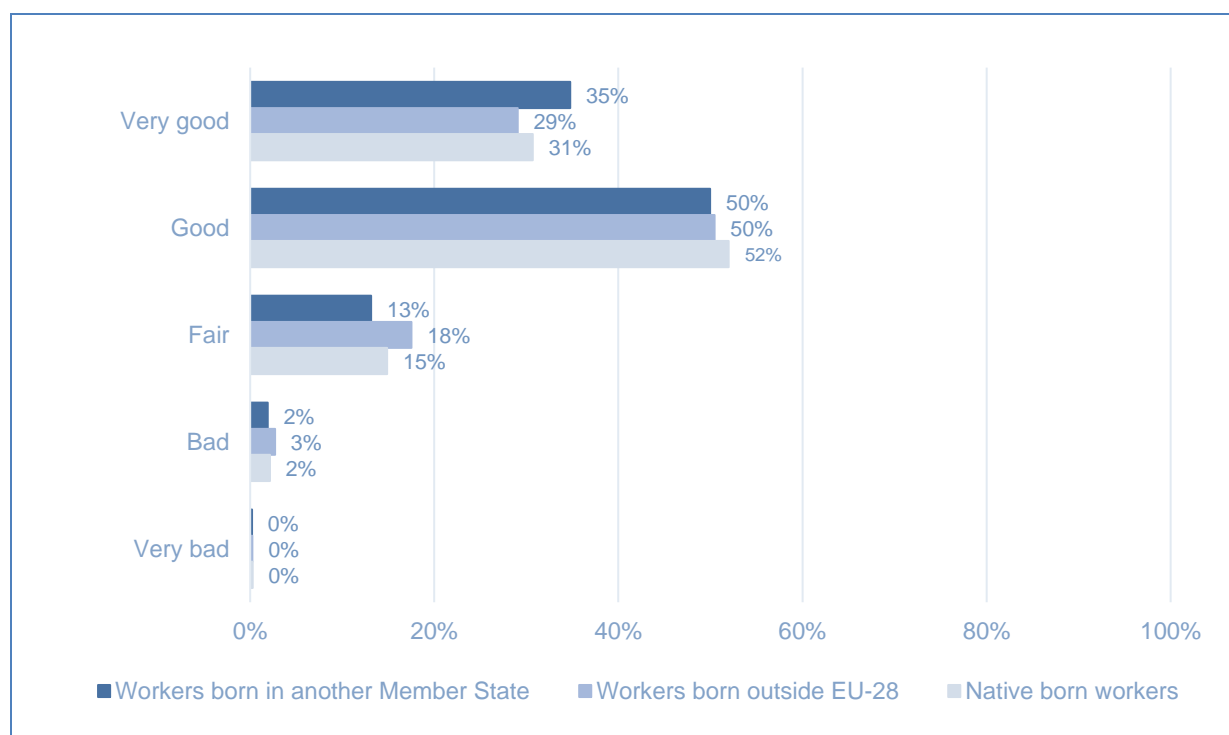
Mucci et al. (2019) reviewed occupational risks and diseases among migrant workers and native workers and found that migrants are at greater risk of developing infectious diseases and metabolic cardiovascular diseases. They also found that migrant workers report lower quality of life, primarily because they have difficulties in accessing local health services. This is frequently related to the precarious working situation of many migrant workers, who often work in jobs with job insecurity, or even as irregular or non-contractual workers, and are unlikely to have health insurance (Dembech, 2015). The lack of access to appropriate health care by migrant workers therefore seems to be a further disadvantage.

Other reports have shown that the prevalence of workplace accidents is higher among migrant workers than among native-born workers (Eurofound, 2007). In addition, a Spanish research project on reported work-related injuries found that prevalence is in general higher among migrants than among native workers, but the difference is particularly pronounced in the case of women and older migrant workers (Agudelo-Suárez et al., 2009). Furthermore, Giraudo et al. (2017) found that, in Italy, occupational injury rates are higher among migrant workers than among Italians, and this is particularly true of serious injuries. The same authors, in another study, found that the differences tended to be more pronounced during periods of economic recession and concluded that the reason for this was that migrant workers continue to be assigned to the more dangerous jobs and the more dangerous tasks (Giraudo et al., 2019). Similar results have also been found in other geographical areas. For instance, a study in the United States found that recent immigrants were at higher risk of occupational fatal injuries and occupational diseases leading to death than native-born workers (Shannon et al., 2009).

Interestingly, also, some authors have identified a so-called 'healthy migrant effect', with newly arrived migrants usually having better health status than their native-born counterparts, mainly explained by the fact that they are usually young, although, of course, this advantage is eroded with time (Ronda-Pérez et al., 2014, pp. 703-714).

Data from the second wave of the EHIS conducted in 2013-2015 are in line with evidence from the literature, as they show that migrant workers are less likely than native-born workers to report their health status as good or very good (Figure 18). This negative perception is even stronger among migrant workers born outside the EU than among migrants from other EU Member States.

Figure 18: Workers' perceived general health, by country of birth, EU-28 (excluding Germany) and Iceland, 2014 (%)



Note: workers include employees and the self-employed.

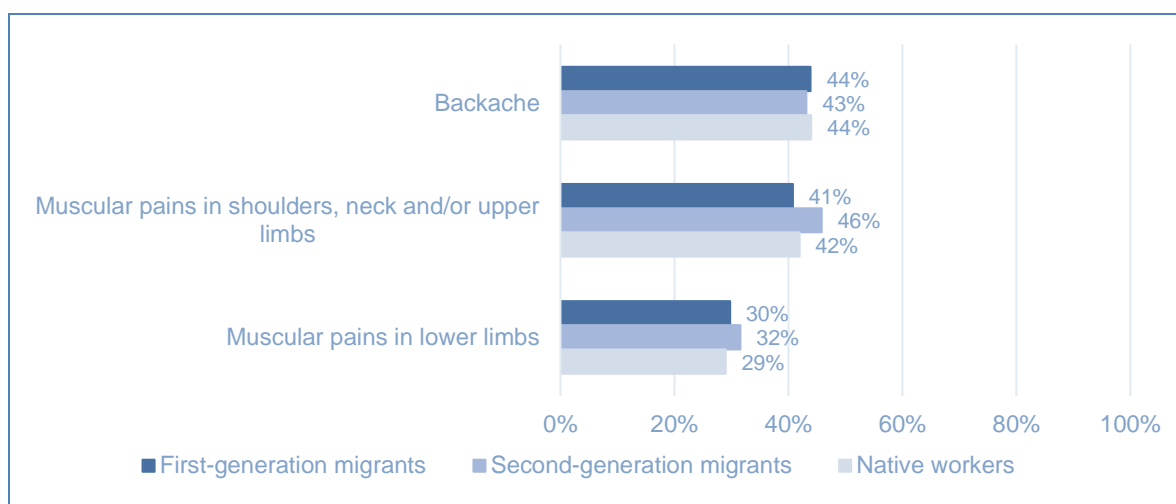
N = 4,571 (workers born in another EU Member State); N=5,954 (workers born outside the EU-28); N = 109,592 (native-born workers).

Source: IKEI/Panteia based on the second wave of the EHIS conducted in 2013-2015.

In terms of MSD prevalence, a number of studies (e.g. EU-OSHA, 2007b; Mladovsky, 2007; Sandberg et al., 2012) have found a higher prevalence of MSDs among migrant workers. In addition, a recent comprehensive review of the international literature found that MSDs are a major health concern among the migrant workforce, with MSDs being specifically mentioned by a large array of international studies (Hargreaves et al., 2019).

In 2015, according to EWCS data, migrant workers reported a higher prevalence of MSDs in the lower limbs than native-born workers. In addition, second-generation immigrant workers were significantly more likely than native-born workers or first-generation migrant workers to report MSDs of the upper limbs (muscle pains in the shoulders, neck and/or upper limbs): 46 %, 42 % and 42 %, respectively. However, the prevalence of back pain was less related to country of birth. For example, 44 % of first-generation migrants, 43 % of second-generation migrants and 44 % of native workers reported backache as their principal musculoskeletal disorder, while muscle pains in the lower limbs was reported by 30 %, 32 % and 29 %, respectively (Figure 19).

Figure 19: Workers reporting different musculoskeletal disorders in the past 12 months, by country of birth, EU-28, 2015 (%)



Note: workers include employees and the self-employed who work at least 12 hours per week. First-generation migrants are workers born abroad and second-generation migrants are workers born in the country where they are working and with at least one parent born in another country. Native workers are all other workers.

$N = 2,788$ to $2,789$ (first-generation migrants); $N = 1,408$ to $1,410$ (second-generation migrants); $N = 26,209$ to $26,215$ (native workers). Only for MSDs in the upper limbs are the differences between native workers, first-generation migrants and second-generation migrants statistically significant at the 5 % significance level.

Source: IKEI/Panteia based on the sixth (2015) wave of the EWCS.

A more in-depth analysis of EWCS data shows that migrants (particularly first-generation migrants) are more likely than native workers to report MSDs: when sociodemographic variables such as country, age, gender and educational level are taken into account, first-generation migrants are the group most likely to report MSDs (Box 3). This result is statistically significant for all three categories of MSDs considered, namely backache; muscle pain in the shoulders, neck and/or upper limbs; and muscle pain in the lower limbs (Figure 19).

Box 3: The relationship between reporting MSDs and various sociodemographic variables¹⁰

Many studies have explored factors associated with MSD prevalence (see the discussion in Chapter 2). For this study, data from the sixth wave of the EWCS were used to identify sociodemographic variables associated with MSD prevalence. The sixth wave of the EWCS includes indicators on three different types of MSDs, as well as indicators for many different risk factors, discrimination and various control variables. In many ways, this is the most complete dataset available at EU level.

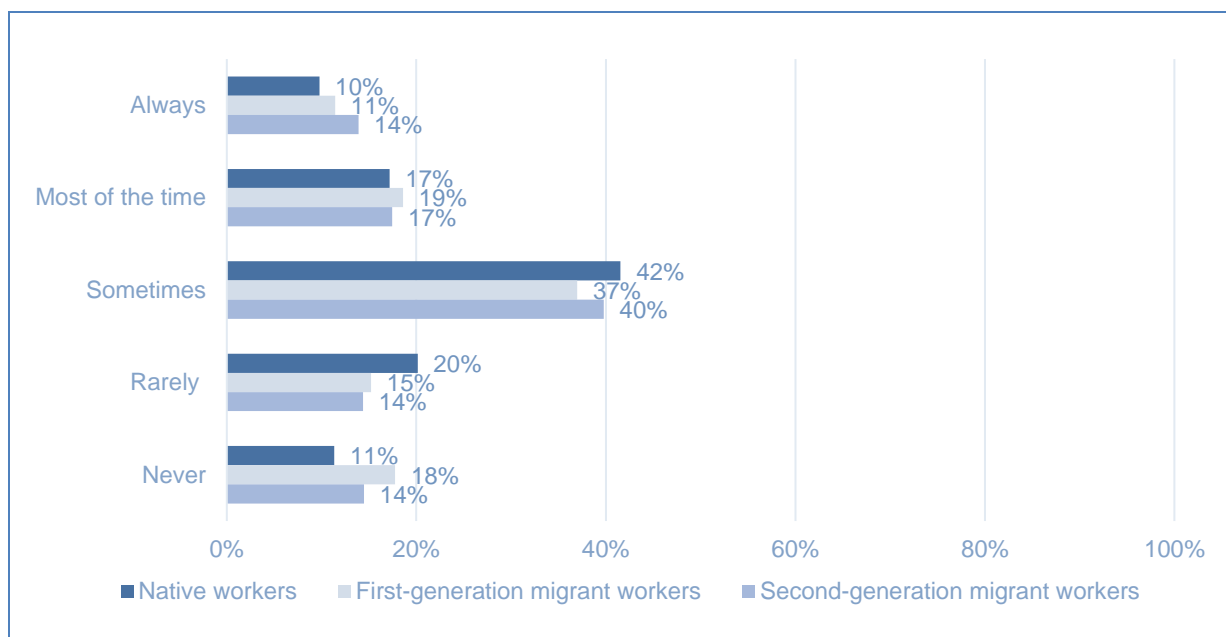
We carried out logistic regression analyses to relate the likelihood of reporting MSDs during the past year to a selection of sociodemographic variables. The dependent variable (MSD prevalence) was treated as a binary variable. Analyses were carried out on the subsample of all workers aged 18-65 years residing in an EU-28 Member State who worked at least 12 hours per week in their main job. This subsample contained 31,662 respondents.

A regression model was estimated to establish the probabilistic association between MSD prevalence and the following sociodemographic variables: country of residence, age, educational level, gender, migrant status and number of hours worked. The results showed that all three categories of MSDs are statistically significantly related to almost all of these sociodemographic variables. Focusing on migrant status, the results show that first-generation migrant workers are significantly more likely than native workers to report any of the three types of MSDs. In the case of second-generation migrant workers, the difference with native-born workers is much smaller. Second-generation migrant workers and native-born workers differ significantly only when it comes to the likelihood of reporting MSDs of the lower limbs.

The results also show that women workers are more likely to report musculoskeletal complaints than men workers. This gender effect is independent of the migrant effect. This implies that women workers born outside their country of residence are the group most likely to report MSDs whereas male native-born workers are the group least likely to report MSDs (once country, age, educational level and hours worked are controlled for).

Migrant workers are also more likely to report mental health problems. Mucci et al. (2020) recently conducted a systematic literature review on the mental health of migrant workers and found that migrant workers are particularly affected by depressive syndromes (poor concentration at work, feeling down, or anger and somatisation), anxiety, alcohol or substance abuse, and poor sleep quality, which in turn result in low life conditions. These results are complemented by data from the sixth wave of the EWCS in 2015, which show that about 30 % of first- and second-generation migrant workers experience stress at work always or most of the time (Figure 20).

¹⁰ Details of these analyses can be found in the Annex B on regression analysis on EWCS data.

Figure 20: Workers reporting experiencing stress at work, by country of birth, EU-28, 2015 (%)

Note: workers include employees and the self-employed who work at least 12 hours per week. First-generation migrants are workers born abroad and second-generation migrants are workers born in the country where they are working and with at least one parent born in another country. Native workers are all other workers.

$N = 26,063$ (native workers); $N = 2,770$ (first-generation migrants); $N = 1,407$ (second-generation migrants).

Source: Panteia based on the sixth (2015) wave of the EWCS.

3.3.3 Exposure to physical, organisational and psychosocial risk factors

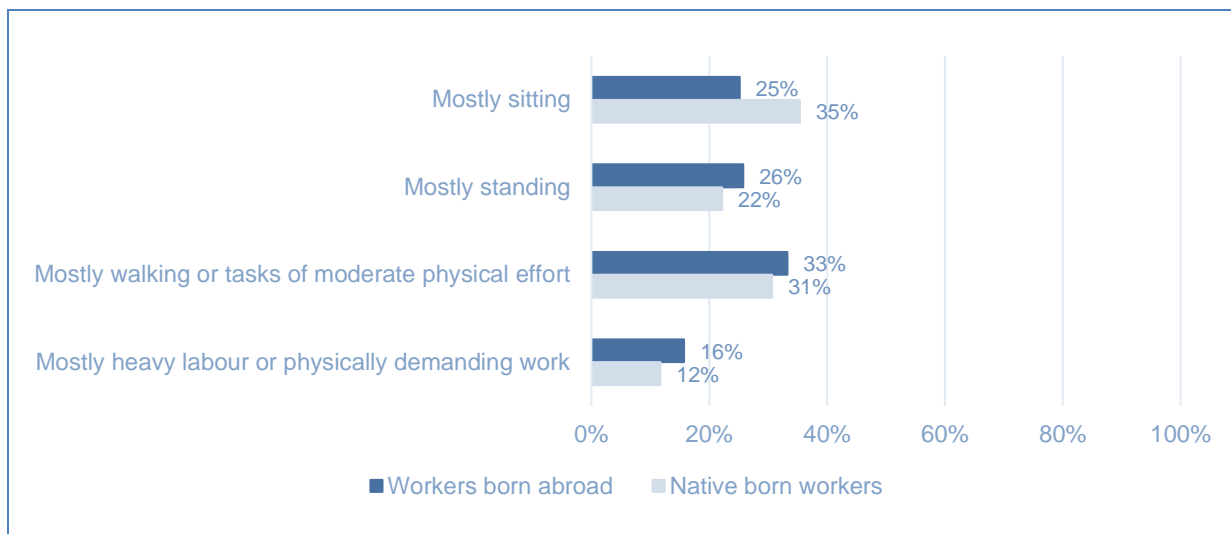
As illustrated in the conceptual framework presented in Chapter 2 of this report, the risk of individual workers developing MSDs is affected by the content of their work and the tasks they carry out, including how this work is organised and managed. Two main categories of risk factors are considered in the analysis: physical risk factors and organisational and psychosocial risk factors. In this subsection we report the available information regarding the extent to which migrant workers are exposed to these risk factors.

Physical risk factors

Many studies have shown that migrant workers are more frequently exposed to physical risk factors than native workers. For example, a study covering 31 European countries found that migrant workers are more exposed to vibrations, painful positions, carrying heavy loads, standing and walking than native workers (Sterud et al., 2018). Moyce and Schenker (2018) report that migrant workers are more likely to be exposed to environmental hazards at the workplace such as toxins, extreme temperatures, pesticides and chemicals. A study by Eurofound showed that migrant workers are more exposed not only to physical risks, but also to accidents at work (Eurofound, 2007).

These findings are supported by data from more recent European surveys. According to the EU-SILC, migrant workers (defined as workers born in another country) are more likely than native-born workers to do mostly heavy labour or physically demanding work (16 % versus 12 %). The data also show that migrant workers are more likely to perform tasks that involve mostly standing or mostly walking, or tasks requiring moderate physical effort. On the other hand, native-born workers are more likely to perform tasks that involve mostly sitting, commonly associated with office-based jobs (Figure 21).

Figure 21: Main posture and level of physical effort among workers, by country of birth, EU-28, Switzerland, Iceland and Norway, 2017 (%)



Note: workers include employees and the self-employed.

$N = 19,741$ (workers born abroad); $N = 186,884$ (native-born workers).

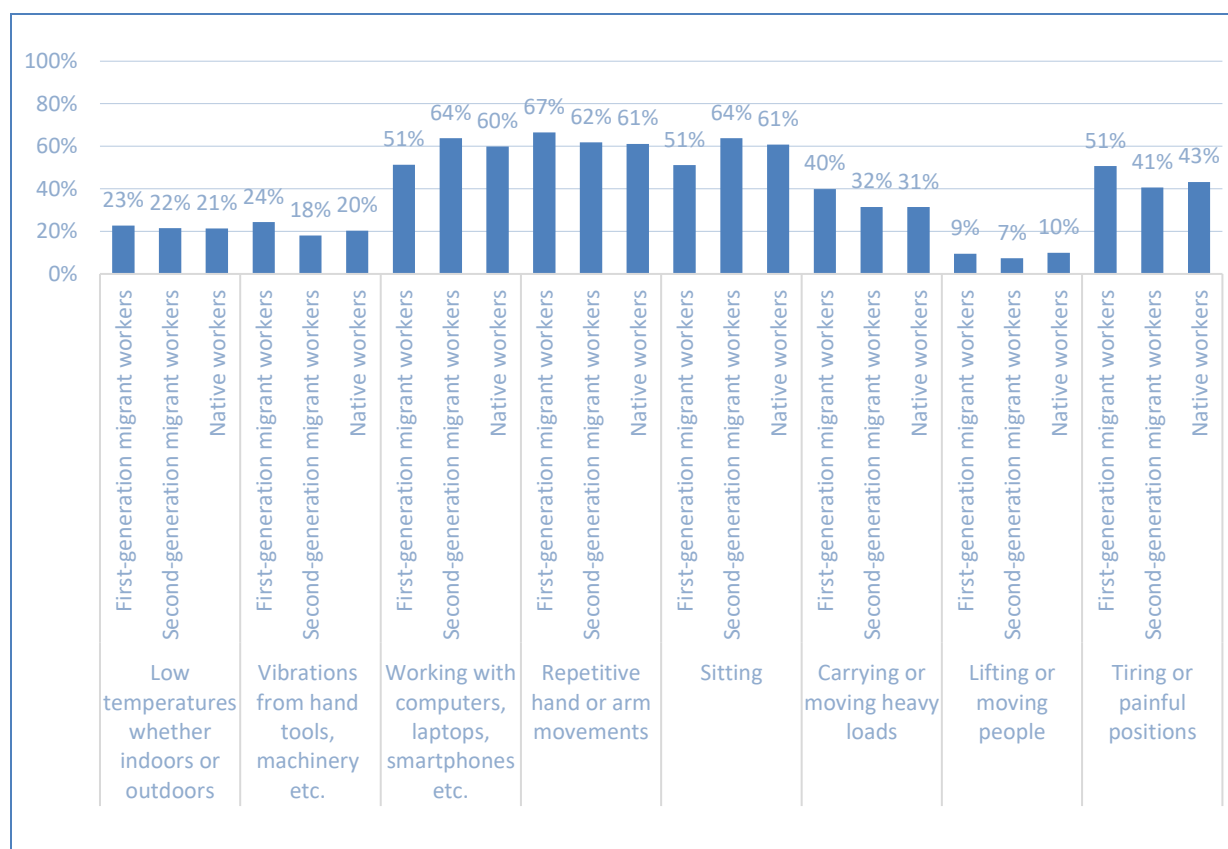
Source: IKEI/Panteia based on the European Union Statistics on Income and Living Conditions (EU-SILC) 2017. In the case of Switzerland and Iceland, data are for 2016.

Information on more specific physical risk factors which are related to MSDs is provided by the EWCS. The sixth wave of the EWCS in 2015 includes information on the prevalence of eight different physical risk factors, which can be compared for first-generation workers, second-generation workers and native workers (Figure 22). According to the available results, first-generation migrant workers report that they are exposed to physically demanding work more often than other workers (including both second-generation migrant workers and native workers). This result may suggest that first-generation migrant workers are more likely than native-born workers to mostly carry out heavy labour or physically demanding work.

The physical risk factors at work to which migrant workers are exposed for at least a quarter of their working time are:

- repetitive hand or arm movements;
- carrying or moving heavy loads;
- working in tiring or painful positions;
- vibrations from hand tools, machinery, etc.;
- working in low temperatures.

This is consistent with the finding that migrant workers are more likely than native-born workers to do mostly heavy labour or physically demanding work.

Figure 22: Workers reporting exposure to different physical risk factors at their work at least a quarter of the time, by country of birth, EU-28, 2015 (%)

Note: workers include employees and the self-employed who work at least 12 hours per week. First-generation migrants are workers born abroad and second-generation migrants are workers born in the country where they are working and with at least one parent born in another country. Native workers are all other workers.

$N = 2,787$ to $2,792$ (first-generation migrants); $N = 1,408$ to $1,411$ (second-generation migrants); $N = 26,185$ to $26,219$ (native workers). The hypothesis that physical working conditions are independent of country of birth is rejected for all physical working conditions.

Source: IKEI/Panteia based on the sixth (2015) wave of the EWCS.

In this sense, and according to this data source, first-generation migrants are particularly likely to be exposed to carrying or moving heavy loads and to working in tiring or painful positions. The survey data also show that 40 % of first-generation migrants spend at least a quarter of their time carrying or moving heavy loads, compared with 32 % of second-generation workers. Furthermore, the 2015 EWCS reports that 51 % of first-generation migrants spend at least a quarter of their time in tiring or painful positions, compared with 41 % of second-generation migrants and 43 % of native workers.

Similarly, the finding that second-generation migrant workers and native workers are more likely to be employed in jobs that are mostly carried out when seated is consistent with the fact that they are more frequently employed in high-skilled and office-based jobs that involve working with computers, laptops, etc., for at least a quarter of their working time.

Exposure to the risks associated with lifting or moving people for at least a quarter of the time affects a smaller proportion of workers, but native-born workers are more frequently exposed than the first- or second-generation migrant workers.

Findings from the EU LFS ad hoc module on OSH also reveal a difference in exposure to physical risk factors between migrant workers (born in another country, either within or outside the EU-28) and native-born workers. The EU LFS investigates exposure to a set of six risk factors. The evidence shows

that migrant workers are slightly more likely than native-born workers to report being exposed to any of the physical risk factors (Table 3).

Table 3: Workers reporting being exposed to physical risk factors at work, by country of birth, EU-28 and Norway, 2013 (%)

| Risk factor | Workers born in another EU Member State (%) | Workers born outside the EU-28 (%) | Native-born workers (%) | Total (%) |
|---|---|------------------------------------|-------------------------|-----------|
| Not exposed to any of physical risk factors | 42 | 41 | 39 | 40 |
| Exposed to at least one of these risk factors, the most important one being | | | | |
| Difficult work postures or work movements | 14 | 16 | 15 | 15 |
| Activities involving strong visual concentration | 12 | 9 | 13 | 13 |
| Handling of heavy loads | 1 | 13 | 11 | 11 |
| Risk of accidents | 9 | 10 | 11 | 11 |
| Chemicals, dust, fumes, smoke or gases | 8 | | 7 | 7 |
| Noise or strong vibration | 4 | | 5 | 5 |
| Total | 100 | 100 | 100 | 100 |

Note: workers include employees and the self-employed.

N = 17,367 (workers born in another Member State); *N* = 20,509 (workers born outside the EU-28); *N* = 357,743 (native-born workers).

Source: IKEI/Panteia based on the EU LFS ad hoc module on OSH (2013). No microdata are available for Germany and the Netherlands.

Organisational and psychosocial risk factors

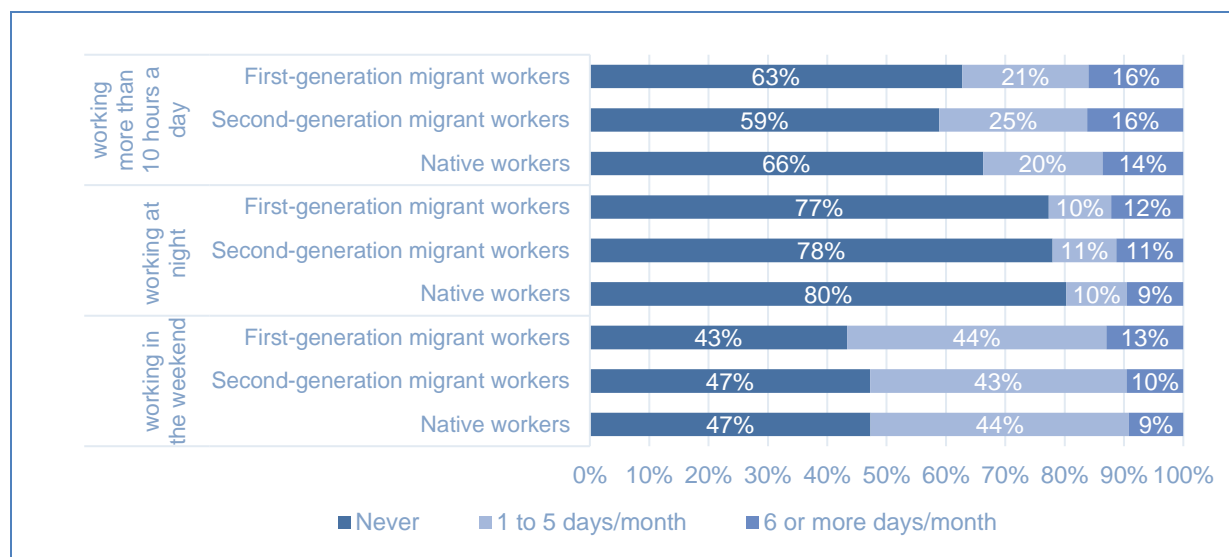
As discussed in the conceptual framework presented in Chapter 2, in addition physical risk factors, organisational and psychosocial risk factors may also be associated — alone or in combination — with a higher risk of developing MSD-related problems.

In this regard, and as far as organisational risk factors are concerned, several studies have shown that migrant workers are exposed more often than native workers to this type of factor, including poorer contractual conditions or working time arrangements.

For example, a study has found that migrants applying for low-paid jobs are often recruited through informal and even illegal channels, which are usually associated with poorer working conditions and greater employer discretion (Buller et al., 2015, p. 10), as well as involuntary or forced acceptance of these poorer working conditions by migrant workers (Daly et al., 2018). In addition, migrant workers are more likely than native workers to have temporary job contracts (Moyce and Schenker, 2018). Other studies confirm that migrant workers more often than the native workforce have temporary work contracts or are working without contracts (Yanar et al., 2018). Moreover, several authors argue that migrant workers are often very dependent on their primary employer (contract holder) and therefore less critical of occupational safety issues (Buckley et al., 2016).

In terms of working time arrangements, migrant workers work longer hours (Eurofound, 2007). This result is also confirmed by data from the sixth wave of the EWCS, which show that first-generation migrant workers are more likely than native workers (but less likely than second-generation migrants) to work more than 10 hours per day and are also more likely than the other groups to work at night or at the weekend (Figure 23).

Figure 23: Workers by working time arrangements, by country of birth, EU-28, 2015 (%)



Note: workers include employees and the self-employed who work at least 12 hours per week. First-generation migrants are workers born abroad and second-generation migrants are workers born in the country where they are working and with at least one parent born in another country. Native workers are all other workers.

$N = 2,782$ to $2,786$ (first-generation migrants); $N = 1,407$ to $1,409$ (second-generation migrants); $N = 26,149$ to $26,189$ (native workers). The hypothesis that working time arrangements are independent of country of birth is rejected for all working time arrangements.

Source: IKEI/Panteia based on the sixth (2015) wave of the EWCS.

Organisations can reduce the extent to which employees are exposed to risk factors or improve the way in which employees deal with these risk factors (in order to reduce the chance that exposure to these risk factors results in accidents or illness). One way to do so is by providing OSH training. Caffaro et al. (2018) reviewed several publications on the effectiveness of OSH training for migrant farm workers. This study highlights the importance of training of migrant farm workers on how to deal with dangerous situations. The majority of the OSH training programmes reviewed had little or no impact, but a few programmes resulted in considerable improvement in the migrants' participation and enthusiasm. Another study focusing on the construction sector emphasised the need for site-specific induction and local translators/interpreters (Tutt et al., 2011).

As far as psychosocial risk factors are concerned, there is solid evidence of higher exposure of migrant workers to this group of risk factors, including bullying, threats, verbal abuse, discrimination and harassment.

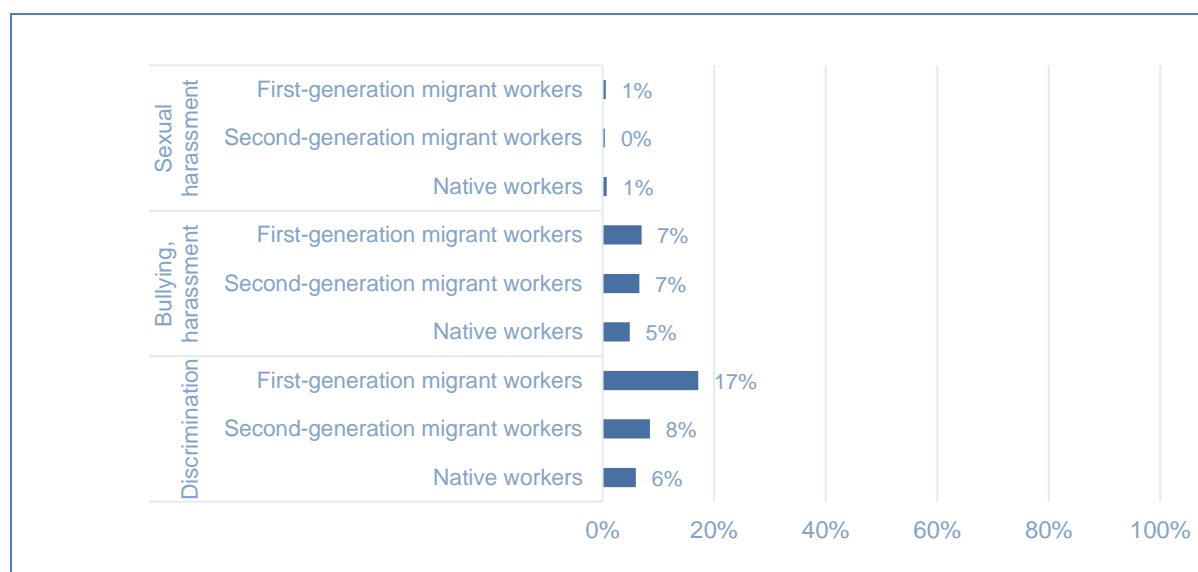
As already mentioned in Chapter 2, workplace discrimination can take many different forms, both formal (discrimination in the areas of hiring, promotion opportunities and compensation) and interpersonal (occurring during everyday workplace social interactions with colleagues and superiors and manifested in negative verbal and non-verbal behaviours) (Dhanani et al., 2018). Sterud et al. (2018) found that the prevalence of perceived discrimination or bullying is consistently higher among migrant workers than among native workers. In addition, a Spanish study found that 73 % of male and 69 % of female immigrants reported discrimination due to their immigrant status (Agudelo-Suárez et al., 2011). Similar findings on bullying and discrimination have been by other authors (Giaccone and Di Nunzio, 2015;

Capasso et al., 2018). In addition, migrant workers have fewer opportunities for training and career advancement than nationals (Eurofound, 2007).

Also of interest is that some groups of migrant workers are particularly affected by discrimination practices. According to Eurofound, this is especially the case for migrant women, who suffer discrimination at work on two or even three counts: gender, origin and class (Eurofound, 2007). Similarly, other studies report that women migrants are more often than their male counterparts exposed to sexual harassment and discrimination in the workplace, probably explained by the fact that women migrants are segregated in sectors and occupations where they come into close contact with clients (Rospenda et al., 2009; Moyce and Schenker, 2018). Another particularly discriminated group are migrants from predominantly Islamic countries, who nowadays often face suspicion and prejudice in European societies, with negative effects on their employment prospects (Eurofound, 2007).

Findings from the sixth wave of the EWCS are consistent with the findings from the above-mentioned studies. In 2015, 17 % of first-generation migrant workers reported being subjected to discrimination in the past year, compared with 8 % of second-generation migrant workers and 6 % of native workers. The difference between first-generation and second-generation migrant workers is considerably larger than between second-generation workers and native workers. First-generation migrant workers also reported being more often subjected to bullying and harassment in the past year than native workers, but the difference was much smaller than in the case of discrimination. In this regard, there was no difference between first-generation and second-generation migrant workers (Figure 24).

Figure 24: Workers reporting being subject to discrimination, bullying and (sexual) harassment in the past year, by country of birth, EU-28, 2015 (%)



Note: workers include employees and the self-employed who work at least 12 hours per week. First-generation migrants are workers born abroad and second-generation migrants are workers born in the country where they are working and with at least one parent born in another country. Native workers are all other workers.

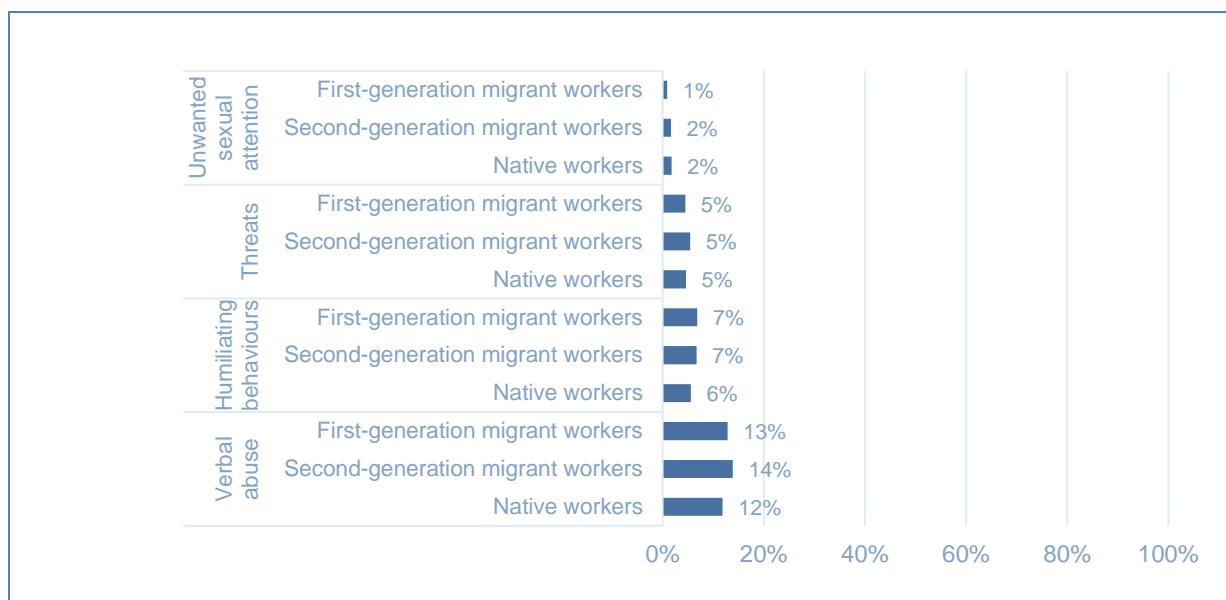
$N = 2,761$ to $2,786$ (first-generation migrants); $N = 1,402$ to $1,409$ (second-generation migrants); $N = 26,055$ to $26,195$ (native workers). The hypothesis that working conditions are independent of country of birth is accepted only for sexual harassment.

Source: IKEI/Panteia based on the sixth (2015) wave of the EWCS.

Migrant workers are often confronted with poor social relations at work and poor communication with superiors and colleagues, as well as a lack of social recognition (Hviid et al., 2012). Mucci et al. (2020) found that migrant workers are particularly exposed to discrimination and to verbal or physical abuse at work, and this on top of other traumatic experiences, such as loss of social status, discrimination outside work and separation from family. Data from the EWCS show that migrant workers are also more

frequently exposed to other psychosocial risk factors, particularly verbal abuse and humiliating behaviours (Figure 25).

Figure 25: Workers reporting being subject to verbal abuse, humiliating behaviours, threats and unwanted sexual attention in the past month, by country of birth, EU-28, 2015 (%)



Note: workers include employees and the self-employed who work at least 12 hours per week. First-generation migrants are workers born abroad and second-generation migrants are workers born in the country where they are working with at least one parent born in another country. Native workers are all other workers.

$N = 2,782$ to $2,786$ (first-generation migrants); $N = 1,407$ to $1,409$ (second-generation migrants); $N = 26,149$ to $26,189$ (native workers). The hypothesis that working conditions are independent of country of birth is accepted only for threats.

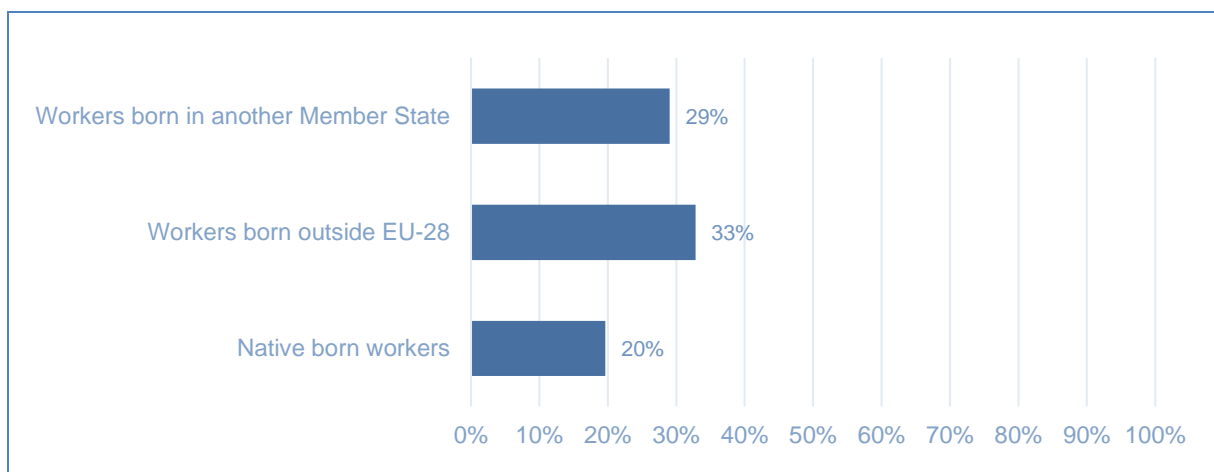
Source: IKEI/Panteia based on the sixth (2015) wave of the EWCS.

Discrimination against migrants is reported not only among workers, but also by job seekers. For instance, Kalter and Kogan (2006) found that young non-EU migrants in Spain and Belgium find it more difficult than their native-born counterparts to enter the labour market, and that this is largely explained by prejudice.

Some studies argue that migrant workers are particularly constrained by problems related to a lack of general knowledge of their new country (in terms of social habits, OSH standards, etc.) (Sergeant and Tucker, 2009; Starren and Drupsteen, 2017), which may have a negative impact on their working and health conditions. In addition, migrant workers often find that the experience and skills obtained in their home country are not officially recognised in their new country of residence (Institute for Work and Health, 2018). As a result, migrant workers are more likely to be in a job for which they are overqualified in their host country, with negative consequences for their job satisfaction and engagement, as well as their self-reported health (Eurofound, 2007; Sterud et al., 2018). All these elements may explain the difficulties that migrant workers experience when attempting to access to high-level occupations and job positions (Sergeant and Tucker, 2009).

Data from the EU LFS ad hoc module on migrants show that — in line with the above-mentioned studies — 29 % of migrant workers born in another EU Member State and 31 % of those born outside the EU report being overqualified for their job, well above the 20 % of native-born workers who report the same (Figure 26).

