

## NEW DATA ON HEALTH AND SAFETY AT WORK IN THE EU27

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### SUMMARY

To study the occurrence of accidents resulting in injury and work-related health problems in the past 12 months in workers aged 15 to 64 years in the EU27 the Labour Force Survey (LFS) in Europe included in 2007 an ad hoc module on health and safety at work. The module consisted of four variables on accidents resulting in injury and five variables on work-related health problems. In the analysis, the wording of the questionnaires was first studied, and subsequently statistical analyses were performed. In total 3.2% of the persons that worked at the time of the survey administration or worked during the previous 12 months reported one or more accidents at work in the past 12 months (range 0.6% in Bulgaria to 6.3% in Finland), which corresponds to 6.9 million persons in the EU27. In 9.6% of the persons with an accident, the most recent accident was a road traffic accident (range 6.4% in Denmark to 28.5% in Poland). Among workers with an accident, 73.4% reported sick leave for at least one day and 22.0% sick leave for one month or more. The differences between countries were substantial, and may be related to differences in culture, policy, awareness, the wording of the questionnaires, and the use of proxies.

### INTRODUCTION

The promotion of health and safety at work, and the promotion of more and better jobs are important goals in the European Union. To achieve these goals, assessment and monitoring is necessary. This paper presents an overview of the results of the European Union Labour Force Survey (LFS) 2007 ad hoc module on accidents at work and work-related health problems of workers aged 15 - 64 years in the EU-27. The main goal of the study was:

*“To perform a sophisticated statistical analysis, including descriptive and multivariate analysis, of the Health and Safety at Work data provided by the LFS 2007 ad hoc module, in order to compare the occurrence of accidents at work, work-related diseases and harmful exposures according to various parameters describing the characteristics of the worker, workplace and employment situation.”*

The module and the entire database of the LFS provide for a rich source of survey data that can give important additional policy information that is not available in national registrations. Accident and disease data collected by means of the module can be related to a multitude of other labour market and socio-demographic variables in the survey.

And at an aggregate level this information can also be related to the information in other types of research and registration databases collected under EC responsibility.

The results of this statistical analysis were published in a Eurostat “Statistics in Focus” (Eurostat, SIF63/2009) and a statistical report (Venema, Van den Heuvel & Geuskens, 2009) and a publication describing the LFS 2007 ad hoc module results and other the key statistical EU level data in the field of Health and Safety at Work (Venema, van den Heuvel & Geuskens, 2010). In this paper we focus on the work accidents data from this study.

## METHOD

The Labour Force Survey (LFS) is a rotating random sample survey of persons in private households. It provides population estimates for the main labour market characteristics and is organised in thirteen modules, covering demographic background, labour status, employment characteristics of the main job, hours worked, employment characteristics of the second job, time-related underemployment, search for employment, education and training, previous work experience of persons not in employment, situation one year before the survey, main labour status, income and technical items relating to the interview. It provides annual information on employment and related variables in EU Member States. The LFS 2007 covers the 27 Member States of the European Union, Croatia, Macedonia, Turkey, Iceland, Norway and Switzerland. The ad hoc module Health and safety at Work 2007 covers the EU27, Croatia, Norway and Iceland<sup>1</sup>.

1. The aims of this module were:
2. To collect harmonised statistical data on those work-related health problems (including exposures) which are not covered by the administrative data collection methodologies, and
3. To be able to analyse the health and safety at work data according to Labour Market related variables available in the LFS.

The aim with regard to accidents at work was to know if the person has had an accident at work during the past 12 months. An accident is defined as a discrete occurrence, illnesses or other health conditions which develop over a long time should not be included. The concept of an accident includes also cases of acute poisoning and wilful acts of other persons. However, deliberate self-inflicted injuries are excluded. Only those accidents that occurred at work or in the course of the work of the interviewed person are considered.

The study population of the questions on accidents at work consisted of all persons that were working at the time of the survey administration or worked during the previous 12 months.

In all analyses the occurrence of one or more accidents at work acted as the dependent variable, while age, sex, country and work characteristics acted as the independent variables. First univariate analyses were carried out, in which all independent variables were analysed separately. Subsequently, multivariate analysis was performed, in which all independent variables were combined in one model (see Annex C). The UK could not be included in the multivariate analysis, since data on two work characteristics were not available (shift work, variables on atypical working hours).

