

# The socio-economic distribution of health-related occupational stressors among wage-earners in a Post-Fordist labour market

by

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## Abstract

*Unequal exposure to occupational stressors is a central pathway towards socio-economic health inequalities in working populations. This paper assesses the differential exposure of such stressors within the population of Flemish wage-earners. Our focus is on differences in gender, age, skill levels, occupational and social class positions.*

## Method

*The analyses are based on the "Flemish Quality of Labour Monitor 2004" (Vlaamse Werkbaarheidsmonitor 2004), a cross-sectional representative sample (N=11,099) of 16- to 65-year-old wage-earners, living in Flanders. The investigated health-related working conditions are: high quantitative, emotional and physical demands, frequent repetitive movements, atypical work schedules, frequent overtime work and schedule changes, low job autonomy, task variation and superior-support, high job insecurity and exposure to bullying. The distribution of the working conditions is assessed by means of standard logistic regression analyses. Also gender specific analyses are performed.*

## Results

*At least two clusters of health-related occupational stressors can be identified. On the one hand, high physical demands, atypical schedules, low control over the work environment and high job insecurity are more common in manual, unskilled and subordinate workers. On the other hand, high quantitative and emotional demands, as well as schedule unpredictability are characteristic of higher skilled, professional and managerial employees.*

## Conclusion

*Since little empirical information on the socio-economic distribution of various health-related occupational stressors is available for Flanders, our results are important for obtaining more insight into the pathways linking occupational health risks to socio-economic health inequalities in the Flemish wage-earning population.*

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## Keywords

*Age distribution, Belgium, gender, health inequality, occupational health, occupational groups, social class, socio-economic factors*

## Introduction

In the past forty years, Western capitalist societies have been characterised by profound socio-economic changes, among others in the world of work (1). The theorists of the regulation school have proclaimed a shift between the ideal types of *Fordist* and *Post-Fordist* production systems (2). Nowadays Post-Fordist work differs from the Fordist “ideal type” of employment conditions in a number of respects. The Fordist production system was characterised by full, life-time employment, in a bureaucratically organised system of industrial mass production, embedded within the context of a national economy (3). In the Post-Fordist ideal type, the content of work has shifted towards the flexible combination of skills in problem-identifying and -solving processes for the production of material and immaterial goods and services (4), within the context of a more deregulated open world economy and a demographically diversified workforce (1). In the labour process these shifts brought along new health-affecting working conditions, like various immaterial stressors (5). Besides, also the employment relations changed. The erosion of the standard employment contract leads to additional stressful demands related to temporal and contractual flexibility, job insecurity, limited social protection, etc. (6;7). In addition, increased claims on personal relation skills led to occupational stress related to problematic social contacts with co-workers, clients or patients (8,9).

It has been demonstrated in many studies that physical and mental distress, caused by these new working conditions, reduce general well-being and can cause health problems, ranging from mental health and physical complaints, over cardiovascular morbidity and mortality (10-12). Known risk factors are high quantitative and qualitative work loads, low control over the work environment (13-17), contractual and temporal flexibility (18-21), job insecurity (22,23) and unfavourable social relations at work (24-26). The main focus of this paper is on the differential distribution of a broad number of these occupational stressors: quantitative, emotional, physical and flexibility-related demands, aspects of low control over the work environment, job insecurity and negatively perceived social relationships at work. Although for each of these stressors, there is abundant evidence relating them to various outcomes of physical and psychological distress, only a very limited amount of empirical studies has specifically investigated the issue of their social distribution (27,28).

Today, the most important social mechanisms that structure general life chances in the population are credentials (educational certificates or recognised experience) and social class relations (29). Credentials are mechanisms distributing the resource of valuable knowledge in society (30), while social class is the general mechanism distributing the material surplus generated by the labour process as a consequence of wage-labour (31). Attached to the so-

cial class mechanism are relations of authority of the employers over the work of employees (31). Because they are such general social mechanisms, credentials and social class can be assumed to be critical in the distribution of occupational stressors too. In addition, social class and credentials are important underlying factors constituting occupational classifications (32), although specific task- and sector-related characteristics are usually also included as additional criteria in defining occupational categories. In this paper, a compound occupational classification, credentials and social class are the central socio-economic variables used for investigating the differential distribution of health-related occupational stressors.

Notwithstanding the lack of attention in occupational health research, the differential exposure of work-related health risks is of much importance to social epidemiology, since it provides a central pathway for explaining the contribution of “work” to the (re)production of socio-economic differences in health (33). In most studies investigating the health effects of occupational stressors, this social and occupational distribution is only obliquely addressed. With this paper we want to provide a valuable reference, empirically documenting this important, but often neglected, assumption of differential socio-economic exposure to health-related occupational stressors.

## **Methods**

### Participants

In this study, we use data from the Flemish Quality of Labour Monitor 2004 (Vlaamse Werkbaarheidsmonitor 2004), conducted by the Socio-Economic Council of Flanders. The Flemish region can be conceived as an example of a Post-Fordist service economy, with a high number of female and highly educated workers, predominantly employed in the service and public sectors. By using the official employee registry as the sampling frame for this survey, a representative sample of the Flemish labour market was obtained (34). Of an initial random sample of 20,000 wage-earners, 12,095 respondents returned a usable copy (60.6 % response rate). Of these, 996 individuals were excluded, because they were not working as wage-earners at the moment they filled in the questionnaire. Our analyses are based on the remaining 11,099 cases. All respondents were administered questionnaires about working conditions in a broad sense: psychosocial and physical stressors, organisational and contractual features, etc. In addition, information was gathered on health outcomes and demographic and socio-economic characteristics.

