



**OSH in figures:
Occupational safety and health in the
transport sector — An overview**

European Agency for Safety and Health at Work

EUROPEAN RISK OBSERVATORY REPORT



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Occupational safety and health in the transport sector —
An overview**

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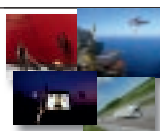


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ABBREVIATIONS AND GENERAL SOURCES

OSH	Occupational Safety and Health
EODS	European Occupational Disease Statistics
ESAW	European Statistics on Accidents at Work
EWCS	European Working Conditions Survey
LFS	Labour Force Survey
NACE	Nomenclature statistique des activités économiques dans la Communauté européenne

Data in the tables are based on the NACE Rev. 1.1., Eurostat data, in particular on health and safety at work statistics, will be collected based on the new NACE Rev. 2 categorisation as from reference year 2008 onwards¹.

(¹) Statistics referring to economic activities performed from 1 January 2008 onwards shall be produced by Member States using NACE Rev. 2 or with a national classification derived there from pursuant to Article 4 of Regulation (EC) No 1893/2006 of the European Parliament and of the Council of 20 December 2006 establishing the statistical classification of economic activities NACE Revision 2 and amending Council Regulation (EEC) No 3037/90 as well as certain EC Regulations on specific statistical domains. Available at: <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:393:0001:0039:EN:PDF>



COUNTRY CODES

AT	.....	Austria
BE	.....	Belgium
BG	.....	Bulgaria
CY	.....	Cyprus
CZ	.....	Czech Republic
DE	.....	Germany
DK	.....	Denmark
EE	.....	Estonia
EL	.....	Greece
ES	.....	Spain
FI	.....	Finland
FR	.....	France
HU	.....	Hungary
IE	.....	Ireland
IT	.....	Italy
LT	.....	Lithuania
LU	.....	Luxembourg
LV	.....	Latvia
MT	.....	Malta
NL	.....	Netherlands
PL	.....	Poland
PT	.....	Portugal
RO	.....	Romania
SE	.....	Sweden
SI	.....	Slovenia
SK	.....	Slovakia
UK	.....	United Kingdom

- EU-12** 12 countries that joined the European Union over the past years:
Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.
- EU-15** Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.
- EU-27** Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.
- NMS** 10 countries that joined the European Union on 1 May 2004:
Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia.
- NMS-2** Two countries that joined the European Union on 1 January 2007: Bulgaria, Romania.



FOREWORD

The European transport sector is a dynamic, rapidly changing and booming sector. The expansion of the European Union, intensified relations with neighbouring countries, changing travelling and food consumption habits, the free movement of goods, as well as environmental concerns, have contributed over the last years to significant changes in the way transport companies operate. This has also had a remarkable impact on their employees' working conditions.

This report, the fifth in the European Risk Observatory's 'OSH in figures' series, seeks to describe the OSH situation of European transport workers and give an outlook to expected future developments. Work organisational changes as well as customer expectations and conflicting demands in a growing service economy have contributed to an increase in violence, there are growing concerns about transport workers fatigue, and increasingly transport workers suffer from stress and a variety of musculoskeletal disorders. Technological changes are hard to keep pace with and have also lead to an ever-increasing need for training. Last but not least the growing number of women and migrant workers employed in the transport sector calls for an adaptation of the working conditions to an increasingly diverse working population. This is why this report highlights issues of concern for risk prevention and gives recommendations for research, practice and monitoring. It is also complemented by a number of other information products describing good practices in occupational health and safety that have been set up to address the many OSH problems.

The report comes at the right moment as Europe's transport policies for the next 10 years are being shaped. Moreover, environmental concerns over greenhouse gas emissions and energy resources will keep on having a high impact on the conditions in transport. The European Agency for Safety and Health at Work will endeavour to mainstream its findings into these discussions to help bring the health and safety of European transport workers higher on the political agenda and tackle the OSH challenges of the years to come.



Jukka Takala
Director
European Agency for Safety and Health at Work



SUMMARY

This report is the fifth in a series of European Risk Observatory thematic reports. It seeks to review in depth what risks transport workers are exposed to at work and what the consequences of these exposures are. It does this not only by analysing statistics and studies, but also through selected case examples of research and prevention. The report is intended for both those working in the sector and policymakers in this domain.

While trying to give an overview and highlight the main issues for policy and prevention, the study covers a wide variety of jobs and tasks and a very diverse working population. To cover at the same time the common trends and explain the problems specific to certain jobs is a challenging task. There are many common issues, such as the increasing number of immigrant workers in transport jobs, or the combination of ergonomic and psychosocial stressors, but they are expressed differently in the different subsectors and need to be tackled differently. That is why the report addresses many transport occupations with specific case studies describing the OSH problems and giving advice on how they were prevented effectively. A more in-depth insight into workplace prevention measures for road transport, haulage, taxi drivers and courier services is also provided by other Agency publications.

Transport — the broader context

The transport sector, including transport over land (by road and train), water and air, is essential to Europe's prosperity: not only does this sector facilitate the mobility of citizens and goods; it also has a significant impact on economic growth, social development and the environment ^(?).

In 2006, about 6 million EU-25 workers were employed in the transport sector (land–road and train, water and air). The share within the whole economy accounted for about 3 %, which varied largely between the Member States: from about 1.9 % in Germany until about 6 % in Estonia and Latvia.

Land transport was by far the largest sub sector in the EU-25. In 2006, 88 % of transport workers were employed in land transport and pipelines, 7.5 % in air transport and 4.3 % in transport over water. According to the latest figures ⁽¹⁾, the transport industry at large accounts for about 7 % of GDP and for over 5 % of total employment in the EU, of which 4.4 % corresponds to transport services and the rest to transport equipment manufacturing, while 8.9 million jobs correspond to transport services and 3 million to transport equipment.

The distribution of workers by sub sector varies largely between the different countries. Transport over land is the most important sub sector in all Member States, with exception of Malta where it is air transport.

^(?) European Commission — Directorate General for Energy and Transport, 'Transport Research in the European Research Area — A guide to European, international and national programmes and projects', 2006.

⁽¹⁾ Future of Transport Communication <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/09/279&format=HTML&aged=0&language=EN#>



Research on safety and health aspects is often focused on transport over land. There should be more focus on the other subsectors, rail, water and air transport.

In transport, since the majority of jobs with a visible risk for occupational accidents and injuries are male-dominated, health and safety action is also male-centred.

In order to make the transport industry a more attractive workplace for women and to eliminate the risk of gender inequality at work, attention has to be devoted to solving problems such as the difficulty of combining work and family, the high physical workload and the lack of female friendly facilities.

As a consequence of land transport being the largest subsector in transport, research on safety and health aspects is often focused on transport over land. Future research should include the hazards and risks characteristic in the other sub sectors of transport (for example the exposure of cabin crews to radiation, the quality of air board of aircrafts; handling of and exposure to asbestos by railway workers or fatigue in drivers in public service, etc.).

In general, the transport sector is a small company sector, with most companies having fewer than 50 employees. Large companies are typical within air transport and railway transport.

More and more women work in the transport sector, but the conditions do not adapt

The transport workforce is also made up primarily of male workers: in 2006, about 84 % of the EU-25 transport workers were male. There are also great variations between Member States: the proportion of female workers is the lowest in Greece (6 %) and the highest in Malta (27 %). However, the proportion/number of female workers has been increasing in several Member States.

The gender difference is not as large in all sub sectors. In 2006, the proportion of female workers in land transport was 13.6 %, in transport over water it was 17.7 %, and in air transport 40.7 %.

In transport, since the majority of jobs with a visible risk for occupational accidents and injuries are male-dominated, health and safety action is also male-centred. Even for occupations and sectors with a growing number of women workers, investment — when funds are available — in workplace ergonomics still reflects a male-only work environment. This report confirms earlier findings from studies performed by other European organisations regarding the impact of working conditions on gender balance ⁽⁴⁾. Women working in transport still have to adjust to a male-centred organisation of work, infrastructures, workplace culture and working conditions. In order to make the transport industry a more attractive workplace for women and to eliminate the risk of gender inequality at work, attention needs to be devoted to solving main problems as the difficulty of combining work and family, the high physical working load and the lack of female friendly facilities. Studies have also found that for some occupations, there is an increasing number of female workers, but their jobs are either not considered as 'typical transport jobs' — this is the case for example for catering tasks — or where they move into technical or driving jobs, the workplace conditions remain the same, despite the need for adaptation.

The transport workforce is ageing at a greater rate than the general working population

Despite the high demands on transport workers, the transport workforce is ageing, at a greater rate than the general working population: in 2006 around 68 % of workers in transport were aged between 25 and 49 and 26 % were in the 50–64 age group. Only 6 % of workers in the sector were under 25 years old, in comparison with 11 % in the overall EU workforce, and the proportion of young workers has been more than halved over less than 10 years in several Member States.

⁽⁴⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.



These demographic changes raise the question as to how to best ensure the transport sector will contribute to the development of skills among older workers, while preserving the health and employability, motivation and capacities of workers as they age. In addition, the introduction of a number of technical applications such as electronic planning and remote monitoring systems and mobile means of communication has changed the content and workload of the transport worker. Transport workers have to operate these complex applications — not necessarily a simple task. This increases the need for continuous and adapted training that keeps up with organisational and technological changes and growing customer demands. In addition, more attention should be given to the ergonomics of workplaces, as it is a known fact that some health problems, including MSDs, increase with age and seniority, at least because of the length of exposure and unsatisfactory working conditions. This report presents a few examples of how to adapt conditions, but more extensive complementary studies have been conducted by EU-OSHA ⁽⁵⁾ ⁽⁶⁾ ⁽⁷⁾.

Training and prevention need to be adapted to a rapidly ageing transport workforce

An increasing proportion of part-timers, but still less than in other sectors

In 2006, about 8 % of the EU-25 transport workers were working part-time in comparison with about one out of five within the total working population. Part-time work in transport strongly increased over the last decade in several Member States. Research reveals that employees with a part-time contract have less control over working time, have work requiring fewer skills, receive less training and have more monotonous jobs. Working conditions and skills needs of part-time transport workers need be addressed, by providing training to employers, workers, inspectors and OSH specialists and raising awareness in employment agencies. Specific transport-tailored guidance should be provided to employers, inspectors and prevention services on part-time workers.

A high proportion of migrant workers

The transport sector is, together with agriculture and horticulture, construction, healthcare, households, and the food sector, one of the sectors that employs more (im)migrant workers. Although conditions and jobs may differ, (im)migrant workers are more occupied in the so-called three D-jobs (dirty, dangerous and demanding) within these sectors, in road transport as long-distance drivers, in air transport as luggage handlers and cleaners, in water transport in maintenance and service jobs. Their work is often characterised by uncertainty, poor working conditions, part-time jobs, and low wages. The increasing migration of transport workers from the acceding countries and from non-EU countries makes this an issue of concern. One study on water transport demonstrated that the increasing proportion of migrant workers from many different cultural backgrounds and other structural changes, such as the registration of fleets in countries under non-EU rules, went hand in hand with a deterioration of OSH conditions, and workers tended to be segregated into different jobs depending on their countries of origin, an internal hierarchy established within the migrant working population.

⁽⁵⁾ Managing risks to drivers in road transport, Report, European Agency for Safety and Health at Work, (EU-OSHA) in print.

⁽⁶⁾ Delivery and despatch riders' safety and health A European review of good practice guidelines, Literature review, European Agency for Safety and Health at Work, (EU-OSHA), 2010.

⁽⁷⁾ Taxi drivers' safety and health. A European review of good practice guidelines, Literature review, European Agency for Safety and Health at Work, (EU-OSHA), 2010.



Transport — a sector in evolution

A 2008 study commissioned by the EEA ⁽⁸⁾ has analysed the drivers of change in the transport sector. Although the study focused on issues with an impact on environmental protection, it identified a number of issues relevant for OSH:

- the rapid growth of air transport, mainly low-cost and with infrastructures newly set up under high time pressure; less workers have to attend more clients in premises that constantly have to be adapted to changing demands;
- the rapid growth of migration linked to increased transport activities and the back-effect on increased transport, as migrant workers visit their families at home;
- the impact of changing consuming habits, for example food consumption, on (food) industry infrastructures as well as on transport demands; other studies, for example Eurostat data, have identified an increase of cabotage (short-distance transport);
- the changing patterns of travelling as regards distances, locations, destinations and length of the journey;
- the impact of an ageing population on transport demands and infrastructures;
- the changing demands on short-distance commuting and public transport, for example regarding the transport of school children. This is confirmed by national reports, and is also one of the main areas where female workers are increasingly employed in the transport sector.

The study presents policy options for influencing some of the drivers of change, such as targeted taxation to reduce long-distance transport of goods. It is important to consider how these policy measures may be able to influence the occupational safety and health of workers and to explore possible synergies and limit detrimental effects.

The study also highlighted a knowledge gap and a need for more research on the transport consequences of non-transport decisions. European experience of managing transport demand by non-transport sectors was found to be undocumented, insufficiently highlighted or to stay within the national boundaries of the EU Member States.

Fast growing emissions from transport are one of Europe's biggest challenges in the fight against climate change. Over the past decade, transport's emissions have increased at a faster rate than any other energy-using sector and about a quarter of greenhouse gas emissions are linked to transport, mainly from road vehicles ⁽⁹⁾. In a 2007 communication ⁽¹⁰⁾, the Commission assessed that energy and transport policies would have meant EU CO₂ emissions would increase by around 5 % by 2030 and global emissions would rise by 55 %. Therefore, the European Union agreed to cut emissions drastically.

However, significant growth in the total demand for transport should be expected, as a result of the extension of the European single market and of further increase in short-

There is a need for more research on the transport consequences of non-transport decisions. European experience of managing transport demand by non-transport sectors is often undocumented.

⁽⁸⁾ Beyond transport policy — Exploring and managing the external drivers of transport demand, European Environment Agency (EEA), 2008. Available at: http://www.eea.europa.eu/publications/technical_report_2008_12

⁽⁹⁾ IPCC Fourth Assessment Report: Working Group III Report 'Mitigation of Climate Change', Intergovernmental Panel on Climate Change, 2007. Available at: http://www.ipcc.ch/publications_and_data/ar4/wg3/en/contents.html. The Intergovernmental Panel on Climate Change (IPCC) was formed in 1988 by the United Nations and the World Meteorological Organization (WMO). The IPCC released research and forecasts into the evidence and possible results of climate change.

⁽¹⁰⁾ Communication from the Commission to the European Council and the European Parliament. An energy policy for Europe. Brussels, 10.1.2007, COM(2007) 1 final. Available at: http://ec.europa.eu/energy/energy_policy/doc/01_energy_policy_for_europe_en.pdf



distance and international transport of goods. Transport predominantly relies on a single fossil resource, petroleum, which supplies 95 % of the total energy used by world transport. The EU Commission estimated that to achieve a sustainable, interconnected European energy system will require massive energy infrastructure change as well as organisation innovation. Very diverse sectors would be affected, not only energy, environment and transport, but also information and communication technologies, agriculture, competition, trade and others. This will require a multidisciplinary approach to issues that are increasingly interconnected. It is therefore recommended that industry and governments work together to keep track of the OSH impact of these changes.

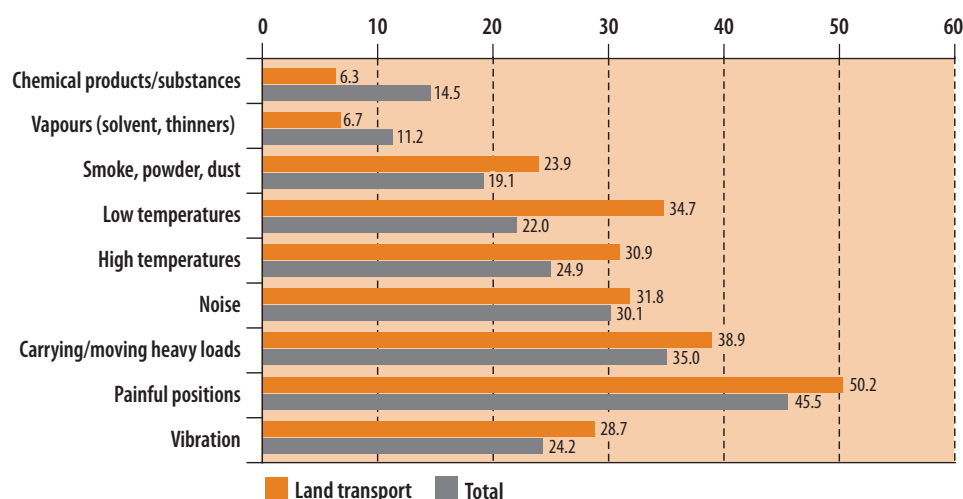
Exposure to risks

Transport workers are not a homogenous group; they represent, within one multifaceted sector, many different occupations with specific sets of working conditions and risks, and very varying demands. Recent changes in the transport sector have contributed to a change in risks and exposures. But there are also some common issues. The following section does not address the details of the different aspects, but attempts to raise the main OSH issues and risks.

