

European Agency for Safety and Health at Work

Work-related musculoskeletal disorders: prevalence, costs and demographics in the EU

National report: France

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Summary

Prevalence of MSDs

- The percentage of both French men and women workers reporting that their work affects their health is higher (47 % and 46 %, respectively) than the average levels for the 28 EU Member States (EU-28) (39 % and 35 %, respectively).
- The percentage of French workers affected by back pain, muscular pain in the shoulders, neck and/or upper limbs as well as muscular pain in the lower limbs is higher than the EU-28 average.
- The prevalence of three common MSDs (rotator cuff syndrome (RCS), lateral epicondylitis and carpal tunnel syndrome (CTS)) is higher among women than among men. Moreover, prevalence increases as age increases. RCS has the highest prevalence figures. Concerning socio-professional categories, RCS has a higher prevalence among skilled workers and unskilled workers; lateral epicondylitis has a higher prevalence among female managers and unskilled workers, and among male administrative employees and skilled workers; and, finally, CTS has a higher prevalence among female skilled workers and unskilled workers, and among male administrative employees and unskilled workers.
- National data on recognised occupational diseases and incidence show that MSDs have the highest incidence in terms of number of cases (accounting for nearly 87 % of the total). MSD cases have an incidence of 229.5 cases per 100,000 insured persons. Among recognised MSD cases, periarticular disorders caused by certain gestures and postures are most common. Particular MSDs seem to affect workers in some specific economic sectors (e.g. CTS seems to particularly affect workers in sectors relating to wood, furniture, paper, cardboard, textiles, clothing, leather and skins, and stones; the food trade and related services; building and public works; and chemicals, rubber, plastics and metallurgy). The number of recognised MSD cases is greater in older age categories. By socio-professional category of employee, labourers suffered the most from MSDs, whereas intermediate professionals and managerial staff suffered the least.

Impact of MSDs

- With regard to the costs and other burdens related to MSDs, the available data on disability-adjusted life years (DALYs) show that the number of years of life lost and lived with disability resulting from work-related MSDs per 100,000 workers represents a lower percentage of the total number of years of life lost and lived with disability due to other reasons (cancer, circulatory problems, injuries, etc.) than the EU-28 average.
- National estimates of the costs resulting from lower back pain show that work-related lower back pain resulted in 12.2 million lost work days, or the loss of 57,000 full-time equivalent workers, in 2017. Estimates of the direct annual costs borne by companies through their contributions to occupational accident and disease insurance funds exceed EUR 1 billion. Meanwhile, indirect costs for businesses, although difficult to quantify, could be up to 10 times higher than the direct costs, according to the French National Research and Safety Institute for the Prevention of Occupational Accidents and Diseases (INRS).
- According to calculations made by the Primary Health Insurance Fund ('Caisse Primaire d'Assurance Maladie' in French) of the Pays de la Loire, the average costs of MSDs for companies range from EUR 12,780 for carpal tunnel-related MSDs to EUR 52,759 for rotator cuff tendonitis-related MSDs, not including the average sick leave for the affected worker.
- A lower percentage of French employees work in companies that support employees to return to work after long-term sickness than the EU-28 average.

- Available data show that a slightly lower percentage of people in France have reported a period off work as a result of a work-related health problem resulting in sick leave than the average level for the EU-28.

Risk factors for MSDs

- A large percentage of French employees are exposed to physical factors at work that may put them at risk of MSDs. More precisely, jobs involving working in standing positions and repetitive hand/arm movements are the main physical risks, followed by working with computers/laptops and working in sitting positions. A comparison with EU-level data shows that the two most prevalent physical risks (job involves standing, job involves repetitive hand/arm movements) are the same in France and the EU-28, although French employees seem to be more exposed to both of them than their EU counterparts. In addition, French employees are more exposed to the risks of working with computers/laptops, sitting positions and tiring/painful positions than their EU counterparts.
- National data show that staying standing for long periods of time is the most frequently encountered physical risk in France, followed by wearing or moving heavy loads and performing painful or tiring movements. Other, less common physical risks include staying in a painful or tiring position and long or frequent periods of walking, as well as being exposed to shocks or vibration. Of employees in metropolitan France, 34 % say that they suffer from at least three physical constraints at work (out of five mentioned, namely standing for long periods, long periods in painful positions, long or frequent periods of walking, having to lift or move heavy loads, and being exposed to shocks or vibration).
- By gender, men are more exposed than women to all the physical constraints and risks covered by the data. By socio-professional category, non-qualified and qualified labourers are the groups with the highest percentages of exposure. For instance, and referring to the most prevalent physical risk factor (staying for a long time in a painful or tiring position), men are more exposed than women; employees under 25 years of age and older workers are also particularly likely to be exposed to this risk. Meanwhile, more than half of labourers (57 %) have to stay for a long time in a painful or tiring position at work, followed by more than one-third of employees. In contrast, the least affected occupational groups are senior managers and those in intellectual professional occupations, together with intermediate professionals. According to employers, exposure to these physical risks is lower than the employees themselves report.
- Data from the French Medical Surveillance of Occupational Risk Exposures Survey (SUMER) on the numbers of workers exposed to different occupational risks show that the most frequently encountered occupational risk is postural and joint constraints, followed by standing or working upright in a fixed location, walking during work and manual load handling. In nearly all cases, the number of workers affected by each risk is higher among men than among women. Regarding age differences, exposure to risks generally decreases as age increases. Concerning socio-professional categories, there are significant differences among different groups in terms of exposure to different occupational risks. Finally, the construction sector is one of the sectors most affected by occupational risks.
- Organisational and psychosocial risk factors also play a role as potential triggers of MSDs. The most relevant of these factors among French employees are the pace of work being dependent on other people's demands, tight deadlines and overall fatigue; other relatively important risks include working at very high speed, the pace of work being under the direct control of the boss and, generally speaking, difficulties with sleep. A comparison with EU-level data shows that the relative importance of the different organisational and psychosocial risk factors is similar in France and in the EU-28, with the exception of the risk linked to overall fatigue (which is particularly relevant in France).

- Available national data show that the most common organisational and psychosocial risk factor is having to frequently leave one task for another more urgent task. Other important factors are always or often having to hurry and not being able to leave one's job. Data broken down by gender show that male employees are more exposed than female employees to most risks, with the only exceptions being having to frequently leave one task for another more urgent task and always or often having to hurry. There are significant differences in the risks to which occupational groups are exposed.
- Other data on psychosocial risk factors related to mental load, ethical conflicts and job insecurity show that having to think about too many things at once is the most frequently encountered such risk factor, followed by having to do excessive work, working under pressure or having to hide one's emotions. Female employees seem to be more exposed to these mental load, ethical conflict and job insecurity factors than male employees. By occupational group, managers seem to be particularly affected by three factors, which are having to think about too many things at once, working under pressure and having to do excessive work.
- There are a number of relevant studies carried out by Santé Publique France (formerly InVS, the Institute for Public Health Surveillance) relating to various physical and psychosocial risk factors leading to MSDs, the main results of which are presented in the report.

Prevention of MSDs

- Surveys of enterprises suggest that the percentage of French employees working in establishments where preventive measures regarding MSDs are in place is slightly below the EU-28 average (the only measure with respect to which France is slightly above the EU-28 average is provision of ergonomic equipment). A relatively low percentage of French employees work in establishments where training on various preventive activities is provided, particularly with regard to training on the proper use and adjustment of work equipment and on how to prevent psychosocial risks.
- National information on prevention activities carried out within enterprises show, among other results, that the probability that new prevention activities will be introduced increases as the size of the establishment grows, irrespective of the type of prevention activity in question.

1 Introduction

1.1 Background

This is the national musculoskeletal disorders (MSDs) facts and figures overview report for the France ⁽¹⁾. This national report is part of a much larger project, '**MSDs facts and figures overview: prevalence, costs and demographics of MSDs in Europe**', intended to support policy-makers at EU and national levels by providing an accurate picture of the prevalence and costs of MSDs across Europe, pulling together existing data from a number of relevant and reliable official statistical sources. This national report is considered complementary to the overview report covering the EU as a whole, *Work-related musculoskeletal disorders: prevalence, costs and demographics in the EU – Final report* ⁽²⁾.

The European Agency for Safety and Health at Work (EU-OSHA), aware of the limits of EU data sources related to MSDs, decided to complement and enrich EU-level findings with national data and analyses. This national report is not intended to provide a comprehensive and exhaustive national overview of MSDs. Rather, the main criteria followed in relation to gathering national data were to identify and focus on national MSD-related information that is either not available at EU level or complementary to existing data. Moreover, EU-OSHA considers that making the information/data identified at national level accessible to the European occupational safety and health (OSH) community and Member States (by publishing it in English) is also important. By sharing this national data at EU level, EU-OSHA aims to improve knowledge on the MSD topic among policy-makers, OSH professionals and national authorities in general.

This national report is structured into five chapters, including this introductory chapter, Chapter 1. Chapter 2 presents some data on the prevalence of MSDs among national workers, as well as information on MSD-related occupational diseases. Chapter 3 analyses the impact of MSDs, presenting information on health, work and employment outcomes (including information on costs linked to MSDs). Chapter 4 identifies several risk factors underpinning MSDs, including physical as well as organisational/psychosocial and sociodemographic risk factors. Chapter 5 provides some information related to activities carried out by enterprises/establishments intended to prevent MSDs within the workforce, including training and support activities to help workers returning to work. Finally, the report lists the main national data sources on MSDs along with (when possible) links through which this information can be accessed. All chapters follow the same structure: each chapter presents national data on MSDs based on EU-level data sources and these data are subsequently complemented with information from national data sources (if any). This has been done to ensure that all reports contain a minimum level of basic information, harmonised for all the Member States analysed.

The structure of this national report is the same as that of the general European overview report (mentioned above), and readers are invited to consult the information available in the equivalent chapter of the general European report for a more comprehensive overview of the issues addressed in this national report.

From a methodological perspective, the information presented in this report comes from national data sources based either on surveys or on administrative data related to the issue of MSDs. This national information has been complemented in some cases with information from European/international data sources to allow comparisons between national and EU-level results.

⁽¹⁾ Information about the occupational safety and health system in France is available at: https://oshwiki.eu/wiki/OSH_system_at_national_level_-_France

⁽²⁾ This report is available at: <https://osha.europa.eu/en/publications/msds-facts-and-figures-overview-prevalence-costs-and-demographics-msds-europe/view>

1.2 Causes and consequences of MSDs: a framework

1.2.1 Main sources of information on MSDs

MSDs refer to impairments of bodily structures such as muscles, joints, tendons, ligaments, nerves, cartilage, bones and the localised blood circulation system (EU-OSHA, 2002) ⁽³⁾. If MSDs are caused or aggravated primarily by work and by the effects of the immediate environment in which work is carried out, they are known as work-related MSDs.

The two main sources of information and data regarding MSDs are surveys based on self-reporting and administrative data.

In the case of self-reporting, people are asked whether or not they suffer from an MSD (either in general or a specific type of MSD). When assessing the prevalence of MSDs through surveys, it is customary to ask about the part of the body affected by health complaints and not about the clinical nature of the complaint.

Questions regarding the prevalence of MSDs are included in different surveys. The formulation of the questions used varies between surveys, and also between different waves of these surveys. These differences are likely to result in different outcomes.

Another important source of information is administrative data. Two examples of available administrative data are:

- data on the number (and proportion) of occupational diseases recognised to be due to diseases of the musculoskeletal system and connective tissue;
- data on declared work-related accidents.

Estimates of MSD prevalence based on self-reporting may include people with relatively mild health complaints as well as people with severe health complaints. Statistics based on administrative data are likely to include only people with more severe health complaints (severe enough to result in the complaint being recognised as an occupational disease).

1.2.2 A multidimensional model of MSDs

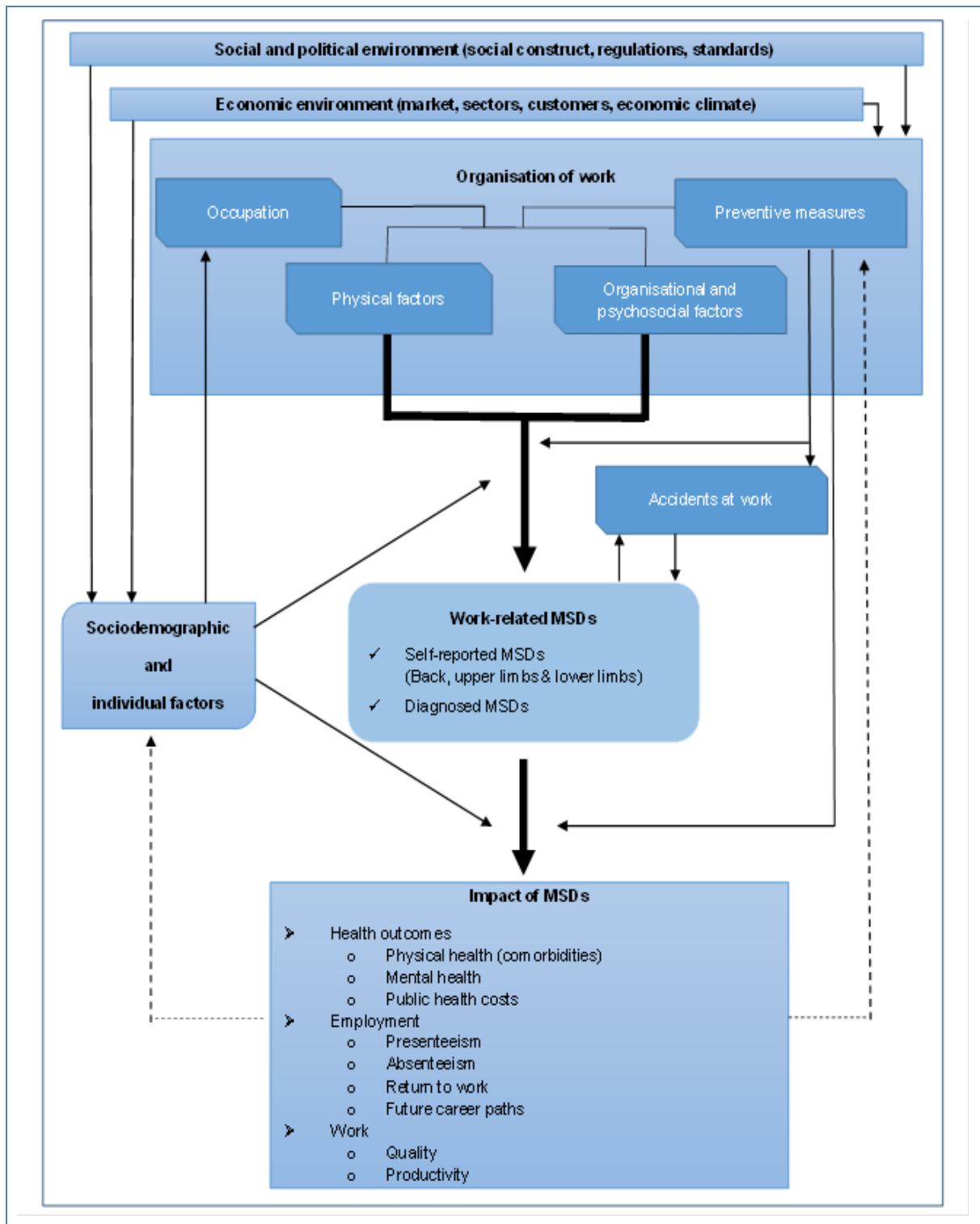
MSDs can be caused by many different (combinations of) factors and may have many different consequences. Figure 1 shows the main causes and consequences of MSDs that have been identified in previous studies.

The objective of this national report is to present additional country-specific information regarding the following aspects of the framework depicted in Figure 1:

- the prevalence of MSDs;
- the impact of MSDs;
- risk factors for MSDs;
- the prevention of MSDs.

⁽³⁾ EU-OSHA — European Agency for Safety and Health at Work, 'Introduction to work-related musculoskeletal disorders', *Facts 71*, 2002. Available at: https://osha.europa.eu/sites/default/files/publications/documents/en/publications/factsheets/71/Factsheet_71_-_Introduction_to_work-related_musculoskeletal_disorders.pdf

Figure 1: Theoretical framework of work-related MSDs



Note: Theoretical framework developed by Panteia, vhp performance and IKEI.