### Variables included in the analyses

#### *Psychosocial item scales*

The questionnaire contains 44 individual items, each consisting of four answer categories: “always”, “often”, “sometimes”, “never” (34). Theoretically they represent five dimensions: job autonomy (11 items), task variation (6 items), quantitative demands (11 items), emotional demands (7 items) and the relationship with direct superiors (9 items). These scales are all

taken from the Dutch Questionnaire on the Perception and Evaluation of Labour (Vragenlijst voor de Beleving en Beoordeling van Arbeid – VBBA) (35). The VBBA-quality of labour-questionnaire has been tested frequently and the measurement scales are found to be one-dimensional, reliable and valid (35,36). This can be confirmed for the data analysed in this paper (37). General scale descriptives are reported in table 1. The indicators are constructed by adding up individual item scores with a range from 0 (favourable) to 3 (problematic) and placing them on a scale that is subsequently standardised to a 0 to 100-range by using this formula:  $(\text{individual score} / (3 * \text{number of items in a scale})) * 100$ . If missing values on a scale are randomly distributed and do not reach over 1/3 of all items in the scale, mean substitution is used. If these conditions are not satisfied, the scale score of a respondent is coded as missing. The psychosocial scales are subsequently categorised into tertiles. Although relating them to the independent variables as parametric summed item scales would have been possible too, we have adopted a categorical approach, mainly for reasons of interpretability. Notwithstanding a known loss of information, a comparison of the chances of belonging to an “acute category” of the risk factors seemed to be more comprehensible than comparing abstract mean scores. Furthermore, it allows us to apply a uniform methodology over all the stressors investigated. A tertile categorisation proved to be the best compromise between sensitivity and parsimony – as appeared from additional analyses (results not shown).

#### *Physical working conditions*

The physical workload is measured by eight items: vibrations, noise, extreme temperatures, dangerous substances, dangerous situations, physically heavy work, inconvenient working postures and repetitive movements of hands and arms. Based on an unrotated Principal Components Analysis, these initial indicators – except repetitive movements – are recoded into one dimension representing the general physical workload (Table 1). For the scale construction the same procedure as described above has been used. The indicator for repetitive movements of hands and arms is used as a single item dichotomy, indicating the frequency of repetitive movements as “never or sometimes” and “often or always”.

Table 1: Description of the scales – Flemish Quality of Labour Monitor, Belgium, 2004

	<b>N</b>	<b>Cronbach's Alpha</b>	<b>Mean</b>	<b>Median</b>	<b>Std. Dev.</b>
Quantitative demands	10,991	.89	44.70	42.42	17.35
Emotional demands	10,987	.80	26.78	23.81	17.07
Physical demands	10,663	.85	41.29	35.71	15.64
Autonomy	10,999	.91	45.86	45.45	22.38
Task variation	10,999	.82	42.51	38.89	21.81
Relationship with superior	10,977	.90	28.86	25.93	19.96

### *Other health-related occupational characteristics*

Types of work schedules are subdivided into two categories: “fixed day work” versus “atypical work” (a.o. night work, rotating shift systems and non-standard daytime shifts). Work schedule flexibility, conceived as the occurrence of sudden schedule changes, is subdivided into “never or sometimes” and “always or often”, while overtime work is also included as a dichotomy consisting of the same categories. Next, subjective job insecurity represents the chance of becoming unemployed as “inexistent to low” versus “very high to medium high”. Finally, a variable for bullying behaviour is included as a dichotomy, contrasting between “at least sometimes” and “never”, within a reference period of one year.

### *Social and occupational indicators*

The analyses are performed among women and men separately. Age is included in the models as an independent and controlling variable. The age-categories correspond to three main periods in a working career: lift-off (16-29 years), a mid-career period (30-49 years) and the end-of-career period (50 years or older). The occupational classification consists of eight categories: un-/semi-schooled workers, schooled manual workers, educational professionals, health care professionals, other professionals, middle managers, higher managers and non-manual routine workers, which is the reference category. The dimension of credentialed skills is a constructed indicator, inspired by Parkin’s notion of credentialism (38). Respondents with no or lower secondary education and those who combine higher secondary education with un-/semi-schooled manual, non-manual routine, educational or healthcare occupations are classified as lower skilled. Schooled manual workers, professionals and managerial employees with higher secondary educational attainment, as well as manual, non-manual routine, educational and healthcare workers with higher non-university educational attainment are categorised into the semi-skilled-category. Finally, professionals and managerial employees with non-university higher education and all respondents with a university degree are classified as experts. Class relations are defined by real economic ownership and its prerogative of strategic policy-making and surveillance authority over employees (29). In this regard, Clement and Myles (31) suggest to make a distinction between higher managers, who combine strategic decision-making and surveillance authorities and supervisors, having no strategic decision-making authority, but only delegated surveillance authority. In addition, there is the category of employees, who lack both properties. The indicator resulting from this distinction is constructed by cross-classifying the occupational qualification of “higher manager” with the property of having authority over other employees.