When looking at OSH risks in the transport sector, the risk of accidents with material loss and damage and/or human victims as an outcome stands out. However, it should not be forgotten that a range of other safety risks (i.e. prolonged sitting, heavy lifting, handling dangerous substances, psychosocial and organisational risks, etc.) are also present when working in the transport sector and some of these risks may seriously affect workers' health.⁽¹¹⁾

Transport workers have multiple exposures to physical risks

Figure 1: Overview of the physical work factors, EWCS 2005 (all the time)⁽¹²⁾



Source: EWCS

⁽¹¹⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.

⁽¹²⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound), Data extracted by Prevent for OSH Data Collection 2007, <http://www.eurofound.europa.eu/working/surveys/index.htm>



Vibrations, for example the full body vibration caused by the driver's cabin, can also have an effect on cognitive faculties such as the vision, coordination and the overall functional ability of the workers.

Lifting aids and ergonomic equipment may not be available or the workers may depend on the equipment at the site of delivery or on the unforeseen shape or weight of the loads.

Care should be given to foresee individual adaptability of the equipment or the working environment by workers (for example in service areas of planes or trains, or the work area of professional drivers).

Noise may interact with exposure to dangerous substances such as exhaust gases and organic solvents, increase fatigue and reduce attention, thus leading to higher accident risk.

More exposed to vibrations, noise and physically strenuous work

Surveys suggest that transport workers, especially drivers, are more exposed to vibrations (i.e. vibration of cabin) than the average working population. Whole body vibration and prolonged sitting or standing are widespread problems, which increase the chance of the development of MSDs, especially back disorders, among transport workers. Vibrations, for example the full body vibration caused by the driver's cabin, can also have an effect on cognitive faculties such as the vision, coordination and the overall functional ability of the workers.

Heavy lifting tasks are another important occupational risk within the transport sector, especially during loading and unloading of vehicles, in service tasks such as catering and maintenance of vehicles, ships and trains, and on delivery of parcels and goods, and at airport check-in desks.

In addition, lifting aids and ergonomic and safety equipment may not be available or the workers may depend on the equipment at the site of delivery or on the unforeseen shape or weight of the loads, making it difficult to lift or carry them in an ergonomically acceptable way. It often depends largely on the arrangements with clients and the awareness of OSH risks whether conditions are adapted or not. Care should be given to foresee individual adaptability of the equipment or the working environment by workers (for example in service areas of planes or trains, or the work area of professional drivers).

Surveys suggest that transport workers are also more exposed to repetitive movements (i.e. while driving, collecting fares, pulling and pushing of loads, and getting on and off the vehicle).

Surveys and workplace measurements demonstrate that transport workers are more exposed to loud noise. There are important noise sources in and around vehicles and some of the highest noise levels observed at workplaces may result from them, not only in road and rail transport, but also on planes or large boats. When driving, performing loading and unloading and when they board vehicles, transport workers may be exposed to high background noise levels. Noise may also interact with exposure to dangerous substances such as exhaust gases and organic solvents, increase fatigue and reduce attention, thus leading to higher accident risk.

Exposure to dangerous substances is more frequent than usually assumed, and not only for dangerous goods transport

Inhalation of vapours and fumes is another important risk for transport workers. For workers loading and unloading vehicles, these exposures are inherent to their jobs, but other workers and drivers may also be exposed at stops and terminals and when servicing and boarding vehicles. The same measures, for example regarding exposure to diesel exhaust, should be applied as for occupational risk prevention in other sectors, but awareness may be low, for example in water and air transport, where either heavy duty motors are used or where the workplace situation is constantly changing, as in the cargo and unloading areas of air transport.

Exposure to road dust and diesel fumes, a carcinogenic mixture, occurs in all subsectors, including public transport, for example at bus stops, at terminals and in loading areas, and when boarding vehicles. Inorganic and organic small-particle dust exposure is also an issue, as well as asbestos exposure, which was identified as an issue for railway maintenance workers.



Exposure to other harmful chemicals also takes place at sites, for example when loading, unloading, weighing, cleaning and servicing containers and vehicles, and work areas. This report presents an overview and a few examples of exposures to dangerous substances in the transport sector.

Intentional handling of dangerous substances is also common in goods traffic ⁽¹³⁾. A further risk for exposure comes from unforeseen incidents and spills involving dangerous substances. Recent waves of accidents on road and water resulting in serious fires should have raised awareness of the fire and explosion risks and the serious consequences such incidents may have.

Risks from exposure to biological agents remain largely unassessed

Recently, attention has been given to the exposure of transport workers, especially in air and long-distance transport, to influenza and the potential for transmission of the disease by these workers. However, risks arise equally from other infectious diseases that may be endemic in areas they travel to. These risks may not only be relevant to flight attendants and drivers, but also to other workers who may come into contact with contaminated areas or loads, or with animals. Furthermore, transport workers may be exposed to the same biological risks other workers are exposed to when cleaning or performing maintenance tasks. Guidance is available on the protection of transport workers to some infectious diseases, but a lot still remains to be done.

Climatic risks

Especially during loading and unloading, and maintenance activities, transport workers may be exposed to extreme climatic conditions. Cargo workers, as well as workers employed on other forms of transport, such as leisure ships, work outdoors. The adaptability of their working environment is very limited in that respect, so it is very important that those measures that can be applied actively are applied (clothing, footwear, and rest facilities). Climatic risks and exposure to UV radiation should be taken into account in risk assessment, especially for transport workers who work outdoors.

Work organisation

There is an increase of work pressure and workload to be observed in the transport sector, often a result, as in road and rail transport, of 'just-in-time' management. The just-in-time principle means that goods are delivered at the moment the customer needs them in the production process. Because the stocks are being decreased to a minimum, a higher frequency of delivery of small amounts is necessary ⁽¹⁴⁾.

Structural changes have also had an impact on working conditions in the other transport subsectors: the rapid growth of air transport in constantly changing work environments or the increase in ship cruises and maritime container transport are just some of the examples to be mentioned here. In public transport, automatic ticketing and reductions in personal services have led to more lone working and the remaining staff often have to act as the intermediaries translating organisational changes to the

The same risk prevention measures to protect transport workers from dangerous substances should be applied as in other sectors, but awareness may be low in other occupations than dangerous goods handling.

Guidance is available on the protection of transport workers to some infectious diseases, but a lot still remains to be done.

Climatic risks and exposure to UV radiation should be taken into account, especially for transport workers who work outdoors.

⁽¹³⁾ Connections between the safety, logistics, working conditions and professional attractiveness of road transport, FIOH 2006.

⁽¹⁴⁾ SERV, Onderzoek naar de kwalificatiebehoeften voor vrachtwagenchauffeur, Brussel: Sociaal-Economische Raad van Vlaanderen, 1998.

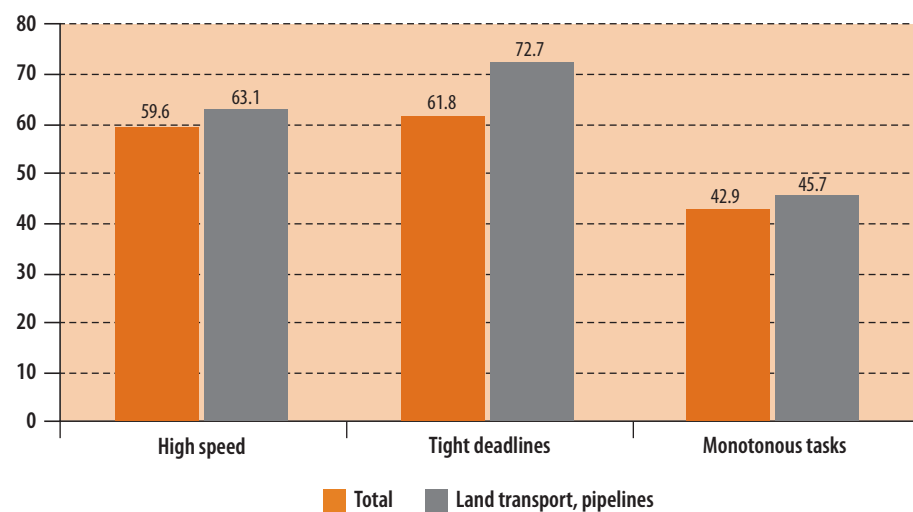


customers. In a service economy, there are also higher customer demands on service attitudes and delivery, and the ability to satisfy demands.

A further element that impacts on workload is the introduction of a number of electronic applications such as remote planning and monitoring systems and mobile means of communication.

For example, in road haulage, due to the open market and the increase in international transport, the job content of professional drivers has changed considerably. Knowledge of the road codes and planning have become more important, as have basic knowledge of European traffic laws and signalisation (which may be different by country) of main European traffic routes, where to find customhouses, and being able to communicate in different European languages, etc. Due to an increase in use of technology, trucks are better equipped and have more comfort. Furthermore, technology results in decreased expenditure, less noise, etc., but it also creates a need for more knowledge on the part of the drivers to handle special circumstances. Drivers need to know how to work with automated systems like an on-board computer, digital tachographs or other telematic equipment ⁽¹⁵⁾. To avoid a certain degree of uneasiness, confusion and irritation among drivers, there is a need for sufficient education and training.

Figure 2: EWCS 2005, percentage of workers reporting monotonous work, working at high speed and to tight deadlines, EU-27 ⁽¹⁶⁾



Transport workers have less influence on their work, have to work at increasing speed, and often have monotonous work. They also often have conflicting tasks, for example to attend to customers while they carry out other tasks.

Source: EWCS

However, several surveys reveal that transport workers, especially drivers and those in public transport are more involved in monotonous tasks and that they have less influence on their work than the average working population. They also often have conflicting tasks, for example to attend to customers while they carry out other tasks. National surveys suggest that transport workers also experience less social support from their colleagues. Furthermore, in general, transport workers have restricted access to training and learning opportunities.

⁽¹⁵⁾ SERV, Flexibilisering van werk- en levertijden in het goederenvervoer: een aanbeveling van de Sectoriële Commissie Goederenvervoer, Brussel: Sociaal-economische Raad van Vlaanderen, 1999.

⁽¹⁶⁾ Statistical annex EWCS 2005. Available at: http://www.eurofound.europa.eu/docs/ewco/4EWCS/ef0698/statistical_annex.pdf



Working time

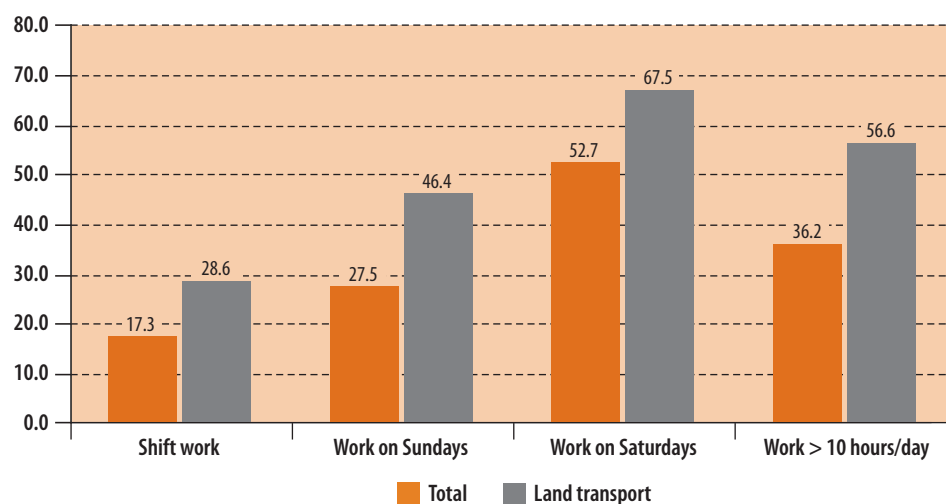
Working in transport is not characterised by the typical '9 to 5' working hours

Several studies indicate that transport workers report long working days and weeks. Varying working hours (working in the evening, shifts, at night, on weekends) are an important issue for transport workers. Health hazards connected to atypical working times, such as insomnia, long-term fatigue and digestive problems, are common in transport and affect the health and well-being of workers.

There are many scientific studies reporting the negative health effects of non-standard working hours and possible psychosocial problems, both short-term effects and long-term associated health effects. Additional problems may also occur in specific risk groups. For example, with regard to female workers, problems concerning reproductive health may occur. A recent Danish study, for example, has revealed an increased breast cancer risk for women working nightshifts, for example flight attendants. Since the attraction of female workers to the profession is mentioned as one of the solutions for the employment problem in the sector, attention should be given to this specific issue. Regarding older workers, increased fatigue problems may occur. Since the number of older workers is increasing — and it is expected that this trend will persist — more attention should be given to adapting work schedules and shift patterns ⁽¹⁷⁾.

Regarding specific work-related accidents on the road, statistics reveal that up to 45 % of accidents resulting in fatalities happen at night, although there is far less traffic at night compared with day time. Regarding the total number of injured people, only 18 % occurs at night. It can be concluded that if an accident occurs at night, the risk for a serious accident is much higher ⁽¹⁸⁾.

Figure 3: Overview working time — length and working time patterns, percentage share of workers, EWCS 2005 ⁽¹⁹⁾



Source: EWCS

⁽¹⁷⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.

⁽¹⁸⁾ BIVV, Jaarverslag 2000: Verkeersveiligheid, 2000.

⁽¹⁹⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound). Available at: <http://www.eurofound.europa.eu/ewco/surveys/index.htm>



Psychosocial factors

In the transport sector, some of the factors that contribute to stress are: working alone, irregular work hours, lack of involvement, work pressure, customers' or co-workers' aggression, and conflicting tasks. Traumatic incidents such as aggression from customers or suicide attempts of passengers may lead to long-term absences and may require prolonged treatment and psychological support for workers. A study found that a high proportion of transport workers who had suffered post-traumatic stress following a traumatic incident were suffering permanent incapacity.

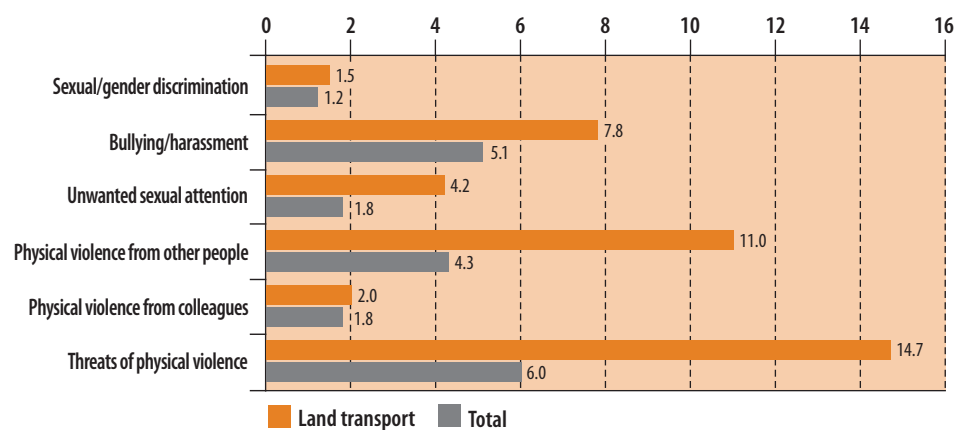
Violence is an increasing risk in the transport sector

Third-party violence is an occupational risk in the transport sector that has attracted increasing attention over recent years. Violence at work can be defined as incidents where employees are abused, threatened, assaulted or subject to other offensive behaviour in circumstances related to their work. Violence includes both physical and non-physical violence.

Staff working in passenger transport services — including airline and airport services, ferry, train, bus, and taxi services — are potentially those most at risk of physical or psychological violence. The main tasks of transport workers include the transport itself, the provision of information to and the supervision of the travelling public, the control of tickets and the prevention of vandalism and violent behaviour. Changes in work organisation, such as increasing lone working, work intensity and direct contact with clients, as well as growing client demands on services and conflicting tasks of transport workers are contributing factors to the rise in violent incidents. In addition, transport workers often have to act as involuntary intermediates for organisational changes that affect customer service.

Transport workers often have to act as involuntary intermediates for organisational changes that affect customer service.

Figure 4: Exposure (in % share of workers) to violence and harassment risk factors, land transport and total 2005



Source: EWCS

Violence and harassment in transport go largely unreported

There is a clear discrepancy between survey results and estimations and actual reports of violence-related incidents in the transport sector, especially in passenger and road transport. Violence and harassment go largely unreported and thus they persist and deepen in gravity and incidence. Reasons for the lack of reporting are the lack of confidence that the cases will be adequately dealt with; fear of the consequences for



job and career and the lack of reporting procedures, prevention measures and follow-up routines. Transport workers need to be trained adequately and encouraged to report such incidents within a clear non-blame culture, and effective reporting procedures are needed so that effective prevention measures can be put in place.

