
Work organization characteristics and MSDs: the French Pays de la Loire study

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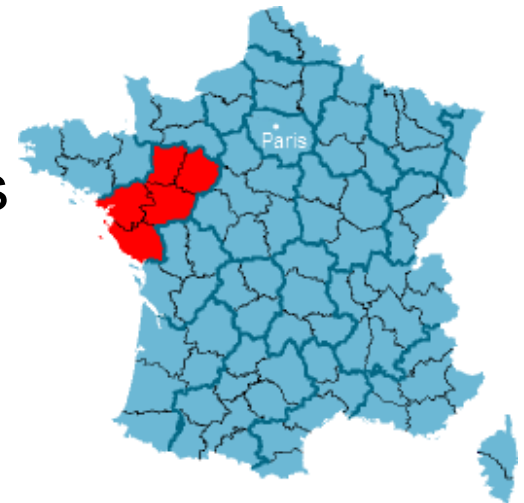
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Context

- **Organizational practices** (job rotation, just-in-time, quality circles, etc.) introduced in companies since the 1980s
 - To improve productivity
 - To respond to the changing world of work (more choice of supply, more demanding customers, increased competition, etc.)
- ↗ **Musculoskeletal disorders (MSDs)** from the 1980s
 - 1st cause of occupational disease in France: 87% (44680 cases) in 2013
- Several European studies have identified patterns of work organization from large surveys (Amossé et al., 2008 ; Bunel et al., 2008 ; Valeyre et al., 2009)
 - Patterns of work organization vary between studies
 - Few have investigated MSDs or only by questionnaire

Objectives

- To identify patterns of work organization characteristics and to study their associations with MSDs
- Using the data of the surveillance program for MSDs in the French Pays de la Loire region