Figure 26: Workers who consider themselves overqualified for their current main job, by country of birth, EU-28 (excluding Germany and the Netherlands), 2014 (%)



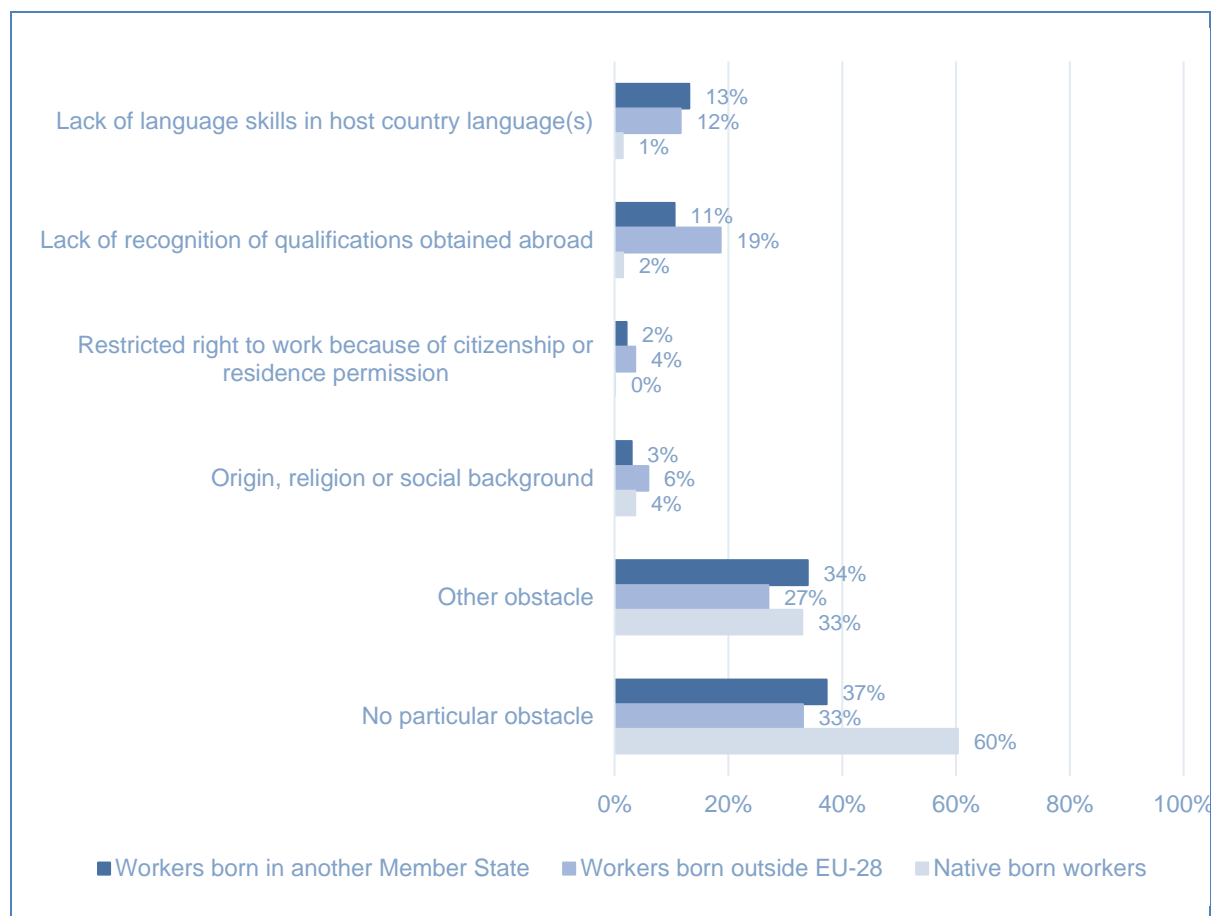
Note: workers include employees and the self-employed.

N = 10,103 (workers born in another EU Member State); N = 14,880 (workers born outside the EU-28); N = 297,609 (native-born workers).

Source: IKEI/Panteia based on the EU LFS ad hoc module on migrants (2014). No microdata are available for Germany and the Netherlands.

The relatively high levels of overqualification among workers born outside the EU-28 may be partly explained by inability to speak the local language adequately (Sergeant and Tucker, 2009), as highly skilled occupations tend to require a better understanding of the local official language than low-skilled, manual jobs. This issue is also recognised as an obstacle by migrant workers themselves, as demonstrated by the EU LFS ad hoc module on migrants: asked about the main obstacle to having a job that corresponds to their level of qualifications, migrant workers born outside the EU were most likely to cite their lack of language skills or the failure of potential employers to recognise qualifications obtained abroad. It is worth noting that the proportion of migrant workers who reported no particular obstacle to getting a job corresponding to their qualifications was a little more than half the proportion of migrant workers who did so (60 %) (Figure 27).

Figure 27: Main reported obstacle to getting a job commensurate with their qualifications among workers reporting being overqualified for their current main job, by country of birth, EU-28 (excluding Germany and the Netherlands), 2014 (%)



Note: workers include employees and the self-employed. Questions about the obstacles to getting a suitable job were asked only of workers who considered themselves overqualified for their current job.

N = 2,551 (workers born in another EU Member State); N = 4,114 (workers born outside the EU-28); N = 2,192 (native-born workers).

Source: IKEI/Panteia based on the EU LFS ad hoc module on migrants (2014). No microdata re available for Germany and the Netherlands.

It is worth mentioning that some authors believe that some groups of migrant workers, especially non-European workers, have different OSH-related values and perceptions from native workers. They attribute this to limited awareness of work-related risks among migrant workers and propose that this may expose them to higher risks (Sergeant and Tucker, 2009), especially if they have limited access to the training opportunities (Eurofound, 2007) that would provide them with the required knowledge of OSH risks on the workplace.

3.3.4 Employment segregation patterns

The prevalence of MSDs among migrant workers is associated with exposure to a number of risk factors, as discussed in the previous section, which in turn are linked with employment segregation patterns among both sectors (horizontal segregation) and occupations (vertical segregation), as also shown in the conceptual framework presented in Chapter 2.

Sectoral segregation

Existing data and literature confirm that migrant workers are more likely to work in specific sectors, including manufacturing, mining and energy; wholesale and retail trade; hotels and restaurants; health and social work; and, finally, household services (Eurofound, 2007; Starren and Drupsteen, 2017).

It is worth mentioning that, although agriculture is not included in this list, the contribution of migrant workers to agriculture may be greater than official statistics would suggest, as temporary and undeclared migration flows, which are particularly relevant in this employment sector, are not included in such statistics (Eurofound, 2007, p. 27). Agriculture is one of the sectors more frequently associated with a higher risk of MSDs. Farmers and farm workers experience high rates of disorders of the lower back, shoulder and upper extremity. A study on ergonomic risks in the United States found that MSDs may disproportionately affect young and migrant farm workers as a result of the types of tasks performed. The authors speculated that a higher risk of MSDs among migrant farm workers may be the result of long days of hard physical work in a reduced amount of time (e.g. the harvesting period) with few days off and limited time to acclimatise to the high physical demands (K. G. Davis and Kotowski, 2007).

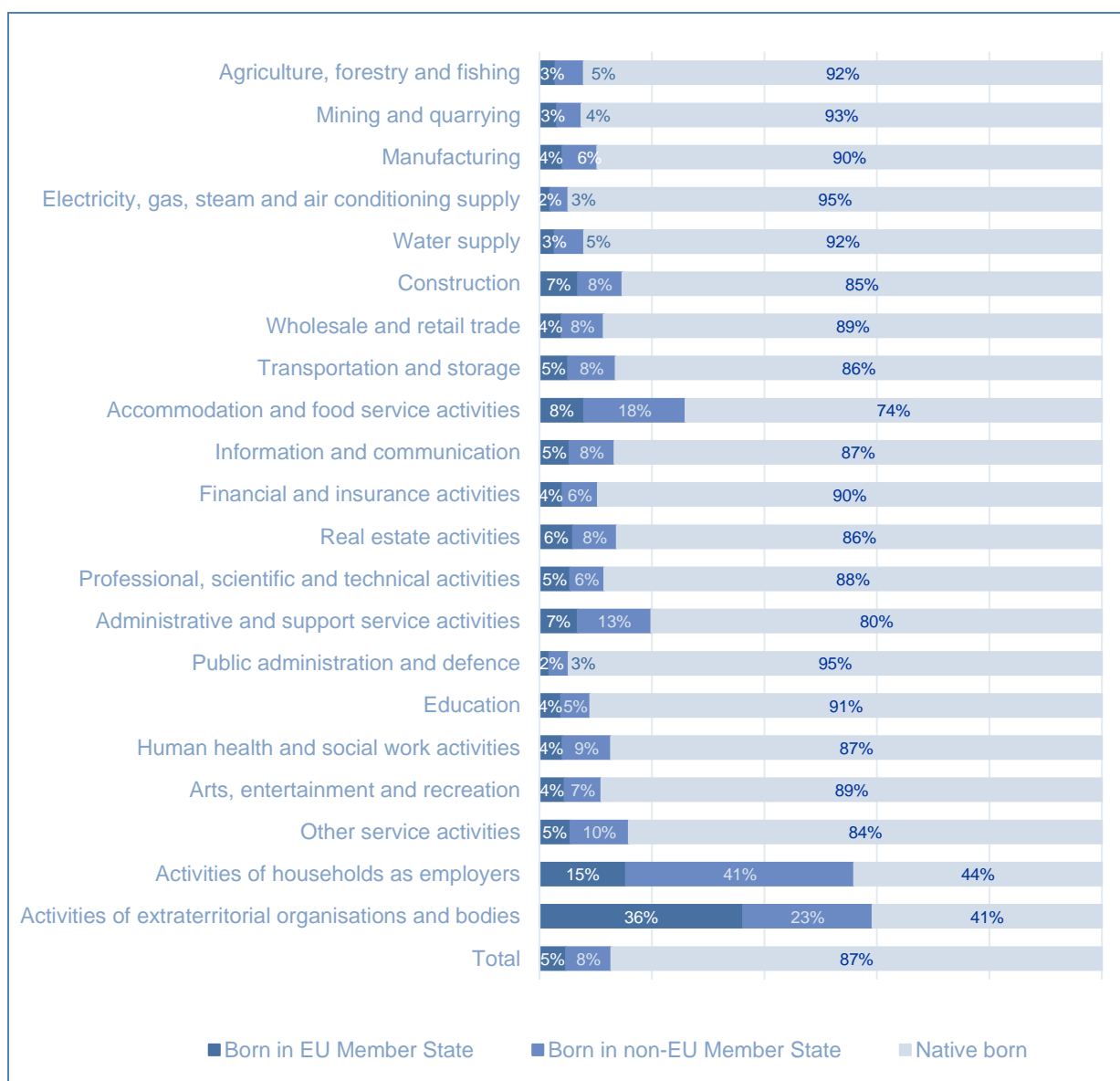
Other studies also indicate a high incidence of migrant workers in the construction sector, where they also undertake the most dangerous tasks within the sector (N. Davis and Gibb, 2009).

EU LFS data allow us to identify the sectors in which workers with a migrant background are more likely to be employed (Figure 28). These sectors include, as might expected, activities of extraterritorial organisations and bodies, but also activities of households as employers (56 % of all employed workers in this sector are migrants), accommodation and food service activities (26 %), administrative and support services (20 %), other services (15 %), construction (15 %) and, finally, human health and social work activities (13 %). The available data also allow us to distinguish between migrant workers from another EU Member State and workers from outside the EU.

Occupational segregation

In terms of occupations (vertical segregation), EU LFS data from 2018 confirm that migrant workers, wherever they were born, are more likely to be employed in low-skilled or unskilled jobs, which are more frequently associated with poor working conditions and higher risks for the worker, the so-called '3D' jobs: dirty, dangerous and demanding (Eurofound, 2007). According to EU LFS data, low-skilled migrants are commonly employed as cleaners and helpers, agriculture, forestry and fishery labourers, labourers in mining, construction, manufacturing and transport, food preparation assistants, street and related sales and service workers, and refuse workers. Migrants are also (although much less frequently) employed in a number of medium-skilled occupations, including personal service workers, personal care workers, building and related trades workers. The data show that migrant workers account for much lower proportions of high-skilled jobs (Figure 29).

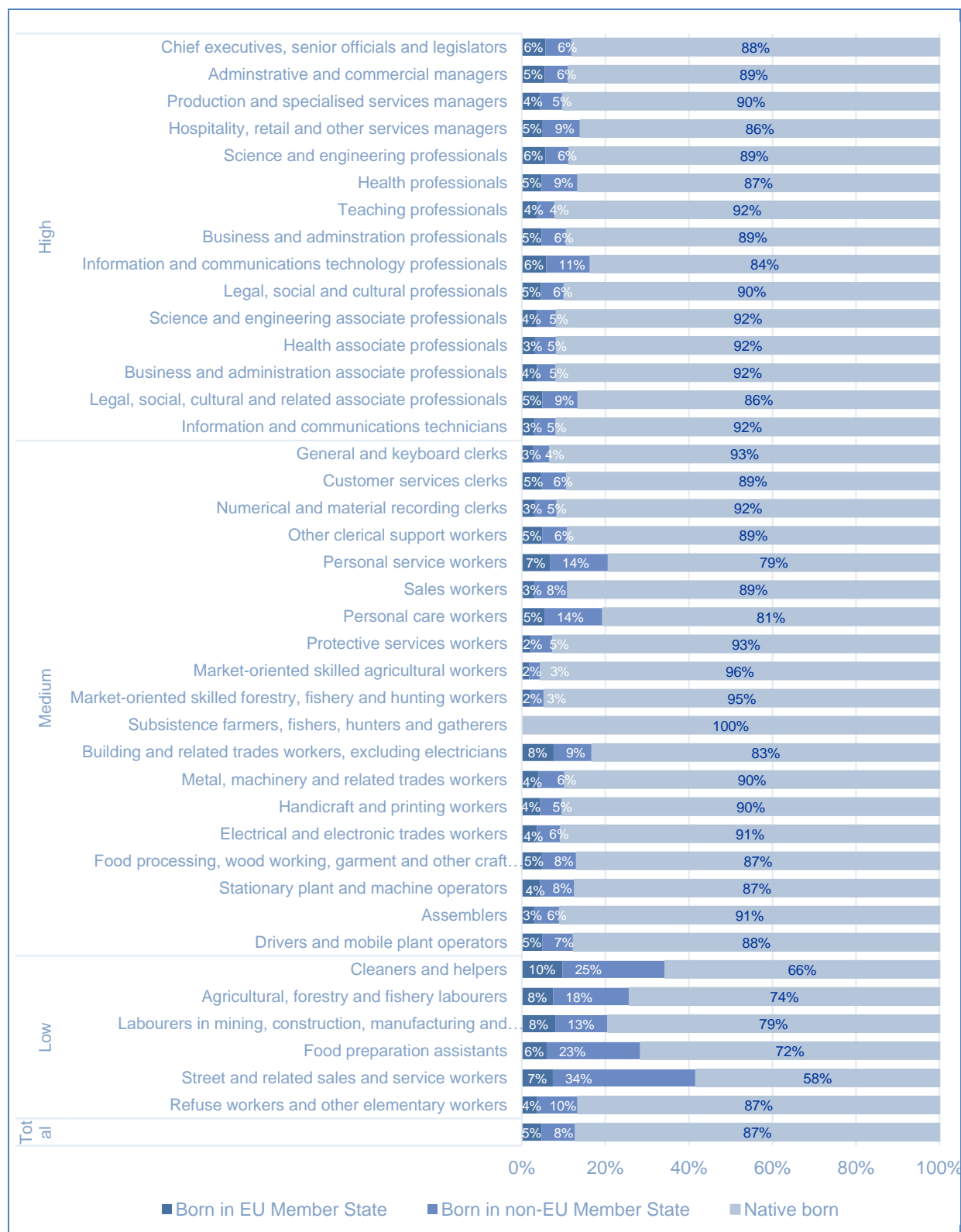
Figure 28: Workers by country of birth and sector (Statistical Classification of Economic Activities in the European Community, NACE, rev. 2), EU-28, 2018 (%)



Note: workers include employees and the self-employed.

$N = 1,255,501$ (native-born workers); $N = 59,568$ (workers born in another EU Member State); $N = 86,263$ (workers born outside the EU-28)

Source: IKEI/Panteia based on the EU LFS 2018.

Figure 29: Workers by country of birth and occupation (ISCO, 2008), EU-28, 2018 (%)


Note: workers include employees and the self-employed.

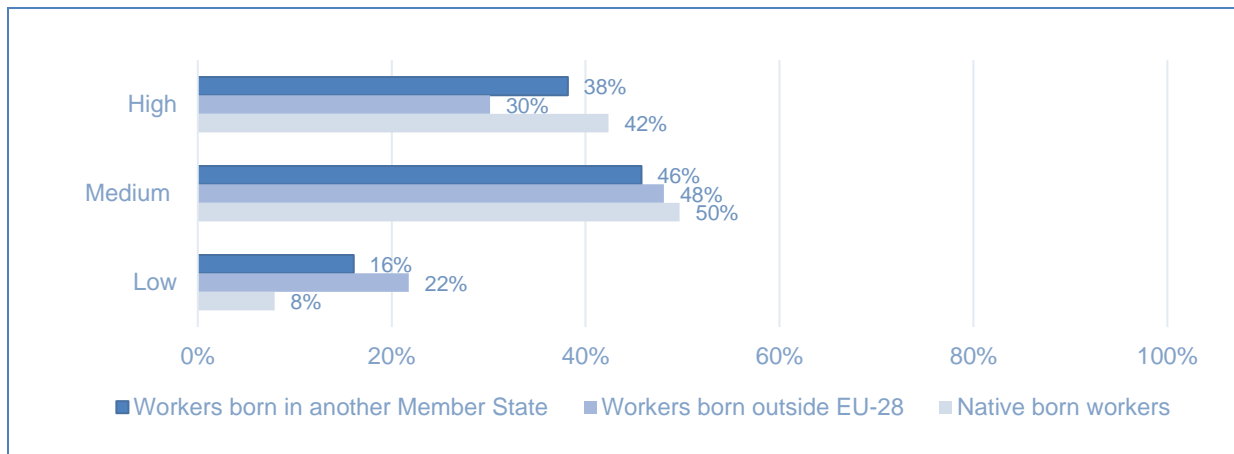
$N = 1,241,617$ (native-born workers); $N = 59,482$ (workers born in another Member State); $N = 86,552$ (workers born outside EU-28).

Source: IKEI/Panteia based on the EU LFS 2018.

The available literature suggests that, within any particular sector, migrant workers are more likely to work in low-skilled jobs, usually explained by the reluctance of native workers to work in low-paid, unskilled, arduous and hazardous jobs. This higher presence in low-skilled occupations results in higher levels of occupational instability and job insecurity, as well as higher risks of accidents and lower salary levels (Eurofound, 2007).

The lower presence of migrant workers in medium/high-skilled occupations is also confirmed by the data from the EU LFS survey showing that 22 % of non-EU migrant workers and 16 % of EU migrant workers are employed in low-skilled jobs, compared with only 8 % of native workers (Figure 30).

Figure 30: Workers by country of birth and occupation levels (ISCO, 2008), EU-28, 2018 (%)



Note: workers include employees and the self-employed.

$N = 1,241,617$ (native-born workers); $N = 59,482$ (workers born in another EU Member State); $N = 86,552$ (workers born outside the EU-28).

Source: IKEI/Panteia based on the EU LFS 2018.

Similarly, Sergeant and Tucker (2009) report that many migrants work in jobs and sectors with poor psychosocial and safety conditions and, therefore, are highly exposed to both physical and psychosocial risk factors. Unsurprisingly, some of the sectors and occupations with a high presence of migrant workers are also sectors associated with a high risk of MSDs.

Finally, there is also evidence of employment segregation based on country of origin, in that migrant workers from the same country seem to be particularly present in some specific sectors and occupations within a given reception country (Eurofound, 2007).

3.3.5 Exposure to risks and prevalence of MSDs

There is some evidence of a link between physical, organisational and psychosocial risks factors and a higher prevalence of MSDs among migrant workers. In this regard, one of the most recent studies, based on a comprehensive review of international literature, concluded that migrants experience a range of physical and psychiatric comorbidities, and that workplace injuries and accidents are relatively common (Hargreaves et al., 2019).

As regards MSDs specifically, Hargreaves et al. (2019) found that a higher prevalence of musculoskeletal injury among migrant workers is associated with several factors, including older age (> 40 years), poor health status, working unsociable or long hours (more than 40 hours per week), heavy workload, use of problematic and unreliable machinery, working in some specific sectors (such as agriculture), the need to adopt awkward postures or to stand for prolonged periods at work and, finally, a poor work safety climate. Interestingly, these authors suggest that MSDs are also often

associated with other psychosocial risks, such as depression and stressful situations (Hargreaves et al., 2019). The regression analyses of the EWCS data discussed in section 3.2.2 are in line with some of the findings of this study, for example that the likelihood of reporting MSDs increases with age and number of hours worked (see Box 3).

Furthermore, a recent Canadian study found that psychosocial factors to which migrant workers are frequently exposed, such as time pressure, double shifts, job demand, cultural factors and/or role expectations, also influence the onset of MSDs (Shi et al., 2016). A recent study on domestic migrant workers employed by households found that this group is at high risk of occupational safety and health problems in general, and of MSDs in particular. This is explained by a number of interrelated reasons, including discrimination, long working hours and lack of rest, hazardous work practices, physically strenuous labour and poor ergonomic conditions, irregular employment status and exposure to sexual abuse and violence (ILO, 2016).

For this study, we further examined the relationships among discrimination, high occupational safety and health risks and migrant status using EWCS data. Our results indicate that first-generation migrants are more likely to report MSDs of various types because they are faced with discrimination more often and because they are more likely to work in sectors and occupations with a higher MSD risk (Box 4).

Box 4: Mediation in the relationship between country of birth and reporting of MSDs¹¹

As previously mentioned, many studies have attempted to identify associations between potential risk factors and the prevalence of MSDs. In this study, we used data from the sixth wave of the EWCS to identify risk factors associated with an increased prevalence of MSDs among migrant workers. The sixth wave of the EWCS includes indicators of three different types of MSDs, as well as indicators of many different risk factors as well as discrimination and various control variables. This box focuses on the relation between migrant status of workers and the likelihood of reporting MSDs, with the aim of determining if this relationship is mediated by discrimination, sector and/or occupation.

Logistic regressions analyses were carried out to relate the likelihood of reporting MSDs (codified as the dependent variable) during the past year with these explanatory variables. were performed on the subsample of all workers residing in an EU-28 Member State, aged 18-65 years, who worked at least 12 hours per week in their main job. This subsample contained 31,662 respondents. As a first step, a regression model was estimated to establish the intensity of the relation between the prevalence of MSDs and the following sociodemographic variables: country of residence, age, educational level, gender, migrant status and hours worked. Focusing on migrant status, the results showed that first-generation migrant workers are significantly more likely than native workers to report any of the three categories of MSDs. In the case of second-generation migrant workers, the difference with native workers is much smaller. One possible explanation for this migrant effect on MSDs is discrimination. As previously mentioned, migrant workers are more likely than native workers to face discrimination. Discrimination, in turn, can have negative effects on workers' health, including musculoskeletal complaints. In the second step, to examine this relationship, available indicators on discrimination (and other types of unwanted behaviour at work, such as verbal abuse, unwanted sexual attention, threats and humiliating behaviours) were added to the regression model. First, the results confirm that perceived discrimination increases the likelihood of reporting musculoskeletal complaints (for all three types of MSDs, the significance level of the estimated parameter for discrimination is less than 1 %). In addition, the results show that the relationship between migrant status and MSDs becomes less strong. This suggests that higher levels of discrimination are one explanation for the finding that first-generation migrants are significantly more likely than native workers to report MSDs. In the third step, dummy variables on sector and occupation were added to the regression model. The results show that the prevalence of MSDs does indeed vary between sectors and occupations. The results also show that the relationship between migrant status and the likelihood of reporting MSDs is mediated by sector, occupation and discrimination (and other types of unwanted behaviour at work): once indicators for sector, occupation and discrimination are added to the regression model, the estimated parameter for first-generation (and second-generation) migrants is no longer statistically significant.

¹¹ Details of these analyses can be found in Annex B on regression analysis on EWCS data.

3.3.6 Summary

Migrant workers report a poorer health situation and a lower quality of life than native workers, as well as a higher prevalence of labour accidents. The literature also identifies a so-called 'healthy migrant effect', the phenomenon that newly arrived migrants usually have better health than their national counterparts (mainly explained by the fact that they are usually young), although this advantage tends to disappear with time. Despite this, MSDs are a major health concern among the migrant workforce, and migrant workers are more likely than native workers to report MSDs.

The development of work-related MSDs is linked to the physical and psychosocial and organisational risk factors to which many migrant workers are frequently exposed at work. In this regard, migrant workers are particularly exposed to physical risks at work, particularly carrying/moving heavy loads, the need to adopt forced and awkward tiring postures or perform repetitive movements, as well as to other environmental hazards that are often directly related to the prevalence of MSDs.

Migrant workers are exposed more often than native workers to several organisational and psychosocial risk factors, including poorer/informal contractual conditions, poorer salary conditions, reduced access to jobs, training or career advancement and less favourable working time arrangements; for instance, migrants are more likely to be required to work long hours or at weekends and at night. There is also a strong evidence showing that migrant workers are more exposed to discrimination and harassment from superiors and colleagues, as well as verbal/physical abuse, while women migrants are also more exposed to sexual harassment. Specifically, the research shows a positive relationship among migrant workers between experiences of discrimination and the likelihood of reporting different types of MSDs.

In addition, migrant workers are exposed to other psychosocial risks, including a lack of knowledge of the social habits/OSH standards of their host country, insufficient language skills and reduced access to local health services. In addition, failure of employers to recognise the experience and skills they have obtained in their home country can lead to migrants being overqualified for their job.

These results are partly explained by the employment segregation patterns among migrant workers, who are often employed in specific sectors and occupations characterised by a higher exposure to physical and psychosocial MSD-related risk factors (the so-called '3D' jobs: dirty, dangerous and demanding). There is also evidence of segregation based on country of origin.

3.4 LGBTI workers

3.4.1 Introduction

The available evidence on working conditions and OSH issues among lesbian, gay, bisexual, transgender and intersex (LGBTI) workers is rather limited as LGBTI workers have become the subject of social research only relatively recently. This is because it is only in the last 10-15 years that LGBTI workers have acquired visibility in a number of EU countries as a result of a changes in attitude, increased activism and the introduction of equality and anti-discrimination legislation to protect LGBTI workers against discrimination. Despite this increased visibility, the working and OSH conditions of LGBTI workers remain largely underinvestigated and significant data and research gaps exist. Two main reasons can be suggested for this.

First, surveys and other systematic collections of data among the working population are not routinely designed to investigate this minority group, and as a result they do not normally ask respondents about their sexual or gender identity. The lack of large-scale representative data makes it difficult to carry out analysis and studies on the working conditions and OSH of LGBTI workers, including MSD-related issues.

Second, LGBTI workers continue to experience discrimination, bullying, harassment and other psychosocial risks in the workplace, leading LGBTI workers to try to minimise their visibility in order to reduce or manage such risks as much as possible. This contributes to turning them into a hidden, hard-to-reach group that is not easy to investigate.

Box 5: LGBTI population size and issues of measurement

According to Organisation for Economic Co-operation and Development (OECD) estimates, in 2019 between 1 % and 4 % of the adult population in OECD countries considered themselves to be either lesbian, gay or bisexual (OECD, 2019). The reported percentages vary between countries, perhaps because different countries rely on different methods to identify LGBTI individuals. For example, questions used in surveys ask about the respondent's sexual self-identification, their sexual behaviour or their sexual attraction, and these different questions lead to different results (OECD, 2017).

Fewer countries record the number of transgender persons. However, available estimates suggest that transgender persons account for a considerably lower proportion of the population than lesbians, gay men or bisexual women or men. The OECD (2019) reports that three OECD countries (Denmark, the United States and Chile) use one of their nationally representative samples to collect information on gender identity. Estimates from these countries suggest that the proportion of transgender persons in the adult population varies from 0.1 % to 0.3%.

Least is known regarding the proportion of intersex persons in the population. None of the nationally representative population surveys of OECD countries includes questions on respondents' intersex status (OECD 2019, p. 15).

Until now, transgender and intersex persons have tended to be ignored in most population surveys. Nor are transgender and intersex persons covered by existing anti-discrimination legislation. In the EU, employment discrimination based on sexual orientation is prohibited, and by the beginning of 2020 all EU-28 Member States had transposed the relevant EU directive¹² into their national legislation. Although the EU directive explicitly mentions gay, lesbian and bisexual persons, it does not mention transgender and intersex persons (Fric, 2016, p. 1).

It is also important to stress that individuals grouped under the label LGBTI do not constitute a homogeneous group, and social exclusion, marginalisation and experiences of discrimination, as well as specific needs, vary considerably across the group. Indeed, differences between lesbian, gay and bisexual (LGB) individuals (sexual minorities) and transgender, gender non-conforming and gender-diverse individuals (gender minorities) can be significant.

As will be shown in this section, LGBTI workers are more frequently exposed to psychosocial risks, including workplace discrimination and harassment/bullying practices, than non-LGBTI workers. This section shows that discrimination and other psychosocial risks to which LGBTI workers are exposed have negative effects on occupational and mental/physical health, which can result in work disability, decreased productivity in the workplace, lower job satisfaction, reduced job opportunities or lower wages. This section will also show how some specific groups of LGBTI workers (for instance transgender persons) are particularly exposed to these psychosocial risks.

Although there is no clear and conclusive evidence of an increased risk of MSDs among LGBTI workers, evidence that discrimination and psychosocial risk affects LGBTI workers' occupational health suggests that the increased psychosocial risks experienced by LGBTI workers is likely to result in a higher prevalence of MSDs in this group. In addition, the existence of segregation within specific jobs and sectors associated with a higher risk of MSDs suggests that LGBTI workers could be more exposed to MSDs than non-LGBTI workers in those jobs and sectors.

This section is organised as follows. Section 3.4.2 focuses on the prevalence of general health problems among LGBTI workers in the EU, although very limited information is presented, as there is little available evidence. In section 3.4.3 we discuss LGBTI workers' exposure to physical, organisational and psychosocial risk factors. Whether or not exposure to certain risk factors is also linked to segregation of the LGBTI group in the labour market is discussed in section 3.4.4. Section 3.4.5 discusses the impacts of these physical, organisational and psychosocial risk factors on the prevalence of MSDs among LGBTI workers. Finally, section 3.4.6 summarises the main points from this section on LGBTI workers.

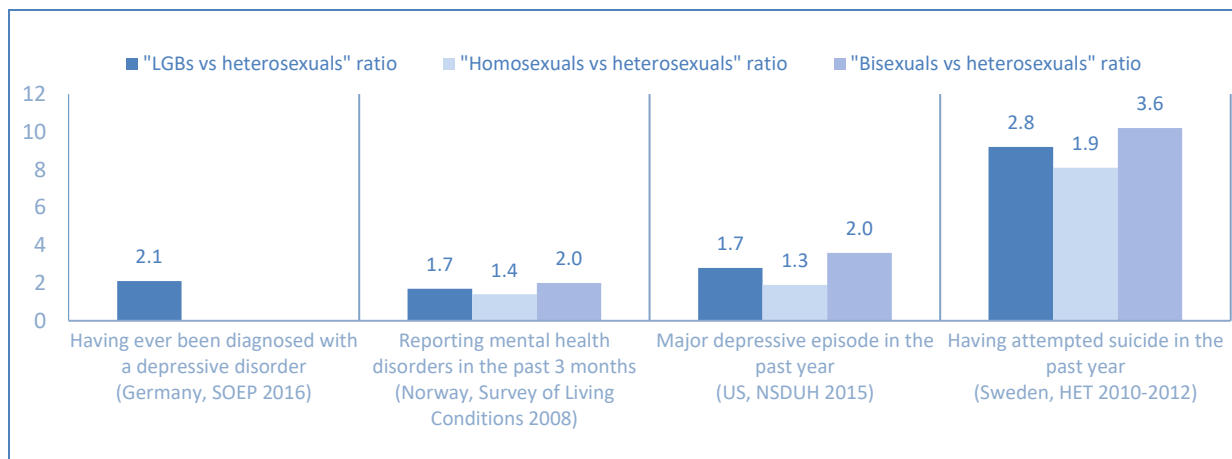
¹² Employment Equality Directive 2000/78/EC.

3.4.2 Prevalence of general health problems and MSDs

Several studies indicate that prolonged exposure to stress and discrimination in the workplace (but also in daily life) results in reduced well-being and mental health among LGBTI workers. More specifically, several studies have found that LGBTI individuals are at higher risk of poor mental health than the general population, with the LGBTI population experiencing a higher incidence of suicidal thoughts, substance misuse, anxiety and deliberate self-harm (Health4LGBTI, 2018). A meta-analysis by Meyer (2013) showed that LGB workers, on average, have a lower level of well-being and a higher risk of developing mental health issues. Meads et al. (2012) also reported a risk of poorer mental health among LGBTI workers and attributed this to their greater exposure to a number of psychosocial risk factors.

OECD (2019) discusses the findings from several country-specific studies regarding the probability of various mental health disorders among LGB and non-LGB individuals. For example, studies from Germany and the United States have found that LGB workers are more likely (than heterosexuals) to have been diagnosed with a depressive disorder or a major depressive episode. A Norwegian study reported a higher likelihood of Norwegian LGB workers having reported mental health problems, and a Swedish study found an elevated risk of attempted suicide among homosexuals and bisexuals and among both groups combined (see Figure 31). Grant et al. (2011) also reported high rates of attempted suicide among transgender persons.

Figure 31: Ratio of the probability of various mental health disorders between LGB and non-LGB individuals in four OECD countries, 2008-2016



Source: OECD (2019, p. 36).

Zeeman et al. (2018) carried out a systematic review of the literature on health inequalities among LGBTI individuals. They found that health problems are experienced differently among the LGBTI group and that this applies to both physical and mental health. LGB individuals reported significantly worse physical health than the general population, with gays showing an increased incidence of long-term health problems sufficient to restrict their activities of daily living, including MSDs, arthritis, spinal problems and chronic fatigue syndrome. Furthermore, compared with their heterosexual counterparts gay and bisexual men are more likely to experience long-term gastrointestinal, liver and kidney problems, whereas lesbians have a higher rate of polycystic ovaries. In addition, Zeeman et al. (2018) found that bisexual people had poorer health than their lesbian and gay counterparts and attributed this to their minority status in both communities.

Zeeman et al. (2018) concluded that LGBT individuals are two to three times more likely than the general population to report enduring psychological or emotional problems, with the prevalence of suicide attempts, suicidal ideation, depression and anxiety disorders all higher among LGB individuals than among their heterosexual peers. Poor mental health is even more common among bisexual and transgender individuals than among their lesbian and gay counterparts. Zeeman et al. (2018) also

reported that mental distress is most pronounced among LGB individuals under the age of 35 or over the age of 55.

Recent data from the second EU LGBTI survey show that up to 4 % of LGBTI workers report bad or very bad health status. The rate is higher among intersex and transgender respondents (10 % in each of the two groups) than among lesbians (4 %) or gay and bisexual men (3 % in both cases). Furthermore, up to 34 % of respondents reported that they were affected by a long-standing illness or health problem. Again, the percentages varied among the different groups, and once again the two groups most likely to report long-standing health problems or illnesses were intersex and transgender respondents (45 % and 46%, respectively), with rates much higher than in other groups such as bisexual men (29 %) or gays and lesbians (31 % in both cases) (Table 4).

Table 4: LGBTI workers by health status, EU-28, 2020 (%)

| Variable | All | Lesbian women | Gay men | Bisexual women | Bisexual men | Trans people | Intersex people |
|---|-----|---------------|---------|----------------|--------------|--------------|-----------------|
| Proportion of respondents with self-perceived bad or very bad health (%) | 4 | 4 | 3 | 9 | 3 | 10 | 10 |
| Proportion of respondents reporting any long-standing illness or health problems lasting or expected to last 6 months or more (%) | 34 | 31 | 31 | 37 | 29 | 45 | 46 |

N = 139,799.

Source: FRA, second EU LGBTI survey (2019).

A recent study by Ghattas (2019) describes some of the main health problems faced by intersex individuals. The health of intersex individuals is often jeopardised as a consequence of the unconsented interventions to which they are subjected at a young age. The long-term effects of these surgical and other medical procedures include physical health problems¹³ as well as mental health issues, including post-surgical depression and trauma from the unconsented interventions they were subjected to (Ghattas, 2019).

3.4.3 Exposure to psychosocial risk factors

As illustrated by the conceptual framework presented in Chapter 2, workers exposed to several work-related risk factors, including physical, organisational and psychosocial risk factors, are more likely to be exposed to the risk of MSDs.

It is worth pointing out that a significant body of research, using a variety of methodologies, on the risk exposure of LGBTI workers in the workplace appears to focus on psychosocial risks, including discrimination, workplace harassment and bullying, whereas evidence regarding the physical or organisational risks to which LGBTI workers are exposed in the workplace seems to be lacking and therefore represents a research gap. In the rest of this section several of the identified psychosocial risk factors are presented, with a specific focus on discrimination, harassment and bullying.

Discrimination at work

One of the main psychosocial risks in the workplace is discrimination. As previously mentioned, workplace discrimination can take many different forms, ranging from 'formal discrimination' (e.g. in the areas of hiring, promotion opportunities or compensation/salaries) to 'interpersonal discrimination' (e.g. occurring in everyday workplace social interactions with colleagues and superiors and manifested in

¹³ Genital insensitivity and impaired sexual function, sterility, massive internal and external scarring, chronic pain, chronic bleeding and chronic infections, premature osteopenia and osteoporosis and metabolic imbalances.

negative verbal and non-verbal behaviours) (Dhanani et al., 2018). Some of these interpersonal forms of discrimination are often quite subtle but nevertheless can be especially harmful and can pose a significant threat to affected workers' mental health (Jones et al., 2017). LGBTI workers are likely to experience more stress than non-LGBTI workers (Blosnich et al., 2013; Ozeren, 2014) as a consequence of being discriminated against in a number of areas and forms.

For instance, the EU LGBT survey of 2012 found that 13 % of gay, lesbians and bisexual workers who were searching for a job experienced labour market discrimination (FRA, 2013). And among transgender job seekers, the prevalence of labour market discrimination was considerably higher (30 %) (FRA, 2013, p. 3). A study by Rundall (2010) confirms that discrimination at work is perceived by a large majority of transgender workers (up to 58 % of reported experiencing discrimination at work).

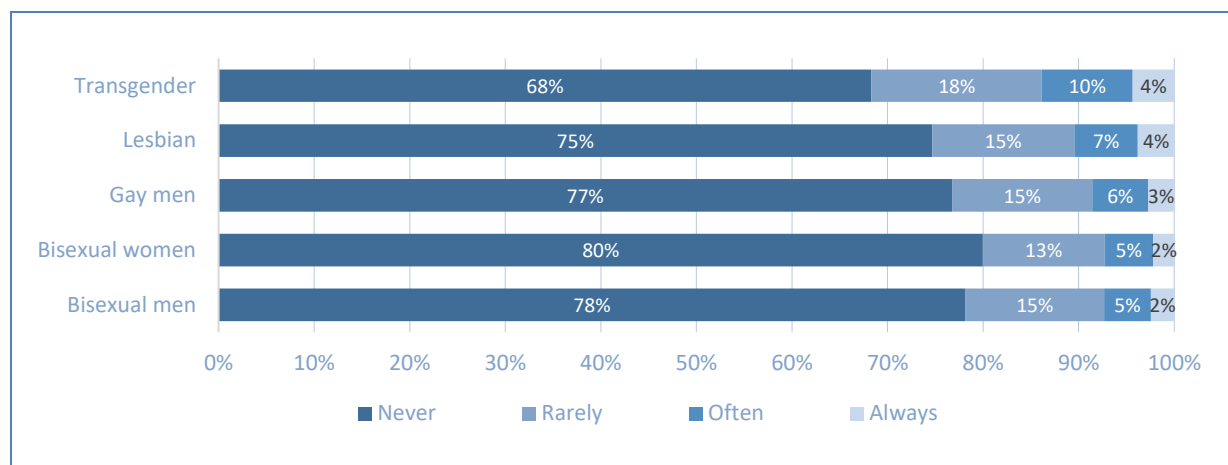
Ueno et al. (2013) argue that hiring discrimination is particularly common when gay men apply for jobs in male-dominated workplaces (e.g. in the construction sector) or when lesbians apply for female-dominated occupations (e.g. nurse or preschool teacher). Ueno et al. (2013) argued that this is because employers believe that lesbians or gay men do not have the 'gender-typical' characteristics that employers consider necessary for particular roles. However, the study also suggested that LGBT workers may anticipate this kind of employer behaviour and exclude such jobs in their job-seeking process (Ueno et al., 2013, p. 84).

A Swedish field experiment found that the rate of positive responses was 14 % higher for heterosexual male job applicants than for gay applicants. In the case of women applicants, the difference between heterosexual women and lesbians was even larger (22 %) (Ahmed et al., 2013, p. 574). The differences (and their significance levels) also varied according to occupation (for example, the difference between gay and heterosexual men, in terms of reduced response rates, was most marked in the case of applications for sales assistants and mechanics). Sears and Mallory (2014) reported that up to 7 % of LGBT employees have been fired because of their sexual orientation.

An example of formal discrimination of LGBTI workers is provided by existing evidence of reduced employment opportunities and lower salaries for LGBTI workers. An OECD report concluded that LGBTI workers are 7 % less likely to be employed than non-LGBTI workers and, among the employed, LGBTI workers earn 4 % less and are 11 % less likely to hold a high managerial position (OECD, 2019). In Germany, homosexual and bisexual men and women earn less per hour than heterosexual men and women (mean hourly rate: heterosexual men EUR 18.14; bi-/homosexual men EUR 16.00; heterosexual women EUR 14.40; bi-/homosexual women at EUR 16.44) and these differences persisted even when statistically controlled for differences in qualifications, occupational status, professional experience, working time models and sectors (Kroh et al., 2017). Similar wage discrimination experiences are also reported by Giray Aksoy et al. (2016).

The EU LGBT survey (FRA, 2013) found that LGBT workers often or always experience unequal treatment with respect to employment conditions or benefits because of their sexual orientation, with the proportion reporting inequality ranging from 7 % (in the case of bisexual women and men) to 14 % (in the case of transgender persons) (Figure 32).