### *Analytical procedure*

The socio-economic distribution of the stressors is assessed through a number of standard logistic regression analyses. Age-controlled analyses are performed in women and men separately. The individual parameter effects are reported as odds ratios with 95% confidence intervals, indicating the extent of difference in exposure compared to a reference category (Tables 3-5). In addition, Wald statistics and their related p-values give an indication of the

significance of the overall effects of the independent variables. It should moreover be noticed that the magnitude of the odds ratio of a certain category of an independent variable in men may not be compared to the same category in women (and vice versa).

Table 2: Descriptives for the categorical variables – Flemish Quality of Labour Monitor, Belgium, 2004

	N	%			N	%	
Gender		Overall		Age		Overall	
Women	4,902	47.5		16-29 years	2,106	20.5	
Men	5,409	52.5		30-49 years	6,378	61.9	
				50 years and older	1,810	17.6	
		Men	Women			Men	Women
Quantitative demands				Low autonomy			
Highest tertile	3,447	32.3	30.0	Highest tertile	3,546	32.3	32.1
Lowest and middle tertile	7,544	67.7	70.0 <sup>*</sup>	Lowest and middle tertile	7,453	67.7	67.9
Emotional demands				Low task variation			
Highest tertile	3,162	26.8	30.9	Highest tertile	3,510	28.1	36.2
Lowest and middle tertile	7,825	73.2	69.1 <sup>***</sup>	Lowest and middle tertile	7,489	71.9	63.8 <sup>***</sup>
Physical demands				Low support			
Highest tertile	3,650	46.9	20.1	Highest tertile	3,393	33.2	28.3
Lowest and middle tertile	7,013	53.1	79.9 <sup>***</sup>	Lowest and middle tertile	7,584	66.8	71.7 <sup>***</sup>
Repetitive movements				Overtime work			
Always-often	3,750	34.2	36.6	Always-often	3,472	35.3	29.6
Never-sometimes	6,879	65.8	34.2 <sup>*</sup>	Never-sometimes	7,205	64.7	70.4 <sup>***</sup>
Type of work schedule				Schedule changes			
Atypical schedule	2,654	25.6	23.9	Always-often	1,560	17.8	11.4
Fixed daytime work	7,956	74.4	76.1 <sup>*</sup>	Never-sometimes	9,122	82.2	88.6 <sup>***</sup>
Bullying behaviour				Job insecurity			
Sometimes-always	1,527	14.4	14.3	High	2,385	23.6	20.9
No	9,108	85.6	85.7	Low	8,316	76.4	79.1 <sup>**</sup>
Occupational categories				Skill			
Un-/semi-schooled man.	1,484	15.3	13.3	Lower skilled	4,666	45.1	46.2
Schooled manual	2,126	32.5	7.5	Semi-skilled	3,582	33.1	37.1
Educational prof.	880	4.5	13.1	Expert	1,977	21.7	16.7 <sup>***</sup>
Healthcare prof.	801	1.6	14.5	Social class			
Other prof.	773	8.5	6.3	Workers	8,311	69.1	87.8
Middle managers	760	9.6	4.5	Supervisors	1,890	24.0	10.2
Higher managers	490	7.1	2.0	Higher management	490	6.9	1.9 <sup>***</sup>
Non-manual routine	2,995	20.8	38.7 <sup>***</sup>				

Significance levels Chi<sup>2</sup> statistics: <sup>\*</sup> p < .05; <sup>\*\*</sup> p < .01; <sup>\*\*\*</sup> p < .001

Table 3: Distribution of highest tertiles of quantitative, emotional and physical demands over socio-economic categories – overall and gender specific analyses (ORs – 95% CIs) – Flemish Quality of Labour Monitor, Belgium, 2004