There may be another reason adding to underestimation: surveys are unlikely to provide a total 'picture' of the incidence and severity of violence because of the 'healthy worker' effect: only workers who are well remain in the job, and those who are ill or injured leave.

Some short case studies of how to prevent violence are presented here and general considerations are given in the conclusions section of this report. Previous and ongoing EU-OSHA ⁽²⁰⁾ work have also targeted the topic. We have included here an illustrative example that was recently awarded a good practice award under the Agency's Europe-wide campaign scheme 2008–9.

Multiple risks to transport workers need to be considered in their totality when assessing risks and setting out prevention

The combination of multiple risks puts specific strain on transport workers. Unusual working times, multiple physical risks, limited control over workload and how they organise their work, lone and monotonous work, working away from home, prolonged customer contact, and unforeseen and partly unpredictable tasks as well as the fact that the working environment may constantly change make work in this sector particularly strainful. Some occupations in transport seemingly have similar risks than comparable professions in other sectors (e.g. catering on ships or by flight attendants) but constrained space, shift working, climatic conditions, longer contact time with customers add to the strain on workers.

More efforts are needed to prevent and monitor violence in the transport sector! Transport workers need to be trained adequately and encouraged to report violence, and effective reporting procedures need to be put in place.

When setting out research, monitoring and prevention, the overall assessment of risks and their possible interaction is particularly important and should be kept in mind. Constant change and the complexity of factors impacting on the situation are a particular challenge for OSH prevention targeting transport workers.

Health outcomes

Transport workers have high rates of musculoskeletal disorders, stress, asbestos-related disorders, hearing loss and infectious diseases.

Transport reports high accident rates and this is also what is the main focus of attention. But the transport sector also reports a high number of musculoskeletal disorders. Due to the demographic changes in the sector, this issue gains importance.

Other common diseases are stress-related health disorders, asbestos-related diseases and noise-induced hearing loss. These diseases are strongly related to the exposures mentioned above. Reporting and recognition rates for occupational diseases are low and not consistent with exposure assessment. A high level of underreporting is therefore probable, as there may be less access for some of the groups over-represented in the transport workforce — migrant workers, field and mobile workers

⁽²⁰⁾ Factsheet 24 — Violence at work, Factsheet 23 — Bullying at work, European Agency for Safety and Health at Work, EU-OSHA, 2002. Available at: <http://osha.europa.eu/en/publications/factsheets/24/view> and <http://osha.europa.eu/en/publications/factsheets/23/view>



— to reporting and recognition systems. Access to prevention service and health monitoring by occupational physicians may also be lacking. Regular medical assessments should be recommended. Additionally, few systematic workplace measurements are available for the sector.

In subsectors where long-distance travelling takes place, such as the maritime sector, infectious diseases of the respiratory and digestive systems and exotic diseases are also an issue. Recent outbreaks of influenza have given more publicity to the issue, but a lot still remains to be done to be able to assess the real impact on the health of transport workers.

Accidents are mainly related to the use of vehicles, but second in frequency are falls of persons and objects

According to the data of the Member States, the transport sector reports a high level of occupational accidents. Numbers have gone down slightly, but the percentage share of accidents in transport in total accidents has increased. The majority of them involve men in the age group 25–45 and most accidents happen in the land transport sector.

The work environment in itself is the cause of most of these occupational accidents. Apart from collisions, falling and slipping as well as falling from a height or jumping appear to be frequent accident causes. Other common types of accident are sprains.

In road transport the most important risk factor remains serious traffic accidents. With regard to the type of accidents, falling and falling objects account for a major part of the accidents. Within air transport, a high percentage of the accidents happen during turbulence or landing, while the cabin crew is performing service tasks, and when loading and unloading. The typical outcome of the accidents are broken bones, sprains, soft-tissue injuries and teeth injuries.

Road safety

Road safety is an important issue in land transport. In some countries, 50–60 % of fatal work accidents are accidents involving vehicles, with up to 20 % occurring in the transport sector. Many of these accidents are commuting accidents, but a significant proportion of them are still linked to the use of vehicles for work. Obviously, professional drivers have a higher risk of being involved in a traffic accident because most of their working time is spent on the road. Driving at night, in bad weather conditions, under time pressure, or in heavy traffic, and being distracted by attending clients or the use of telecommunication means monitoring their activity, increases the risk. Increasing work pressure, the use of new technologies and non-standard working schedules may contribute to driver fatigue, a major cause also contributing to fatal work accidents occurring on railways, airports or waterways. The time of day is known to be a significant factor in accidents among commercial drivers. Increased crash risk occurs at night (peak levels at night can be 10 times those of daytime levels) the longer the working day and with irregular hours. An Australian review of train driving has highlighted similar issues to those for road transport.

In this report, we present a number of sectoral and national initiatives, for example from France and Spain, to address the high road accident rates. Social partners, trade associations, and public authorities in OSH and traffic control are increasingly working together to lower the death toll. Occupational safety and health is also an issue that has recently been mentioned in the discussions around the new Commission road safety



action plan (under the coordination of the European Commission's General Directorate for Transport and Communication). A new European road safety action plan is due to be published in the near future.

Overall fatigue is the most frequently mentioned work-related problem, and even more so for transport workers!

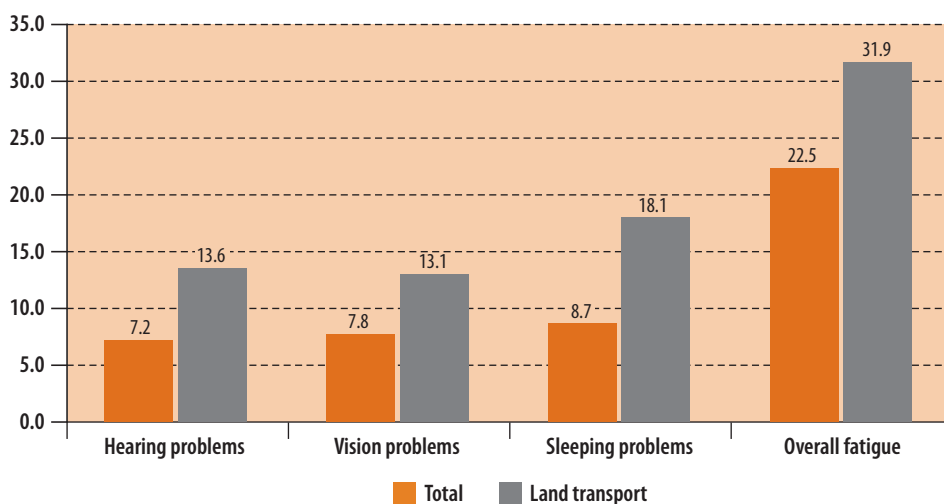
Fatigue is an OSH issue that is common and widespread, and even more so in the transport sector. Non-standard working times, long shifts and inadequate break organisation and facilities, monotonous work, limited control over the organisation of work and multiple exposures add to the risk of developing fatigue. Studies found that driver fatigue has similar effects on drivers' reactivity and alertness as alcohol consumption. This has serious health implications for the workers: as many as 20 % of serious accidents are reported to be caused by driver fatigue.

While in road transport there is clear evidence of the effect of fatigue on accidents, there is still a lack of evidence of the consequences of fatigue in other subsectors. In the Australian rail workers study mentioned above, it was recommended to set up a fatigue management program consisting of a fatigue management policy, limits on hours of work and provisions for adequate rest breaks, fatigue risk assessments and monitoring, a worker fatigue reporting mechanism with associated feedback and procedures for reporting, and investigating incidents that are attributable to fatigue.

Strategies to address fatigue exist (regulation, enforcement, awareness campaigns, training and guidance), but they need to be implemented effectively. Compared to the other subsectors, in water transport the problem appears to be least addressed by current legislation, management or working practices, and there is an urgent need to rectify the situation. One reason for the better developed approach in other sectors has been the knowledge base that now exists about fatigue in these industries. A second reason for developments in this area in other sectors has been the interaction of all the stakeholders to advance the understanding of what underlies fatigue and what can be done to prevent and manage it.

Studies found that driver fatigue has similar effects on drivers' reactivity as alcohol consumption and at least 20 % of the serious accidents on roads are caused by driver fatigue.

Figure 5: Fatigue and other work-related health problems, in percentage share of workers, land transport and total, EU-27, 2005



Source: EWCS



Multiple physical exposures may also affect the cognitive abilities and alertness of transport workers

Transport workers usually have non-standard working hours and long shifts — a driver, flight attendant or cargo worker spends a lot of time in a vehicle, plane or loading area. In addition, transport workers might have to divide their attention between different tasks at the same time or keep their alertness up while performing a very monotonous task for a long time. Their working environments are often high-noise areas and noise may divert their attention or reduce the alertness to warning signals and accident situations. Vibrations, for example the full body vibration caused by the driver's cabin, can also have an effect on cognitive faculties, such as the vision, coordination and the overall functional ability of the workers. Ergonomic design, taking a holistic approach, and a better location and development of controls and displays are therefore an important issue for the prevention not only of MSDs, but also of accident risks. As mentioned above, exposure to dangerous substances, such as exhaust fumes, volatile substances from fuels, cleaning products and de-icing liquids in air transport, may reduce the alertness of workers and make them more prone to accidents. Recent studies of the EU air transport safety agency EASA have demonstrated that accident risks are high in this subsector, especially when handling cargo.

Fatigue goes hand in hand with other cognitive problems that may add to increased accident risk

It has been mentioned above that high noise and vibration may contribute to cognitive problems, and thereby to accident risks. More than twice as many transport workers are suffering from sleeping problems than on average.

One study found that driver fatigue has similar effects on drivers' reactivity as that of alcohol consumption. While lack of sleep is considered to be one of the primary causes of fatigue, sleep apnoea is another contributing factor that has been investigated in professional drivers. Rates of sleep apnoea, leading to reduced sleep and sleeping problems, are worryingly high in transport workers. In addition, other factors contribute to the development of sleep apnoea. Static work may lead to lack of physical activity which in turn, together with reduced access to healthy food leading to unhealthy eating habits and short rest breaks in inadequate rest facilities, may result in obesity, thereby contributing to the risk of developing cardiovascular problems and sleep apnoea.

It is also essential to monitor fatigue as an alarm signal and a cause for major accidents. Step-wise alarm levels and routines to prevent fatigue-related incidents when it came to unforeseen events would also be needed.

From the above it can be concluded that it is very important to reduce fatigue, increased accident risks or negative cognitive effects induced by the combination of organisational and physical risks.

Training and informing transport workers is essential

As mentioned above, transport workers may be exposed to a multiplicity of physical and organisational risks. They may also be exposed to considerable risk when unforeseen incidents occur.

Research and the results of our research have shown that transport workers may have less access to training, as they often work in the field, work shifts, or belong to groups with less access to training, such as older, migrant or part-time workers. Additionally to

Rates of sleep apnea, leading to reduced sleep and sleeping problems, are worryingly high in transport workers. More than twice as many transport workers are suffering from sleeping problems than on average.

It is essential to monitor fatigue. Step-wise alarm levels and routines to prevent fatigue-related incidents when it came to unforeseen events, would also be needed.



the primary prevention measures, it is therefore essential to inform and train transport workers and to tailor training to their specific situation.

A study requested by the European Parliament's Committee on Transport and Tourism analysed the factors affecting labour supply and demand in the road freight transport ⁽²¹⁾. It reported a progressive shortage of professional drivers, which has emerged as one of the most critical issues seriously affecting the competitiveness of the sector. The competences and skills required by firms do not match (in general being higher) with those offered by the workers, since technological innovation, globalisation, increased complexity of regulations and additional tasks have implied a substantial transformation of jobs in the transport sector, entailing new and more complex skills and training needs, and thus producing a shortage of qualified personnel.

As regards specific measures to tackle the problem of shortage of qualified personnel in the road freight transport sector, so far no specific and direct measures have been taken at EU level. However, within the short- to medium-term actions intended to help Europe address its current and future challenges, for example, in the framework of the EU Freight Logistics Action Plan ⁽²²⁾, it was decided that the Commission will work with the European social partners and other relevant stakeholders to address training as a priority. The aims are to draw up a list of minimum qualifications and training requirements at different levels of specialisation, ensure the mutual recognition of training certificates, and to find ways to improve the attractiveness of transport logistics professions.

The EP study mentioned above also recommended that the attractiveness of the profession and working conditions should be improved by increasing the number and enhancing the comfort and security of truck parking areas, harmonising regulations and penalties across EU countries, and increasing the integration between employers' and employees' needs and objectives.

Final considerations

Working in the transport sector requires high levels of professional skill and competence. Transport workers are not a homogenous group; they represent, within one sector, many different occupations with specific sets of working conditions and risks, and very varying demands.

The workers must not only be capable in their specific fields, but they often have to solve technical problems, have certain language skills, carry out basic administration, and act as 'ambassadors' for their company. In addition, they have a major responsibility for the safety or well-being of passengers and often act as involuntary intermediates for organisational changes impacting on customer services. Recent changes in work organisation and demands on the services have had a high impact on transport workers' occupational safety and health, as could be demonstrated in this report: they work longer and under non-standard conditions, are increasingly exposed to multiple risks, and their working conditions are constantly changing, while there is limited scope for them to shape their work or hamper the health effects, and support from colleagues

⁽²¹⁾ Lodovici, M. S., et al., Shortage of qualified personnel in road freight transport, study for the Policy Department Structural and Cohesion Policies of the European Parliament, IP/B/TRAN/IC/2008-169, 2009.

⁽²²⁾ Communication from the Commission. Freight Transport Logistics Action Plan. Brussels, 18.10.2007. COM(2007) 607 final. Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52007DC0607:EN:NOT>



and management is limited. Violence and fatigue are two major risks insufficiently addressed.

When developing the new framework transport policy, the EU Commission envisaged several solutions regarding sustainable development: a good network of highways (avoid the silting up of roads and ‘forgotten’ parts of roads; the creation of specific truck roads (truck corridors) may relieve highways and the use of automatic road transport; more transport of goods during the night; increased use and development of telematics to bring important information to the driver and in so doing increase safety; the replacement of the traditional transport chain by eliminating the boundaries between different transport systems (rail and maritime transport); and network development between companies and their supply industries (companies that are located in the same industrial area could investigate if they could organise transport of goods together).

Some of these proposals, such as the increased night transport of goods, may be in contradiction of the reduction goals for better OSH — after all, it has been demonstrated that road accident rates may be 10 times as high at night — which is why the impact these possible mobility problem solutions may have on the employment and OSH situation and the working conditions of transport workers should indeed be investigated.

Further policy changes are planned in urban transport as well as in the tourism industry and long-distance transport. Maritime and road transport are expected to increase further, and European transport policies are introducing the combined use of different transport means to address increased transport needs. Environmental policies, the reduction of greenhouse gases and of the use of fossil fuels may further shape the way transport is organised and impacts on workers’ health and safety. It is therefore essential for European transport and related policies to take account of their effect on the safety and health of transport workers. If society wants healthy, motivated and highly skilled transport workers, more attention should be given to the working conditions of this sector.



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Recommendations for monitoring, research and prevention

- Enlarge the concept of what a transport worker is and cover the diversity of jobs and tasks, including the many service and administrative ones.
- Map the exposures and risks to transport workers, addressing all the subsectors and groups of workers.
- A wider inclusion of accidents involving vehicles would considerably improve possibilities to assess the situation across the EU; if it is true that almost half of fatal accidents are vehicle-bound, then an important proportion of the accidents is omitted in the statistics of some Member States.
- Awareness of some risks, for example exposure to dangerous substances or contracting infectious diseases, may be low. Attract attention to issues normally overlooked, and clarify whether they may combine to do more harm.
- The transport workforce is ageing, especially in road and public transport. This needs to be addressed by work organisation, workplace adaptation and training — how to use their skills and maintain employability.
- Adapt research, monitoring, prevention and health surveillance to an increasingly diverse working population, addressing the specific needs of women, migrant, and part-time workers.
- Provide better access to infrastructure, rest and break facilities and to OSH prevention services and health surveillance for transport workers. Static work may lead to lack of physical activity and reduced access to healthy food and short rest breaks in inadequate rest facilities may lead to unhealthy eating habits, thereby contributing to the risk of developing cardiovascular health problems and sleep apnea.
- Provide better reporting procedures for transport workers' health problems and occupational diseases.
- Many transport jobs involve ergonomic and complex work organisational risks. Adapt risk assessment and workplace prevention to cover these risks together and take a holistic approach. Care should also be given to foresee individual adaptability of the equipment or the working environment by workers (for example in service areas of planes or trains, or the work area of professional drivers).
- Address accident risks with a wider concept taking into account the multiplicity of factors which interfere.
- Mainstream OSH into transport accident prevention in all subsectors, building on the experiences and knowledge from road safety measures.
- Make use of policies in other areas, such as speed reduction policies in urban transport, to further reduce risks to transport workers.
- Mainstream policy approaches addressing working time issues in road transport to other transport subsectors.
- Expand on the use of technological means to monitor and control risks, but also assess how these may negatively impact on the OSH of transport workers.