Figure 32: Workers experiencing unequal treatment with respect to employment conditions or benefits (for example leave, pension, etc.) because of having a same-sex partner during the last 5 years, as a percentage of LGBTI workers with a same-sex partner, by LGBT subgroup, EU-28, 2012 (%)

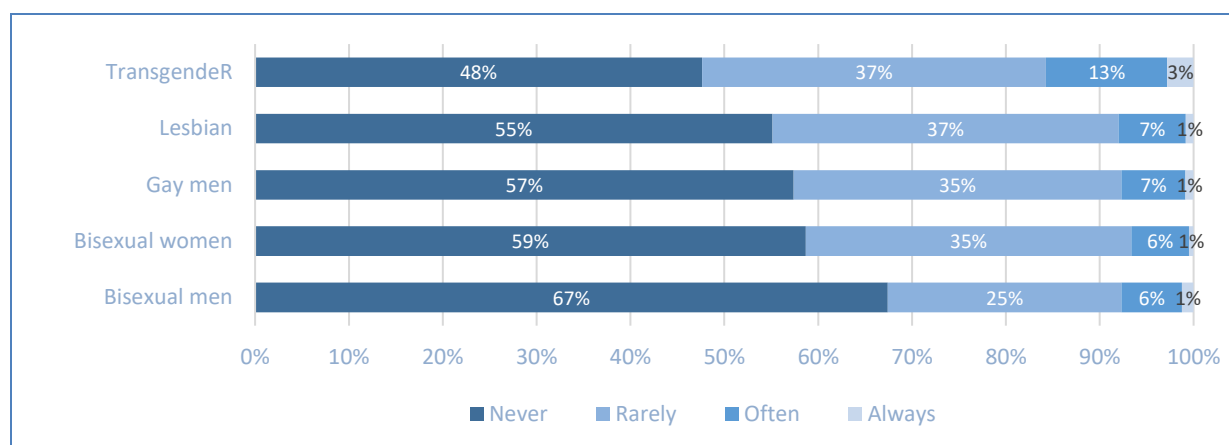


Note: Workers means respondents working in paid jobs.

$N = 6,490$ (lesbians); $N = 29,081$ (gay men); $N = 1,637$ (bisexual women); $N = 2,844$ (bisexual men); $N = 2,082$ (transgender person). A large number (12,518) of respondents chose the option 'does not apply' or did not answer this question. These are presumably respondents without a same-sex partner.

Source: IKEI/Panteia based on FRA (2013).

Furthermore, and as far as interpersonal forms of discrimination are concerned, according to the EU LGBT survey (FRA, 2013) 7-8 % of LGBT workers often or always personally experience negative comments or conduct at work because of their sexual orientation or identity. Acceptance of sexual or gender orientation appears to be the lowest in the case of transgender persons: 16 % of transgender workers reported often or always experiencing negative comments or being subject to negative behaviour at work because of their sexual orientation or identity (Figure 33). Silva and Warren (2009) report that LGBT workers believe that their managers and colleagues feel uncomfortable working with them, while García Johnson and Otto (2019) use the term 'microaggressions' to describe the jokes and mockeries that LGBTI individuals experience on a daily basis: in the United Kingdom four out of five LGBTI individuals are exposed to jokes about being LGBTI in their day-to-day life (García Johnson and Otto, 2019, pp. 2-3). These findings are in line with those of a large-scale audit study from 2011 among openly gay men in the United States (Tilcsik, 2011, p. 1). These forms of discrimination are also perceived and reported by heterosexual colleagues, and can become a source of stress and discomfort for those who feel them unfair (Sears and Mallory, 2014).

Figure 33: Workers experiencing negative comments or conduct at work in the last 5 years due to being LGBT EU-28, 2012 (%)

Note: Workers refer to respondents working in paid jobs.

$N = 7,116$ (lesbians); $N = 32,604$ (gay men); $N = 2,072$ (bisexual women); $N = 3,107$ (bisexual man); $N = 2,064$ (transgender persons).

Source: IKEI/Panteia based on FRA (2013).

More recent data, from the second EU LGBTI survey (FRA, 2020), show that incidents of discrimination have not fallen over the last few years: in 2020, 10 % of LGBTI workers reported having experienced discrimination when looking for a job and 21 % reported discrimination at work. Once again, transgender and intersex workers were the two groups reporting the most acute discrimination experiences, well above the other groups (Table 5).

Table 5: Workers experiencing discrimination in the last 12 months because they are LGBTI, EU-28, 2020 (%)

| | All | Lesbian | Gay men | Bisexual women | Bisexual men | Trans | Intersex |
|----------------------------|-----|---------|---------|----------------|--------------|-------|----------|
| When looking for a job (%) | 10 | 8 | 8 | 4 | | 32 | 27 |
| At work (%) | 21 | 20 | 19 | 18 | 17% | 35 | 32 |

Source: FRA, second EU LGBTI survey.

Similar experiences of discrimination are reported in other geographical areas outside Europe. For instance, in the United States, transgender individuals (including, but not limited to, workers), in line with existing evidence for European countries, seem to be the most exposed subgroup. The results of a survey of more than 6,000 transgender individuals showed that the whole sample experienced discrimination, although to varying degrees and in different places, forms and combinations. The group most vulnerable to discrimination were transgender Afro-Americans (Grant et al., 2011).

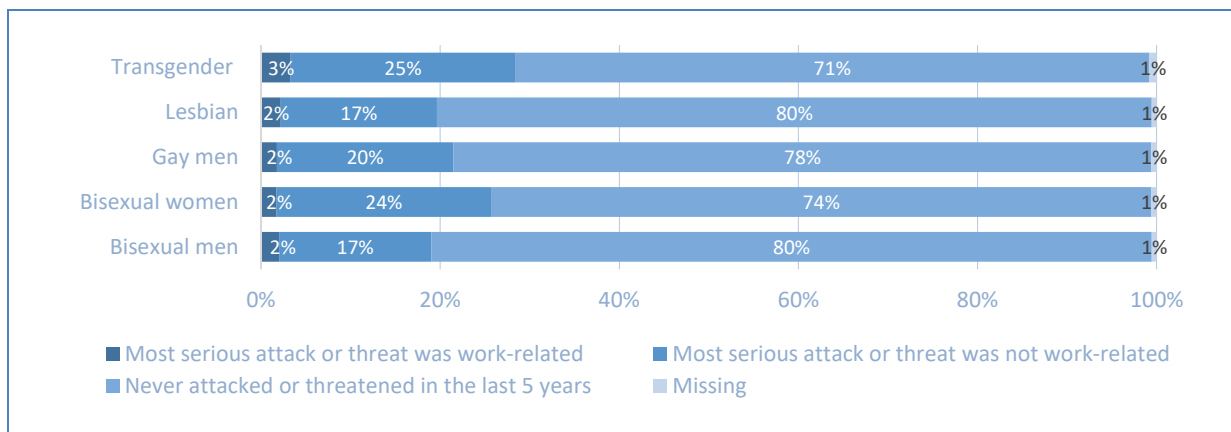
Finally, the role of institutional discrimination against LGBTI individuals should not be forgotten, particularly when existing laws and policies in the public domain sustain inequalities such as the prohibition of same-sex marriage or the lack of legal protection against discrimination based on gender identity, sexual orientation or sex characteristics (Meads et al., 2012; García Johnson and Otto, 2019, p. 2). Specifically, in the case of intersex individuals, the study by Ghattas (2019), mentioned previously, shows that intersex individuals often face severe obstacles when trying to access health and care services, including discrimination and (re)traumatising experiences with health care professionals as well as lack of adequate psychosocial counselling. Furthermore, the treatments and medications needed as a direct consequence of so-called 'normalising' surgical procedures are often not covered by health insurance.

Workplace harassment and bullying

As previously mentioned, LGBTI workers are also more frequently exposed than heterosexual workers to workplace harassment and bullying practices, placing these workers in a more vulnerable position in the labour market. In one study, bullying practices in the workplace were reported by 6 % of heterosexual workers, compared with 14 % of gay workers, 17 % of lesbian workers and 19 % of bisexual workers (García Johnson and Otto, 2019, pp. 2-3). A UK-based survey found that 39 % of respondents (all identifying themselves as LGBTI persons) had been harassed or bullied by a colleague, 29 % by a manager and 14 % by a client or patient (TUC, 2017). A meta-analysis of 386 research studies of LGB people undertaken across 19 countries found that up to 55 % had experienced verbal harassment, 45 % sexual harassment and 41 % discrimination: higher levels than in the general population (Katz-Wise and Hyde, 2012).

In addition, the EU LGBT survey (FRA, 2013) found that almost a quarter of EU LGBT workers had experienced attacks or threats during the last 5 years (either at work or outside), with 2-3 % reporting that the most serious attacks or threats during the last 5 years were work related (Figure 34). Transgender workers were once again the most affected group.

Figure 34: Workers experiencing attacks or threats during the last 5 years, by LGBT subgroup, EU-28, 2012 (%)



Note: Workers means respondents working in paid jobs.

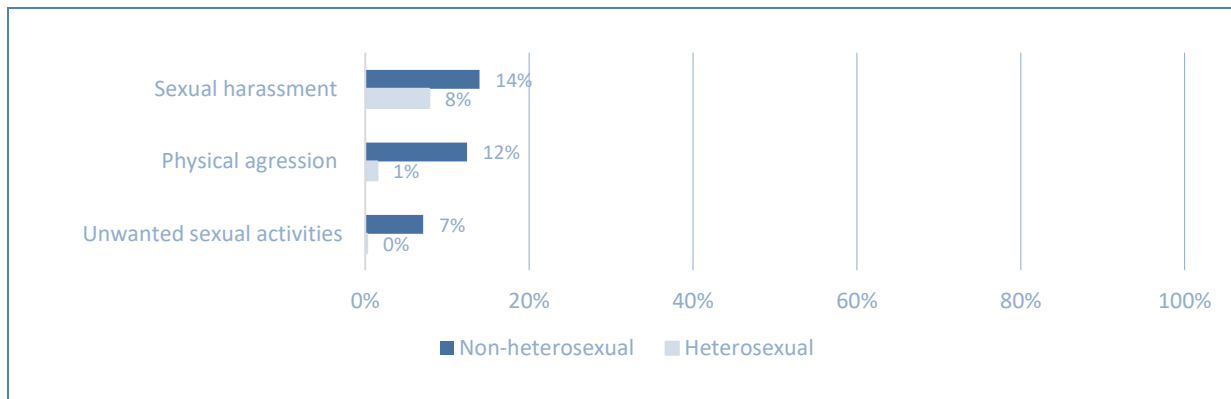
N = 8,066 (lesbians); N = 36,638 (gay men); N = 2,479 (bisexual women); N = 4,137 (bisexual men); N = 3,332 (transgender persons).

Source: IKEI/Panteia based on FRA (2013).

Several studies show that the bullying/harassment practices are particularly directed against transgender workers. For instance, in one survey, 90 % of transgender workers reported that they had directly experienced harassment or mistreatment at work or felt forced to take actions to hide their gender identity. In addition, 47 % reported that they had experienced an adverse job outcome, such as denied a promotion, because of being transgender, and a quarter of respondents reported having lost a job because they were transgender (Grant et al., 2011).

Another group that is particularly disadvantaged is LBT women, who are more exposed to a range of unwanted sexual behaviours including sexual harassment, unwelcome sexual messages or advances and sexual assault (TUC, 2019). Similarly, the results of a FRA survey on women's well-being show that lesbians and bisexual women are much more likely than heterosexual women to report experiencing sexual harassment, physical aggression or unwanted sexual activities by a boss, colleague or client in the last 12 months (Figure 35).

Figure 35: Women workers reporting sexual harassment, physical aggression or unwanted sexual activities by a boss, colleague or client in the last 12 months, by self-reported sexual orientation, EU-28, 2012 (%)



Note: Workers means respondents working in a paid job. Source: IKEI/Panteia based on FRA (2012)

$N = 280$ (non-heterosexual women workers); $N = 19,802$ (heterosexual women workers).

Finally, a study of intersex individuals by the Netherlands Institute for Social Research in 2014 (Lisdonk, 2014) found that virtually all the intersex individuals interviewed encountered obstacles and difficulties in their daily life and at work. They talked about being 'different', feeling lonely and experiencing shame and embarrassment, including at work (Lisdonk, 2014). Recently, ILGA Europe and OII Europe have published a toolkit (Ghattas, 2019) describing the areas of life in which intersex individuals are most vulnerable, including employment issues (Box 6).

Box 6: Experiences of discrimination in job search and employment among intersex workers

Intersex individuals are one of the most vulnerable groups within the LGBTI spectrum when it comes to job search and employment. Challenges faced by intersex individuals in school often continue into their working life, perpetuating taboo, secrecy and shame. They can be victims of direct or indirect discrimination and harassment because of their physical appearance or gender expression.

When applying for a job, intersex workers might need to explain gaps in their education or employment history because of hospitalisation or being unable to work owing to depression or trauma. Once they secure employment, intersex workers have reported intrusive curiosity about their bodies from their co-workers, or, when they opened up, disbelief and rejection. Just as in education, the strain of discrimination and stigmatisation may lead to higher absence rates among intersex workers, increasing the risk of them losing their jobs.

Employee medical checks can be extremely difficult for intersex individuals, especially when the medical practitioner in charge is not educated about the existence of intersex individuals or considers them to have a 'disorder of sex development'. This is often exacerbated by trauma associated with having to undergo a medical examination.

Some intersex individuals have obtained disability status because of physical impairments resulting from unconsented surgeries and other medical procedures. Depending on the country, this status can offer some protection; however, it can also come at the cost of additional discrimination and stigma experienced by persons with disabilities.

Source: Ghattas (2019, p. 30).

Relevant research on intersex individuals has also been developed outside Europe, for example the Inclusion Guide developed in 2014 in Australia by Pride in Diversity and Organisation Intersex International Australia (Carpenter and Hough, 2014). In conclusion, there remains a large gap in our knowledge of the experiences of intersex individuals — including intersex workers — as acknowledged by some recent documents (FRA, 2015).

3.4.4 Employment segregation patterns

Currently, no conclusive evidence is available about the employment patterns of LGBTI workers. Nevertheless, a few studies on this topic have been carried out. Discrimination on the grounds of sexual orientation or gender identity, which leads to increased exposure to psychosocial risk and has a negative impact on workers' health, could explain the patterns of occupational segregation among LGBTI workers that have been identified in some studies and which could result in specific OSH risks. Plug et al. (2014) studied what they name 'prejudice-based segregation', which describes the tendency of sexual minorities to choose jobs where they expect to experience less intolerance and discrimination. They found that the least prejudiced occupations were librarians, artists, medical practitioners and teachers, whereas the most prejudiced included plant operators and trades workers. In Germany, LGB workers are more likely to have a higher level of education and a white-collar job and are less likely to be employed in blue-collar roles (Kroh et al., 2017).

Tilcsik et al. (2015) found that LGBTI workers tend to segregate in sectors and jobs where the risk of discrimination and harassment is lower (Tilcsik et al., 2015). They found that gay men cluster in some specific women-dominated occupations while lesbians cluster in some male-dominated occupations. Some of these occupations are associated with an increased prevalence of MSDs; for example, gay men are often employed as air stewards and transport attendants, hairdressers and hairstylists and nurse practitioners, whereas lesbians often work in manual jobs, for example as lift installers/repairers, heating and refrigeration mechanics/installers, security and fire alarm systems installers, home appliance repairers and bus and truck mechanics.

In their 2015 study, Tilcsik et al. also found that the threat of discrimination in the workplace can result in the need for workers to conceal their sexual orientation: the need for concealment is therefore an important factor shaping the career choices of lesbian and gay workers. In particular, these workers might avoid occupations in which concealment is difficult and disclosing their sexuality would result in a potentially high penalty, preferring instead occupations in which concealment is easier and revealing their sexual orientation will have fewer negative repercussions. In addition, task independence (defined as the degree to which an occupation allows a worker to perform his or her tasks without substantially depending on co-workers or supervisors) and social perceptiveness (defined as the capacity to anticipate and accurately perceive others' intentions and reactions) come into play when attempting to understand patterns of occupational segregation among gay and lesbian workers (Tilcsik et al., 2015).

Interestingly, also, a study by Yoder and Mattheis (2016) found that gay men working in STEM (science, technology, engineering and mathematics) fields tend to drop out sooner than heterosexual men, whereas lesbians are less likely to drop out than heterosexual women, a finding that the authors suggest is related to the genderedness of these fields and the gender stereotyping of lesbian and gay workers.

3.4.5 Exposure to risks and prevalence of health and MSD-related problems

The available information regarding discrimination and psychosocial risks among LGBTI workers and how such risks impact on workers' occupational health suggests that there is likely to be a relationship between increased psychosocial risks among LGBTI workers and MSDs. In addition, patterns of segregation within specific jobs and sectors associated with a higher risk of MSDs suggest that LGBTI workers could be, on average, at greater risk of developing MSDs.

Zeeman et al. (2018) conclude that several factors are likely to contribute to health issues among LGBTI individuals and workers. In particular, the existing cultural and social norms that favour, promote and prioritise heterosexuality and heteronormativity, both at work and outside work, may result in discriminatory attitudes, prejudice or demeaning behaviour against LGBTI individuals. As a result, LGBTI individuals and workers may experience more stress than non-LGBTI individuals, and it is this disproportionate experience of stress that can lead to an increased incidence of physical and mental health problems (Zeeman et al., 2018).

Similarly, Meyer (2013) found that LGBTI workers report, on average, a lower level of well-being and a higher risk of mental health issues, mostly associated by the stress generated by perceived practices of discrimination and stigmatisation, compounded, for those who opt not to disclose their sexual

orientation or gender identity to protect themselves from undesired behaviours, by the concealment strategies they feel obliged to adopt (Meyer, 2013).

Furthermore, in a survey carried out by the UK Trades Union Congress (TUC), over half of all LGBT respondents, and 7 out of 10 transgender respondents, reported that their experience of workplace harassment or discrimination had had a negative effect on their mental health (TUC, 2017). In addition, sexual harassment is recognised to lead to post-traumatic stress disorder (Avina and O'Donohue, 2002, pp. 69-70).

Chan (2016) found that discrimination and other psychosocial risks in the workplace can have negative effects on LGBTI workers in terms of occupational and mental health, while others have shown that such negative effects can result in decreased productivity in the workplace and lower job satisfaction (Drydakis, 2019) and even in work disability (Björkenstam et al., 2016).

Although no specific evidence on the MSD prevalence among LGBTI workers is currently available, it can reasonably be expected – in line with studies confirming a relationship between psychosocial risks and MSDs (e.g. Roquelaure, 2018) and considering the higher exposure of LGBTI workers to psychosocial risk – that the prevalence of MSDs among LGBTI workers will be above the average recorded for the general workforce. Nevertheless, more research will be needed to determine if and how the increased psychosocial risk to which LGBTI workers are exposed in the workplace is associated with health issues, and in particular with MSDs.

3.4.6 Summary

LGBTI workers, on average, have poorer levels of well-being and are at higher risk of poor mental and emotional health. For example, the incidence rates of depressive episodes, suicidal thoughts, anxiety and deliberate self-harm are higher among LGBTI workers.

There is, in addition, some evidence that LGBTI workers report worse physical health, including a higher incidence of musculoskeletal problems, arthritis, spinal problems and chronic fatigue syndrome.

The two groups most likely to report illnesses or long-standing health problems are intersex and transgender individuals. In particular, the health of intersex individuals is often jeopardised from an early age as a consequence of the unconsented interventions to which they are subjected when they are young.

LGBTI workers are disproportionately exposed to psychosocial risks. In this regard, LGBTI workers are exposed to workplace discrimination practices, ranging from 'formal discrimination' (e.g. in terms of hiring, promotion opportunities or compensation/salaries) to 'interpersonal discrimination' (e.g. in terms of everyday workplace social interactions with colleagues and superiors and manifested also in negative verbal and non-verbal behaviours, often in 'subtle' forms). LGBTI workers are also exposed to institutional discrimination practices, particularly when existing laws and policies sustain inequalities (e.g. prohibition of same-sex marriage, lack of legal protection, etc.).

LGBTI workers are more frequently exposed to workplace harassment and bullying practices, including verbal abuse and sexual harassment, threats and physical attacks. Transgender workers as well as lesbians and bisexual women are particularly exposed to these psychosocial risk factors.

Concerning employment segregation patterns, LGBTI workers tend to work in those sectors/occupations where they expect both to feel safer and to experience less discrimination and harassment (so-called 'prejudice-based segregation'). Some of these sectors/occupations are characterised by a higher prevalence of MSDs. In many cases, LGBTI workers avoid occupations in which concealment is difficult and disclosing their sexuality or gender identity may potentially result in negative consequences.

The information available suggests the existence of a negative impact of psychosocial risks on the physical and mental health of LGBTI workers, including MSD-related issues. However, more research is needed to better understand the effects of these risks on LGBTI workers' health, particularly in relation to MSDs. More general research on the working conditions and OSH issues facing LGBTI workers is needed to overcome the existing research gaps.

4. A qualitative view on the topic: results from fieldwork

4.1 Introduction

This chapter presents findings from fieldwork consisting in in-depth interviews with selected stakeholder organisations and focus groups with workers belonging to the three groups of workers under study (for further details see Annex A).

More specifically, this chapter presents primary data on the experiences and the situation of the three analysed groups of workers in terms of exposure to a range of OSH risks stemming from poor working conditions – including discrimination and occupational and sectoral segregation – with a specific focus on MSDs.

As demonstrated in the following, fieldwork findings corroborate most of the existing evidence presented in Chapter 3, complementing and further qualifying it. A number of findings not previously reported have been identified and are presented in the sections below, accompanied by quotations from the consulted workers.

Fieldwork findings suggest that certain factors seem to be associated with an increased risk of MSDs, particularly those related to social context characteristics, living conditions, family responsibilities, the presence of formal or informal support networks or good and accessible public/private social services, among others. In addition, the findings suggest that enterprises may play a key role in contributing to reduce physical, psychosocial and organisational risks and, thus, to the prevention of MSDs.

This chapter is divided into three main sections, each focusing on one of the three groups under investigation. Each section presents in turn a detailed discussion on the main OSH and work-related MSD risk factors identified by interviewees for each relevant target group, including existing labour segregation patterns, and concludes with a discussion on the presence of health problems in general and MSDs in particular among the target worker group.

4.2 Women workers

4.2.1 Introduction

The results of the fieldwork carried out through interviews with selected experts and focus groups with women workers confirmed and further qualified most of the different psychosocial and organisational risk factors identified in the existing evidence and reported in section 3.2. However, the fieldwork also identified a number of additional psychosocial and organisational risk factors that are presented next.

The fieldwork confirmed that MSDs are highly prevalent among women workers, particularly in those sectors and jobs where women are predominantly present. The fieldwork also showed that women workers are more prone to develop certain types of MSDs owing to their specific physiology. However, the fieldwork revealed that biological and physical complexion-related women's intrinsic aspects are often not taken into account, as 'the man is still considered to be the norm'.

4.2.2 OSH and work-related MSD risk factors

This section presents the main OSH and work-related MSD risk factors to which women workers are more frequently exposed, as identified during the fieldwork.

Physical risk factors

The experts consulted confirmed the existence of a relationship between physical risk factors in the workplace and a number of work-related MSDs, as reported in the existing evidence and presented earlier in this report. Women are frequently employed in some specific sectors and occupations — as will be discussed later — that are characterised by high physical demands and higher physical risks (e.g. lifting or moving patients, repetitive movements, awkward positions) associated with MSDs. Nevertheless, the physical demands of women-dominated sectors/occupations are often underestimated, and the physical effort required deemed 'light' by research and OSH authorities, when in reality women are often exposed to the same physical stress risks as men.

The fieldwork has allowed us to identify a number of examples of physical and MSD-related risks in specific women-dominated sectors and occupations.

In the *cleaning sector*, women workers are overexposed to frequent kneeling, squatting and overexertion when moving furniture or trolleys, as well as cumulative lifting or bending movements, which can result in injuries, especially of the shoulder and back.

In the *food processing industry*, women manual workers are overexposed to small repetitive hand and arm movements, usually coupled with high work intensity, that cause discomfort in the upper body, but can also result in low back pain and injuries.

Workers involved in *caring for pre-school children* are required by the fact that the furniture is designed for children but not for adults to frequently adopt unnatural postures (kneeling, stooping). In addition, such workers are often exposed to extreme noise pollution, as often the groups of children are large and the rooms are small.

In the *textile and garment industry* women workers are frequently exposed to prolonged static postures (standing or squatting) or upper-body bending in addition to carrying heavy loads, leading to a number of MSD-related impairments. In this regard, fatigue and tingling of feet and ankles, physical exhaustion, neck muscle wear and tension, headaches, cervical spine pain, fatigue of the eye muscles and dryness, knee and hip pain were frequently reported in one of the focus groups. One participant suffered from a disc prolapse that required her to reduce her working hours. None of the participants felt confident that they would be physically able to continue to work until the statutory pension age of 67 years:

The physical strain is of course high. All of us experience some sort of pain. We have to stand all day and work with our upper body bent forward. You can get back pain there. Quite often, I have to carry high weights from a to b. Sometimes someone helps me, sometimes not. Sometimes someone is using the crane, sometimes I can use it. Also bending down or working in the squat is normal for us. I also push and pull the cubs back and forth more often, depending on how I need it. I also often have to lift heavy loads backwards or carry them from backwards to forward or carry fabrics somewhere. The working area is always somehow crowded with equipment. We all must pay attention to avoid hazards.

(Participant in focus group with women manufacturing workers in the textile industry, Germany)

In the *hairstressing sector*, which is another physically demanding women-dominated sector, women are exposed both to repetitive hand and arm movements and to forced postures and prolonged standing, although traditionally it has not been regarded as a sector characterised by arduous conditions.

In *office-based and administrative jobs* (including travel agencies and call centres), in which women are frequently overrepresented, there is increased risk of prolonged use of monitors, prolonged use of keyboard and mouse (related to a higher risk of tendinitis in the arm and carpal tunnel syndrome) and prolonged sitting.

In *care sector jobs* (at home, in hospitals or care homes, etc.), there is very high exposure to physical burdens resulting from manually handling (e.g. lifting, moving) patients. As pointed out by participants in the focus group with women workers in the social and health care sector in Denmark, it is often necessary to physically move patients (for instance from a wheelchair to the toilet) and to adopt awkward positions or make repetitive movements over a long period, and this can frequently result in osteoarthritis and back pain. Exposure to physical burdens is even higher in workplaces such as private houses than in hospitals and residential care homes for a variety of reasons (small and/or inaccessible spaces, non-mobile furniture, lack of proper equipment, cranes, etc.). The right equipment is regarded as a great help, and allows many social and health care workers to stay longer in their jobs:

The helping tools are the reason I can still work in the sector. In the beginning of my career we simply lifted the patients without tools. The problem now, is that we have to do more work than one person can possibly do. The balance between demands, resources and expectations is not there any more.

(Participant in focus group with women social and health care workers, Denmark)

Alongside these physical risks, the fieldwork identified the existence of a number of women-specific risk factors, which are reportedly related to women's biological and physical characteristics. For example, changes in physiology and the hormone system that occur during and after pregnancy expose women to a higher risk of developing MSDs.

More generally, biological and physical differences between women and men are seen as factors that should be taken into account when designing women's job tasks: for example, women should not generally be expected to handle the same physical loads as men, as this will expose them to a higher risk of MSDs than men. When jobs carried out by both men and women are not adjusted for women – that is, considering their specific physiology and needs – their risk of suffering from MSDs is higher:

As the only woman in the team, I feel often disadvantaged because my tasks are not adjusted and I have to do the same tasks as male counterparts.

(Participant in focus group with migrant workers in Hungary)

In this regard, it is also worth pointing out that women are reported to be more prone to the development of certain types of MSDs, such as osteoarthritis, rheumatic arthritis or osteoporosis, owing to their specific physical constitution and biology, factors that should be considered when designing job tasks.

It emerged during the fieldwork that a men-dominated view on occupational diseases and OSH issues is still prevalent ('the man is still considered to be the norm', stressed one expert). In this sense, priority is often given to risk assessment in men-dominated occupations, while less attention is paid to the risks of women workers, which may result in failure to recognise as occupational in origin diseases that affect women to a greater extent than men or failure to take account of women when recommending appropriate measures to address occupational disease. In addition, many OSH tools and protective equipment are designed for men, and account poorly for the physical characteristics of women's bodies. These resources (i.e. goggles, protective masks, surgical masks, clothing and gloves, etc.) are still rarely adapted to the physical features of women, especially those employed in men-dominated occupations, putting women at additional physical risk.

Psychosocial and organisational risk factors

The existing literature and statistical evidence presented in section 3.2 shows that, compared with men, women more frequently report exposure to psychosocial and organisational risks in the workplace. This is also because women are more likely to work in jobs and sectors involving continued contact and interaction with members of the public, such as patients, pupils or customers, who can be emotionally demanding, a source of stress, and sometimes a source of abuse or a threat. According to one Danish expert consulted in the field research phase, some of these women-dominated sectors (particularly the social care sector, the day care sector and the education sector) score above average on existing national indexes for psychosocial and organisational risks. Exposure to such risks — sometimes in combination with exposure to physical risks — can be related to a higher probability of developing health-related issues and MSDs. The fieldwork has highlighted a number of such risk factors.

High exposure to work-related mental load and stress, emotional demands

Women workers are characterised by a high exposure to emotional demands and work-related mental load and stress, a finding already identified in section 3.2 of this report.

For instance, high mental loads and stress levels among *teachers*, in combination with other factors, such as insufficient time to relax, are issues frequently reported in combination with MSDs, particularly backache, and the effects of these risks are cumulative and increase with age.

A Spanish expert interviewed for this project suggested that *hotel chambermaids* are exposed not only to considerable physical effort but also to high levels of stress, because they have to do a lot of work in a short time (particularly in peak season), resulting in a high risk of developing MSDs. In addition, the expert reported high rates of consumption of pain medication or mood stabilisers among workers in this occupation, which can be attributed to stress and physical effort.

Women *care workers* – in addition to being exposed to heavy physical work related to the handling of people and shift work/long working hours – are also exposed to high pressure and the emotional burden of dealing with ill people, which frequently results in stress and burnout syndrome. In this case also, combined exposure to both physical risks and psychosocial and organisational risks can contribute to the development of musculoskeletal problems:

Yes, my work has a negative influence on my physical health. The back and neck pain arises from the unnatural postures and movements I have to engage in every day. We also don't have any ergonomically shaped aids to help us to make it easier to do the work. We have often claimed about that in the past, but there is still no answer from the management yet. Then there are the social anxieties you have – the textile branch is going down – and all this together has a great effect on my well-being.

(Participant in focus group with women manufacturing workers in the textile industry, Germany)

High demands and time pressure at work can push *nursing care workers* to ignore the tools and rules that are in place to address identified health risks (e.g. by making use of auxiliary equipment provided or carrying out physical balancing exercises), resulting in additional physical stress and MSDs, particularly of the back.

Additional psychosocial and organisational risks to which women are frequently exposed include harassment and unwanted sexual attention and discrimination on the grounds of gender, resulting in lack of career development opportunities or pay gaps, and all these factors can result in more health complaints in general, including MSDs, as well as in longer periods of incapacity for work.

Harassment and unwanted sexual attention

The presence of harassment and unwanted sexual attention as psychosocial risk factors is confirmed by our fieldwork with experts and focus groups. Moreover, we found that harassment affects not only women at the lower levels of the organisational hierarchy, but also high-level women managers. For instance, one Danish expert reported the existence of culture clash between male migrant workers and Danish women managers. Some migrants do not respect women as managers, and this sometimes results in violence. Another expert stressed the importance of psychosocial risks generated by domestic violence and abuse, and pointed out that this is likely to have consequences in the workplace also.

Lack of career opportunities and pay gaps

Women often find it difficult, for various reasons, to progress beyond middle management positions and, as a result, relatively fewer women than men are to be found in high-level/decision-making positions (the so-called 'glass ceiling', already mentioned in section 3.2), even taking into account levels of qualifications and even in women-dominated sectors. As a result of this 'vertical segregation', women are usually underrepresented in higher hierarchical positions or in managerial functions. One expert suggested that a lack of career opportunities for women means that they are more exposed than their male colleagues to occupational risks because they are more likely to carry out the same job for a long period of time.

Women workers are also frequently paid less than men for doing the same job involving the same tasks. This situation has important consequences for women both during their working life and later, in retirement, in terms of motivation, self-esteem and of financial independence. This wage gap usually extends throughout women's working life, resulting in what was defined during our fieldwork as a 'gender lifetime earning gap'.

Atypical forms of employment

Women workers are usually overrepresented in atypical forms of employment, particularly temporary or marginal employment (such as mini-jobs or side jobs) and part-time employment. Interestingly, in many cases part-time work is involuntary, in that many women who would like to work full time are offered only part-time positions that have no other option but to accept. In some sectors women workers work on shifts and longer hours.

The field research revealed a number of additional psychosocial and organisational risk factors not identified by the existing evidence reported in section 3.2 that affect women workers' health in general and musculoskeletal health in particular.

Work-life balance and women's 'dual' role'

Women workers frequently report issues of work-life balance arising from their 'dual role' as both worker as well as home-maker and unpaid carer (for example caring for children or other family members), which frequently results in a higher burden (both physical and psychological) and can result in an increased risk of developing physical and mental health issues, including MSDs.

In some cases this dual role (especially in the case of women breadwinners) can lead to presenteeism (working also when sick) or failure to undergo health checks, thereby increasing the risk of developing more severe health-related issues. A Dutch expert reported that a large proportion of women workers, because of their dual role and their care obligations, do not fully engage in work-related health prevention activities, particularly outside working hours, despite the fact that in general women are more concerned than men about health and more likely to seek professional treatment. It was also suggested that the current 'standard model of employee' is someone who is always available for work and 'with an always fit, unproblematic body' and with no care obligations. It is likely to be particularly difficult for women meet this 'standard model', influencing not only their labour market opportunities but also their health status.

In their 'dual role', women workers are more likely to take family-related career breaks and/or to work part-time for family reasons, which may delay their career progression or limit their opportunities for professional careers and promotions (particularly in critical life stages). This can have a direct negative impact on the proportion of women occupying better-paid functions and positions (vertical labour market segregation), leading indirectly to discrimination in wage and salary conditions.

It is also important to be aware of additional difficulties generated by the need to reconcile work and other (family/home) duties, including added stress, less time for rest and difficulty undertaking training courses or attending conferences and workshops (especially when they take place outside working hours). According to one expert, the lack of ad hoc supporting structures (for instance full-day child care in nurseries) contributes to this situation:

As a single mother you always have a hard time in Germany. It's hard to get everything under one roof, e.g. the school performance of your daughter and the early shift. I feel stressed and discriminated when I need to take time off work because of my daughter.

(Participant in focus group with women manufacturing workers in the textile industry, Germany)

Women's voice and rights

Women workers are less likely to speak out about work-related health risks, and to be heard, for a number of reasons. Women are more frequently employed in some industries and occupations where work councils or trade unions do not have a significant presence or are not particularly strong, so they have a limited say and therefore few opportunities to report work-related risks. In addition, women are more reluctant than men to claim their rights under law or collective agreements, individually but also collectively. Furthermore, women are usually less represented than men on companies' OSH steering committees, as a result of which any adopted OSH measures may be less suited to their needs. Our focus group with women workers in the textile industry revealed a good example of this. Some participants recounted that their employer had ordered work equipment without prior consultation with

the workers, and as a result purchased equipment that they did not need and which did not provide the help that they had asked for:

I think the people up there have no idea what our job is about, what we do and what we need.

(Participant in focus group with women workers in the textile industry, Germany)

Self-employment and OSH

Being self-employed, as is common in some specific women-dominated occupations (e.g. hairdressing), can increase the risk of MSDs compared with being employed. The experts we consulted suggested two main reasons for this. First, the self-employed are often willing to push themselves harder than they should, ignoring health considerations and possible consequences. Second, national OSH regulations assume that employees' health and safety is the responsibility of their employer, and pay limited attention to self-employed.

Absence of basic facilities for women in some men-dominated sectors

One of the experts interviewed pointed out that, in some male-dominated sectors, it is still relatively common for basic facilities for women (for instance, appropriate sanitation facilities for women) to be lacking, even when there are women workers within the company. This lack of access can create or exacerbate health problems for women, while sharing the same facilities with men can put women workers at risk of violence, including sexual violence.

Health inequalities among women workers themselves

Another reported risk factor is the existence of health inequalities within the population: women from less advantaged social groups (especially single mothers in atypical employment, uneducated women, low-skilled and low-income women, women with disabilities, migrant women, etc.) are often overrepresented in jobs and sectors with poor working conditions that are deleterious to health, and they are frequently also exposed to unhealthy lifestyles (including unhealthy diet).

During the focus group with women workers in the textile industry in Germany, the participants were asked to demonstrate the movements they perform most often in their work. The women paid no heed to ergonomic considerations. For example, when demonstrating lifting a heavy load, they failed to protect their back muscles by bending the knees, using their leg rather than back muscles to absorb the weight, adopt a head position in extension of the spine, etc. The workers reported that, after their shift, they feel the need to rest their body and their eyes. Most of them relax at home in front of the TV, closing their eyes and only listening without watching. None of them reported engaging in any sort of physical activity or corrective exercises in their leisure time.

In turn, these poor working conditions further aggravate existing health inequalities. For instance, one expert suggested that health care sector workers (particularly those working night shifts) are more likely to gain weight,¹⁴ which in turn has a detrimental effect on muscles and joints. This risk of overweight and other unhealthy lifestyles was also confirmed in the focus group with Danish women social and health care workers:

I can feel that the work pressure affects my mental condition. Some of my colleagues smoke when they get a break. It is beyond doubt that I am overweight because of the mental and physical

¹⁴ At night, the human body demands a greater intake of unhealthy fats and the body's metabolism slows down. As a consequence, these fats are processed less efficiently, so night workers face a greater risk of gaining weight.

workload. People try to eat their troubles away. There should be more focus on preventing smoking and overweight.

(Participant in focus group with social and health care workers, Denmark)

Employment segregation patterns

The fieldwork, in line with the evidence displayed by the literature and the statistical data and presented in section 3.2 of this report, confirmed that women's employment is characterised by significant labour segregation, that is, women are more likely to be employed in a number of specific sectors, jobs and occupations.

In general, women are disproportionately employed in the tertiary sector, particularly in sectors such as health and social work, commerce and trade, hotels and restaurants, the beauty industry (e.g. hairdressing), household and cleaning services, education, other tertiary sectors (such as travel agencies and call centres) and, finally, in the public sector. However, it is worth noting that women account for a large number of workers in some non-service sectors, such as some manufacturing-related activities such as food processing and the textile industry, as well as in agriculture (primarily manual harvesting).

Women are more frequently than men employed as hairdressers, cosmetologists, cleaning assistants, chambermaids, day carers, cooks, manual workers in manufacturing organisations, supermarket cashiers, primary and high school teachers or medical health professionals (particularly nurses, nursing assistants or midwives) and in administrative, office-based jobs.

One of the experts we consulted suggested that, despite all the social changes that have taken place in recent decades, the proportion of women employed in the tertiary sector has largely remained stable and occupational segregation persists. In contrast, in recent times there has been an increase in the proportion of women found in some sectors and occupations that previously were almost exclusively male dominated (e.g. judges, medical doctors, etc.).

Some of these sectors and jobs are characterised — as mentioned earlier — by tougher working conditions and health risks in terms of high physical or emotional demands or long or unsociable working hours. Thus, several of occupations in sectors such as education, health, services and commerce are particularly characterised by atypical forms of employment (part-time, temporary or marginal employment) and lower wage levels (partly account for by atypical forms of employment but also by the salary levels associated with these occupations/sectors), as well as shift work, night work and long working hours (typical for instance in the health and care sectors or in cleaning activities).

According to participants in our focus group with women social and health care workers in Denmark, working conditions in the social and health care sector are tough, particularly in relation to wage and salary conditions, working hours, physical risks and the psychosocial working environment. In general, the participants perceived that their wages are low in comparison with other occupations (for example, educators and other social helpers) and not related to the competences that social and health care workers have. They also reported working under great time pressure, with few breaks during working hours, and that this, in turn, affects their mental health.

In addition, the sector often involves physically demanding work, including the need to adopt forced postures, to lift or move people and to make repetitive movements, as well as high levels of noise (for instance, many patients often have the television turned on, creating a lot of noise during working hours). Finally, the participants mentioned several other stressful features of their job, including too little time to do too many tasks (including paperwork, which some found very frustrating) as well as imposing self-exigencies in terms of the work activities ('it is a pity for the patient if workers do not complete all the tasks that they have to').

High physical risks are also characteristic of some women-dominated sectors, but are often underestimated.

Textile workers in our focus group in Germany reported having to stand throughout their shift, i.e. for 8 hours a day. Only one woman reported being able to sit on a chair. They demonstrated the unfavourable postures they are required to adopt, for example bending their upper body forward and lifting their elbows to hold a magnifying glass in one hand while correcting irregularities in the fabric with the other. A stooped posture is also necessary when packing the fabric rolls and preparing them for transportation while low bending is necessary when pushing and pulling the iron wheels (up to 200 kg) into the required position or to pick up rolls of fabric and put them on or take them off the wheel. The women are also regularly required to carry heavy loads (10-15 kg up to 40 times a day), while watching the rolling fabrics necessitates frequent changes of the viewing direction, right and left as well as up and down, leading to the physical risk of neck impairment. Thus, everyday work consists of repetitive movements of the arms, neck and upper body, all carried out in a limited space.

Psychological demands and emotional burdens are also very high in some of the sectors and occupations in which women are more frequently employed, as has been discussed in the previous section. Examples identified include, in the care sectors, the high emotional demands of dealing with patients' illness, suffering and even death; in the education sector, high stress levels; in other occupations, such as nurses or chambermaids, time pressures; and in many cases also a lack of opportunities to participate more fully in the department or company as a whole.

Finally, it is worth mentioning that several of the sectors and occupations with a higher presence of women workers are characterised by exposure to a combination of risks in both the physical and psychosocial and organisational domains, which can in turn result in a higher prevalence of MSDs and health-related issues. For instance, as previously mentioned, hotel chambermaids are exposed to a combination of high levels of time pressure as well as physical risks (overexertion when moving furniture or trolleys, repetitive movements, etc.), this combined with low salary levels and, often, temporary contracts.

4.2.3 Work-related health outcomes and MSDs

The risk factors identified at the field research stage and described in the above sections were associated by the experts and workers we interviewed and by participants in focus groups with a number of health outcomes and MSD-related problems. Some of these associations confirm the results of previous studies reported in section 3.2 above.

As mentioned above, women workers frequently report mental health issues as a consequence of working in jobs involving greater exposure to emotionally demanding tasks and prolonged interaction with external parties such as patients, pupils or customers, in addition to other psychosocial and organisational risks previously described. Women are more likely than men to report symptoms of mental conditions, including anxiety and depression, and they are also more likely to take sick leave because of depression or other mental health issues.

