



European Foundation for the Improvement of Living and Working Conditions

# Survey highlights rise in psychosocial demands at work

*Trends in working conditions 2000–2005*

*Job-related differences*

*Sector-related differences*

*Gender-related differences*

*About the study*

*Commentary*

*Related publications*

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*The National Research Centre for the Working Environment, formerly the National Institute of Occupational Health, has conducted the fourth Danish Work Environment Cohort Study (DWECS) covering the five-year period 2000–2005. The 2005 results indicate no clear trend of overall better or worse conditions for workers. Nevertheless, an increase in psychosocial demands at the workplace has been identified, such as a high pace of work, a demanding workload and emotional demands. Conversely, the study also reveals increases in decision latitude, better future prospects in the job and more support for workers from superiors. However, considerable differences among workers persist in relation to jobs, sectors and gender.*

## **Trends in working conditions 2000–2005**

Every five years, the working conditions, health and lifestyle of Danish workers are assessed through the official national working conditions survey entitled the [Danish Work Environment Cohort Study \(DWECS\) \(in Danish\)](#). DWECS is conducted by the National Research Centre for the Working Environment ([NRCWE](#)), the former National Institute of Occupational Health. The DWECS survey sample is representative of the total national population aged 18–59 years, thereby encompassing employees, self-employed people and unemployed individuals.

For the period 2000–2005, no clear trend towards an overall better or worse work environment has been discerned, as was the case in the previous DWECS 2000 survey ([DK0312SR01](#)). Instead, both poorer and improved working conditions can be identified in specific areas of the research.

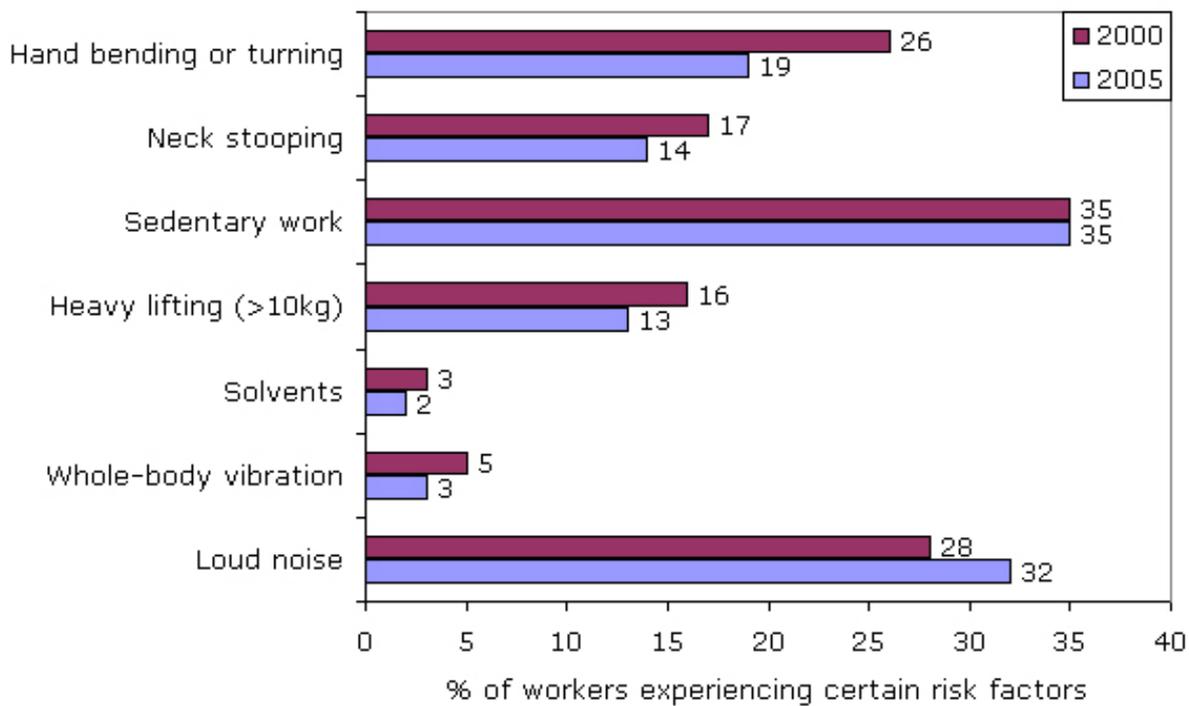
### **Significance of traditional risk exposure factors**

Figure 1 shows that some of the ‘traditional’ risk exposure factors, pertaining to chemical, physical and ergonomic risks, continue to decline. From 2000 to 2005, a statistically significant decrease was evident in exposure to risks such as heavy lifting, solvents, body vibration, and the two injurious work postures of neck stooping and hand bending or turning while working. However, improvements in relation to these risk factors do not necessarily reflect a transition towards more jobs characterised by less physical activity, as the expected increase in sedentary work ([DK0601NU05](#)) did not occur between 2000 and 2005.

On the negative side, exposure to loud noise has increased significantly. Apart from the categories of workers traditionally reporting loud noise as a risk factor – in the crafts and manufacturing sectors – teachers and personnel working in childcare institutions in particular report exposure to noise.

Irrespective of the decrease in some risk exposure factors, most chemical, physical and ergonomic factors assessed by DWECS have remained constant throughout the period. However, the overall level of exposure to chemical risks is relatively low.

### **Figure 1: Physical, chemical and ergonomic risk exposure factors, 2000–2005 (%)**



Note: Development in sedentary work not statistically significant.