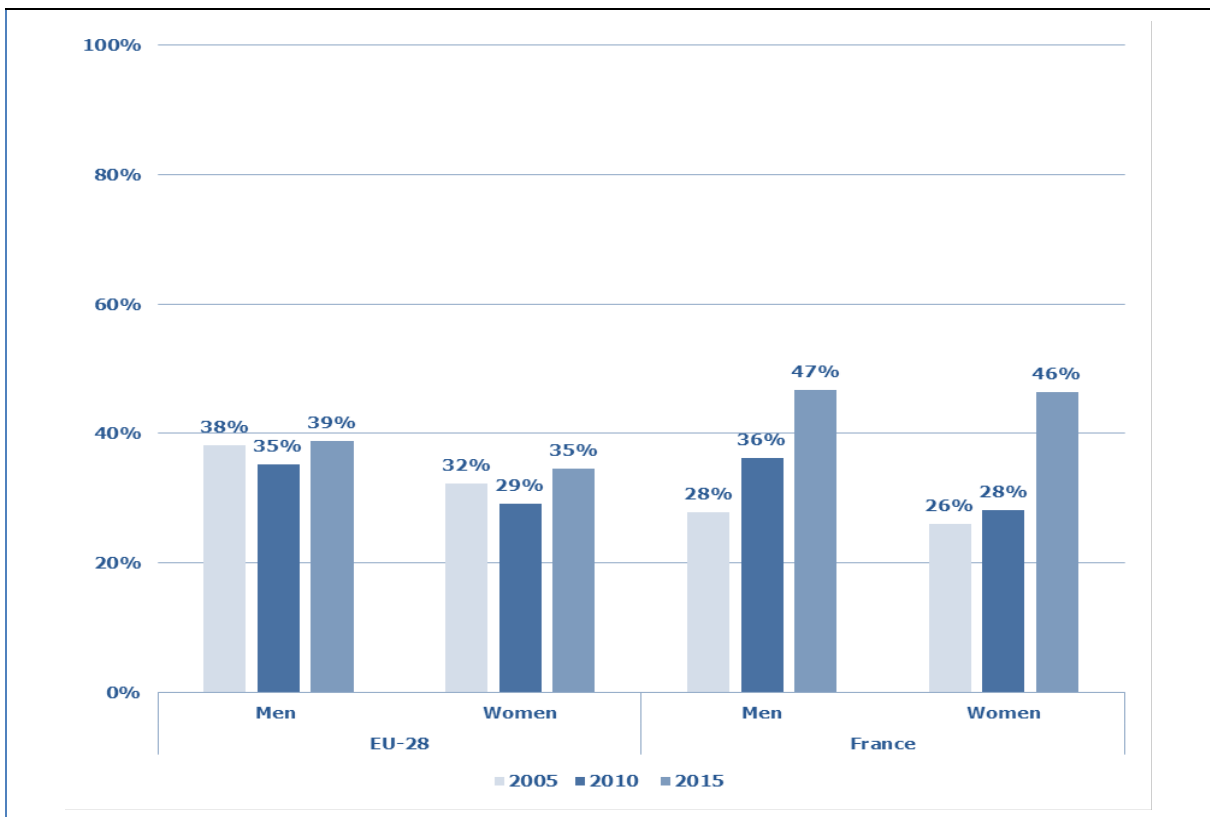
2 Prevalence of MSDs

2.1 Self-reported MSDs

In this chapter, an overview of the prevalence of MSDs in France and in comparison with the EU-28 is presented.

First, Figure 2 illustrates the percentages of workers, by gender, in France who report that their work affects their health. Around 47 % of men and 46 % of women report that their work affects their health (data for 2015); both percentages are higher than the corresponding EU-28 averages (39 % and 35 %, respectively).

Figure 2: Percentages of workers who reported that their work affects their health in the EU-28 and in France, by gender, in 2005, 2010 and 2015



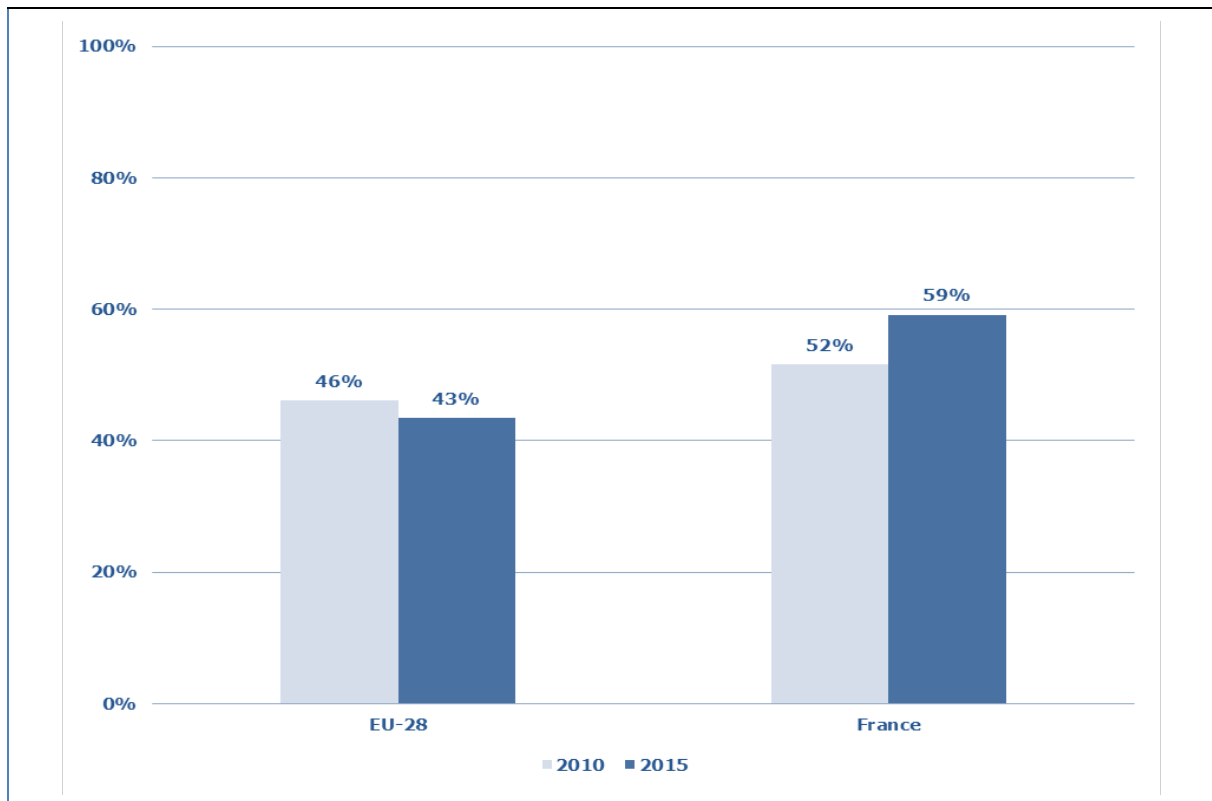
Source: Panteia, based on data from the 2005, 2010 and 2015 waves of the European Working Conditions Survey (EWCS) ⁽⁴⁾

The main focus is on three specific categories of MSDs, namely back pain, muscular pain in the upper limbs and muscular pain in the lower limbs.

⁽⁴⁾ Eurofound (European Foundation for the Improvement of Living and Working Conditions), EWCS. Information about the survey is available at: <https://www.eurofound.europa.eu/surveys/european-working-conditions-surveys>

Figure 3 shows the percentages of workers who reported back pain in the past 12 months in the EU-28 and in France. According to the available information, back pain is more prevalent in France than in the EU-28, which is confirmed by the last two waves of the European Working Conditions Survey (EWCS 2010 and 2015). In 2015, 59 % of French workers reported back pain in the past 12 months, whereas this percentage was 43 % in the EU-28.

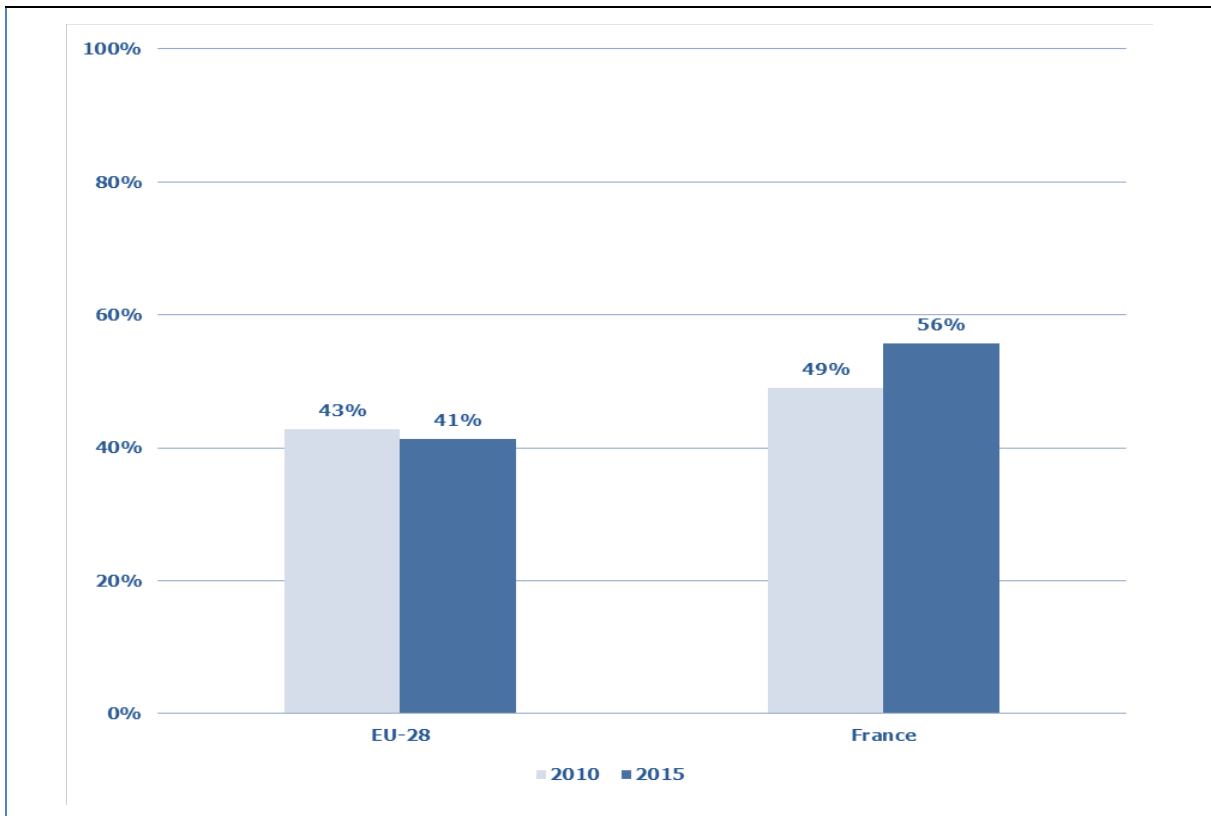
Figure 3: Percentages of workers who reported back pain in the past 12 months in the EU-28 and France, in 2010 and 2015



Source: Panteia, based on data from the 2010 and 2015 waves of the EWCS

Figure 4 illustrates the percentages of workers who reported muscular pain in the shoulders, neck and/or upper limbs in the past 12 months in the EU-28 and in France. According to the available data, the percentage of French workers reporting this type of muscular pain was 56 % in 2015, considerably higher than the figure for the EU-28 (41 %).

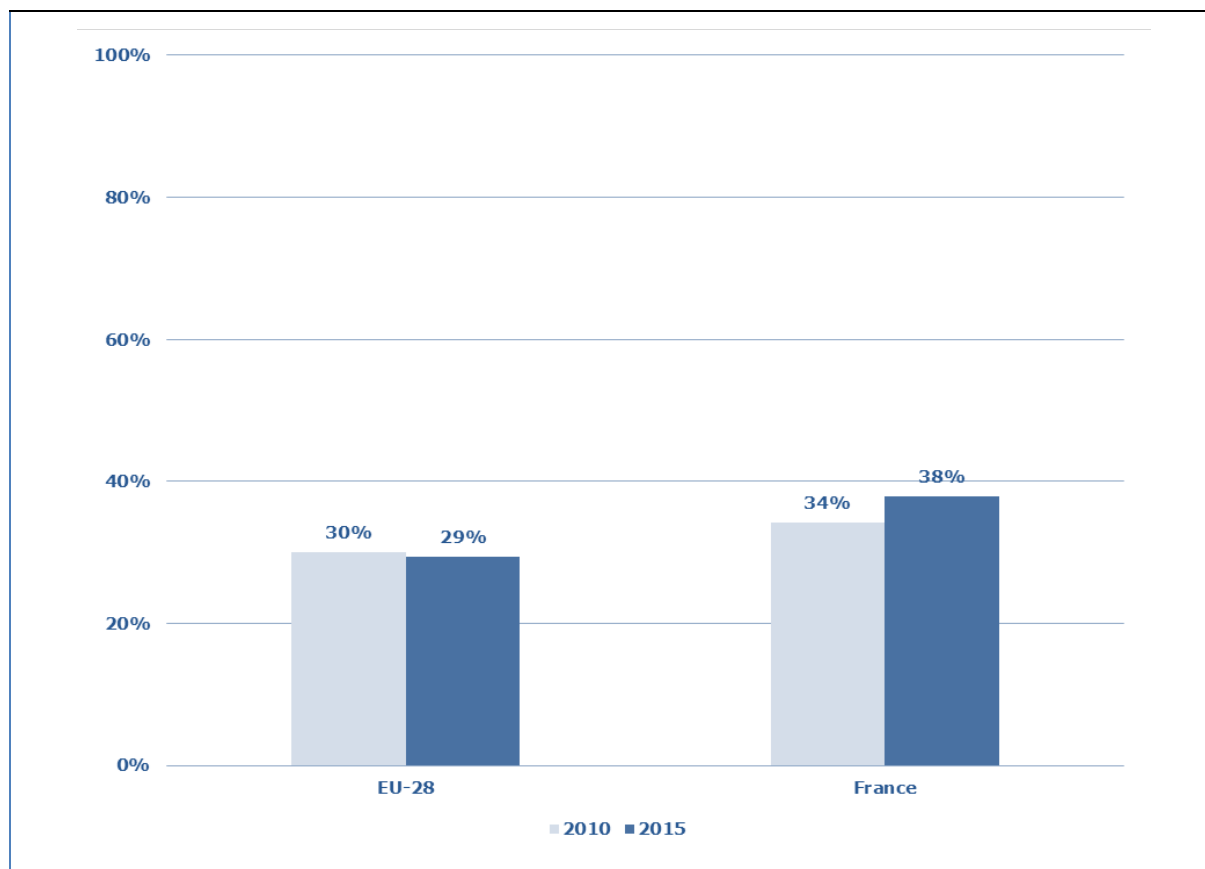
Figure 4: Percentages of workers who reported muscular pain in the shoulders, neck and/or upper limbs in the past 12 months in the EU-28 and France, in 2010 and 2015



Source: Panteia, based on data from the 2010 and 2015 waves of the EWCS

Finally, Figure 5 presents the percentages of workers who reported muscular pain in the lower limbs in the past 12 months in the EU-28 and in France. The available data show that the percentage of French workers reporting being affected by this muscular pain was 38 % in 2015, higher than the figure for the EU-28 (29 %).

Figure 5: Percentages of workers who reported muscular pains in the lower limbs in the past 12 months in the EU-28 and in France, in 2010 and 2015



Source: Panteia, based on data from the 2010 and 2015 waves of the EWCS

2.2 MSD-related occupational diseases

The 2016 Annual Report of the Primary Health Insurance Fund (“Caisse Nationale de l’Assurance Maladie” in French) on occupational risks ⁽⁵⁾ provides data on recognised occupational diseases and incidence (cases per 100,000 insured persons). Of the 48,762 recognised cases in total, 42,535 were MSDs (see Table 1). MSDs have an incidence of 229.5 cases per 100,000 insured persons. Of the recognised cases, 38,740 were periarticular disorders caused by certain gestures and postures; 3,183 were lumbar spine diseases; 485 were chronic lesions of the meniscus; and 127 were MSDs caused by shocks or vibration. In addition, other occupational diseases with a considerable number of recognised cases were cancers (1,775 cases) and pleural plaques (1,693 cases).