Variables were checked for co linearity. Based on the high correlations between the variables indicating working hours per week and full-time/part-time, working hours per week was not included in the multivariate analyses. The variables evening work, night work, Saturday work and Sunday work were also highly correlated. Based on these high correlations and preliminary analyses showing the separate variables were in a similar way related to accidents at work, only the variable atypical working hours was included in the multivariate analyses. The variable atypical working hours is a combination of the variables evening work, night work, Saturday work, and Sunday work.

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<sup>1</sup> The data from Iceland were not ready for analysis at the time of this study.

## RESULTS

### Occurrence of accidents at work

Of the respondents in the EU27 that worked at the time of the survey administration or worked in the previous 12 months, 3.2% reported one or more accidents at work in the past 12 months (see Table 1). This percentage corresponds to 6.9 million persons in the EU27. The occurrence of an accident ranged from 0.6% in Bulgaria to 6.3% in Finland (Figure 1). In total, 0.4% of all respondents reported two or more accidents, which corresponded to approximately 0.8 million persons.

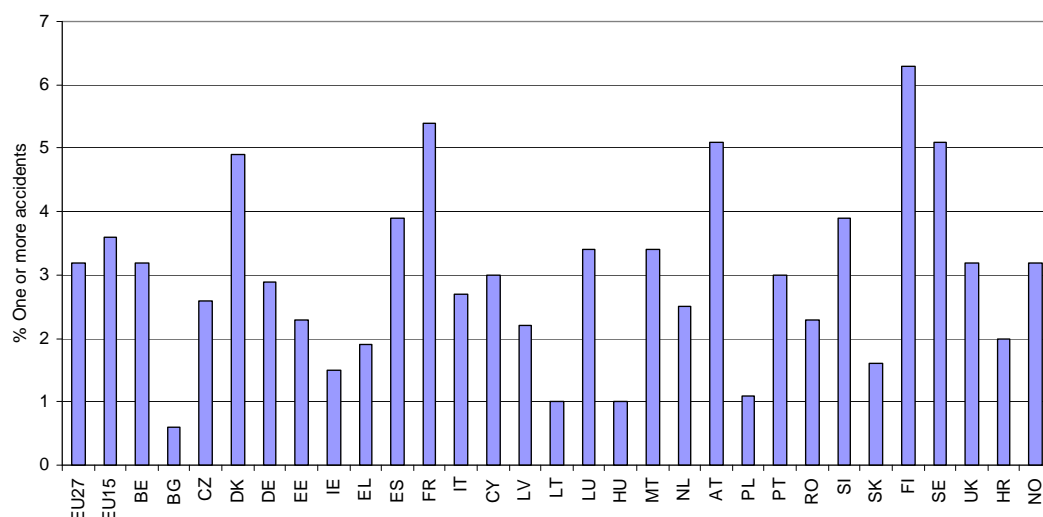
Respondents were asked if the most recent accident resulted in sick leave. In the EU27, 2.3% of all respondents reported sick leave for at least one day due to an accident at work. This corresponds to approximately 5.0 million persons. Among those with one or more accidents, 73.4% of the respondents in the EU27 reported sick leave for at least one day. Sick leave for one month or more due to an accident at work was reported by 0.7% of all respondents in the EU27, corresponding to 1.5 million persons in the EU27. Among those reporting one or more accidents in the EU27, sick leave for one month or more was reported by 22.0%.

Road traffic accidents at work were reported by 0.3%, corresponding to 0.67 million persons in the EU27. Road traffic accidents constituted 9.6% of the most recent accidents at work. Among countries, this ranged from 3.5% in Norway to 28.5% in Poland (Figure 2).