Source: DWECS 2005

Physical, chemical and ergonomic risk exposure factors, 2000–2005

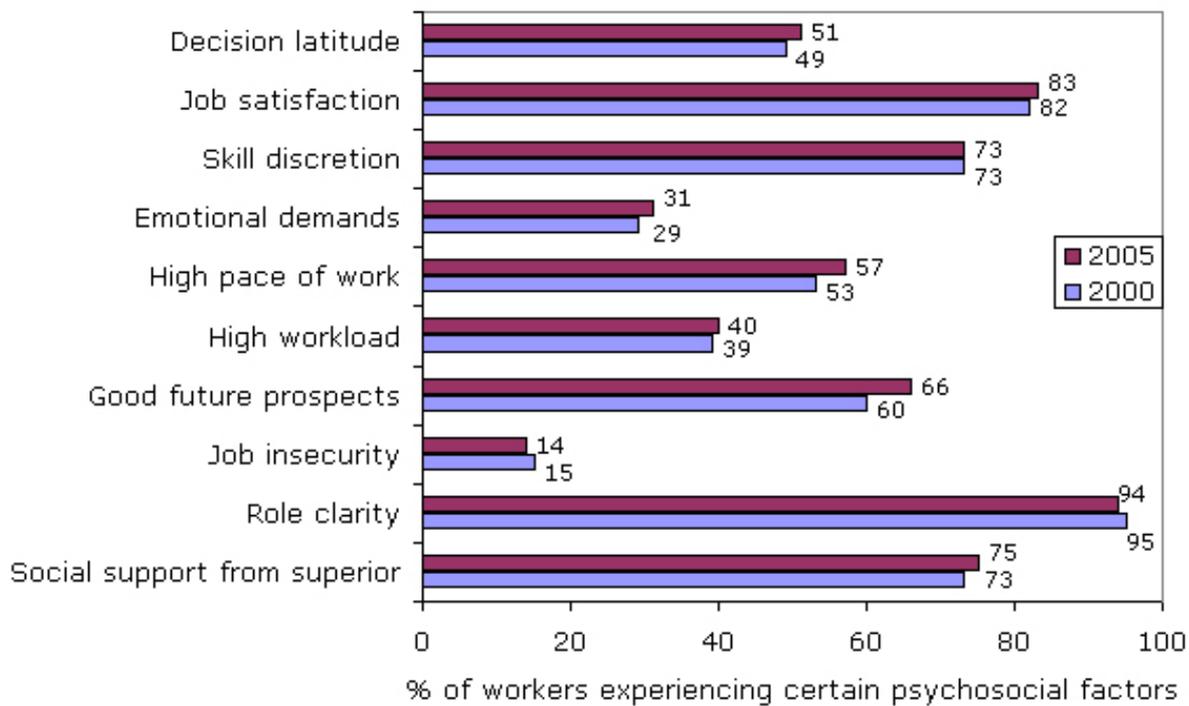
### Increasing psychosocial demands

The study has identified a significant increase in the level of demands at work, such as those relating to pace of work, workload and emotional stress (Figure 2). Moreover, the level of ‘role clarity’ has decreased, such that employees experienced their fields of responsibility at work to be less defined in 2005 than they were in 2000. Conversely, decision latitude and social support from superiors have increased, while the levels of skill discretion and job satisfaction, or the feeling of work being meaningful to the individual employee, remained almost unchanged.

Overall, work demands have increased more than the improvements recorded for decision latitude and social support from superiors. In the context of the job strain model developed by Robert Karasek, if the trend of improvements in the psychosocial work environment is not proportional to the increases in demands at work, problems may arise. The factors of decision latitude, skill discretion and social support are known to counteract the negative impacts of work demands. It should be mentioned, however, that it is not known exactly to what extent these factors should increase in order to fully counteract increased demands at the workplace.

Finally, an increase has been recorded in the survey respondents’ expectations of good future prospects in the job. Moreover, job insecurity levels have marginally declined.

**Figure 2: Psychosocial work environment, 2000–2005 (%)**



Note: Developments in job satisfaction, skill discretion and job insecurity not statistically significant.

Source: DWECS 2005

Psychosocial work environment, 2000–2005

### Stability in work arrangements and improved work–life balance

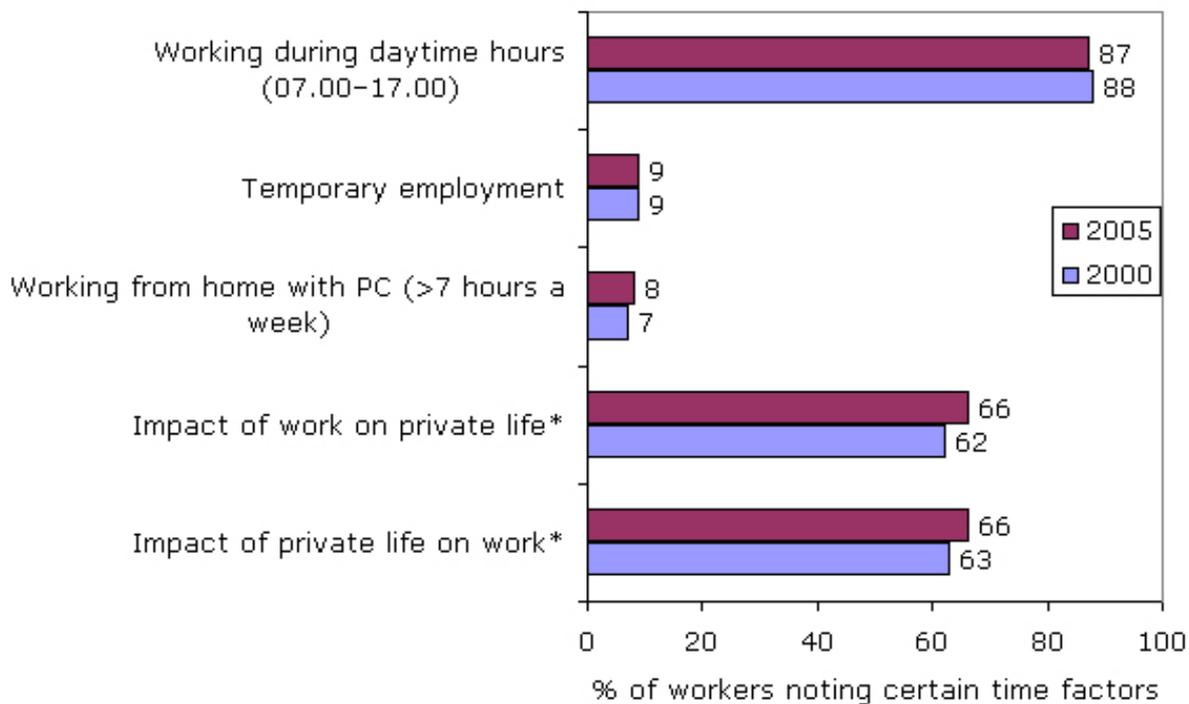
Surprisingly, the anticipated increase in flexible work arrangements and limitless or ‘boundless’ jobs has not occurred. ‘Limitless’ work (*grænseløst arbejde*) is a concept introduced by researchers in order to describe jobs that are characterised as not being fixed to a certain location, not having to be performed within a certain timeframe and being less permanent in terms of employment relationships and tasks to be undertaken, often organised around project-based work. Thus, there is a sense of work without any of the usual boundaries. The limitless job is typically characterised by high job demands, long hours, high job control and greater stress ([DK06070191](#)).

Instead, the following findings emerge from the DWECS 2005 study (Figure 3):

- the vast majority of workers continue to perform work during normal daytime working hours;
- temporary employment has not increased;
- working from home has increased only slightly.

In addition, the survey identified significant increases in workers’ experience of the possibility of reconciling work and private life for the period 2000–2005.

**Figure 3: Working time and work–life balance, 2000–2005 (%)**



Notes: \* 0 = Most negative answer, 100 = Most positive answer. Developments in working during daytime, temporary employment and working from home not statistically significant.

Source: DWECS 2005

Working time and work-life balance, 2000-2005

### ***Job-related differences***

Regarding job-related differences, the DWECS 2005 data reveal considerable divergence and distinct patterns in risk exposure.

#### **Factors affecting work environment profiles**

As part of DWECS 2005, the 64 different job groups surveyed are based on a grouping of the jobs contained in the Danish classification of occupations, Dansk Fagkode (Arbejdsdirektoratet, 1986), taking into account the nature of job tasks performed, duration of education, sector and institutional setting. Moreover, analysis of the 2005 data shows that the various job groups share certain work environment characteristics according to whether the jobs involve the handling of materials, dealing with people or processing information. In general, employees working with information and people encounter lower physical activity and higher skill discretion than employees working with materials.

#### **Different job clusters and risks**

Furthermore, in-depth analyses reveal that the 64 different job categories make up 12 clusters of jobs in the sense that some occupations have somewhat similar work environment profiles. Table 1 shows the risk factors most typical for the different job clusters.

Distinct differences exist in terms of risk exposure, according to the various types of jobs. These differences are underlined by a general tendency towards a decrease in risk exposure with increases in development opportunities

and a rise in risk exposure with greater physical activity. As a result, the jobs with the fewest risks are mainly office jobs, managerial positions or jobs of teaching professionals, whereas jobs involving a high level of physical activity and requiring lower levels of education carry most risks for workers.