	High quantitative demands		High emotional demands		High physical demands		Frequent repetitive movements	
	Women	Men	Women	Men	Women	Men	Women	Men
Age (N)	(4,846)	(5,347)	(4,851)	(5,337)	(4,702)	(5,169)	(4,687)	(5,160)
Wald	6.99*	18.25***	0.17	21.87***	8.34*	46.37***	6.07*	3.75
16-29 years	0.86 (0.69-1.06)	0.78 (0.64-0.94)	1.04 (0.84-1.29)	0.62 (0.51-0.77)	1.42 (1.10-1.84)	1.77 (1.48-2.12)	0.78 (0.64-0.95)	1.20 (0.99-1.44)
30-49 years	1.06 (0.88-1.27)	1.10 (0.95-1.28)	1.04 (0.86-1.25)	0.89 (0.77-1.04)	1.37 (1.09-1.72)	1.56 (1.35-1.80)	0.84 (0.71-1.00)	1.06 (0.92-1.24)
50 years and older	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Occ. Categories (N)	(4,613)	(5,110)	(4,619)	(5,103)	(4,631)	(5,118)	(4,615)	(5,110)
Wald	75.42**	221.93***	520.17***	587.31***	458.12**	1,257.49***	483.99***	345.72***
Un-/semi-schooled man.	1.03 (0.84-1.27)	0.94 (0.76-1.16)	0.34 (0.25-0.46)	0.31 (0.23-0.40)	4.88 (3.92-6.08)	6.78 (5.50-8.36)	2.19 (1.81-2.66)	2.41 (1.99-2.92)
Schooled manual	0.91 (0.69-1.19)	0.99 (0.83-1.17)	0.53 (0.38-0.74)	0.37 (0.30-0.45)	5.63 (4.34-7.30)	8.31 (6.96-9.93)	2.02 (1.59-2.56)	1.30 (1.10-1.52)
Educational prof.	1.05 (0.85-1.29)	0.77 (0.55-1.09)	2.56 (2.10-3.12)	2.91 (2.16-3.92)	0.43 (0.30-0.63)	0.45 (0.30-0.67)	0.19 (0.14-0.24)	0.35 (0.24-0.51)
Healthcare prof.	1.12 (0.92-1.37)	1.05 (0.64-1.74)	5.23 (4.31-6.35)	5.97 (3.65-9.75)	3.52 (2.83-4.37)	1.22 (0.76-1.98)	0.37 (0.30-0.45)	0.27 (0.14-0.53)
Other prof.	1.92 (1.48-2.49)	1.75 (1.38-2.22)	1.87 (1.43-2.45)	1.23 (0.97-1.57)	0.36 (0.21-0.63)	0.34 (0.24-0.47)	0.54 (0.41-0.71)	0.63 (0.49-0.81)
Middle managers	2.41 (1.79-3.24)	3.05 (2.43-3.82)	3.24 (2.40-4.38)	2.33 (1.86-2.92)	1.15 (0.75-1.75)	0.86 (0.67-1.11)	0.30 (0.21-0.43)	0.45 (0.35-0.58)
Higher managers	2.80 (1.82-4.29)	3.07 (2.39-3.95)	3.45 (2.25-5.29)	2.94 (2.29-3.78)	0.51 (0.22-1.18)	0.33 (0.23-0.48)	0.21 (0.11-0.39)	0.25 (0.17-0.35)
Non-manual routine	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Skill (N)	(4,794)	(5,269)	(4,799)	(5,259)	(4,652)	(5,095)	(4,637)	(5,088)
Wald	86.31***	181.65***	227.23***	213.25***	74.14***	550.15***	226.46***	204.78***
Expert	2.25 (1.90-2.67)	2.65 (2.28-3.07)	2.94 (2.47-3.51)	3.14 (2.69-3.67)	0.32 (0.25-0.42)	0.10 (0.08-0.12)	0.30 (0.25-0.36)	0.29 (0.25-0.35)
Semi-skilled	1.12 (1.11-1.47)	1.14 (0.99-1.30)	2.66 (2.31-3.07)	1.45 (1.25-1.68)	0.79 (0.68-0.92)	0.79 (0.69-0.89)	0.44 (0.39-0.51)	0.62 (0.54-0.71)
Lower skilled	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Social class (N)	(4,667)	(5,134)	(4,673)	(5,127)	(4,682)	(5,143)	(4,667)	(5,134)
Wald	53.01**	198.89***	83.76**	230.30***	9.84**	139.75***	34.80**	99.34**
Higher management	2.71 (1.78-4.12)	3.28 (2.62-4.10)	2.59 (1.70-3.92)	4.52 (3.60-5.67)	0.28 (0.12-0.64)	0.13 (0.91-0.18)	0.25 (0.14-0.46)	0.21 (0.15-0.29)
Supervisors	1.79 (1.48-2.18)	2.20 (1.92-2.52)	2.25 (1.85-2.72)	2.13 (1.85-2.46)	1.10 (0.87-1.38)	0.96 (0.84-1.09)	0.65 (0.53-0.80)	0.70 (0.61-0.80)
Workers	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Gender specific models: all effects controlled for age; Significance of the Wald statistics: \*p < .05; \*\*p < .01; \*\*\*p < .001

Table 4: Distribution of highest tertiles of repetitive movements, atypical work schedules and overtime work over socio-economic categories – overall and gender specific analyses (ORs – 95% CIs) – Flemish Quality of Labour Monitor, Belgium, 2004