According to a Spanish expert we interviewed, although it is generally socially accepted that women are more likely than men to be affected by mental illness, women are also more susceptible to MSDs, something of which society is generally less aware. She pointed out that, for instance, around 80 % of women working in the health sector suffer from MSDs, and back and shoulder pain are particularly present in the cleaning sector.

In spite of being less likely than men to be employed in jobs involving physically very demanding tasks, our fieldwork suggests that MSDs are very common among women, and that this is a result of combined exposure to physical and psychosocial risks. In this regard, one expert stressed that it is important not to focus on psychosocial risks and underplay purely physical risks, as there is a danger that overemphasising the relationship between psychosocial stressors and MSDs could cause some to conclude that higher prevalence of MSDs among women is not real, but is all 'in their heads'. This expert also stressed that some risks related to time pressure or working with the public can involve both physical and psychological constraints, so teasing out the relationships is difficult.

Several of the interviewed experts also stressed that work-related repetitive strain injuries such as tendonitis, carpal tunnel syndrome, arthritis and osteoporosis are more frequent among women than men, often resulting in sick leave. According to another expert, based on statistical data from the German BIBB/BAuA 2012 Employment Survey, women workers are more likely than men to complain about pain in the lower back, the neck and shoulder area, arms, hands, legs and feet as well as swollen legs. The same German expert reported that among women workers the highest rates of sickness absence compared with a reference group of qualified commercial and administrative occupations are in three specific occupational groups: low-skilled manual occupations, qualified manual occupations and low-skilled service occupations. The most common MSD-related diagnoses in these three occupational groups of women workers are coxarthrosis (ICD-10 M16), gonarthrosis (ICD-10 M17), rhizarthrosis (ICD-10 M18), internal knee injury (ICD-10 M23), shoulder lesions (ICD-10 M75), back pain (ICD-10 M54) and spondylosis (ICD-10 M47).

Finally, age is an important variable affecting the prevalence of MSDs, as identified by several consulted experts. Thus, the natural ageing process, together with cumulative exposure to physical and psychosocial and organisational risks over time and the cumulative effect of chronic diseases, means that older workers are at higher risk of health problems in general and of MSDs in particular. Therefore, older workers should be viewed as a particularly vulnerable group with one Spanish expert suggesting that the incidence of MSDs is higher among older women than among older men:

When I was younger my state of health was better, of course. But now that I am older the work demands take a toll on me. Especially when you have to bend over or carry heavy loads for 3 days straight. My back and neck start to hurt after half an hour of work. Usually, the pain disappears during my shift and comes back in my leisure time. Measured in school grades I would rate my state of health with a 4 (note: 6 being the worst grade).

(Participant in the focus group with women workers in the textile industry, Germany)

4.2.4 Summary

The evidence from our fieldwork activities confirms that women workers are more frequently employed in sectors and occupations where they are exposed to higher physical, psychosocial and organisational risks, with significant consequences for their health, including an increased risk of MSDs. Physical risk factors experienced by women workers include lifting/handling patients, repetitive movements, awkward positions and postures and prolonged static postures. The experts we consulted also suggested that the physical demands (as well as some psychological demands) of women-dominated sectors/occupations are often underestimated.

Women workers are also exposed to some specific physical risk factors related their body shape and physical characteristics. Failure to account for such differences, for instance in the design of OSH tools/protective equipment, means that women are more prone to develop certain types of MSDs. Interestingly, several experts suggested that the physical demands of women-dominated sectors/occupations are often underestimated, commonly being described as 'light' by research workers and OSH authorities. Reality is often different and, in practice, women can be exposed to physical risks to the same degree as men.

In addition, our fieldwork confirmed that women workers are particularly exposed to organisational and psychosocial risk factors, for example emotional demands and work-related mental load and stress, as well as harassment and unwanted sexual attention, limited career opportunities, lower salary levels and a higher presence of atypical forms of employment.

The fieldwork also identified some additional risk factors, including women workers' 'dual role' as carer and worker, a reluctance or lack of power to speak out and about work-related health risks, and difficulty being heard and, finally, the prevailing 'male-dominated' view of occupational diseases and OSH issues.

The fieldwork also showed that many of the sectors and occupations in which women are more likely to work seem to combine physical as well as psychosocial/organisational risks, a factor that also contributes to a higher prevalence of health problems and MSDs among women.

4.3 Migrant workers

4.3.1 Introduction

This section presents the main OSH and work-related MSD risk factors, including physical, psychosocial and organisational risks, to which migrant workers are more frequently exposed and existing labour segregation patterns within this group, reflected in a higher presence of migrant workers in some specific sectors and occupations. Migrant workers are more frequently employed in the so-called '3D' (dirty, dangerous and demanding) jobs, which results in a higher exposure to a wide range of work-related physical, psychosocial and organisational MSD-related risk factors. Finally, the section concludes by discussing health problems in general, and the prevalence of MSDs in particular, among migrant workers.

4.3.2 OSH and work-related MSDs risk factors

This section presents physical risk factors and psychosocial and organisational risk factors to which migrant workers are more frequently exposed, as identified by stakeholders and workers interviewed during the fieldwork.

Physical risk factors

The evidence collected confirms the findings reported in section 3.3: migrant workers are more frequently exposed to physical risks at work, that is to repetitive movements, forced and awkward postures and working with heavy loads, in combination with a very intense work pace, long working hours and short rest periods. In addition, migrant workers are more exposed to risks to their safety, resulting in a higher incidence of workplace accidents in this group.

Several illustrative examples provided by our interviewees can be mentioned. For example, in the Netherlands, employees in the *meat processing industry* (many of them Turkish and Polish) are exposed to highly repetitive work tasks and movements that increase the risk of developing MSDs.

Also in the Netherlands, *aircraft loaders*, who are predominantly migrant workers, have to handle heavy loads in cramped environments and with limited time to recuperate between shifts. The need for low-paid migrant workers to work long hours, and often more than one job, and overtime, increases their exposure to physical risks and fatigue. These circumstances seem to explain a higher prevalence of MSD-related issues among these migrant workers.

In Spain, although much of *agriculture* is now mechanised, there are still many manual tasks that are predominantly carried out by migrant workers. These tasks are very physically demanding, requiring turning, bending down, forced and repetitive postures and movements of body parts such as arms and hands, prolonged standing, etc., combined with a very intense work pace (as in most cases payment is based on the number of pieces harvested) and short rest periods. The combined exposure to these risks is reported to result in an increased risk of MSDs among these manual workers.

Participants in the Spanish focus group with workers in the *cleaning sector* reported exposure to repetitive movements and moving heavy loads; moreover, they are required to work at a fast pace to finish all their duties.

Those working in *kitchens* endure high temperatures and are required to move heavy loads (e.g. large pots). This is coupled with need to work quickly to meet clients' demands. These strenuous physical conditions are reported to result in pain and discomfort:

I have elbow and hand pain in my right arm, and I'm seeing an osteopath regularly. Also, my doctor prescribed me some pills. It is my job which causes this pain, because I spend the whole day making the same movements with my arm.

(Participant in focus group with third-country migrant workers in Spain)

Psychosocial and organisational risk factors

Our fieldwork activities also revealed that migrant workers are more exposed to a range of psychosocial and organisational risk factors. These risk factors, particularly discrimination at work, are reported to aggravate the physical risks described above, exposing migrant workers to higher health risks including the risk of MSDs. Most of these psychosocial and organisational risk factors were discussed in section 3.3, but some additional ones have been identified. The fieldwork findings are presented next.

Lower bargaining power of migrant workers with employers

Migrant workers (especially those in irregular legal situations) have little bargaining power. As already mentioned in section 3.3, this, combined with other factors such as job insecurity, lack of representation on work councils and economic dependence on a single employer, forces many migrant workers to accept jobs involving more risks and to avoid reporting general OSH-related issues or work-related accidents. One Hungarian expert interviewed suggested that migrant workers in irregular situations are employed in some of the most demanding jobs, involving carrying or lifting heavy loads and exposure to dangerous substances (i.e. cleaning, construction jobs), often with very few protective measures.

I worked in a restaurant as a cook assistant for several months with no labour contract. I was instructed by the owner to respond that I was there in the kitchen only as a friend in case somebody might turn up there and may start making lots of questions. This implied also that, just in case, I was not wearing proper clothing for the job, including some protective equipment.

(Participant in the focus group of LGBTI migrant workers in Spain)

Migrant workers are usually in a disadvantaged position relative to their employers and supervisors for fear of losing their job. In these circumstances, migrants have no option but to submit to the demands of employers and supervisors, who are able to abuse their power under an exploitative employment relationship:

I just want to work and get money. I accept any kind of job, I do not complain. I know that if I don't take a job offer, there will be another person who will take it.

(Participant in the focus group of third-country migrant workers in Spain)

This situation is particularly acute among those migrant workers in irregular legal situations. For instance, several participants in the focus groups said that migrant workers who do not have a legal work permit are forced to accept all kind of work situations, often beyond what it is initially agreed and with little access to external support:

I worked as hair stylist for 1 month but I was never paid due to my irregular legal situation in Spain. In this situation, you feel completely helpless as you cannot rely on any external institution (trade union, justice, police).

(Participant in the focus group with LGBTI migrant workers in Spain).

Participants in the fieldwork activities mentioned that migrant workers can find themselves in a delicate situation as a result of their irregular legal status, because they cannot afford to lose their jobs. For them, granting of a right to stay in the country depend on having a job, so they feel obliged to tolerate unfair or unsafe and unhealthy working situations. This causes significant psychological pressure and stress. Our group also criticised the employers who take advantage of this situation and hire migrant workers under bad/discriminating conditions, or even without a labour contract:

As a foreign worker, I have to put up with frustrating situations. Employers in general take advantage of foreign people's need for a job to stay in the country. We have to shut up and keep on.

(Participant in the focus group of third-country migrant workers in Spain)

Migrant workers' forced acceptance of difficult working conditions

Several participants in the field research were in agreement that migrant workers often have no option but to push themselves harder than they should, ignoring possible health considerations and consequences. For instance, seasonal migrant workers working in the host country on a temporary basis naturally want to earn as much money as possible during the short duration of their contract. They are therefore prepared to accept long hours, and to work for many consecutive days in a row, and are willing to take on any additional risks at work to get the job done more quickly (e.g. avoid using helping tools, carrying heavier loads, etc.):

I have endured many things. But you have to fight to survive. I came to Spain to work.

(Participant in the focus group of third-country migrant workers in Spain)

Long working hours and overtime

The existing evidence shows that migrant workers often work long hours, and they are more likely to work shifts, or to work 'antisocial' or undesirable hours (e.g. at weekends, in the evenings or at night) and to be 'on call':

When I arrived in Barcelona, I found a job in a hostel for 20 hours a week, six days per week. I was offered a much lower salary than some of my colleagues, but I had to accept it since I had no alternative and I needed desperately some money.

(Participant in the focus group with LGBTI migrant workers in Spain).

In addition, migrant workers often have to work much harder, and work unpaid overtime, to be accepted by employers, and they have to be extremely careful not to make a mistake (as they are likely to be more heavily criticised and more severely punished than a national worker would be for any problem they cause):

When there is a mistake, usually we are blamed for it because we did not understand the task.

(Interview with participant in the focus group with migrant workers in Hungary)

With the same job and the same mistake, the scolding is not the same for me or for them. Reproaches are more serious for immigrant workers.

(Interview with participant in the focus group with third-country migrant workers in Spain)

Are cultural differences and language knowledge an issue?

Section 3.3 of this report showed that migrant workers are particularly constrained by a lack of knowledge of their new country and its customs (such as social habits, OSH standards) as well insufficient mastery of the local language. Our fieldwork research supplemented our knowledge in this area and allowed us to further qualify the cultural difficulties faced by migrants.

Participants in our field research pointed to a relationship between cultural differences and differences in migrant workers' OSH practices and the likelihood of developing MSDs. Examples reported included differences between native and host country OSH regulations, differences in resilience, different

attitudes towards abiding by the rules, misinterpretation of certain body signs, fear of public authorities (e.g. police) and mistrust of trade unions (sometimes regarded poorly in migrants' origin countries).

Our fieldwork identified that many migrant workers are poorly familiar with national regulations governing working conditions and so they have a poor knowledge of their labour rights (e.g. salary rights, working time rights, OSH issues, etc.), and this can be made worse by language barriers. This lack of knowledge makes them more vulnerable to discrimination and abusive practices that may not meet existing legal or OSH-related standards.

One expert pointed out that religious requirements (e.g. periods of fasting) may affect migrant workers' capabilities, resulting in higher OSH risks both for themselves and for work colleagues.

The absence of specific policies and initiatives at workplace level to account for such cultural differences and to minimise the OSH risks stemming from them can be seen as an organisational gap.

In addition, limited knowledge of the hosting country language can constitute a significant OSH-related risk factor for migrant workers. Migrant workers with limited knowledge of the local language are not able to communicate and/or understand OSH-related instructions and work processes, and they may find it more difficult to participate in OSH training activities or properly understand existing working rights. This leads in turn to misunderstandings, lack of compliance with OSH rules, more accidents and risky situations (e.g. failure to use helping tools or to wear protective equipment).

Language barriers are reported to hamper protective OSH-related factors such as managerial support or support from co-workers, and also contribute to poor mental health among migrant workers. Fieldwork in Hungary identified the communication barriers caused by a lack of knowledge of the local language as an element putting migrant workers at a disadvantage in everyday work or in case of disagreement. Migrant workers also may feel discriminated against or badly treated by managers because they do not speak the language:

The language barrier is the most difficult part. We cannot communicate directly with the shift leaders. We are very much dependent on the mood and opinion of the translator. Several times I explain my opinion in 5-6 sentences, and the translator sums it up in one short sentence. If I complain about this, he says they can understand the problem like this.

(Participant in focus group with migrant workers in Hungary)

The lack of initiatives or training specifically aimed at improving migrant workers' understanding of instructions and OSH-related information and their knowledge of the local language can also be seen as an organisational gap. On the other hand, as a Danish expert pointed out, migrant workers sometimes pretend to have understood an instruction even when they have not, which makes it difficult to identify their language needs. This strategy seems to be more common in low-skilled manual professions.

Lack of involvement in OSH-related activities in workplaces

The field research identified an additional factor affecting migrant workers' health: the fact that many employers fail to provide OSH activities aimed specifically at this group, together with a limited presence of migrant representatives on work councils. For instance, one of the interviewed labour inspectors suggested that it is quite common to find that migrant workers have not undergone compulsory medical fitness-for-work checks. In addition, migrant workers are less likely to be provided with proper equipment adapted to their needs, and companies devote less resource to informing and training them on OSH issues, including on their existing rights and services available in this area (medical check-ups, health services, risk prevention/assessment activities, etc.):

Sometimes I have pain in my fingertips because I use them to press the pieces into place. We have gloves, but nowadays we get less new ones. So I keep the old ones, take them home to wash and use them longer.

(Participant in focus group with migrant workers in Hungary)

In contrast, some participants in the focus group with third-country migrants in Spain acknowledged that they had received OSH training from their company on an equal basis to their national colleagues, which helped them to adopt the correct position, make the right movements or use suitable protective equipment.

In addition, the fact that many migrant workers occupy a low position in the company hierarchy, are more often in precarious work situation and have lower qualifications or skills levels may explain why some employers take health and safety measures for this group less seriously than they do for those in critical/higher-responsibility posts:

We can work faster if we don't follow the work safety instructions. There are pieces that are easier to grab and carry than to lift with the machine. The lifting machines are not adjustable to different sized/shaped pieces, proper work equipment is not provided. In spite of this, high productivity is expected. That is why this job is physically demanding and not a lot of people can keep up with it.

(Participant in focus group with migrant workers in Hungary)

High prevalence of temporary and precarious work

As pointed out in section 3.3, migrant workers are frequently (and involuntarily) employed under precarious work conditions, including temporary contracts, short-term contracts or bogus self-employment. Migrant workers are also more likely to have no labour contract or social insurance at all, which obviously makes them invisible in any official OSH-related register. One Spanish expert suggested that employers downplay OSH issues among those with short-term contracts (which are more common among migrant workers), putting at risk workers' health in general.

Lower pay and income

Migrants usually face poorer wage and salary conditions than their national counterparts. One expert postulated that migrants on a low salary are more likely to have more than one job in order to increase their income, which causes more stress and fatigue:

I have even worked in cleaning activities for four euro per hour since I needed the money to survive and save it to send it back to my country. I am ready to do whatever it is needed, but I also have the feeling that some people benefit from my difficult situation.

(Participant in the focus group with LGBTI migrants in Spain).

Limited training and career opportunities

The fieldwork revealed that migrant workers have very limited access to training opportunities including training on country-specific practices (i.e. on social and employment rights) for newly arrived migrants. Career development opportunities for migrant workers are usually rare, with migrant workers typically occupying low hierarchical positions within companies:

Discrimination at work really hurts. I see that my boss supports Spanish workers more than me, and it hurts.

(Participant in the focus group with third-country migrant workers in Spain)

Migrant workers are subject to discrimination in the sense that vacant positions (career opportunities) are unlikely to be offered to them. However, active demand for career opportunities among migrants is usually low, particularly if they have a short employment history in the host economy or few qualifications:

I've been working in the cleaning sector for 13 years. But if they hire a Spanish worker, automatically he will have a better post and will be above me.

(Participant in the focus group with third-country migrant workers in Spain)

Our fieldwork found that migrant workers are frequently overqualified and overskilled for their job, corroborating existing evidence. This seems to be partly due to the lack of official recognition (or the cumbersome and time-consuming process of recognition) of formal professional or academic qualifications obtained in migrants' country of origin. This disadvantage particularly affects non-EU nationals, but also, as one expert pointed out, nationals from some EU countries, such as Romania or Bulgaria, and results in segregation of migrant workers into specific sectors and low-skilled occupations.

Bullying, harassment and discrimination at work

The fieldwork, in line with evidence discussed in section 3.3, highlighted bullying and harassment in migrant workers' workplaces. The perpetrators are not always native-born workers, but occasionally also other migrant workers; for example, workers of one ethnicity or from one national group can bully those from another country or of different ethnicity:

I was once helping two Spanish cooks in the kitchen, and, out of nowhere, they suddenly threw a napkin on my face. I did not dare to do or say anything.

(Participant in the focus group with third-country migrant workers in Spain)

In addition, migrant workers are more frequently discriminated against and seem to be particularly exposed to psychosocial risks such as lack of recognition, which results in low self-esteem or feelings of loneliness (especially if they are far away from their families):

I work with people of different nationalities (Spanish, Colombians, Mexicans), and I can easily notice that foreign workers are treated differently. Our own work colleagues talk to foreign workers with contempt.

(Participant in the focus group with third-country migrant workers in Spain)

Verbal abuse and harassment involving references to stereotypes and based on prejudice and racism were also mentioned during the fieldwork as a psychosocial risk factor to which migrant workers are commonly exposed, particularly non-Europeans or non-white workers:

I have two children and I need to keep my job. Once, one of my colleagues said to me some rude and sexist commentaries for being a woman. I told my boss about it, but he didn't support me. I'm scared of defending my own rights.

(Participant in the focus group with third-country migrant workers in Spain)

I have heard many times: if you do not like the rules, you can go back to your country.

(Participant in the focus group with LGBTI migrants in Spain)

These stereotypes based on prejudice and racism are well illustrated by a concrete example provided by one expert, according to whom the probability of being invited to an interview that may lead to a job

or a traineeship in a company is lower for individuals with foreign names than for individuals with names in the language of the host country:

It is really hard to notice that people are afraid of you or they think that you are going to commit some type of crime just for the fact of being a foreigner. I came to Spain to work, I do not want to harm anyone or do anything illegal!

(Participant in the focus group with third-country migrant workers in Spain)

Feelings of isolation and lack of support

Migrant workers are also reported to experience feelings of isolation as a consequence of a lack of social and family support networks, which may result in poor mental health and other health-related issues. However, migrants often help their compatriots, particularly to find a job, through non-governmental organisations and informal channels:

I have received a lot of support from several fellow countrymen and women. This support has never been monetary, but rather in-kind, in terms of shelter and favourable reception, as well as information support.

(Participant in the focus group with LGBTI migrants in Spain)

On the other hand, our focus groups revealed that abusive and exploitative practices can also be perpetrated by fellow nationals:

I was hired to work for an ad hoc job as crystal cleaner by a person of my own country. I agreed with my boss a number of hours and activities to be conducted, but this agreement was never fulfilled and my boss exploited my weak labour situation (I have no work permit), so I had to work much longer than initially agreed for a finally lower than agreed salary.

(Participant in the focus group with LGBTI migrant workers in Spain)

Limited access to social and health services

The fieldwork confirmed existing evidence showing that migrant workers are also affected by limited access to some specific public or private services, such as suitable accommodation or health services, which affects both their general health situation and their working capability, with indirect impacts also on their OSH:

When owners hear a foreigner's accent on the phone looking for an apartment to rent, they often make up excuses, saying that the apartment is already booked.

(Participant in the focus group with third-country migrant workers in Spain)

Migrant workers may have more limited access to health services than native-born workers, but language problems may also prevent migrants from making the most of these services. One expert considered that migrants experience an above-average frequency of disparaging treatment by some actors in the health care system, leading them to put off visiting a doctor until there is no choice but to do so, which in turn can complicate or prolong therapy:¹⁵

¹⁵ One Hungarian expert mentioned an emergent sector in the Hungarian economy: the provision of private health care services for migrant workers provided by Russian-speaking practitioners.

I had to go to a dentist recently, but my registration into the Hungarian public health insurance was not ready yet. I still do not understand why it takes up to 6 months to get the health insurance card. Meanwhile, if we get ill, we have to pay for the expenses (private doctor, more expensive medicine, etc.).

(Participant in the focus group with migrant workers in Hungary)

Several participants in fieldwork activities suggested that economic problems experienced by migrant workers may result in poor diet, which also has a negative influence on their health.

Existence of particularly disadvantaged groups within migrant workers

Finally, the fieldwork found that individuals with characteristics that identify them as a member of multiple disadvantaged groups (such as being female or older or having a low level of education or a different appearance such as different skin colour or wearing different dress or accessories, perhaps for religious reasons) are at particularly high risk of poorer working conditions and discrimination, both at work and in society. Obviously, different combinations of these specific characteristics (intersectionality) may lead to different degrees of disadvantage.

Employment segregation patterns

The field research has allowed us to identify horizontal segregation of the migrant workforce, that is, a concentration in specific sectors and jobs or occupations, in line with the existing evidence.

Several experts suggested that migrant workers' jobs are often of the type referred to as 3D (dirty, demanding, dangerous) jobs, as they are characterised by very poor working conditions.

According to the fieldwork findings, typical sectors where migrants concentrate include seasonal agriculture and forestry, hotels, restaurants and catering (Horeca), some manufacturing activities such as the meat sector/slaughterhouses, the construction industry, and some services, such as parcel logistics, domestic care and cleaning services. A Hungarian expert suggested that organised mass blue-collar employment of foreign workers is becoming increasingly common among national manufacturing companies, and one German expert suggested that the most ethnically heterogeneous workforce in Germany is now probably found in the care sector. Interestingly, several experts point out that migrants of the same geographical origin tend to be concentrated in some sectors (i.e. Eastern European and Turkish migrants in the German meat sector/slaughterhouses and Polish and Moroccan workers in the Dutch and Spanish agricultural sectors, respectively).

Typical jobs filled in by migrant workers include seasonal farm workers, operators of heavy machinery, manual assemblers in manufacturing, loaders and warehouse workers, cleaners and carers, usually at the lower occupational levels. These sectors and occupations are, for the most part, in line with those identified and described in section 3.3.

Participants in fieldwork activities frequently associated the above-mentioned sectors and jobs with poor working conditions and increased risks. For instance, unsociable working hours (long working hours/night work) and poorer wage and salary conditions are typical in the Horeca sector. Several sectors, such as domestic care and cleaning services, are characterised by a lack of formal labour contracts or forms of bogus self-employment. Finally, construction and seasonal agriculture are characterised by high physical work requirements and high work intensity.

All in all, migrants are increasingly needed in many sectors and countries owing to labour shortages and increasingly ageing native populations. One expert pointed out that migration policies in some countries (for instance Germany) favour the recruitment of well-qualified or highly skilled migrant workers in occupations where the local labour is lacking, whereas other migrant groups (particularly those with low qualifications) are not well supported, which can sometimes result in abusive labour practices that are insufficiently controlled by public authorities.

4.3.3 Work-related health outcomes and MSDs

The fieldwork elicited mixed opinions regarding the prevalence of MSDs among migrant workers. Some experts contended that, in spite of higher exposure to specific risks — presented in a previous section — the prevalence of (chronic) MSDs among migrant workers is similar to or even below the average prevalence among national workers. This seems to contradict existing evidence, as pointed out by several other interviewed experts, who stressed that migrant workers are particularly affected by MSDs, especially disorders affecting the shoulders, neck and back. Several German and Hungarian experts also believe that accidents at work (especially severe or even fatal) are more common among migrant workers. Finally, mental health issues (including depression and anxiety) are reported to be rather common among migrant workers.

An explanation for these differing perspectives relates to the fact that age is a key factor affecting the work-related health (including MSDs), including that of migrant workers. Thus, and in line with the so-called 'healthy migrant effect' already explained in section 3.3, it is important to record that in some European countries a large proportion of first-generation migrant workers are relatively young, which may explain why migrants seem to have relatively good general health status and a lower prevalence of MSDs.

For instance, most of the participants in the focus group with migrant workers in Spain reported good health status, which, it can be assumed, is because they were mostly young. However, all reported exposure to physical risks and strenuous working conditions, and many reported suffering backache or shoulder pain at work or shortly after work that resolves after a period of rest (although irregular working shifts do not make it easy to rest and recover). Meanwhile, the oldest participants in the group were more aware of the negative impact of specific risks on their health. Extreme fatigue and pain are more habitual among middle-aged and older workers.

Nevertheless, migrant workers appear to be susceptible to the rapid development of chronic diseases as a result of their poor working conditions and the cumulative effect of continuous exposure to risks, particularly physical ones. In this regard, a Hungarian expert thought that older first-generation migrants are likely to suffer from work-related health problems and MSDs in the future, as their occupational history is characterised by exposure to physical risks and poor working conditions, usually combined with an early start to working life in their country of origin:

I do not feel that the work is physically demanding, but I am concerned about the steam and gases emitted during soldering and engraving. I have no information about how dangerous they are. There are signs on the machine, but the colleagues did not tell us about them. We do not use any safety equipment. I have no idea how this is going to affect my health in the long term. And I heard that three shift schedules are not healthy either, I'm wondering if it will have any consequence when I get older.

(Participant in focus group with migrant workers in Hungary)

4.3.4 Summary

In line with existing evidence and data presented in Chapter 3, the evidence collected at fieldwork stage confirms that migrant workers are particularly exposed to a wide range of work-related physical, psychosocial and organisational factors associated with the development of MSDs. These risk factors are most often embedded in the sectors and occupations in which migrant workers are more frequently employed, the so-called 3D – dirty, dangerous and demanding – jobs (and sectors), most of them characterised by difficult working conditions.

Physical risk factors to which migrant workers are typically exposed include repetitive movements, forced and awkward postures, carrying/lifting heavy loads and exposure to temperature extremes, all previously identified by the literature and existing data.

Migrant workers are also particularly exposed to psychosocial and organisational risk factors, which are reported to aggravate the existing physical risks, exposing migrant workers to greater health risks in general and to a greater likelihood of developing MSDs. Our fieldwork not only confirmed and further qualified the different psychosocial and organisational risk factors presented in section 3.3, but also identified a set of additional psychosocial and organisational risk factors.

Additional risks identified by the fieldwork include the poor bargaining power of migrant workers with employers (leading many migrant workers to accept jobs involving more abusive and risky situations), the self-acceptance of difficult working conditions and the failure of many workplaces to provide OSH-related activities for migrant workers. In addition, limited access to some key social services in addition to health such as housing services may constitute an additional health risk.

Finally, and as far as MSD outcomes are concerned, the fieldwork results revealed mixed opinions on the prevalence of (chronic) MSDs among migrant workers in comparison with native-born workers. Age is suggested as an explanatory variable for these apparently contradictory results, in that the fact that a significant proportion of first-generation migrant workers are young may explain their relatively good general health status (the so-called 'healthy migrant effect'). Despite this, there is consensus that migrant workers are prone to develop chronic diseases (including MSDs) very quickly as a result of their poor working conditions and the cumulative effect of continuous high exposure to risks, particularly physical ones.

4.4 LGBTI workers

4.4.1 Introduction

This section presents findings from the field research on OSH and work-related MSD risk factors – including physical, psychosocial and organisational risks and employment segregation patterns – alongside the health and MSDs outcomes of lesbian, gay, bisexual, transgender and intersex (LGBTI) workers covered by this research project.

The fieldwork has complemented and further qualified the existing evidence presented in section 3.4 of this report, and at the same time has enriched it and added new perspectives. In this regard, the fieldwork confirmed that LGBTI workers are disproportionately exposed to psychosocial and organisational risks in the workplace, in form of discrimination, harassment and bullying. In contrast, we found limited evidence regarding exposure of LGBTI workers to physical risks, as such risks mostly occupation and sector specific and it was not possible to identify a clear pattern of employment segregation among this group of workers. However, reports of employment in jobs and occupations with poor working conditions (including increased physical risks) were collected during the fieldwork, especially during the focus group with LGBTI migrant workers, most likely as a consequence of the combination of being a migrant and a LGBTI worker.

4.4.2 OSH and work-related MSD risk factors

This section presents psychosocial and organisational risk factors to which LGBTI workers are more frequently exposed as identified by interviewed stakeholders and workers during the fieldwork.

Psychosocial and organisational risks

Fieldwork — in line with existing research described in section 3.4 — highlighted the importance of not considering LGBTI workers as a homogeneous group. Transgender or intersex workers face different (and bigger) challenges than lesbians, gays and bisexuals, who are nowadays more socially accepted in most EU countries than in the past.

Difficulties in getting a job

In line with the evidence presented in section 3.4, our field research showed that LGBTI workers often face discrimination when searching or applying for a job, either because they are frequently not hired at the end of the recruitment process or because they withdraw from the process before the end for fear of failure. One expert thought that, generally speaking, male recruiters are more reluctant to hire LGBTI workers.

Limited promotion opportunities and career prospects

Also in line with existing evidence, the fieldwork showed that the promotion and career prospects of LGBTI workers appear to be much more limited than those of non-LGBTI workers in similar jobs and roles, and even within the same workplace. One expert postulated the existence of a 'glass ceiling' for gay men (as exists for women), limiting their chances of climbing the organisational hierarchy. Another expert suggested that the international mobility of LGBTI workers might be limited as companies (as well as individuals) cannot guarantee that LGBTI employees will enjoy same rights in another country, and this will negatively influence their career prospects. For example, in some countries being LGBTI is illegal or criminalised, and gay marriages and civil partnerships are not recognised in all countries. Notwithstanding this negative perspective, one German expert interviewed suggested that there is no problem of underrepresentation of gay men in management positions, although is not the case for lesbians. Finally, another expert interviewed suggested that LGBTI workers are less likely to be mentored as heterosexual male mentors may be unwilling to accept gay men as mentees for fear of being branded gay themselves.

Lower salaries for LGBTI workers

Our experts confirmed the existing evidence and suggested that LGBTI workers tend to earn less than their heterosexual counterparts. More specifically, gay men tend to earn less than heterosexual men working in the same role and employment sector whereas no such pattern is apparent in the case of lesbian workers. In addition gay men tend to earn less than heterosexual men because they are more likely than heterosexual men to work in women-dominated sectors, where typically salaries are lower, whereas the experience of lesbian women is quite the opposite: they are more likely than heterosexual women to work in well-paid male-dominated sectors. By way of contrast, one Hungarian expert suggested that gay men and lesbians who dare to be visible have better jobs and therefore earn more than average. Another expert suggested that, based on empirical evidence, the household incomes of heterosexual couples or gay men couples are higher than those of lesbian couples, who rely on two (lower) women salaries.

Higher prevalence of (involuntary) atypical contractual forms

Precariousness, labour insecurity and fixed-term contracts are reported to be more common among LGBTI workers than among the general working population. Thus, one expert interviewed suggested that gay men workers are more likely than heterosexual men workers to sign short-term or fixed-term contracts, although other factors might also play a role (such as age, as visible gay men are generally younger than average, and young people are more likely to work on fixed-term contracts). Fixed-term contracts also seem to be more common among transgender workers, whereas fixed-term contract rates do not differ between heterosexual women workers and lesbian workers.

Psychosocial risks and discrimination on grounds of gender identity

The field research revealed — in line with existing evidence — that transgender workers are more exposed to discrimination practices, exclusion from recruitment opportunities, verbal abuse, violence and workplace bullying, and poor working conditions. For instance, one of the experts interviewed suggested that transgender workers are two to three times more likely to be unemployed than other members of the general working population.

Under these extreme circumstances, transgender workers frequently end up accepting jobs with poorer working conditions and for which they are overqualified, as they find it difficult to get good jobs that are more in line with their skills and qualifications:

I have lost many employment opportunities when attending the job interviews due to my transgender status. Transgender women are one of the most vulnerable groups, irrespective of the country.

(Participant in the focus group with LGBTI migrant workers, Spain)

One of the key difficulties for some transgender workers undertaking the process of aligning their biological sex with their gender identity can be a lack of acceptance and support from employers and colleagues. This process often involves multiple surgeries and prolonged treatment with associated sickness absence and reduced work capacity. This, combined with the administrative burden of dealing with changes of legal identity and a disconnect between an individual's physical appearance and legal gender, is a source of uncertainty for employers, who can consider — based also on lack of knowledge and prejudice — this process upsetting, leading to termination of a contract or reluctance to hire transgender workers in the first place:

I lost my job after my transition period. My boss never accepted my new nature and I was invited to quit the job.

It is always a problem to decide when to disclose your transgender status when sending a CV, particularly when your transition period is not yet complete.

(Participants in the focus group with LGBTI migrant workers, Spain)

This situation is well illustrated by the example of a transgender woman participating in the focus group with LGTBI workers in the Netherlands. She described a terrible experience at her former employer, a manufacturing company, where her superiors refused to tackle the harassment perpetrated by her colleagues, instead stating: 'You have to accept that others will not accept who you are'. In fact, at one point her team urged her 'to act normally' and to abandon the transition process that was already under way. During the transitioning process she had to take long-term sick leave, and on her return was required to undergo a reintegration programme that enabled the employer to demote her. This situation led to high stress and psychological burden, ultimately resulting in suicidal ideation that necessitated psychiatric hospitalisation. She was subsequently declared unfit for work and is currently undergoing reskilling with a view to obtaining employment in a different sector.

It is worth mentioning that transgender workers who are not willing to align their biological sex with their gender identity can also face discrimination and exclusion, resulting in distress and mental health issues. For example, several interviewed experts suggest that employers are not always willing to provide inclusive or dedicated facilities such as toilets and changing rooms for transgender workers.

Most of the consulted experts had very little to report on intersex workers, who seem to be a largely underresearched group about whom it is difficult to collect relevant evidence.

Psychosocial risk and discrimination on grounds of sexual orientation

Some of the consulted experts reported that lesbian workers are discriminated against on two grounds, that is, on the grounds of gender and of sexual orientation. This was extensively reported to result in difficulties in the job-seeking process, especially for some specific posts, and also to restrict promotion opportunities. Gay workers are more likely to be discriminated against and harassed at work (particularly in some male-dominated sectors) especially if they are effeminate, facing reduced social acceptance or finding it more difficult to be promoted. Finally, one of the experts interviewed suggested that bisexual workers are also highly marginalised, as there is significant biphobia and a lack of understanding around them at the workplaces, resulting in discrimination and exclusion at work:

I had to leave my home country when I received death threats due to my LGTBI status. I feel often completely alone in life.

(Participant in the focus group with LGBTI migrant workers in Spain)

Discrimination on multiple grounds

Several characteristics, such as skin colour and ethnic background, migration background and legal status (for instance being an asylum-seeker), disability or residence in a rural community, are transversal elements that, alone or in combination, increase the risk of discrimination or poor working conditions, or are associated with higher levels of violence at work. For example, one expert cited the problems faced by older LGBTI older workers, who are less likely than young LGBTI individuals to disclose their sexual identity and are less accepted by society in general, as a result being more likely

to experience labour exclusion or harassment. Similarly, older transgender individuals undergoing transition often face more problems in terms of social acceptance than if they had transitioned at a younger age.

Higher prevalence of harassment, subtle discrimination and other antisocial behaviours at work

Harassment and subtle discrimination practices at work are more commonly experienced by LGBTI workers than by other groups of workers on average, as highlighted by the existing evidence. LGBTI workers have frequently to put up with forms of subtle discrimination such as jokes and mockeries, glances, gossiping, etc., that contribute to feeling unsafe and can push the target of such discrimination to self-isolation:

I have stopped attending drinks at work because I am fed up with the constant jokes about my sexual orientation.

(Participant in focus group with LGTBI workers, the Netherlands)

Harassment can also take the form of hostile or aggressive talks and arguments with superiors, and can result in isolation of LGBTI workers in the workplace and ultimately even to premature exit from employment:

I have had 'many awful talks' with my managers. Ultimately, this situation also reflected at the workplace, so people started talking less to me, while gossiping increased. This ultimately led me to quit the organisation, and start a business for myself.

(Participant in focus group with LGBTI workers in the Netherlands)

Most participants in the focus groups reported having experienced harassment or some form of subtle discrimination in their daily life outside work and which they attributed to being LGBTI. According to the participants in the fieldwork activities, this element places an additional emotional burden on them:

It has happened to me that I have been requested on the phone if I was a man or a woman. I find this particularly disdainful.

(Participant in the focus group with LGBTI migrants in Spain)

Physical violence and threats are usually less common, although present. Both of these practices can undermine individuals' confidence and self-esteem. Unfortunately, they take place not only at work but also on public transport when commuting to work, which can be an additional space for work-related discrimination.

Last year, I was assaulted in the train on my way back home from work. Afterwards I was consoled by travellers, one of whom stated that the assault was unfair as it was not obvious that I was transgender. This comment killed me off.

(Participant in the focus group with LGTBI workers, the Netherlands)

Concealment in the workplace as a protective strategy

One of the key elements that differentiate LGBTI workers from the other two research groups considered in this project is that they can be identified as such only if they disclose their sexual orientation or gender identity, which means that they have to deal with the dilemma of coming out (or not). This key factor may not only influence LGBTI individuals' choice of sector/occupation (as shown

in section 3.4), but brings additional emotional burdens for them. Thus, some LGBTI workers decide to conceal — for as long as possible — their sexual orientation or gender identity at work. According to one of the Spanish experts consulted, just 30-35 % of LGBTI workers do so in Spain, despite the fact that the Spanish legal framework is relatively advanced in comparison with that of other European countries, and protects LGBTI workers from unequal treatment.

Workers who decide to conceal their sexuality or gender identity usually do so because it is the only way to feel safe and to protect themselves, and perhaps because it is a route to a better job or necessary to retain their current job. This decision can place a high psychological pressure (with effects on LGBTI workers' health), in the sense that they have to take extra precautions not to reveal too much about themselves. This situation was well described by several of the participants in the focus group with Dutch LGBTI workers, who reported attempting to fully conform to heteronormativity, only to feel constantly stressed and with no opportunity to share this burden with someone. Indeed, many of the focus group participants admitted to keeping their LGBTI status to themselves unless disclosure was absolutely necessary.

On the other hand, LGBTI workers who decide to disclose their status usually take some time before doing so. These workers risk exposing themselves to labour exclusion, discrimination and harassment or poorer working conditions. Interestingly, to increase their chances of promotion, many gay men and lesbians also feel obliged to conceal their sexual/gender orientation, particularly in sectors where homosexuals are not fully accepted.

LGBTI inclusion and acceptance: differences among countries, companies and sectors

The probability of experiencing negative consequences such as labour exclusion, harassment or undesirable working conditions is not the same in all countries, companies (depending on their culture) or sectors/occupations. There are still important differences between countries and EU Member States in LGBTI inclusion and acceptance levels, partly as a consequence of their legal frameworks, but also as a result of prevailing cultural, social or family values. For instance, most participants in the focus group with LGBT migrants in Spain said that the situation in Spain is much better than in their home countries, although they stressed that it is always wise to be 'cautious':

Unless many things might change, I will never return to my home country. I only feel secure here and I am ready to put up with any situation here, however difficult it might be.

(Participant in the focus group with LGBTI migrants in Spain)

Employment segregation patterns

As mentioned earlier, there are no clear patterns of occupational and sectoral segregation of LGBTI workers. Nevertheless, some general indications have arisen from fieldwork activities, which complement and further qualify the existing evidence presented in section 3.4.

Generally speaking, LGBTI workers — especially those who opt to be visible — tend to work in sectors and jobs where they feel safer, less discriminated against, and not in sectors and jobs perceived and described as homophobic:

I worked in many different companies and I never experienced any sense of discrimination and harassment linked to the fact that I am gay. However, this situation changed when I started working in the large metal manufacturing company, where the company male-dominated culture resulted in daily jokes, mockery and disparaging comments towards myself. As a result, I quit the job.

(Participant in the focus group with LGBTI migrants in Spain)

On the whole, gay workers feel safer in sectors and jobs where women are overrepresented as they are less accepted in men-dominated sectors. Lesbian workers, on the other hand, report being more likely to be discriminated against in women-dominated sectors (the so-called 'prejudice-based

segregation' mentioned in section 3.4). For instance, several of the interviewed experts suggested that sectors with a higher presence of gay men include arts and the media, the fashion sector, commerce and shops, and hairdressing. Conversely, some experts suggested that many less skilled LGBTI workers find it difficult to access the labour market or get a good job and as a result are forced to work in sectors which are less safe and have worse working conditions, including lower salary levels.

Transgender workers, one interviewed expert pointed out, tend to work in sectors and occupations associated with the opposite gender, in that transgender women tend to work in jobs stereotypically dominated by men, while the opposite is true for transgender men. This expert also suggested that transgender workers appear to gravitate towards the IT sector, which might be attributed to the relatively isolated nature of the working environment in this sector.

Interestingly, the public and civil sector is regarded as one of the safest sectors for LGBTI workers for a number of reasons. First, the sector is associated with labour stability as individuals are better protected from discriminatory practices such as unfair dismissal. Second, in the event of experiencing harassment or discrimination linked to LGBTI-phobia, the process for making a complaint is clearer than in a small organisation or private companies. Recruitment practices are also fairer in the public sector, as in many European countries they are officially regulated and transparent and based on public competition involving tests and interviews, rather than on personal interviews only as in the private sector. In contrast, some male-dominated sectors such as industry or construction are particularly difficult for LGBTI individuals, especially for transgender people. Our experts also suggested that discrimination in general is more common in low-ranked occupations, with low education requirements.