**Table 1: Risk factors most typical for job clusters, 2005**

Job clusters	Risk factors*
Bank assistants; bookkeepers and accountants; office assistants; medical secretaries	Sedentary work, high workload
Academic professionals; managers; computer professionals; administrators in public sector; engineers and architects; journalists and media professionals; social counsellors; sales assistants	Sedentary work, high workload (includes working from home with a personal computer (PC) more than seven hours a week)
Supervisors; shopkeepers; retail managers; self-employed people in industry and services	High workload, long working weeks of more than 48 hours (includes working from home with a PC more than seven hours a week)
Primary and lower secondary school teachers; upper secondary school teachers; other teachers	Emotional demands (includes working from home with a PC more than seven hours a week)
Librarians and museum officials; occupational and physiotherapists; laboratory professionals; doctors and dentists; police and prison officers; residential institution care professionals; technicians and builders	High workload, emotional demands
Childcare workers, home-based; farmers; self-employed workers in construction	Whole-body vibration, wet hands, bending or turning back, heavy lifting (>10kg), physically straining work, high workload, long working weeks of more than 48 hours
Plumbers; construction workers, skilled and unskilled; carpenters	Hearing-impairing noise, whole-body vibration, high temperatures, draughts, solvents, bending/turning back, heavy lifting (>10kg), physically straining work
Kitchen staff; food, drink and tobacco workers; cleaning assistants; waiters and other assistants	High temperatures, wet hands, bending or turning back, physically straining work, low skill discretion, high work pace, poor future prospects**, evening or night work, less flexibility in relation to reconciling work with family needs
Postal workers; slaughterhouse workers; packing and bottling department workers	Hearing-impairing noise, whole-body vibration, bending or turning back, physically straining work, monotonous and repetitive work, low skill discretion, poor future prospects**, evening or night work
Care assistants; workers caring for elderly people, home and institution-based; care workers in hospitals; nurses	High temperatures, wet hands, bending or turning back, heavy lifting (>10kg), physically straining work, emotional demands, evening or night work, less flexibility in relation to reconciling work with family needs
Childcare professionals; childcare workers	Hearing-impairing noise, bending or turning back, heavy lifting (>10kg), emotional demands, poor future prospects**
Building caretakers; shop sales assistants; electricians; storage and dock workers; storage clerks; agricultural workers; truck drivers; machine setter operators; mechanics; metal workers, unskilled	Whole-body vibration, wet hands, bending or turning back, heavy lifting (>10kg), physically straining work, monotonous and repetitive work, low skill discretion, poor future prospects**

Notes: \* Statistically significant differences from national average; \*\* self-rated future prospects.

Source: Burr et al, [Arbejdsmiljø i Danmark 2005 \(in Danish, 661Kb PDF\)](#), 2006

### Imbalances in psychosocial demands and resources

According to the occupational stress research inspired by Karasek, the imbalance between demands at work and the resources available to cope with such demands can cause stress and related negative health outcomes. This suggests that the resources available – such as decision latitude and skill discretion – to solve work-related demands may counteract the potentially negative impacts of high demands at work. Therefore, it is relevant to investigate whether certain groups of employees experience such potential imbalances between demands and resources.

Table 2 lists jobs characterised by high demands and low decision latitude and/or skill discretion – the jobs in which employees are likely to experience the most psychosocial stress. Of the 15 jobs represented in Table 2, nine are jobs that may be undertaken by unskilled workers, whereas only one job category contains highly educated professionals such as doctors and dentists. Furthermore, eight of the jobs can be labelled as human service work, relating to jobs in which emotional demands tend to be high and displaying higher levels of exhaustion or ‘burnout’ ([DK0606019I](#)).

**Table 2: High demands and low levels of control, by jobs, 2005**

Job groups	Low decision latitude	Low skill discretion	High emotional demands	High volume of information	High work pace	High workload
Office assistants, public	Yes	Yes		Yes	Yes	Yes
Nurses	Yes		Yes	Yes	Yes	Yes
Doctors and dentists	Yes		Yes	Yes		Yes
Bank assistants	Yes			Yes	Yes	Yes
Medical secretaries	Yes		Yes		Yes	
Care assistants	Yes	Yes	Yes			
Postal workers	Yes	Yes			Yes	
Shop sales assistants	Yes	Yes			Yes	
Kitchen staff	Yes	Yes			Yes	
Waiters	Yes	Yes			Yes	
Slaughterhouse workers	Yes	Yes			Yes	
Care workers, hospitals	Yes		Yes			
Carers of elderly people,	Yes		Yes			

institution-based						
Carers of elderly people, home-based	Yes		Yes			
Police and prison officers	Yes		Yes			

*Note: Statistically significant differences from national average.*

*Source: DWECS 2005*

## **Sector-related differences**

DWECS 2005 found distinct sector-related differences and these trends are described below. For a graphic presentation of the DWECS 2000 results by sector, see the earlier survey data report ([DK0312SR01](#)).

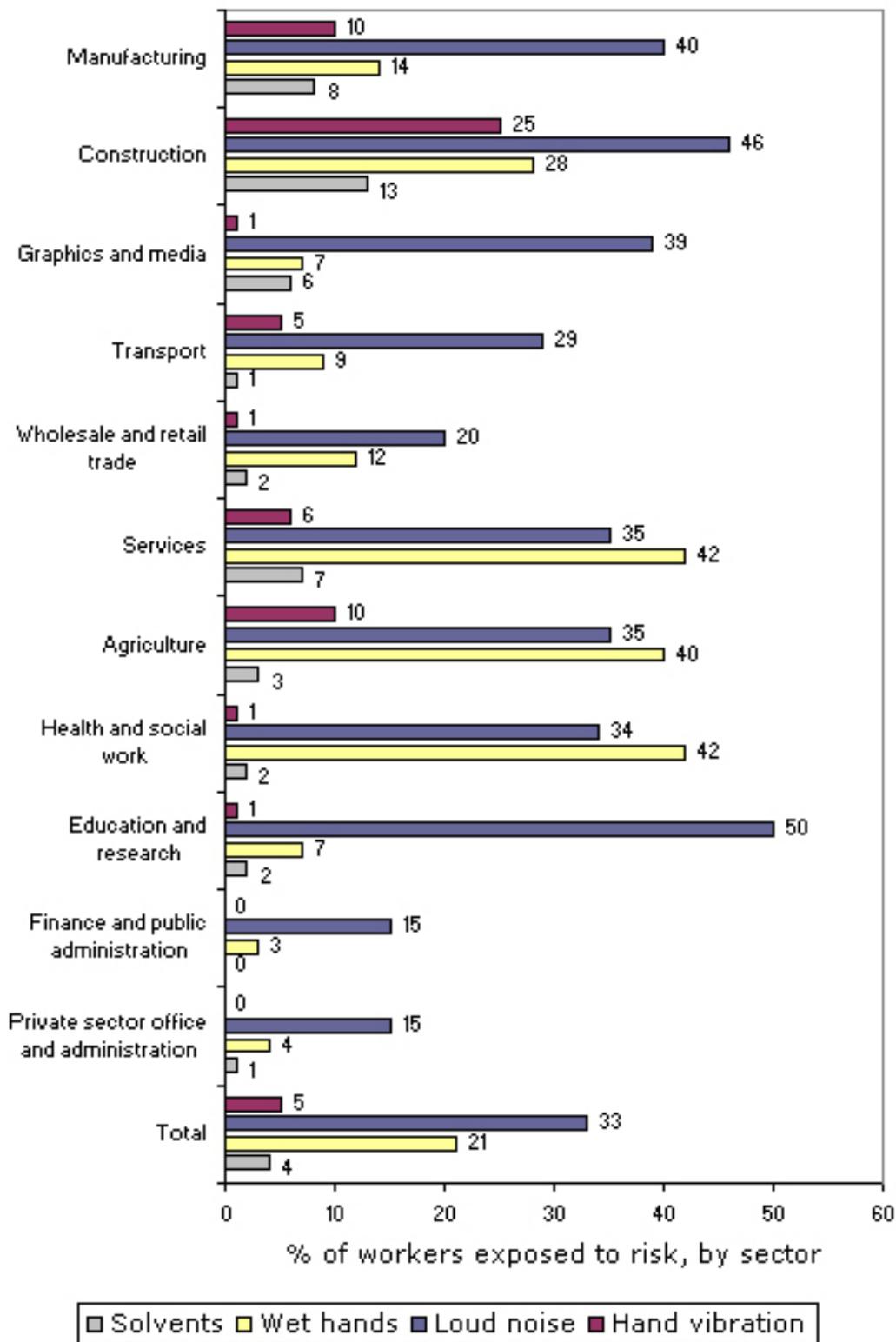
### **Physical and chemical risk factors**