⁽⁵⁾ Caisse nationale de l’Assurance Maladie des Travailleurs Salariés, *Rapport annuel 2016: L’Assurance Maladie — Risques professionnels (2016 Annual Report: Health insurance — Occupational risks)*. Available at: https://www.ameli.fr/sites/default/files/ra-risques-professionnels-2016_assurance-maladie.pdf

Table 1: Recognised occupational diseases and incidence (cases per 100,000 insured persons), 2016

Occupational disease	Recognised cases	Incidence
MSDs	42,535	229.5
- Periarticular disorders caused by certain gestures and postures	38,740	209.1
- Chronic lesions of the meniscus	485	2.6
- MSDs caused by shocks and vibrations	127	0.7
- Lumbar spine diseases	3,183	17.2
Cancers	1,775	9.6
Hearing loss	704	3.8
Eczematiform lesions of allergic mechanism	235	1.3
Rhinitis and occupational asthma	191	1.0
Diseases related to infectious or parasitic agents (in hospitals)	129	0.7
Pleural plaques	1,693	9.1
Asbestosis	243	1.3
Other	1,257	6.8
Total	48,762	263.2

Source: Caisse nationale de l'Assurance Maladie des Travailleurs Salariés, *Rapport annuel 2016: L'Assurance Maladie — Risques professionnels (2016 Annual Report: Health insurance — Occupational risks)*. Available at: https://www.ameli.fr/sites/default/files/ra-risques-professionnels-2016_assurance-maladie.pdf

The same source includes data on the incidence of MSDs recognised as occupational diseases per 100,000 insured persons, by economic sector (see Table 2). One of the most frequently occurring syndromes is carpal tunnel syndrome (CTS; hand/wrist problems), with a total incidence of 71.7 cases per 100,000 insured persons. More precisely, it has a high incidence in some specific sectors, affecting particularly workers in sectors relating to wood, furniture, paper, cardboard, textiles, clothing, leather and skins, and stones; the food trade and related services; building and public works; and chemicals, rubber, plastics and metallurgy). Other frequently occurring syndromes are epicondylitis (elbow problems), with a total incidence of 39.8 (affecting particularly workers in chemicals, rubber, plastics and metallurgy, and in sectors relating to wood, furniture, paper, cardboard, textiles, clothing, leather and skins, and stones); and rotator cuff partial rupture (shoulder problems), with a total incidence of 34.4 (affecting particularly workers in building and public works, and in sectors relating to wood, furniture, paper, cardboard, textiles, clothing, leather and skins, and stones).

Table 2: Incidence of MSDs recognised as occupational diseases per 100,000 insured persons, by economic sector, 2016

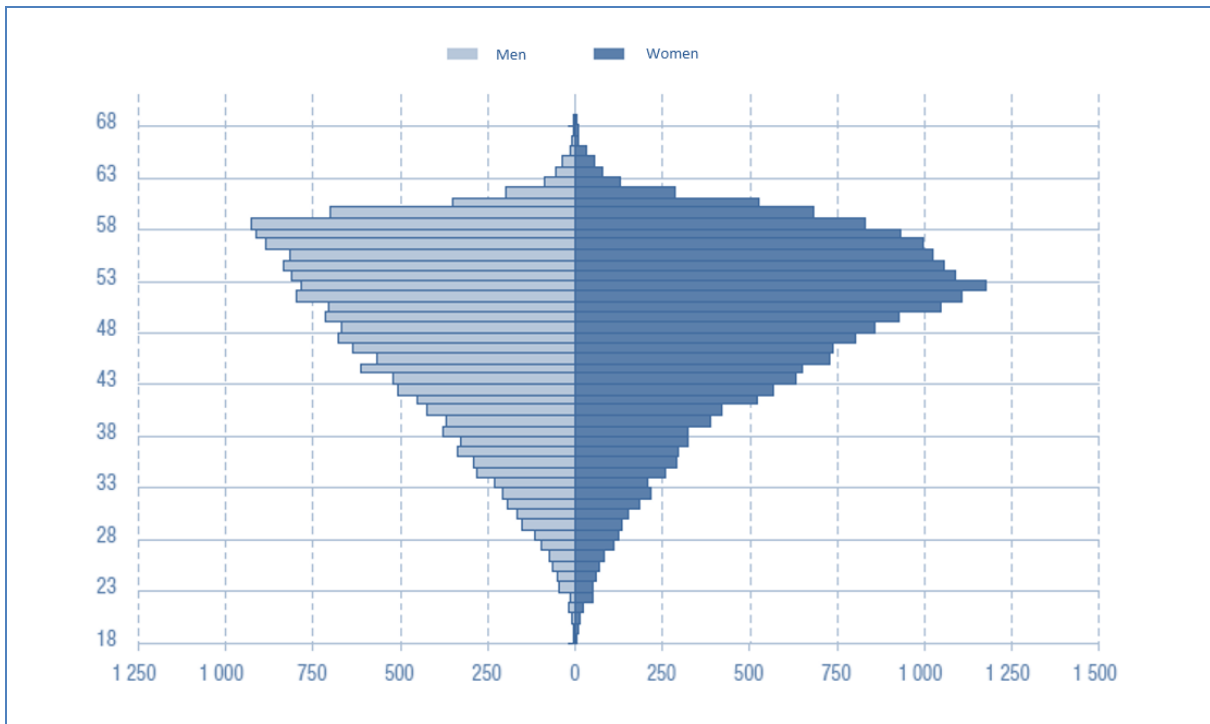
Part of the body	Syndrome	Sectors									
		1	2	3	4	5	6	7	8	9	10
Elbow	Entrapment neuropathy of the ulnar nerve in the epitrochlear olecranon fossa	7.2	8.6	3.3	8.4	8.5	10.5	1.6	0.6	2.8	4.3
	Arthrosis	0.5	1.6	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2
	Acute hygroma	0.2	0.3	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
	Chronic hygroma	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Epitrochleitis	11.0	8.3	4.0	11.4	10.7	14.0	3.5	0.8	4.6	5.8
	Epicondylitis	71.9	67.4	24.5	71.1	74.4	106.4	18.3	6.5	34.6	39.8
Hand, wrist, finger	Angioneurotic conditions of the hand	0.1	0.1	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.1
	Osteonecrosis of the lunate (Kienböck's disease)	0.7	1.4	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.2
	Osteonecrosis of the scaphoid bone (Köhler disease)	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ulnar-palmar vascular disorder	0.6	0.5	0.0	0.1	0.0	1.0	0.0	0.0	0.0	0.2
	Carpal tunnel syndrome	85.0	90.5	36.5	141.4	89.4	173.5	33.4	13.1	81.3	71.7
	Guyon's canal syndrome	0.4	0.7	0.2	0.4	0.7	1.0	0.0	0.0	0.1	0.3
	Tenosynovitis	11.9	7.4	3.7	18.4	14.6	25.2	3.9	2.2	10.4	8.8
	Tendonitis	9.4	4.8	3.4	16.3	9.2	21.4	2.3	1.4	6.9	6.6
Shoulder	Stiff shoulder	0.6	1.0	0.3	0.5	0.0	1.7	0.2	0.1	0.2	0.5
	Painful shoulder	4.3	3.3	0.9	3.3	2.2	5.2	0.9	0.2	1.3	1.9
	Rotator cuff tendinopathy	43.0	50.6	21.8	59.9	58.1	89.0	14.6	5.1	32.0	33.1
	Rotator cuff partial rupture	49.6	74.7	20.9	48.9	50.8	89.5	15.2	5.1	27.3	34.4
Spine	Sciatica by disc hernia	13.7	41.2	14.3	12.0	13.4	31.7	6.8	0.7	6.1	14.2
	Crural radiculalgia by disc hernia	3.0	8.9	2.9	2.3	3.6	6.5	1.5	0.2	1.4	3.0
Knee	External popliteal sciatic nerve compression syndrome	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Chronic lesions of the meniscus	3.2	19.4	0.9	0.8	0.2	3.2	1.0	0.2	0.5	2.6
	Acute hygroma	0.5	7.2	0.1	0.0	0.0	0.2	0.1	0.0	0.0	0.7
	Chronic hygroma	0.2	6.9	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.6
	Subquadricepsal or rotulian tendonitis	0.1	1.3	0.1	0.1	0.0	0.2	0.0	0.0	0.0	0.2
	Crow's foot tendonitis	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Foot, ankle	Achilles tendonitis	0.1	1.5	0.4	0.4	0.2	0.5	0.2	0.1	0.2	0.3
More than one		0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL		317.5	408.4	138.4	396.1	336.1	582.3	104.2	36.2	210.0	229.5

Note: 1, metallurgy; 2, building and public works; 3, transportation, water, gas, electricity; 4, the food trade and other services; 5, chemicals, rubber, plastics; 6, sectors relating to wood, furniture, paper, cardboard, textiles, clothing, leather and skins, and stones; 7, non-food services; 8, service activities 1 (banks, insurance, administration); 9, service activities 2 (temporary work, social care, health, cleaning); 10, averages for all nine sectors plus special categories (non-classifiable companies)

Source: Caisse nationale de l'Assurance Maladie des Travailleurs Salariés, *Rapport annuel 2016: L'Assurance Maladie — Risques professionnels (2016 Annual Report: Health insurance — Occupational risks)*. Available at: https://www.ameli.fr/sites/default/files/ra-risques-professionnels-2016_assurance-maladie.pdf

The 2016 Annual Report of the Assurance Maladie on occupational risks provides information on differences between genders and age groups with regard to MSDs. Figure 6 shows the numbers of new recognised MSD-related occupational diseases in 2016. The data show that these new recognised MSD-related occupational diseases are more prevalent among women and older workers than among men and younger workers. In women, new recognised MSD cases are particularly concentrated in 48-58 year olds (women of around 53 years of age have more recognised MSD cases than men). Among men, the number of cases increases more gradually with age, and the greatest number of cases are in 56-58 year olds.

Figure 6: Distribution of new recognised MSD-related occupational diseases by gender and age, 2016



Source: Caisse nationale de l'Assurance Maladie des Travailleurs Salariés, *Rapport annuel 2016: L'Assurance Maladie — Risques professionnels (2016 Annual Report: Health insurance — Occupational risks)* (p 120). Available at: https://www.ameli.fr/sites/default/files/ra-risques-professionnels-2016_assurance-maladie.pdf

In addition, the ANSES activity report 2016 ⁽⁶⁾ (ANSES is the French agency for food, environmental and occupational health and safety) provides data on the number of new recognised occupational diseases related to the osteoarticular system, muscles and connective tissue (M00-M99 in the 10th International Classification of Diseases (ICD-10)) and new recognised cases of CTS (G56 in ICD-10), based on various sources. France's 31 occupational disease clinics recognised 3,469 new occupational health problems falling into these ICD-10 categories, whereas the country's eight occupational health services recognised a total of 349 new such cases (data for 2016; see Table 3).

⁽⁶⁾ ANSES (Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail), *Rapport d'activité*, 2016. Available at: <https://www.anses.fr/fr/system/files/RNV3P-RA-2016.pdf>

Table 3: Number of new occupational health problems related to the osteoarticular system, muscles and connective tissue (M00-M99) plus new occupational CTS cases (G56) and the percentage they represent of the total number of new recognised occupational diseases, according to various sources, 2016

	Number	%
In 31 occupational disease clinics	3,469	18.5
In 8 occupational health services	349	46.3

Source: ANSES (Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail), *Rapport d'activité 2016 (Activity report 2016)*. Available at: <https://www.anses.fr/fr/system/files/RNV3P-RA-2016.pdf>

The data set out above can be complemented with data on recognised occupational diseases from 2012⁽⁷⁾. According to this information (see Table 4), the number of recognised MSD-related occupational diseases was higher among women than among men (26,262 cases in women, in comparison with 22,312 cases in men). By age, the largest proportion of MSD cases affected workers between 50 and 59 years of age (21,348), followed by those aged between 40 and 49 (16,769). Differentiating by socio-professional category of employees, labourers suffered 31,954 cases of MSDs and employees 11,446. The two other categories were much less affected: there were 1,052 recognised MSD cases among intermediate professionals and 813 among managerial staff.

Table 4: Number of MSDs related occupational diseases recognised in 2012 by gender, age and socio-professional category of workers

	Number
Gender	
Men	22,312
Women	26,262
Age	
15-19	41
20-29	1,924
30-39	7,197
40-49	16,769
50-59	21,348
60 years and more	1,295
Socio-professional category of affected employees	
Managerial staff	813
Intermediate professions	1,052
Employees	11,446
Labourers, workers	31,954
All employees of the general scheme	45,265

(*) All workers in the national general and agricultural insurance scheme

(**) Since the socio-professional category is not included in the agricultural scheme data, the distribution of diseases by socio-professional category is available only for employees in the general insurance scheme. This figure sums up 45,265.

Source: DARES, Chiffres clés sur les conditions de travail et la santé au travail 2016 (Key Figures on the Working and Health Conditions 2016), Number 22, November 2016. Available at: https://dares.travail-emploi.gouv.fr/IMG/pdf/synthese_stat_chiffres_cles_cond_travail.pdf

(7) DARES, Chiffres clés sur les conditions de travail et la santé au travail 2016 (Key Figures on the Working and Health Conditions 2016), Number 22, November 2016. Available at: https://dares.travail-emploi.gouv.fr/IMG/pdf/synthese_stat_chiffres_cles_cond_travail.pdf

Looking at additional national sources, there is also interesting information available from Santé Publique France (formerly InVS, the Institute for Public Health Surveillance) ⁽⁸⁾, in the form of a study based on the surveillance of the main MSDs in the upper limbs and back among employees in companies, implemented through the participation of voluntary occupational physicians in the surveillance network in the Pays de la Loire. Employee monitoring made it possible, through a network of 83 voluntary occupational physicians, to study the prevalence rate of the six main MSDs in the upper limbs (rotator cuff tendinopathy, lateral epicondylitis, flexor tendinopathies or finger extensors, De Quervain's tenosynovitis, CTS and ulnar nerve compression syndrome at the elbow) in a sample of 3,710 subjects randomly selected between 2002 and 2005 among employees aged 20 to 59 years. The MSD diagnoses were made by the occupational physicians during periodic medical examinations. The results of this study are presented in Table 5.

The prevalence of the three most common MSDs analysed (rotator cuff syndrome (RCS), lateral epicondylitis and CTS) is higher among women than among men. Moreover, prevalence increases as age increases. RCS has the highest prevalence figures. In workers aged 50 to 59 years, the prevalence of RCS is 14.30 among women and 10.50 among men (in those aged 20 to 29 years, the prevalence is 2.90 for women and 1.70 for men). Concerning socio-professional categories, RCS has a higher prevalence among skilled workers and unskilled workers; lateral epicondylitis has a higher prevalence among female managers and unskilled workers, and among male administrative employees and skilled workers; and, finally, CTS has a higher prevalence among female skilled workers and unskilled workers, and among male administrative employees and unskilled workers.