- Address emerging risks such as violence and fatigue, and cognitive impairments with specific monitoring, reporting and prevention measures. It is essential to monitor fatigue. Step-wise alarm levels and routines to prevent fatigue-related incidents in the event of unforeseen events would also be needed.
- More efforts are needed to prevent and monitor violence in the transport sector. Transport workers need to be trained adequately and encouraged to report violence, and effective reporting procedures need to be put in place.
- Inform employment agencies on the specific OSH risks transport workers may incur.
- Train employers and workers on how to better protect their health and safety.
- Raise awareness of OSH issues in policy areas that may impact on the health and safety of transport workers.
- Address major changes in the way transport is organised by analysing how this may impact on OSH.
- Promote cooperation between transport stakeholders and OSH stakeholders.
- Research and prevention need to cover the combination of very diverse hazards (ergonomic, unusual working times, noise, vibration, complex work situation and constant change). Build on effective examples.

Subsector	Some issues highlighted
Rail transport	Work organisational changes and outsourcing leading to increased workload. Lone work. Working time issues, shift work and weekend work. Increasing long-distance transport. Ergonomics and workplace design. Climatic conditions.
Public passenger transport	Violence and harassment. Increased customer contact, including translating organisational changes to customers, including at ticket counters. Lone work. Shift work. Conflicting demands (attending customers and driving), leading to high blood pressure and cardiovascular diseases. Needs of an ageing workforce.



Subsector	Some issues highlighted
Taxi services	<p>Violence and assault, lack of reporting systems and training.</p> <p>Lone work.</p> <p>Working time and shift work issues.</p> <p>Workplace design.</p> <p>Having to use communication devices while driving.</p>
Long-distance road haulage	<p>Just-in-time management leading to high work pressure.</p> <p>Client pressures; working on sites of others.</p> <p>Increasing use of remote monitoring and complex technology.</p> <p>Workplace design.</p> <p>Accessibility of facilities and services (hygienic, food and medical).</p> <p>Infectious diseases.</p> <p>Violence and assault.</p> <p>Lone work.</p> <p>Prolonged sitting and exposure to vibration.</p> <p>Accident risks, including when loading and unloading.</p> <p>Needs of an ageing workforce.</p>
Dangerous goods transport	<p>Accident risks, including fire and explosion risks.</p> <p>Exposure to dangerous substances, especially when loading and unloading.</p> <p>Risks of falls from vehicles and other transport means.</p>
Courier services	<p>Unforeseeable conditions at customers' premises, e.g. availability of safe lifting aids.</p> <p>Customer expectations and contact.</p> <p>Accident risks and climatic conditions, e.g. for bicycle couriers.</p> <p>Lifting and handling parcels/goods of unforeseeable sizes and shapes.</p> <p>Work organisational issues — work pressure due to short-term changes in tasks, use of remote monitoring/contact systems (drivers receive orders while driving).</p>



Subsector	Some issues highlighted
<p>Water transport</p>	<p>Addressing migrant and diverse working population.</p> <p>Gender segregation into very different jobs and tasks.</p> <p>Infectious diseases.</p> <p>Confinement and isolation.</p> <p>Risks from fumigation gases in container transport.</p> <p>Increasing use of inland water transport for goods.</p> <p>Applicability of EU and OSH legislation when ships sail under foreign flags.</p> <p>Increasing use in the tourism sector, service and administrative professions not regarded as transport jobs.</p>
<p>Air transport</p>	<p>Working time issues, shift work, irregular working times.</p> <p>Ergonomic conditions, confined spaces, e.g. for flight attendants.</p> <p>Heavy lifting and climatic conditions for luggage handlers.</p> <p>Cosmic radiation.</p> <p>Time/shift adaptation for long-distance flying, sudden climatic changes.</p> <p>Increasing customer demands.</p> <p>Time pressure and work organisational issues for air controllers.</p> <p>Accident risks, including with vehicles and from falls.</p> <p>Very loud noise and vibrations.</p>
<p>All</p>	<p>The specific combination of risks and combination of factors such as ergonomic risks, work organisational stressors, noise, dangerous substances, vibration, unusual working times, working away from home and from a work base, lack of facilities, complex work situation, the need for constant adaptation, and the many structural changes that have occurred in the sector are a particular challenge for monitoring and prevention.</p>



INTRODUCTION



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The transport sector, including transport over land (by road and train), water and air, is one of the booming sectors in Europe and currently undergoing profound changes ⁽²³⁾.

Transport forecasts ⁽²⁴⁾ ⁽²⁵⁾, reveal considerable growth rates of transport performance in the EU-27 countries between 2000 and 2020: +31 % for passenger x km and +75 % for freight (tons x km). There are also significant differences between the Member States. During the 1990s, freight transport by rail declined by 16 % in the new member/ accession countries, whereas freight transport activity in the EU-15 increased by 30 %. Although the new member countries have inherited a transport system which encourages rail, road haulage increased between 1990 and 1998 by 43.5 %. The transport sector used to be one of the most protected economic sectors in the former European Economic Community. During the past two decades, the various transport modes were progressively liberalised: maritime transport, road haulage, inland waterway transport, air transport and presently rail transport ⁽²⁶⁾.

This report is the fifth in a series of European Risk Observatory thematic reports and aims to address these changes in the sector and to highlight the main OSH issues. It seeks to review in depth what risks transport workers are exposed to at work and what the consequences of these exposures are. It does this not only by analysing statistics and studies, but also through selected case examples of prevention. It is intended for both those working in the sector and policymakers in this domain.

⁽²³⁾ European Commission — Directorate General for Energy and Transport, 'Transport Research in the European Research Area — A guide to European, international and national programmes and projects', 2006.

⁽²⁴⁾ TEN-STAC. Scenarios, Traffic forecasts and analysis of corridors on the Transeuropean Network. Coordination: NEA Rijswijk. 2004.

⁽²⁵⁾ European energy and transport. Trends to 2030. European Commission. 2003.

⁽²⁶⁾ Thematic prospective scenario 'Transport, ESPON 3.2 — Third Interim Report — January 2006. Available at: http://www.mcrit.com/scenarios/files/thematicscenarios/thematic_transport.pdf



When looking at work-related OSH risks in the transport sector, the risk of accidents with material loss and damage and/or human victims as an outcome catches the eye. However, it should not be forgotten that many other safety risks (prolonged sitting, loading and unloading goods, handling dangerous substances, etc.) are also present when working in the transport sector and some of these risks seriously affect workers' health ⁽²⁷⁾. Also the change and development in information technology in the last decade (a number of computer applications such as planning systems and mobile means of communication), structural changes and the increase of 'just-in-time' management have had far-reaching implications for the transport sector. These changes have significantly influenced work and employment conditions in the sector ⁽²⁸⁾.

The transport sector, as described in this report, refers to the NACE Rev. 1.1. codes I.60, I.61 and I.62, as specified below. In this report data in the tables with reference to NACE economic activities are based on the NACE Rev. 1.1. Eurostat data, in particular on health and safety at work statistics, will be collected based on the new NACE Rev. 2 categorisation as from reference year 2008 onwards ⁽²⁹⁾ ⁽³⁰⁾.

For many countries and subsections, not all information is available for this sector as a whole or for the different subsections. Therefore, references are made in the different subsections of the report when data differ from this classification.

Table 1: Transport sector as described in this report— NACE Rev. 1.1. codes

60 Land transport; transport via pipelines
601 Rail transport
602 Road transport
6021 + 6022 + 6023 = Transport of persons
6024 = Freight transport by road
603 Transport through pipes
61 Transport over water
611 Transport overseas
612 Inland navigation
62 Air transport

Source: Eurostat

⁽²⁷⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.

⁽²⁸⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: Work and employment conditions, 2004. Available at: <http://www.eurofound.europa.eu/publications/htmlfiles/ef03102.htmh>

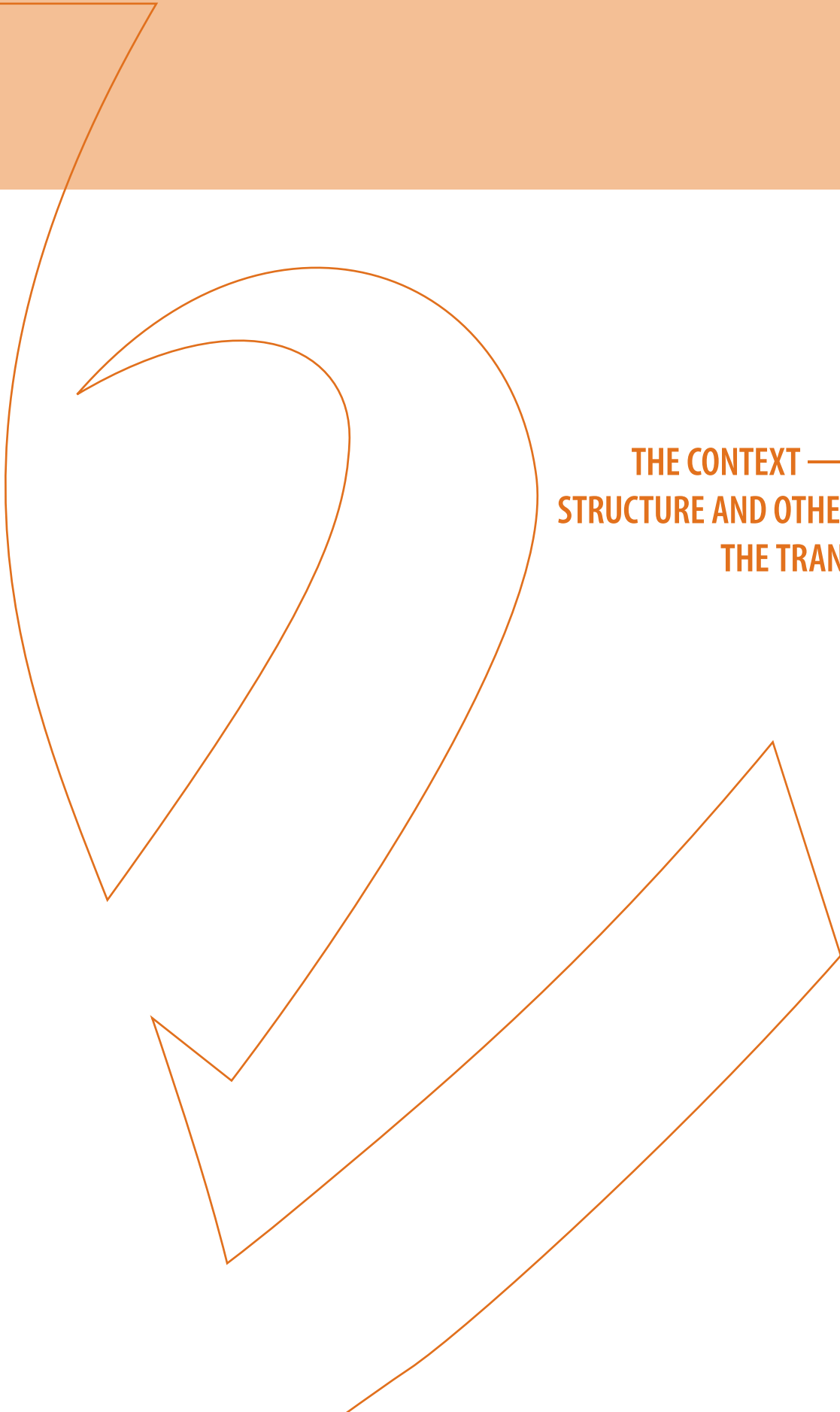
⁽²⁹⁾ Statistics referring to economic activities performed from 1 January 2008 onwards shall be produced by Member States using NACE Rev. 2 or with a national classification derived there from pursuant to Article 4 of Regulation (EC) No 1893/2006 of the European Parliament and of the Council of 20 December 2006 establishing the statistical classification of economic activities NACE Revision 2 and amending Council Regulation (EEC) No 3037/90 as well as certain EC Regulations on specific statistical domains. Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:>

⁽³⁰⁾ Comparative tables of NACE 1.1. versus NACE Rev. 2. are available on Eurostat's website at: http://epp.eurostat.ec.europa.eu/portal/page/portal/nace_rev2/documents/



1.

THE CONTEXT — EMPLOYMENT STRUCTURE AND OTHER FEATURES OF THE TRANSPORT SECTOR



Before describing the risks that transport workers are exposed to in the work place and the related health outcomes, it is essential to present a statistical portrait of its labour force. The following chapter describes:

- the proportion of employment in the transport sector within the total work force and its evolution;
- the distribution by gender;
- the age structure;
- the types of contract;
- other work organisational factors, such as the organisation of working time (i.e. part-time work, shift work).

Many of these contextual features influence and interact with the OSH situation of the transport workers. This statistical portrait of the transport sector helps to clarify their status and to explain to some extent their occupational safety and health situation at work.

Research difficulties

Studies looking at the contextual features (subsections in transport, age and gender distribution) of transport workers have some methodological problems: statistics broken down for transport workers in the different sub sectors (NACE Rev. 1.1. codes I.60, I.61 and I.62) can be limited or lacking, or the numbers available for analyses in some fields can be small. Therefore, a uniform dataset of the European Labour Force Survey was used for the different Member States, which makes it possible to compare the data of the Member States. Also, non-comparable data, examples from one Member State only, one-off studies and studies from outside national official data all help to fill in gaps and present some of the complexity of the situation of transport workers' exposure to risk rates.



EMPLOYMENT IN THE TRANSPORT SECTOR AND ITS SUBSECTORS (LAND (ROAD AND TRAIN), WATER, AIR) ⁽³¹⁾

1.1.

In 2006, about 6 million EU-25 workers were employed in the transport sector (land—road and train, water and air). The share within the whole economy accounted for about 3 %, which varied largely between the Member States: from about 1.9 % in Germany to about 6 % in Estonia and Latvia.

Land transport was by far the largest sub sector in the EU-25. In 2006, 88 % of transport workers were employed in land transport and pipelines, 7 % in air transport and 4.5 % in transport over water.

The distribution of workers by sub sector varies largely between the different countries. Transport over land is the most important sub sector in all Member States, with the exception of Malta where air transport is the sub sector with the highest employment figures.

Overall, the transport sector is a small company sector, with most companies having fewer than 50 employees. Large companies are typical within air and railway transport.

In 2006 there were 6,091,000 workers employed in transport, accounting for 3 % of total employment in Europe.

Table 2: Employment (15–64 years) in transport and total and percentage share of transport in total, EU-25, 2004–2006

Year	Transport (NACE Rev. 1.1. 60 + 61 + 62)		Total
	Number (1,000)	Share of transport (%)	Number (1,000)
2004	6,064	3.18	190,687.1
2005	6,024	3.09	194,894.7
2006	6,091	3.07	198,375.0

Source: LFS

There are considerable differences between the Member States: in 2006, transport workers accounted from about 1.9 % of the total workforce in Germany to about 6 % of the total workforce in Estonia and Latvia.

⁽³¹⁾ Eurostat. European Union Labour Force Survey, 1983–2006. Available at: http://epp.eurostat.ec.europa.eu/portal/page/portal/labour_market/introduction



Table 3: Employment in transport and total and percentage share of transport in total, EU-25 and Member States data, 2004–2006, LFS 2006

Country	Transport (NACE Rev. 1.1. I.60 + I.61 + I.62)		Trend ^[32]
	Number (1,000)	Share within total workforce (%)	
EU-25	6,091	3.10	Stable since 2004
Belgium	163	3.90	Stable since 1995
Czech Republic	253	5.30	
Denmark	89	3.20	Stable since 1995
Germany	711	1.90	Stable since 1995
Estonia	38	6.10	
Ireland	61	3.10	
Greece	149	3.40	Stable since 1998
Spain	626	3.20	Decreased since 1995
France	791	3.20	Stable since 1995
Italy	618	2.70	Stable since 1995
Cyprus	7	2.00	Stable since 1999
Latvia	63	6.00	Increased since 1998
Lithuania	71	4.80	
Luxembourg	9	4.60	Stable since 1995
Hungary	190	4.90	Decreased since 1996
Malta	4	2.60	
Netherlands	264	3.30	
Austria	119	3.10	
Poland	641	4.50	
Portugal	127	2.60	Stable since 1995
Slovenia	32	3.40	
Slovakia	115	5.00	
Finland	94	3.90	Stable since 1995
Sweden	141	3.20	
United Kingdom	717	2.60	

Source: LFS

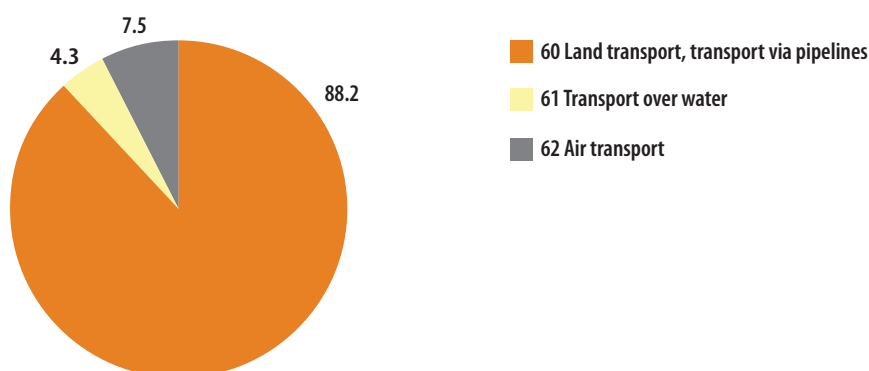
LFS data make it possible to distinguish the three sections within the transport sector: land transport (NACE Rev. 1.1. 60), which includes rail and road transport (of both people and goods), transport over water (NACE Rev. 1.1. 61), which includes inland navigation and overseas transportation, and air transport (NACE Rev. 1.1. 62).