Overall, physical and chemical risk exposure is highest for workers in the construction sector, but is also high for the manufacturing, services, agricultural, and health and social work sectors (Figure 4). Specific risks in the construction sector include exposure to solvents and hand vibration. However, exposure to solvents has decreased in the graphics and media industry and increased in the services sector.

The risk of wet hands at work mostly concerns employees in services where the exposure level has increased, in agriculture despite a decrease in the exposure level, and in health and social work. Moreover, the risk of having wet hands while working decreased in the construction sector.

Exposure to loud noise is a common complaint from workers across all sectors; however, workers in the manufacturing, construction, and education and research sectors experience significantly more noise exposure compared with the sectoral average level of exposure. The overall increase in exposure to loud noise identified from 2000 to 2005 is particularly accounted for by the services sector and the education and research sector.

### **Figure 4: Physical and chemical risk exposure factors, by sector, 2005 (%)**



Source: DWECS 2005

Physical and chemical risk exposure factors, by sector, 2005

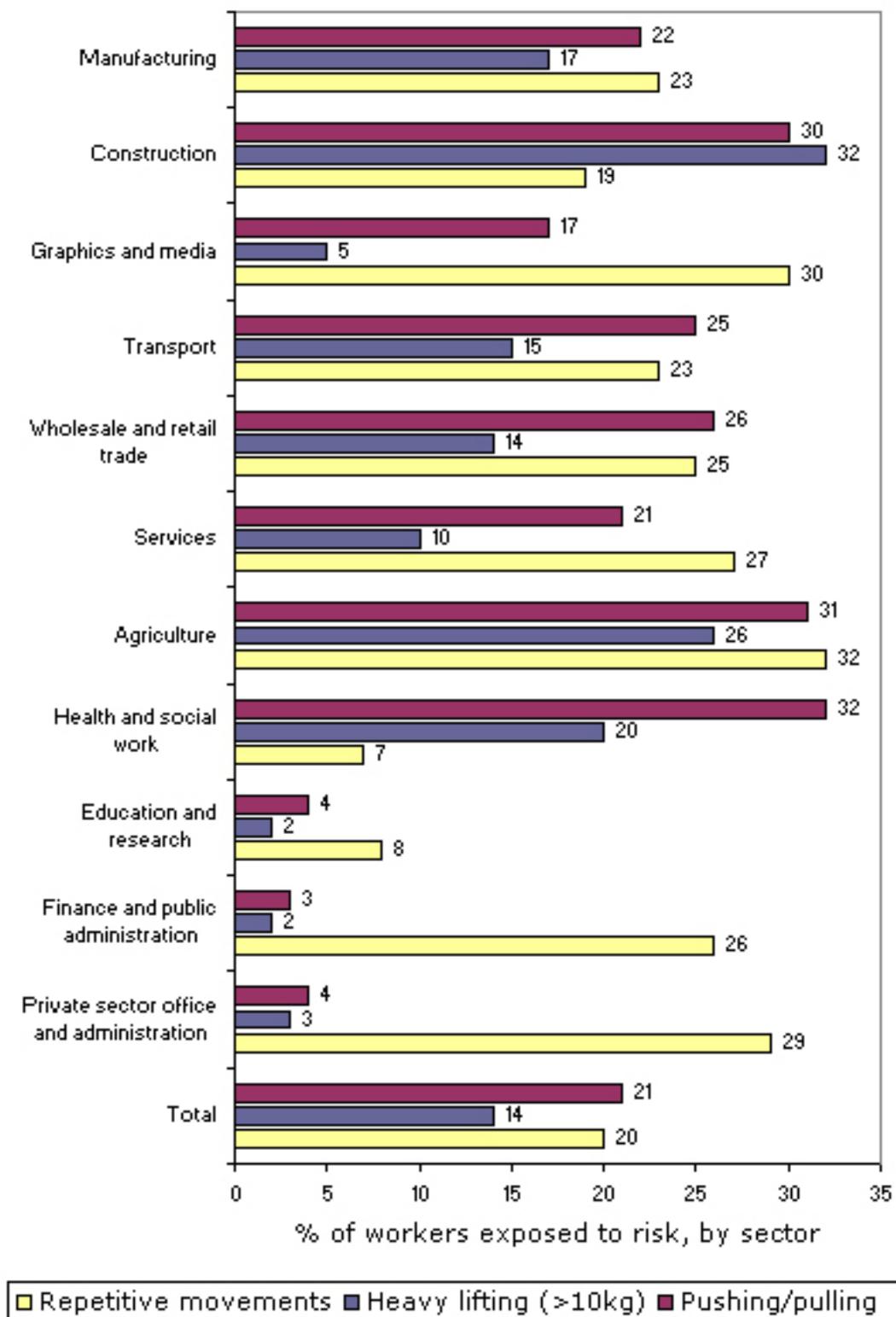
### Ergonomic risk factors

Workers employed in agriculture and in the graphics and media industry are continuously required to make

repetitive movements in their work (Figure 5). In addition, this risk factor increased substantially in the wholesale and retail trade and services sectors from 2000 to 2005. Furthermore, repetitive movements remain a risk for workers in manufacturing, finance and public administration, and private sector office and administration.

Heavy lifting is the most prevalent risk in the construction, agriculture, and health and social work sectors, whereas pushing and pulling are mostly related to work in construction, transport, wholesale and retail trade, agriculture, and health and social work.