Table 5: MSD prevalence rates (%) by age group and sex (information for the 2002-2005 cohort), 2015

Characteristic	RCS		Lateral epicondylitis		CTS	
	Women	Men	Women	Men	Women	Men
Age						
20 to 29 years old	2.90	1.70	0.60	0.50	1.00	0.80
30 to 39 years old	4.90	4.70	1.80	1.20	3.50	2.50
40 to 49 years old	11.70	9.40	2.90	3.40	4.80	2.40
50 to 59 years old	14.30	10.50	5.50	5.40	6.00	3.90
Socio-professional category						
Managers, those in intellectual professions	3.60	4.40	4.30	1.00	6.50	0.60
Intermediate professionals	5.10	4.30	3.70	1.60	2.50	2.30
Administrative employees	6.10	3.60	1.00	3.00	4.00	3.20
Trade and service employees	10.80	3.90	2.10	1.70	1.40	0.00
Skilled workers	14.00	8.50	2.50	3.00	7.30	2.50
Unskilled workers	11.80	6.70	4.10	2.30	6.70	2.80

Source: Santé Publique France, 'Programme de surveillance épidémiologique des TMS dans les Pays de la Loire (Lombalgies et TMS du membre supérieur)' ('Epidemiological surveillance programme for MSDs in the Pays de la Loire (lumbago and upper limb disorders)'). Available at: <https://www.santepubliquefrance.fr/maladies-et-traumatismes/maladies-liees-au-travail/troubles-musculo-squelettiques/notre-action>

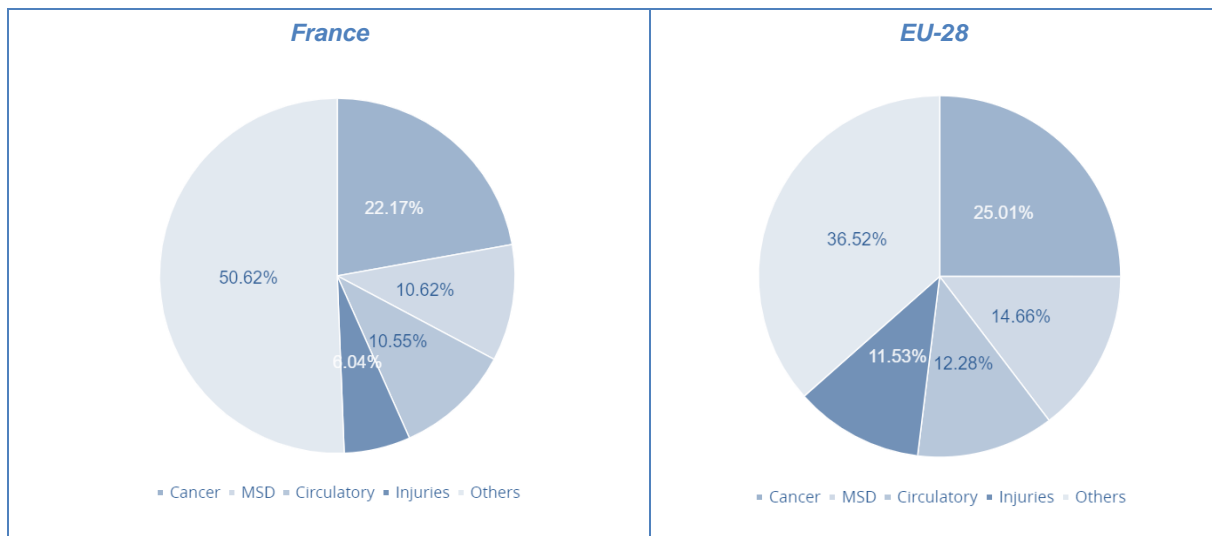
⁽⁸⁾ Santé Publique France, 'Programme de surveillance épidémiologique des TMS dans les Pays de la Loire (Lombalgies et TMS du membre supérieur)' ('Epidemiological surveillance programme for MSDs in the Pays de la Loire (lumbago and upper limb disorders)'). Available at: <https://www.santepubliquefrance.fr/maladies-et-traumatismes/maladies-liees-au-travail/troubles-musculo-squelettiques/notre-action>

3 Impact of MSDs

3.1 Health outcomes

With regard to costs and burdens related to MSDs, the available data⁽⁹⁾ on DALY rates⁽¹⁰⁾ show that the number of years of life lost and lived with disability resulting from work-related MSDs represent 10.62 % of the total number of years of life lost and lived with disability due to other reasons (cancer, circulatory problems, injuries, etc.), which is slightly lower than the EU-28 average (14.66 %) (see Figure 7).

Figure 7: Distribution of years of life lost and lived with disability (DALYs) per 100,000 workers, by main work-related illnesses, in France and EU 28, 2017



Source: Panteia based on EU-OSHA, data visualisation, 'The economics of occupational safety and health', 2017. Available at: <https://visualisation.osha.europa.eu/osh-costs#!/eu-analysis-illness>

In addition, national sources of information provide some estimates of the costs of MSDs in France. Specifically referring to lower back pain, national data⁽¹¹⁾ show the following:

- One in five instances of lower back pain causes sick leave, but in 50 % of cases the duration of the sick leave is less than 2 weeks. Meanwhile, 7 out of every 100 people still have pain after 12 weeks.
- Lower back pain accounts for 30 % of sick leave over 6 months. The duration of sick leave for lower back pain resulting from an accident at work is 2 months on average; the duration of sick leave for lower back pain caused by a recognised occupational disease is 1 year.
- From a personal perspective, chronic lower back pain results in a loss of confidence and may cause psychological or social problems for the affected individual. Partly as a result, lower back pain is the main cause of incapacity before the age of 45 and the third leading cause of disability in France.

⁽⁹⁾ EU-OSHA, data visualisation, 'The economics of occupational safety and health', 2017. Available at: <https://visualisation.osha.europa.eu/osh-costs#!/eu-analysis-illness>

⁽¹⁰⁾ A DALY is the sum of years of life lost (YLL) because of work-related death and years of life lived with disability (YLD) due to work-related injury and illness. DALY rate refers to DALYs per 100,000 workers.

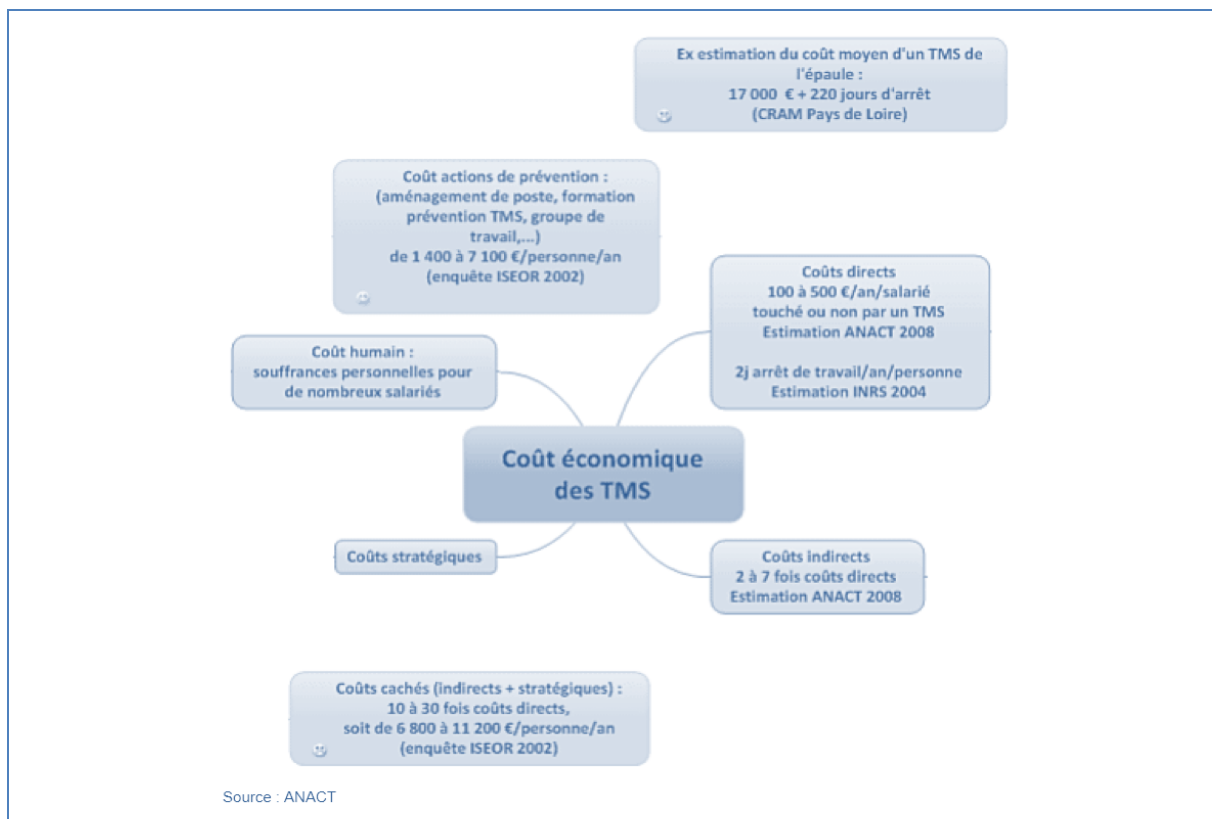
⁽¹¹⁾ Information obtained from Assurance Maladie, Campagne de Prévention du Mal de Dos au Travail, Dossier de Presse Novembre 2019 (see https://www.ameli.fr/fileadmin/user_upload/documents/DP_Lombalgie-06112018.pdf)

- From a broader perspective, work-related lower back pain resulted in 12.2 million lost work days, or the loss of 57,000 full-time equivalent workers (data for 2017). Estimates of the direct annual costs borne by companies through their contributions to occupational accident and disease insurance funds exceed EUR 1 billion. More than half of this cost (EUR 580 millions) is accounted for by sick leave compensation. Meanwhile, indirect costs for businesses — including disruptions to working teams, reduced productivity, production delays, etc. — although difficult to quantify, could be up to 10 times higher than the direct costs according to the French National Research and Safety Institute for the Prevention of Occupational Accidents and Diseases (INRS) ⁽¹²⁾.

Furthermore, according to calculations made by the Caisse primaire d'assurance maladie (CPAM) of the Pays de la Loire:

- The average cost of a back-related MSD for the company is EUR 17,000, not including the average 220-day sick leave for the affected worker.
- The average cost of a carpal tunnel-related MSD for the company is EUR 12,780, not including the average 151-day sick leave for the affected worker.
- The average cost of a rotator cuff tendonitis-related MSD is EUR 52,759, not including the average 298-day sick leave for the affected worker.
- The average cost of an epicondylitis-related MSD for the company is EUR 18,220, not including the average 195-day sick leave for the affected worker.

Figure 8: Estimated costs of MSDs, 2012



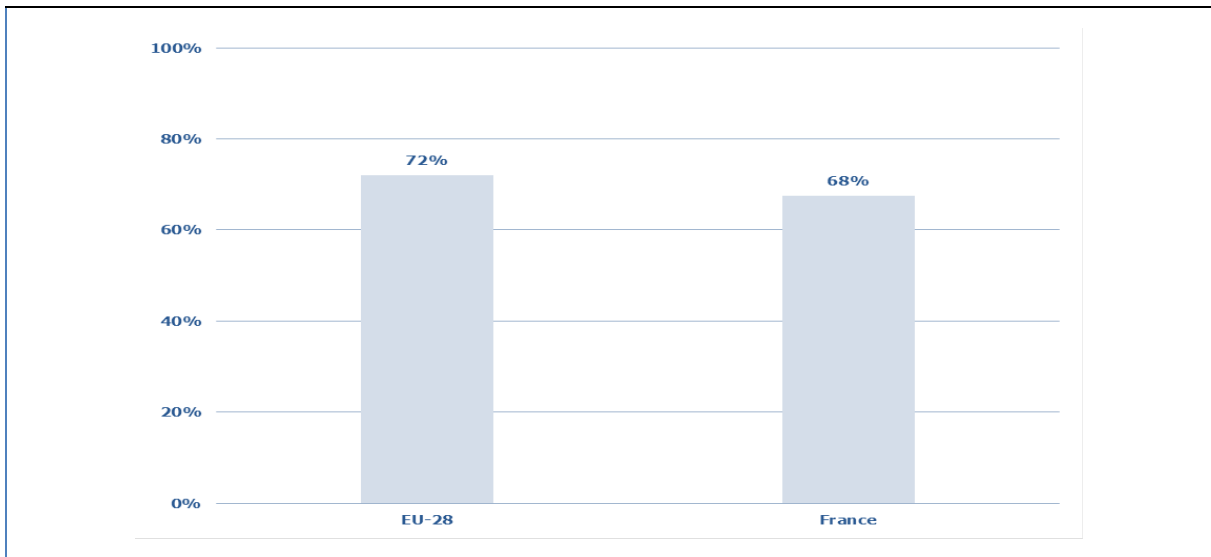
Source: <https://www.back-office-sante.com/category/troubles-musculo-squelettiques/article/exemple-de-cout-des-tms>

⁽¹²⁾ See <http://www.inrs.fr/risques/lombalgies/statistique.html>

3.2 Employment and work outcomes

In France, 68 % of employees work in companies that support employees to return to work after long-term sickness. This percentage is higher in the EU-28 (72 %) (data from ESENER 2 ⁽¹³⁾ for 2014; see Figure 9).

Figure 9: Percentages employees working in establishments with support measures for employees returning to work after long-term sickness in the EU 28 and France, 2014



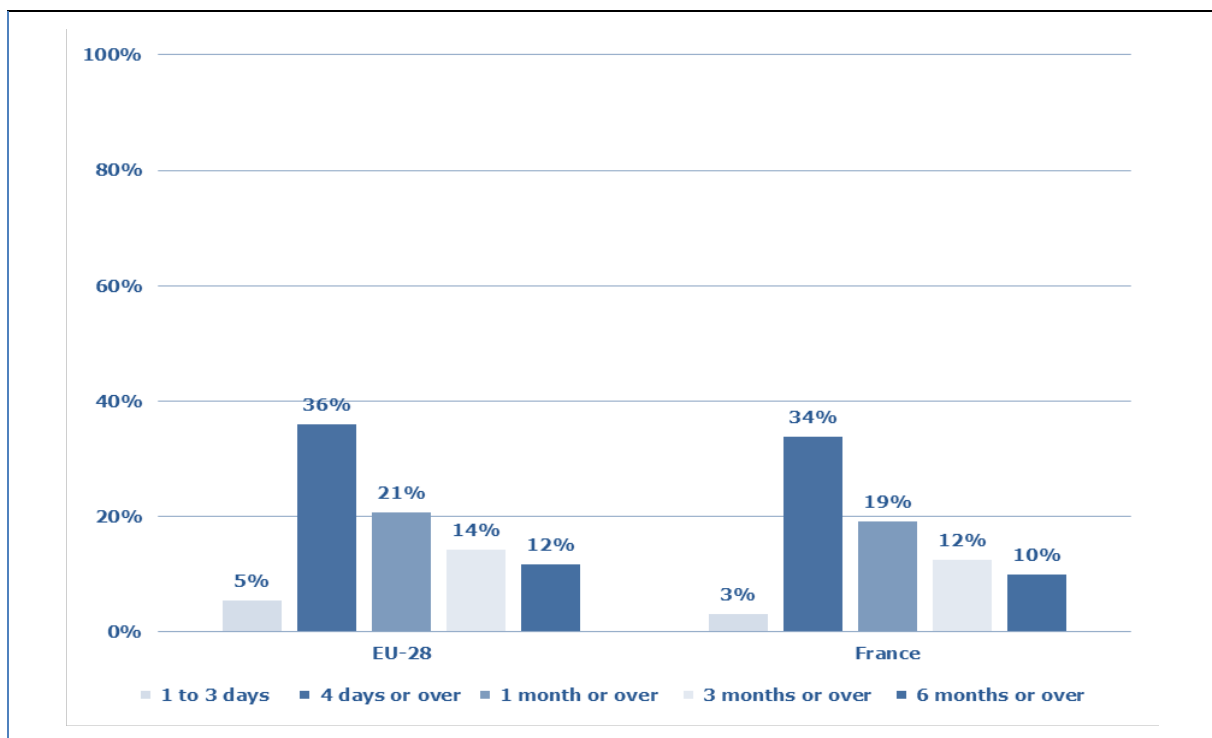
Note: Data are weighted with the employee-proportional weighting factor. This weighting factor controls for the disproportional nature of the national samples, is scaled to the number of employees instead of the number of establishments in the universe, and allows for international analysis. ESENER covers employees in enterprises employing five or more workers.

Source: Panteia based on ESENER 2 data

⁽¹³⁾ EU-OSHA, Second European Survey of Enterprises on New and Emerging Risks (ESENER 2). Information about the survey is available at: <https://osha.europa.eu/en/facts-and-figures/esener>

Figure 10 is based on publicly available data from the Labour Force Survey (LFS) ⁽¹⁴⁾ ad hoc modules. It shows the percentages of people who reported a work-related health problem resulting in sick leave characterised by various periods off work, in the EU-28 and in France in 2013. Available data show a higher percentage of people reporting a relatively long period off work as a result of a work-related health problem resulting in sick leave. Thus, up to 34 % of French workers had a period of 4 days or more off work, in comparison with 36 % of workers in the EU-28. Furthermore, 10 % of French employees reporting a work-related health problem resulting in sick leave had a period off work of 6 months or over, in comparison with 12 % in the EU-28.