	Atypical work schedules		Frequent overtime work		Sudden schedule changes		Low autonomy	
	Women	Men	Women	Men	Women	Men	Women	Men
Age (N)	(4,713)	(5,187)	(4,704)	(5,178)	(4,717)	(5,174)	(4,852)	(5,346)
Wald	8.82 <sup>*</sup>	27.05 <sup>**</sup>	17.71 <sup>**</sup>	32.25 <sup>**</sup>	24.34 <sup>**</sup>	12.71 <sup>*</sup>	2.62	13.95 <sup>**</sup>
16-29 years	1.40 (1.11-1.77)	1.75 (1.42-2.17)	1.60 (1.28-2.00)	1.63 (1.35-1.97)	2.17 (1.55-3.03)	1.45 (1.14-1.84)	0.85 (0.69-1.04)	1.43 (1.19-1.73)
30-49 years	1.18 (0.96-1.45)	1.63 (1.37-1.94)	1.34 (1.10-1.63)	1.50 (1.29-1.75)	1.49 (1.09-2.03)	1.41 (1.16-1.71)	0.93 (0.77-1.11)	1.05 (0.90-1.23)
50 years and older	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Occ. Categories (N)	(4,644) <sup>***</sup>	(5,142) <sup>***</sup>	(4,630) <sup>***</sup>	(5,129) <sup>***</sup>	(4,643) <sup>***</sup>	(5,125) <sup>***</sup>	(4,622) <sup>***</sup>	(5,111) <sup>***</sup>
Wald	732.66 <sup>***</sup>	367.82 <sup>***</sup>	448.00 <sup>***</sup>	697.79 <sup>***</sup>	141.54 <sup>***</sup>	320.67 <sup>***</sup>	226.06 <sup>***</sup>	454.68 <sup>***</sup>
Un-/semi-schooled man.	3.86 (3.11-4.79)	2.40 (1.96-2.95)	0.50 (0.38-0.65)	0.63 (0.50-0.78)	1.23 (0.88-1.72)	0.85 (0.65-1.12)	3.31 (1.91-2.80)	2.82 (2.32-3.42)
Schooled manual	3.13 (2.40-4.07)	1.66 (1.39-1.98)	0.61 (0.44-0.84)	0.70 (0.59-0.84)	1.35 (0.91-2.00)	0.82 (0.65-1.03)	<b>2.04 (1.60-2.58)</b>	1.53 (1.30-1.80)
Educational prof.	0.42 (0.29-0.60)	0.20 (0.11-0.37)	3.71 (3.04-4.52)	1.92 (1.42-2.60)	0.85 (0.59-1.23)	0.45 (0.26-0.78)	0.81 (0.65-1.00)	0.60 (0.42-0.84)
Healthcare prof.	10.33 (8.38-12.72)	7.86 (4.81-12.86)	1.65 (1.35-2.01)	1.40 (0.88-2.23)	3.02 (2.33-3.92)	2.17 (1.30-3.63)	1.21 (1.00-1.46)	1.19 (0.74-1.91)
Other prof.	0.24 (0.13-0.45)	0.27 (0.18-0.40)	3.12 (2.41-4.04)	2.70 (2.14-3.42)	2.26 (1.57-3.26)	1.90 (1.43-2.53)	0.40 (0.28-0.56)	0.28 (0.20-0.39)
Middle managers	0.50 (0.29-0.86)	0.61 (0.46-0.82)	4.45 (3.29-6.00)	5.34 (4.22-6.76)	3.75 (2.58-5.47)	3.09 (2.38-4.00)	0.24 (0.15-0.38)	0.23 (0.16-0.32)
Higher managers	0.22 (0.07-0.69)	0.17 (0.10-0.28)	16.69 (9.58-29.05)	12.36 (9.14-16.72)	5.31 (3.25-8.69)	5.44 (4.12-7.18)	0.08 (0.02-0.24)	0.04 (0.02-0.09)
Non-manual routine	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Skill (N)	(4,664) <sup>***</sup>	(5,112) <sup>***</sup>	(4,653) <sup>***</sup>	(5,104) <sup>***</sup>	(4,666)	(5,099) <sup>***</sup>	(4,801) <sup>***</sup>	(5,270) <sup>***</sup>
Wald	125.80 <sup>***</sup>	233.12 <sup>***</sup>	331.19 <sup>***</sup>	555.82 <sup>***</sup>	49.73 <sup>**</sup>	181.07 <sup>***</sup>	157.13 <sup>***</sup>	352.72 <sup>***</sup>
Expert	0.20 (0.15-0.26)	0.15 (0.12-0.19)	5.00 (4.18-5.99)	6.41 (5.48-7.50)	2.34 (1.85-2.97)	3.02 (2.54-3.60)	0.25 (0.20-0.31)	0.14 (0.11-0.17)
Semi-skilled	0.92 (0.80-1.06)	0.73 (0.64-0.84)	2.68 (2.31-3.12)	1.52 (1.32-1.75)	1.36 (1.10-1.68)	1.11 (0.93-1.33)	0.70 (0.61-0.80)	0.56 (0.49-0.63)
Lower skilled	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Social class (N)	(4,696)	(5,165)	(4,683) <sup>***</sup>	(5,153) <sup>***</sup>	(4,696)	(5,150) <sup>***</sup>	(4,675)	(5,134) <sup>***</sup>
Wald	16.94 <sup>**</sup>	73.76 <sup>***</sup>	183.38 <sup>***</sup>	458.29 <sup>***</sup>	63.85 <sup>***</sup>	256.29 <sup>***</sup>	85.67 <sup>***</sup>	212.44 <sup>***</sup>
Higher management	0.11 (0.03-0.34)	0.12 (0.07-0.21)	13.49 (7.81-23.32)	13.52 (10.23-17.87)	3.88 (2.43-6.21)	6.16 (4.85-7.82)	0.06 (0.20-0.20)	0.03 (0.01-0.06)
Supervisors	0.82 (0.65-1.04)	0.76 (0.66-0.89)	2.74 (2.26-3.32)	2.65 (2.31-3.03)	2.19 (1.71-2.81)	2.23 (1.89-2.63)	0.35 (0.27-0.46)	0.38 (0.33-0.45)
Workers		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Gender specific models: all effects controlled for age.; Significance of the Wald statistics: \* p &lt; .05; \*\* p &lt; .01; \*\*\* p &lt; .001

Table 5: Distribution of highest tertiles of sudden schedule changes, low autonomy and low task variation over socio-economic categories – overall and gender specific analyses (ORs – 95% CIs) – Flemish Quality of Labour Monitor, Belgium, 2004