**Figure 5: Ergonomic risk exposure factors, by sector, 2005 (%)**



Source: DWECS 2005

Ergonomic risk exposure factors, by sector, 2005

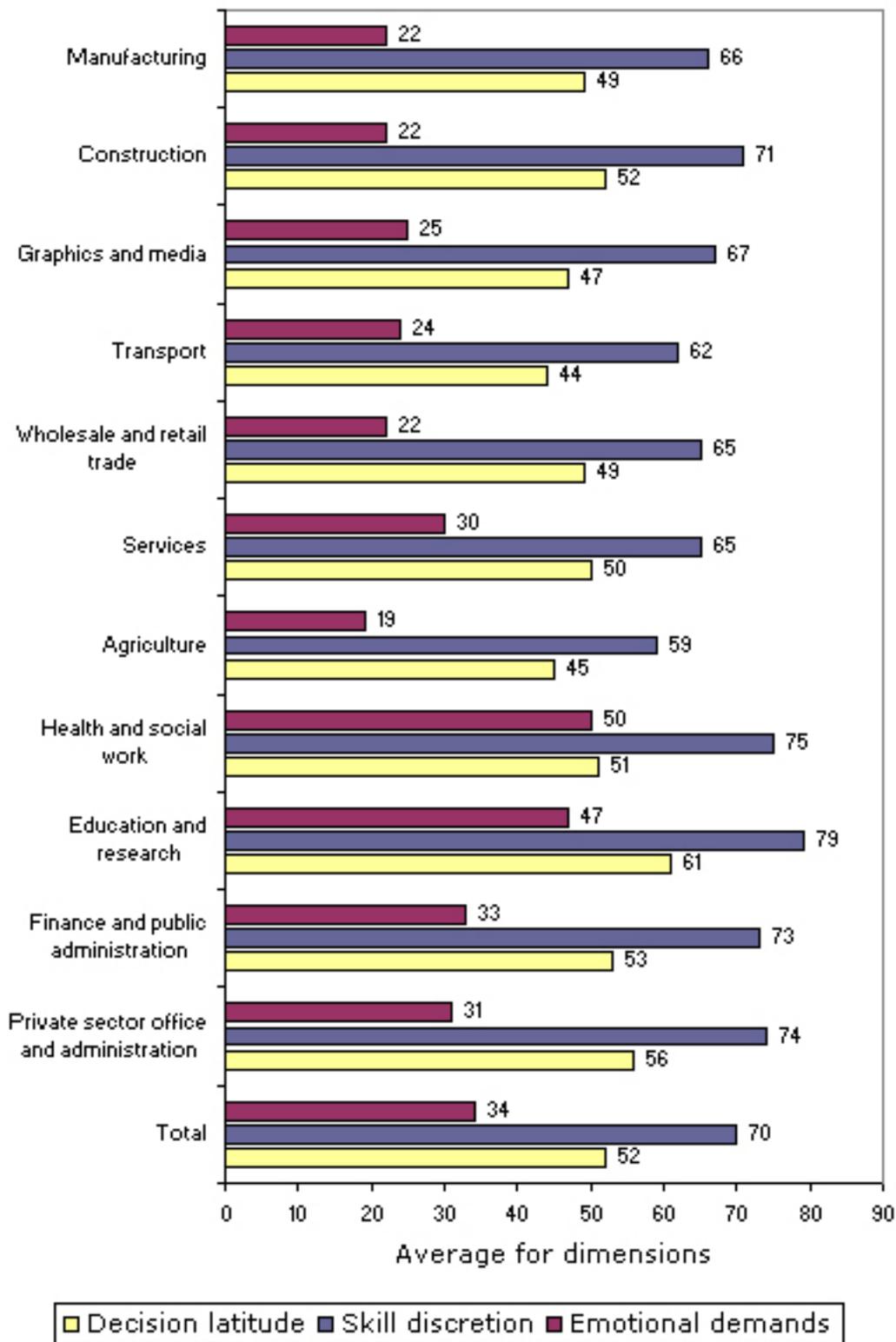
### **Psychosocial work environment**

In terms of emotional demands across sectors, health and social work, and education and research stand out with significantly higher levels of risk exposure (Figure 6). Apart from these two sectors, as well as in administration, workers in the remaining sectors experience significantly lower than average emotional demands at work.

Skill discretion is relatively high across all sectors. However, the possibility of skill discretion is significantly lower in the manufacturing, transport, wholesale and retail trade, services and agricultural sectors.

Significantly lower than average decision latitude is reported by employees in manufacturing, graphics and media, transport, wholesale and retail trade, and agriculture; this problem had been mainly encountered in the transport and agricultural sectors in 2000. Nevertheless, decision latitude has increased for all sectors according to the 2005 data.

### **Figure 6: Psychosocial work environment, by sector, 2005**



Note: 0 = Most negative answer, 100 = Most positive answer.

