

## Expert forecast on emerging physical risks related to occupational safety and health

### Why focus on emerging risks?

Working environments are continuously changing under the influence of new technologies and of shifting economic, social and demographic conditions. In this context, the Community strategy 2002–06 <sup>(1)</sup> called on the agency to 'set up a risk observatory' and 'anticipate new and emerging risks'. The risk observatory aims to identify and anticipate occupational safety and health (OSH) trends in Europe so as to better target resources and enable more timely and effective interventions.

### What are emerging risks?

An 'emerging risk' can be defined as any risk that is both **new** and **increasing**.

**New** means either that:

- the risk was previously non-existent; or
- a long-standing issue is now considered to be a risk due to a change in social or public perceptions or to new scientific knowledge.

The risk is **increasing** if:

- the number of hazards leading to the risk is growing; or
- the likelihood of exposure to the hazard leading to the risk is increasing; or
- the effect of the hazard on workers' health is getting worse.

### How to identify emerging risks?

The forecast formulation consisted in a three-round Delphi survey. The Delphi method is based on an iteration process in which the results of the previous rounds are fed back to the experts for new evaluation. For the rating of risks, a five-point Likert scale was used. Of the 137 experts who were invited to participate in the survey, 66 returned the questionnaire, covering 14 European countries and the USA.

### What are the top emerging OSH physical risks?

The risks identified in the forecast reflect a growing concern for multi-factorial issues.



#### • Lack of physical activity

The causes identified are the growing use of visual display units (VDUs) and automated systems resulting in prolonged sitting at the workplace, as well as the increasing time spent sitting during business travel. A literature review showed that occupations with very little physical activity and increased prevalence of musculoskeletal disorders (MSDs) usually involve prolonged sitting, but workplaces where there is prolonged standing are also a concern. The health outcomes are MSDs of the upper limbs and of the back, varicose veins and deep-vein thrombosis, obesity and certain types of cancer.

#### • Combined exposure to MSD and psychosocial risk factors

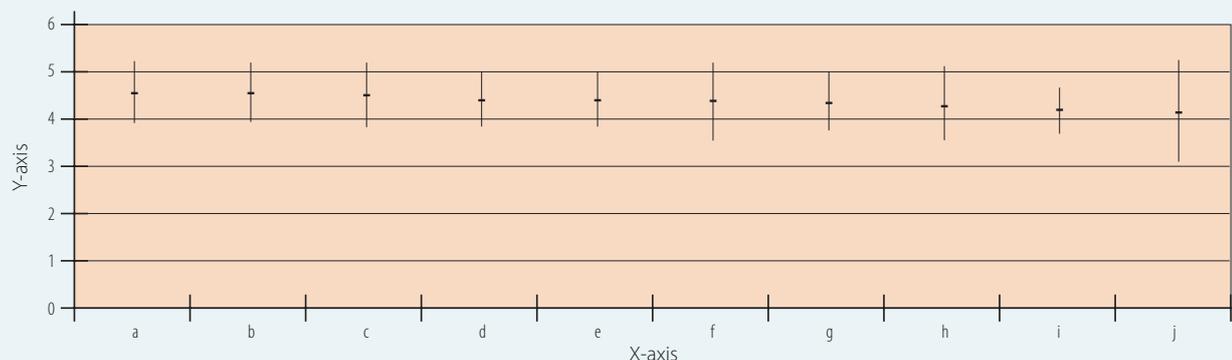
Unfavourable psychosocial aspects are seen to accentuate the effects of physical risk factors and contribute to an increased incidence in MSDs. The literature focuses on VDUs and call centre jobs and on the healthcare sector. The psychosocial factors mentioned are too high or too low job demand, complex tasks, high time pressure, low job control, low decision level, poor support from colleagues, job insecurity and bullying. Combined exposure to MSD and psychosocial risk factors has a more serious effect on workers' health than exposure to one single risk factor.

#### • Complexity of new technologies and human-machine interfaces

The physical characteristics of workplaces, such as poor ergonomic design of human-machine interfaces, augment workers' mental and emotional strain and therefore the incidence of human errors and the risk of accidents. 'Intelligent' but complex human-machine interfaces are found in the air industry, in the healthcare sector (computer-aided surgery), in heavy trucks and earth moving machinery (e.g. in-cab joysticks) and in complex manufacturing activities (cobots).

<sup>(1)</sup> 'Adapting to change in work and society: a new Community strategy on health and safety at work 2002–06', COM(2002) 118 final.

Top ten emerging OSH physical risks identified in the survey (Y-axis: mean values on the one-to-five-point Likert scale and standard deviations; X-axis: risks)



- a. Lack of physical activity
- b. Combined exposure to vibration and awkward postures
- c. Poor awareness of thermal risks among low-status worker groups exposed to unfavourable thermal conditions
- d. Multi-factorial risks
- e. Combined exposure to musculoskeletal disorder and psychosocial risk factors
- f. Thermal discomfort
- g. Combined exposure to vibration and muscular work
- h. Complexity of new technologies, work processes and human-machine interfaces
- i. Insufficient protection of high-risk groups against long-standing ergonomic risks
- j. General increase of exposure to ultraviolet radiation during and outside working time

### Multi-factorial risks

The experts especially highlighted multi-factorial risks. The literature focuses on call centres, which are multiplying and bring new types of jobs with multiple exposure: prolonged sitting, background noise, inadequate headsets, poor ergonomics, low job control, high time pressure, high mental and emotional demands. MSDs, varicose veins, nose and throat diseases, voice disorders, fatigue, stress and burnout are observed in call centre agents.



Increasing number of call centre jobs in Germany  
HVVG, Germany — Pressebilder

### Insufficient protection of high-risk groups against long-standing ergonomic risks

This issue is recurrent through the forecast. Workers with low employment status and poor working conditions, who paradoxically are the subject of fewer training and awareness-raising measures, are identified as particularly at risk. An example is workers in the agriculture and construction sectors with poor knowledge of the thermal risks related to work in cold or hot environments.

### Thermal discomfort

Lack of measures against thermal discomfort at industrial workplaces, where only thermal stress has been addressed so far, is highlighted. The impact of thermal comfort on workers' stress and

well-being is considered as not adequately assessed. Thermal discomfort may impede workers' performance and safety behaviour, hence increasing the probability of occupational accidents.

### General increase of exposure to ultraviolet radiation (UVR)

The respondents strongly acknowledge ultraviolet radiation as an emerging risk. As UVR exposure is cumulative, the more workers are exposed during but also outside their working time, the more UVR sensitive they are at work. Hence a potentially growing need for prevention measures at the workplace.

### Combined exposure to vibration, awkward postures and muscular work

Vibration, although considered a more 'traditional' risk, has gained more attention with the European Directive 2002/44/EC (?).

### Further information

Expert forecasts on human, social and organisational risks, chemical risks and biological risks complement the forecast on physical risks to provide as comprehensive a picture as possible of the emerging risks in the world of work.

Complete results from the risk observatory are available at: <http://riskobservatory.osha.europa.eu>

The agency's report 'Expert forecast on emerging physical risks related to occupational health and safety': <http://osha.europa.eu/publications/reports/6805478>

The agency's working paper 'Research on changing world of work': <http://osha.europa.eu/publications/reports/205>

The agency's report 'New trends in accident prevention due to the changing world of work': <http://osha.europa.eu/reports/208/>

The agency's website provides links to research related to the changing world of work: <http://osha.europa.eu/research/rtopics/change/>

(?) 'Directive 2002/44/EC of the European Parliament and of the Council of 25 June 2002 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration) (OJ L 177, 6.7.2002).