Methods: study sample

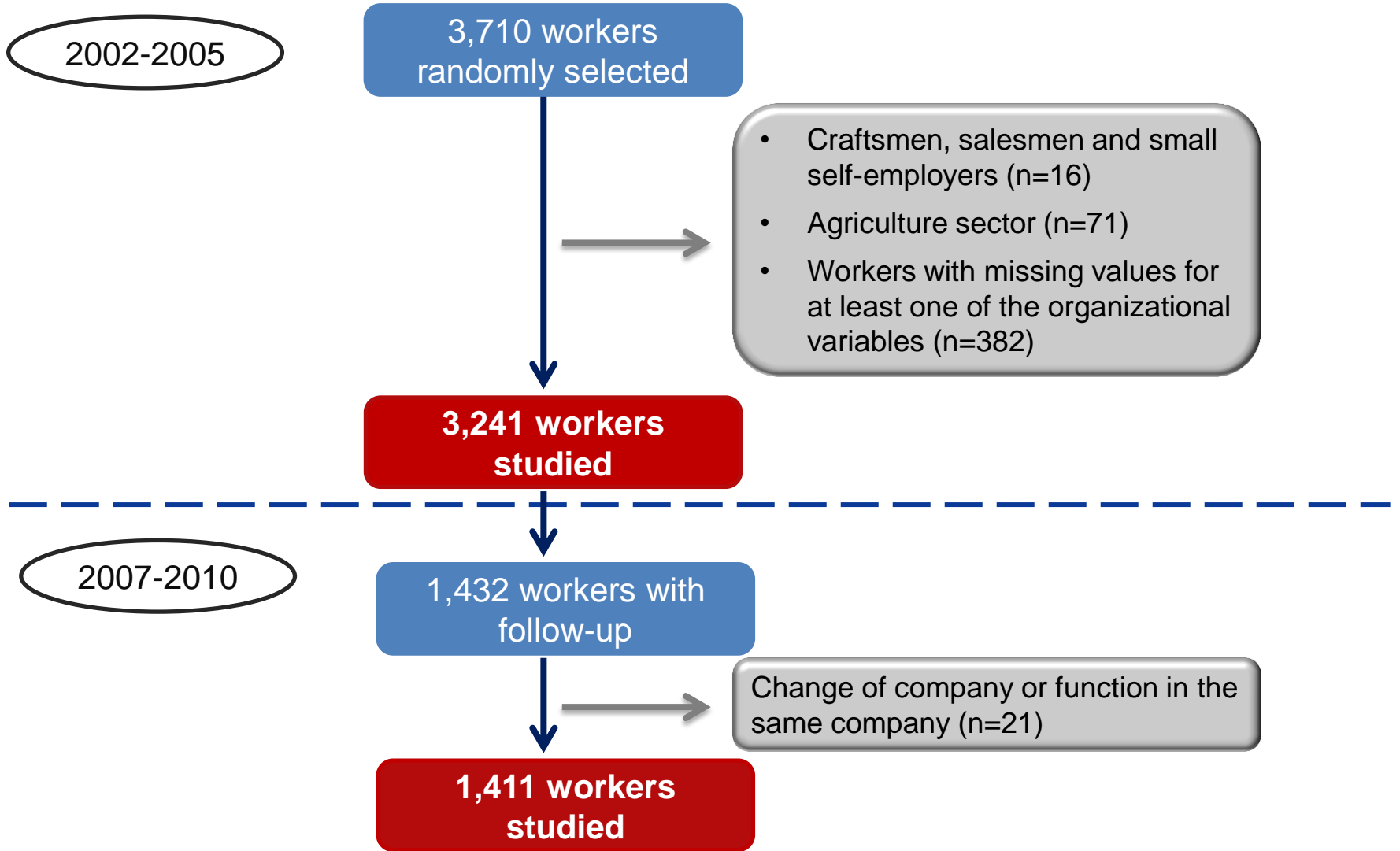
■ Baseline: 2002-2005

- ❑ Network of 83 occupational physicians (18% of OP of the region)
- ❑ 3,710 workers randomly selected
- ❑ **Self-administered questionnaire**
 - ❑ Individual factors
 - ❑ Work-related factors (work organization, biomechanical and psychosocial factors)
- ❑ **Physical examination** (Criteria document for evaluating the work-relatedness of MSD (Sluiter et al, 2001))

■ Follow-up: 2007-2010

- ❑ **Physical examination**

Methods: study sample



Methods: measures

- **16 organizational variables** (accessed by self-administered questionnaire)
 - Shift work
 - Job/task rotation
 - 5 variables measuring the work pace dependent on:
 - Paced work/automatic rate
 - Colleagues' work
 - Quantified targets
 - Permanent controls or surveillance
 - Customer demand
 - Repetitiveness of tasks
 - 8 variables measuring decision latitude assessed on the Job Content Questionnaire (JCQ)

- **MSDs** (diagnosed by occupational physicians)
 - Recommendations of the Criteria document for the evaluation of work-related MSDs (Sluiter et al. 2001)

Methods: statistical analysis

- Two methods used to identify patterns of work organization characteristics
 - Multiple correspondence factor analysis (MCA) and hierarchical cluster analysis (HCA)
 - Clustering of variables (Chavent et al, 2012) and HCA
- Associations between MSDs and patterns of work organization characteristics
 - Adjusted logistic regression models
 - Statistical significance: 0.05

Results

- 3,241 workers
 - Men: 59%
 - Mean age (std): 38.5 (10.4) years
 - Blue-collar workers: 43%
 - Industry sector:
 - Industry: 59%
 - Services: 36%
 - Construction: 5%
 - ~ 1,300 companies

Results

- Clustering of variables and hierarchical cluster analysis (HCA): best results
- 5 patterns of work organization characteristics
 - Technical/process constraints and weak decision latitude
 - Internal/external demand and mean decision latitude
 - Weak pace constraints and mean decision latitude
 - Internal/external demand and high decision latitude
 - Weak pace constraints and high decision latitude

Results

		Technical/process constraints and weak decision latitude (22%)	Internal/external demand and mean decision latitude (6%)	Weak pace constraints and mean decision latitude (19%)	Internal/external demand and high decision latitude (22%)	Weak pace constraints and high decision latitude (31%)
Shift work		x ^f				
Job/task rotation (≥1 per week)		x			x	x
Work pace dependent on:	Paced work/automatic rate	x				
	Colleagues' work	x	x		x	
	Quantified targets	x	x		x	
	Permanent controls/surveillance	x			x	
	Customer demand		x		x	
High repetitiveness of tasks		x				
Decision latitude	Allows own decisions					
	<i>Agree</i>		x	x		
	Totally agree				x	x
	Little decision freedom					
	<i>Disagree</i>		x	x		
	Totally disagree				x	x
	A lot of say					
	<i>Agree</i>		x	x		
	Totally agree				x	x
	Learn new things					
	<i>Agree</i>	x	x	x		
	Totally agree				x	x
	Requires creativity					
	<i>Agree</i>		x	x	x	
	Totally agree				x	x
	High skill level					
	<i>Agree</i>		x	x		x
	Totally agree				x	x
	Develop own abilities					
	<i>Agree</i>		x	x		
	Totally agree				x	x
	Variety					
	<i>Agree</i>		x	x		
	Totally agree				x	x