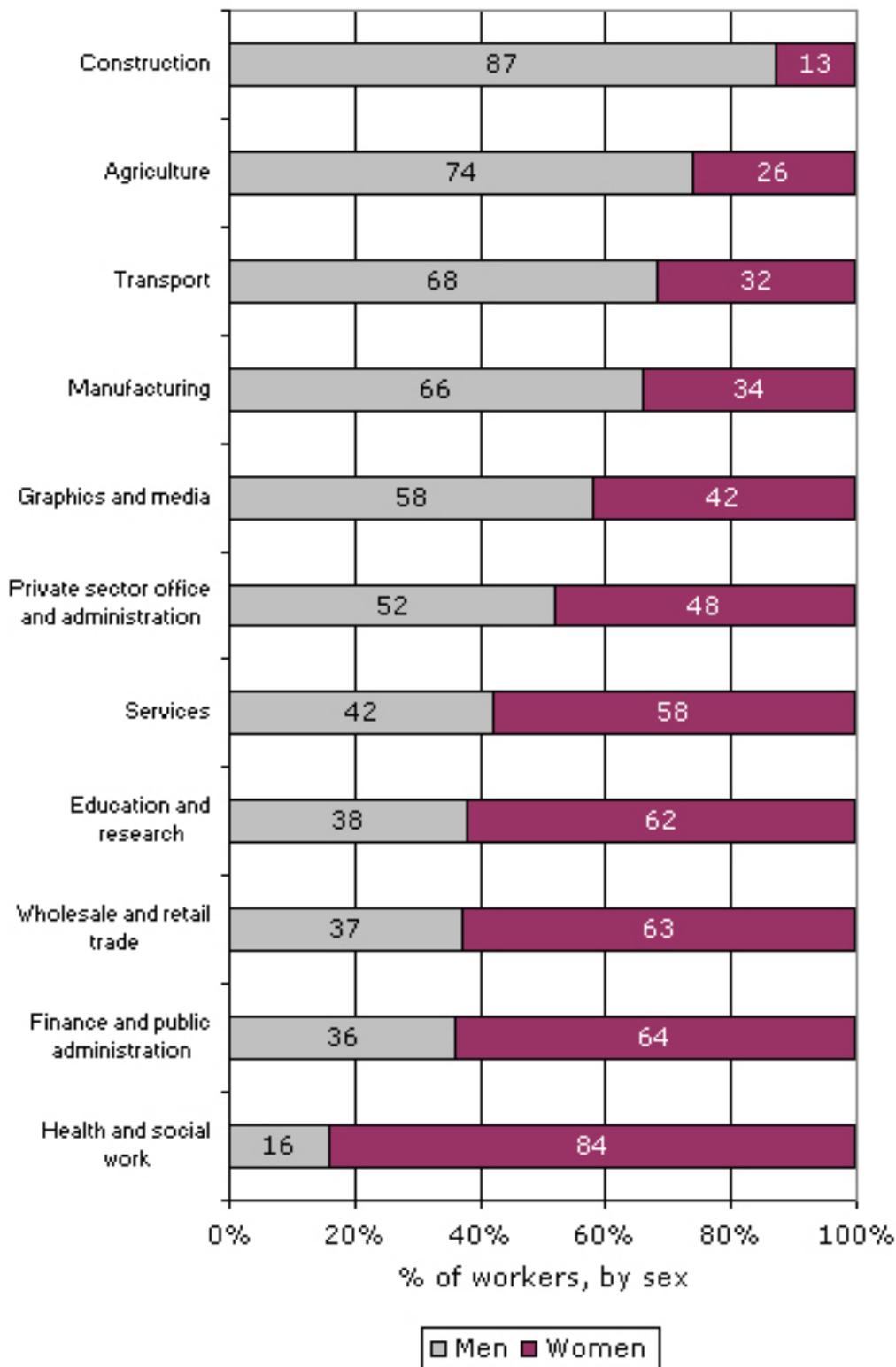
Source: DWECS 2005

Psychosocial work environment, by sector, 2005

## ***Gender-related differences***

Working conditions vary greatly according to sex. However, these differences mostly reflect the different occupational patterns chosen by men and women. Only three sectors display a gender distribution proportional to the total working population as represented in DWECS 2005, namely graphics and media, private sector office and administration, and services sector (Figure 7). The construction sector predominantly employs men, while the health and social work sector mostly employs women. According to the DWECS 2005 survey, no significant trend changes for gender differences emerge. The latest figures can be compared with those of the DWECS 2000 survey data report ([DK0312SR01](#)).

**Figure 7: Sectors, by sex, 2005 (%)**



Source: DWECS 2005

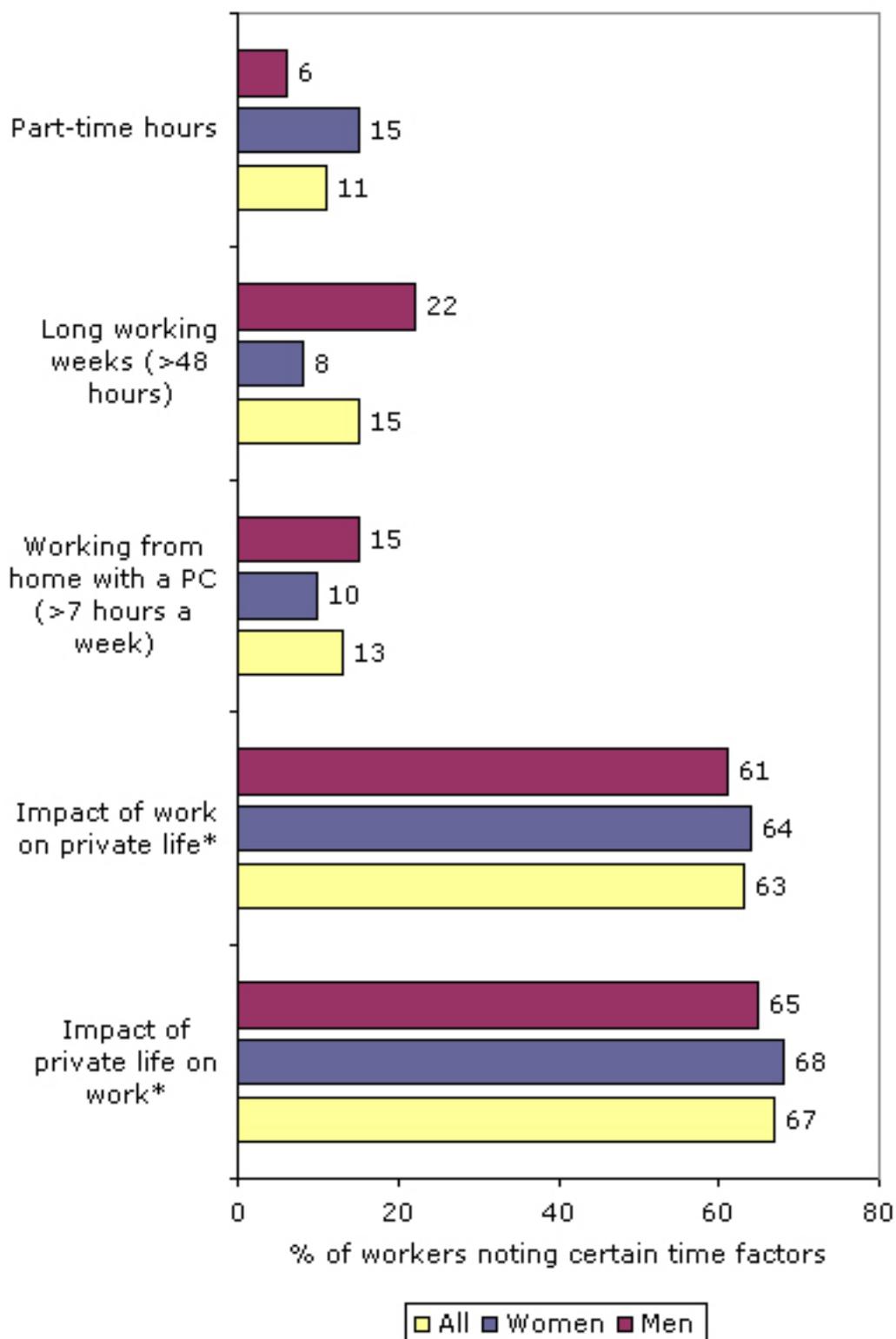
Sectors, by sex, 2005

### Working time and work–life balance

In relation to long working hours, DWECS 2005 reveals that the gender difference is identical to the difference

observed in DWECS 2000: men are far more likely to be working long hours than women (Figure 8). Furthermore, the proportion of men with part-time jobs is low, compared to women. In addition, more men than women have the option of working from home. However, no distinct gender-related differences are evident in the experience of work–life balance.

**Figure 8: Working time and work–life balance, by sex, 2005 (%)**



Note: \* 0 = Most negative answer, 100 = Most positive answer.