Finally, one interviewed expert suggested that multinational and large companies are increasingly active in promoting diversity and inclusion practices to attract a better quality of job applicants, whereas this is not always true of smaller companies. Interestingly, another expert thought that intermediate/middle managers are often less likely to be supportive towards LGBTI workers, whereas top managers might be more aware of the value of LGBTI inclusion (or inclusive policies in general).

4.4.3 Work-related health outcomes and MSDs

As a consequence of exposure to the numerous psychosocial and organisational risks presented in the previous sections, LGBTI workers are reported to suffer from a range of mental health issues (such as depression, stress, anxiety, low self-esteem and eating disorders), mentioned by several participants in our fieldwork activities. In particular, as one expert pointed out, the suicide rate among transgender workers is higher than average, a key indicator of poor mental health stemming from repeated harassment and discrimination.

Although most of the interviewed experts were in agreement that there is limited evidence relating to the prevalence of MSDs among LGBTI workers, many of our focus group participants reported prolonged exposure to increased psychosocial and organisational risks, in combination with exposure to physical risks and in some cases MSDs. Poor mental health is known to have adverse effects on workers' physical health, including a higher prevalence of MSDs (cervical tension, neck pain, back pain), and mental health issues are more common among LGBTI workers. Mental health issues are reported to have an impact on LGBTI workers' physical health, resulting in higher prevalence of MSDs (cervical tension, neck pain, back pain) among LGBTI workers.

For instance, the two oldest participants in the focus group with LGBTI workers in the Netherlands reported having experienced mental health issues, with both participants linking these issues with their sexual orientation or, rather, the societal response to it. In particular, they attributed their burnout to the conflict between their sexual orientation and their work environment. One could no longer bear the burden of having to conceal his sexuality, while the other was worn down by constant gossiping and ridicule. Both participants reported having experienced physical discomfort that they attributed to burnout, including all manner of muscle aches, but also pain in the shoulders, back and neck.

Participants in the focus groups also stressed that discrimination and harassment, both at work and in society, have a very strong impact on the individuals' health, as evidenced by constant stress or irritability, sleep disorders and anxiety, which very often results in musculoskeletal pain, particularly in the neck and back. One expert also stressed that LGBTI workers feeling insecure or being afraid of not being accepted usually make an extra effort to show that they are capable of doing their work, which in turn generates more stress and anxiety:

When I feel gazes or gossiping at me, my body aches.

(Participant in the focus group with LGBTI migrant workers, Spain)

One participant in the focus group with LGBTI migrant workers in Spain believed that a combination of physical risks in her multiple jobs (cleaning and private care activities, assistant cook), together with stress and mental overload, had affected her health in general. Working in more than one job and commuting between them and home, long working hours and experiences of abuse and discrimination on the ground of sexuality had all, she believed, contributed to musculoskeletal problems (e.g. back pain and lumbago). She also attributed changes in her physical appearance, that is weight gain and partial hair loss, largely to her work.

Unfortunately, in many cases undesirable situations continue for long periods, with the result that health risks accumulate over an individual's working life, resulting in poor health in the medium/and long term: the higher and longer the exposure, the greater the impact on health:

High physical overload can be solved with rest, but high mental overload levels cannot be solved this way as it remains in your head.

(Participant in the focus group with LGBTI migrant workers, Spain)

Related to this final aspect, age is considered an important factor contributing to health risks in general and to the risk of MSDs in particular, and this is also true of LGBTI workers. Thus, among both interviewed experts and focus group participants there was a belief that continued exposure to several health risks over time may increase the likelihood health problems in general, and of MSDs in particular, among LGBTI workers.

4.4.4 Summary

Our fieldwork confirmed that LGBTI workers are disproportionately exposed to several psychosocial MSD-related risks in the workplace, although this situation may vary among countries, companies, depending on their culture, and sectors/occupations.

Fieldwork findings confirm most of the psychosocial risks already described in section 3.4, including added difficulties when searching or applying for a job, limited promotion opportunities and career prospects (particularly for lesbian workers) or lower salaries.

The fieldwork confirmed that repeated discrimination and harassment in the workplace on the grounds of gender or sexual identity, even if it takes subtle forms such as jokes and mockeries, glances or gossiping, is perpetrated by both colleagues and superiors and is one of the most common psychosocial risks to which LGBTI individuals are exposed. Conversely, physical violence and threats are usually less common, although still present. Indeed, these practices contribute to LGBTI workers feeling unsafe and undermine their confidence and self-esteem,

The field research has also confirmed that the strategy of 'concealment' of sexual orientation or gender identity at work not only steers LGBTI workers towards those sectors and jobs where they feel safer and less discriminated against, but also constitutes an additional source of psychological pressure. The public and civil sector is regarded as one of the safest sectors for LGBTI workers, and multinational and large companies are considered safer than small ones.

Additionally, field research findings confirmed the existence of some specific subgroups of LGBTI workers who are particularly exposed to health-related risks, namely those affected by a combination of different individual and social factors (for instance, LBT migrant women workers from some specific ethnic origins, LGBTI older people living in rural areas, transgender or intersex workers).

Finally, and as far as health and MSDs outcomes are concerned, the fieldwork confirmed that LGBTI workers suffer from poor levels of mental as well as physical health, including musculoskeletal

problems. The higher exposure of LGBTI workers to work-related psychosocial and organisational risks, occasionally in combination with high exposure to physical risks, depending on their specific occupation, is at the heart of the problem. Age and the associated cumulative exposure to risks over time increase the probability of experiencing health problems in general, and MSDs in particular.

5. Analysis of practices and policy initiatives

5.1 Introduction

Based on existing evidence and our fieldwork findings, the previous chapters of this report have discussed higher exposure to psychosocial and organisation risks in the workplace, poor working conditions and health-related issues, with a specific focus on MSDs, among the three selected groups of workers.

This chapter presents nine selected short case studies of policies and company practices in EU Member States targeting specifically the three groups of workers covered by this project and aimed at improving the working environment and reducing OSH risks — in particular MSD-related physical and psychosocial or organisational risks — to prevent MSDs and, more generally, to protect health and well-being at work..

Table 6 lists the policies and initiatives described in the case studies and summarises their main characteristics. In particular, in each case the geographical scope, the target group, the type of intervention and the responsible body are presented.

The analysed policies are a mix of EU-level, national and regional initiatives carried out by public authorities, private and not-for-profit organisations, specifically targeting one or more of the groups of workers covered by this research and consisting of risk assessment tools, guidance, awareness raising activities, labour inspections, etc.

The methodology used to identify the case studies is presented in Annex A.

Table 6: Main elements related to the analysed selected case studies

| Name | Geographical scope | Target group | Type of intervention | Type of responsible body |
|--|-------------------------|--|---|--|
| National Strategy for the Work Environment | Denmark/national | All study groups | Policy strategy, law enforcement, labour inspections, information and guidance, research | Public authority |
| Airbus Diversity and Inclusion policy | Europe | Women and LGBTI workers | Involvement of workers, training, awareness raising, conciliation and telework opportunities | Private company |
| Shared Concerns and Joint Recommendations on migrant domestic and care work | Europe | Migrant workers | Awareness raising | Different stakeholders including trade unions and NGOs |
| Risk assessment toolkit for third-country nationals | Italy/regional | Migrant workers | Risk assessment/prevention toolkit | Public authority in collaboration with social partners |
| Diversity Policy at the Dutch Research Council (NWO) | Netherlands/national | Women workers (but also LGBTI and migrant workers) | Finance support, support and guidance | Public authority |
| Business Network for LGBTI Diversity and Inclusion (REDI) | Spain/national | LGBTI workers | Consultancy and guidance, awareness raising, networking with relevant stakeholders, research activities | Not-for-profit association |
| Toolkit for the Integration of the Gender Perspective in the Prevention of Occupational Risks | Spain/regional | Women workers | Risk assessment/prevention toolkit | Public authority |
| Women's Work Environment | Sweden/national | Women workers | Awareness raising, research, labour inspections, development of risk assessment tools | Public authority |
| Transgender Workplace Support Guide | United Kingdom/regional | LGBTI workers | Research, guidance | Public authority |

Source: authors' elaboration.

This overview of the main features of the case studies that will be presented in detail in the following pages concludes with Table 7, which presents the main objectives/goals pursued by the selected initiatives.

As shown in Table 7, although a number of the analysed interventions aim directly at preventing MSDs by reducing MSD-related risks (either physical or psychosocial), many others mostly deal only indirectly with the prevention of MSDs. Such interventions are primarily designed to prevent organisational and psychosocial risks in the workplace which — as described in previous chapters — are highly relevant to the groups of workers covered by this study and are frequently associated with MSDs. More in generally, it can be said that most of the interventions described are aimed at promoting a safer, more inclusive workplace in which workers are less exposed to MSD-related risks.

Table 7: Main objectives of the analysed selected case studies

| Name | Objectives/goals |
|---|--|
| National Strategy for the Work Environment | To ensure a safe, secure and healthy work environment in Denmark, so that more workers can have a long and fulfilling working life. The three main priority areas of intervention are the psychosocial work environment, musculoskeletal overload and serious work accidents |
| Airbus Diversity and Inclusion policy | To manage diversity, enforce equal opportunities and prevent discrimination within the company |
| Shared Concerns and Joint Recommendations on migrant domestic and care work | To raise awareness of and prevent poor working conditions, discrimination and limited access to social protection among migrant workers (both non-EU and EU mobile citizens) who work in domestic and care jobs |
| Risk assessment toolkit for third-country nationals | To allow employers to comply with OSH legal requirements and carry out risk assessments for non-EU workers, and to promote specific OSH-related activities addressed to them |
| Diversity Policy at the Dutch Research Council (NWO) | To reduce discrimination towards women in academia, fostering an inclusive and equal opportunities strategy. Current target group priorities include also other disadvantaged groups such as LGBTI workers, workers with a disability and non-EU migrant workers |
| Business Network for LGBTI Inclusion and Diversity (REDI) | To foster an inclusive and respectful environment in participating organisations, contributing to the social acceptance of LGBTI workers and the eradication of socio-cultural prejudices and discrimination practices that hinder the professional development and optimum performance of LGBTI workers |
| Toolkit for the Integration of the Gender Perspective in the Prevention of Occupational Risks | To introduce a gender perspective in OSH risk prevention activities, overcoming the 'man prototype' point of view prevailing in the existing Spanish OSH risk prevention patterns |
| Women's Work Environment | To improve women's work environment, with a focus on MSD risks. The initiative includes research into women's OSH, new ways of conducting labour inspections and a set of different tools for workplaces |
| <i>Transgender Workplace Support Guide</i> | To facilitate a successful integration of transgender workers in workplaces by providing useful information and guidance for different stakeholders |

Source: authors' elaboration.

In the remainder of this chapter, the short case studies are presented individually, following a common structure, comprising background information, information on what has been done and how, a description of what has been achieved and transferability issues and future perspectives.

5.2 Description of selected targeted policies and practices

5.2.1 National Strategy for the Work Environment (Denmark)

Abstract

The initiative National Strategy for the Work Environment was introduced in 2011 to ensure a safe, secure and healthy work environment in Denmark. The National Working Environment Authority is responsible for the initiative. The strategy was further extended and improved in 2015.

Target group of workers

All groups of workers under study

Country and geographic scope

Denmark, national

Objectives

To ensuring a safe, secure and healthy work environment in Denmark, so that more workers may have access to a long and fulfilling working life. The strategy identifies three main priority areas for policy intervention: (i) the psychosocial work environment, (ii) musculoskeletal overload and (iii) serious work accidents.

Background information

The name of the initiative in Danish is Strategi for arbejdsmiljøindsatsen frem til 2020 (in English the National Strategy for the Work Environment until 2020).¹⁶

The rationale behind the National Strategy for the Work Environment is the desire to ensure a safe, secure and healthy work environment across workplaces in Denmark, so that more workers may have access to a long and fulfilling working life.

In 2010, the Danish Ministry of Employment expressed interest in preparing a technical document prioritising national efforts towards a better and safer work environment in Denmark. The resulting report identified the main future problems, challenges and focus areas for the Danish work environment up to 2020, giving a mandate to the National Working Environment Authority (WEA)¹⁷ to develop a strategy to deal with these challenges.

The strategy was developed at national level and was first introduced and approved in 2011. It was implemented for an initial period of 4 years, then was subsequently improved and extended until 2020. The new agreement was signed on 26 March 2015 by public authorities and social partners. The target group of the strategy is the Danish working population in general, although it will clearly benefit workers with poorer working conditions.

The strategy is the responsibility of the WEA and is implemented in collaboration with the WEA's social partners, the National Research Centre for the Working Environment,¹⁸ sectoral working environment committees¹⁹ and the Working Environment Council.²⁰ The strategy is funded by the Danish government and the social partners.

¹⁶ The strategy documents are available at <https://amid.dk/om-os/om-strategi-for-arbejdsmiljoeindsatsen-frem-til-2020/>

¹⁷ WEA is an agency under the auspices of the Ministry of Employment, whose main role is to contribute to the creation of safe and healthy working conditions at Danish workplaces.

¹⁸ The National Research Centre for the Working Environment (Videncenter for Arbejdsmiljø (VFA)) is a government research institute under the Danish Ministry of Employment whose main goal is to ensure that both private and public workplaces have access to the latest research-based knowledge, and the best tools to ensure a healthy and good work environment.

¹⁹ These sectoral work environment committees map the industry's occupational health and safety issues and help companies to deal with them.

²⁰ The Working Environment Council (Arbejdsmiljørådet) is a forum where employers and employees collaborate on the development of a better work environment in Denmark.

What has been done and how

The strategy — in both the first and second rounds — identifies three main priority areas for work environment interventions: (i) the psychosocial work environment, (ii) musculoskeletal overload and (iii) serious work accidents.

Three main goals associated with main priority areas and specific OSH risks have been set for the period 2012-2020:

- the proportion of employees who are stressed to be reduced by 20 %;
- the proportion of employees who experience MSDs to be reduced by 20 %;
- the number of serious accidents at work to be reduced by 25 % in relation to the number of employees.

Initially, the strategy identified 19 initiatives to achieve its objectives. Later, the signatories felt it necessary to strengthen the work environment efforts by launching a further 15 initiatives to help achieve its goals by 2020.²¹ These initiatives can be categorised into three main groups:

- law enforcement and labour inspections;
- information and guidance to employees and employers;
- research and evaluation of the strategy.

The strategy reinforces the role of labour inspections, particularly at those enterprises and in those sectors mostly affected by psychosocial and MSDs risks, a higher prevalence of mental ill health and MSDs and a higher incidence of serious work accidents or those companies with a long and extensive record of work environment problems. The strategy also strengthens the powers of law enforcement agencies by allowing stricter punishments and higher fines for infringements of labour law and OSH regulation, and makes it easier for enterprises to access information and guidance services, including specialised health and safety consultancy services. Finally, the strategy reinforces the coordination between the work of the Labour Inspectorate and the Working Environment Council.

What has been achieved

Evaluation of the strategy includes a survey, first carried out in 2012 and then every 2 years since, to measure progress in relation to the working environment and workers' physical and psychosocial conditions. This survey is conducted by the National Research Centre for the Working Environment. More than 25,000 workers from all branches of the Danish labour market take part in these biannual surveys. Several load indexes have been constructed to measure the results achieved on the three identified goals of the strategy. For instance, in the case of MSDs, the load index measures the proportion of employees who are exposed to MSDs in the workplace and also the proportion of employees who report their work as being physically hard.

In 2018, the musculoskeletal load index was 9.9 %, still a long way off the 2020 goal of 7.7 %, and in fact slightly higher than the 2012 index (9.7 %). The mental load index also increased between 2012 and 2018.

These results show the difficulty of preventing MSDs in the workforce, particularly in some specific sectors such as construction, cleaning services, butchery, hairdressing and the day care/home care sectors, all of which are characterised by a high prevalence of musculoskeletal-related problems and hard physical work. These results also show the need for specific tailored actions and activities in these sectors, in some of which women and migrant workers are overrepresented.

²¹ For further information on these initiatives and goals see <https://at.dk/media/2953/strategy-working-environment-efforts-2020.pdf>

Transferability issues and future perspectives

The Danish National Strategy for the Work Environment is a national strategy developed in a national context characterised by a long tradition of social dialogue and the involvement of social partners. As a result it is not easily transferable to other national contexts without considerable modification. In fact, some of the tools developed for the Danish National Strategy for the Work Environment have been used in other national contexts. For example, some of the questions included in the evaluation survey have been used to develop measures of the impact of the strategy on work-related risks, and a shorter version of one such measure, known as the Copenhagen Burnout Inventory, has been used in other countries (i.e. Sweden Finland, Slovenia). The role played by social partners in the definition and running of the Danish national strategy could also set a good example to other countries.

Looking to the future, an expert committee established under the auspices of the Ministry of Employment identified in 2018 the importance of updating the strategy, particularly taking into account progress towards the 2020 reduction goals presented above.

5.2.2 Airbus Diversity and Inclusion policy (Europe; Spain)

Abstract

Airbus is a European multinational aerospace corporation, specialised in the design, manufacturing and sale of civil and military aerospace products worldwide. Airbus has developed over the years a very active diversity and inclusion policy, particularly on women and LGBTI employees.

Target group of workers

Women and LGBTI employees of Airbus

Country and geographic scope

Europe, international

Objectives

The Airbus Diversity and Inclusion policy is aimed at managing diversity, promoting equal opportunities and preventing discrimination practices within the company.

Background information

Airbus is a European multinational aerospace corporation, specialised in the design, manufacturing and sale of civil and military aerospace products worldwide. The current company is the result of the consolidation of several European aerospace companies initiated in the 1970s, and the company's current name was adopted in April 2017. The company has three main divisions, commercial aircraft, defence and space, and helicopters, and it has final assembly production sites in France (Toulouse), Germany (Hamburg), Spain (Seville), China (Tianjin), and the United States (Mobile, Alabama), as well as production sites in other countries. In 2019, the company became the world's largest airliner manufacturer. In 2018, the company generated revenues of EUR 63.7 billion and employed a workforce of around 134,000 people worldwide. To ensure an inclusive work environment, in which equal opportunities are promoted, and discrimination is actively discouraged, in such a complex organisation, with a workforce of more than 120 different nationalities, and speaking more than 20 languages, Airbus has introduced a company-wide diversity and inclusion policy. From an OSH viewpoint, this contributes to the prevention psychosocial risks, in particular for some groups of workers, creating a safer and healthier working environment.

What has been done and how

In the last few years Airbus has actively developed an inclusion and diversity policy, in the belief that an inclusive working environment composed of diverse groups of workers encourages a wide range of ideas as well as fostering engagement, encouraging creativity and improving company performance, at

all levels. With this aim, in 2011 Airbus signed a long-term agreement with employee representative organisations covering social diversity, equal opportunities and the prevention of discrimination among whole group. Diversity also forms part of Airbus's Responsibility & Sustainability Charter,²² introduced in 2017, which identifies nine commitments as part of its responsible business strategy, including diversity issues.

As part of the wider inclusion and diversity policy, Airbus established an Inclusion & Diversity Division, which is responsible for the implementation of the agreement on diversity and the charter, and therefore responsible for developing initiatives for different specific groups of workers, including disabled workers, young and older workers, women and LGBTI workers. This Division has around 20 employees in total, scattered around national units in the core countries (i.e. France, Germany, the United Kingdom and Spain), and coordinates all the initiatives implemented and presented below. All national units are coordinated by the Inclusion & Diversity Division, which is located in the company's headquarters in France.

Airbus implements its diversity policy through Airbus Employee Resource Groups (Airbus ERGs), self-empowered, trust-based and collaborative communities made up of company employees who volunteer to develop ad hoc initiatives in co-ordination with the company and within its diversity policy (see below for a further description of these initiatives). Specifically, and in the case of women, the ERG is called WoMen Network, whereas the group for LGBT workers is called Pride@Airbus.²³ The federating platform for these Airbus ERGs is called Balance For Business.

The Airbus Diversity and Inclusion policy has developed so far several initiatives aimed at women and LGBTI workers. For example, each year on 8 March (International Women's Day), Airbus organises, in collaboration with WoMen Network, internal events (usually speeches and conferences guided by a high-ranking woman manager) promoting awareness within the company of the key role that women play in society and business. In addition, throughout the year Airbus holds motivation events at which women managers share their views and experiences with other Airbus women workers. The company also organises several specific training activities for women workers, on subjects including confidence building, personal brand building, soft skills and communication. Finally, Airbus has in place several measures to support conciliation and teleworking opportunities.²⁴

Airbus also supports the UN Women's Empowerment Principles, an initiative aimed at empowering women to participate fully in economic life across all sectors and all levels of economic activity. Furthermore, Airbus is a leading member of the International Aviation Women's Association (IAWA)²⁵ and has signed the UK Women in Aviation and Aerospace Charter, committing itself to support the progression of women into senior roles and to publicly report on progress.

As regards LGBTI workers, Airbus is committed to ensuring an open and inclusive working environment for members of the LGBTI community so that all workers feel respected and valued in their workplace. The company's attention to the LGBTI community is more recent than that towards women. However, it was still one of the early adopters of the UN Standards of Conduct for Business tackling discrimination against lesbian, gay, bi, trans and intersex people, which it signed in 2018 at Davos.

Airbus runs several internal awareness-raising campaigns. For instance, each year on 17 May (International Day Against Homophobia, Transphobia and Biphobia) the company organises several activities, including open discussion events, inspirational speeches and 'rainbow flag' decorations in its different workplaces. Airbus has also recently committed to the Charter of LGBT+ developed by l'Autre Cercle, a leading French national LGBTI voluntary association.

²² See <https://www.airbus.com/content/dam/channel-specific/website-company/responsibility-and-sustainability/responsibility-and-sustainability-landing-page/Responsibility-and-Sustainability-Charter-English.pdf>

²³ In Spain, WoMen Network (founded in 2011) has more than 500 members (approximately 10 % of them active), whereas Pride@AIRBUS, which was founded more recently, in 2017, has around 30-40 members.

²⁴ It is worth mentioning that WoMen Network organises and develops so-called 'inspirational speeches at schools', that is, sessions for girls attending secondary school where Airbus women workers try to inspire girls to follow a career in STEM (science, technology, engineering and mathematics).

²⁵ IAWA supports women leaders in the aviation and aerospace industries through its global membership network.

What has been achieved

Many of the activities carried out under the Airbus Diversity and Inclusion policy are evaluated to measuring the results they achieve. For instance, Airbus has developed a number of key performance indicators (KPIs) related to gender diversity, including the proportion of women promoted to a position of senior manager or above, the proportion of women among white-collar external hires, the number of women participating in training activities and the gender pay gap at all levels. In contrast, however, no specific KPIs have yet been defined for LGBTI workers,.

Airbus has published reports on the company's gender pay gap in France and the United Kingdom.²⁶ A similar exercise is being carried out in Spain, but the results have not yet been published.

The inclusive working environment in Airbus is reportedly a major strength of the company, and — according to Airbus representatives — has had positive results in terms of employee engagement, commitment, innovation and performance. The company is also perceived as an attractive employer not just by students but also by professionals,²⁷ characterised by an inclusive culture that respects and values all employees irrespective of their gender, ethnicity or sexual orientation.

The Airbus employee whom we interviewed stressed the importance of adopting a medium/long-term perspective when measuring the effects of inclusion and diversity policies, as organisational changes in this area often happen very gradually, and it takes time for conclusive results to become apparent.

Transferability issues and future perspectives

The experience of Airbus in the area of inclusion and diversity management could be transferred to other organisations, provided account is taken of differences in international reach, and the size of the company and sector of activity. Airbus's inclusion and diversity activities will continue in the coming years. For instance, activities planned for the very near future include so-called 'unconscious bias' training for the entire Airbus workforce. The aim is to eliminate existing, perhaps unconscious, prejudices that are common among the general population. It is also hoped that the ERGs will play a more active role in the future with greater coordination among the ERGs such that the Airbus Inclusion & Diversity Division can play a secondary role but still supportive role.

5.2.3 Shared Concerns and Joint Recommendations on migrant domestic and care work (Europe)

Abstract

The 'Shared Concerns and Joint Recommendations on migrant domestic and care work' declaration describes challenges, risks and recommendations to different stakeholders concerned with the issue. It aims at raising awareness on and preventing poor working conditions, discrimination and limited access to social protection of migrant workers (both non-EU and EU migrant workers) who work in domestic and care jobs.

Target group of workers

Migrant workers involved in domestic and care work, mostly women workers

Country and geographic scope

Europe, international

Objectives

Raising awareness on and preventing poor working conditions, discrimination and limited access to social protection of migrant workers (both non-EU and EU mobile citizens) who work in domestic and care jobs.

²⁶ See *Airbus in the UK Gender Pay Gap Report* (<https://www.AIRBUS.com/content/dam/corporate-topics/corporate-social-responsibility/ethics-and-compliance/AIRBUS-uk-gender-pay-gap-statement.pdf>) and the *France Gender Pay Gap Report* (<https://www.AIRBUS.com/content/dam/corporate-topics/publications/AIRBUS-Employees-Gender-Pay-Gap-in-France.pdf>), both published in 2019.

²⁷ See <https://universumglobal.com/list-assessment/>

Background information on the policy initiative

The 'Shared Concerns and Joint Recommendations on migrant domestic and care work' joint declaration²⁸ was launched in February 2018 by a network of 29 European organisations, including EU-level and national trade unions (e.g. the European Trade Union Confederation (ETUC), the European Federation of Food, Agriculture and Tourism Trade Unions (EFFAT), Union Network International (UNI) Europa, the European Federation of Public Service Unions (EPSU)) as well as several EU-level and national-level NGOs and networks addressing migrants (e.g. Charitas Europa, Platform for International Cooperation on Undocumented Migrants (PICUM)). PICUM was one of the key driving forces behind the joint declaration.²⁹

The target group of the joint declaration are policy-makers in the EU and EU Member State and social partners (the European Commission and the European Parliament, European committees, trade unions and employer's associations, etc.) with a say in the employment, working conditions and OSH of migrant domestic and care workers in the EU.

The main goal of the declaration is to further strengthen protections and reduce the OSH risks of migrant workers employed in the domestic and care sectors, including a set of recommendations for policy-makers. The ultimate aim is to ensure that the care needs of Europe are met while preventing the exploitation of migrant workers and ensuring that employment in the domestic and care sector is decent and dignified.

Migrant domestic and care workers are employed in jobs characterised by very poor working conditions and high exposure to OSH risks, including MSD risks, in addition to a high risk of exploitation, lack of social recognition and difficulty in reporting abuses to the authorities and labour inspectors (especially for those in an irregular employment situation). The gender dimension of this sector (around 80 % of these workers are women) is a source of additional risks for these workers, including gender-based violence, both physical and psychological.

The origin of the joint declaration goes back to different documents elaborated by several institutions on irregular migrants and care workers, specifically the opinion document entitled *The rights of live-in care workers*,³⁰ approved in September 2016 by the European Economic and Social Committee (EESC) and the European Commission against Racism and Intolerance (ECRI)³¹ in its General Policy Recommendation (GPR) number 16, which encourages governments to uphold the human rights of all people who are present within their borders, regardless of their immigration status.³²

What has been done and how

PICUM initiated talks with different trade unions and NGOs at national and EU levels to develop some specific action for this group of migrant workers. To this end, at three strategy meetings held between December 2016 and October 2017 participants defined the content, scope and policy recommendations of this declaration. Specifically, this joint declaration is structured around four main areas:

- challenges around lack of recognition and poor regulation of domestic and care work/economy;
- risks of exploitation and challenges to access justice for migrant workers;
- discrimination, violence and limited access to services and social protection faced by migrant domestic and/or care workers in private households;
- policy recommendations for these three fields of action and to support a multi-stakeholder

²⁸ See https://picum.org/Documents/Publi/2018/concerns_recommendations_migrant_domestic_care_work_February2018.pdf, which also includes a list of participating organisations.

²⁹ PICUM, based in Brussels, is a network of organisations working to ensure social justice and human rights for undocumented migrants. It was established in 2001 and currently has 162 members in 32 countries, primarily in Europe..

³⁰ See <https://www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/rights-live-care-workers-own-initiative-opinion>

³¹ ECRI is a human rights monitoring body established in 1993 by the Council of Europe and specialising in the fight against racism, discrimination, xenophobia, antisemitism and intolerance in Europe.

³² See 'Safeguarding irregularly present migrants from discrimination' (<https://rm.coe.int/ecri-general-policy-recommendation-no-16-key-topics-safeguarding-irreg/16808b763b>).

approach to address them effectively.

In this regard, some of the key policy recommendations include ensuring that domestic workers can change jobs and still retain their visa or employment rights, and ensuring that regular labour standards apply to all domestic workers. The joint declaration also stresses that all workers should be free to report abuses to the authorities without fear of arrest or deportation.

What has been achieved

The joint declaration has been extensively disseminated on several fora and learning platforms. For instance, it has been uploaded to Apolitical, a global learning platform for policy-makers.³³ Meanwhile, on 15 June 2018, and also on the occasion of the International Domestic Workers' Day (16 June), a call to recognise the labour and social rights of migrant domestic workers and migrant care workers³⁴ was disseminated by PICUM and other participating partners to the governments of EU Member States and the institutions of the EU. The signatories included the European Federation of Services for Individuals (EFSI) and three European trade union confederations (EFFAT, EPSU and UNI Europa). The declaration was attached to the call.

In addition, in July 2018, PICUM actively participated in the final round of inter-governmental negotiations on the UN Global Compact on Migration Process, holding more than 50 bilateral or multilateral meetings with government representatives and UN delegations, including the majority of EU Member State delegations at the UN. In these talks, the joint declaration was presented and discussed. PICUM presented this joint declaration on 15 October 2019 in a conference organised by the EESC to discuss the future of live-in care work in Europe, at which representatives of the European Commission, the International Labour Organization and EU employers' networks were also present. Finally, all stakeholders participating in the declaration have uploaded it to their website, to increase visibility.

The joint declaration has promoted the inclusion of migrant workers in the domestic and care sector and their working conditions in the debate and political discussion at EU level, and at the same time has raised awareness of the issue of undocumented migrant domestic and care workers in the political arena, particularly at EU level.

Transferability issues and future perspectives

The initiative has not yet been extended to other groups of workers. It is unlikely, given expected developments in Europe in the coming years, such as increasing demand for domestic and care services due to ageing societies, shortages of (skilled) workers, climate change, regional conflicts and the increased mobility of people worldwide, that migration, including illegal migration, will decrease. In this context, it will become more necessary than ever to ensure good and safe working and living conditions for migrant workers.

5.2.4 Risk assessment toolkit for third-country nationals (Lombardy, Italy)

Abstract

The initiative 'Valutazione dei rischi per la sicurezza e la salute con riferimento alla provenienza da altri paesi' (Assessment of health and safety risks of workers from non-EU countries) was launched in 2009 by the local health authority of Brescia in collaboration with social partners, and provides reference toolkit to be used by Italian firms to incorporate OSH risks related to non-EU migrant workers within their risk assessment.

Target group of workers

Migrant workers from third countries

Country and geographic scope

Italy, regional

³³ See https://apolitical.co/en/solution_article/cross-border-care-how-to-protect-migrants-in-domestic-work

³⁴ See <https://picum.org/the-united-nations-global-compact-on-migration-is-a-key-opportunity-to-recognise-rights-of-migrant-domestic-and-care-workers/>

Objectives

To develop a suitable and comprehensive toolkit that will allow employers to comply with the existing Italian legal requirements on OSH, including the specific requirements of third-country workers, and to take account of these requirements in their risk assessment activities and to develop OSH-related activities specifically aimed at this group.

Background information

The initiative Valutazione dei rischi per la sicurezza e la salute con riferimento alla provenienza da altri paesi (Risk assessment of health and safety related to third-nations provenance)³⁵ was launched in 2009 in the province of Brescia, in the Lombardy region (northern Italy). Brescia is a highly industrialised area specialised in metalworking. The initiative was promoted by the ASL (Azienda Sanitaria Locale, local health authority) in Brescia.³⁶ Specifically, this initiative was developed in collaboration with local social partners, including the local employers' association, AIB (Associazione Industriali di Brescia, Association of Industrialists of Brescia), and the local branches of main national-level Italian trade unions (the Italian Confederation of Labour (CGIL), the Italian Confederation of Workers' Trades Unions (CISL) and the Italian Labour Union (UIL)).

The group targeted by the initiative was non-EU migrant workers in Brescia. The province of Brescia has the highest proportion of migrants in Italy, most of whom are employed in the manufacturing and construction sectors. The nature of their work means that these migrant workers are particularly exposed to OSH-related risks, so they need risk assessments adapted to their characteristics and specific needs. This initiative was partially based on another developed by the ASL of Verona,³⁷ but expanded to include socio-occupational information and also information on living and working conditions and eating habits.

What has been done and how

The main goal of the initiative was to develop a suitable and comprehensive toolkit that will allow employers to comply with the existing Italian legal requirements on OSH:³⁸ it is a legal obligation for employers to take into account in their risk assessments the sociodemographics of their workforce (in this case being citizen of a non-EU country), and to promote specific and targeted OSH-related interventions based on identified risks and needs.

The initiative developed a risk assessment toolkit aiming at evaluating the most relevant personal, social and work-related risk factors that contribute to migrants' greater vulnerability in the workplace. More precisely, the toolkit comprises three separate questionnaires. The first evaluates the linguistic competence of migrant workers. The second collects information on various personal (such as length of residence in Italy, knowledge of the health system, living conditions) and work-related factors (such as professional experience, knowledge of OSH legislation) that impact on migrants' health and safety at work. Finally, a third questionnaire is aimed at Italian colleagues in the same workplace and with similar working conditions. This group of workers forms a control group to enable identification of risks that are specific to migrant workers. The toolkit is free and can be accessed by all.

The project was conducted in two main phases. In the first phase, in 2009, a preliminary set of relevant factors contributing to migrants' higher vulnerability was identified and three questionnaires were developed to allow further investigation of these factors. Later, experts from local social partner organisations streamlined the questionnaires, which were then tested, in summer 2010, on both migrant workers and a control group of Italian colleagues in seven medium and large manufacturing metalworking firms (250+ employees) with well-established OSH internal services. The results were

³⁵ See <https://www.cislbrescia.it/wp-content/uploads/2011/11/Un-progetto-sulla-sicurezza-per-i-lavoratori-stranieri.pdf>

³⁶ In 2017, ASL was renamed ATS (Azienda Territoriale Sanitaria, in English Territorial Health Services Company). ASL Brescia is a public body whose responsibilities include investigations and epidemiological studies addressing critical health issues in the province of Brescia, including health and safety in workplaces.

³⁷ The original initiative was called 'Promossi. In classe' ('Passed. In classroom') in 2007-2008. See http://www.ulss22.ven.it/UploadDocs/2600_promossi_in_classe.pdf

³⁸ See Article 11 of legislative decree 81/2008 (Testo Unico sulla Salute e sicurezza sul Lavoro, the consolidated Law on Occupational Safety and Health (OSH) in Italy).

presented in autumn 2010. Subsequently, a second phase was launched in 2014 among construction workers attending several training courses, with the support of the local Cassa Edile.³⁹ The results were summarised in a report on diversity and risk assessment (Sottini et al., 2015, see Table A4 in Annex A).

What has been achieved

The 2010 and 2014 surveys showed that most migrant workers report insufficient knowledge of Italian OHS regulations and poorer understanding of OHS training than national workers. The surveys also showed that a large proportion of migrant workers believe that employees need to pay more attention to OSH to reduce risks and prevent work accidents. The results of the surveys revealed three main ways in which OSH risks among migrant workers can be reduced, namely improving migrants' expertise in Italian, promoting migrants' knowledge of their rights and, finally, providing and promoting OSH training tailored to their needs.

The project had in the following positive outcomes.

- *Continued use of the toolkit.* The toolkit is currently used by many employers to comply with the existing Italian legal requirements on OSH.⁴⁰ The toolkit was reported to be 'something that regularly reappears' among OHS officers and workers representatives in unionised firms. Therefore, the toolkit is regarded as a reference tool thanks to its good methodological design and validation among social partners in Italy.
- *Enhanced cooperation among social partners.* The toolkit was jointly developed in cooperation between local social partners, who arrived at a 'frank' consensus on its contents and scope. This result is very important, as Brescia has a reputation for strongly adversarial industrial relations. In this regard, it is worth stressing the key role played by ASL Brescia, fostering collaboration between social partners.
- *Change of employers' mentality.* The project has promoted a shift in companies' approach to workers from third-country origins, from paternalism towards a more pragmatic and effective style of protection that helps retain migrant workers.

Finally, the analysed project highlights the pivotal role of both a multidisciplinary approach to OSH for specific social targets, such as migrants, and extensive involvement of social partners in order to ensure the project's successful implementation. This project also shows that OSH is a common concern, which can mobilise social partners and public OSH authorities and result in cooperation and joint effort.

Transferability issues and future perspectives

The toolkit has been extensively disseminated in Italy by various means, including publication on the websites of the project partners and dissemination in specialised fora, notably at a meeting held in Brescia on 6 November 2010, the proceedings of which were published in a major Italian journal on labour medicine because the toolkit was deemed to be of interest to both employers and OSH services practitioners. The toolkit has also been extensively used by Italian companies interested in complying with the existing legal requirements derived from Article 11 of legislative decree 81/2008. No further extension of the project is currently envisaged.

³⁹ Cassa Edile is a bipartite body in the construction sector engaged in the provision of various services, including vocational training and OHS services, to companies and workers.

⁴⁰ See Article 11 of legislative decree 81/2008 (Testo Unico sulla Salute e sicurezza sul Lavoro, the Consolidated Law on Occupational Safety and Health) in Italy.

5.2.5 Diversity Policy at the Dutch Research Council (NWO) (Netherlands)

Abstract

After observing in 2017 that most of the recipients of research grants and appointees in academia were men, the Dutch Research Council (NWO), which provides research grants and makes appointments, implemented a strategy of inclusive policy-making, seeking to enhance women's position in academia and in Dutch research institutes. Since then, the strategy has been expanded to ensure equal opportunities, regardless of cultural, ethnic or religious background, and regardless of gender or sexual identity.

Target group of workers

Women workers in academia, as well as other minority groups such as LGBTI and non-western migrant researchers

Country and geographic scope

The Netherlands, national

Objectives

Reducing discrimination towards women in academia, fostering an inclusive and equal opportunities strategy. Current target group priorities include also other disadvantaged groups such as LGBTI workers, workers with a disability and non-EU migrant workers .

Background information

Studies show that women working in the academia in the Netherlands face barriers in their career and are underrepresented in senior positions. In 2019, the National Network of Women Professors (LNVH) published a study on harassment experienced by women in their academic jobs, and on the causes and the consequences of harassment for individuals, organisations and science in general. The study showed that women felt unwelcome, excluded and unsafe in their workplace because of harassment. In addition, women in academic jobs interviewed for this study reported physical and psychological consequences of psychosocial risk, including chronic pain, cardiac arrhythmia, anxiety, burnout and depression, leading some to need medication to be able to cope with harassment and go on with their work.

Against this background, the Dutch Research Council (Nederlandse Organisatie voor Wetenschappelijk Onderzoek; NWO⁴¹) introduced a Diversity Policy to address these issues and to strengthen the position of women in academia, contributing to create a safer and healthier working environment for them. The policy was introduced in 2017 after it became clear that the overwhelming majority of applicants for and recipients of research grants provided by NWO were men. Women were also found to be less likely to receive an academic appointment, let alone hold a high position in academia. Moreover, women constituted a relatively small proportion of the research workforce employed at the NWO. With the aim of changing these trends, the initiative initially focused on women but was later broadened to include LGBTI workers, workers with a disability and non-EU migrant workers.

What has been done and how

Broadly, the initiative seeks to ensure that all researchers have the same opportunities to secure grants and appointments in academia and at research institutes. As part of the initiative the following activities were developed:

- The *Aspasia programme* provides additional funds to women researchers in receipt of a NWO grant as well as to those who were unsuccessful but who were nonetheless evaluated very

⁴¹ The NWO manages and distributes public research funding and programmes that tackle contemporary social challenges in line with the national research agenda. The first task is carried out at the head office of NWO, while the second task is carried out by nine NWO research institutes.

positively.

- The *Science and Technology Fund* provides personal grants to women researchers in the natural, applied and engineering sciences, as well as funding additional positions in academia reserved solely for women.
- The *Women in Science Excel (WISE)/Project 11* provides tenure track positions to women researchers who wish to set up their own research programme and group, and also provides support and guidance.

To ensure that the award process for research grants provide equal opportunities, the NWO selection committees are instructed to consider any gender biases that might disadvantage women from being selected. Similarly, application forms are designed to avoid gender-biased selection.

Four of the NWO's institutes jointly decided to draw up Gender Equality Plans (GEPs) for their own organisation. Under these plans, Gender Equality Teams within each NWO were set up to organise and evaluate means of enhancing gender equality. So far, most effort has gone into increasing the use of gender-neutral language, and making their employees aware of biases by discussing them in team meetings and performance reviews. In addition, employees are trained in gender diversity, which in the future will be supplemented by further training on cultural, ethnic, religious and sexual diversity. In addition network meetings are organised. NWO has also joined Workplace Pride. Plans are being made to let all NWO's institutes to draw up GEPs to enable a NWO-wide approach.

What has been achieved

A direct consequence of this policy has been an increase in the number of women appointees in academia and at NWO research institutes. By extension, the initiative has also led to a diversification of the board of the head office of NWO, which now includes two more women. In many other respects, the effects of the policy initiative can be described as earl and small. Most of these steps pertain to increasing awareness of the influence of biases in shaping disadvantaged groups' chance of securing successful careers and safer and healthier workplaces. These efforts have nonetheless been placed front and centre, with hiring procedures having been adapted, while project evaluations explicitly enquire about harassment.

Although the initiative has been considered a success by the NWO's human resources department in charge of the policy, its implementation has been subject to several challenges. As the implementation of the initiative progressed, it became clear that the scope was wider than anticipated, and required a greater commitment in terms of time. Progress towards an inclusive workplace is being made, but this could probably be enhanced if dedicated staff could work full-time overseeing the policy implementation. In addition, the decentralised nature of NWO research institutes makes it more difficult to reach a quick agreement on how to tackle inclusivity across the organisation. Furthermore, although the initiative is supported throughout NWO, the success of subprojects still tends to be dependent on individual project leaders, raising questions about continuity if these leaders were to leave.