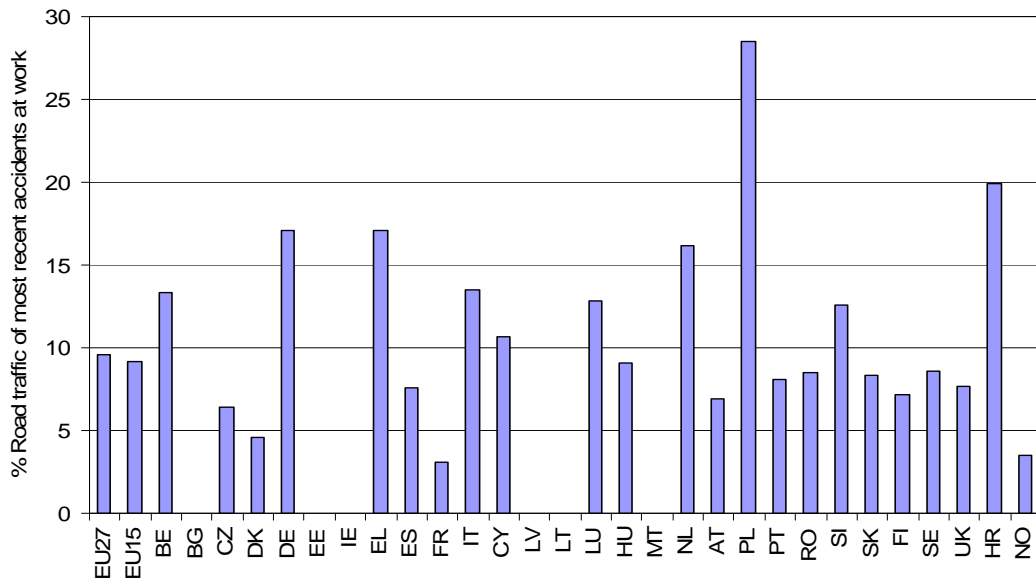
**Table 1** Accidents at work in the past 12 months in the EU27 and EU15 among persons that work or worked during the past 12 months

	Accident(s) at work %	Sick leave > 1 day* % of accidents	Sick leave > 1 month % of accidents	Road accidents % of accidents
EU27	3.2	73.4*	22.0	9.6
EU15	3.6	72.1*	20.9	9.2

\*: IE not included since IE did not distinguish between “no sick leave” and “one day of sick leave”



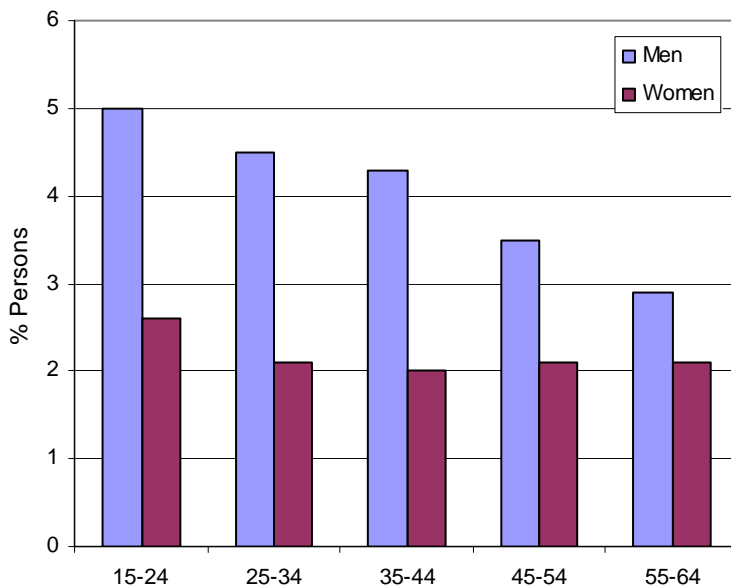
**Figure 1** Accidents at work in the past 12 months among persons that work or worked during the past 12 months in the EU27, EU15, and participating countries including HR and NO\*  
% of LT has limited reliability due to small sample size.



**Figure 2** Proportion of road traffic accidents among persons with accidents in the EU27, EU15 and the participating countries including HR and NO\*  
 \* % of DK, FR, CY, LU, HU, SI, SK and HR has limited reliability due to small sample size; sample size of BG, EE, IE, LV, MT, LT, and MT is below publication limit

**Demographic characteristics**

Men (4.0%) reported more often one or more accidents than women (2.1%), and also reported sick leave more often. Among men, the occurrence of accidents at work decreased with age (Figure 3). In both men and women, sick leave as a result of an accident at work increased with age. Persons with a low educational level more often reported an accident, and these accidents also resulted more often in sick leave. The proportion of road accidents among the reported accidents was highest in persons with a high level of education, in particular in men. Single persons reported more often accidents than married persons, but these accidents resulted less often in sick leave.