Figure 10: Percentages of people reporting a work-related health problem resulting in sick leave by period off work, in the EU-28 and France, 2013



Source: Panteia, based on LFS ad hoc module (Eurostat)

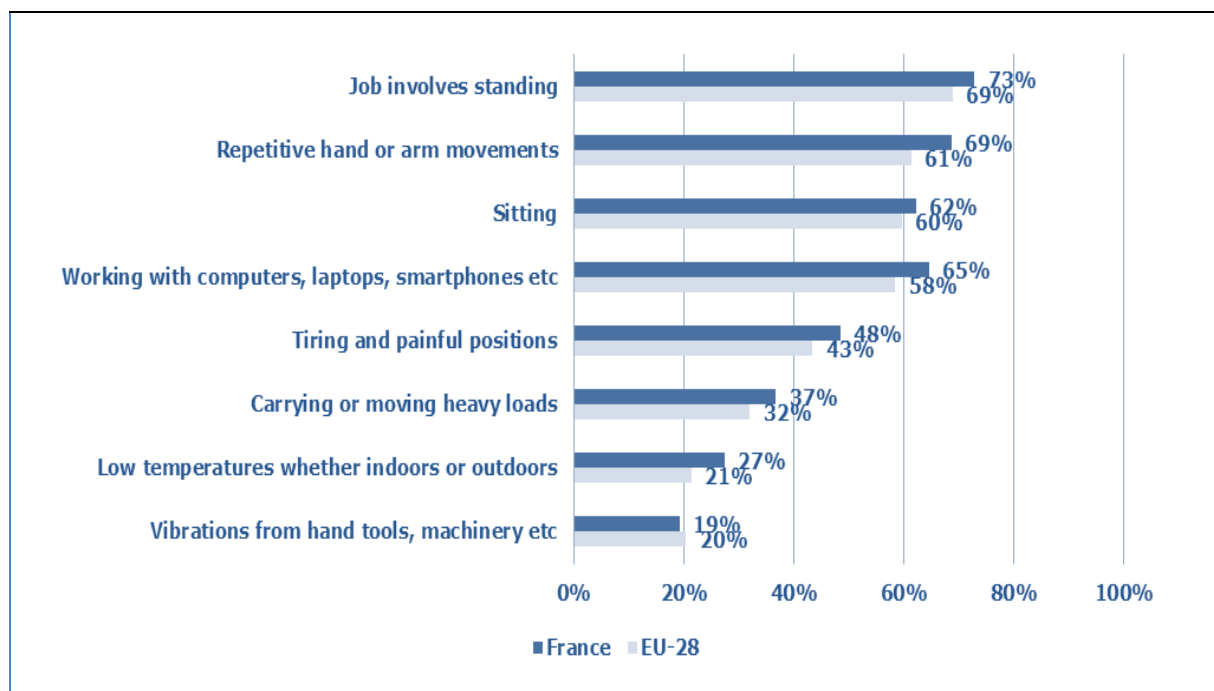
⁽¹⁴⁾ Eurostat, European Union LFS ad hoc module on accidents at work and other work-related health problems. Information about the survey is available at: <https://ec.europa.eu/eurostat/web/microdata/european-union-labour-force-survey>

4 Risk factors for MSDs

4.1 Physical factors at work

A large percentage of French employees are exposed to physical factors at work that may put them at risk of MSDs. More precisely, 73 % and 69 % of employees work in establishments where jobs involve standing and repetitive hand/arm movements, respectively. Meanwhile, between 65 % and 62 % work in establishments where employees work with computers/laptops and work in sitting positions, respectively. Other physical risks, such as working in tiring/painful positions, affect approximately half of employees (48 %), whereas other physical factors such as carrying/moving heavy loads, low temperatures and vibrations are less prevalent.

Figure 11: Percentages of employees working in establishments where there are certain physical risk factors in France and the EU-28, 2015 (2010 for standing)



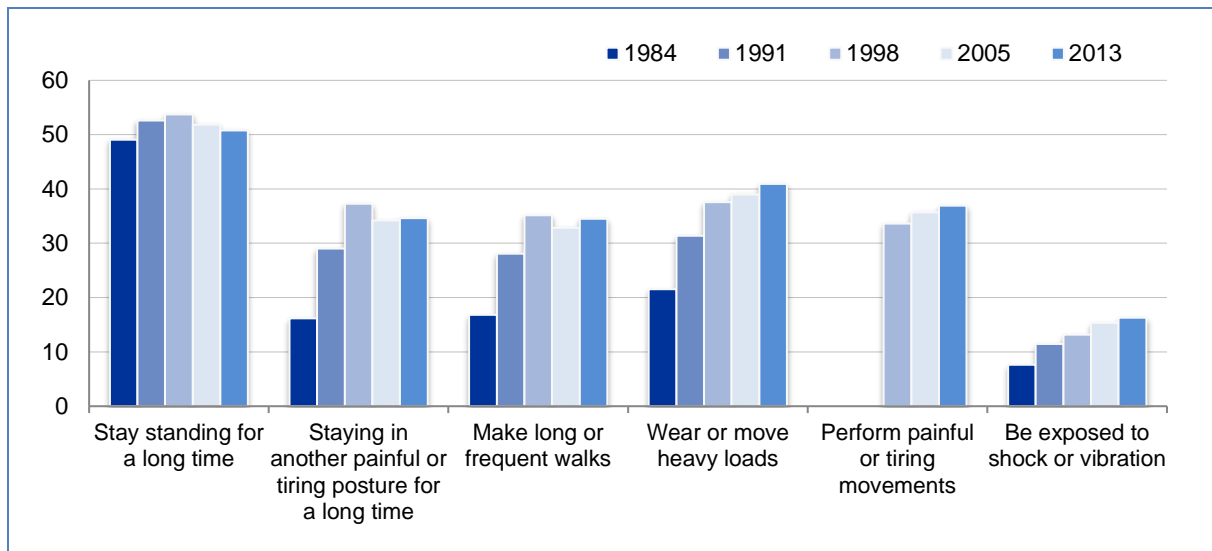
Note: Data are weighted with the employee-proportional weighting factor. This weighting factor controls for the disproportional nature of the national samples, is scaled to the number of employees instead of the number of establishments in the universe, and allows for international analysis. ESENER covers employees in enterprises employing five or more workers.

Source: Panteia based on ESENER 2 data

A comparison with EU-level data shows that the two most prevalent physical risks (job involves standing, job involves repetitive hand/arm movements) are the same in France and the EU-28, although French employees seem to be more exposed to both of them than their EU counterparts. In addition, French employees are more exposed to the risks of working with computers/laptops, sitting positions and tiring/painful positions than their EU counterparts.

Available national data complement the picture described above. Among all the physical efforts and constraints covered by the data, staying standing for a long time is the most frequently encountered, affecting around half of employees, followed by wearing or moving heavy loads (41 % of employees in 2013, with this percentage having increased from those in previous years) and performing painful or tiring movements (affecting around one-third of employees, 36.9 %, in 2013) (see Figure 12). Other, less common physical risks include staying in a painful or tiring position other than standing and long or frequent periods of walking, as well as being exposed to shocks or vibration.

Figure 12: Physical efforts and postural constraints in 1984, 1991, 1998, 2005 and 2013



Field: Metropolitan France, all employees

Source: DARES, «Enquête Conditions de Travail, 1984-2013 (French Working Conditions Survey, several years). Available at: <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes/#c>

In addition, according to publications by the French Directorate of Research and Studies (DARES) on French working conditions surveys ⁽¹⁵⁾, physical efforts and postural constraints show certain trends over time. Among all the types of effort and constraint considered, staying standing for a long time is the most prevalent one, affecting around half of employees. The proportion of employees affected has not changed greatly in the past 30 years. It increased slightly to 53.7 % in 1998 but has gradually decreased since then. Meanwhile, wearing or moving heavy loads also affects a considerable proportion of employees (41 % in 2013). In this case, the percentage has substantially increased, from 21.5 % of employees affected in 1984. Concerning performing painful or tiring movements, this risk factor affects around one-third of employees (33.7 % in 1998; 36.9 % in 2013).

In addition, staying in a painful or tiring position other than standing and long or frequent periods of walking affect approximately the same proportions of employees, and have also evolved in a similar way. More precisely, they affected around 35 % of employees in 2013, and they had both increased since previous years, from around 16 % in 1984. In both cases, the percentages have stabilised (or even slightly reduced) since 1998. Finally, being exposed to shocks or vibration is the least common physical effort or postural constraint, affecting 16.3 % of employees in 2013. However, the percentage of workers exposed has gradually increased in recent decades (in 1984, this risk affected 7.6 % of employees).

According to data for 2016, 34 % of employees in metropolitan France say that they suffer from at least three physical constraints at work (out of five mentioned, namely standing for long periods, long periods in painful positions, long or frequent periods of walking, having to lift or move heavy loads, and being exposed to shocks or vibration). This proportion has significantly increased since 1984, when the proportion of employees affected amounted to 12.1 %. Furthermore, 30.1 % of employees breathe fumes or dust, 28.9 % are in contact with dangerous substances and 18.3 % are exposed to intense noise (data from 2016). These percentages have not changed greatly in recent decades, remaining at similar levels over time.

By gender, men are more exposed than women to all the physical constraints and risks considered here. Thus, 39.3 % of male employees are exposed to at least three of the physical constraints in question

⁽¹⁵⁾ DARES, «Enquête Conditions de Travail, 1984-2013 (French Working Conditions Survey, several years). Available at: <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes/#c>

(compared with 28.8 % of female employees). In both cases, the percentages have considerably increased in recent decades. Furthermore, 42.1 % of male employees breathe fumes or dust (18.3 % of female employees), 36.7 % are in contact with dangerous substances (21.2 % of female employees) and 22.7 % are exposed to intense noise (14.1 % of female employees).

By occupational level, non-qualified and qualified labourers are the most exposed groups (see Table 6). More precisely, 63.4 % of non-qualified labourers are exposed to at least three of the physical constraints suggested (60.8 % of qualified labourers), 67.1 % breathe fumes or dust (65.6 % of qualified labourers), 53.6 % are in contact with dangerous substances (48.6 % of qualified labourers), and 38.8 % are exposed to intense noise (37.3 % of qualified labourers). In contrast, managers are on average the least exposed group (6.0 % suffer from at least three physical constraints, 9.1 % breathe fumes or dust and 6.6 % are exposed to intense noise). However, in the case of contact with dangerous substances, it is administrative employees who are least likely to be exposed (5.3 %).

Table 6: Physical constraints and risks, by occupational level, 1984, 1991, 1998, 2005, 2013 and 2016

		Middle managers	Intermed. occupations	Administrative Employees	Trade and services employees	Qualified labourers	Non-qualified labourers	Average	Men	Women
At least three physical constraints (*)	1984	2.1	6.7	2.3	13.2	23.5	21.2	12.1	15.7	7.2
	1991	4.0	14.8	5.8	32.0	43.2	42.7	24.6	30.1	17.9
	1998	7.1	22.5	8.8	47.6	56.7	60.3	33.9	39.8	27.0
	2005	6.5	22.7	9.3	45.0	57.2	61.4	32.7	39.7	24.9
	2013	7.9	25.0	10.8	46.1	63.2	64.6	34.3	40.5	28.1
	2016	6.0	26.1	13.0	46.9	60.8	63.4	34.0	39.3	28.8
Being exposed to intense noise (**)	1984	4.3	8.5	6.8	6.7	30.1	37.1	16.1	20.0	10.8
	1991	5.6	11.0	9.3	10.0	36.1	39.3	18.8	23.2	13.3
	1998	6.1	11.7	7.9	11.1	35.5	37.0	17.6	22.2	12.2
	2005	6.5	13.6	7.9	10.8	38.4	40.4	18.0	24.0	11.3
	2013	7.0	14.7	10.1	13.8	37.3	38.8	18.1	23.2	13.0
	2016	6.6	15.7	7.3	15.5	38.5	36.3	18.3	22.7	14.1
Breathing fumes or dust (***)	2005	12.7	23.1	16.6	27.1	65.8	61.2	32.4	44.6	18.8
	2013	11.0	23.0	14.2	24.8	66.4	65.9	29.2	43.1	18.1
	2016	9.1	22.4	12.7	26.3	65.6	67.1	30.1	42.1	18.3
Being in contact with dangerous products (***)	2005	12.4	25.5	6.8	30.4	49.9	45.0	28.2	36.6	19.0
	2013	13.5	27.5	4.8	30.8	52.1	50.4	30.7	37.8	20.6
	2016	13.3	27.0	5.3	31.8	48.6	53.6	28.9	36.7	21.2

(*) Among five constraints: standing for long periods, long periods in painful positions, long or frequent periods of walking, having to lift or move heavy loads, being exposed to shocks or vibration

(**) The employee reports that they cannot hear a person standing 2-3 metres away when they speak to them unless the person raises their voice

(***) These questions were introduced into the survey in 2005

Source: DARES, «Enquête Conditions de Travail, 1984-2013 (French Working Conditions Survey, several years). Available at: <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes/#c>

A further breakdown of the most prevalent physical risk factor (staying for a long time in a painful or tiring position) by gender, age and socio-occupational category (see Table 7) shows that men are more exposed than women to this risk (in 2013, 36.6 % of men and 32.6 % of women reported being exposed to staying for a long time in a painful or tiring position at work). Those employees under 25 years of age and older workers were also particularly likely to be exposed to this risk (42.4 % and 35.0 %, respectively). The least affected age group was 25 to 29 years old (32 %). Meanwhile, more than half of labourers (57 %) have to stay for a long time in a painful or tiring position at work, followed by more than one-third of employees (36.6 %). In contrast, the least affected occupational groups are senior managers and those in intellectual professional occupations (14.2 %), together with intermediate professionals (26.7 %).

Table 7: Percentages of employees who have to stay for a long time in a painful or tiring position during their work, 1998, 2005 and 2013

Characteristic		1998	2005	2013
Gender	Men	39.2	37.2	36.6
	Women	35.1	30.9	32.6
Age	Under 25	46.8	45.5	42.4
	25-29	36.1	32.9	32.0
	30-39	36.7	32.8	33.2
	40-49	36.3	33.4	34.5
	50 or over	37.3	33.4	35.0
Socio-occupational category	Senior managers and those in intellectual professional occupations	12.9	12.7	14.2
	Intermediate professionals	25.7	24.7	26.7
	Employees	37.4	35.0	36.6
	Workers/labourers	57.0	54.8	57.0
Average		37.3	34.2	34.6

Field: Metropolitan France, all employees

Source: DARES, Chiffres clés sur les conditions de travail et la santé au travail 2016 (Key Figures on the Working and Health Conditions 2016), Number 22, November 2016. Available at: https://dares.travail-emploi.gouv.fr/IMG/pdf/synthese_stat_chiffres_cles_cond_travail.pdf; DARES, «Enquête Conditions de Travail, 1984-2013 (French Working Conditions Survey, several years). Available at: <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes/#c>

The data set out above can be complemented with information on the employers' perspective. Available national data show that, according to employers, exposure to these physical risks is lower than the employees themselves report. The only two physical risks for which employers reported higher exposure levels were manual handling of heavy loads along and maintaining strenuous postures (see Table 8). More precisely, 9.6 % of employers consider that more than 50 % of their employees are exposed to manual handling of heavy loads (7.4 % of employers reported that 10 %-50 % of their employees were exposed to this risk). Moreover, 9.3 % of employers say that more than 50 % of their employees have to maintain strenuous postures (7.8 % of employers indicated that 10 %-50 % of their employees were exposed to this risk).