Transferability issues and future perspectives

Aspects of the policy can be easily transferred to other academic organisations and research institutions both in the Netherlands and elsewhere in Europe. Some organisations have already drafted plans with the aim of addressing inclusivity. The policy initiative pursued by NWO might provide these organisations with a concrete example of how to tackle the question of inclusivity.

As for the NWO itself, the end goal of the policy initiative is to ensure that presently disadvantaged groups can secure a successful research career without explicit support. However, achieving this goal is likely to take substantial time owing to the scope of the actions required. Hence, a step-by-step approach has been taken, tackling the issues of individual groups one by one. At present, most effort is directed at the inclusion of women and LGBTI workers, and the inclusion of migrant researchers will be tackled later. Looking to the future, NWO is seeking additional international funding specifically geared towards questions of inclusivity in order to further support the initiative.

5.2.6 Business Network for LGBTI Inclusion and Diversity (REDI) (Spain)

Abstract

REDI is a non-profit association formally established in 2015 and comprising a network of member companies (both SMEs and large ones), including some of the most important Spanish companies and international multinationals located in Spain. REDI works for the diversity and inclusion (D&I) of LGBTI workers within Spanish companies, and develops a number of activities in this domain that, ultimately, favour the removal of any form of discrimination against these workers within Spanish workplaces.

Target group of workers

LGBTI workers

Country and geographic scope

Spain, national

Objectives

Fostering an inclusive and respectful environment in participating organisations, contributing to the social acceptance of LGBTI workers and the eradication of socio-cultural prejudices and discrimination practices that hinder professional development and full performance of LGBTI workers.

Background information

REDI is an inter-business network of professionals active in fostering diversity and inclusion of LGBTI employees within Spanish companies. REDI stands for Red Empresarial por la Diversidad e Inclusión LGTB (Business Network for LGBTI Inclusion and Diversity).⁴²

REDI was set up in June 2015⁴³ as a network of professionals with proven expertise in human resources and diversity, and who were interested in promoting best inclusion practices for LGBTI employees in the Spanish business context. The creation of REDI was inspired by the experience of similar international entities, such as Stonewall in the United Kingdom and Out & Equal in the United States.

REDI's main goals are:

- to foster an inclusive and respectful working environment in organisations, where talent is valued regardless of identity, gender expression or sexual orientation;
- to contribute to the social acceptance of LGBTI workers and the eradication of socio-cultural prejudices that hinder their professional development and prevent optimum performance;
- to ensure that LGBTI diversity and inclusion becomes common practice and is perceived as a competitive advantage among Spanish companies.

Indeed, the rationale behind REDI's activities is that the incorporation of sexual orientation and gender identity within companies' diversity and inclusion programmes enhances innovation and brings better business results in terms of higher attraction and retention of talent, greater innovation of products and services and a higher level of satisfaction and commitment among LGBTI employees, which results in a performance and productivity increase. From the point of view of LGBTI employees' health and safety, diversity and inclusion programmes contribute to considerably reducing psychosocial risks (especially

⁴² See <http://www.redi-lgbti.org/>

⁴³ In February 2018, and as a result of its increasing activities and the resources required, REDI was formally established as a non-profit association by 14 founding member organisations (11 large companies and three SMEs or institutions), including some of the most important Spanish companies in different sectors as well as several international companies located in Spain. Since its foundation, the number of associated companies has increased rapidly, and membership at November 2019 stood at 63.

discrimination practices, but also harassment, bullying and verbal abuse) and therefore to the establishment of a healthier and safer workplace for LGBTI employees and for everybody.

REDI is financially supported by its associated companies (both SMEs and large ones). In 2018, its budget was EUR 22,504, with annual membership fees accounting for the majority of its income (nearly 94 %); in 2019 this figure had increased to EUR 71,126.

REDI's governing bodies include a General Assembly (comprising representatives from all member companies and constituting the supreme governing) and a Management Board (composed of representatives from member organisations and tasked with the management of REDI).

What has been done and how

Since its creation, REDI has developed a large number of activities, specifically in four main areas:

- *Supporting the implementation of LGBTI diversity and inclusion policies within companies.* Example training and mentoring of managers and employees; consultancy services for human resources departments in the area diversity and inclusion company policies; and support in the development of internal communication activities.
- *Active presence in different media and public fora to create synergies and amplify the visibility of best practices,* particularly those involved in diversity, corporate social responsibility, employment/recruitment fairs or, finally, LGBTI events.
- *Collaboration with different public and private organisations* involved in the promotion of social acceptance and labour inclusion of LGBTI individuals (in universities, LGBTI groups and associations, NGOs, public institutions, etc.).
- *Publication of reports and studies.* REDI has published a number of reports and studies on LGBTI diversity and inclusion issues.

What has been achieved

REDI has helped to make diversity and inclusion of LGBTI employees a 'hot topic' for many companies, interested in learning from the experiences of other companies. Interest in the activities carried out by REDI is growing, as demonstrated by the increasing number of associated companies, for which partnering with REDI provides additional benefits, including the opportunity to network with other companies and institutions and share relevant knowledge and experiences as well as higher visibility for the company and its diversity and inclusion programmes.

REDI has promoted its activities on various media and in a range of public fora, including the annual IE LGBT@Work symposium, the Intrama LGBTI Diversity Congress and several LGBTI pride events in Madrid and Barcelona. REDI has also developed the so-called REDI Networking events for the exchange and dissemination of company best practice in the areas of diversity and inclusion in Spain. REDI has also participated in the Spanish Diversity and Inclusion LGBTI Companies Barometer as well as in the Think Tank for Diversity and Innovation in companies, developed in collaboration with a Spanish Business School.

Transferability issues and future perspectives

Organisations working for diversity and LGBTI inclusion in the workplace similar to REDI already exist in several countries, which implies that this is a fully transferable initiative. REDI is currently engaged in a process of growth and consolidation of the REDI brand image, including the launch of a new REDI website and better internal and external communication management. In the future REDI is interested in increasing both the scope and number of the services provided to its company associates, as well as fostering the standardisation of REDI's procedures, particularly in relation to the services provided.

5.2.7 Toolkit for the integration of the gender perspective in the prevention of occupational risks (Basque Country, Spain)

Abstract

The toolkit, Guidelines for the integration of the gender perspective in the prevention of occupational risks, is aimed at helping companies and prevention services professionals and experts to include a gender perspective in occupational risk prevention activities, including the prevention of MSDs. It is published by Osalan (Basque Institute of Occupational Safety and Health, Basque Country, Spain).

Target group of workers

Women workers

Country and geographic scope

Spain, regional

Objectives

Developing an ad hoc toolkit for introducing a gender perspective in OSH risk prevention activities, overcoming the 'man stereotypical' point of view prevailing in the existing Spanish OSH risk prevention patterns.

Background information

The name of the toolkit is Pautas para la integración de la perspectiva de género en la prevención de riesgos laborales (Guidelines for the integration of the gender perspective in the prevention of occupational risks).⁴⁴ This toolkit has been developed at regional level, in the Basque Country region in the north of Spain, but it could easily be applied to the whole of Spain as most OSH and risk prevention practices apply equally to all Spanish regions. The entity responsible for this toolkit is Osalan, the Basque Institute of Labour Safety and Health,⁴⁵ supported by Emakunde, the Basque Women's Institute.⁴⁶ The toolkit was financed from the public budget assigned to Osalan by the Basque government.

The target group of this toolkit are companies and prevention services professionals and experts interested in integrating the gender perspective in OSH risk prevention activities, including of course MSD-related risks. The authors of the toolkit suggest that existing Spanish occupational risk prevention tools (including generally applied protocols and practices, legal limits on exposure to certain risks, etc.) are designed from a 'man prototype' point of view. Therefore, there is an urgent need to bring a gender perspective into the discussion, to make sure that such tools can take into account characteristics of women and their jobs. The toolkit was designed to address this need.

What has been done and how

Development of toolkit by the Osalan team began in 2016, and a pilot version of the toolkit was eventually published at the end of 2017. It has since been revised and improved, and a new version is expected to be published. Further improvements are also expected in the coming years.

During 2018 and 2019, the toolkit was piloted in four companies. This process allowed Osalan to test the validity of the toolkit and improve it, with a view to producing a second version. One of the most important new features is a 'self-diagnosis test', to be used by companies to detect deficiencies and areas in need of improvement, supported by suggested actions to be implemented by the company.

⁴⁴ See http://www.osalan.euskadi.eus/contenidos/libro/gestion_201710/es_def/adjuntos/pautas_integracion_prl.pdf

⁴⁵ Osalan is an autonomous administrative entity of the Basque government that is attached to the Department of Labour and Justice and is responsible for the management, coordination and promotion of actions aiming to improve workers' health, in all sectors and company types. A multidisciplinary Gender Group composed of eight Osalan staff members was responsible for the creation of the toolkit. See <https://www.osalan.euskadi.eus/>

⁴⁶ Emakunde is an autonomous administrative entity of the Basque government that designs, coordinates, promotes and evaluates gender equality policies in the Basque Country.

The toolkit provides recommendations and methodological advice on how to incorporate a gender perspective in risk prevention activities for businesses. It aims to provide a holistic view of women and OSH risk prevention, going beyond traditional issues, such as pregnancy, breastfeeding or sexual harassment. The idea is that all workers, employers and prevention services experts are aware of sexual (biological) and gender (cultural) differences between men and women, so these differences can be taken into account when developing and implementing prevention activities.

The content of the toolkit takes into account existing legislation, and considers existing prevention tools and processes. More precisely, the toolkit provides information to organisations in two different areas: the *development of the prevention plan* (organisation of the prevention system, objectives and prevention services, analysis of the company features and design of the prevention system); the *design of the activities included in the prevention plan* (risk evaluation, planning of the prevention action, information and training, acquisition of protection equipment and resources, etc.).

What has been achieved

This toolkit is a pioneering initiative in Spain, as nothing similar has yet been published in the country. This 'novelty factor' is a strength of the initiative, reinforcing the added value it provides, as it can be seen as a ground-breaking initiative that brings gender diversity in the OSH prevention arena in Spain. This is confirmed by the interest shown by Spanish public authorities including other regional governments, OSH authorities and prevention services experts when they were presented with the toolkit. The toolkit is publicly available free of charge on the Osalan website as a PDF file, but unfortunately data on the number of downloads are not available.

It is worth mentioning that important barriers and obstacles lie in the way of implementation of the initiative. For instance, awareness of gender equality issues appears to be uncommon in everyday business practice (generally speaking), although increasing attention is being given to gender issues within companies and society. In this respect, this toolkit should help to further foster a gender-inclusive culture of OSH risk prevention in Basque and Spanish businesses.

Transferability issues and future perspectives

The toolkit is easily transferable within the Spanish territory, as it revolves around Spanish legislation. It is not particularly useful outside Spain, as it cannot be applied directly. Nevertheless, the work behind the toolkit and its rationale and methodology could be applied in other regions and/or countries, where the toolkit would need to be adapted to the local legislation and characteristics of each area.

Osalan has plans to implement the toolkit in more companies in the future, particularly in male-dominated manufacturing companies, the idea being to learn from this experience and to further develop the toolkit. Osalan also hopes to make the construction of a digital self-diagnosis test publicly available on its website and accessible to all types of companies and to publish tailored guides, adapted to the needs of particular sectors and types of company.

5.2.8 Women's Work Environment (Sweden)

Abstract

The Swedish Women's Work Environment initiative was initiated in 2011 by the Swedish Work Environment Authority (SWEA), a public body dependent on the Swedish government. The initiative was officially concluded in 2014 but a large number of these activities have become embedded in the everyday work of the SWEA.

Target group of workers

Women workers

Country and geographic scope

Sweden, national

Objectives

Improving women's work environment, with a focus on MSD risks. The initiative includes research into women's OSH, new ways of conducting labour inspections and a set of different tools for workplaces.

Background information

The initiative Jämställdhet i arbetsmiljön (Women's Work Environment)⁴⁷ was developed at national level and started in autumn 2011. It was carried out during the period 2011-2014, and the results obtained were compiled in a final report released in autumn 2015. The institution responsible for implementing the initiative was the Swedish Work Environment Authority (SWEA).⁴⁸

The initiative was funded by the Swedish government with SEK 20.5 million (approximately EUR 2.26 million). In 2014 extra funding of SEK 240,000 was provided to create and make accessible tools for risk assessment with a special focus on women's work environment.

The rationale behind the initiative was that women are comparatively more frequently than men exposed to OSH risks and more likely to leave the labour market earlier because of negative health outcomes. This situation prompted the Swedish government to take some specific actions in order to improve the working conditions and OSH of women workers. To this end, the Swedish government identified a need to expand the knowledge base relating specifically to women's working conditions and OSH risks and develop new working methods for labour inspections to deal with women-specific risks and their OSH-related issues, with a specific focus on MSDs. The ultimate goal of the Women's Work Environment initiative was to reduce women-specific work-related risks and prevent women from being prematurely exiting working life because of work-related problems.

What has been done and how

Specifically, the initiative developed a number of activities and outputs during its 4-year lifespan.

First, three research reports (so-called 'knowledge compilations') on gender-specific issues related to the work environment, particularly including MSDs risk factors (including psychosocial risk factors), were produced by well-known experts.⁴⁹

Second, several risk assessment tools were developed to help labour inspectors as well as employers to better identify and assess the different specific work-related risks (including MSD-related risks) that women face in their working life. Specific tools for assessing the risk of MSDs already available internationally were identified, and three were selected:

- the PTAI (Patient Transfer Assessment Instrument);
- the HARM (Hand-Arm Risk Assessment Method);
- the KIM (Key Indicator Method).

These three instruments were translated into Swedish and some additional questions were included to incorporate a gender-specific perspective. Subsequently, the three tools were used to develop customised risk assessment tools for specific sectors. For instance, the so-called Lighten the Load in Patient Transfer document⁵⁰ was specifically developed for health care workplaces. Several

⁴⁷ See <https://www.av.se/arbetsmiljoarbete-och-inspektioner/arbets-med-arbetsmiljon/jamstalldhet-i-arbetsmiljon/>

⁴⁸ SWEA is a public body dependant on the Swedish Ministry of Employment with the mandate to ensure a good and sound work environment for all, in line with the Swedish Work Environment Act. Among its activities, the SWEA is required to produce legally binding provisions, inspect workplaces and disseminate information about work environment regulations and good practices, among other tasks.

⁴⁹ These three reports (available on the website of the Swedish Work Environment Authority) are *Physical work, gender and health in working life*, 2013; *Under the Magnifying Glass – gender perspective in work environment and work organisation*, 2013; and *Women and men and their working conditions: The importance of organisational and psychosocial factors for work-related and health-related outcomes*, 2016

⁵⁰ See <https://www.av.se/globalassets/filer/publikationer/broschyrrer/english/lighten-the-load-in-patient-transfers-adi581eng.pdf>

consultation exercises with employers were undertaken to enrich the risk assessment tools from a gender perspective

These assessment tools have been used by SWEA labour inspectors in approximately 4,100 Swedish workplaces and 65 municipalities across Sweden. In addition, SWEA labour inspectors were trained in gender-specific aspects of MSD risk assessment. The results of the initiative and experiences were disseminated at four conferences that were well attended by various stakeholders and relevant actors.

Finally, SWEA has developed several informational materials to communicate the research findings developed over the 2011-2014 period, including an animated film and three lecture films.

What has been achieved

A report produced by SWEA in 2015 and a white paper published in 2017 present some achievements of the initiative. The knowledge acquired showed that women are more affected by MSDs than men because they are more exposed to both MSD-related risks and psychosocial risks as a result of their greater involvement in sectors and jobs characterised by the need to perform monotonous repetitive movements as well greater exposure to interpersonal interactions. It was also found that many employees and employers do not have sufficient knowledge about how to prevent MSDs. According to the reports, the new risk assessment tools received very positive feedback from workplaces and employers, and awareness about gender issues among labour inspectors has increased.

The main conclusion of the initiative, summarised in the white paper, is that profound changes in the workplace, in terms of governance, management, organisation and allocation of resources, are needed to improve the work environment and working conditions of both men and women. The values and norms that underlie working conditions and the work environment cannot be considered gender equal, and must be questioned. Responsibility for changing working conditions and the work environment lies with the partners at the workplaces. Finally, change needs to be implemented not only at organisational level, but at municipal, that is political, level.

Transferability issues and future perspectives

Some of the contents of the Women's Work Environment initiative could be transferred to other Member States and institutions, particularly the knowledge compilation activities and the methods developed. However, it is worth remembering that Sweden has a long-standing tradition of gender equality, so Swedish authorities and employers are accustomed to this type of intervention, as demand for gender mainstreaming is strong.

The initiative is considered complete. Nevertheless, the tools and instruments developed have been incorporated into the daily practices of the Swedish Labour Inspectorate. In addition, the tools are used regularly by many employers, although there is still scope to increase the number who do so.

5.2.9 Transgender Workplace Support Guide (Scotland, United Kingdom)

Abstract

The Transgender Workplace Support Guide is a guide to support transgender employees, their employers/human resource staff and work colleagues to develop a safe and supportive working environment where transgender employees can be fully integrated, which in turn may result in reducing adverse psychosocial environments that might negatively affect OSH and MSDs. The need for this guide comes from a recognition that transgender employees are valuable members of staff, yet the workplace can be a daunting environment for some.

Target group of workers

LGBTI workers

Country and geographic scope

United Kingdom, regional

Objectives

Facilitating a successful integration of transgender workers in workplaces providing useful information and guidance for different stakeholders.

Background information

The *Transgender Workplace Support Guide* aims to help companies to successfully integrate transgender employees into the workplace. The guide is free and available online.⁵¹ The guide principally targets employers, managers and human resources staff who need support and advice on the integration of transgender workers in the workplace, but also transgender employees themselves and their colleagues.

Although the rights of the transgender population and of transgender workers are recognised in UK law (e.g. in the Gender Recognition Act 2004 and the Equality Act 2010), in reality these rights are far from being fully respected in workplaces and in society in general. For instance, according to the guide, up to 7 out of 10 transgender workers report being 'never' or only 'sometimes' able to open up in the workplace, and employment ranks second among areas of concern for the transgender community.

With this in mind, the main goal of the guide is to facilitate the successful integration of transgender individuals in workplaces in Lothian, a region of the Scottish Lowlands that includes Edinburgh. The guide provides information about how to create a supportive and healthy working environment where transgender employees can feel comfortable, safe and fully integrated. The guide was published in June 2016 and was primarily intended for employers/managers and human resources staff in the Lothian region, but it has proved to be valuable in other areas of Scotland and elsewhere in the United Kingdom.

The guide was funded by National Health Service (NHS) Lothian, the public health care provider in the Lothian region.

What has been done and how

From a methodological perspective, the guide was drafted following one-to-one interviews with a number of transgender employees and employers/managers and consultation with professionals and members of the transgender community in the Lothian region, and by incorporating also other relevant resources. Specifically, the guide was developed by NHS Lothian Health Promotion⁵² and LGBT Health and Wellbeing.⁵³ The guide also benefited from input from other regional stakeholders including stakeholder organisations such as Midlothian and East Lothian Councils, Healthy Working Lives (an organisation that provides OSH advice and support free of charge to employers and employees in Scotland and is part of the UK National Health Service) and the Royal Edinburgh Hospital (a psychiatric hospital).

The guide is organised around five main parts.

The first part provides some background information about gender, including the definition of gender from a non-binary perspective, as well as about transitioning, transsexual people and non-binary people.

The guide then identifies the main pieces of legislation that are relevant to transgender employees and to managers/employers supporting transgender employees and fostering a trans-inclusive and healthy working environment.

The third part, on policies, looks at what kind of policies can support transgender employees in the workplace and which pieces of legislation they build on (i.e. confidentiality and data protection policies, policies on discrimination, harassment and bullying of transgender employees, etc.).

The guide also looks at some practical ways in which employers/managers and organisations can support an employee who is transitioning or coming out in the workplace (i.e. recruitment practices, informing colleagues, dealing with harassment, discrimination and bullying, management of absence for

⁵¹ See <http://www.lgbthealth.org.uk/wp-content/uploads/2016/07/TWSP-Info-Guide-Final.pdf>

⁵² NHS Lothian Health Promotion leads the implementation of health promotion approaches in order to tackle health inequalities and improve health among the population of Lothian.

⁵³ LGBT Health and Wellbeing is an NGO working to improve the health, wellbeing and equality of LGBT people in Scotland.

medical assessments/treatments, practicalities related to working with external customers or clients, provision and use of facilities, dress codes, use of pronouns, etc.).

Finally, the guide provides a list of useful organisations such as support groups and transgender community groups and, by way of a summary, provides a list of 10 top tips for each of the three groups, transgender employees, employers and human resources staff, to aid successful workplace integration.

What has been achieved

The project provides the information necessary for successful integration of transgender workers in workplaces, by fostering a safe and comfortable working environment for all, and promoting among employers and colleagues an understanding of transgender workers and their needs.

By providing employers and employees with the information they need, misunderstandings and consequent problems can be avoided. According to the expert we interviewed, companies and employers are trying their best to be supportive and to treat transgender workers sensitively, but they often lack the appropriate information. This guide can help to prevent misunderstandings, offence or conflict in the workplace.

Transferability issues and future perspectives

The guide can be used elsewhere in Scotland and the United Kingdom, as the relevant legislation applies throughout. In the case of other countries, the guide would need to be adapted to take account of applicable legislation (if any). However, most of the tips and practical suggestions included in the guide could be put to use anywhere.

6. Conclusions and policy recommendations

6.1 Main conclusions of the research

Musculoskeletal disorders (MSDs) are one of the most common work-related health problems in Europe, with important consequences for workers, businesses and society at large. MSDs can be defined as impairments of body tissues such as muscles, joints, tendons, ligaments, nerves and cartilage, bones and of the local blood circulation (EU-OSHA, 2007a). MSDs that are caused or aggravated primarily by work and by the effects of the immediate environment in which work is carried out are referred to as work-related MSDs.

This research project has investigated the extent to which the increasing diversity of the European workforce is associated with greater exposure to risk factors in the workplace and an increased health-related issues, with a specific focus on MSDs. Work-related MSDs are associated with a number of (combinations of) risk factors and may have several consequences for workers. Within the framework of this project, and based on the findings of a previous EU-OSHA research project on MSDs, a conceptual model of the interrelationships between risk factors, MSDs and their impacts has been developed. The research project focused on three specific groups of workers – women workers, migrant workers and lesbian, gay, bisexual, transgender and intersex (LGBTI) workers. The existing evidence shows that these groups are more likely to be in jobs (and sectors) associated with increased exposure to increased health and MSD risks, including psychosocial and organisational risks, often in a context of poor working conditions.

The project involved an extensive review and analysis of the current evidence base, namely the international scientific literature and statistical data from several official sources, which informed the collection and analysis of primary data through fieldwork activities. Interviews with stakeholder and experts at EU and national levels, and focus groups and interviews with workers from the three groups under scrutiny were carried out. Fieldwork findings complemented existing evidence.

Overall, the fieldwork findings confirmed what is already known, but also provided new information on a number of issues particularly relevant to the groups of interest (in particular LGBTI workers). This new evidence is especially welcome as OSH and OSH-related risks in these groups, including the risks of MSDs and related prevention measures and initiatives, are relatively underinvestigated, and research gaps exist. In addition, we identified and analysed a number of initiatives expressly targeting these groups of workers and aimed at assessing and reducing OSH risks, and creating safe workplaces and safe working environments. The findings of the research project and the interaction with experts at the validation stage have allowed us to formulate a number of policy recommendations, also related to research gaps, which are presented in the next section.

The findings show that the three groups of workers under investigation tend to be in poorer health (both physical and mental health) and report a higher prevalence of MSDs than other groups. Women workers report not only poorer self-perceived physical and mental health but also more limitations in their daily activities as a result of health problems and higher levels of absence from work for health reasons. Migrant workers report poorer health than native workers, as well as more accidents at work although, in some countries, this finding is confounded by the fact that many newly arrived migrant workers are young and in good health (the so-called 'healthy migrant effect'). However, even among young migrant workers chronic health problems often develop very quickly as a result of their poor working conditions and continuous exposure to risks, particularly physical risks. LGBTI workers report poorer well-being and mental health, including a higher incidence of depression, suicidal thoughts, anxiety and self-harm, with some specific subgroups (for instance transgender workers) likely to report even worse health. Regarding specifically the prevalence of MSDs, there is extensive evidence in the literature and from existing data and our fieldwork that the prevalence of MSDs is higher among women and migrant workers. The current evidence, although limited, and our fieldwork findings also show that LGBTI workers report worse physical health than the general population, including more musculoskeletal problems.

The findings of this research suggest that the three groups of interest experience poorer working conditions in several domains, as well as increased exposure to physical, organisational and psychosocial risk factors associated with poor health and MSD-related issues. The research findings also show that most workers are exposed not to a single risk factor, but to a combination of factors. This contributes to an increased OSH risk, as cumulative exposure to multiple risk factors over time increases the probability of experiencing health problems in general, and MSDs in particular.

The existing evidence and fieldwork findings show that all three groups of workers are exposed to psychosocial and organisational risk factors in the workplace, namely harassment, discrimination, bullying and verbal abuse, temporary work, job insecurity, lower pay and limited career prospects, as well as to physical risk factors such as carrying or moving heavy loads, repetitive movements, prolonged sitting and moving of people, among others.

We found that women workers are exposed to some physical risk factors known to be associated with MSDs, such as lifting/handling/moving (resisting) persons, repetitive movements, awkward/forced/tiring postures or prolonged static standing/sitting postures. These physical job demands are often underestimated by research and OSH authorities, which tend to pay more attention to other heavy or physically demanding work activities in male-dominated sectors. Migrant workers are particularly exposed to several physical risks at work, including those related to carrying/moving heavy loads, exposure to forced and awkward/tiring postures and repetitive movements, or exposure to other environmental hazards (vibrations, extreme temperatures, etc.). There is limited evidence regarding LGBTI workers' exposure to physical risks in the workplaces, but it is reasonable to assume that those employed in specific sectors and occupations associated with physical risks will be exposed to those risks.

Physical risk factors can be found also in combination with a range of organisational and psychosocial risk factors, which can have important consequences for the health and well-being of workers, including the risks of MSDs. The evidence collected shows that the three groups under scrutiny are exposed to a number of risk factors associated with poor working conditions, including lower wages/salaries, precarious forms of employment (e.g. all three groups are commonly employed under temporary contracts while women workers are sometimes required to take involuntary part-time employment and migrants may have only irregular contracts or no contracts at all), reduced career opportunities (the so-called 'glass-ceiling' facing women workers and LGBTI workers) and longer or unsociable working hours.

These factors negatively affect motivation, self-esteem and earning capacity (with knock-on effects on living conditions, diet, housing, etc.), causing more stress and fatigue. In addition, precarious forms of employment, which are common in our study groups, may be associated with employers who place less value on OSH issues, putting these workers at increased risk of health problems in general and of MSDs in particular.

More specifically, women workers are particularly exposed to emotional demands and work-related mental load and stress associated with employment segregation in jobs requiring interaction with external parties such as patients, clients, contractors or pupils. As highlighted by the field research, another risk for women workers stems from their dual role of carer at home (unpaid care activities, e.g. child care, care of other family members, housework) and worker, which frequently results in an increased mental and physical burden and can result in physical and mental health issues, including MSDs. Women workers are nevertheless reportedly less likely to speak out and be heard regarding work-related health risks, one reason for which is that they are less represented than men on companies' OSH steering committees. This situation often results in gender bias of the OSH measures adopted, to the detriment of women. Our fieldwork also revealed a prevailing 'male-dominated' view of occupational diseases and OSH issues that is harmful for women. For instance, many OSH tools, personal protective equipment (PPE) and workstations are mainly designed for male rather than female bodies, exposing women to greater physical risk.

The field research showed that migrant workers are frequently forced to accept more difficult working conditions, either because they have no other choice or because they are less aware of OSH-related risks or pay less heed to health considerations and consequences. Migrant workers are also frequently less familiar with national regulations governing working conditions, so they have a poor knowledge of their labour rights, sometimes compounded by language barriers. Migrant workers with little or no knowledge of the local language are not able to communicate and/or understand OSH-related instructions and work processes, and find it more difficult to participate in OSH training activities. This leads in turn to misunderstanding, lack of compliance with OSH regulations, more accidents and greater exposure to risky situations (e.g. failure to use the right tools or wear appropriate PPE). This lack of knowledge makes them more vulnerable to discrimination and abusive practices that contravene laws or regulations, including OSH-related ones. A lack of active involvement of migrant workers in OSH activities in many workplaces and a limited presence of migrant representatives in work councils have been identified.

The field research revealed that LGBTI workers frequently face discrimination when searching or applying for a job, either being not hired at the end of the recruitment process or withdrawing from the process before the end for fear of not being accepted. LGBTI workers also face being fired because of their sexual orientation or gender identity. Lesbian workers are susceptible to discrimination on two counts, gender and sexual orientation. Among gay workers, effeminate men are particularly likely to experience discrimination and harassment at work (especially in some male-dominated sectors), and are less likely to be socially accepted or to be promoted. Bisexual workers are also highly marginalised, resulting in discrimination and exclusion at work. A significant proportion of LGBTI workers conceal their sexuality or gender identity at work, usually because this is the only way to feel safe and to protect themselves, as well as a possible route to access better jobs or to retain their job. This is a specific and additional psychosocial risk for LGBTI workers that may not only influence their choice of sector/occupation, but also constitute an additional psychological burden that can negatively affect their health.

The existing evidence and our field research show that the three groups are also disproportionately exposed to psychosocial risks stemming from a poor social environment and negative social behaviours in the workplace. The psychosocial risks most commonly reported include discrimination, bullying, harassment, verbal abuse, physical violence, unwanted sexual attention (especially in the case of women and transgender or intersex workers) and subtle verbal microaggressions in forms of jokes and mockeries, glances, gossiping or negative comments (in the case of LGBTI workers). These experiences contribute to create a sense of insecurity, leading workers to self-isolate in the workplace. They are also associated with stress and declining mental and general health, including increased MSDs, and can ultimately result in premature exit from employment. The field research showed — corroborating existing evidence — that transgender workers are the group most exposed to discrimination practices, exclusion from recruitment opportunities, verbal abuse, violence and workplace bullying. Transgender workers frequently end up accepting jobs with poorer working conditions and for which they are overqualified, as they do not have better options and struggle to get better jobs, more in line with their skills and qualifications, and are more likely to drop out of employment.

Intersectionality, that is the combination of several disadvantageous sociodemographic characteristics in the same individual worker (e.g. gender identity, sexual orientation, ethnic background, physical appearance, skin colour, social class, level of education), can represent an additional disadvantage for workers within the three groups under investigation and can result in increased exposure to increased OSH risks in the workplace. Many of the risk factors identified in this research are associated with occupational/sectoral segregation patterns, with these workers more frequently employed in specific jobs characterised by specific (normally higher) OSH risks.

Clear employment segregation patterns among women and migrant workers apparent in the existing data were confirmed by our fieldwork findings. Many of the sectors/occupations in which women and migrants typically work are characterised by high exposure to OSH and MSD-related (physical, organisational and psychosocial) risks, such as the so-called '3D' jobs — dirty, dangerous and demanding — in the case of migrant workers, or health, social care, hotel and restaurants or office jobs in the case of women. Evidence for employment segregation among LGBTI workers is limited and less straightforward. Existing evidence and the fieldwork findings show that LGBTI workers are more frequently employed in sectors and occupation where they expect to feel safer and experience less intolerance and discrimination, so-called 'prejudice-based segregation'. This may result in general in a higher presence of gay and bisexual men in jobs in female-dominated sectors or occupations, and of lesbian workers in male-dominated sectors or occupations. Some of these sectors and occupations are associated with higher OSH and MSD-related risks.

As previously mentioned, as part of this research nine examples of policies and company practices targeting the three groups of workers under examination and aimed at improving the working environment and reducing OSH risks in order to prevent MSDs were selected for in-depth analysis. These examples reflect a considerable range of strategic approaches to the creation of a safer, more equal and inclusive workplace with reduced OSH and MSD-related risks. Selected initiatives include risk assessments and prevention tools, awareness-raising activities, training, consultancy and guidance, research activities and specific labour inspection activities.

It is hoped that the examples chosen will inspire others to devise policies and initiatives intended to tackle the OSH and MSD risks of the groups of workers under investigation and minimise negative effects on workers' health. They, along with the other findings of this research project and the experts'

advice, informed the formulation of the policy recommendations that are presented next and which conclude this report.

6.2 Policy recommendations

In conclusion, and based on the findings of this research project, some policy recommendations have been formulated and are reported below. Interdisciplinarity, participation of workers, awareness raising, OSH and prevention of MSDs are all crucial aspects that need to be embedded in the policies and practices implemented by both public authorities and private companies in order to successfully manage OSH issues and MSDs affecting an increasingly diverse workforce in Europe.

6.2.1 Increase interdisciplinary MSD-related research that takes into account workforce diversity issues

It is important to support research on MSDs (and other OSH issues) that takes into account the diversity existing within the workforce (including elements of intersectionality), moving away from the traditional 'native-born heterosexual man-centred approach' that has dominated much of the research so far, towards a richer and more complex approach reflecting the specific realities of a diverse workforce. Thus, more effort should be made to improve data collection from a diverse workforce perspective. There is also a need to support further interdisciplinary scientific research that takes account of MSDs and their associated risks from a holistic approach, including ergonomic as well as other social science-related elements. Finally, more research is needed on particular groups (e.g. LGBTI workers in general and intersex workers in particular), as well as on some economic sectors/occupations (some women-dominated ones) that are less well covered by traditional research on OSH and MSDs.

6.2.2 Promote a 'diversity' perspective among public authorities and labour inspectorates

Public authorities should adopt a 'workforce diversity' approach in their activities. They could, for example, produce and disseminate materials related to a diverse workforce to various stakeholders (employers and private companies, worker representative organisations, labour inspectors, researchers, OSH professionals, etc.), or they could run awareness-raising campaigns on differences in the hazards and risks facing diverse groups of workers or collect and disseminate examples of good practice and case studies describing how such risks have been successfully addressed. Public authorities could also reinforce the national health systems, for instance developing specific training activities for their occupational health specialists on the health needs and problems of a diverse workforce. Furthermore, national labour inspection services could focus their activities on those specific sectors/occupations employing a large proportion of migrants, women or LGBTI workers and those most associated with irregular or risky situations.⁵⁴ In addition, the tools that labour inspectors currently have at their disposal (including penalties and fines) should be supplemented by, for instance, employing diversity experts or improving labour inspectors' skills and competences to deal with a diverse workforce. It would be helpful to expand the guidance and counselling services provided by labour inspectorates.

6.2.3 Show companies the positive effects of employing a diverse workforce

It is very important to demonstrate to companies and employers the important positive benefits that workforce diversity and inclusion policies can bring to the workplaces (for instance, attraction of best talent and skills, access to a younger workforce, better employer-employee relationships, lower absenteeism levels and higher productivity levels, etc.).⁵⁵ Public authorities and third-sector organisations (e.g. NGOs and charities) can play a key role in this respect, including the provision of specific expertise on the issue.⁵⁶

⁵⁴ See, for instance, the activities conducted by the Danish 'National Strategy for the Work Environment' presented in Chapter 5 of this report.

⁵⁵ In this respect, good examples are the experiences of the Diversity Policy at the Dutch Research Council and Airbus's Diversity and Inclusion policy, described in Chapter 5 of this report.

⁵⁶ See, for instance, the activities conducted by NGOs and other stakeholders around the Shared Concerns and Joint Recommendations on Migrant Domestic and Care Work declaration and presented in Chapter 5 of this report.

6.2.4 Build a culture of inclusion and zero tolerance of discrimination within companies

Workplaces can benefit from an inclusive culture with a diverse and well-integrated workforce. This requires the development of new organisational models more responsive to and supportive of the specific needs of different groups of workers. A significant step in that direction would be to create a policy of zero tolerance of discrimination in the working environment where workers are safe and feel comfortable in reporting any experience of work-related interpersonal discrimination, violence or harassment, knowing that negative practices may also lead to measures being taken against the offenders. In many cases, it will require significant effort to inform and train managers (including middle managers) and employees to be sensitive to the need for inclusion so that they can recognise, address and react appropriately to negative situations. Public authorities also have a role to play, by reinforcing legislation and labour inspection against discrimination practices or by launching of awareness-raising campaigns on the issue.

6.2.5 Promote a participative approach to MSD prevention activities, giving voice to diverse groups within the workforce

It is very important to support the active participation of workers and their representative organisations (trade unions, employee committees) in the development of OSH prevention measures, including company-level MSD prevention activities. This approach gives better results and is more likely to be a win-win situation for employers and employees. It is also important to encourage the active participation of representatives of underrepresented minority groups of workers in national and sectoral tripartite bodies and in bipartite committees at the enterprise/sectoral level when dealing with OSH and MSDs prevention policies and strategies. These representatives may bring their specific voice on health and safety issues, ensuring that their concerns and views are discussed and taken into account at OSH committees. Trade unions could also set up ad hoc diversity committees with a specific mandate to improve the working conditions of different groups of workers.

6.2.6 Raise awareness of and promote MSD prevention activities among private companies, particularly those targeting specific groups of workers

Prevention initiatives developed by companies have the greatest potential for addressing workers' health-related problems in general and MSDs in particular, by reducing both physical and psychosocial and organisational risks. Early detection of risks and the prompt introduction of solutions can help to prevent the development of more serious health and MSD-related impairments in the future, particularly among those specific worker groups most likely to benefit from preventative activities (i.e. young people) and in sectors (either public or private) and occupations in which health and MSD-related problems are particularly common.

6.2.7 Develop ad hoc tools to deal with a diverse workforce

Linked to the above recommendation, it is important to develop tools, including risk assessment tools, specifically designed to take into account the specificities of different groups that make up a diverse workforce, including the different characteristics of their jobs and tasks.⁵⁷ Particular attention should be paid to psychosocial and organisational risk factors (including discrimination practices), which are often underestimated in comparison with physical risks. Finally, special attention should be paid to job design and the development of protective tools and equipment specifically adapted to take account of the biological characteristics and skin colour of a diverse workforce.

⁵⁷ In this regard, this report has provided some examples of risk assessment tools specifically designed for some of the research groups (see the examples of the Italian Risk Assessment toolkit for third-country nationals and the Spanish Toolkit for the integration of the gender perspective in the prevention of occupational risks, both described in Chapter 5 of this report).

6.2.8 Develop a gender perspective in OSH-related public policies

Public authorities with responsibility for developing OSH policies and strategies should adopt a gender-sensitive perspective that recognises that women and men are exposed to different work-related physical, organisational and psychosocial risks and that they may react differently to the same risks because of their different physical characteristics, working and living conditions or gender roles in society.⁵⁸ For instance, OSH legislation could ensure that workers can have a good work-life balance, particularly those with family responsibilities.

6.2.9 Improve working and health conditions in women-dominated sectors and occupations

Public authorities should pay particular attention to improving working and health conditions in those sectors where women are most present (for instance, the care and health sectors), thus reducing work-related OSH risks, including MSD risks. This could include, for example, the introduction of negotiated patient/caregiver ratios to ensure a good-quality service delivery, reducing temporary employment or enabling greater participation of women in middle- and high-ranking roles.

6.2.10 Treat work-life balance as an OSH issue

Policies could also raise awareness about the negative effects of poor work-life balance, including financial dependence, reduced career opportunities, added stress, reduced resting times or negative effects on health. Several policies to address this can be proposed, including the development of better, affordable child care facilities, the development of flexible work organisational measures within companies or the removal of existing cultural gender-related patterns.

6.2.11 Develop ergonomic and protective equipment specifically adapted for women

Particular attention should be devoted to the development of ergonomics and personal protective equipment (PPE) that takes into account the physical and biological differences between men and women, which is often not the case (especially in male-dominated occupations).

6.2.12 Improve the access of migrant workers to appropriate health and labour public authorities and services

Migrant workers have difficulty in fully accessing some basic public services, including health services. Therefore, public authorities should ensure that migrant workers have access to some key social services that may improve their living and working conditions, as well as their health status, for example (occupational) health services, housing services, child care. In addition, labour inspection services should be empowered to ensure migrant workers' protection.

6.2.13 Help migrant workers to adapt to the work culture of their host country, by providing information on labour and OSH issues, social rights and how they can access the labour market

It is very important to facilitate the adaptation of migrant workers to the working culture of the host country through the provision of training and information. Migrant workers can be provided with OSH-related induction, training and guidance activities. Additionally, migrant workers can be provided with relevant information on their labour and social rights and information on the different public and private institutions at their disposal in this domain. NGOs and supportive migrant network organisations can play a key role in facilitating this adaptation process by promoting the formation of social networks enabling migrants to support each other.

6.2.14 Help migrant workers to overcome language barriers

Related to the previous point, particular attention should be paid to overcoming the language barriers facing migrants. Suggested solutions include local language courses, promote the presence of language

⁵⁸ See, for instance, the Swedish Women's Work Environment Initiative, described in Chapter 5 of this report.

mediators within companies and public services, translating the complaint forms for labour inspection services and creating easy-to-be-understand health and safety guides/leaflets in several languages.

6.2.15 Facilitate the recognition of educational/vocational qualifications obtained abroad

This research has shown that migrants frequently struggle to achieve official recognition of formal professional or academic qualifications obtained in their country of origin, resulting in segregation of some migrant workers in occupations that are low-skilled relative to their educational level. A process for easy/quick official recognition of educational/vocational qualifications obtained in migrants' home country is essential for the successful integration of migrant workers into the host country's labour market.

6.2.16 Increase knowledge on the main work-related health risk factors that affect LGBTI workers and improve the visibility of this group

There is a need to increase the visibility of the main work-related problems that affect LGBTI workers' health status, with a particular emphasis on psychosocial risk factors (discrimination, acceptance at work, harassment, etc.). A variety of activities can be developed to achieve this (aimed at society in general or more specifically at representative organisations of employers and employees and private companies), including information and awareness-raising campaigns, development of action plans, promotion of support/learning networks and training activities, provision of consultancy services, etc.⁵⁹ These activities are particularly relevant for some groups who are less known to the general public (i.e. intersex and transgender workers), as well as in those countries that are less LGBTI tolerant (which can be challenging, of course). NGOs and associations can play a key role in this respect.⁶⁰

6.2.17 Develop non-binary safety and health legislation and administrative procedures

Existing OSH-related legislation and administrative procedures in most parts of Europe have been designed from a traditional binary perspective (men/women). In order to take into account the specific needs of transgender and intersex workers, OSH legislation and administrative procedures should be designed based on a non-binary perspective. A starting point could be the use of gender-neutral descriptions in official identification documents, followed by the development of legislation to secure time off work during the gender transition process, provision for financial support during the transition period (akin to parental leave) and friendly health systems that take into account the specific needs and characteristics of intersex workers. In addition, processes that make it straightforward for institutions to recognise transgender workers' new gender identities should be developed.