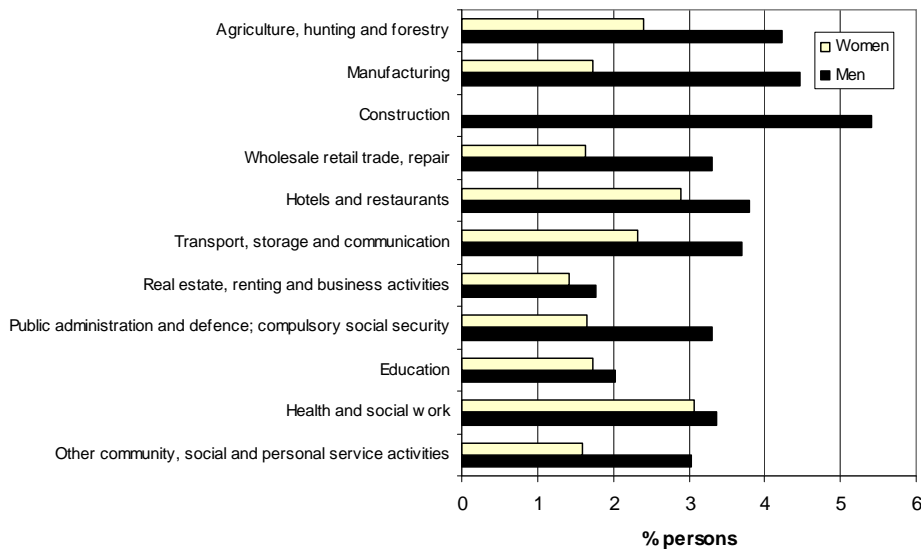
**Figure 3** Accidents at work in the past 12 months in the EU27 in different age groups of persons that work or worked during the past 12 months

## Work characteristics

Figures on work characteristics refer to persons that did not suffer from an accident in another job than their main job. This selection had consequences for the occurrence rate of accidents. Therefore, the percentages presented should be considered as an aid to compare subgroups of workers, and should not be considered as the percentage of accidents in these groups.

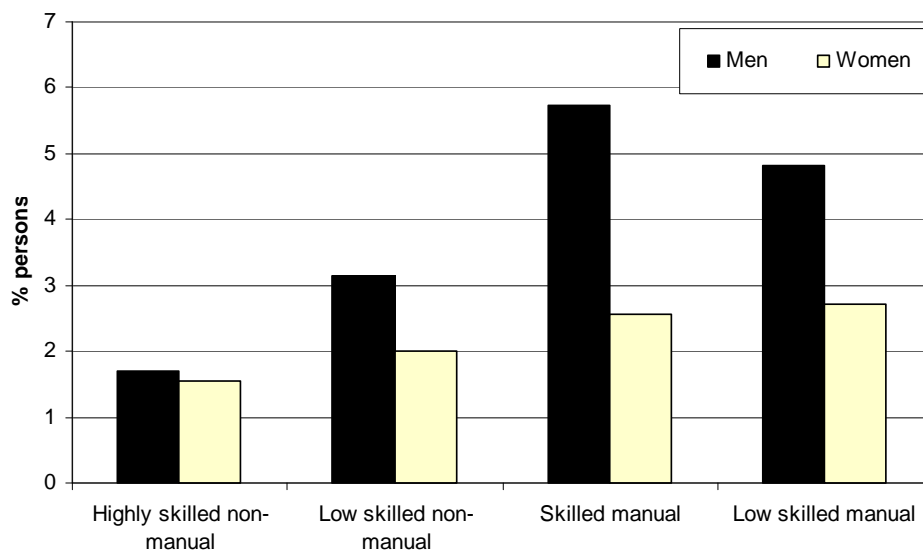
Figure 4 shows that accidents at work were most prominent in the sectors 'Agriculture', 'Manufacturing', and 'Construction'. Women in the sectors 'Health and social work' and 'Hotels and restaurants' reported more often one or more accidents than women working in other sectors. As expected, the proportion of road accidents was highest in the sector 'Transport'.