Table 8: Percentages of workers exposed to certain physical risks in 2013, according to employers

Physical risk	Percentage of workers exposed (according to employers)					Total
	More than 50 %	10 %-50 %	Very few	None	DK/NA (*)	
Manual handling of heavy loads	9.6	7.4	13.5	60.9	8.6	100
Strenuous postures	9.3	7.8	12.4	60.8	9.7	100
Dangerous chemical agents (dust, fumes, etc.)	3.8	4.1	9.1	73.1	9.9	100
Extreme temperatures	2.1	1.5	4.0	84.1	8.3	100
Noise greater than 85 dB, mechanical vibration	4.7	4.0	6.5	73.5	11.3	100
Night work (between 9 p.m. and 6 a.m.)	2.1	3.4	7.3	79.8	7.4	100
Work in alternating teams	1.8	1.8	2.1	86.2	8.1	100
Work in a chain, repetitive work	1.4	1.5	1.6	82.2	13.3	100

(*) Does not know or no answer

Source: DARES, 'L'enquête "Conditions de travail" auprès des employeurs: résultats détaillés' ('The Working Conditions Survey of employers: detailed results'), *Synthèse.Stat*, No 23, July 2017. Available at: https://dares.travail-emploi.gouv.fr/IMG/pdf/synthese.stat_no23_-_enquete_ct_volet_employeurs.pdf

Finally, other relevant studies related to individual risk factors and MSDs carried out by Santé Publique France or InVS are the following:

- Study 1 ⁽¹⁶⁾: the main goal of this study was to examine the prevalence of MSDs in the general population based on demographic and socio-occupational features, including among workers with no or little access to occupational medicine, such as temporary workers. According to the results, the prevalence of persistent pain in women varied between 14 % (elbows) and 35 % (back); persistent pain in men varied between 9 % and 24 % (respectively for the same locations). The prevalence of spinal pain in working-class women was 35 %, compared with 22 % among female executives; spinal pain in working-class men was 35 %, compared with 25 % among male executives. Prevalence also varied depending on exposure to biomechanical risk factors, age and type of employment contract.
- Study 2 ⁽¹⁷⁾: the pilot phase of the COSET-MSA study provided an estimate of the prevalence of upper-limb musculoskeletal symptoms in agricultural workers, especially farmers and agricultural blue-collar workers, covered by the French health insurance fund Mutualité Sociale Agricole (MSA). According to the results of the study, the prevalence of upper-limb musculoskeletal symptoms during the past 12 months was 54 % in men and 67 % in women, and 20 % of men and 34 % of women had symptoms for more than 30 days. The highest prevalence of disorders during the past 12 months was observed in the shoulders in men (37 %) and in the hands/wrists in women (49 %). Women had significantly higher prevalence rates than men, except with regard to the elbows/forearms. Symptom prevalence was not significantly different between farmers and agricultural blue-collar workers in either gender.

⁽¹⁶⁾ Carton M, Santin G, Leclerc A, Gueguen A, Goldberg M, Roquelaure Y, Zins M, Descatha A, 'Prévalence des troubles musculo-squelettiques et des facteurs biomécaniques d'origine professionnelle: Premières estimations à partir de Constances' ('Prevalence of musculoskeletal disorders and occupational biomechanical factors: Preliminary estimates from the French CONSTANCES cohort'), *Bull. Epidémiol. Hebd.*, 2016;(35-36):630-639.

⁽¹⁷⁾ Coset-MSA: Cercier E, Fouquet N, Bodin J, Chazelle E, Geoffroy-Perez B, Brunet R, Roquelaure Y, 'Prévalence des symptômes musculo-squelettiques du membre supérieur chez les travailleurs de l'agriculture en France en 2010: Résultats de la phase pilote de Coset-MSA ('Prevalence of upper-limb musculoskeletal symptoms in French agricultural workers in 2010: Results of the pilot phase of COSET-MSA study'), *Bull. Epidémiol. Hebd.*, 2015;(8):134-141.

In addition, according to the Medical Surveillance of Occupational Risk Exposures (Surveillance médicale des expositions aux risques professionnels — SUMER) survey ⁽¹⁸⁾, the construction sector is one of the sectors most affected by specific occupational risks. In the construction sector, 62.2 % of employees are exposed to manual load handling, 53.5 % to working in a kneeling position, 44.4 % to keeping the arms in the air, 50.8 % to other postural constraints (e.g. squatting, twisting), 37.9 % to work requiring a forced position of one or more joints and 24.4 % to awkward postures (defined as kneeling position, keeping the arms in the air, work requiring a forced position of one or more joints, or other postural constraints (e.g. squatting, twisting)) for 10 hours or more per week (data for 2010; see Table 9).

Meanwhile, employees in accommodation and catering are particularly likely to be exposed to postural and joint constraints (90.3 % of employees) and to repetition of the same gesture or series of gestures at a fast rate (44.4 %). In addition, fixed position of the head and neck is common in the telecommunications sector (60.2 % of the sector employees), and walking during work is common in agriculture, forestry and fishing (65.3 %).

Table 9: Main sectors affected by specific occupational risks (percentages of sector employees exposed to those risks), 2010

Occupational risks	%
Manual load handling	
Construction	62.2
Woodworking, paper and printing industries	56.9
Manufacture of foodstuffs, beverages and tobacco products	52.4
Postural and joints constraints	
Accommodation and catering	90.3
Manufacture of textiles, clothing, leather and footwear industry	89.5
Manufacture of foodstuffs, beverages and tobacco products	88.5
Standing or working upright in a fixed location	
Accommodation and catering	81.3
Manufacture of foodstuffs, beverages and tobacco products	70.5
Woodworking, paper and printing industries	66.7
Walking during work	
Agriculture, forestry and fishing	65.3
Construction	60.2
Metallurgy and manufacture of metal products except machinery and equipment	58.9
Kneeling position	
Construction	53.5
Other manufacturing industries; repair and installation of machinery and equipment	27.8
Medical, social and medico-social accommodation and social work without accommodation	26.1
Fixed position of the head and neck	
Telecommunications	60.2
Scientific research and development	48.3
Financial and insurance activities	47.4
Keeping the arms in the air	
Construction	44.4
Other manufacturing industries; repair and installation of machinery and equipment	27.0
Administrative and support services activities	24.5

⁽¹⁸⁾ DARES, 'Surveillance médicale des expositions aux risques professionnels (SUMER): édition 2010' ('Medical Surveillance of Occupational Risk Exposures (SUMER) survey: 2010 edition'). Available at: <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes-de-a-a-z/article/surveillance-medecale-des-expositions-aux-risques-professionnels-sumer-edition>

Occupational risks	%
Other postural constraints (squatting, twisting)	
Construction	50.8
Medical, social and medico-social accommodation and social work without accommodation	43.8
Agriculture, forestry and fishing	38.8
Repetition of the same or a series of gestures at a high rate	
Accommodation and catering	44.4
Woodworking, paper and printing industries	43.5
Manufacture of textiles, clothing industries, leather and footwear industry	42.0
Work requiring a forced position of one or more joints	
Construction	37.9
Manufacture of textiles, clothing industries, leather and footwear industry	24.3
Metallurgy and manufacture of metal products except machinery and equipment	24.1
Awkward postures (defined as kneeling position, keeping the arms in the air, work requiring a forced position of one or more joints or other postural constraints (e.g. squatting, twisting)) for 10 hours or more per week.	
Construction	24.4
Agriculture, forestry and fishing	21.5
Woodworking, paper and printing industries	16.9

Source: DARES, 'Surveillance médicale des expositions aux risques professionnels (SUMER): édition 2010' ('Medical Surveillance of Occupational Risk Exposures (SUMER) survey: 2010 edition'). Available at: <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes-de-a-a-z/article/surveillance-medicaux-risques-professionnels-sumer-edition>

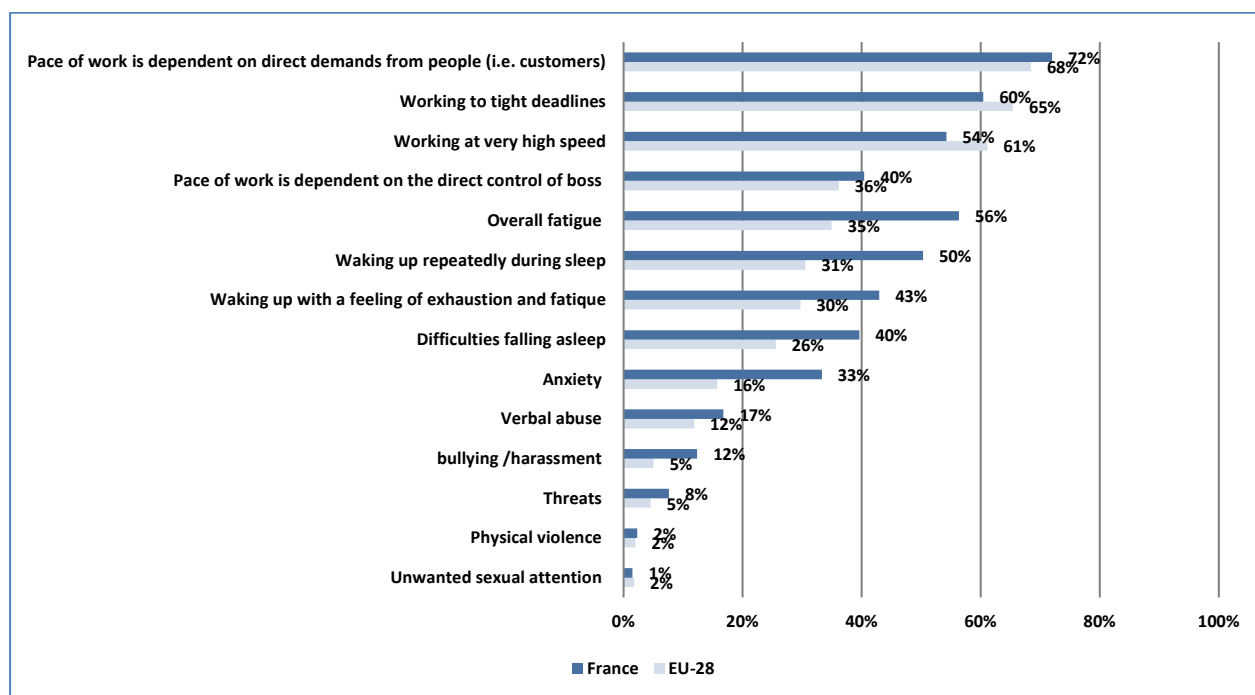
Another relevant study related to physical risk factors and MSDs has been carried out by Santé Publique France/InVS. Study 1⁽¹⁹⁾ can be summarised as follows: De Quervain's disease is a significant cause of musculoskeletal pain among workers. The aim of this study was to assess the relative importance of personal and occupational risk factors for the disease in a working population. The study found that personal risk factors for De Quervain's disease were in particular older age and female gender. Work-related factors are (i) workplace dependent on technical organisation, (ii) repeated or sustained wrist bending in an extreme position and (iii) repeated movements associated with the twisting or driving of screws.

4.2 Organisational and psychosocial risk factors

Organisational and psychosocial risk factors also play a role as potential triggers of MSDs (see Figure 14). The most relevant of these factors among French employees are the pace of work being dependent on other people's demands, tight deadlines and overall fatigue (between 72 % and 56 % of employees report working in establishments where these risks are present). Meanwhile, other relatively important risks include working at very high speed, the pace of work being under the direct control of the boss and, generally speaking, difficulties with sleep (between 54 % and 40 % of employees work in establishments where these risks are present).

⁽¹⁹⁾ Petit-Le Manac'h A, Roquelaure Y, Ha C, Bodin J, Meyer G, Bigot F, Veaudor M, Descatha A, Goldberg M, Imbernon E. 'Risk factors for De Quervain's disease in a French working population', *Scand. J. Work Environ. Health*, 2011;37(5):394-401.

Figure 13: Percentages of employees working in establishments where there are certain organisational/psychosocial risk factors in France and the EU-28, 2015



Note: Data are weighted with the employee-proportional weighting factor. This weighting factor controls for the disproportional nature of the national samples, is scaled to the number of employees instead of the number of establishments in the universe, and allows for international analysis. ESENER covers employees in enterprises employing five or more workers.

Source: Panteia based on ESENER 2 data

A comparison with EU-level data shows that the relative importance of the different organisational and psychosocial risk factors is similar in France and in the EU-28, with the exception of the risk linked to overall fatigue (which is particularly relevant in France). The available data show that French employees are more exposed than their EU counterparts to some risks (i.e. the pace of work being dependent on other people's demands, overall fatigue and the pace of work being under the direct control of the boss). Meanwhile, French employees are slightly less likely than their EU counterparts to be exposed to some risks (i.e. working to tight deadlines or working at very high speed).

The data set out above can be complemented with some national data ⁽²⁰⁾ showing that the most common organisational and psychosocial risk factor is having to frequently leave one task for another more urgent task. Of employees in metropolitan France, 65.4 % say that they are exposed to this labour intensity factor (data for 2016; see Table 10). Other important factors are always or often having to hurry (45.5 %) and not being able to leave one's job (43 %). Meanwhile, having at least three rhythm constraints (out of the following: automatic movement of a product or part; automatic rate of a machine; other technical constraints; immediate dependence on colleagues; production standards to be met in 1 day; external demands; and permanent constraints or supervision exercised by the hierarchy) and having the pace of work imposed by an external control or a computerised follow-up affect in both cases 35.2 % of employees. Finally, changing position according to the needs of the company affects 23.1 % of employees.

Data broken down by gender show that male employees are more exposed than female employees to most risks, with the only exceptions being having to frequently leave one task for another more urgent task and always or often having to hurry. There are significant differences in the risks to which occupational groups are exposed. With regard to exposure to at least three rhythm constraints, qualified

⁽²⁰⁾ DARES, «Enquête Conditions de Travail, 1984-2013 (French Working Conditions Survey, several years). Available at: <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes/#c>.

labourers are the most exposed group (53.4 %), whereas managers are the least affected (23.9 %). In contrast, having to frequently leave one task for another more urgent task is most likely to affect managers (75.5 %), while non-qualified labourers are the group least likely to be exposed to this risk (43.2 %). In addition, managers commonly encounter always/often having to hurry up (49.3 %), whereas administrative employees reported the lowest rate of exposure to this risk factor (43 %).