	Low task variation		High job insecurity		Low support		Exposure to bullying	
	Women	Men	Women	Men	Women	Men	Women	Men
Age (N)	(4,856)	(5,342)	(4,719)	(5,186)	(4,844)	(5,332)	(4,685)	(5,161)
Wald	4.93	18.97**	24.32**	18.23**	3.41	7.94*	11.69*	15.24**
16-29 years	0.80 (0.65-0.97)	1.56 (1.28-1.90)	1.87 (1.45-2.41)	1.50 (1.21-1.86)	0.85 (0.69-1.06)	0.87 (0.72-1.06)	0.61 (0.46-0.81)	0.64 (0.49-0.83)
30-49 years	0.87 (0.73-1.04)	1.27 (1.08-1.50)	1.44 (1.14-1.81)	1.43 (1.20-1.71)	0.98 (0.82-1.19)	1.09 (0.94-1.27)	0.97 (0.77-1.23)	1.00 (0.82-1.22)
50 years and older	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Occ. Categories (N)	(4,624)	(5,108)	(4,645)	(5,137)	(4,616)	(5,097)	(4,613)	(5,109)
Wald	569.18***	448.71***	131.77***	133.19***	5.99	25.44*	4.64	30.41**
Un-/semi-schooled man.	2.58 (2.12-3.15)	2.13 (1.76-2.58)	1.85 (1.50-2.28)	2.18 (1.76-2.67)	0.87 (0.71-1.07)	1.28 (1.05-1.55)	1.07 (0.82-1.38)	1.31 (1.02-1.69)
Schooled manual	1.39 (1.10-1.76)	0.78 (0.66-0.92)	1.49 (1.14-1.93)	1.29 (1.07-1.55)	0.90 (0.70-1.18)	1.04 (0.88-1.23)	1.03 (0.74-1.44)	0.99 (0.80-1.24)
Educational prof.	0.05 (0.04-0.08)	0.16 (0.10-0.26)	0.54 (0.41-0.71)	0.45 (0.29-0.71)	0.96 (0.78-1.18)	1.06 (0.78-1.44)	0.94 (0.72-1.23)	1.27 (0.86-1.86)
Healthcare prof.	0.47 (0.40-0.58)	0.44 (0.25-0.78)	0.45 (0.34-0.58)	0.44 (0.22-0.89)	0.84 (0.68-1.03)	0.91 (0.56-1.48)	0.94 (0.73-1.23)	1.38 (0.77-2.49)
Other prof.	0.16 (0.11-0.23)	0.28 (0.21-0.38)	0.88 (0.64-1.21)	0.87 (0.65-1.15)	0.79 (0.60-1.06)	0.77 (0.60-0.99)	0.99 (0.69-1.41)	0.56 (0.38-0.81)
Middle managers	0.20 (1.33-0.30)	0.17 (0.12-0.24)	0.83 (0.57-1.21)	0.82 (0.62-1.08)	0.87 (0.63-1.21)	0.87 (0.69-1.10)	0.79 (0.51-1.23)	0.84 (0.61-1.16)
Higher managers	0.06 (0.02-0.16)	0.09 (0.05-0.15)	0.53 (0.28-1.01)	0.63 (0.45-0.89)	0.77 (0.47-1.26)	0.74 (0.56-0.97)	0.54 (0.26-1.12)	0.66 (0.45-0.96)
Non-manual routine	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Skill (N)	(4,804)	(5,264)	(4,668)	(5,112)	(4,793)	(5,254)	(4,636)	(5,086)
Wald	438.36***	304.12***	60.88**	51.24**	7.04*	12.64*	1.81	15.23**
Expert	0.13 (0.11-0.17)	0.17 (0.14-0.21)	0.70 (0.58-0.86)	0.57 (0.47-0.68)	1.11 (0.92-1.33)	0.76 (0.65-0.89)	0.94 (0.74-1.20)	0.65 (0.52-0.81)
Semi-skilled	0.35 (0.30-0.40)	0.51 (0.44-0.58)	0.52 (0.44-0.62)	0.67 (0.58-0.78)	1.21 (1.05-1.39)	0.96 (0.84-1.09)	1.10 (0.91-1.32)	0.90 (0.76-1.08)
Lower skilled	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Social class (N)	(4,678)	(5,131)	(4,698)	(5,160)	(4,666)	(5,120)	(4,666)	(5,134)
Wald	99.81***	206.42***	4.20	36.33***	1.57	6.21*	2.79	5.97
Higher management	0.07 (0.03-0.19)	0.09 (0.06-0.15)	0.54 (0.29-1.02)	0.49 (0.36-0.67)	0.82 (0.51-1.34)	0.74 (0.58-0.95)	0.54 (0.26-1.12)	0.65 (0.46-0.92)
Supervisors	0.35 (0.27-0.44)	0.37 (0.32-0.44)	0.90 (0.71-1.15)	0.69 (0.59-0.81)	0.90 (0.72-1.11)	1.02 (0.89-1.17)	0.97 (0.74-1.27)	0.95 (0.79-1.14)
Workers	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Gender specific models: all effects controlled for age; Significance of the Wald statistics: \*p < .05; \*\*p < .01; \*\*\*p < .001

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## Results

### Descriptive results

In table 2 the overall absolute numbers of the categories of the dependent and independent variables are shown, as well as their gender-specific prevalence. When looking at the occupational stressors that are used as outcome variables in the further analyses, significant gender differences in exposure can be seen for most of them, except for low autonomy and bullying behaviour. Men are more exposed to high quantitative and physical demands of work, atypical work schedules, low social support, overtime work, frequent schedule changes and high job insecurity. Women, on the other hand, find themselves more often in a situation of high emotional demands, frequent repetitive movements and low task variation. Also significant gender differences exist for the independent socio-economic indicators. Women are overrepresented as healthcare and educational professionals and as non-manual routine workers. In addition, there is a lower proportion of women in expert level, supervising and higher managerial positions.