6.2.18 Develop LGBTI company policies that take into account the diverse realities of LGBTI workers' lives

This report has shown that more and more companies (particularly large ones) are increasingly interested in integrating the LGBTI dimension within their OSH and human resources policies, assuring a supportive and safe working environment for this group. However, this report has also shown that the abbreviation LGBTI encompasses many different situations and realities, so a comprehensive LGBTI company policy should also consciously reflect these differences and develop customised programmes/initiatives targeting specific LGBTI groups.

⁵⁹ See, for instance, the Scottish *Transgender Workplace Support Guide* presented in Chapter 5 of this report.

⁶⁰ See, for instance, the activities conducted by the Spanish 'Business Network for LGBTI Inclusion and Diversity (REDI)' presented in Chapter 5 of this report.

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Annex A: Methodology

From a methodological perspective, the study has been conducted around five work packages (WPs) that are presented in detail next.

Work Package 1 (WP1): Review of literature and research

The general objective of WP1 was to conduct a review of the literature and research to gain a deeper understanding of the relationship between the three groups under scrutiny and the risk of MSDs.

WP1 comprised three steps, as follows.

Step 1: Collection of relevant literature

First, inclusion and exclusion criteria were defined to guide the strategy for selecting the literature for analysis. To ensure that all relevant literature would be identified, the inclusion criteria were purposely broad (Table A1).

Table A1: Inclusion/exclusion criteria

| Inclusion criteria |
|---|
| <p>Time period: research published in the last 20 years: this timeframe should allow identification of a wide range of literature but restrict analysis of working conditions that are outdated, e.g. because new technologies have since reduced the risk of MSDs in the relevant sectors.</p> <p>Type of publications: scientific literature, academic publications, grey literature from reliable sources, policy documents, official documents and research outputs.</p> <p>Language: publications in English, and Danish, Dutch, French, German, Italian, Spanish and Swedish</p> <p>Types of studies: systematic reviews/meta-analyses, randomised controlled trials, (longitudinal) observational data analysis studies, experimental design studies, micro-level studies, cross-sectional studies, (qualitative) case studies, literature reviews and OSH legal analyses.</p> |
| Exclusion criteria |
| <p>Time period: studies published more than 20 years ago</p> <p>Types of studies: theoretical studies that are not backed up by empirical data analysis</p> |

Source: Authors' elaboration.

Subsequently, the most relevant academic research engines were identified, including major scientific sources such as Sage, MDPI (Multidisciplinary Digital Publishing Institute) and PubMed, search engines hosted on relevant organisational websites, such as EU and national OSH authorities, relevant national sector authorities and bodies, and representative bodies of women, migrants and LGBTI groups, as well as Google search engine. In addition to this, a specific list of search terms was developed in order to identify relevant studies (see Table A2).

Table A2: Search terms

| Terms relating to specific groups and/or characteristics | Policies/interventions | Risk outcomes | Other outcomes |
|--|------------------------|--------------------------------|--|
| Migrant workers | OSH legislation | Psychosocial risk | Backache |
| Migrants | OSH policy | Physical risk | Musculoskeletal disorders |
| women | OSH initiatives | Bullying | Muscle pains in shoulders, neck, upper limbs |
| LGBTI individuals | OSH | Harassment | Muscle pains in lower limbs |
| Female workers | Psychosocial | Racism | Mental health |
| Gay men | Ergonomic | Homophobia | |
| Lesbians | Diversity | Institutional discrimination | |
| Transgender | Anti-bullying | Age discrimination | |
| Foreign workers | | Gender discrimination (sexism) | |
| Sexual orientation | | Discrimination | |
| Refugees | | Xenophobia | |
| Ethnicity | | Linguistic discrimination | |
| Gender | | Labour market discrimination | |
| | | Task segregation | |
| | | Occupational segregation | |
| | | Sectoral segregation | |
| | | Bad jobs | |
| | | Working conditions | |
| | | Working environment | |

Source: Authors' elaboration.

The initial search returned a large number of publications, including many duplicates. We therefore decided to focus the relevant literature included in three specific and very comprehensive databases: Jstor, PubMed and Open Grey. In addition, the consultant team identified a further list of relevant literature, including some suggested by members of the project scientific committee,⁶¹ national research teams and EU-OSHA, as well as references cited in the publications already identified (i.e. the snowballing approach).

Once the search was considered complete, the abstracts and conclusions of the studies identified were reviewed to determine their relevance for the literature review and to select the publications to be admitted to subsequent step 2.

⁶¹ The project benefited from the participation of a scientific committee comprising Sue Hignett, Associate Dean (Teaching) and fellow of the Chartered Institute of Ergonomics and Human Factors (FCIEHF) (UK); Mario Giaccone, Vice-president of Fondazione Cesare Pozzo per la Mutualità, lecturer in industrial relations at the University of Turin, and lecturer in labour economics at the University of Ferrara (Italy); and Egle Sumskiene, Associate Professor and Head of the Department of Social Work and Social Welfare in Vilnius University Faculty of Philosophy (Lithuania).

Step 2: Analysis of selected literature

Step 2 consisted in an in-depth analysis of the selected literature. The validity and reliability of the results reported in the identified studies were rated using a four-grade scale (highly valuable, valuable, less valuable and not valuable). Reports whose results were categorised as not valuable were excluded from the final literature review, as were reports considered not relevant to the study.

At the end of this process, a total of 149 reports remained and were considered for this report (see section on bibliography).

Step 3: Reporting of results

The findings of the relevant literature included in the final selection have been described in Chapter 3 of this report, in which the results of the literature review are combined with the results obtained from the analysis of statistical data presented in WP2.

Work Package 2 (WP2): Collection and analysis of existing statistical data

WP2 consisted in the collection and analysis of existing statistical data sources to answer the research questions of this study.⁶² The analyses were selected to complement, as far as possible, the information obtained from WP1.

WP2 comprised three steps, as follows.

Step 1: Identification of relevant data sources

To help meet the general objectives of this study, the aim of step 1 was to identify relevant statistical data sources that included information on as many as possible of the following:

- personal characteristics allowing identification of at least one of the three groups of workers of interest to this study (women workers, migrant workers and LGBTI workers);
- sector and/or occupation of workers;
- general health situation and prevalence of MSDs;
- working conditions, including reported or perceived discrimination and other negative social behaviours;
- exposure to other MSD risk factors (physical, organisational and/or psychosocial);
- interventions and policies to improve working conditions and/or prevent health issues.

For this purpose, a combination of own knowledge, desk research and consultation with EU experts in the field of MSDs resulted in the identification of 12 international data sources and five national data sources (Table A3).

⁶² Disclaimer: the statistical information presented in many cases refers to the EU-28 because at the time the data were extracted and analysed the UK was still a EU Member State.

Table A3: International and national data sources identified

| Statistical data source | Nature of data (survey or administrative) | Supplier | Most recent year available | Available for researchers | Selected |
|---|---|---------------------------|----------------------------|---------------------------|----------|
| International | | | | | |
| Labour Force Survey (LFS) core module | Population survey | Eurostat | 2018 | Yes | Yes |
| LFS ad hoc module on occupational safety and health | Population survey | Eurostat | 2013 | Yes | Yes |
| LFS ad hoc module on migrant workers | Population survey | Eurostat | 2014 | Yes | Yes |
| European Statistics on Accidents at Work (ESAW) | Administrative | Eurostat | 2017 | No | No |
| European Health Interview Survey (EHIS) | Population survey | Eurostat | 2013-2015 | Yes | Yes |
| European Union Statistics on Income and Living Conditions (EU-SILC) | Population survey | Eurostat | 2017 | Yes | Yes |
| European Working Condition Survey (EWCS) | Workers survey | UK data archive | 2015 | Yes | Yes |
| FRA survey on women's well-being and safety | Survey among women | UK data archive | 2012 | Yes | Yes |
| FRA EU LGBT survey | Survey among LGBT people | UK data archive | 2012 | Yes | Yes |
| FRA EU minorities and discrimination survey (MIDIS) | Survey among immigrants and people with an ethnic minority background | UK data archive | 2015 | No | No |
| Flash Eurobarometer 398 | Population survey | Gesis | 2014 | Yes | No |
| Eurobarometer 437 | Population survey | Gesis | 2015 | Yes | No |
| National | | | | | |
| Dutch survey on perceptions of employees and SME employers regarding LGBT | Enterprise survey and employee survey | Panteia | 2011 | No | No |
| Barometer on the perception of discriminations at work | Population survey in France | Defenseur des Droits/IFOP | 2018 | No | No |

| Statistical data source | Nature of data (survey or administrative) | Supplier | Most recent year available | Available for researchers | Selected |
|---|--|--|----------------------------|---------------------------|----------|
| Diskriminierung umfrage in Deutschland 2015: Diskriminierungserfahrungen in Deutschland | Survey among German citizens experiencing discrimination | German Federal Anti-Discrimination Agency (FADA) | 2015 | No | No |
| Young Women's Trust annual surveys on discrimination at work | Population survey in England and Wales | Young Women's Trust | 2018 | No | No |
| Office for National Statistics annual population survey on sexual identity | Population survey (UK extension of the annual Labour Force Survey) | Office for National Statistics | 2019 | Yes | No |

Source: Authors' elaboration.

Step 2: Selection and acquisition of data sources

For each of the identified data sources, we considered which of our research questions the data source might be able to answer, what reported variables would be of value to us, what methodologies should be applied to answer these research questions and, finally, whether or not the data source was available to researchers.

We then compared the findings for each data source. In the case of some research questions, only one or two of the publicly available data sources would be helpful. For others, several publicly available data sources were available. In these cases, in close cooperation with EU-OSHA, we decided which data sources to use, based on size, coverage and year of observations.

Two of the identified international data sources were not available to researchers.⁶³ In addition, in the case of two Eurobarometer data sources identified, the data were available to researchers but turned out not to be very relevant for the current study.⁶⁴ The remaining eight international data sources were obtained and analysed for this study.

None of the five identified national data sources was selected for further analysis.⁶⁵

Step 3: Analysis of selected data sources

The following statistical methodologies were applied to the eight selected data sources:

- frequencies;
- cross-tabulations, involving mostly two but sometimes three dimensions.

To examine the extent to which the general health of people can be related to various forms of harassment, physical aggression and discrimination, logistic regression models were estimated. These models were estimated using data from the FRA survey on women's well-being and safety.

To examine the extent to which the mental health of workers can be related to discrimination, we estimated four logistic regression models relating each of four different aspects of mental health to discrimination (and several control variables). These models were estimated using data from the sixth wave of the EWCS.

To examine the extent to which the prevalence of MSDs among workers is related to various MSD risk factors (including discrimination), we estimated logistic regression models relating the prevalence of three different types of MSDs to various risk factors (including discrimination) and various control variables. These models were estimated using data from the sixth wave of the EWCS.

Detailed information on the logistic regressions can be found in Annex B.

The results of these analysis were combined with the results obtained from the literature review (WP1) and are presented in Chapter 3.

Work Package 3 (WP3): Identification and in-depth description of selected practices and policy cases

The general objective of WP3 was the identification and in-depth review of nine examples of targeted policies and company practices intended to improve working conditions and prevent health risks (and

⁶³ Data from the FRA EU minorities and discrimination survey in 2015 will be made available to researchers, but are not available yet at the time of this study; in the case of the European Statistics on Accidents at Work, only aggregated statistics are publicly available.

⁶⁴ Flash Eurobarometer 398 includes only information on variables that are also included in other, more recent, surveys; Eurobarometer 437 does not include information on MSDs, health or any physical, organisational or psychological risk factors.

⁶⁵ Only one of these data sources (the ONS annual population survey on sexual identity) was available to researchers, and then only on a restricted basis: information on sexual orientation is not available to all researchers (only to those working within a UK-based secure environment that meet several other criteria). Without this information, this data source adds little to the European Labour Force Survey (on which it is based). The ONS annual population survey on sexual identity was therefore not selected for the current study. In addition, data from the Dutch survey on perceptions of employees and SME employers regarding LGBT, although accessible by Panteia, one of the research companies involved in the current study, were not used because they are not very recent and are based on a small, non-representative sample.

MSD-related risks in particular) of the three groups of workers covered by this project (namely migrant workers, women workers, LGBTI workers). The results of WP3 are presented in Chapter 5 of this report.

WP3 comprised three steps, as follows.

Step 1: Preliminary identification of a longlist of 'good practice' examples to be considered for analysis

We first drew up a longlist of 28 examples of targeted policies and company practices in EU Member States and other, non-EU, countries (i.e. Canada, Australia), including relevant examples at European, national or regional level. These targeted policies and company practices covered a wide typology (legislative initiatives, policies and strategies, programmes, framework agreements, campaigns, social dialogue practices, toolkits, consultancy support, etc.) and were developed by different types of stakeholders (public regulators, social partners, preventative services organisations, NGOs, companies, etc.). The identification of these examples was based on the results of the other work packages, particularly the review of literature and research (WP1) and the interviews with selected international/national stakeholders (WP4), as well as other sources of information (ad hoc desk research, consultation with the scientific committee members, suggestions from EU-OSHA).

A brief description of each identified example was created in order to facilitate the selection of examples to be reviewed.

Step 2: Selection of examples to be reviewed

Subsequently, and based on the information collected in step 1, EU-OSHA, in consultation with the consultant team, selected nine examples to be reviewed in-depth (see Chapter 5 for the list of examples selected).

Step 3: Systemic review of the selected examples of targeted policies and practices

In the final step, the nine examples selected were systematically reviewed, and the information was presented in a standardised format agreed by the consultant team and EU-OSHA. Information on each reviewed policy/practice was obtained from a combination of desk research plus (at least) an interview based on a semistructured questionnaire with a person responsible for running the initiative. Subsequently, the collected results for selected example were summarised and presented in an ad hoc two-page description (about 1,000-1,500 words) comprising the following sections: (i) abstract; (ii) background information (name, geographic scope, time reference, target group(s), body(ies) responsible and other actors/stakeholders involved, funding); (iii) contents (main goals and rationale of the initiative, main activities developed and way of provision); (iv) main results achieved (outcomes, success factors/barriers and difficulties); and, finally; (v) transferability and future perspectives (transferability, challenges for the future, lessons learned).

Table A4: List of references for policy case studies

| Case study | Literature/website references used |
|---|--|
| National Strategy for the Work Environment (Denmark) | <p>National Strategy for the Work Environment, 2011 agreement (see https://amid.dk/media/3110/aftaletekst-strategi-2011.pdf)</p> <p>National Strategy for the Work Environment, 2015, second, agreement with improvements (see https://amid.dk/media/3108/aftaletekst-arbejdsmiljoe-2015.pdf)</p> <p>Technical foundations of the Strategy (see https://amid.dk/media/2312/fremtidens-arbejdsmiljoe-2020.pdf)</p> <p>Method of Measurements (see https://amid.dk/media/4819/metode-til-opgoerelse-af-reduktionsmaalene-vedr-muskel-skelet-og-psyisk-arbejdsmiljoe.pdf)</p> <p>Third evaluation, 2019 (see https://amid.dk/media/5493/3-evaluering-2020-maal.pdf)</p> <p>The Expert Committee's Recommendations (see https://bm.dk/media/8002/piece.pdf)</p> |
| Airbus Diversity and Inclusion policy (Europe/Spain) | <p>Airbus's website (see https://www.airbus.com/)</p> <p>Airbus's Inclusion and Diversity Policy (see https://www.airbus.com/company/sustainability/inclusion-diversity.html)</p> <p>Airbus in the UK Gender Pay Gap Report 2018 (see https://www.airbus.com/content/dam/corporate-topics/corporate-social-responsibility/ethics-and-compliance/airbus-uk-gender-pay-gap-statement.pdf)</p> <p>Airbus, 'France Gender Pay Gap Report (see https://www.airbus.com/content/dam/corporate-topics/publications/Airbus-Employees-Gender-Pay-Gap-in-France.pdf)</p> <p>Airbus's 'Responsibility & Sustainability Charter' see https://www.airbus.com/content/dam/channel-specific/website-/company/responsibility-and-sustainability/responsibility-and-sustainability-landing-page/Responsibility-and-Sustainability-Charter-English.pdf</p> |
| Shared Concerns and Joint Recommendations on migrant domestic and care work (Europe) | <p>Shared Concerns and Joint Recommendations on migrant domestic and care work (see https://picum.org/Documents/Publi/2018/concerns_recommendations_migrant_domestic_care_work_February2018.pdf)</p> |
| Risk assessment toolkit for third-country nationals (Italy) | <p>Caritas Migrantes, <i>Dossier Statistico Immigrazione 2011 (Immigration Statistical Dossier 2011)</i>, Rome: Edizioni Idos</p> <p>Regione Lombardia, ASL Brescia, <i>Valutazione dei rischi per la sicurezza e la salute con riferimento alla provenienza da altri paesi</i> ('Risk assessment of health and safety related to third-nations provenience'). 2010 (see https://www.cislbrencia.it/wp-content/uploads/2011/11/Un-progetto-sulla-sicurezza-per-i-lavoratori-stranieri.pdf)</p> <p>Scarcella, C., Benedetti, L., Comincini, F., El Hamad, J., Magoni, M., Provasi, M., Sottini, D., 'Il ruolo dell'ASL di Brescia nella tutela della salute e della sicurezza dei lavoratori immigrati' ('The ASL Brescia role in migrant workers' health and safety protection'), <i>Giornale Italiano di Medicina del Lavoro ed Ergonomia</i>, Vol, XXXIII, No 2 supplement, 2011</p> <p>Sottini, D., Benedetti, L., Scarcella, C., 'Diversi per origine. Valutazione dei rischi con riferimento alla provenienza da altri paesi: una proposta operativa della ASL di Brescia'</p> |

| Case study | Literature/website references used |
|--|---|
| | <p>(‘Diverse for origins. Risk assessment with reference to third-country provenance: an operational proposal by ASL Brescia’), <i>Dossier Ambiente</i> No 112, 2015</p> |
| Diversity Policy at the Dutch Research Council (NWO) (Netherlands) | <p>NWO (2019). Diversity and Inclusion (see https://www.nwo.nl/en/common/policies/diversity-and-inclusion/index).</p> <p>NWO (2018). NWO works on gender equality (see https://www.nwo.nl/en/news-and-events/news/2018/07/nwo-works-on-gender-equality.html)</p> <p>NWO (2018). NWO annual report 2017 (see https://www.nwo.nl/binaries/content/documents/nwo/algemeen/over-nwo/publicaties/items/nwo/jaarverslag-2017/NWO_jaarverslag2017_NL-pdf.pdf)</p> <p>NWO (2018). Signing for gender equality in European physics research (see https://www.nwo.nl/en/news-and-events/news/2018/01/signing-for-gender-equality-in-european-physics-research.html)</p> <p>NWO (2018). NWO Strategy 2019-2022: Connecting Science and Society (see https://www.nwo.nl/binaries/content/documents/nwo-en/common/documentation/application/nwo/strategy/nwo-strategy-2019-2022/NWO_strategy_2019-2022_Connecting_Science_and_Society-pdf.pdf).</p> <p>Landelijk Netwerk Vrouwelijke Hoogleraren (LNVH) (2019) Radboud Universiteit Nijmegen, Harassment in Dutch academia Exploring manifestations, facilitating factors, effects and solutions (see https://www.lnvh.nl/a-3078/harassment-in-dutch-academia.-exploring-manifestations-facilitating-factors-effects-and-solutions)</p> |
| REDI Business Network for LGBTI Inclusion and Diversity (Spain) | <p>Web page of REDI (see http://www.redi-lgbti.org/)</p> <p>REDI’s Annual Report 2018</p> <p>REDI, <i>Frequent Questions</i> leaflet</p> <p>REDI, <i>La Diversidad LGBTI en la Empresa: 12 claves para entenderla y gestionarla</i> (LGBTI Diversity within Enterprises: 12 key elements to understand and manage it), Madrid 2019 (see http://www.redi-lgbti.org/REDI_Informe_Diversidad_LGBTI_Empresa.pdf).</p> |
| Toolkit for the integration of the gender perspective in the prevention of occupational risks (Spain) | <p>The Toolkit is available online, at the website of Osalan (Basque Institute of Labour Safety and Health), see http://www.osalan.euskadi.eus/contenidos/libro/gestion_201710/es_def/adjuntos/pautas_integracion_prl.pdf</p> |
| Women’s Work Environment (Sweden) | <p>The initiative has been evaluated by the Work Environment Authority: https://www.av.se/globalassets/filer/publikationer/rapporter/womens-work-environment-2011-2014-knowledge-compilation-rap-2015-6-eng.pdf;</p> <p>White Paper on women’s work environment, Report 2017: https://www.av.se/globalassets/filer/publikationer/rapporter/white-paper-on-womens-work-environment-2017-6.pdf</p> <p>SWEA’s thematical web page of the Initiative (in English): https://www.av.se/en/work-environment-work-and-inspections/work-with-the-work-environment/gender-equality-in-the-work-environment/</p> <p>Knowledge compilations: https://www.av.se/globalassets/filer/publikationer/kunskapssammanstallningar/under_the_magnifying_glass.pdf; https://www.av.se/globalassets/filer/publikationer/kunskapssammanstallningar/physical</p> |

| Case study | Literature/website references used |
|---|---|
| | -work-gender-and-health-in-working-life-kunskapssammanställning-2013-9-eng.pdf , https://www.av.se/globalassets/filer/publikationer/kunskapssammanstallningar/women_and_men_and_their_working_conditions.pdf HARM risk assessment method: https://www.fysiekebelasting.tno.nl/en/instrumenten/welcome-to-the-hand-arm-risk-assessment-method-harm/ PTAI assessment method: https://www.av.se/globalassets/filer/arbetsmiljoarbete-och-inspektioner/method-for-evaluating--the-load-of-patient-transfers.pdf |
| Transgender Workplace Support Guide (Scotland, United Kingdom) | The guide is available online: http://www.lgbthealth.org.uk/wp-content/uploads/2016/07/TWSP-Info-Guide-Final.pdf and http://www.nhslothianhpac.scot.nhs.uk/HPAC/Index.jsp . LGBT Health&Wellness: https://www.lgbthealth.org.uk/ NHS Lothian Health Promotion Service: https://services.nhslothian.scot/healthpromotionservice/Pages/default.aspx |

Table A5: List of interviewed organisations for policy case studies

| Case study | Stakeholders interviewed |
|---|--|
| National Strategy for the Work Environment (Denmark) | Head of Research and analysis, National Research Centre for the Working Environment |
| Airbus Diversity and Inclusion policy (Europe/Spain) | Inclusion& Diversity National leader, Airbus Spain |
| Shared concerns and Joint Recommendations on migrant domestic and care work (Europe) | Senior Advocacy Officer, Labour Rights and Labour Migration, PICUM |
| Risk assessment toolkit for third-country nationals (Italy) | Two members of the Safety unit, AIB, Brescia Member of the HSE department, CGIL Brescia Member of the HSE office, CISL Brescia Member of PSAL-ATS Brescia |
| Diversity Policy at the Dutch Research Council (NWO) (Netherlands) | HRM staff member at CWI, a NWO research institute |
| REDI Business Network for LGBTI Inclusion and Diversity (Spain) | Co-general director of REDI and general manager of Mpátika, a consultancy company specialised in research on diversity and LGBTI inclusion |

| Case study | Stakeholders interviewed |
|--|--|
| Toolkit for the integration of the gender perspective in the prevention of occupational risks (Spain) | Two members of the Gender Group of Osalan (a working group dealing with gender issues) |
| Women's Work Environment (Sweden) | Senior advisor, Swedish Work Environment Authority |
| Transgender Workplace Support Guide (Scotland, United Kingdom) | Transgender activist in Edinburgh, Scotland |

Work Package 4 (WP4): Identification and in-depth description of selected practices and policy cases

The main goal of WP4 was to collect, analyse and report primary data on the experiences and the situation of the three analysed groups of workers in terms of exposure to poor working conditions (including discrimination, occupational and sectoral segregation) and health-related issues, with a specific focus on MSDs. The results of WP4 as a whole are presented in Chapter 4.

WP4 comprised two activities, as follows.

Activity 1: In-depth interviews with selected stakeholders

Activity 1 comprised three steps, as follows.

Step 1: Identification and selection of relevant stakeholders

A longlist of 43 relevant stakeholders with a strong interest in and/or good knowledge of working conditions and the prevention of health risks (and MSD-related risks in particular) among the three groups of interest was drawn up. The stakeholders were identified from various sources and comprised national stakeholders from five selected EU Member States⁶⁶ chosen to represent different socioeconomic systems in the EU (seven from each) and eight European-level stakeholders. They included social partners (both employers and trade unions), NGOs representing the target groups, government representatives, labour inspectors and occupational health services at regional, national and European, but also sectoral, level.

The longlist of stakeholders (including contact details, target group expertise and reasons for their inclusion) was subsequently sent to EU-OSHA for them to select a list of 30 selected stakeholders to be interviewed in detail.

Step 2: Carrying out interviews with already selected stakeholders

The consultant team and national research partners contacted the 30 selected stakeholders and held a 45-50 minute interview (face-to-face or by phone) in accordance with an interview guide/questionnaire developed by the consultant team and agreed with EU-OSHA. This interview guide, intended to facilitate the collection of information, was structured around four main research areas: (i) general description of the interviewed stakeholder; (ii) working conditions, discrimination issues and sectoral/occupational segregation within the target group(s); (iii) health status and MSD-related problems within the target group(s); and (iv) public/private policy interventions.

The results of each interview were recorded on an ad hoc template, and sent to the consultant team.

⁶⁶ The selected Member States were Denmark, Germany, Hungary, Spain and The Netherlands. In each Member State, stakeholders came from a single national research institute: Oxford Research A/S (Denmark), BIT e.V. (Germany), National Public Health Center (Hungary), Ikei Research and Consultancy (Spain and Europe) and Panteia (the Netherlands).

Step 3: Analysis of the obtained results

The consultant team revised and analysed all the primary data collected in steps 1 and 2, identifying emerging patterns/themes, commonalities and divergences suggested by respondents, the main factors underpinning/explaining these diverging patterns or the complementarity/divergence of these common/diverging patterns/themes with the results of WP1 and WP2, and including the identification of new ideas.

Table A6: List of interviewed organisations

| Country/geographic scope | Name of the organisation |
|--------------------------|---|
| Denmark | BrancheFællesskabet for Arbejdsmiljø for Velfærd og Offentlig administration (The sector council for working environment in the public and social sector) |
| | Branchearbejdsmiljøudvalget Jord til bord (The sector council for working environment in the food industry) |
| | Arbejdstilsynet (The Working Environment Authority) |
| | Nationalt forskningscenter for arbejdsmiljø (The Danish Research Centre for the Working Environment) |
| | ISS |
| Germany | Trade Union Ver.Di (United Service Union), departments Frauen und Gleichstellung' (Women and Equal Treatment) and Genderpolitik |
| | Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (Federal Institute for Occupational Safety and Health) |
| | Antidiskriminierungsstelle des Bundes (Federal Anti-Discrimination Agency) |
| | IG Metall (Metal Workers' Union) |
| | Berliner Institut für empirische Integrations- und Migrationsforschung (Berlin Institute for Empirical Integration and Migration Research) |
| Hungary | Magyar Üzemegészségügyi Tudományos Társaság — MÜTT (Hungarian Scientific Society for Occupational Health and Medicine) |
| | Magyar Ergonómiai Társaság – MET ('Hungarian Ergonomics Society') |
| | Egészségesebb Munkahelyekért Egyesület – EMEGY (Association for Healthier Workplaces) |
| | Budapest Főváros Kormányhivatala Munkavédelmi Osztály (Occupational Safety and Health Inspection Unit in the Budapest Capital Government Office) |
| | University of Pecs Medical School — WHO collaborating centre |
| Spain | Instituto Nacional de Seguridad y Salud en el Trabajo (INSST) ('Spanish National Institute of Safety and Health at Work') |
| | Inspección de Trabajo y Seguridad Social (Spanish Inspectorate of Labour and Social Security) |
| | UGT trade union |

| Country/geographic scope | Name of the organisation |
|------------------------------|---|
| | FELGTB-Federación Estatal de Lesbianas, Gais, Transexuales y Bisexuales (Spanish State Federation of Lesbians, Gays, Transsexuals and Bisexuals) |
| | Centro de investigación en Salud Laboral, CISAL. Universidad Pompeu Fabra (Barcelona) (Research Centre on Labour Health (CISAL) of Pompeu Fabra University) |
| Netherlands | SZW – Directie Gezond en Veilig Werken (Ministry of Social Affairs and Employment – Directorate for Health and Safety at Work) |
| | SZW – Inspectie SZW (Inspectorate of the Ministry of Social Affairs and Employment) |
| | FNV (Netherlands Trade Union Confederation) |
| | Women Inc |
| | Transgender Network Netherlands |
| European/International level | FRA- European Union Agency for Fundamental Rights |
| | Workplace Pride Foundation. International Platform for LGBTI Inclusion at work |
| | BusinessEurope |
| | ILO, Fundamentals Principles and Rights at Work Branch and Labour Administration, Labour Inspection and Occupational Safety and Health Branch |
| | European Network for Workplace Health Promotion |
| | Organisation Intersex International Europe (OII Europe) |

Activity 2: Focus groups with workers belonging to the research groups

Activity 2, again, comprised three steps, as follows.

Step 1: Identification, access and securing participation of workers

Stakeholder organisations from the five selected EU Member States representing the views of the three groups of workers covered by this project were contacted and asked to identify suitable workers from any of the three target groups.

After several attempts, six stakeholder organisations responded positively, providing the names of individual workers.

Step 2: Carrying out of focus group dynamics

Six focus groups were conducted in the five selected Member States (see Table A7). The aim of the focus groups was to discuss participants' individual experiences and situation in terms of working conditions, workplace and social discrimination, occupational/sectoral segregation and the impacts on their health, particularly MSDs. The focus groups were attended by 8-10 people and lasted around 2 hours. Discussions were overseen by national senior research experts with experience of moderating/facilitating focus groups, and organised around three main blocks (in addition to preliminary presentation considerations: (i) personal experiences of participants in relation to working conditions and discrimination issues; (ii) personal experiences on Health issues and MSDs and influence of work and, finally; ideas for effective public policy interventions. A detailed list of topics and questions was developed for this purpose, in agreement with EU-OSHA.

Table A7: List of focus groups carried out

| Country | Focus group | Date |
|-------------|--|-------------------|
| Denmark | Women health and social care workers | 25 October 2019 |
| Germany | Women workers in textile industry | 17 September 2019 |
| Hungary | Agency migrant workers from non-EU countries | 30 September 2019 |
| Spain 1 | Third-country migrant workers | 28 October 2019 |
| Spain 2 | Migrant LGBTI workers | 31 January 2020 |
| Netherlands | LGBTI workers | 8 October 2019 |

In addition, at least one face-to-face or phone interview was conducted with one or more particularly active or interesting participant to explore in more in depth specific issues arising during the focus group. These interviews were conducted in accordance with a predefined questionnaire agreed with EU-OSHA.

A report on each focus group was produced following a predefined template, describing and summarising the main results obtained on each topic and question, and identifying commonalities and shared views but also divergences and differences of opinions. In addition, significant quotations of individuals that might be particularly explanatory or relevant for underpinning or contradicting some of the results were included in the focus groups reports. Subsequently, these materials were sent to the research team for analysis.

Step 3: Analysis of the results

The research team revised and analysed all the primary data collected in steps 1 and 2, identifying emerging patterns/themes, commonalities and divergences emerging from the focus groups, the main factors underpinning/explaining these diverging patterns or the complementarity/divergence of these common/diverging patterns/themes with the results of WP1 and WP2, and including the identification of new ideas.

Work Package 5 (WP5): Validation webinars

Finally, three validation webinars, organised in close collaboration with EU-OSHA, were held on 29 and 30 June 2020 to discuss and validate the findings of the project. Experts from a number of organisations participated.

Table A8: List of participating organisations

| Organisation |
|--|
| FRA (European Union Agency for Fundamental Rights) |
| Fundamentals Principles and Rights at Work Branch, International Labour Organization (ILO) |
| Vilnius University (Lithuania) |
| Transgender Network Netherlands (TNN) |

| Organisation |
|---|
| Lesbian, Gay, Bisexual and Transgender Workplace Inclusion, Leiden University (Belgium) |
| Eurofound |
| Research Centre on Labour Health (CISAL), Pompeu Fabra University (Spain) |
| Department of Operational Medicine, Migration Health, University of Pecs |
| Collegio Carlo Alberto, Università degli Studi di Torino |
| ENWHP (European Network for Workplace Health Promotion) |
| Federal Institute for Occupational Safety and Health (BAuA) |
| Department of Biological Sciences, Université du Québec à Montréal |
| ILO Vision Zero Fund (VZF) |
| Swedish Work Environment Authority |

Annex B: Detailed results from regressions analysis

Regression analysis on EWCS data

Which data were used?

The sixth wave of the European Working Conditions Survey (EWCS) includes indicators on three different types of MSDs and different aspects of mental health, as well as indicators for many different risk factors, discrimination and relevant control variables. In many ways, this is the most complete dataset available at EU level.

The analyses were conducted on the subsample of all respondents residing in an EU-28 Member State, aged 18-65 years, who work at least 12 hours per week in their main job. This subsample contains 31,662 respondents.

Which dependent variables were examined?

To test the (indirect) relation between discrimination and MSD prevalence, regression models in which the prevalence of MSDs was related to discrimination and other variables as explanatory variables were estimated. Previous studies have shown that the relationship between potential determinants and MSDs varies between different types of MSDs. Therefore, analyses were conducted separately for each of the three MSD indicators available in the EWCS:

- MSD_back: a dummy variable indicating whether or not a respondent has reported backaches during the past 12 months;
- MSD_upper: a dummy variable indicating whether or not a respondent has reported muscular pains in the shoulders, neck and/or upper limbs during the past 12 months;
- MSD_lower: a dummy variable indicating whether or not a respondent has reported muscular pains in the lower limbs during the past 12 months.

The effect of discrimination on MSD prevalence can be mediated by mental health only if discrimination has a direct effect on mental health. To determine whether or not this is the case, models were estimated with discrimination as the independent variable of interest (together with several control variables) and the following four aspects of mental health as dependent variables:

- anxiety: a dummy variable indicating whether or not a respondent has reported anxiety (as a health problem) during the past 12 months;
- fatigue: a dummy variable indicating whether or not a respondent has reported overall fatigue (as a health problem) during the past 12 months;
- waking up repeatedly during sleep: a dummy variable indicating whether or not a respondent has reported waking up repeatedly during sleep at least several times a month during the past 12 months;
- waking up exhausted: a dummy variable indicating whether or not a respondent has reported waking up with a feeling of exhaustion and fatigue at least several times a month during the past 12 months.

Which explanatory variables were included?

Additional scales

Many variables included in the sixth wave of the EWCS included in the regression models. Most of the time, the original variables from the survey were used. In some cases, however, the answers to several

questions concerning related subjects were used to construct a single scale.⁶⁷ Using Cronbach's alpha to establish the scale reliability, three scales were constructed with an acceptable level of reliability (Cronbach's alpha ≥ 0.6):

1. Mental well-being (the mental well-being of respondents during the past 2 weeks). Respondents were asked how often in the past 2 weeks the following statements about how they had been feeling were true:
 - I felt cheerful and in good spirits.
 - I felt calm and relaxed.
 - I felt active and vigorous.
 - I woke up fresh and rested;
 - Daily life has been filled with things that interest me.

This scale was calculated based on respondents' average score to each question.

Cronbach's alpha for these five questions was 0.88.

2. Energetic (feeling energetic at work). This scale was calculated as the average score in response to the question 'How often in the past 2 weeks have each of the following statements been true?':
 - At my work I feel full of energy.
 - I am enthusiastic about my job.
 - Time flies when I am working.

Cronbach's alpha for these three questions was 0.72.

3. Employee voice (having a role in the organisation of work). This scale was calculated as the average score in response to the question 'How often in the past 2 weeks have the following statements been true of your work situation?':
 - I am consulted before objectives are set for my work.
 - I am involved in improving the organisation or processes.
 - I have a say in the choice of my work colleagues.
 - I am able to apply my own ideas in my work.
 - I can influence decisions that are important for my work.

Cronbach's alpha for these five questions was 0.83.

Explaining mental health

The models explaining four aspects of mental health included the following explanatory variables.

Discrimination in general

The EWCS asks respondents if they have experienced discrimination on seven different grounds. In all cases the proportion of positive responses is less than 3.5 % (and often less than 0.5 %). These numbers are so small that for the logistic regression a more general indicator of discrimination was required. The indicator for discrimination in general measures whether or not a respondent has experienced discrimination on any grounds, resulting in a figure of 7 % of respondents.

⁶⁷ All of the questions used to construct these scales are measured on a five-point ordinal scale.

Whether in the past month, workers were subject at work to verbal abuse, unwanted sexual attention, threats and/or humiliating behaviours (four different indicators);

Country

Sector

Occupation

Gender

Age

Educational level

Hours usually worked per week (in main job and other jobs when relevant)

Country of birth

Workers can be classified into three groups, based on the country of birth of the worker and of the worker's parents. This makes it possible to compare the migrant workers (both workers born in another country and workers born in the country from immigrant parents) with native workers (with native parents). Interaction between gender and country of birth was not significant in any of the models, and was therefore removed from the final model specifications.

Explaining MSD prevalence

The analyses focusing on the (indirect) effect of discrimination on MSD prevalence included the following risk factors:

Physical risk factors⁶⁸

Extent of being exposed to:

- vibrations from hand tools;
- low temperatures (whether indoors or outdoors).

Main paid job involves:

- working in tiring or painful positions;
- carrying or moving heavy loads;
- repetitive hand or arm movements;
- lifting or moving people;
- sitting.

Organisational and psychosocial risk factors

Extent to which job involves:

- working at very high speed.

Pace of work:

- is dependent on direct demands from others, such as customers, etc.,
- is under the direct control of your boss;
- is within your remit to choose or change:
- is dependent on methods of work.

⁶⁸ All physical risk factors are measured on a seven-point scale. For the analyses, this was reduced to a three-point scale: (almost) never; one quarter to three quarters of the time; and (almost) all of the time.

Extent to which following descriptions apply to your work situation:

- I can take a break when I wish.
- I have enough time to get the job done.
- The job gives me the feeling of work well done.
- I know what is expected of me at work.
- I am treated fairly at the workplace.
- I experience stress at work.
- The job requires me to hide my feelings.

Working time arrangements:

- hours worked (average hours worked per week, for all jobs).⁶⁹

The constructed scales:

- mental well-being;
- feeling energetic;
- employee voice.

Past month, at work subject to:

- verbal abuse;
- unwanted sexual attention;
- threats;
- humiliating behaviours.

Four aspects of mental health (comorbidities):

Health problems in the past 12 months:

- anxiety;
- overall fatigue..

Sleep-related problems in the past 12 months:

- waking up repeatedly during the sleep,
- waking up with a feeling of exhaustion and fatigue.

Although the focus was on the role of these risk factors, the analyses also included various control variables.

Country dummies

- Sector dummies (based on the Statistical Classification of Economic Activities in the European Community, NACE, rev. 2 sector classification at one-digit level, which distinguishes 22 sectors).
- Occupation dummies (based on the ISCO 2008 classification of occupations, which

⁶⁹ Other aspects of working time arrangements (working shifts or at nights or weekends) were not significantly related to any of the MSD indicators and are therefore not included in the final model versions.

distinguishes 44 occupations);

- Educational level (based on the ISCED 08 classification).

Which regression technique to use?

The dependent variables for the models to be estimated are dichotomous. This implies that standard regression techniques (which assume that the dependent variable is continuous) would result in biased parameter estimates. This problem can be solved by estimating logistic regressions.⁷⁰

Logit regressions can be used to estimate the probability that a person reports a specific type of MSD, as a function of the risk factors and control variables discussed before. One of the characteristics of a logistic regression is that the interpretation of the parameter estimates is rather complicated. The estimated parameters represent the effect of changes in a specific variable not on the probability of reporting MSDs, but on the so-called logit transformation of that probability. This logit transformation renders the log of the odds, where the odds are the probability of reporting MSDs relative to the probability of not reporting MSDs.

According to Wikipedia:

*a widely used rule of thumb, the 'one in ten rule', states that logistic regression models give stable values for the explanatory variables if based on a minimum of about 10 events per explanatory variable (EPV); where event denotes the cases belonging to the less frequent category in the dependent variable.... However, there is considerable debate about the reliability of this rule, which is based on simulation studies and lacks a secure theoretical underpinning.*⁷¹

The EPV has been calculated for anxiety (the dependent variable with the lowest likelihood of occurring — 17 % in the EWCS sample) and for the most elaborate model for MSDs in the lower limbs. In both cases EPV is well above 10, suggesting that it is safe to apply logistic regressions:

For anxiety: $EPV = 5140 \text{ (cases of anxiety)} / 103 \text{ (degrees of freedom of the estimated model)} = 50$.

For MSDs in the lower limbs: $EPV = 12,253 \text{ (respondents with MSDs)} / 128 \text{ (degrees of freedom of the estimated model)} = 96$.

Which models were estimated?

Explaining mental health

First, logistic regressions were estimated to examine the (direct) relation between discrimination and the four aspects of mental health (anxiety, fatigue, waking up repeatedly at night, waking up exhausted). For each of these four aspects, the models were estimated with all of the explanatory variables entered into the model in a single step.

Explaining MSD prevalence

For each of the three MSD types, the models were estimated with the explanatory variables entered into the model in consecutive steps:

1. First, only dummies indicating country, age, hours worked, educational level, gender and migration (and gender \times migration) were included. This model shows the extent to which MSD prevalence differs by gender and/or country of birth.
2. Next, the indicators on discrimination, verbal abuse, unwanted sexual attention, threats and humiliating behaviours were included. This model shows the extent to which discrimination has a direct effect on MSD prevalence.
3. Next, sector and occupation dummies were added. This tells us the extent to the

⁷⁰ Alternatively, a probit model could be estimated. Generally speaking, logit and probit estimations lead to the same conclusions.