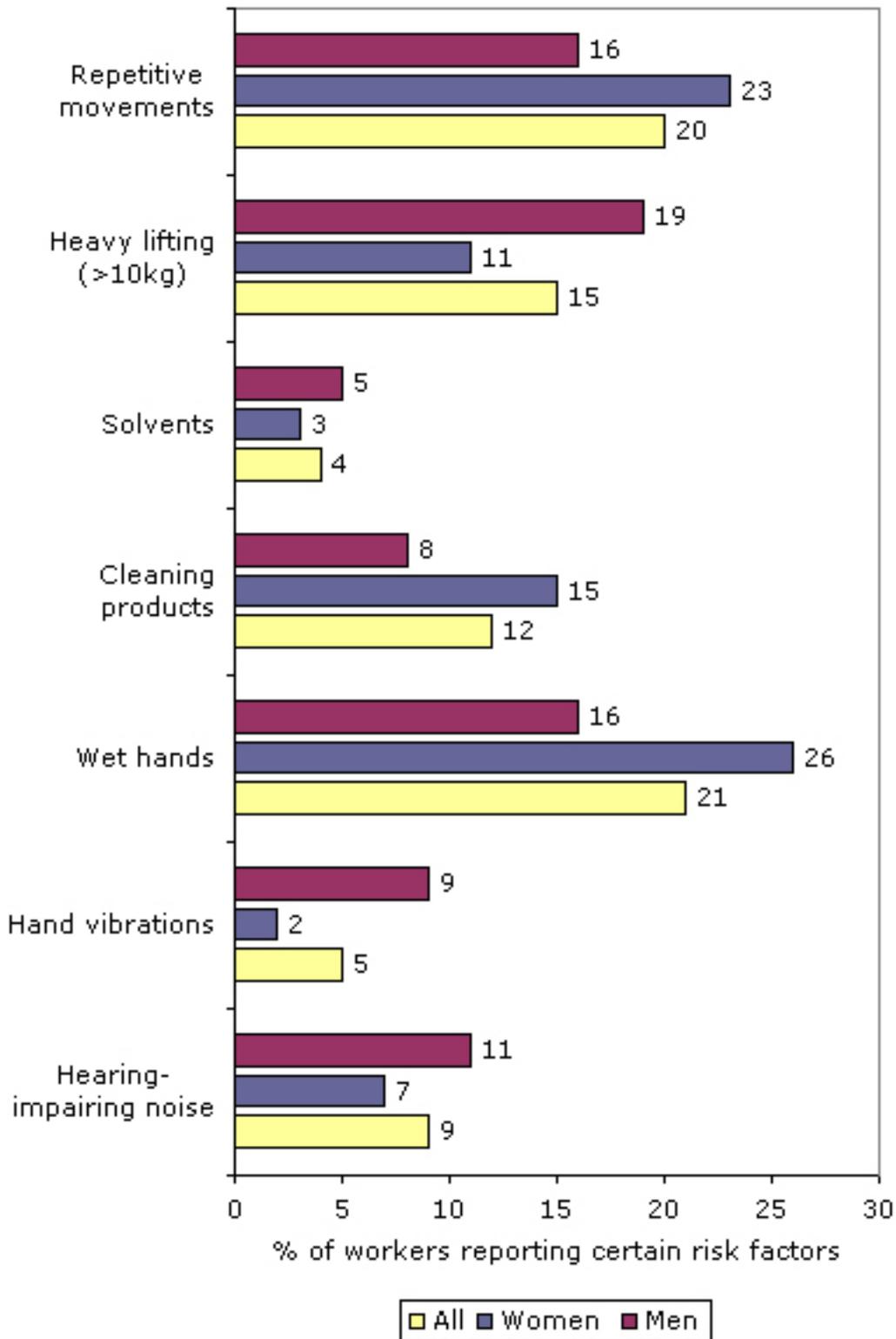
Source: DWECS 2005

Working time and work–life balance, by sex, 2005

### **Physical, chemical and ergonomic risk exposure**

Regarding exposure to ergonomic risk factors, women are more exposed to repetitive movements in their jobs, whereas men are more exposed to heavy lifting (Figure 9). Contact with cleaning products and working with wet hands are the most common risk factors experienced by women, while men are more often exposed to solvents, hand vibrations and hearing-impairing noise. Overall, men are more exposed than women are to physical, chemical and ergonomic risk factors. Moreover, the gender differences are almost identical in relation to both the DWECS 2000 and 2005 data.

**Figure 9: Ergonomic, chemical and physical risk exposure factors, by sex, 2005 (%)**



Source: DWECS 2005

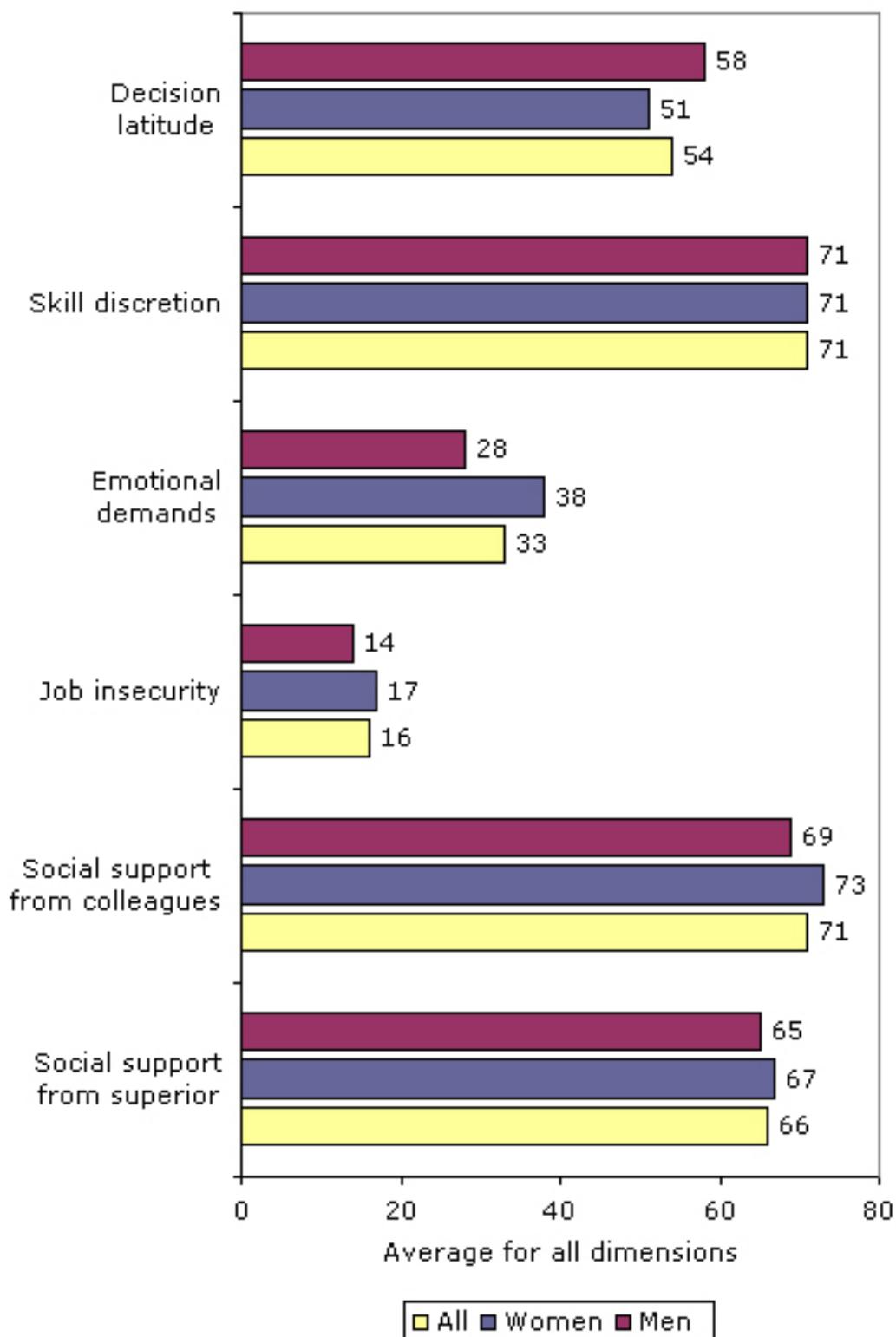
Ergonomic, chemical and physical risk exposure factors, by sex, 2005

**Similarities in psychosocial work environment**

The 2005 data reveal that, in general, psychosocial work conditions are relatively similar for men and women. This

was also the case in 2000. For example, skill discretion is the same for both sexes (Figure 10). However, women may still encounter a slightly worse psychosocial work environment than men. As a group, women have a lower decision latitude, higher emotional demands and more job insecurity when compared with men. Conversely, men receive slightly less social support from colleagues and superiors than women.