### The age-corrected socio-economic distribution of the occupational stressors

In tables 3 to 5 the gender-specific distribution of the occupational stressors according to age, occupation, credentialed skills and social class is reported. All the reported results are controlled for age. The reference categories of the independent variables are employees of 50 years and older, non-manual routine occupations, lower skilled and workers without authority.

#### Age

Younger employees have a higher chance of being exposed to high physical demands, frequent overtime work, schedule changes and high job insecurity. In addition, also atypical work schedules are more prevalent in female employees belonging to the youngest age category, while for male workers, the oldest age category shows a lower prevalence of atypical work schedules. Low task variation and low autonomy are more frequently reported in the youngest male age category, compared to the oldest. For women, however, there are no significant age differences in (low) task variation and autonomy. High quantitative demands and exposure to bullying are significantly less prevalent among the youngest respondents. Furthermore, high emotional demands in men, and frequent repetitive movements in women are slightly more prevalent in the oldest age group. Low social support shows no clear age-variation.

#### Occupational categories

First, there is a series of occupational risk factors that tend to be more prevalent in manual occupations. Unsurprisingly, manual occupations have a markedly higher exposure to physical demands and frequent repetitive movements, compared to non-manual occupations. This pattern can be seen in both women and men, although it is somewhat stronger in men. Fe-

male healthcare occupations also have elevated odds for exposure to high physical working conditions. Atypical work schedules are more common in manual occupations and healthcare professionals. Interestingly, the contrast in the prevalence of atypical schedules between manual and healthcare occupations on the one hand, and non-manual on the other hand, is bigger in women than in men. High job insecurity is another risk factor that is typical for manual occupations, while healthcare (and educational) professionals are the most advantaged categories with regard to this outcome. Finally, also the conceptually and empirically related occupational stressors of low autonomy and low task variation are more apparent in (lower skilled) manual occupations. Specifically among women steep differences with non-manual workers are seen. Furthermore, the reference category of non-manual routine employees also shows a relatively high prevalence of low autonomy and task variation in both gender groups. In general terms, professional and managerial employees seldom report problems with the above discussed list of risk factors. However, in these occupational categories, a number of other potentially health-damaging occupational stressors are more prevalent. Compared with routine non-manual workers, professionals, middle managers and higher managers have more than double the odds of being exposed to high quantitative demands. Very much related to quantitative demands are overtime work and sudden schedule changes. Overtime work is a typical characteristic of professional and managerial occupations, with both male and female higher managers having odds of more than 10 times higher than the reference category. Also female educational professionals have higher chances for experiencing overtime work. Largely the same picture holds for sudden schedule changes in the case of professionals and managerial occupations. Elevated odds ratios for this outcome are also seen in healthcare professionals. Finally, also the more “qualitative” indicator of emotional demands, shows more or less the same occupational pattern. Here, however the most important risk category is healthcare professionals. Two work-related stressors are only very modestly related with occupational categories: social support and exposure to bullying behaviour. With regard to social support it is shown that managerial jobs generally have slightly less problems, while male un- or semi-schooled manual workers are facing a significantly higher prevalence of exposure. Nearly exactly the same pattern holds for exposure to bullying behaviour.

The pattern that is seen for the occupational classification is also reflected in its main constituting factors, credentialed skills and social class. As concerns credentialed skills, expert-level workers have the highest prevalence of quantitative demands, overtime work, frequent schedule changes and emotional demands. On the other hand, exposure to high physical demands and frequent repetitive movements tends to decrease with higher skill levels. The same holds for atypical work schedules, low autonomy and task variation, as well as job insecurity and bullying behaviour. Interestingly, the association – although it is rather weak – between low support and credentialed skills is different for men and women: while higher (semi-skilled) female employees tend to have a slightly higher prevalence of low support, compared to lower skilled, this pattern is opposite for male employees. Finally, in general, for each of these stressors semi-skilled workers take an intermediate position. The indicator of

social class shows members of the higher management to be less exposed to physical demands, repetitive movements, atypical work schedules, low autonomy, low task variation and bullying. On the other hand, the reference category of workers without any authority over other workers is less likely to experience high quantitative or emotional demands, frequent overtime work or sudden schedule changes. Contrary to the semi-skilled workers, the category of supervisors in this social class indicator is not always taking an in-between position between workers and higher managers. In the case of physical demands, atypical work schedules, job insecurity, low support and exposure to bullying behaviour, the position of supervisors inclines more towards that of the (less advantageous) category of workers. In general, the relative differences between the class-categories are very much the same in men and in women. The only exception to this pattern is seen for the exposure to frequent schedule changes: the odds ratio (compared to workers) of higher managerial employees is far more elevated in men than in women.