^fMore often exposed than the whole sample

Results: Associations with MSDs

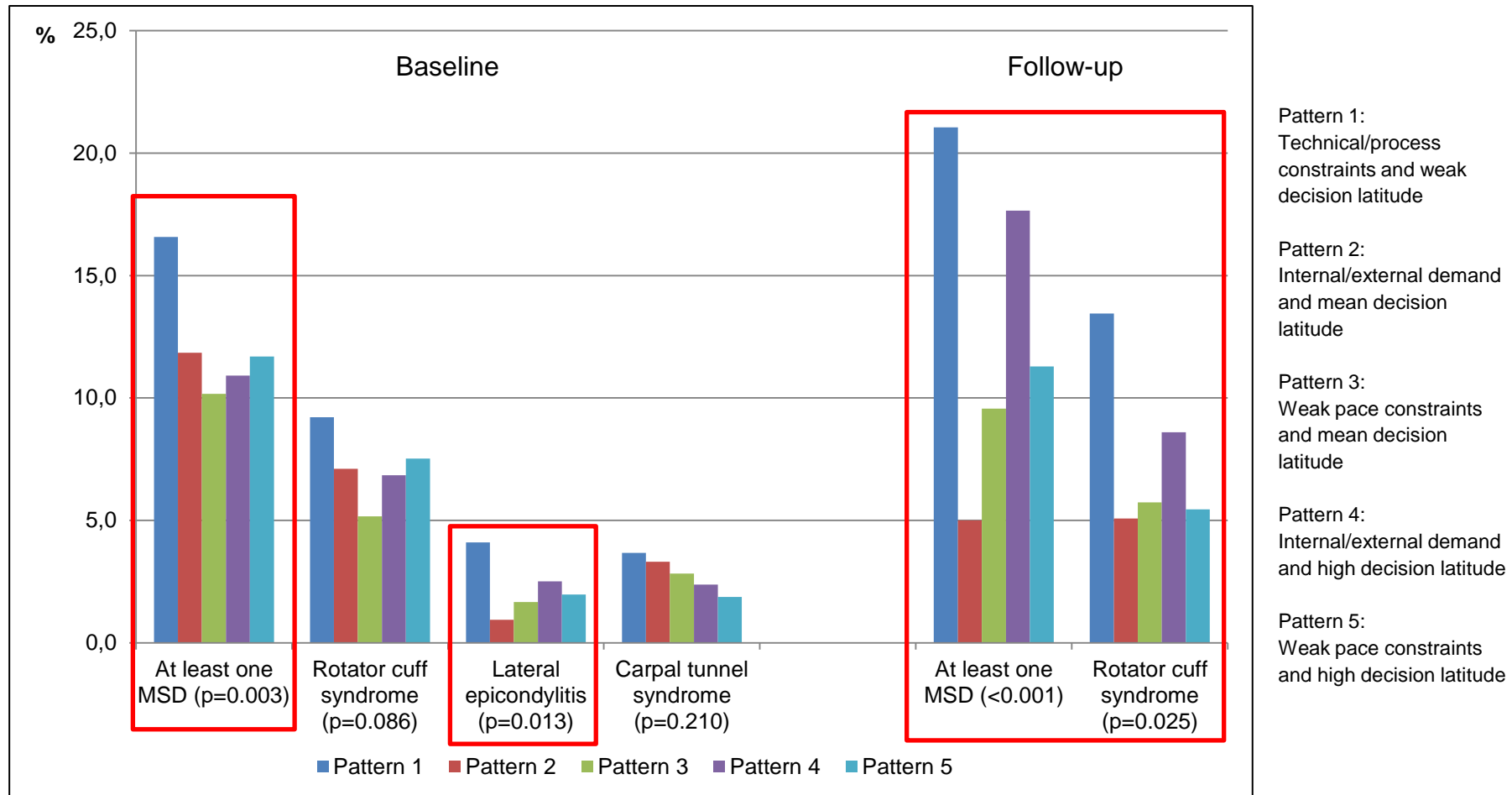
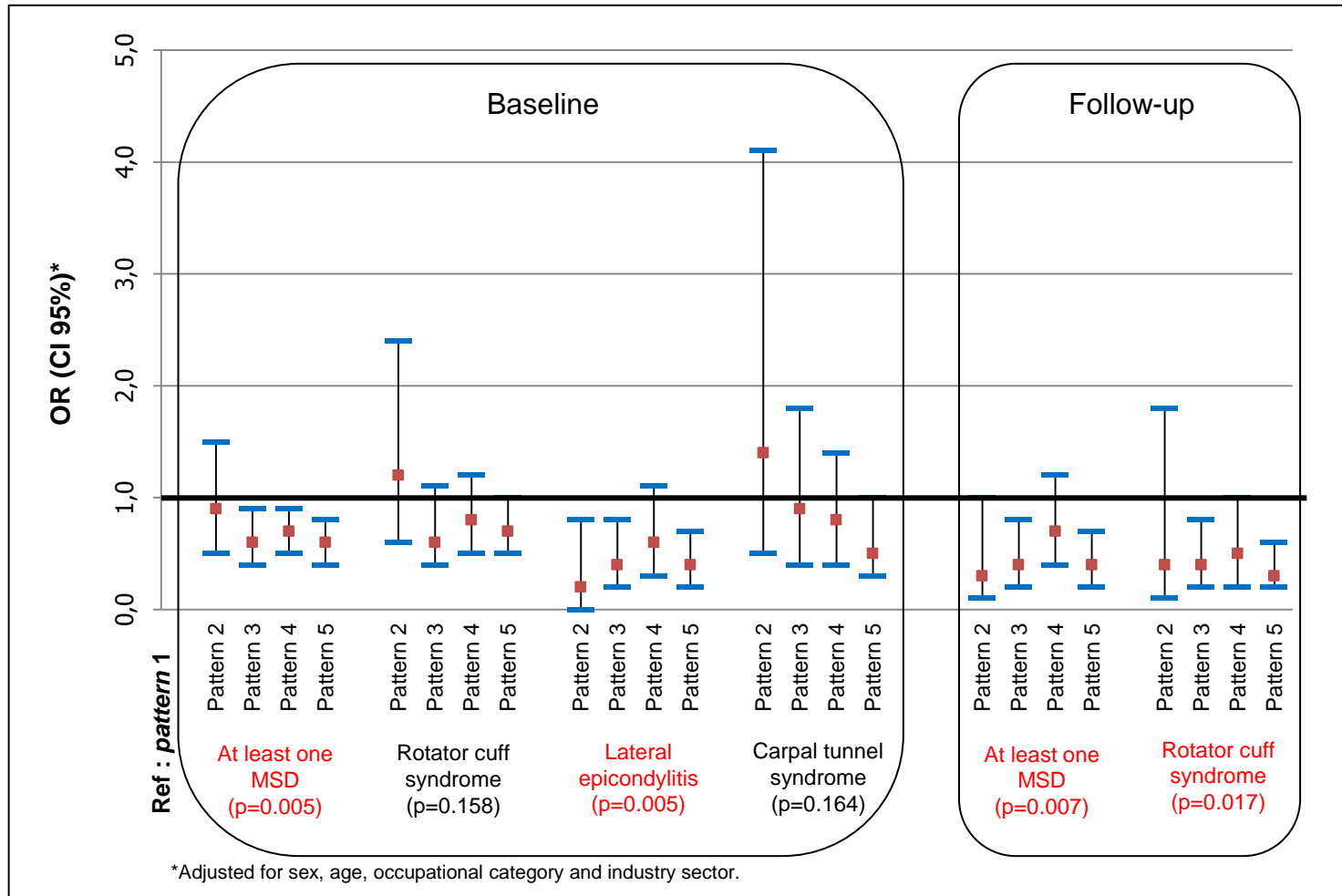


Figure 1: Prevalence of MSDs according to the five patterns of work organization characteristics

Results: Associations with MSDs



Pattern 1:
Technical/process constraints and weak decision latitude

Pattern 2:
Internal/external demand and mean decision latitude

Pattern 3:
Weak pace constraints and mean decision latitude

Pattern 4:
Internal/external demand and high decision latitude

Pattern 5:
Weak pace constraints and high decision latitude

Figure 2: Associations between the five patterns of work organization characteristics and MSDs

Discussion

■ Strengths

- Organizational variables
 - Chosen according to the literature
 - Questions derived from large French surveys
- MSDs clinically diagnosed by trained OPs
- Clustering of variables

■ Limitations

- Exposure data self-reported
- Worker level and no information available at the company level
- No questions about the use of quality standards, self-assessment of the quality of work, possibility of discussing the work organization, collective activity, or managerial practices

Conclusion

- Five patterns of work organization characteristics from sixteen organizational variables
- Workers with technical constraints and weak decision latitude had higher risks of MSDs than workers in other patterns of work organization characteristics
- Perspectives: study the relationships with biomechanical factors

**Thank you for your
attention**