⁷¹ Source: https://en.wikipedia.org/wiki/Logistic_regression

gender/migration differences are related to the sector/occupation of workers.

4. Next, indicators on mental health were added. If the introduction of these factors reduces the direct effect of discrimination, this supports the hypothesis that discrimination has an indirect effect on MSD prevalence (by affecting factors such as stress, anxiety and sleeping problems).
5. Finally, the other relevant sociodemographic variables and risk factors that were found to be significant were included.

The most elaborate models include many independent variables. This introduces the risk that many observations from the sample will not be used (which may result in selection bias) if at least one of the questions used in the models has not been answered by the respondent. Additional analysis showed that the proportion of respondents who could not provide an answer was at least 5 % for two of the questions used in the models ('Do you feel that you are treated fairly at the workplace?' and 'Is your pace of work under the direct control of your boss?'). For these two questions, the answer category 'don't know' was included as a separate answer category in the logistic regressions. This ensures that the observations from these respondents can still be used for the logistic regressions (while the estimated parameter for this answer category is not relevant).

Results

The main outcomes are presented in Table B1 (the models explaining different aspects of mental health), Table B2 (regarding MSDs in the back), Table B3 (regarding MSDs in the upper limbs) and Table B4 (regarding MSDs in the lower limbs). Each table includes Exp(B) and the associated significance level for the variables included in the different models. (Exp(B) shows the impact of the associated independent variable on the odds of the probability of reporting MSDs. Values larger (smaller) than 1 imply a positive (negative) relationship.)

Most of the explanatory variables are either dummy variables (such as gender), nominal variables (such as country, sector and occupation) or ordinal variables (such as the extent to which the main paid job involves repetitive hand or arm movements). All of these variables were treated as categorical variables in the logistic regression, which implies that separate dummy variables were estimated for each answer category (except for the default category).

Relation between discrimination and mental health

The results for the four aspects of mental health are similar.

Regarding anxiety, the results show that being subjected to discrimination, verbal abuse, threats and, especially, humiliating behaviours are all associated with a higher probability of suffering from anxiety. These relationships are not the results of differences in anxiety levels between countries, sectors or occupations, since these variables are also included in the model. In general, the proportion of workers reporting anxiety varies between countries and occupations, but not between sectors (when controlling for the other variables in the estimated model). In addition, the likelihood of reporting anxiety is higher for women workers, for second-generation migrants (workers born in the current country and with at least one parent born in another country), for older workers and for workers who work a relatively large number of hours per week (see model 1).

The likelihood of the other three indicators for (poor) mental health are also positively associated with being subjected to discrimination, verbal abuse, threats and humiliating behaviours (with the exception that threats are not significantly related to waking up repeatedly). The likelihood of these indicators varies between countries. In addition, the likelihood of overall fatigue varies between sectors and occupations. The likelihood of these indicators is also higher for women workers. The relation with other worker characteristics (including age, educational level and hours worked) varies between these indicators (see models 2, 3 and 4).

Relation between discrimination, mental health and MSD prevalence

Discrimination is positively associated with the prevalence of each of the three MSD types (see model 2 in Table B2, Table B3 and Table B4). This relationship does not depend on the sector or occupation of workers (the parameter estimates for discrimination are almost the same in models 2 and 3 in Table B2, Table B3 and Table B4). Once the four aspects of mental health are included in the model, the (direct) relationship between discrimination and MSDs becomes much smaller (see model 4 in Table B2, Table B3 and Table B4). This supports the hypothesis that the relation between discrimination and MSD prevalence is mediated by mental health.

If mental health is included in the model, the direct relationship between discrimination and MSD prevalence remains significant for all three types of MSDs. If the other relevant risk factors are included, there is no longer a significant direct relationship between discrimination and MSD prevalence (see model 5 in Table B2, Table B3 and Table B4). This indicates that some (or all) of these risk factors also mediate the effect of discrimination.

Relation between gender and MSD prevalence mediated by mental health and discrimination

The results in Table B1 show that women workers than male workers are more likely to report anxiety, overall fatigue and different kinds of sleeping problems. This suggests that the relationship between gender and MSD prevalence may be mediated by these aspects of mental health.

The analyses on determinants of MSD prevalence suggest that this is indeed the case: women workers are more likely to report MSDs than male workers, but the direct relationship between gender and MSD prevalence becomes smaller once the four aspects of mental health are included in the models (see Table B2, Table B3 and Table B4 at the end of this document; in each of these tables, the parameter for gender in model 4 (with mental health variables) is smaller than in model 3 (without mental health variables)).

The relationship between gender and MSD prevalence also becomes weaker if discrimination (and indicators for verbal abuse, unwanted sexual attention, threats and humiliating behaviours) is included in the models (the parameter for gender is smaller in model 2 than in model 1). The decline is relatively small, but it does occur for all three MSD types.

Relationship between country of birth and MSD prevalence mediated by sector, occupation and discrimination

According to Table B1, being born in another country (indicator for migrants) does not increase the likelihood of reporting any of the four indicators of mental health. In fact, in the case of one of these markers (waking up repeatedly during sleep), the results suggest a relationship in the opposite directions (i.e. workers born in another country are less likely than native workers to report waking up repeatedly). This indicates that mental health cannot mediate the relation between country of birth and MSD prevalence. Indeed, the results in Table B2, Table B3 and Table B4 show that the parameter 'being born in another country' does not change if the indicators for four aspects of mental health are included (see model 4 in Table B2, Table B3 and Table B4).

The results in Table B2, Table B3 and Table B4 show that workers born in another country are more likely than native-born workers to report MSDs (see model 1 in Table B2, Table B3 and Table B4). This relationship is independent of the workers' gender. This means that women workers born in another country are the group most likely to report MSD complaints and male native workers are the group least likely to do so.

The results also suggest that the relationship between country of birth and MSD prevalence is mediated by discrimination, sector and occupation: once indicators for discrimination, sector and occupation are included in the models, there is no longer a significant relationship between country of birth and reporting MSDs.

Table B1: Logistic regressions on the prevalence of four different indicators of mental health

| Variable | Model 1: anxiety | | | Model 2: fatigue | | | Model 3: waking up repeatedly | | | Model 4: waking up exhausted | | |
|---|------------------|-------|-------|------------------|-------|-------|-------------------------------|-------|-------|------------------------------|-------|-------|
| | Exp(B) | Sign. | | Exp(B) | Sign. | | Exp(B) | Sign. | | Exp(B) | Sign. | |
| Discrimination | 1.86 | ** | 0.000 | 1.75 | ** | 0.000 | 1.82 | ** | 0.000 | 1.88 | ** | 0.000 |
| Verbal abuse | 1.56 | ** | 0.000 | 1.69 | ** | 0.000 | 1.50 | ** | 0.000 | 1.75 | ** | 0.000 |
| Unwanted sexual attention | 1.06 | | 0.609 | 0.93 | | 0.487 | 1.07 | | 0.472 | 1.01 | | 0.949 |
| Threats | 1.31 | ** | 0.000 | 1.27 | ** | 0.001 | 1.15 | | 0.051 | 1.24 | ** | 0.002 |
| Humiliating behaviours | 2.71 | ** | 0.000 | 2.18 | ** | 0.000 | 1.68 | ** | 0.000 | 1.89 | ** | 0.000 |
| Gender (reference: male) | 1.44 | ** | 0.000 | 1.50 | ** | 0.000 | 1.47 | ** | 0.000 | 1.48 | ** | 0.000 |
| Country of birth (reference: current country) | | | | | | | | | | | | |
| At least one parent born in another country | 1.24 | ** | 0.004 | 1.12 | | 0.071 | 1.10 | | 0.111 | 1.17 | ** | 0.008 |
| Respondent born in another country | 1.03 | | 0.640 | 1.03 | | 0.505 | 0.88 | ** | 0.010 | 0.99 | | 0.870 |
| Age of respondent (ln) | 1.48 | ** | 0.000 | 1.43 | ** | 0.000 | 2.53 | ** | 0.000 | 1.00 | | 0.974 |
| Education (reference: (pre)primary education) | | | | | | | | | | | | |
| Lower secondary | 0.93 | | 0.475 | 0.86 | * | 0.050 | 1.02 | | 0.797 | 0.86 | | 0.056 |
| Upper secondary | 0.81 | * | 0.036 | 0.81 | ** | 0.006 | 0.90 | | 0.173 | 0.77 | ** | 0.001 |
| Post-secondary non-tertiary | 0.82 | | 0.081 | 0.83 | * | 0.027 | 0.93 | | 0.446 | 0.75 | ** | 0.001 |
| Tertiary | 0.87 | | 0.176 | 0.84 | * | 0.031 | 0.82 | * | 0.015 | 0.72 | ** | 0.000 |
| Hours worked per week (ln) | 1.42 | ** | 0.000 | 1.68 | ** | 0.000 | 1.04 | | 0.365 | 1.48 | ** | 0.000 |
| Country | Yes | ** | | Yes | ** | | Yes | ** | | Yes | ** | |
| Sector (NACE rev. 2, one digit) | Yes | | | Yes | ** | | Yes | | | Yes | | |

| Variable | Model 1: anxiety | | Model 2: fatigue | | Model 3: waking up repeatedly | | Model 4: waking up exhausted | |
|---------------------------------|------------------|-------|------------------|-------|-------------------------------|-------|------------------------------|-------|
| | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. |
| Occupation (ISCO 08, one digit) | Yes | ** | Yes | ** | Yes | | Yes | |
| Number of observations | 30,676 | | 30,666 | | 30,702 | | 30,701 | |
| Percentage predicted correctly | 83.8 | | 67.2 | | 71.3 | | 71.5 | |
| Nagelkerke R^2 | 0.192 | | 0.170 | | 0.129 | | 0.097 | |

Significant at ** $p < 0.01$; * $p < 0.05$.

Source: Panteia based on EWCS 2015.

Table B2: Logistic regressions on the prevalence of MSDs in the back

| Variable | Model 1: baseline | | | Model 2: discrimination | | | Model 3: sector and occupation | | | Model 4: mental health | | | Model 5: other risk factors | | |
|---|-------------------|-------|-------|-------------------------|-------|-------|--------------------------------|-------|-------|------------------------|-------|-------|-----------------------------|-------|-------|
| | Exp(B) | Sign. | | Exp(B) | Sign. | | Exp(B) | Sign. | | Exp(B) | Sign. | | Exp(B) | Sign. | |
| Age (ln) | 2.31 | ** | 0.000 | 2.46 | ** | 0.000 | 2.45 | ** | 0.000 | 2.32 | ** | 0.000 | 2.36 | ** | 0.000 |
| Hours worked per week (ln) | 1.27 | ** | 0.000 | 1.24 | ** | 0.000 | 1.25 | ** | 0.000 | 1.08 | | 0.116 | 0.96 | | 0.431 |
| Education (reference: (pre)primary education) | | | | | | | | | | | | | | | |
| Lower secondary | 0.80 | ** | 0.007 | 0.81 | * | 0.011 | 0.87 | | 0.089 | 0.90 | | 0.241 | 0.91 | | 0.295 |
| Upper secondary | 0.69 | ** | 0.000 | 0.69 | ** | 0.000 | 0.82 | * | 0.014 | 0.87 | | 0.104 | 0.89 | | 0.186 |
| Post-secondary, non-tertiary | 0.62 | ** | 0.000 | 0.62 | ** | 0.000 | 0.79 | ** | 0.008 | 0.84 | | 0.062 | 0.88 | | 0.181 |
| Tertiary | 0.45 | ** | 0.000 | 0.44 | ** | 0.000 | 0.66 | ** | 0.000 | 0.69 | ** | 0.000 | 0.77 | ** | 0.005 |
| Gender (reference: male) | 1.22 | ** | 0.000 | 1.18 | ** | 0.000 | 1.30 | ** | 0.000 | 1.13 | ** | 0.000 | 1.14 | ** | 0.000 |
| Country of birth (reference: current country) | | | | | | | | | | | | | | | |
| At least one parent born in another country | 1.11 | | 0.089 | 1.08 | | 0.213 | 1.07 | | 0.242 | 1.02 | | 0.722 | 1.02 | | 0.756 |
| Respondent born in another country | 1.16 | ** | 0.001 | 1.11 | * | 0.028 | 1.05 | | 0.298 | 1.05 | | 0.280 | 1.03 | | 0.541 |
| Discrimination | | | | 1.57 | ** | 0.000 | 1.55 | ** | 0.000 | 1.23 | ** | 0.000 | 1.10 | | 0.104 |
| Verbal abuse | | | | 1.56 | ** | 0.000 | 1.60 | ** | 0.000 | 1.32 | ** | 0.000 | 1.20 | ** | 0.001 |
| Unwanted sexual attention | | | | 1.27 | * | 0.016 | 1.26 | * | 0.022 | 1.30 | * | 0.012 | 1.28 | * | 0.024 |
| Threats | | | | 0.94 | | 0.354 | 0.98 | | 0.794 | 0.87 | | 0.059 | 0.81 | ** | 0.007 |
| Humiliating behaviours | | | | 1.55 | ** | 0.000 | 1.56 | ** | 0.000 | 1.15 | * | 0.029 | 0.98 | | 0.771 |
| Anxiety | | | | | | | | | | 1.43 | ** | 0.000 | 1.24 | ** | 0.000 |
| Fatigue | | | | | | | | | | 2.80 | ** | 0.000 | 2.26 | ** | 0.000 |

| Variable | Model 1: baseline | | Model 2: discrimination | | Model 3: sector and occupation | | Model 4: mental health | | | Model 5: other risk factors | | |
|--|-------------------|-------|-------------------------|-------|--------------------------------|-------|------------------------|-------|-------|-----------------------------|-------|-------|
| | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | | Exp(B) | Sign. | |
| Sleeping problems: waking up repeatedly | | | | | | | 1.44 | ** | 0.000 | 1.32 | ** | 0.000 |
| Sleeping problems: waking up exhausted | | | | | | | 1.61 | ** | 0.000 | 1.30 | ** | 0.000 |
| Exposed to vibrations from hand tools, machinery, etc. (reference: (almost) never) | | | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | | 1.10 | * | 0.048 |
| Almost all of the time | | | | | | | | | | 1.00 | | 0.959 |
| All of the time | | | | | | | | | | 1.03 | | 0.719 |
| Job involves tiring or painful positions (reference: (almost) never) | | | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | | 1.86 | ** | 0.000 |
| (Almost) all of the time | | | | | | | | | | 2.29 | ** | 0.000 |
| Job involves carrying or moving heavy loads (reference: (almost) never) | | | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | | 1.25 | ** | 0.000 |
| (Almost) all of the time | | | | | | | | | | 1.40 | ** | 0.000 |
| Job involves repetitive hand or arm movements (reference: (almost) never) | | | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | | 1.14 | ** | 0.000 |
| (Almost) all of the time | | | | | | | | | | 1.21 | ** | 0.000 |
| Pace of work depends on direct demands from customers etc. | | | | | | | | | | 1.05 | | 0.123 |

| Variable | Model 1: baseline | | Model 2: discrimination | | Model 3: sector and occupation | | Model 4: mental health | | Model 5: other risk factors | |
|--|-------------------|-------|-------------------------|-------|--------------------------------|-------|------------------------|-------|-----------------------------|----------|
| | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. |
| Pace of work under direct control of boss (reference: no) | | | | | | | | | | |
| Yes | | | | | | | | | 0.94 | * 0.046 |
| Don't know/no answer | | | | | | | | | 0.95 | 0.539 |
| Mental well-being past 2 weeks | | | | | | | | | 1.20 | ** 0.000 |
| Feeling energetic at work | | | | | | | | | 1.09 | ** 0.001 |
| Having enough time to get the job done (reference: all of the time) | | | | | | | | | | |
| Rarely or never | | | | | | | | | 0.87 | * 0.012 |
| Sometimes/most of the time | | | | | | | | | 1.02 | 0.491 |
| Knowing what is expected of you at work (reference: all of the time) | | | | | | | | | | |
| Rarely or never | | | | | | | | | 0.73 | ** 0.002 |
| Sometimes/most of the time | | | | | | | | | 0.88 | ** 0.000 |
| Health or safety at risk because of work | | | | | | | | | 1.16 | ** 0.000 |
| Does your work affect your health? (reference: no) | | | | | | | | | | |
| Yes, mainly positive | | | | | | | | | 1.00 | 0.992 |
| Yes, mainly negative | | | | | | | | | 1.60 | ** 0.000 |
| Country | Yes | ** | Yes | ** | Yes | ** | Yes | ** | Yes | ** |
| Sector (NACE rev. 2, one digit) | No | | No | | Yes | ** | Yes | ** | Yes | ** |

Workforce diversity and musculoskeletal disorders: review of facts and figures and case examples

| Variable | Model 1: baseline | | Model 2: discrimination | | Model 3: sector and occupation | | Model 4: mental health | | Model 5: other risk factors | |
|---------------------------------|-------------------|-------|-------------------------|-------|--------------------------------|-------|------------------------|-------|-----------------------------|-------|
| | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. |
| Occupation (ISCO 08, one digit) | No | | No | | Yes ** | | Yes ** | | Yes ** | |
| Number of observations | 28,347 | | 28,347 | | 28,347 | | 28,347 | | 28,347 | |
| Percentage predicted correctly | 60.2 | | 61.5 | | 62.6 | | 68.6 | | 71.2 | |
| Nagelkerke R^2 | 0.06 | | 0.08 | | 0.10 | | 0.22 | | 0.29 | |

Significant at ** $p < 0.01$; * $p < 0.05$.

Source: Panteia based on EWCS 2015.

Table B3: Logistic regressions on the prevalence of MSDs in the upper limbs

| Variable | Model 1: baseline | | | Model 2: discrimination | | | Model 3: sector and occupation | | | Model 4: mental health | | | Model 5: other risk factors | | |
|---|-------------------|-------|-------|-------------------------|-------|-------|--------------------------------|-------|-------|------------------------|-------|-------|-----------------------------|-------|-------|
| | Exp(B) | Sign. | | Exp(B) | Sign. | | Exp(B) | Sign. | | Exp(B) | Sign. | | Exp(B) | Sign. | |
| Age (ln) | 2.23 | ** | 0.000 | 2.38 | ** | 0.000 | 2.43 | ** | 0.000 | 2.33 | ** | 0.000 | 2.43 | ** | 0.000 |
| Hours worked per week (ln) | 1.27 | ** | 0.000 | 1.25 | ** | 0.000 | 1.24 | ** | 0.000 | 1.04 | | 0.472 | 0.91 | | 0.082 |
| Education (reference: (pre)primary education) | | | | | | | | | | | | | | | |
| Lower secondary | 0.82 | * | 0.016 | 0.83 | * | 0.022 | 0.90 | | 0.190 | 0.94 | | 0.462 | 0.93 | | 0.450 |
| Upper secondary | 0.70 | ** | 0.000 | 0.71 | ** | 0.000 | 0.86 | | 0.061 | 0.92 | | 0.365 | 0.93 | | 0.442 |
| Post-secondary non-tertiary | 0.66 | ** | 0.000 | 0.65 | ** | 0.000 | 0.86 | | 0.087 | 0.92 | | 0.405 | 0.97 | | 0.739 |
| Tertiary | 0.49 | ** | 0.000 | 0.49 | ** | 0.000 | 0.73 | ** | 0.000 | 0.78 | ** | 0.005 | 0.86 | | 0.119 |
| Gender (reference: male) | 1.39 | ** | 0.000 | 1.36 | ** | 0.000 | 1.57 | ** | 0.000 | 1.38 | ** | 0.000 | 1.42 | ** | 0.000 |
| Country of birth (reference: current country) | | | | | | | | | | | | | | | |
| At least one parent born in another country | 1.09 | | 0.155 | 1.06 | | 0.346 | 1.06 | | 0.348 | 1.00 | | 0.974 | 0.99 | | 0.919 |
| Respondent born in another country | 1.10 | * | 0.032 | 1.04 | | 0.343 | 0.98 | | 0.681 | 0.97 | | 0.550 | 0.95 | | 0.296 |
| Discrimination | | | | 1.59 | ** | 0.000 | 1.56 | ** | 0.000 | 1.22 | ** | 0.000 | 1.08 | | 0.176 |
| Verbal abuse | | | | 1.71 | ** | 0.000 | 1.79 | ** | 0.000 | 1.48 | ** | 0.000 | 1.37 | ** | 0.000 |
| Unwanted sexual attention | | | | 1.25 | * | 0.028 | 1.22 | * | 0.048 | 1.26 | * | 0.034 | 1.24 | | 0.056 |
| Threats | | | | 0.92 | | 0.247 | 0.99 | | 0.905 | 0.88 | | 0.090 | 0.84 | * | 0.027 |
| Humiliating behaviours | | | | 1.53 | ** | 0.000 | 1.54 | ** | 0.000 | 1.10 | | 0.158 | 0.96 | | 0.596 |
| Anxiety | | | | | | | | | | 1.61 | ** | 0.000 | 1.45 | ** | 0.000 |

| Variable | Model 1: baseline | | Model 2: discrimination | | Model 3: sector and occupation | | Model 4: mental health | | Model 5: other risk factors | |
|---|-------------------|-------|-------------------------|-------|--------------------------------|-------|------------------------|-------|-----------------------------|-------|
| | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. |
| Fatigue | | | | | | | 2.94 ** 0.000 | | 2.40 ** 0.000 | |
| Sleeping problems: waking up repeatedly | | | | | | | 1.41 ** 0.000 | | 1.30 ** 0.000 | |
| Sleeping problems: waking up exhausted | | | | | | | 1.71 ** 0.000 | | 1.40 ** 0.000 | |
| Exposed to vibrations from hand tools, machinery, etc. (reference: (almost) never) | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | 1.11 * 0.040 | |
| Almost all of the time | | | | | | | | | 1.34 ** 0.000 | |
| All of the time | | | | | | | | | 1.08 0.351 | |
| Exposed to low temperatures (indoors or outdoors) (reference: (almost) never) | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | 1.15 ** 0.000 | |
| (Almost) all of the time | | | | | | | | | 1.21 * 0.018 | |
| Job involves tiring or painful positions (reference: (almost) never) | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | 1.83 ** 0.000 | |
| (Almost) all of the time | | | | | | | | | 2.26 * 0.000 | |
| Job involves carrying or moving heavy loads (reference: (almost) never) | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | 1.17 ** 0.000 | |
| (Almost) all of the time | | | | | | | | | 1.39 ** 0.000 | |

| Variable | Model 1: baseline | | Model 2: discrimination | | Model 3: sector and occupation | | Model 4: mental health | | Model 5: other risk factors | |
|--|-------------------|-------|-------------------------|-------|--------------------------------|-------|------------------------|-------|-----------------------------|----------|
| | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. |
| Job involves working at very high speed (reference: (almost) never) | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | 1.11 | ** 0.002 |
| (Almost) all of the time | | | | | | | | | 1.11 | ** 0.010 |
| Mental well-being past 2 weeks | | | | | | | | | 1.20 | ** 0.000 |
| Employee voice | | | | | | | | | 1.03 | 0.093 |
| Job gives feeling of work well done (reference: all of the time) | | | | | | | | | | |
| Rarely or never | | | | | | | | | 0.82 | ** 0.009 |
| Sometimes/most of the time | | | | | | | | | 1.04 | 0.232 |
| Knowing what is expected of you at work (reference: all of the time) | | | | | | | | | | |
| Rarely or never | | | | | | | | | 0.77 | * 0.013 |
| Sometimes/most of the time | | | | | | | | | 0.92 | * 0.017 |
| Treated fairly at the workplace (reference: all of the time) | | | | | | | | | | |
| Rarely or never | | | | | | | | | 0.82 | * 0.011 |
| Sometimes/most of the time | | | | | | | | | 0.98 | 0.527 |
| Don't know/no answer | | | | | | | | | 0.92 | 0.112 |
| Stress experienced at work (reference: rarely or never) | | | | | | | | | | |

Workforce diversity and musculoskeletal disorders: review of facts and figures and case examples

| Variable | Model 1: baseline | | Model 2: discrimination | | Model 3: sector and occupation | | Model 4: mental health | | Model 5: other risk factors | | |
|---|-------------------|-------|-------------------------|-------|--------------------------------|-------|------------------------|-------|-----------------------------|-------|-------|
| | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Sign. |
| Sometimes/most of the time | | | | | | | | | 1.13 | ** | 0.000 |
| All of the time | | | | | | | | | 1.08 | | 0.156 |
| Job requires hiding of feelings (reference: rarely or never) | | | | | | | | | | | |
| Sometimes/most of the time | | | | | | | | | 0.90 | ** | 0.002 |
| All of the time | | | | | | | | | 0.76 | ** | 0.000 |
| Health or safety at risk because of work | | | | | | | | | 1.18 | ** | 0.000 |
| Job involves repetitive hand or arm movements (reference: (almost) never) | | | | | | | | | | | |
| Yes, mainly positive | | | | | | | | | 1.06 | | 0.184 |
| Yes, mainly negative | | | | | | | | | 1.54 | ** | 0.000 |
| Country | Yes | ** | Yes | ** | Yes | ** | Yes | ** | Yes | ** | |
| Sector (NACE rev. 2, one digit) | No | | No | | Yes | * | Yes | * | Yes | | |
| Occupation (ISCO 08, one digit) | No | | No | | Yes | ** | Yes | ** | Yes | ** | |
| Number of observations | 27,971 | | 27,971 | | 27,971 | | 27,971 | | 27,971 | | |
| Percentage predicted correctly | 60.7 | | 62.2 | | 63.2 | | 69.6 | | 71.9 | | |
| Nagelkerke R^2 | 0.08 | | 0.10 | | 0.12 | | 0.26 | | 0.31 | | |

Significant at: ** $p < 0.01$; * $p < 0.05$.

Source: Panteia based on EWCS 2015.

Table B4: Logistic regressions on the prevalence of MSDs in the lower limbs

| Variable | Model 1: baseline | | | Model 2: discrimination | | | Model 3: sector and occupation | | | Model 4: mental health | | | Model 5: other risk factors | | |
|---|-------------------|-------|-------|-------------------------|-------|-------|--------------------------------|-------|-------|------------------------|-------|-------|-----------------------------|-------|-------|
| | Exp(B) | Sign. | | Exp(B) | Sign. | | Exp(B) | Sign. | | Exp(B) | Sign. | | Exp(B) | Sign. | |
| Age (ln) | 2.74 | ** | 0.000 | 2.95 | ** | 0.000 | 3.22 | ** | 0.000 | 3.10 | ** | 0.000 | 3.21 | ** | 0.000 |
| Hours worked per week (ln) | 1.08 | | 0.113 | 1.05 | | 0.306 | 1.09 | | 0.095 | 0.92 | | 0.087 | 0.82 | ** | 0.000 |
| Education (reference: (pre)primary education) | | | | | | | | | | | | | | | |
| Lower secondary | 0.79 | ** | 0.002 | 0.79 | ** | 0.004 | 0.86 | | 0.072 | 0.89 | | 0.160 | 0.88 | | 0.151 |
| Upper secondary | 0.61 | ** | 0.000 | 0.61 | ** | 0.000 | 0.75 | ** | 0.000 | 0.78 | ** | 0.003 | 0.80 | ** | 0.008 |
| Post-secondary, non-tertiary | 0.56 | ** | 0.000 | 0.56 | ** | 0.000 | 0.76 | ** | 0.002 | 0.79 | * | 0.016 | 0.84 | | 0.072 |
| Tertiary | 0.34 | ** | 0.000 | 0.34 | ** | 0.000 | 0.56 | ** | 0.000 | 0.57 | ** | 0.000 | 0.65 | ** | 0.000 |
| Gender (reference: male_ | 1.18 | ** | 0.000 | 1.14 | ** | 0.000 | 1.26 | ** | 0.000 | 1.08 | * | 0.026 | 1.12 | ** | 0.002 |
| Country of birth (reference: current country) | | | | | | | | | | | | | | | |
| At least one parent born in another country | 1.17 | ** | 0.010 | 1.14 | * | 0.037 | 1.15 | * | 0.032 | 1.10 | | 0.147 | 1.10 | | 0.165 |
| Respondent born in another country | 1.21 | ** | 0.000 | 1.15 | ** | 0.004 | 1.05 | | 0.285 | 1.06 | | 0.232 | 1.03 | | 0.534 |
| Discrimination | | | | 1.59 | ** | 0.000 | 1.56 | ** | 0.000 | 1.23 | ** | 0.000 | 1.10 | | 0.095 |
| Verbal abuse | | | | 1.49 | ** | 0.000 | 1.49 | ** | 0.000 | 1.21 | ** | 0.000 | 1.11 | | 0.059 |
| Unwanted sexual attention | | | | 1.41 | ** | 0.001 | 1.31 | ** | 0.006 | 1.36 | ** | 0.003 | 1.34 | ** | 0.007 |
| Threats | | | | 1.10 | | 0.176 | 1.16 | * | 0.043 | 1.05 | | 0.527 | 0.99 | | 0.921 |
| Humiliating behaviours | | | | 1.56 | ** | 0.000 | 1.57 | ** | 0.000 | 1.18 | * | 0.011 | 1.03 | | 0.649 |
| Anxiety | | | | | | | | | | 1.37 | ** | 0.000 | 1.22 | ** | 0.000 |

| Variable | Model 1: baseline | | Model 2: discrimination | | Model 3: sector and occupation | | Model 4: mental health | | Model 5: other risk factors | |
|---|----------------------|-------|----------------------------|-------|-----------------------------------|-------|---------------------------|----------|--------------------------------|----------|
| | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. |
| Fatigue | | | | | | | 2.74 | ** 0.000 | 2.26 | ** 0.000 |
| Sleeping problems: waking up repeatedly | | | | | | | 1.48 | ** 0.000 | 1.38 | ** 0.000 |
| Sleeping problems: waking up exhausted | | | | | | | 1.66 | ** 0.000 | 1.38 | ** 0.000 |
| Exposed to low temperatures (indoors or outdoors) (reference: (almost) never) | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | 1.23 | ** 0.000 |
| (Almost) all of the time | | | | | | | | | 1.20 | * 0.015 |
| Job involves tiring or painful positions (reference: (almost) never) | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | 1.52 | ** 0.000 |
| (Almost) all of the time | | | | | | | | | 2.02 | ** 0.000 |
| Job involves carrying or moving heavy loads (reference: (almost) never) | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | 1.17 | ** 0.000 |
| (Almost) all of the time | | | | | | | | | 1.27 | ** 0.000 |
| Job involves sitting:(reference: (almost) never) | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | 0.86 | ** 0.000 |
| (Almost) all of the time | | | | | | | | | 0.72 | ** 0.000 |
| Job involves repetitive hand or arm movements (reference: (almost) never) | | | | | | | | | | |
| One-quarter to three-quarters of the time | | | | | | | | | 1.17 | ** 0.000 |

| Variable | Model 1: baseline | | Model 2: discrimination | | Model 3: sector and occupation | | Model 4: mental health | | Model 5: other risk factors | |
|--|----------------------|-------|----------------------------|-------|-----------------------------------|-------|---------------------------|-------|--------------------------------|----------|
| | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. |
| (Almost) all of the time | | | | | | | | | 1.14 | ** 0.001 |
| Feeling energetic | | | | | | | | | 1.07 | ** 0.005 |
| Mental well-being past 2 weeks | | | | | | | | | 1.15 | ** 0.000 |
| Having enough time to get the job done (reference: all of the time) | | | | | | | | | | |
| Rarely or never | | | | | | | | | 0.84 | ** 0.003 |
| Sometimes/most of the time | | | | | | | | | 0.99 | 0.737 |
| Knowing what is expected of you at work (reference: all of the time) | | | | | | | | | | |
| Rarely or never | | | | | | | | | 0.77 | * 0.012 |
| Sometimes/most of the time | | | | | | | | | 0.95 | 0.130 |
| Health or safety at risk because of work | | | | | | | | | 1.20 | ** 0.000 |
| Does your work affect your health (reference: no) | | | | | | | | | | |
| Yes, mainly positive | | | | | | | | | 1.10 | 0.051 |
| Yes, mainly negative | | | | | | | | | 1.47 | ** 0.000 |
| Country | Yes | ** | Yes | ** | Yes | ** | Yes | ** | Yes | ** |
| Sector (NACE rev. 2, one digit) | No | | No | | Yes | ** | Yes | ** | Yes | ** |
| Occupation (ISCO 08, one digit) | No | | No | | Yes | ** | Yes | ** | Yes | ** |

| Variable | Model 1: baseline | | Model 2: discrimination | | Model 3: sector and occupation | | Model 4: mental health | | Model 5: other risk factors | |
|--------------------------------|----------------------|-------|----------------------------|-------|-----------------------------------|-------|---------------------------|-------|--------------------------------|-------|
| | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. |
| Number of observations | 28,696 | | 28,696 | | 28,696 | | 28,696 | | 28,696 | |
| Percentage predicted correctly | 69.28 | | 69.95 | | 70.40 | | 73.67 | | 75.31 | |
| Nagelkerke R^2 | 0.08 | | 0.10 | | 0.13 | | 0.24 | | 0.29 | |

Significant at ** $p < 0.01$; * $p < 0.05$.

Source: Panteia based on EWCS 2015.

Regression analysis on FRA data

Which data were used?

The FRA Violence Against Women Survey 2012 includes indicators on different types of discrimination, on violence and harassment and on health, as well as indicators for relevant control variables.

The analyses were conducted on the subsample of all (women) working respondents residing in an EU-28 Member State, aged ≥ 18 years. This subsample contains 20,513 respondents.

Which dependent variables were examined?

To test the relation between health and various forms of harassment, physical aggression and discrimination, regression models in which health was related to discrimination, harassment, physical aggression and other variables as explanatory variables were estimated.

Health is measured as an ordinal variables on a five-point scale (very good; good; fair; bad; very bad). For the purpose of these analyses, answers were aggregated into a binary variable indicating whether a respondent's health is 'very good' (33 % of total responses) or 'less than very good' (67 % of total responses).

Which explanatory variables were included?

The analyses focusing on the effect of harassment, discrimination and physical aggression on health included the following variables:

- *Sexual harassment.* A dummy variable indicating if a respondent was subjected during the past 12 months to any of the following behaviours by a boss, colleague or client:
 - unwelcome touching, hugging or kissing;
 - inappropriate staring or leering;
 - sexually suggestive comments or jokes;
 - sending or showing of sexually explicit pictures or sending of sexually explicit photos or gifts;
 - inappropriate invitations to go out on dates;
 - intrusive questions about her private life;
 - intrusive comments about her physical appearance;
 - sending of unwanted sexually explicit emails or SMS messages;
 - inappropriate and offensive advances on social networking websites or in chat rooms;
 - indecent exposure;
 - requiring the respondent to watch or look at pornographic material against her wishes.
- *Physical aggression.* A dummy variable indicating if a respondent was subjected during the past 12 months to any of the following behaviours by a boss, colleague or client:
 - being threatened with physically harm;
 - pushing or shoving;
 - slapping;
 - having a hard object thrown at her;

- hair grabbing or pulling;
 - being beaten with a fist or hard object, or kicking;
 - burning;
 - attempted suffocation or strangulation;
 - cutting, stabbing or shooting;
 - beating her head against something;
 - being forced into sexual intercourse by being held down or hurt in some way.
- *Discrimination*. A dummy variable indicating if the respondent was discriminated against at work because of being a woman during the past 12 months.

Two other control variables were used:

- *Worry about being hurt*: a dummy variable indicating whether during the past 12 months the respondent was worried (sometimes or more often) that someone from work, school or training might hurt her.
- *Avoiding being alone with another person at work*: a dummy variable indicating whether during the past 12 months the respondent had avoided being alone with a colleague or boss at work.

While the focus was on the role of the variables described above, the analyses also included various control variables:

- country dummies;
- occupation dummies (based on the ISCO 2008 classification of occupations, which distinguishes 44 occupations);
- educational level (based on the ISCED 08 classification);
- age group dummies;
- citizenship status.

Which regression technique to use?

The dependent variable for the models to be estimated is dichotomous. This implies that standard regression techniques (which assume that the dependent variable is continuous) would result in biased parameter estimates. This problem can be solved by estimating logistic regressions.⁷²

Logit regressions can be used to estimate the probability that a person reports very good health, as a function of the risk factors and control variables discussed before. One of the characteristics of a logistic regression is that the interpretation of the parameter estimates is rather complicated. The estimated parameters represent the effect of changes in a specific variable not on the probability of reporting a very good health, but on the so-called logit transformation of that probability. This logit transformation renders the log of the odds, where the odds are the probability of reporting very good health relative to the probability of not reporting very good health.

According to Wikipedia:

a widely used rule of thumb, the 'one in ten rule', states that logistic regression models give stable values for the explanatory variables if based on a minimum of about 10 events per explanatory variable (EPV); where event denotes the cases belonging to the less frequent category in the dependent

⁷² Alternatively, a probit model could be estimated. Generally speaking, logit and probit estimations lead to the same conclusions.

*variable.... However, there is considerable debate about the reliability of this rule, which is based on simulation studies and lacks a secure theoretical underpinning.*⁷³

The EPV has been calculated for having a very good health. The EPV is well above 10, suggesting that it is safe to apply logistic regressions:

EPV = 61,19 (respondents with very good health in general)/54 (degrees of freedom of the estimated model) = 113.

Which models were estimated?

The model was estimated with the explanatory variables entered into the model in consecutive steps:

1. First, only dummies indicating country, age, educational level and citizenship were included. This model shows the extent to which health differs by age and/or educational level.
2. Next, the indicators on discrimination, sexual harassment and physical aggression were included. This shows the extent to which discrimination, sexual harassment and physical aggression are related to health, given the control variables from step 1.
3. Finally, the indicators 'avoiding being alone with someone else at work' and 'worry about being hurt by someone from school work or training' were included.

Results

The main outcomes are presented in Table B5. The table includes Exp(B) and the associated significance level for the variables included. (Exp(B) shows the impact of the associated independent variable on the odds of the probability of reporting a very good health. Values larger (smaller) than 1 imply a positive (negative) relationship.)

Most of the explanatory variables are either dummy variables (such as citizenship), nominal variables (such as country and occupation) or ordinal variables (age group). All of these variables were treated as categorical variables in the logistic regression, which implies that separate dummy variables were estimated for each answer category (except for the default category). The main findings from these logistic regressions are discussed in Chapter 2.

Relationship between discrimination, harassment, physical violence and health

The analyses on the FRA data confirm that (for women) health is related to discrimination and sexual harassment: women workers who reported being subject to discrimination and sexual harassment overall are less likely to report very good health. These relationships are corrected for differences between women workers from different countries and occupations, and for different worker characteristics such as age, citizenship and educational level (see Table B5). Age and educational level are related to health (younger and better-educated women workers are more likely to report very good health than older and less-educated women workers); citizenship is not.

Sexual orientation is not related to health, nor is being subject to physical aggression from someone from work or avoiding being alone at work. Respondents who report being worried about being hurt by someone from school, training or work overall are less likely to report very good health.

⁷³ Source: https://en.wikipedia.org/wiki/Logistic_regression.

Table B5: Logistic regressions on having a (very) good general health

| Variable | Model 1: baseline | | | Model 2: discrimination, harassment and violence | | | Model 3: mental health indicators | | |
|---|-------------------|----|-------|--|----|-------|-----------------------------------|----|-------|
| | Exp(B) | | Sign. | Exp(B) | | Sign. | Exp(B) | | Sign. |
| Age group (years) (reference: 18-24) | | | | | | | | | |
| 25-29 | 0.765 | ** | 0.003 | 0.768 | ** | 0.003 | 0.768 | ** | 0.003 |
| 30-34 | 0.544 | ** | 0.000 | 0.545 | ** | 0.000 | 0.545 | ** | 0.000 |
| 35-39 | 0.424 | ** | 0.000 | 0.424 | ** | 0.000 | 0.425 | ** | 0.000 |
| 40-49 | 0.284 | ** | 0.000 | 0.283 | ** | 0.000 | 0.283 | ** | 0.000 |
| 50-59 | 0.181 | ** | 0.000 | 0.179 | ** | 0.000 | 0.178 | ** | 0.000 |
| 60+ | 0.171 | ** | 0.000 | 0.167 | ** | 0.000 | 0.167 | ** | 0.000 |
| Education (reference: (pre)primary education) | | | | | | | | | |
| Lower secondary | 1.22 | | 0.106 | 1.21 | | 0.013 | 1.21 | | 0.114 |
| Upper secondary | 1.56 | ** | 0.000 | 1.55 | ** | 0.000 | 1.55 | ** | 0.000 |
| Post-secondary, non-tertiary | 1.78 | ** | 0.000 | 1.80 | ** | 0.000 | 1.80 | ** | 0.000 |
| Tertiary | 2.13 | ** | 0.000 | 2.15 | ** | 0.000 | 2.14 | ** | 0.000 |
| Citizenship (reference: no citizenship) | 1.08 | | 0.482 | 1.08 | | 0.471 | 1.08 | | 0.470 |
| Sexual orientation | 1.01 | | 0.944 | 1.04 | | 0.808 | 1.04 | | 0.783 |
| Discrimination | | | | 0.81 | ** | 0.007 | 0.83 | ** | 0.019 |
| Sexual harassment | | | | 0.81 | ** | 0.002 | 0.84 | ** | 0.012 |
| Physical aggression | | | | 0.79 | | 0.136 | 0.84 | * | 0.266 |

| Variable | Model 1: baseline | | Model 2: discrimination. harassment and violence | | Model 3: mental health indicators | |
|---------------------------------|-------------------|-------|--|-------|-----------------------------------|-------|
| | Exp(B) | Sign. | Exp(B) | Sign. | Exp(B) | Sign. |
| Worried about being hurt | | | | | 0.83 | * |
| Avoided being alone | | | | | 0.87 | |
| Country | Yes | ** | Yes | ** | Yes | ** |
| Occupation (ISCO 08, one digit) | Yes | ** | Yes | ** | Yes | ** |
| Number of observations | 18,509 | | 18,509 | | 18,509 | |
| Percentage predicted correctly | 71.8 | | 71.9 | | 72 | |
| Nagelkerke R^2 | 0.239 | | 0.24 | | 0.241 | |

Significant at ** $p < 0.01$; * $p < 0.05$.

Source: Panteia based on FRA Violence Against Women Survey 2012.

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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