Table 10: Percentages of workers exposed to certain labour intensity and time pressure risk factors, 1984, 1991, 1998, 2005, 2013 and 2016

Risk factor		Middle managers	Intermed. occupations	Administrative employees	Trade and services employees	Qualified labourers	Non-qualified labourers	Average	Men	Women
Having at least three rhythm constraints (*)	1984	3.5	4.8	4.2	2.3	8.7	10.5	5.8	6.8	4.4
	1991	12.0	19.7	19.3	13.4	30.2	31.8	21.4	24.1	18.1
	1998	19.6	29.3	25.7	20.9	47.0	45.3	31.0	37.2	23.7
	2005	22.8	32.4	27.1	19.9	47.3	46.1	31.6	37.9	24.5
	2013	25.6	34.8	31.6	28.0	54.0	45.8	35.2	41.3	29.0
	2016	23.9	35.1	30.3	29.2	53.4	49.1	35.2	41.4	29.1
Having the pace of work imposed by an external control or a computerised follow-up	1984	–	–	–	–	–	–	–	–	–
	1991	–	–	–	–	–	–	–	–	–
	1998	–	–	–	–	–	–	–	–	–
	2005	23.5	29.7	33.8	15.5	26.2	18.5	24.7	27.5	21.6
	2013	35.9	42.3	45.6	25.6	35.6	25	35.3	37.2	33.4
	2016	32.6	41.2	43.7	27.8	37.2	27.4	35.2	37.9	32.6
Not being able to leave one's job	1984	6.1	9.8	14.1	7.5	25.5	27.3	15.5	15.9	15.0
	1991	11.6	20.1	24.9	19.3	40.4	38.3	26.3	27.8	24.5
	1998	16.5	25.9	28.5	28.3	49.3	43.2	31.9	34.9	28.4
	2005	17.3	29.5	25.8	32.9	53.6	46.5	33.7	37.7	29.2
	2013	26.2	37.0	31.6	39.3	58.6	44.9	39.0	41.9	36.1
	2016	27.1	41.5	33.5	42.9	65.8	51.6	43.0	46	40
Always or often having to hurry	1984	–	–	–	–	–	–	–	–	–
	1991	–	–	–	–	–	–	–	–	–
	1998	57.7	53.2	53.0	47.0	51.4	49.2	51.8	51.0	52.8
	2005	54.3	49.8	47.2	44.4	46.4	43.9	47.9	46.5	49.5
	2013	50.8	47.6	43.6	45.9	44.3	40.6	46.4	43.5	49.2
	2016	49.3	47.0	43.0	44.0	43.3	43.3	45.5	42.9	48.1
Having to frequently leave one task for another more urgent task	1984	–	–	–	–	–	–	–	–	–
	1991	55.3	52.4	53.0	49.2	41.9	36.1	48.0	47.8	48.3
	1998	59.3	60.7	63.3	54.1	51.0	40.8	55.7	55.7	55.9
	2005	66.5	66.5	66.9	55.9	51.1	41.8	59.5	58.3	60.7
	2013	74.8	72.5	71.6	58.4	52.2	44.6	64.3	63.5	65.1
	2016	75.5	74.8	74.7	60.9	49.7	43.2	65.4	62.6	68.1
Changing position according to the needs of the company	1984	–	–	–	–	–	–	–	–	–
	1991	12.2	17.4	22.8	21	29.9	32.5	22.7	24.7	20.3
	1998	10.6	18.5	21.0	21.8	32.9	35.3	23.0	26.1	19.4
	2005	8.8	15.7	17.7	16.6	28.6	30.7	18.7	22.2	14.7
	2013	12.0	21.9	22.3	22.2	33.7	35.6	23.1	26.0	20.2
	2016	–	–	–	–	–	–	–	–	–

(*) Out of the following: automatic movement of a product or part; automatic rate of a machine; other technical constraints; immediate dependence on colleagues; production standards to be met in 1 day; external demands; permanent constraints or supervision exercised by the hierarchy; Source: DARES, «Enquête Conditions de Travail, 1984-2013 (French Working Conditions Survey, several years) (Available at: <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes/#c>)

Other psychosocial risk factors, relating to mental load, ethical conflicts and job insecurity, were covered by new questions introduced into the French Working Conditions Survey in 2013 (see Table 11). Among the seven factors considered, the most frequently encountered in 2016 were having to think about too many things at once (43.9 % of employees in metropolitan France) and having to do excessive work (40 %). Other important factors were working under pressure (31.2 %), having to hide one's emotions (24.9 %), fear of losing one's job (24.7 %) and not being recognised for one's work (23.8 %). Finally, the risk factor mentioned least frequently was having to do things that one disapproves of, affecting 10 % of employees.

Data broken down by gender show that female employees seem to be more exposed to these mental load, ethical conflict and insecurity factors than male employees. In particular, the greatest differences among genders appear in relation to having to hide one's emotions (31.1 % of women, compared with 18.8 % of men) and having to think about too many things at once (47.2 % of women, compared with 40.5 % of men). For the rest of the factors analysed (having to do excessive work, working under pressure, not being recognised for one's work and fear of losing one's job), the percentages of women affected are only around 1 to 3 percentage points higher than the percentages of men. Finally, only the percentage of those having to do things that one disapproves of is higher among men than among women (10.6 %, compared with 9.4 %). By occupational group, the two for which the largest differences between occupational groups can be seen are the following: having to think about too many things at once (57 % of managers report experiencing this psychosocial risk factor, compared with 25.4 % of non-qualified labourers) and working under pressure (43.3 % of managers consider that they work under pressure, compared with 21.4 % of non-qualified labourers). There is also another factor for which managers have the highest exposure rate, which is the need to do excessive work. On the other hand, for three of the factors analysed managers are the least affected among all the occupational groups considered; these are having to do things that one disapproves of (5.8 % of managers, compared with 16.9 % of non-qualified labourers), the fear of losing one's job (18.1 % of managers, compared with 33.4 % of non-qualified labourers), and not being recognised for one's work (18.8 % of managers, compared with 28.4 % of administrative employees).

Table 11: Percentages of workers exposed to certain mental load, ethical conflict and job insecurity risk factors, 2013 and 2016

Risk factor		Middle managers	Intermed. occupations	Administrative employees	Trade and services employees	Qualified labourers	Non-qualified labourers	Average	Men	Women
Having to do excessive work	2013	45.1	43.7	38.6	34.9	38.4	35.0	40.1	39.3	40.9
	2016	45.8	43.6	39.4	33.7	37.7	36.3	40.0	38.6	41.4
Having to think about too many things at once	2013	63.0	57.9	48.7	40.4	39.1	28.6	49.1	47.1	51.1
	2016	57.0	51.7	44.3	37.4	31.8	25.4	43.9	40.5	47.2
Working under pressure	2013	50.6	42.8	32.6	27.3	29.1	24.1	36.4	36.1	36.8
	2016	43.3	35.9	27.9	24.0	25.0	21.4	31.2	30.8	31.6
Doing things that one disapproves of	2013	6.9	9.3	9.4	11.8	11.8	10.2	9.9	10.2	9.5
	2016	5.8	8.4	9.1	11.4	12.8	16.9	10.0	10.6	9.4
Having to hide one's emotions	2013	29.8	31.6	32.0	39.0	22.6	19.1	30.5	24.8	36.3
	2016	24.6	27.2	26.7	31.8	15.2	16.2	24.9	18.8	31.1
Not being recognised for one's work	2013	23.2	31.8	32.6	27.0	32.9	28.1	29.1	28.1	30.0
	2016	18.8	25.4	28.4	21.9	24.8	27.3	23.8	22.9	24.7
Fear of losing one's job	2013	18.8	22.4	22.8	23.9	31.1	33.3	24.3	24.9	23.8
	2016	18.1	23.9	26.7	24.5	28.3	33.4	24.7	23.3	26.1

Source: DARES, «Enquête Conditions de Travail, 1984-2016 (French Working Conditions Survey, several years). Available at: <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes/#c>

The data set out above can be complemented with information on the employers' perspective. Available national data show that, according to employers, the most common psychosocial risk is having to work under time pressure (see Table 12). The results show that 11.5 % of employers considered that 50 % of their employees were exposed to this risk, and 10.1 % of employers reported that 10 %-50 % of their employees were. Other important psychosocial risks are tension with the public, customers, etc. (4.7 % of employers reported that more than 50 % of their employees were exposed to this risk); followed by having a heavy workload and risk of losing one's job (in both cases, 3.6 % of employers estimated that more than 50 % of their employees were exposed to these risks). Conversely, the least frequently encountered psychosocial risks were an unpredictable work schedule (71.8% of employers reported that none of their employees were exposed to this risk), followed by tensions with the hierarchy and tension between colleagues (58.4 % and 58.1 % of employers, respectively, stated that none of their employees suffered from these risks).

Table 12: Percentages of workers exposed to certain psychosocial risks in 2013, according to employers

Psychosocial risk	Percentage of workers exposed (according to employers)					Total
	More than 50 %	10 %-50 %	Very few	None	DK/NA (*)	
Having to work under time pressure	11.5	10.1	18.3	46.6	13.5	100
The feeling of not being able to do quality work	2.3	6.3	17.5	56.2	17.8	100
Tensions between colleagues	1.6	4.2	20.4	58.1	15.8	100
Tensions with the hierarchy	1.3	3.3	20.6	58.4	16.4	100
Tensions with the public, customers, patients, users, etc.	4.7	9.4	20.8	50.9	14.2	100
Risk of losing one's job	3.6	5.6	13.6	57.3	19.8	100
Unpredictable work schedule	2.3	2.7	9.8	71.8	13.4	100
Heavy workload	3.6	6.6	16.7	57.4	15.8	100

(*) Does not know or no answer

Reading: 11.5% of managers in establishments estimate that more than 50% of their employees are exposed to having to work under time pressure. Field: France, establishments with one or more employees

Source: DARES, 'L'enquête "Conditions de travail" auprès des employeurs: résultats détaillés' ('The Working Conditions Survey of employers: detailed results'), *Synthèse.Stat*, No 23, July 2017. Available at: https://dares.travail-emploi.gouv.fr/IMG/pdf/synthese.stat_no23_-_enquete_ct_volet_employeurs.pdf

Other relevant studies related to psychosocial risk factors and MSDs carried out by Santé Publique France or InVS are the following (with a summary of main results):

- Study 1 ⁽²¹⁾: the study aimed to determine the risk factors for incident carpal tunnel syndrome (CTS) in a large working population, with a special focus on factors related to work organisation. The study found an association between CTS and some factors related to work organisation. Payment on a piecework basis and the pace of work being set at an automatic rate were associated with an increased risk of CTS.
- Study 2 ⁽²²⁾: the aim of the study was to examine the organisational and psychosocial risk factors for CTS in workers exposed to various levels of work-related constraints, with a special focus on factors related to work organisation. The main results suggest that among the factors related to work organisation, working in temporary work is associated with CTS for women but not for men. Task rotation during the job and the pace of work being dependent on quantified targets are associated with CTS only for men. The work-related psychosocial factors highlighted by the logistic modelling are high psychological demand for women and low skill discretion for men.
- Study 3 ⁽²³⁾: the aim of this study was to assess the persistence of rotator cuff syndrome (RCS) in workers and to study associations with personal and work-related factors, job change, exposure change and treatment. According to the results, recovery occurred in 61.5 % of men and 51.4 % of women. Factors related to work organisation were associated with persistence of RCS in men whereas upper limb pain symptoms and the absence of rotation of tasks were associated with persistence of RCS in women.
- Study 4 ⁽²⁴⁾: the aim of this study was to compare risk factors for shoulder pain without and with RCS. The results of this study show that in men shoulder pain and RCS were associated with age, high perceived physical exertion and arm abduction. The pace of work being set at an automatic rate and low support from supervisors were associated with shoulder pain, and high psychological demand and low skill discretion with RCS. In women, shoulder pain and RCS were associated with age, repetitive tasks and low support from supervisors. High perceived physical exertion and exposure to cold temperatures were associated with shoulder pain.
- Study 5 ⁽²⁵⁾: the aim of this study was to assess the effects of personal and work-related factors on the incidence of RCS in a large working population. The study found that age was the strongest predictor for incident cases of RCS and that arm abduction was the major work-related risk factor for both genders. Lack of social support was a predictor for RCS among men.

⁽²¹⁾ Petit A, Ha C, Bodin J, Rigouin P, Descatha A, Brunet R, et al., 'Risk factors for carpal tunnel syndrome related to the work organization: A prospective surveillance study in a large working population', *Appl. Ergon.*, 2015;47:1-10.

⁽²²⁾ Rigouin P, Ha C, Bodin J, Le Manac'h AP, Descatha A, Goldberg M, Roquelaure Y, 'Organizational and psychosocial risk factors for carpal tunnel syndrome: A cross-sectional study of French workers', *Int. Arch. Occup. Environ. Health*, 2014;87(2):147-154.

⁽²³⁾ Bodin J, Ha C, Petit A, Descatha A, Thomas T, Goldberg M, Leclerc A, Roquelaure Y, 'Natural course of rotator cuff syndrome in a French working population', *Am. J. Ind. Med.*, 2014;57(6):683-694.

⁽²⁴⁾ Bodin J, Ha C, Chastang JF, Descatha A, Leclerc A, Goldberg M, Imbernon E, Roquelaure Y, 'Comparison of risk factors for shoulder pain and rotator cuff syndrome in the working population', *Am. J. Ind. Med.*, 2012;55(7):605-615.

⁽²⁵⁾ Bodin J, Ha C, Petit Le Manac'h A, Sérazin C, Descatha A, Leclerc A, Goldberg M, Roquelaure Y, 'Risk factors for incidence of rotator cuff syndrome in a large working population', *Scand. J. Work Environ. Health*, 2012;38(5):436-446.

4.3 Sociodemographic risk factors

The SUMER survey monitors the numbers of workers exposed to different occupational risks. The most prevalent occupational risk is postural and joint constraints, which affects 74.6 % of men and 73.9 % of women, followed by standing or working upright in a fixed location (48.6 % of men and 42.9 % of women), walking during work (47.5 % of men and 34.5 % of women) and manual load handling (44.1 % of men and 29.0 % of women). The number of workers affected by each risk is higher among men than among women, except in the case of fixed position of the head and neck; women are more likely than men to be exposed to this risk (32.4 % of women compared with 26.4 % of men). Exposure to risks decreases as age increases. In general terms, the most exposed group are workers under 25 years of age, followed by 25 to 29 year olds. The only exception is fixed position of the head and neck; the group most exposed to this risk is 30 to 39 year olds, and the group least exposed is those under 25 years old.

With regard to socio-professional categories, skilled workers are particularly likely to be exposed to manual load handling, walking during work, working in a kneeling position and other postural constraints (e.g. squatting, twisting); trade and service employees are particularly likely to be exposed to postural and joint constraints, standing or working upright in a fixed location and repetition of the same gesture or a series of gestures at a fast rate; and unskilled workers are particularly likely to be exposed to keeping the arms in the air, work requiring a forced position of one or more joints and awkward postures for 10 hours or more per week.

Overall, there is no clear pattern in terms of company size and exposure. It seems that employees in companies with 1 to 9 employees are more likely to be exposed to standing or working upright in a fixed location, working in a kneeling position, keeping the arms in the air, work requiring a forced position of one or more joints and awkward postures for 10 hours or more per week, whereas employees in companies with 50 to 199 employees are more likely to be exposed to manual load handling, postural and joint constraints, walking during work and other postural constraints (e.g. squatting, twisting). There are, however, no significant differences in exposure rates by company size.

Table 13: Numbers (N) and percentages (%) of workers exposed to different occupational risks, by gender, age socio-professional category and size of establishment, 2010

	Types of occupational risk																					
	Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		Type 9		Type 10		Type 11	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Gender																						
Men	5,211.2	44.1	8,821.5	74.6	5,749.2	48.6	5,622.2	47.5	2,467.4	20.9	3,127.7	26.4	2,219.9	18.8	3,398.9	28.7	2,775.0	23.5	2,294.7	19.4	1,447.6	12.2
Women	2,833.0	29.0	7,227.2	73.9	4,192.0	42.9	3,374.3	34.5	1,013.8	10.4	3,174.0	32.4	1,302.3	13.3	2,203.7	22.5	2,586.8	26.4	1,438.1	14.7	990.4	10.1
Age group																						
Under 25	1,238.7	52.2	2,017.7	85.0	1,598.1	67.3	1,301.8	54.8	624.8	26.3	545.9	23.0	602.1	25.4	862.3	36.3	852.2	35.9	579.8	24.4	344.6	14.5
25-29	1,006.3	40.9	1,890.7	76.8	1,228.1	49.9	1,091.2	44.3	475.5	19.3	716.2	29.1	425.4	17.3	679.4	27.6	647.6	26.3	460.1	18.7	296.2	12.0
30-39	2,072.3	35.4	4,288.3	73.4	2,520.8	43.1	2,362.8	40.4	865.6	14.8	1,821.8	31.2	839.7	14.4	1,432.4	24.5	1,320.0	22.6	902.7	15.4	610.2	10.4
40-49	2,185.4	36.9	4,346.9	73.3	2,610.8	44.0	2,404.3	40.5	896.8	15.1	1,774.2	29.9	931.1	15.7	1,475.9	24.9	1,418.9	23.9	1,040.1	17.5	679.4	11.5
50 or over	1,541.4	30.9	3,505.1	70.2	1,983.5	39.7	1,836.4	36.8	618.5	12.4	1,443.6	28.9	723.8	14.5	1,152.6	23.1	1,123.1	22.5	750.1	15.0	507.7	10.2
Socio-professional category																						
Exe&HIP	227.2	7.2	1,628.8	51.4	341.5	10.8	412.4	13.0	53.2	1.7	1,239.6	39.1	67.4	2.1	127.2	4.0	248.9	7.9	158.2	5.0	132.5	4.2
Intprof	1,364.1	25.8	3,309.7	62.7	1,664.1	31.5	1,709.6	32.4	439.6	8.3	1,720.9	32.6	378.2	7.2	802.5	15.2	611.8	11.6	456.5	8.6	264.8	5.0
Admemp	321.7	11.2	1,817.3	63.1	388.9	13.5	478.2	16.6	45.0	1.6	1,379.4	47.9	75.2	2.6	215.6	7.5	520.7	18.1	202.7	7.0	155.8	5.4
Tra&Ser	2,120.8	51.5	3,695.4	89.7	3,135.7	76.1	2,424.4	58.9	891.4	21.6	623.6	15.1	973.0	23.6	1,681.2	40.8	1,479.4	35.9	951.0	23.1	627.3	15.2
Skilwork	2,494.3	65.4	3,359.7	88.2	2,517.0	66.0	2,308.2	60.6	1,269.5	33.3	905.5	23.8	1,170.9	30.7	1,637.3	43.0	1,258.7	33.0	1,172.5	30.8	738.9	19.4
Unskwor	1,516.0	64.5	2,237.9	95.2	1,894.1	80.6	1,663.8	70.8	782.6	33.3	432.6	18.4	857.4	36.5	1,138.8	48.4	1,242.3	52.8	791.9	33.7	518.7	22.1