⁽³²⁾ Trend of share within total workforce based on descriptive information in the country reports.



It is evident that land transport is the largest sub sector within the transport sector. By subsector, 88.2 % of transport workers were employed in land transport and pipelines, 7.5 % in air transport and 4.3 % in transport over water.

Figure 6: Employment, percentage share in sub sectors of transport (15–64 years), EU-25, LFS 2006



Land transport is by far the most important sub sector in all Member States, with the exception of Malta.

Source: LFS - Codes according to NACE Rev. 1.1

Land transport is by far the most important sub sector in all Member States, with the exception of Malta where air transport is the sub sector with the highest employment figures:

The distribution of workers by sub sector varies largely between countries. In 2006, land transport accounted for between 42 % in Malta to about 95 % in Poland, Slovenia and Hungary. The share of air transport varied from about 1.5 % in Poland to about 48 % in Malta, while the share of water transport ranged from about 1 % in Luxembourg and Hungary to 19 % in Cyprus.

Table 4: Percentage distribution of employment (15–64 years) in transport subsectors, EU-25 and Member States data, LFS 2006

Country	60 Land transport, transport via pipelines		61 Transport over water		62 Air transport	
	Share in transport	Trend ³³	Share in transport	Trend	Share in transport	Trend
EU-25	88.20		4.30		7.50	
Belgium	87.80		3.00		9.30	
Czech Republic	94.40		1.80		3.80	
Denmark	76.90	+ (1995)	13.10	-(1995)	10.10	S (1995)
Germany	81.30	-(1995)	3.60	-(1995)	15.10	+(1995)
Estonia	85.00		13.60		1.40	
Ireland	82.70		4.20		13.10	
Greece	80.50	+(1998)	15.80	-(1998)	3.70	-(1998)
Spain	89.50	+(1995)	2.50	S (1995)	8.10	+(1995)



Table 4: Percentage distribution of employment (15–64 years) in transport subsectors, EU-25 and Member States data, LFS 2006

Country	60 Land transport, transport via pipelines		61 Transport over water		62 Air transport	
	Share in transport	Trend ³³	Share in transport	Trend	Share in transport	Trend
France	90.90	S (1995)	1.70	S (1995)	7.30	S (1995)
Italy	88.70	S (1995)	5.80	- (1995)	5.50	+ (1995)
Cyprus	55.90	- (1997)	18.80	+ (1997)	25.40	S (1997)
Latvia	87.90	+ (1995)	10.20	S (1998)	1.90	S (1998)
Lithuania	88.20		7.20		4.60	
Luxembourg	71.50	- (1995)	1.00	NA	27.50	- (1995)
Hungary	95.10	+ (1996)	1.00	- (1996)	3.90	S (1996)
Malta	41.90		10.20		47.90	
Netherlands	78.90		7.70		13.50	
Austria	92.70		1.30		6.10	
Poland	95.10		3.40		1.50	
Portugal	83.90	+ (1995)	3.50	- (1995)	12.50	- (1995)
Slovenia	95.10		1.40		3.50	
Slovakia	94.80		2.30		2.90	
Finland	81.00	+ (1995)	10.30	- (1995)	8.70	+ (1995)
Sweden	85.00		9.60		5.40	
United Kingdom	88.80		3.80		7.30	

Source: LFS - Codes according to NACE Rev. 1.1

According to the latest figures⁽³⁴⁾, the transport industry at large accounts for about 7 % of GDP and for over 5 % of total employment in the EU, of which 4.4 % corresponding to transport services and the rest to transport equipment manufacturing, while 8.9 million jobs correspond to transport services and 3 million to transport equipment.

⁽³³⁾ Trend of share within transport sector based on descriptive information in the country reports (S = stable, - = decrease, + = increase).

⁽³⁴⁾ Future of Transport Communication. Available at: <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/09/279&format=HTML&aged=0&language=EN#>



GENDER ISSUES ⁽³⁵⁾

1.2.



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The transport sector is made up primarily of male workers: in 2006, about 84 % of the EU-25 transport workers were male. The proportion of female workers is the lowest in Greece (6 %) and the highest in Malta (27 %). However, in several Member States, the proportion/number of female workers has been increasing.

The gender difference is not as big in all sub sectors. In 2006, the proportion of female workers in land transport was 13.6 %, in transport over water it was 17.7 % and in air transport 40.7 %. In all Member States, with the exception of Cyprus, Lithuania and Hungary, the highest proportion of female workers can be found in air transport, while the proportion of female workers within the other subsectors varies largely between the different Member States.

In transport, since the majority of jobs with a visible risk for occupational accidents and illnesses are male-dominated, health and safety action is male-centred. Even for occupations and sectors with a growing number of women workers, investment — when funds are available — in workplace ergonomics still reflect the male-dominated work environment. Thus, women working in transport have to adjust to a male-centred organisation of work, workplace culture and working conditions.

⁽³⁵⁾ Eurostat, European Union Labour Force Survey, 1983–2006. Available at: http://epp.eurostat.ec.europa.eu/portal/page/portal/labour_market/introduction



1.2.1. Employment figures by gender

The transport workforce (land, water and air) is made up primarily of men. In 2006, there were about 5 million male and almost one million female workers employed in the transport sector. About 84 % of the transport workers were men, as compared to about 55.5 % male workers in the total working population.

Table 5: Employment (15–64 years) in transport and percentage share by gender, LFS 2004-2006

Year	Transport (I.60 + I.61 + I.62)			
	Males (1,000)	Females (1,000)	Males %	Females %
2004	5,113	951	84.30	15.70
2005	5,056	968	83.90	16.10
2006	5,125	966	84.10	15.90

Source: LFS - Codes according to NACE Rev. 1.1.

Among men employed in transport, 90 % worked in land transport, around 5 % in transport over water and 5 % in air transport. Women showed a higher share of employment in air transport (18 %) but still a majority of them (76 %) worked in land transport, while the remaining 5 % were employed in transport over water.

The distribution by gender differs between the different Member States. The proportion of female workers is the lowest in Greece (6 %) and the highest in Malta (27 %). It is worth noting, however, that the share of female workers is increasing in several Member States.

Table 6: Employment (15–64 years) — percentage share by gender in transport, EU-25 and Member States data, LFS 2006

Country	Transport (I.60 + I.61 + I.62)		
	Males (%)	Females (%)	Trend ³⁶
EU-25	84.10	15.90	
Belgium	84.90	15.10	
Czech Republic	82.90	17.10	
Denmark	81.00	19.00	S (1995)



Table 6: Employment (15–64 years) — percentage share by gender in transport, EU-25 and Member States data, LFS 2006 (continued)

Transport (I.60 + I.61 + I.62)			
Country	Males (%)	Females (%)	Trend ³⁶
Germany	77.80	22.20	F + (1995)
Estonia	76.60	23.40	
Ireland	85.00	15.00	
Greece	94.00	6.00	F + (1998)
Spain	88.30	11.70	F + (1995)
France	82.00	18.00	F + (1995)
Italy	87.90	12.10	F + (1995)
Cyprus	78.00	22.00	F + (1996)
Latvia	79.30	20.70	F - (1998)
Lithuania	81.00	19.00	
Luxembourg	81.40	18.60	S (1995)
Hungary	83.50	16.50	F - (1996)
Malta	73.50	26.50	
Netherlands	79.40	20.60	
Austria	84.90	15.10	
Poland	86.70	13.30	
Portugal	87.00	13.00	F + (1995)
Slovenia	85.30	14.70	
Slovakia	85.30	14.70	
Finland	84.80	15.20	F - (1995)
Sweden	84.90	15.10	
United Kingdom	84.10	15.90	

Source: LFS - Codes according to NACE Rev. 1.1.

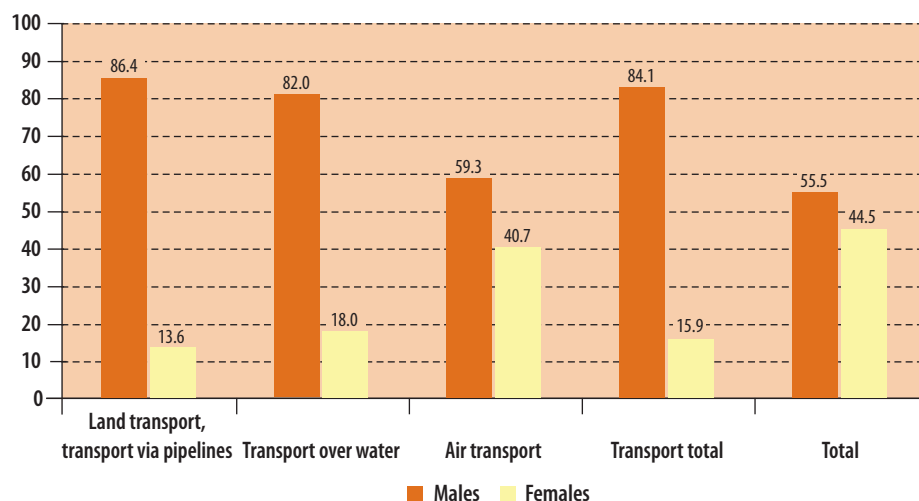
⁽³⁶⁾ Trend based on descriptive information in the country reports (S = stable, F +/- = female workforce increasing/decreasing)



Air transport is the sub sector with the highest proportion of female workers.

Across all sub sectors, it is clear that there are more men than women. However, the gender difference is not as big in all sub sectors. In 2006, the proportion of female workers in land transport was 13.6 %, in transport over water it was 17.7 % and in air transport 40.7 %.

Figure 7: Percentage distribution of employment (15–64 years) by gender in total, transport and transport subsectors, EU-25, 2006



Source: LFS

The proportion of female workers within the different sub sectors varies largely between the Member States:

- in land transport from 2.6 % in Malta to 21.4 % in Latvia;
- in water transport varies from 2.4 % in Greece to 52.8 % in Cyprus; and
- in air transport from 18.7 % in Lithuania to 57 % in Estonia.

In all Member States, with the exception of Cyprus, Lithuania and Hungary, the highest proportion of female workers can be found in air transport. In Estonia, France, Cyprus and the UK, female workers constitute even a larger part than do male workers.

Table 7: Employment (15–64 years) — percentage share by gender in sub sectors, EU-25 and Member States data, LFS 2006

Country	60 Land transport, transport via pipelines		61 Transport over water		62 Air transport	
	Males	Females	Males	Females	Males	Females
EU-25	86.40	13.60	82.30	17.70	59.30	40.70
Belgium	86.70	13.30	80.70	19.30	68.50	31.50
Czech Republic	84.10	15.90	93.30	6.70	53.60	46.40
Denmark	84.50	15.50	73.00	27.00	64.60	35.40
Germany	81.00	19.00	67.40	32.60	63.30	36.70
Estonia	79.90	20.10	56.30	43.70	43.00	57.00



Table 7: Employment (15–64 years) — percentage share by gender in sub sectors, EU-25 and Member States data, LFS 2006 (continued)

Country	60 Land transport, transport via pipelines		61 Transport over water		62 Air transport	
	Males	Females	Males	Females	Males	Females
Ireland	89.20	10.80	80.20	19.80	63.60	36.40
Greece	95.20	4.80	97.60	2.40	52.80	47.20
Spain	90.80	9.20	79.50	20.50	62.70	37.30
France	84.40	15.60	92.70	7.30	48.80	51.20
Italy	89.40	10.60	88.50	11.50	62.70	37.30
Cyprus	93.50	6.50	47.20	52.80	47.40	52.60
Latvia	78.60	21.40	93.90	6.10	55.30	44.70
Lithuania	80.20	19.80	94.80	5.20	81.30	18.70
Luxembourg	88.40	11.60	80.70	19.30	69.70	30.30
Hungary	84.20	15.80	63.10	36.90	66.90	33.10
Malta	97.40	2.60	68.40	31.60	65.10	34.90
Netherlands	82.40	17.60	82.50	17.50	59.80	40.20
Austria	86.80	13.20	66.20	33.80	62.90	37.10
Poland	86.50	13.50	97.10	2.90	79.90	20.10
Portugal	90.70	9.30	84.90	15.10	65.00	35.00
Slovenia	85.90	14.10	95.20	4.80	51.50	48.50
Slovakia	86.60	13.40	76.10	23.90	56.50	43.50
Finland	90.50	9.50	66.30	33.70	58.00	42.00
Sweden	87.30	12.70	77.10	22.90	61.50	38.50
United Kingdom	87.70	12.30	72.30	27.70	45.40	54.60

Source: LFS - Codes according to NACE Rev. 1.1



1.2.2. Gender issues in the transport sector — studies and initiatives



SAMOTRACE — workplace mental health observatory (France) ⁽³⁷⁾

Begun in 2006, the SAMOTRACE programme (workplace mental health observatory for Rhône-Alpes and Centre) is an early version of a permanent national system of epidemiologic surveillance of work-related mental health. Its objective is to determine the frequency of mental disorders according to the type of job and their course over time and to identify exposures to recognized or presumed risk factors. The pilot phase covered the Centre region, since joined by the Pays-de-la-Loire and Poitou-Charentes, as well as two districts in the Rhône-Alpes (Rhône and Isère). 3 000 people randomly selected during mandatory visits to their occupational physician were included in the sample and responded to a detailed questionnaire about their work activity, its psychosocial constraints, and their health status. Early results revealed some interesting findings: 43 % of the workers in the sample considered that their training does not correspond to the job they do and figures were significantly higher for transport workers, and more so for female transport workers. Some 10 % of the men and 3 % of the women reported that their usual work hours did not allow them to sleep at night. Significantly, 16 % of the employees reported that they had been intimidated, threatened, or humiliated at work at least once during the past 12 months, while 12 % indicated that they had been required to violate their conscience at work at least once during the same period. Transport also reported highest shares on work organisational factors such as low decision latitude, particularly for female workers, and low social support.



Gender Equality — ETF Action Plan 2009-2013 (EU) ⁽³⁸⁾

According to the conclusions from the 2005 European Transport Federation's (ETF) conference ⁽³⁹⁾ ⁽⁴⁰⁾, unequal treatment in access to employment, professional training, pay and working conditions remained a common practice in the industry.

In November 2005 the ETF Women's Committee proposed to include a gender debate on the agenda of one of their bi-annual meetings and further analysed the outcome of these discussions ⁽⁴¹⁾.

Some of the findings:

- Women transport workers reported that maternity / child / elderly care leave had a negative effect on their career; that there is less and less guarantee that,

⁽³⁷⁾ Samotrace — Volet 'Épidémiologie en entreprise'. Résultats intermédiaires à un an. Collection 'Santé et travail' Mai 2007. Available at: <http://www.invs.sante.fr/publications/2007/samotrace/samotrace.pdf>

⁽³⁸⁾ Mobilising trade union action on gender equality, European Transport Workers' Federation <http://www.itfglobal.org/etf/mobeq-main.cfm>

⁽³⁹⁾ The Gender Dimension in the Transport Industry in Europe. Available at: [http://www.itfglobal.org/files/sealsodocs/1129/The %20gender %20dimension %20in %20the %20trans](http://www.itfglobal.org/files/sealsodocs/1129/The%20gender%20dimension%20in%20the%20trans)

⁽⁴⁰⁾ Conclusions and action plan for gender equality for 2005–2009, ETF Women's Conference, Mariehamn, 24 May 2005 Available at: <http://www.itfglobal.org/etf/women.cfm>

⁽⁴¹⁾ ETF Gender Equality section tour, results at: <http://www.itfglobal.org/etf/section-activities.cfm>

after professional breaks, they will return to their original job. Family unfriendly working hours prevent women from taking up certain jobs in transport, particularly jobs involving prolonged absence from home. Unpredictable work shifts and overtime — particularly in companies involved in the door-to-door delivery — were a considerable source of stress for women transport workers with family responsibilities.