## Discussion

This study provides a detailed description of the differential distribution of health-related occupational stressors according to gender, age, occupational categories, skill levels and social class. In the international empirical occupational health literature, reliable data on the socio-economic distribution of such a large amount of occupational stressors is scarce – especially within a large sample, representative for the entire wage-earning population in a region. Only a limited number of studies investigated the demographic and socio-economic distribution of common psychosocial stressors, such as immaterial demands, control over the work environment or support, as well as general physical demands (27,28,39-41). The distribution of risk factors such as emotional demands, features of precarious employment, bullying, etc. has remained nearly unaddressed (for one exception, see: Letourneux (42)). As a consequence, this paper provides a valuable reference in documenting the often assumed pathway informing work-related socio-economic inequalities in health.

In summary, it may be concluded that women report a clearly higher prevalence of high emotional demands and low task variation, which is in line with findings from previous research (28,39-41). In men, by contrast, high physical demands, overtime work and sudden schedule changes are more prevalent. Previous research on gender-associations with work demands is not conclusive. Some authors have found higher demands in men (43,44), but also non-significant gender differences (41), and a higher prevalence of time pressure and emotional demands are reported for women (39). Finally, the gender-association with low support from direct superiors is limited – which is in line with previous research (39,45).

The youngest age category reports higher odds for high physical demands, atypical schedules, frequent overtime work, schedule changes and high job insecurity, as well as low autonomy and task variation – the latter however only in men. High emotional demands and – to a lesser extent – exposure to bullying are more common in the older age category. In contrast to our findings, in the scientific literature, low control (autonomy and task variation) is

frequently found to be more prevalent in the older age categories (28,40,41). On the other hand, our findings of job demands – and specifically physical demands – being more prevalent in younger ages are in line with previous findings (27,28,46).

Manual occupational categories are more frequently exposed to high physical demands, frequent repetitive movements, atypical work schedules, low autonomy and task variation and high job insecurity. The “higher-end” occupations of managerial and professional employees are more often exposed to high quantitative and emotional demands, frequent overtime work and schedule changes. A specific position is taken by educational and health care professionals – which are typical examples of emotional labourers (47). Emotional labourers are more prone to stressors related to interpersonal conflicts or touching interpersonal contacts (9). This situation is reflected in the elevated exposure to high emotional demands. Moreover, frequent overtime work in educational professionals and atypical work schedules and high physical demands in healthcare professionals reflect the specificity of work organisation in these sectors. On the other hand, these occupational categories are less confronted with job insecurity, a finding that can be explained by their predominant public sector employment. The stressors related to social interactions show no clear distribution – something that is also seen in previous research (39,45). Problems of low control in manual (and other routine) occupations have been reported frequently before (46,48) – just as the experience of high immaterial demands in professional and managerial occupations (27,28,46). When considering the indicators of class and skill, high physical demands, atypical schedules, low control over the work environment and high job insecurity are more common in manual, unskilled and subordinate workers. On the other hand, a cluster of high quantitative and emotional demands, as well as schedule-unpredictability can be seen in higher-skilled and managerial employees.

Although, in general terms, the patterns of distribution in both sexes are fairly similar, some gender-specific patterns exist. Exceptions are the smaller occupational variation in physical demands within female workers and the lower prevalence of schedule unpredictability among female managerial workers. The latter may be related to generally higher domestic demands which need to be reconciliated with professional demands (49). In addition, some very specific gendered patterns are seen for quantitative demands, repetitive movements, atypical work schedules, overtime work and low autonomy.

In interpreting these results, some limitations have to be kept in mind. First of all, a small age-selection effect in these data can be assumed, related to the “selecting-out” of specific types of older employees – for example, those working in the most adverse conditions. This could not be controlled formally; however, the non-response analysis showed that the number of people that stopped working between the time of sampling and their participation in the survey was highest in the oldest age categories (34). Another limitation is the cross-sectional nature of the data. As a result, causality assumptions cannot be tested empirically. Of course, some causal orders are clear from a theoretical point of view, but in some instances the direction of causality can be discussed. An associated problem is the lack of ‘exposure

time estimates'. Possibly the time of exposure to unfavourable occupational characteristics is also socially distributed.

## Conclusions

In sum, this study suggests that the distribution of health-related occupational stressors within the Flemish wage-earning population is clustered and associated with socio-economic and occupational positions. On the one hand, high physical demands, atypical schedules, low control over the work environment and high job insecurity are more common in manual, unskilled and subordinate workers. On the other hand, a cluster of high quantitative and emotional demands, as well as schedule unpredictability can be seen in higher-skilled, professional and managerial employees. This finding – at least in terms of health-affecting working conditions – contradicts dual labour market theories (50), assuming the division of contemporary Post-Fordist labour into “good jobs” and “bad jobs”. Similar conclusions are also made by De Beer (51), finding that the hierarchical segmentation of the labour market into good jobs and bad jobs can only be partly supported, since a number of distinct stressors, like different psychological work demands, are more prevalent in the higher-end occupations. Our findings are of relevance to occupational health research as well as research on socio-economic health inequalities.

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