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	Types of occupational risk																					
	Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		Type 9		Type 10		Type 11	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Employment size of employing establishment (number of workers)																						
1-9	1,739.3	39.6	3,429.2	78.2	2,382.3	54.3	1,777.7	40.5	873.5	19.9	1,167.1	26.6	950.8	21.7	1,247.7	28.4	1,169.1	26.6	827.1	18.9	578.7	13.2
10-49	2,090.5	39.2	3,979.3	74.7	2,518.7	47.3	2,255.0	42.3	973.8	18.3	1,469.8	27.6	928.8	17.4	1,467.9	27.5	1,384.5	26.0	924.7	17.3	613.6	11.5
50-199	1,906.7	41.6	3,583.7	78.2	2,228.6	48.6	2,162.4	47.2	747.2	16.3	1,353.6	29.5	788.7	17.2	1,323.6	28.9	1,252.1	27.3	829.9	18.1	542.1	11.8
200-499	924.8	37.6	1,873.2	76.1	1,087.9	44.2	1,067.7	43.4	352.5	14.3	756.6	30.7	395.1	16.0	628.6	25.5	716.8	29.1	437.6	17.8	280.4	11.4
500+	1,382.8	28.6	3,183.2	65.7	1,723.7	35.6	1,733.7	35.8	534.2	11.0	1,554.5	32.1	458.7	9.5	934.8	19.3	839.3	17.3	713.4	14.7	423.2	8.7
Total	8,044.2	37.2	16,048.7	74.3	9,941.2	46.0	8,996.5	41.6	3,481.2	16.1	6,301.7	29.2	3,522.1	16.3	5,602.6	25.9	5,361.8	24.8	3,732.8	17.3	2,438.0	11.3

Types of occupational risk: 1, manual load handling; 2, postural and joint constraints; 3, Standing or working upright in a fixed location; 4, walking during work; 5, kneeling position; 6, fixed position of the head and neck; 7, keeping the arms in the air; 8, other postural constraints (e.g. squatting, twisting); 9, repetition of the same gesture or a series of gestures at a fast rate; 10, work requiring a forced position of one or more joints; 11, awkward postures (defined as kneeling position, keeping the arms in the air, work requiring a forced position of one or more joints, or other postural constraints (e.g. squatting, twisting)) for 10 hours or more per week

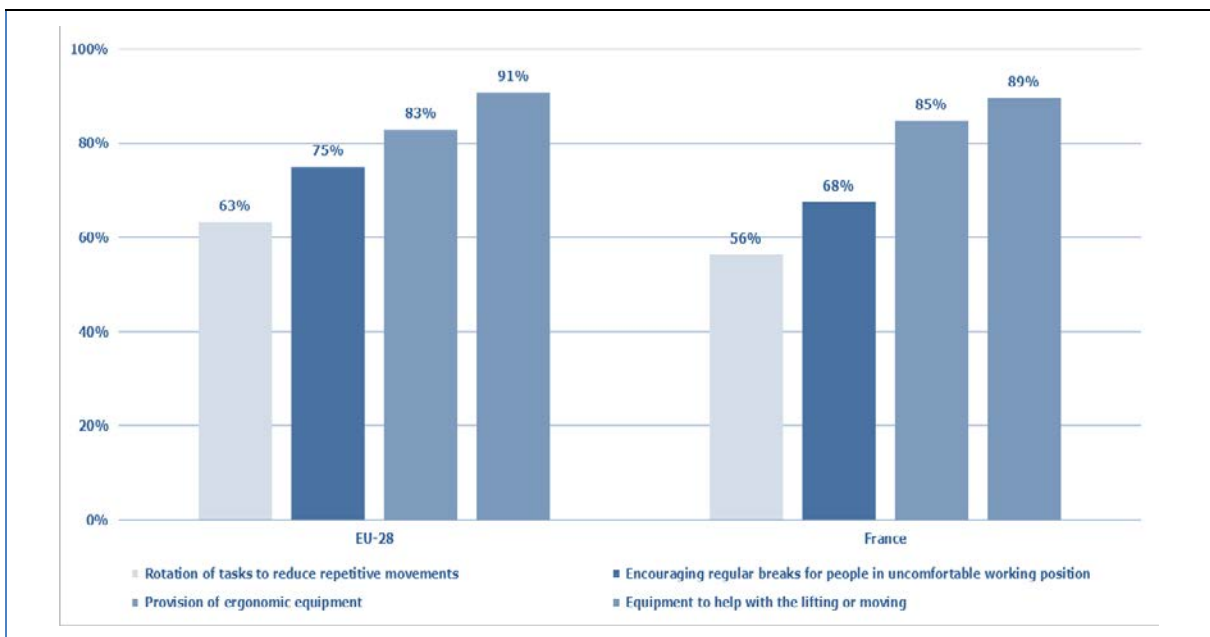
Professional categories: Exe&HIP, executives and higher intellectual professions; Intprof, intermediate professions; Admemp, administrative employees (public/private); Tra&Ser, trade and service employees; Skilwork, skilled workers; Unskwor, unskilled workers/agricultural workers

Source: DARES, 'Surveillance médicale des expositions aux risques professionnels (SUMER): édition 2010' ('Medical Surveillance of Occupational Risk Exposures (SUMER) survey: 2010 edition'). Available at: <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes-de-a-a-z/article/surveillance-medicate-des-expositions-aux-risques-professionnels-sumer-edition>

5 Prevention of MSDs

A high proportion of French companies report implementing measures to prevent MSDs within their establishments: 89 % of employees work in companies that provide equipment to help with lifting or moving and 85 % work in companies that provide ergonomic equipment. In addition, 68 % of French employees work in companies that encourage regular breaks for people who work in uncomfortable positions and 56 % work in companies where rotation of tasks has been introduced to reduce repetitive movements (data for 2014; see Figure 15). These results are in line with the EU-28 figures, although in most cases the French percentages are slightly lower than the EU-28 percentages. The only measure with respect to which France is above the EU-28 average is provision of ergonomic equipment (83 % in the EU-28).

Figure 14: Percentages of employees working in establishments where there are certain preventive measures in place, in the EU-28 and France, 2014

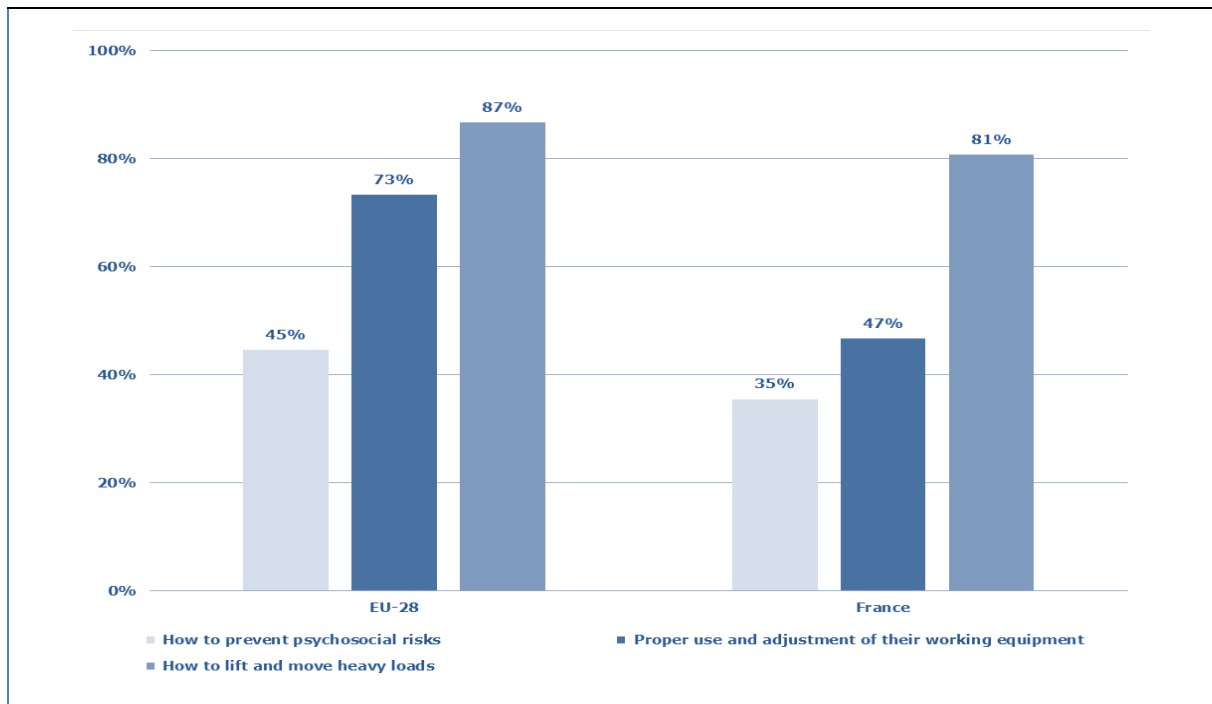


Note: Data are weighted with the employee-proportional weighting factor. This weighting factor controls for the disproportional nature of the national samples, is scaled to the number of employees instead of the number of establishments in the universe, and allows for international analysis. ESENER covers employees in enterprises employing five or more workers.

Source: Panteia based on ESENER 2 data

Furthermore, 81 % of French employees work in companies where training on how to lift and move heavy loads is provided, 47 % work in companies where training on the proper use and adjustment of work equipment is provided and 35 % work in companies where training on how to prevent psychosocial risks is provided (data for 2014; see Figure 16). These percentages are slightly lower than EU-28 levels, particularly with regard to training on the proper use and adjustment of work equipment and on how to prevent psychosocial risks (73 % and 45 % in the EU-28, respectively).

Figure 15: Percentages of employees working in establishments where training is provided, in the EU-28 and France, 2014



Note: Data are weighted with the employee-proportional weighting factor. This weighting factor controls for the disproportional nature of the national samples, is scaled to the number of employees instead of the number of establishments in the universe, and allows for international analysis. ESENER covers employees in enterprises employing five or more workers.

Source: Panteia based on ESENER 2 data

Looking at national sources, the French Working Conditions Survey conducted among employers provides interesting data on prevention activities carried out in enterprises (data for 2013; see Table 14). According to these data, 18.8 % of establishments provided new personal protective equipment to their employees, 18.2 % offered staff security training, 16.8 % modified premises, equipment or products used, 9.8 % modified work organisation and 8.3 % developed a new prevention plan.

Data by economic sector show that in the public sector, the hospital sector has considerably higher figures than the average. With regard to the private sector, the data clearly reveal that the probability that new preventive activities will be introduced increases as the size of the establishment grows. The survey results reveal that 49.4 % of establishments with 500 employees or more provided new personal protective equipment to their employees (16.5 % of establishments with 1 to 9 employees); 80.6 % offered staff security training (12 %); 57.1 % modified premises, equipment or products used (14.5 %); 27.9 % modified work organisation (13.5 %), and 58.6 % developed a new prevention plan (6 %).

Table 14: New prevention activities in the past 12 months, 2013

	Average	Public sector			Private sector				
		State	Territorial	Hospitals	From 1 to 9 employees	From 10 to 49 employees	From 50 to 249 employees	From 250 to 49 employees	500 employees or more
Provision of new personal protective equipment	18.8	17.4	18.0	28.2	16.5	29.3	41.9	47.9	49.4
Offered staff security training	18.2	23.4	31.1	49.7	12.0	42.8	65.9	75.8	80.6
Modification of premises, equipment or products used	16.8	18.4	18.9	33.5	14.5	25.7	38.9	51.0	57.1
Modification of work organisation	9.8	12.8	11.1	24.6	8.6	13.5	18.3	23.1	27.9
Development of a new prevention plan	8.3	11.8	6.7	21.9	6.0	16.7	32.2	49.2	58.6
Other measures	4.9	2.5	6.9	3.3	5.3	3.1	3.3	6.8	5.8

Reading: In the 12 months preceding the survey, 18.8 % of establishments made new personal protective equipment available to their employees. Field: France, establishments with one or more employees

Source: DARES, 'L'enquête "Conditions de travail" auprès des employeurs: résultats détaillés' ('The Working Conditions Survey of employers: detailed results'), *Synthèse.Stat*, No 23, July 2017. Available at: https://dares.travail-emploi.gouv.fr/IMG/pdf/synthese.stat_no23_-_enquete_ct_volet_employeurs.pdf

6 Main national data sources on MSDs

- Data source 1: Caisse nationale de l'Assurance Maladie des Travailleurs Salariés, *Rapport annuel 2016: L'Assurance Maladie — Risques professionnels (2016 Annual Report: Health insurance — Occupational risks)*. Available at: https://www.ameli.fr/sites/default/files/ra-risques-professionnels-2016_assurance-maladie.pdf
- Data source 2: DARES (Direction de l'animation de la recherche, des études et des statistiques), 'Contraintes physiques, prévention des risques et accidents du travail' ('Physical constraints, risk prevention and accidents at work'), *Synthèse.Stat*, No 10, March 2015 (based on the French Working Conditions Survey 2013). Available at: https://dares.travail-emploi.gouv.fr/IMG/pdf/Synthese_Stat_no_10_-_Conditions_de_travail_Vol-1.pdf
- Data Source 3: DARES, 'L'enquête "Conditions de travail" auprès des employeurs: résultats détaillés' ('The Working Conditions Survey of employers: detailed results'), *Synthèse.Stat*, No 23, July 2017. Available at: https://dares.travail-emploi.gouv.fr/IMG/pdf/synthese.stat_no23_-_enquete_ct_volet_employeurs.pdf
- Data source 4: DARES, 'Surveillance médicale des expositions aux risques professionnels (SUMER): édition 2010' ('Medical Surveillance of Occupational Risk Exposures (SUMER) survey: 2010 edition'). Available at: <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes-de-a-a-z/article/surveillance-medicales-des-expositions-aux-risques-professionnels-sumer-edition>. Focus on physical constraints (available at: https://dares.travail-emploi.gouv.fr/IMG/pdf/Synthese_Stat_no_08_-_Risques_professionnels_ambiances_et_contraintes_physiques.pdf)
- Data source 5: ANSES (Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail), *Rapport d'activité 2016 (Activity report 2016)*. Available at: <https://www.anses.fr/fr/system/files/RNV3P-RA-2016.pdf>
- Data source 6: Santé Publique France, 'Programme de surveillance épidémiologique des TMS dans les Pays de la Loire (Lombalgies et TMS du membre supérieur)' ('Epidemiological surveillance programme for MSDs in the Pays de la Loire (lumbago and upper limb disorders)'). Available at: <https://www.santepubliquefrance.fr/maladies-et-traumatismes/maladies-liees-au-travail/troubles-musculo-squelettiques/notre-action>
- Data source 7: CNAM (Caisse nationale de l'Assurance Maladie), 'Statistiques de sinistralité' ('Statistics on occupational accidents'). Available at: <http://www.risquesprofessionnels.ameli.fr/statistiques-et-analyse/sinistralite-atmp.html>
- Data Source 8: DARES, «Enquête Conditions de Travail, 1984-2016 (French Working Conditions Survey, several years)». Available at: <https://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes/#c>
- Data source 9: Database Evrest, 'Evolutions et relations en santé au travail' ('Evolutions and relationships in occupational health'). Available at: <http://evrest.istnf.fr/page-0-0-0.html>
- Data Source 10: Modernet (Monitoring Occupational Diseases and Tracing New and Emerging Risks in a Network). Available at: <https://www.modernet.info/about-us/>

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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