**Figure 10: Psychosocial work environment, by sex, 2005**



Note: 0 = Most negative answer, 100 = Most positive answer.

Source: DWECS 2005

Psychosocial work environment, by sex, 2005

## About the study

The Danish Working Environment Cohort Study (DWECS) is a continuation of the previously named Danish Employee Study (WEC) which has been conducted every five years since 1990. The change of name is due to the inclusion of self-employed and unemployed workers in the 2000 and 2005 surveys, ensuring that the entire labour market is covered in the research.

## Methodology

DWECS has a twofold purpose:

- to monitor work environment risk exposure, and the prevalence and incidence of health-related consequences;
- To study the changes in health outcomes and changes in employees' labour market status as possible consequences of exposure to specific work environment risk factors.

As a result, DWECS 2005 is designed as a split panel survey, meaning that respondents interviewed for the survey are re-interviewed in future rounds while new respondents are included to maintain a survey population representative of the total working population. From the single panel interviewed in 1990, DWECS comprised nine panels in 2005 (Table 3). This survey design makes it possible to perform cross-sectional analyses – describing the Danish work environment at specific moments in time – as well as longitudinal studies, which assess the relative influence of risk factors on workers' health over a period of time.

**Table 3: Panels interviewed for DWECS 2005**

1990	1995	2000	2005
1. 1990 cohort	2. Immigrants	4. Immigrants	6. Immigrants
	3. Young workers (18–22 years of age)	5. Young workers (18–22 years of age)	7. Young workers (18–22 years of age)
			8. Supplementary cohort
			9. Sample of 15 jobs/sectors not adequately covered by random sample

*Notes: Sample size for the panels in DWECS 2005: Panels 1–5: 10,131 persons; Panel 6: 236 persons; Panel 7: 943 persons; Panel 8: 8,545 persons; Panel 9: 7,000 persons. Response rates for the panels in DWECS 2005: Panels 1–5: 66% of respondents; Panel 6: 33% of respondents; Panel 7: 48% of respondents; Panel 8: 61% of respondents; Panel 9: 67% of respondents.*

Source: Burr et al, [Arbejdsmiljø i Danmark 2005 \(661Kb PDF\)](#), National Institute of Occupational Health, Copenhagen, 2006

## Questionnaire

The DWECS questionnaire seeks information on the following variables:

- background of the respondents in terms of sex, age, ethnicity, body mass index (BMI), family status, education, job and sector;

- exposure to noise, vibrations, physical work demands, work postures, accidents, sickness-related absences, as well as chemical, thermal and psychosocial risk exposure factors;
- working time, work organisation, contractual relations with employer and employer characteristics;
- labour market status, recognising employees, self-employed or unemployed individuals;
- lifestyle, health and disease symptoms, including self-rated health and doctors' diagnoses, if any.

**Table 4: Technical details on DWECS 2005**

Survey name	Danish Work Environment Cohort Study (DWECS) 2005
Coverage	Total national labour market, regardless of respondents' labourmarket status
Frequency	Conducted every five years since 1990: the 2005 edition is the fourth wave of the survey
Survey population (participants)	1990: 8,664 individuals; 1995: 8,583 individuals; 2000: 8,583 individuals; 2005: 15,228 individuals
Response rate	1990: 90%; 1995: 80%; 2000: 75%; 2005: 63%
Sampling strategy	Split panel design: stratified simple random samplings with proportional allocation, and, in 2005, 15 additional small samples each with the sample probability
Registers used for the sample	Representative random sample from the Central Population Register (CPR) and registers conducted by Statistics Denmark
Interviews	Types of interviews: postal or internet questionnaire and by telephone. Location: respondents' homes
Contact point	National Research Centre for the Working Environment (NRCWE)*
Public access to data	<a href="http://www.arbejdsmiljoforskning.dk/Nationale%20Data/NAK2005.aspx">www.arbejdsmiljoforskning.dk/Nationale%20Data/NAK2005.aspx</a> (in Danish)

Note: \* The former National Institute of Occupational Health – name changed on 1 January 2007.

Sources (and further information): Burr et al, [Arbejdsmiljø i Danmark 2005 \(661Kb PDF\)](#), 2006; Burr et al, [Arbejdsmiljø i Danmark 2000 \(630Kb PDF\)](#), 2002; Pedersen et al, [Danish Work Environment Cohort Study, 2000](#), 2003; European Foundation for the Improvement of Living and Working Conditions, [Working conditions surveys – A comparative analysis](#) and the [National survey: Denmark](#), 2003

## Commentary

In light of the results of the DWECS 2005 survey, there is no general improvement of the Danish work environment, as was the case in 2000. Notwithstanding lower levels in some 'traditional' risk exposure factors, other factors appear to persist. Most important, however, is the significant increase in work-related demands, such as increases in pace of work, workload, and emotional stress, alongside less role clarity. This presents a trend which needs to be examined more closely, as the increasing demands at work might not be fully counterbalanced by improved conditions in other areas of the psychosocial work environment, such as decision latitude, job satisfaction or meaningfulness, skill discretion and social support.

This development is noteworthy in the sense that it may lead to an increase in negative health outcomes for workers. Moreover, the increased demands at work identified for the period 2000–2005 are also critical, considering that the Danish labour market may face a general labour shortage in the near future. In the context of a labour shortage, the risk may arise that demands at work will continue to increase as fewer employees might have

to undertake more work, possibly resulting in more psychosocial occupational disorders among these workers. As a consequence, policy efforts should aim at ensuring the long-term social sustainability of the entire labour market.

Rune Holm Christiansen and Helle Ourø Nielsen

## ***Related publications***

### **Website**

[National Research Centre for the Working Environment](#) : Tabular data for selected variables from the [Danish Work Environment Cohort Study 2005 \(in Danish\)](#) .

### **Main report**

Burr, H., Bach, E., Gram, H. and Villadsen, E., [Arbejdsmiljø i Danmark 2005 \(661Kb PDF\)](#) , National Institute of Occupational Health, Copenhagen, 2006.

### **Leaflets**

Burr, H., [Psykosocialt arbejdsmiljø \(225Kb PDF\)](#) , National Institute of Occupational Health, Copenhagen, 2006.

Burr, H. and Albertsen, K., [Arbejdstid \(368Kb PDF\)](#) , National Institute of Occupational Health, Copenhagen, 2006.

Burr, H. and Søgaard, K., [Fysiske krav, løft og arbejdsstillinger i arbejdsmiljøet \(224Kb PDF\)](#) , National Institute of Occupational Health, Copenhagen, 2006.

Burr, H. and Villadsen, E., [Støj og vibrationer i arbejdsmiljøet \(184Kb PDF\)](#) , National Institute of Occupational Health, Copenhagen, 2006.

Burr, H., Villadsen, E. and Pejtersen, J., [Træk, varme og belysning i arbejdsmiljøet \(182Kb PDF\)](#) , National Institute of Occupational Health, Copenhagen, 2006.

Burr, H., Villadsen, E. and Flyvholm, M-A., [Kemisk arbejdsmiljø \(199Kb PDF\)](#) , National Institute of Occupational Health, Copenhagen, 2006.