- Poor work-life balance keeps women from entering the sector and determines women to leave their job. In addition, low representation leads to pay inequalities and lack of adaptation of working conditions and facilities to female workers.
- Employment under very specific precarious conditions (seasonal work on ships, low-cost air carriers) and segregation in transport maintains pay gaps and makes them more difficult to trace down and address. Men were concentrated in technical jobs — which are regarded as more qualified — while women are predominant in administrative and customer service.
- Generally, there is a lack of reliable and recent statistics on female workers in inland waterways and maritime transport; apart from the leisure boats, participation of women in the sector is extremely low. This is due to the hostile working conditions and lack of accommodation conditions for mixed crew on board vessel in the freight transport. However, there are an increasing number of young women taking up season-based jobs on hotel boats / passenger liners and these workers may lack information on rights and training. They are also considered more as catering personnel. As they tend to be concentrated in fewer occupations, they are often not considered to be transport workers (administrative workers in ports, food processing workers in fisheries, etc.).
- Consequently, as they are not considered to belong to the 'core' working population in the sectors, their specific needs and situation may be overlooked. However, the number of women taking up occupations in the deck and engine sector is also increasing.
- Vehicle and cab design: drivers' seats and cabs are designed with men in mind, and then wrongly assumed to suit women's bodies too.
- Fumes: some 62 % of women in the ITF survey said that no steps have been taken to minimise their exposure to fumes.
- In urban public transport, women workers are at higher risk than their male colleagues when it comes to attacks and violence.

The results were summarised in a booklet that also gives recommendations on how to adapt workplaces in transport to women ⁽⁴²⁾. The brochure also provides links to factsheets addressing specific issues: workplace mapping for safety, exposure to diesel exhaust, body mapping (to identify health problems).

In 2007–2008, the European Transport Workers' Federation (ETF) subsequently launched a one-year EU-funded project aimed to guide and mobilise trade union action to make the transport industry a more attractive workplace for women and to eliminate the risk of gender inequality at work.

⁽⁴²⁾ Women on the road to ... a safe and healthy working environment. Available at: <http://www.itfglobal.org/files/extranet/-1/7387/RTWomen.pdf>





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Structural changes and OSH risks in the maritime world — cruise ships ⁽⁴³⁾

This review brought together information from several studies and focused on the changes in the employment structure and working conditions in maritime transport with a special emphasis on leisure trips. It found that while it appears that the workers in this sector are an increasingly multicultural, multiethnic workforce, there was still a strong gender and geographical segregation by hierarchical position and jobs performed:

- men seafarers from countries of the Global North and South, respectively and overwhelmingly dominated the shipboard positions of senior officers and lower level support staff;
- within the hotel divisions of large cruise ships, for example, North American and Western European men most often held the positions of hotel manager, cruise director and head of security. Western European and, to a lesser extent, Eastern European women could be found in front-line positions such as that of receptionists, casino dealers, guest relations officers, entertainers and head stewards. Meanwhile, Central/South American and Southeast Asian men (and to a lesser degree Southeast Asian women) seafarers were placed mainly in restaurant and cabin work.

Regarding contracting practices, the review reports that:

- while cruise lines directly recruit skilled workers (e.g. captains, chefs, engineers, hotel managers and so forth), lower skilled positions (e.g. dining, bar and cabin stewards) are outsourced and off-shored to crewing agencies in different countries of the world. Seafarers in the latter group then become temporary workers without the guarantee of automatic renewal upon contract expiration;

⁽⁴³⁾ Chin, C.B.N., Labour Flexibilisation at Sea, Mini UN crew on cruise ships, International Feminist Journal of Politics 10 (1), March 2008, pp. 1-18. Available at: <http://www.informaworld.com/smpp/section?content=a790527202&fulltext=713240928>

- the average length of employment in the industry has declined from three years in 1970, to eighteen months in 1990, and eight to ten months in 2000 ⁽⁴⁴⁾. Significantly, the ILO study also found that seafarers from traditional maritime countries in the Global North have higher level positions and shorter contracts, whereas those from the Global South occupy lower level positions and longer contracts.

Some figures on the growth of the sector were also provided:

- the study reported a steady growth of deep ocean pleasure cruising that averages between 8–9 per cent per annum, situated at the intersection of the shipping and tourism sectors;
- some cruise ships were refitted or redesigned to compete with landed interests. The size of cruise ships has grown to very large or megaships that can carry upwards of 3,000 or more passengers together with approximately 2,000 crew members. Aside from increasing the total number of berths/cabins, these ships also offer many more shipboard amenities (alternative restaurants, rock-climbing, ice-skating rinks, outdoor movies). Forty new ships were introduced into the market during the 1980s, and the number doubled to 80 new ships one decade later. By 2004, approximately 200 cruise ships had carried a total of 10.6 million passengers globally since the 1980s. Nearly 40 % had taken oceanic or deep water cruises between 2000 and 2005 ⁽⁴⁵⁾ ⁽⁴⁶⁾. There has also been a concentration process in the sector that led to the emergence of three major cruise corporations that, together, control over 80 per cent of deep ocean pleasure cruises covering all regions of the world.

The authors characterise the ships as ‘dream ships’ in which passengers can experience fantasy lives (generally week-long) of having their cabins cleaned twice a day, all meals served in elegantly appointed restaurants and/or cabins, a selection of shipboard entertainment venues ranging from Broadway-like shows and miniature golf to casinos, while sailing from port to port. Consequently, there is also a diversification to be expected on health and safety risks and working conditions of the seafarer workforce. Accident risks may include risks characteristic for sports accidents, the hospitality sector and cleaning work, as well as risks more specifically linked to the conditions of cruising on sea. The specificities of work organisation on board cruise ships (shift work linked to 24-hour service, for example) combine with the variety of risks and exposures to form a specific set of working conditions.

Finally, the study reported on a radical change in the registration of oceanic vessels. For the first half of the twentieth century, primary or national ship registries regulated the majority of ships, which meant that ships were built and registered in, flew the flag of, and were crewed by citizen-seafarers from the ship owner’s country of domicile-citizenship. All of these dimensions were united

⁽⁴⁴⁾ International Labour Organization (ILO) (2003) *Women Seafarers: Global Employment Policies and Practices* ILO, Geneva. Available at: http://www.ilo.org/global/What_we_do/Publications/ILOBookstore/Orderonline/Books/langen/WCMS_PUBL_9221134911_EN/index.htm

⁽⁴⁵⁾ Cruise Lines International Association (CLIA) (2004) *Cruise Industry Mid-Year Sourcebook Update*. Available at: <http://www.cruising.org>

⁽⁴⁶⁾ Mathisen, O. (2005) *Full Steam Ahead*. *Cruise Industry News*. Available at: http://www.cruiseindustrynews.com/index.php?option=com_content&task=view&id=43&Itemid=42



under, and subject to, comprehensive national regulations. However, towards the late 1960s and especially during the maritime world's economic downturn, ship owners responded to declining profits by transferring their vessels' registration overseas to 'open' or 'international' ship registries established by non-traditional maritime flag states.



Safety belts for pregnant workers (Spain)

The use of safety belts can put at a risk the pregnant mother as well as the foetus in case of an accident. To address this issue, the OSH prevention statutory insurance service MUTUA has put at the service of workers safety belt adapters for pregnant women that maintain the safety belt in the adequate position. The organisation has planned an awareness raising campaign in 2009.



By courtesy of Mutalia, Spain.



The TRANSAM study: gender difference in the transport of goods sector (Belgium) ⁽⁴⁷⁾

The Social Fund for Transport of Goods investigated a market study on the sector, called TRANSAM and performed by the bureau ECWS (results of 440 companies). The study included both quantitative and qualitative data. Regarding gender differences, several questions were asked to employers and employees. According to the employers, these were the main reasons why there are not many female drivers in the sector transport of goods:

- difficulty in combining work and family (73.4 %);
- physical burden is too high (26.4 %);
- too long away from home (23.2 %);
- female workers mention as another important aspect the lack of female friendly organisation (e.g. toilet infrastructure at rest locations);
- 14.2 % of the employers agreed with the statement 'When a woman seeks a non-driving profession in my company, she has a lower chance of being hired than a man';
- 34.5 % agreed with 'When a woman seeks a driving profession, she has a lower chance of being hired than a man';
- 57.8 % agreed with 'Women are equally suited to have a driving function', but 58.7 % mentions that it is easier for a woman to find work in the sector transport of persons;
- 34 % revealed that the sector does not do enough at the moment to hire women.

⁽⁴⁷⁾ ECWS, TRANSAM: arbeidsmarktstudie m.b.t. de sector goederenvervoer en -behandeling voor rekening van derden, in opdracht van het Sociaal Fonds voor het goederenvervoer: Brussel, 2001.

1.3.

DISTRIBUTION BY AGE

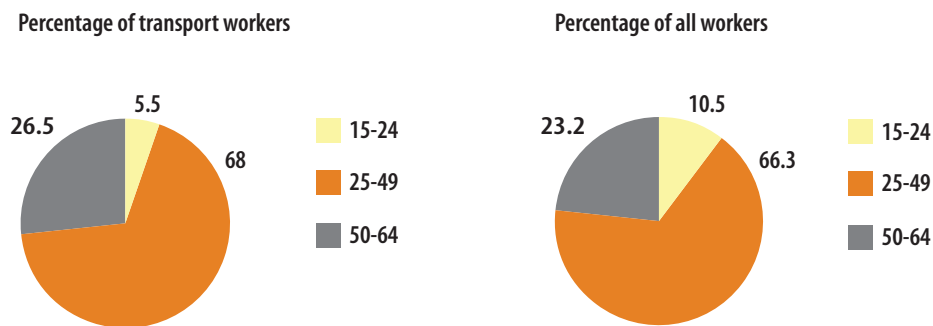
The highest number/proportion of workers in the transport sector can be found in the age category 25–49 years, followed by the age category 50–64. The distribution of male and female workers by age shows the same pattern.

The proportion aged 50–64 is increasing in several Member States. The challenge for the sector is therefore to develop the skills and employability of older workers, while maintaining the health, motivation and capacities of workers as they age. Actions need to be taken to combat discrimination and negative stereotypes of older workers. Above all, working conditions as well as employment opportunities must be appropriate for an age-diverse workforce.

1.3.1. Employment figures by age

In 2006 around 68 % of workers in transport were aged between 25 and 49 and 26 % were in the 50–64 age group. Less than 6 % of workers in the sector were under 25 years old. In comparison with the overall workforce in the EU, 10.5 % of workers were young, while the share of those in the age group 25–49 was similar to that in transport, around 66 %. The remaining 23 % were aged between 50 and 64 years old.

Figure 8: Employment by age in transport (I.60 + I.61 + I.62) as compared to the general working population, total workforce, (%), EU-25, LFS 2006



Source: LFS - Codes according to NACE Rev. 1.1

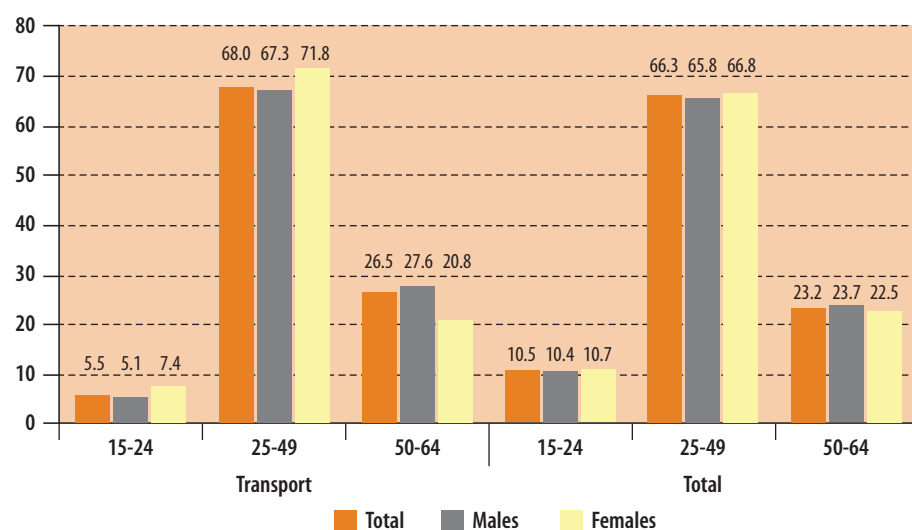


Table 8: Employment (in 1,000) by age, transport and total, EU-25, 2004-2006

Year	Males			Females		
	15-24	25-49	50-64	15-24	25-49	50-64
2004	261	3,506	1,347	80	685	187
2005	261	3,412	1,382	78	705	185
2006	261	3,450	1,414	71	693	201

Source: LFS

Figure 9: Percentage distribution of employment by age group and gender, transport and total, EU-25, 2006



Source: LFS 2006

The average age of workers in transport is increasing. The challenge for the sector is therefore to develop the skills and employability of older workers.

There are very few young workers employed in the sector: The proportion of transport in total employment by age class: only 1.6 % of all young workers were employed in transport in 2006, and that includes 2.3 % of the male young workers and less than 1 % (0.8 %) of young females.

The shares for the age-classes 25–49 and 50–64 were 3.2 % and 3.5 %, respectively.

By age and gender, among male workers aged 25–49, around 5 % were employed in the transport sector and the same proportion is found for males aged 50–64; for women the shares are 1 % of those aged 25–49 and 50–64, respectively.

Figures from the Member States also show that the proportion of workers aged 50–65 in transport has been increasing over the last 10 years. The challenge for the sector is therefore to develop the skills and employability of older workers, while maintaining the health, motivation and capacities of workers as they age. Actions need to be taken to combat discrimination and negative stereotypes of older workers. Above all, working conditions as well as employment opportunities must be appropriate for an age-diverse workforce.



Table 9: Employment by age in transport sector — Trends in the Member States ⁽⁴⁸⁾

Country	15-24	25-49	50-64
Belgium	- (1995)	- (1995)	+ (1995)
Czech Republic	NA	NA	NA
Denmark	- (1995)	- (1995)	+ (1995)
Germany	S (1995)	S (1995)	S (1995)
Estonia	NA	NA	NA
Ireland	NA	NA	NA
Greece	- (1998)	+ (1998)	+ (1998)
Spain	+ (1995)	+ (1995)	+ (1995)
France	S (1995)	- (1995)	+ (1995)
Italy	S (1995)	S (1995)	+ (1995)
Cyprus	NA	NA	NA
Latvia	S (1998)	+ (1998)	+ (1998)
Lithuania	NA	NA	NA
Luxembourg	S (1995)	S (1995)	S (1995)
Hungary	- (1996)	- (1996)	+ (1996)
Malta	NA	NA	NA
Netherlands	NA	NA	NA
Austria	NA	NA	NA
Poland	NA	NA	NA
Portugal	S (1995)	+ (1995)	S (1995)
Slovenia	NA	NA	NA
Slovakia	NA	NA	NA
Finland	+ (1995)	S (1995)	+ (1995)
Sweden	NA	NA	NA
United Kingdom	NA	NA	NA

A number of issues may have to be considered when adapting working conditions to an ageing workforce — a few shall be mentioned here. As outlined in Sections 2 and 3 on the exposures of transport workers and related health outcomes, an ageing transport workforce may pose additional challenges on OSH prevention and the need to adapt workplaces: older workers may suffer from the consequences of long-lasting exposure to the typical transport-related risks: from chronic MSDs, noise-related hearing loss, vibration-related diseases and the effects of long-term shift and night work, for example sleeping problems, sleep apnoea and fatigue. As a consequence,

⁽⁴⁸⁾ Trend based on descriptive information in the country reports (S = stable, NA = not available).



workplaces may have to be adapted more specifically to the needs of these workers, and work organisational measures may increasingly be needed.

OSH directives may have an impact on the working environment and work organisation of ageing and older workers — for example, the working time directive (93/104/EC). Its main aim is to ensure that workers are protected against adverse effects on their health and safety caused by working excessively long hours, inadequate rest or disruptive working patterns. Branch-specific provisions exist for road transport, work at sea and civil aviation, but there is further need for improvement. Research indicates that working patterns and times can have a greater negative impact on older workers than on younger workers, and that poor working times can lead to older workers leaving the workforce.

Ageing of the population as a wider issue may also impact on the working conditions of the ageing transport workforce: A study by the EEA (see Section 1.6.1 — studies and initiatives) focused on how non-transport related issues impact on the conditions in the transport sector: the age of travellers will have an influence on the way travelling is organised and on the service demands on transport workers, as more and more older people travel long distances and the conditions may have to be adapted to their needs.