Skilled manual workers reported most often one or more accidents (Figure 5). Workers in relatively large companies and workers with shift work or atypical working hours reported an accident relatively often, whereas workers with part-time jobs and temporary jobs reported relatively few accidents.



**Figure 4** Workers reporting one or more accidental injuries at work or in the course of work in the past 12 months in their main job in different sectors\*

\*sample size is below publication limit for Fishing, Mining and quarrying, Electricity gas and water supply, Construction (females), Financial mediation, Private households with employed persons, Extra-territorial organisations and bodies.



**Figure 5** Workers reporting one or more accidental injuries at work or in the course of work in the past 12 months in their main job in different occupations

\* sample size is below publication limit for Army

## Univariate and multivariate analyses

Table 2 shows the odds ratio's of different categories of the independent variables. Values less than one imply a lower likelihood of an accident and values greater than one imply a higher likelihood, when compared to the reference value. If no reference value is indicated in the table, the mean of the other categories served as the reference value. The table shows that for many variables the results of the multivariate analyses did not differ substantially from the univariate analyses. In some sectors the likelihood of the occurrence of an accident decreased after including work characteristics in the model ('Agriculture', 'Manufacturing', 'Construction'). An explanation is that the higher likelihood of an accident in these sectors was caused by the presence of these potential work-related risk factors in these sectors.

**Table 2** Contribution of demographic and work characteristics to the likelihood of an accident at work in the past 12 months in the main job (Odds Ratio's and Confidence Intervals)

	Univariate analyses		<i>Multivariate analyses</i>	
	OR	CI	OR	CI
<b><i>Gender</i></b>				
Men	ref			
Women	0.52	0.49-0.55	0.69	0.64-0.75
<b><i>Age</i></b>				
15-24 jr	1.15	1.09-1.22	1.14	1.04-1.24
25-34 jr	1.06	1.01-1.11	1.12	1.06-1.19
35-44 jr	1.03	0.99-1.08	1.04	0.98-1.10
45-54 jr	0.91	0.97-0.95	0.89	0.84-0.95
55-64 jr	0.87	0.83-0.92	0.85	0.78-0.92
<b><i>Country<sup>1</sup></i></b>				
<b><i>Professional status</i></b>				
Employee	ref			
Self employed	0.84	0.79-0.90	<sup>2</sup>	
<b><i>Sector</i></b>				
Agriculture, hunting and forestry	1.43	1.26-1.62	1.30	1.06-1.60
Fishing	u	u	u	u
Mining and quarrying	u	u	u	u
Manufacturing	1.47	1.33-1.63	1.20	1.08-1.34
Electricity, gas and water supply	u	u	u	u
Construction	2.09	1.88-2.32	1.57	1.39-1.78
Wholesale retail trade, repair	1.00	0.90-1.11	1.16	1.02-1.32
Hotels and restaurants	1.33	1.16-1.52	1.69	1.43-2.00
Transport/storage/communication	1.36	1.20-1.53	1.13	0.97-1.30
Financial intermediation	0.52	0.44-0.62	0.51	0.38-0.69
Real estate, renting and business activities	0.64	0.56-0.73	0.96	0.82-1.13
Public administration and defense	1.02	0.90-1.16	1.29	1.11-1.50
Education	0.72	0.63-0.83	1.29	1.09-1.52