1.3.2. Studies and initiatives — older transport workers



Adapting the working conditions of older women (UK)

The Trades Union Congress (TUC) in the United Kingdom publishes reports and guidance on age issues, such as the report on health and safety and the menopause, a rare practical study on this issue. In this study, the TUC recommends that employers should:

- provide cold drinking water, easily adjustable temperature and humidity controls; encourage flexible working and reduce long hours; avoid penalising staff for taking frequent toilet breaks, provide quiet rest facilities and advice for female employees;
- avoid negative and discriminatory attitudes towards older women at work by recognising the potential problems related to the menopause and provide appropriate information and training to their managers;
- develop policies in consultation with unions on the menopause to cover sickness absence, paid leave for treatment, occupational health screening, flexible working patterns and rest breaks.

The Transport and General Workers Union has taken the issue further, producing a practical guide, relating to the menopause. In it, there is a checklist for use in carrying out a risk assessment. This factsheet, aimed particularly at worker-safety representatives, identifies the issues relating to the menopause and provides a checklist for use during the risk assessment process and a model policy checklist. The identification of age and gender related issues during risk assessment is a core step in preventing harm to older workers.

More generally, the report by the European Agency for Safety and Health at Work entitled 'Gender issues in safety and health at work, a review' ⁽⁴⁹⁾ looked at the health and safety of older women workers. The report notes that employers should recognise that older workers are not a homogeneous group, and that gender differences do exist in this section of the workforce.

- Risk assessments and preventive actions should take into account both the gender and the ageing dimension.
- Consultation with the workforce should be made in the risk assessment and implementation of preventive actions, and this includes older women workers. In some workplaces, these people are performing part-time or 'non-process' tasks and can be easily missed ⁽⁵⁰⁾.
- In addition, making jobs easier for women will make them easier for men, too. So it is important to include gender issues in workplace risk assessments for older female workers, and 'mainstreaming' gender issues into risk prevention is now an objective of the European Community.



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Let's build work ability together (Finland)

Länsilinjat Oy is a privately owned bus company employing 155 persons (15 women, and 140 men). Most of the employees are bus drivers. Most of the supervisors were young in both age and length of employment and the mean age of the personnel was 45 years. The high mean age of the workers and the well-being of the personnel were the main concerns behind the programme. Developing new operating methods and models to conform better to the different challenges of the young generation of supervisors and the long-term personnel was also an important starting point for the development work, as finding a joint line of action was no longer easy. The company had the opportunity to participate in the 'Let's Build Work Ability Together' project run by the Finnish Institute of Occupational Health. The project was a part of National Programme for Ageing Workers (1998–2002) and launched by the Finnish Government. The project was supported by European Social Fund. Most of the development work carried out during this project targeted professional competence and training, as well as the work organisation.

The company has 80 buses that furnish the west and northwest regions of Tampere with transportation. Länsilinjat handles short-haul traffic, and offers regular service, express service and charter service in 15 other locations. The drivers leave for work independently, according to their personal driving schedules and from their own designated locations. This situation created major demands for independent responsibility and supervisory work. Drivers visit garages irregularly, some almost daily, and some weekly or even more scarcely. It is only natural that communication and supervisory work are especially challenging in such a work environment.

⁽⁴⁹⁾ European Agency for Safety and Health at Work, EU-OSHA, 2003. Available at: <http://osha.europa.eu/en/publications/reports/209/view>

⁽⁵⁰⁾ Factsheet 43 — Including gender issues in risk assessment, European Agency for Safety and Health at Work, EU-OSHA, 2003. Available at: <http://osha.europa.eu/en/publications/factsheets/43/view>



The following actions were taken between 1999 and 2002 and covered drivers, maintenance and office workers:

Health and well-being occupational healthcare services (physical examinations, special courses for workers with poor work ability):

- information on a healthy lifestyle (exercise, diet),
- provision of opportunities to participate in rehabilitation courses,
- occupational rehabilitation,
- introduction of part-time retirement arrangements;

Working environment and safety:

- tailored safety education,
- education of emergency situations,
- introduction concerning work postures for express traffic (freight ergonomics),
- lessons of scotopic vision and presbyopia;

Development of professional skills and know-how:

- updating the induction system and writing an induction manual,
- creating a framework for an induction plan,
- initiation of 'god-parent driver system' (mentor drivers),
- training for drivers wanting to pass the professional driver's examination,
- introduction of a professional examination for maintenance workers,
- introduction of professional examination for automotive electricians,
- management training,
- training targeted towards special issues in traffic questions;

Work organisation:

- more flexible working time arrangements (individual working schedules),
- improvements in meeting practices and interaction,
- introduction of small group discussions among drivers on current topics,
- initiation of work rotation.

The bus drivers also appreciated being involved in planning of working time schedules.

The following measures have been maintained after the end of the project: rehabilitation courses, part-time pension, occupational rehabilitation, and development of professional skills and know-how of drivers, apprenticeship-based professional examination for maintenance workers, the god-parent driver system for new drivers, more flexible working time arrangements and meeting practices.

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Evaluating age related issues (France)

Autoroutes du Sud de la France (ASF) is the leading motorway network in France. The company has over 8500 employees, whose average age is slightly higher than the national average. Several factors led ASF to take an active interest in the question of ageing, in particular the cost of its system of gradual early retirement, and a large number of particular situations bringing to light the problems related to employee ageing and safety questions.

In 2003–2004, ASF launched an initiative on this subject under the European programme EQUAL on the promotion of active ageing. The objective was not to introduce a specific management procedure for older workers, but to allow for longer active lives in management policies and actions.

The project took place in five stages:

- a generic study: identification of the causes of exclusion of ageing employees from the labour market;
- an impact analysis: identification of the effects of ageing. Some 120 employees aged over 45 and 20 managers were met with, as well as the trade union organisations;
- implementing new forms of organisation, special training schemes and raising awareness among managers;
- tests at the Salon and Vedène sites;
- a review and consolidation of the approach.

Five actions were taken:

- preparing the company, workers, and management to work longer;
- carrying out analysis on the effects of ageing in the company and provide management with information for action;
- developing post-accident support based on the experience of the older workers; reinforcement of post-traumatic support system already established, and organisation of 'feedback' seminars intended for patrol personnel — these workers are responsible for road supervision and operations on the road, reporting on and intervening in cases of traffic incidents and accidents;
- facilitating mobility of foremen and supervisors after age 40 (or after 10 years in the same position), by performing a career review;
- adapting the instruction methods and content of the training courses by allowing for ageing and in particular to raise managers' awareness so that they may convey a positive message on the purpose of the training, organise short sequences with alternate theoretical and practical training, and establish referral agents in the departments.

The question of 'seniors' is now part of the Human Resources policy and is monitored, for example by follow-up of occupational interview performance, or assessing the proportion of older workers in training programmes. This project has also provided input for other diversity-related activities in the company.



1.4. OTHER CHARACTERISTICS OF THE TRANSPORT SECTOR

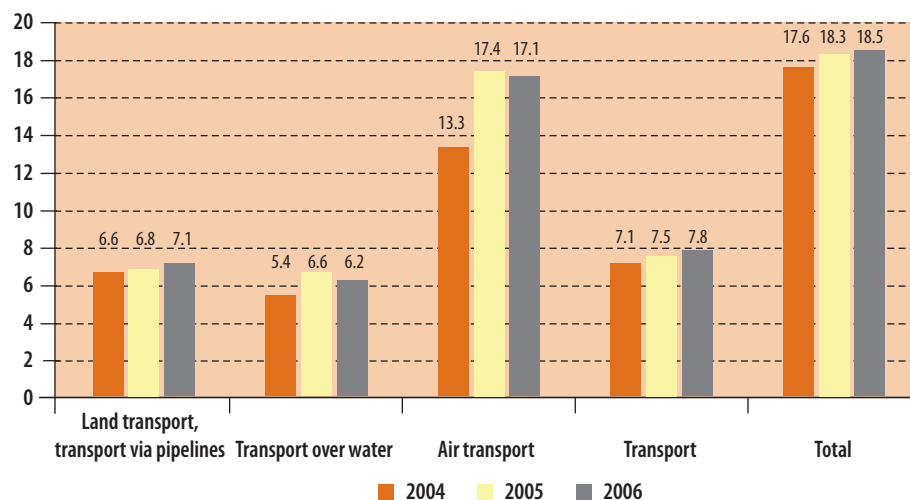
1.4.1. Part-time work

In 2006, about 8 % of the EU-25 transport workers were working part-time in comparison with nearly one out of five within the total working population.

Part-time work in transport strongly increased in the past decade in several Member States.

According to the LFS, part-time employment is less common among transport workers than within the total working population: part-time employment accounted for around 7 % of total employment in transport in 2006 as opposed to 18 % in the overall workforce. By transport sub sector, the highest share of part-time work was found in air transport (17.1 %), followed by land transport (7.1 %) and transport over water (6.2 %).

Figure 10: Percentage share of part-time employment in the overall economy, transport and transport sub sectors, EU-25, 2004–2006



Part-time employment is less common among transport workers. However, in some Member States it is increasing.

Source: LFS - Codes according to NACE Rev. 1.1

Part-time employment is less common among transport workers. However, in some Member States it is increasing.



Table 10: Part-time employment, LFS 1983–2006

Year	Transport (60 + 61 + 62)		Total	
	Number (1,000)	Proportion as % of the total transport sector ⁵¹	Number (1,000)	Proportion as % of the total work force ⁵²
2004	428	7.1	34,333.3	17.6
2005	452	7.5	36,136.2	18.3
2006	477	7.8	37,346.4	18.5

Source: LFS - Codes according to NACE Rev. 1.1

Table 11: Part-time employment, LFS 1983–2006

Year	60 Land transport, transport via pipelines	61 Transport over water	62 Air transport
2004	355	15	58
2005	360	18	75
2006	383	16	78

Source: LFS - Codes according to NACE Rev. 1.1

The percentage of part-time work has been rising for many years now in several Member States.

⁽⁵¹⁾ Number part-time 'Transport' / Transport Total * 100

⁽⁵²⁾ Number part-time 'Total' / Total * 100



Table 12: Part-time employment in transport sector — trends in the Member States ⁽⁵³⁾

Country	Part-time employment	Country	Part-time employment
Belgium	+ (1995)	Luxembourg	NA
Czech Republic	NA	Hungary	- (1996)
Denmark	+ (1997)	Malta	NA
Germany	+ (1995)	Netherlands	NA
Estonia	NA	Austria	NA
Ireland	NA	Poland	NA
Greece	+ (1998)	Portugal	+ (1995)
Spain	+ (1995)	Slovenia	NA
France	S (1995)	Slovakia	NA
Italy	+ (1995)	Finland	S (1995)
Cyprus	+ (2003)	Sweden	NA
Latvia	NA	United Kingdom	NA
Lithuania	NA		



Working conditions in part-time jobs (Europe)

Several Eurofound studies have looked at the working conditions of workers in part-time jobs. They found that employees with a part-time contract tend to ⁽⁵⁴⁾:

- work under more favourable ambient conditions;
- work fewer non-standard hours;
- have less control over working time;
- have work requiring less skills;
- receive less training.

⁽⁵³⁾ Trend based on descriptive information in the country reports (S = stable, NA = not available).

⁽⁵⁴⁾ 'Employment status and working conditions', Goudswaard A, Andries F. Available at: <http://www.eurofound.europa.eu/publications/htmlfiles/ef0208.htm>

A report on part-time work in Europe indicates fewer opportunities for training and career progress⁽⁵⁵⁾. Part-time workers might miss out on training, if it occurs when they are not at work, and on information exchange. The level of salaries and social security benefits is often lower and jobs are typically monotonous. Part-time employment often comes at the beginning or at the end of working life, especially for men. Not all part-time workers are satisfied with their status. On the other hand, the report reveals a higher level of general satisfaction with working hours and better opportunities to achieve a positive work-life balance.

1.4.2. Migrant workers in transport

The transport sector is, together with the agriculture and horticulture, construction, healthcare, households, and food sector one of the sectors that employ more (im) migrant workers.

A previous EU-OSHA study found that⁽⁵⁶⁾ the transport sector is, together with the agriculture and horticulture, construction, healthcare, households, and food sector one of these sectors. Immigrant workers are more occupied in the so-called three D-jobs (dirty, dangerous and demanding) within these sectors. Work is often characterised by uncertainty, poor working conditions, part time jobs, and low wages. Research from ILO⁽⁵⁷⁾ showed that more than one third of the vacancies for semi-skilled jobs were closed to young, male applicants of migrant or ethnic minority origin. This was especially the case in the services sector and in small and medium-sized enterprises.

The ILO study found three important reasons why OSH issues are of specific interest for migrant workers:

- the high employment rates of migrant workers attending in high-risk sectors;
- language and cultural barriers: these require specific OSH communication, instructions and training approaches;
- they often work overtime and/or are in poor health and thus more prone to occupational diseases and injuries.

⁽⁵⁵⁾ Part-time work in Europe, European Foundation for the Improvement of Living and Working Conditions (Eurofound), Dublin, 2005. Available at: <http://www.eurofound.europa.eu/ewco/reports/TN0403TR01/TN0403TR01.pdf>.

⁽⁵⁶⁾ Literature study on migrant workers, European Agency for Safety and Health at work EU-OSHA, 2006. Available at: http://osha.europa.eu/en/publications/literature_reviews/migrant_workers/view

⁽⁵⁷⁾ International Labour Conference, 92nd sessions: Towards a fair deal for migrant workers in the global economy, 2004. Available at: <http://www.ilo.org/wcmsp5/groups/public/—dgreports/—dcomm/documents/meetingdocument/kd00096.pdf>



Studies give several explanations for the poor and/or precarious position of the migrant workers on the labour market:

- non-Western migrants occupy more low skilled and flexible jobs;
- undocumented workforce occupies jobs that require low skills;
- poor language skills;
- low education; in general the level of education and profession of the migrants are lower than that of the locals;
- poor knowledge of the labour market;
- less efficient strategies than the native workers to find a job;
- difficulties to validate the original qualifications (e.g. university degrees).

In transport, migrant workers tend to be segregated into certain jobs, as described more in detail in the case studies below and in other case studies in this report (see for example Section 1.2.2):

- foreign drivers in long-distance hauling;
- immigrant luggage handlers at airports;
- service workers and cleaners on ships;
- low-skilled workers in transport by rail.



Investigating accidents at sea and implications for prevention (Germany) ⁽⁵⁸⁾

In this study, an analysis of 645 accidents on sea-going vessels was made, with the aim to identify actions in prevention and training. During the in-depth investigations, necessary requirements regarding the individual performance of seamen (engineer officers and nautical officers) to master critical situations were elaborated and procedures were suggested. At the same time, evidence was produced showing that the employment of multinational crews creates particularly high requirements for individuals being part of the ship's management. Integrated programmes to tackle the issue were suggested. The project concludes with recommendations for prevention.



'Risk profiles in sectors of handicraft, SMEs and public services: passenger sea transport' (Italy) ⁽⁵⁹⁾

The case study focused on passenger ships in the harbour of Genoa. The risks faced by sea transport workers depend on the type of work, the typology of the ship or cruiser, the characteristics of the ship and the type of cargo. A risk common to all phases is fatigue, which is directly linked to the organisation of work: shifts,

⁽⁵⁸⁾ Hahne, J.; Baaske, G.; Moser, H.-J.; Rothe, R. Identifikations- und Anwendungsprogramme zur Ermittlung von Gefährdungssituationen in der Seeschifffahrt, Schriftenreihe der Bundesanstalt für Arbeitsschutz und Arbeitsmedizin: Forschungsbericht, Fb 924.

guard duties, night work, impossibility to have a proper rest in what is the same work environment, strict hierarchy, excessive responsibility in terms of ship safety and the nature itself of the jobs at sea — long periods away from home, forced communal living, high turnover of colleagues, difficult weather. Often comprising hundreds of people, crews are made up of various nationalities, people who must interact with each other and to whom a wide range of duties are entrusted. Aboard the largest Genoa-based ship, for example, there are 1,000 workers of 39 different nationalities, including 160 Italian workers. Other factors contribute to making conditions more difficult, especially in the cruise business, such as the difficulty to socialise with crew/passengers as a consequence of the presence of various international communities.

All these elements generate a risk factor that is inherent to sea transport, which has been defined as 'fatigue factor', regulated in Italy by legislative decree No 271/99. It is further aggravated by the poor quality and lack of rest and sleep, heavily affected by shifts and the need to tackle exceptional onboard demands requiring overtime work. It is clear that shift work, including night shifts, may affect the normal sleeping cycle and ultimately also the psychological and biological balance of workers.

Common to all work phases, and linked to the fatigue factor, this study found that there is the risk arising from the different nationalities of sea workers, which leads to difficulties in communication and requires the provision of specialised information and training.



Road safety programme to assist Migrant Workers (UK)

The York and North Yorkshire Road Safety Partnership launched a programme to assist migrant workers in September 2009⁽⁵⁹⁾. Nine people had died in collisions involving migrant workers on the County's roads since 2006. A new CD aimed at helping migrant workers to stay safe on roads has been produced by 95 Alive York and North Yorkshire Road Safety Partnership. Over 1,000 migrant workers were asked for their opinions about driving on Britain's roads before the CD was made. This gave the producers a good idea of what might be confusing and what could be contributing to collisions. It covers all aspects of driving in Britain from documentation to road signs, speed limits and the rules and laws of the road. There is also information from North Yorkshire Fire and Rescue about how to stay safe in the home.