Health and social work	1.27	1.13-1.42	1.92	1.68-2.19
Other community activities	0.90	0.78-1.04	1.16	0.97-1.38
Private households with employed persons	u	u	u	u
<i>Extra-territorial organizations and bodies</i>	u	u	u	u
	<i>Univariate analyses</i>		<i>Multivariate analyses</i>	
	OR	CI	OR	CI
<b>Occupation</b>				
Highly skilled non manual	0.50	0.46-0.54	0.52	0.46-0.57
Low skilled, non manual	0.74	0.68-0.80	0.82	0.74-0.91
Highly skilled, manual	1.67	1.54-1.81	1.95	1.76-2.17
Low skilled, manual	1.30	1.19-1.41	1.43	1.29-1.58
Army	u	u	u	u
<b>Size firm</b>				
> 10 persons	ref			
10 persons or less	0.84	0.79-0.89	0.84	0.77-0.91
<b>Time since started work</b>				
60 months or more	ref			
<12 months	0.75	0.69-0.81	0.67	0.60-0.75
12-24 months	1.21	1.11-1.31	1.20	1.07-1.35
24-60 months	1.16	1.08-1.23	1.14	1.04-1.25
<b>Full-time/Part-time</b>				
Full time	ref			
Part time	0.59	0.55-0.64	0.72	0.64-0.81
<b>Type of contract</b>				
Permanent	ref			
Temporary	0.89	0.82-0.96	0.91	0.82-1.02
<b>Shift work</b>				
No shift work	ref			
Shift work	1.47	1.38-1.58	1.19	1.09-1.29
<b>Atypical working hours</b>				
Never	ref			
Sometimes	1.18	1.09-1.27	1.30	1.19-1.42
Usually	1.49	1.40-1.58	1.43	1.32-1.56
<b>Evening work</b>				
Never	ref			
Sometimes	1.04	0.97-1.12		
Usually	1.47	1.37-1.57		
<b>Night work</b>				

<i>Never</i>	ref			
<i>Sometimes</i>	1.41	1.29-1.54		
<i>Usually</i>	1.82	1.67-1.99		
<b><i>Saturday work</i></b>				
<i>Never</i>	ref			
<i>Sometimes</i>	1.22	1.13-1.31		
<i>Usually</i>	1.38	1.30-1.46		
<b><i>Sunday work</i></b>				
<i>Never</i>	ref			
<i>Sometimes</i>	1.12	1.03-1.21		
<i>Usually</i>	1.49	1.39-1.60		

<sup>1</sup> Results per country not included in this table. Only EU27 countries are included in the present analysis.

<sup>2</sup> Dropped as a result of missing data

( ): limited reliability due to small sample size, u: not available or sample size below publication limit

The likelihood of an accident at work in workers with shift work and atypical working hours decreased as well. This may be related to the high correlation between these variables, causing that the effect of one variable is partly explained by the effect of the other variable. Additional analyses showed that the OR of shift work in multivariate analyses without atypical working hours is 1.40 (CI: 1.30-1.51) and the OR of atypical working hours in multivariate analyses without shift work is 1.35 (CI: 1.24-1.47) for sometimes atypical working hours and 1.52 (CI: 1.42-1.64) for usually atypical working hours. These OR's do not differ much from those of the univariate analyses.

## **Discussion and conclusion**

In the EU27, 3.2 % of the respondents that are currently working or have been working during the last 12 months reported an accident at work in the past 12 months. This figure may be an underestimation as result of the high number of proxies used (see Venema, Van den Heuvel & Geuskens, 2009). Almost three-quarter (73%) of these accidents resulted in sick leave for at least one day, and 22% for at least one month. Ten percent of all accidents concerned road accidents.

Men reported more often accidents than women. The multivariate analyses showed that this difference could partly be explained by different work characteristics. Among men, the occurrence of accidents decreased with age. Although differences in work characteristics seem to be an obvious explanation, the multivariate analyses showed no indication for that.

The highest percentage of accidents at work was reported by men in the sector Construction. The multivariate analyses showed that the likelihood of an accident was also relatively high in the sectors Hotels and restaurants and Health and social work, in particular after the adjustment for work characteristics. This suggests that despite the fact that certain risk factors of accidents at work are less prevalent in these sectors (e.g. manual work, full-time work, less time in the job), relatively many accidents occur.

Of the work characteristics, the highest occurrence of accidents was reported by manual workers. Manual work goes together with other unfavourable work characteristics such as shift work and atypical working hours, which also were associated with a high occurrence of accidents.

Differences between Member States are large. The multivariate analyses showed that these differences could not be explained by differences in demographic characteristics or the work characteristics, as known from the Labour Force Survey. Interpretation of these differences is difficult. Differences between Member States could be attributed to several factors, such as culture, policy, awareness, wording of the questionnaires and use of proxies. Since, most of these factors are unknown we cannot draw conclusions on differences between countries.

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