The CD has been made in Polish initially but the aim is to translate it into up to six other languages by the end of the year. A series of workshops where copies of the CD will be distributed was also planned.

⁽⁵⁹⁾ Research financed by ISPESL (Istituto Superiore Prevenzione E Sicurezza del Lavoro), 2003. Available at: http://www.ispesl.it/profli_di_rischio/_trasporto_mar_pass/index.htm

⁽⁶⁰⁾ Road safety CD released for migrant workers (23 September 2009), <http://www.roadwise.co.uk/news>



1.5. INFORMATION FROM THE MEMBER STATES

In Austria, the share of young workers (7 %) is only half of that of 50–64 year olds (16 %) in the transport sector.

Austria ⁽⁶¹⁾ ⁽⁶²⁾

The communications, transport and delivery services sector is a predominantly male-dominated profession. With the exception of the freight forwarding and tourism specialists' professional sectors in which the number of women easily exceeds the number of men at 50.7 %, the number of men altogether amounts to 87.6 %. This area is dominated by occupations in land transport with 82.9 % of employees working in this occupational field.

Due to the increased trend for outsourcing logistics services, the areas of freight forwarding and logistics have recorded the biggest growth in the 'communications, transport and delivery services' sector. Shipping merchants and qualified warehousing logistics are predicted to have increased demand in the period forecasted up to 2011. Owing to the constantly increasing passenger and freight traffic, air traffic developed positively.

Most enterprises are very small in transport: in 2006, 83 % of enterprises in land transport, 91 % in transport over water and 86 % in air transport employed less than 10 people. These small companies account for 22 %, 48 % and 2 %, respectively, of the workforce, and for 13 %, 25 % and 4 % of the turnover in land transport, transport over water and air transport. Rail transport is mainly state-owned.

Between 1995 and 2006 on average about 77 % of workers in transport were 25–49 years old. The share of young workers (7 %) is only half of that of 50–64 year olds (16 %) in the transport sector. This distribution is similar for male workers whereas the female workforce reports a greater balance between young workers and those aged 50–64 years old.

Belgium

In Belgium, the percentage of part-time work has considerably risen in transport in recent years, from 3.4 % of total employment in the sector in 1995 to 11 % in 2006.

Land transport is by far the largest transport sub sector in Belgium. Overall figures (tons of goods) have increased steadily since 1999, while national road transport has decreased, a reflection of increasing outsourcing to international road transport. The globalisation of this market results in an increase in the distance between production and consumer, the main consequence being a larger geographic spread, a bigger logistic circle and, consequently, an increase in international transport. In terms of forwarded tonne-kilometres, international transport clearly outnumbers national transport ⁽⁶³⁾ ⁽⁶⁴⁾.

⁽⁶¹⁾ Branchenbericht der Transportwirtschaft, Wirtschaftskammer Österreich.

⁽⁶²⁾ Weitere Beschäftigungszuwächse im Bereich Verkehr und Transport, anhaltender Arbeitskräfterrückgang bei den Zustelldiensten, Prognose 2008 – 2011. http://bis.ams.or.at/qualibarometer/berufsbereich.php?id=83&show_detail=1&query=

⁽⁶³⁾ SERV, Onderzoek naar de kwalificatiebehoeften voor vrachtwagenchauffeur, Brussel: Sociaal-Economische Raad van Vlaanderen, 1998.

⁽⁶⁴⁾ FOD Economie — Algemene Directie Statistiek & NMBS, http://www.statbel.fgov.be/figures/d74_nl.asp#1



The highest number and proportion of workers in transport can be found in the age category 25–49 years, followed by the age category 50–64 and young workers. The number/proportion of workers in the age category 25–49 years has decreased since 1995, while those in the age category 50–64 years increased. The number of female workers has increased in all age categories since 1995.

In 2006, about one out of ten transport workers were working part-time in comparison with about one out of five within the total working population. In any case, part-time work in transport has increased remarkably during the last decade from 3.4 % of total employment in the sector in 1995 to 11 % in 2006.

As within the total workforce, most enterprises in transport and supportive activities — about 95 % of them in 2007 — are small (less than 50 workers). In 2007, about 68 % employed less than 5 people, a considerably higher proportion than on average, about 15 % employed between 5 and 9 workers, about 8 % employed between 10 and 19 people and about 6 % employed between 20 and 49 workers. The number and proportion of self-employed workers has decreased from 1999 onwards, from 1.23 % to 1.11 % ⁽⁶⁵⁾.

Cyprus

According to the census of Cypriot establishments conducted in 2005, small-sized enterprises employed about 40 % of transport workers in the country, while medium and big-sized enterprises employed 22.5 % and 38 % of transport workers, respectively. Employment in transport increased by 19 % between 1999 and 2005, reaching 12,000 workers in 2005 and representing about 3.5 % of the total employment in Cyprus. By transport subsector, employment in land transport appears to have stagnated between 1997 and 2005, while in water and air transport there has been a remarkable growth of 81 % and 14.3 %, respectively, in the same period of time. Accordingly, employment in land, water and air transport represented 40 %, 39 % and 20 %, respectively, of total employment in transport in 2005.

According to CYSTAT, the Statistical Service of the Republic of Cyprus, by gender, the number of male workers had increased by some 15 % since 1999, while among women employment figures in transport rose by 25 %. As far as employment status is concerned, the number of self-employed transport workers increased by 45.5 % between 2002 and 2005, in contrast with the total workforce across all sectors. The number of part-time workers in the sector in Cyprus increased remarkably by 90.7 % between 2003 and 2005, while in the total workforce part-time employment increased by 5.5 %.

An important aspect of employment in Cyprus is the presence of migrant workers, who have undertaken a significant part of existing work, filling the shortage of manual labour in transport as well as in other economic activity sectors, although growth rates are smaller than on average.

The bulk of truck transport or road hauling (in tonnage) in Cyprus is international transport, carried out by vehicles over 25 t.

In Cyprus, the growth of the transport sector has benefited women: the female workforce increased by 25 % as compared to 15 % for men. Labour shortage has been filled by migrant workers, performing manual and physical work mainly. The number of self-employed has nearly doubled between 2002 and 2005. Also, the number of part-time workers nearly doubled.



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⁽⁶⁵⁾ Rémunérations et périodes rémunérées déclarées. Dénombrement des postes de travail. Office national de sécurité sociale. <http://www.onssrszls.fgov.be/fr/content/statistics/stathome.html>



Denmark

In 2005, there were 13,345 enterprises in the transport sector in Denmark. Out of these, about 91 % had less than 20 employees, while only 3 % had more than 50 employees.

In 2004, from 106,249 transportation workers 37.55 % or 39,900 workers were employed at a small enterprise (1–49), 9.6 % or 10,229 employees worked at a medium-sized enterprise (50–99), and 52.8 % or 56,120 workers held a job at one of the large transportation enterprises. In other words, most of the transportation workers are employed at the small and very large enterprises.

In 2006, there were 72,000 men, representing more than 70 % of the transport workers, and 17,000 women employed in the sector. This has been a constant trend over the years.

In Denmark, the share of part-time workers is higher in transport than on average, and the number of part-time workers has more than doubled between 1995 and 2006.

The largest age group among transport workers was that made up by those aged 25 to 49 years old, while the smallest one is that of those under the age of 25. The same holds for both genders. This age distribution has been constant since 1995. In 2006, there were 56,000 workers between 25 and 49 years old, 28,000 between 50 and 64 years, and only 5,000 workers under the age of 25. The difference between the youngest and oldest age group is, however, not as big in all sectors as it is in transport.

Approximately 8 % of all transport workers were self-employed, out of these, only 8 % women, a similar picture as across all sectors. Part-time work was more common in transport than across all sectors: 29 % as compared to 24 %. According to the LFS, 12,000 people worked part-time in 1995, which increased to 26,000 by 2006. Concerning migrant workers, their numbers in transport were also increasing, according to Statistics Denmark. In 2006, there were also 9,678 workers with a migrant background in transport, up from 8,714 back in 2003.

Finland

In 2006, in Finland about 100,000 people were working full-time in transport, out of which 80,000–90,000 in road transport. There were approximately 400 bus companies employing 11,000 people and around 15,000 taxi drivers, 9,000 of which were self-employed.

In Finland, the proportion of workers aged 50 to 64 has increased from 19.3 % in 1995 to 29.7 % in 2006. Also, as opposed to other Member States, the number of male workers in air transport has considerably increased.

The number of workers in road and air transport has slowly increased and is expected to continue to increase. In water transport the number of workers is expected to decrease, even though the amount of transport over water is expected to increase, done by ships under foreign flags.

The majority of employees (82 %) in the freight transport by road sector are employed by companies with less than 50 employees. The corresponding percentage of the bus transport sector was 33 % and for all sectors 44 %. The average number of trucks was 2.4 per company and 66 % of the trucking companies had only one truck in 1999. The bus transport system is also dominated by small enterprises. Typically, a Finnish bus company owns no more than five buses. Only nine bus companies and two transport systems in Finland have more than 100 buses ⁽⁶⁶⁾ ⁽⁶⁷⁾.

Transport in Finland is a male dominated sector, with only 15 % of workers being women. There are significant differences across transport subsectors. While in road

⁽⁶⁶⁾ Finnish Bus and Coach Association 2001.

⁽⁶⁷⁾ The national report on working conditions in road transport in Finland.



transport the proportion of female workers is only 10 %, it goes up to 30 % in transport over water and 40 % in air transport. The gender composition in land transport has remained fairly constant in time, while in transport over water it has been more variable. Air transport instead has witnessed an increase in the proportion of male workforce from 35.2 % in 1995 to 58 % in 2006. While the share of young workers has remained relatively stable around the 10 % mark, workers aged 25 to 49 have witnessed a drop in their share, while the proportion of workers aged 50 to 64 has increased from 19.3 % in 1995 to 29.7 % in 2006.

France

Employment in transport accounts for about 3 % of the overall labour market in France. This proportion has been constant between 1995 (717,000 workers) and 2006 (791,000). In 2006, 82 % of workers in transport were male (648,000 workers) and 18 % females (143,000 workers). Between 1995 and 2006, the proportion of females has increased slightly. Among males working in transport, 94 % did so in land transport in 2006, 4 % in air transport and 2 % in transport over water. Among females working in transport, 78 % worked in land transport in 2006, 21 % in air transport (compared to 4 % for males) and only 1 % in transport over water.

In 2006, the transport sector employed 71 % of workers aged 25–49 and 23 % of workers aged 50–64. Young workers under 25 accounted for 6 % of the sector workforce. Between 1995 and 2006, while the proportion of young workers was constant, that of workers aged 25–49 decreased from 79 % to 71 % and the share for workers aged 50–64 increased from 15 % to 23 %. Compared to the overall economy, transport reports a lower share of young workers: 9 % and 6 %, respectively. The female workforce in transport has a lower share of young workers (4 % instead of 6 % for males) and the proportion has decreased from 11 % back in 2000. Females aged 25–49 accounted for 73 % (71 % for males) and those aged 50–64 accounted for 24 % in 2006 (10 % in 1998).

Germany

According to the Labour Force Survey (LFS) of Eurostat, around 712,000 people were employed in transport (NACE Rev. 1.1. 60+61+62) in Germany in 2006, which represents a 1.94 % share of the total German workforce. Employment in the sector has decreased since 1998, when it reached 797,000 people, making up 2.26 % of total employment. In land transport, a drop from 85.1 % in 1995 to 81.2 % in 2006 can be noted. There is also a decrease in transport over water — from 5.7 % in 1995 to 3.6 % in 2006 —, whereas the share of air transport in total transport has gone up from 9.3 % in 1995 to 15.2 % in 2006.

Most transport workers (68.4 % in 2006) are aged 25 to 49 years. The share of young workers has experienced a drop from 7.3 % in 1995 to 4.1 % in 2006. Female employment is highest in air transport: 36.1 % in 2006.

Self-employment in transport is lower than in other sectors. Similarly, although there is a constant increase, the share of part-time employment is lower than for the overall economy. By transport subsectors, the increasing trend in part-time employment has been most remarkable in air transport, from 14.3 % in 1995 to 25.9 % in 2006. But land transport and transport over water, too, have more than doubled and tripled, respectively, their respective shares of part-time employment between 1995 and 2006. The BIBB/BAuA survey 2005/06 shows that 4.8 % of workers in transport are foreigners and 3.9 % are Germans with a migrant background.

In France, the proportion of workers aged 50–64 has increased more among women than among men (from 10 % in 1998 to 24 % in 2006).

In Germany, the share of young workers has experienced a drop from 7.3 % in 1995 to 4.1 % in 2006. In air transport, there has been a remarkable increase in part-time work: from 14.3 % in 1995 to 25.9 % in 2006. One in ten workers in transport is either a foreigner or German with a migrant background.



In Greece, female employment in transport grew by 78 % between 1998 and 2006, mostly in land transport. The proportion of young workers has decreased by almost 30 %.

In 2006, the Hungarian railways had a share of 30.1 % of the total freight transport in the country, compared to a European average of 12–16 %.

Greece

According to the National Statistical Service of Greece (NSSG) employment in transport in Greece increased by 12.4 % since 1998, reaching almost 150,000 workers in 2006 and representing 3.3 % of the total country workforce across all sectors. Female employment grew by 78 % between 1998 and 2006. The age group 15–24 experienced a remarkable decrease of 28.4 % between 1998 and 2006. Temporary employment in transport grew by 12 % between 1998 and 2006, while part-time work increased by 10 % in the same period, mostly in land transport.

Hungary

The general trend in the breakdown by age is an increase in the percentage share of workers aged 50 to 64, which is the case both in transport and the overall working population in Hungary. The proportion of part-time work is slightly lower than the average 4 % in transport, where 3.1 % of workers were employed part-time in 2006, up from 1.4 % in 2001.

In 2006, the Hungarian railways had a share of 30.1 % of the total freight transport in the country ⁽⁶⁸⁾, which represented a significant increase compared to the 24 % reported the previous year. These figures are particularly significant as the European average rate is around 12–16 %. Due to the longer transportation distances, conditions for economically combined (multimodal) transport of goods are gradually more established. The objectives of increasing combined transport are:

- reducing environmental pollution and noise;
- reducing traffic congestions;
- increasing transport safety;
- delaying road deterioration;
- making better use of energy and raw materials;
- taking advantage of the spare capacity of rail and water transport;
- protecting and expanding road transport market.

Terminals of combined transport are interfaces of transport subsystems transacting local and/or regional and long-distance carriage of goods (e.g. rail-road, rail-water). The organisational tasks of combined transport are accomplished by so-called national combined companies.

Italy

The national infrastructure network is made up of 172,000 km of roads and motorways, 19,500 km of railways, 146 ports and 101 airports. The industry is dominated by road transport, a sector where there are some 120,000 operators, which represent 27 % of the total in Europe ⁽⁶⁹⁾.

- In 2004, the share of transport in the total added value of the national economy amounted to 4.2 %.

⁽⁶⁸⁾ http://www.europauniversitas.hu/upload/ENERGIA_20050216_1.ppt#15; <http://tranzitonline.eu/index.php?link=news%2Fnews.php&newid=5707>

⁽⁶⁹⁾ 'Dati Inail', No 8, August 2005.



- In 2005, a total of 508 million tons of goods were transported by road, up 5.9 % from 2004.
- Between 2000 and 2004, passenger transport rose by a total of 2 % (measured in terms of passengers-km), although not uniformly across all subsectors; air transport had a plus of 16.9 %, while rail transport experienced a 0.6 % drop. In 2005, around 112 million passengers travelled through Italian airports, 5.3 % up from 2004. The number of passengers who transited in Italian ports, on the other hand, decreased from just over 83 million to approximately 79 million ⁽⁷⁰⁾.
- In 2005, rail operators transported approximately 760 million passengers, for a total of approximately 50 billion passenger-km, up 4.4 % in the number of passengers and 1.7 % in passenger-km.

In Italy, in transport of goods around 60 % of enterprises have one person only, the so-called 'padroncino' or 'one's own boss'. Part-time work has doubled up in transport, from 9 to 18 % between 2000 and 2006.

It is important to highlight that since 1995, when women made up 7.4 % of the overall workforce in transport, their share went up to 12.1 % in 2006, mostly determined by increases in air transport.

Road transport of passengers is featured by small enterprises, with only 5.5 % of the sector enterprises employing more than 100 workers. The scenario is even more fragmented in the transport of goods, with only 0.1 % of enterprises employing more than 100 workers and a vast majority of them (88.7 %) having a workforce between 1 and 5 employees. Around 60 % of enterprises have one person only, the so-called 'padroncino' or 'one's own boss'. These enterprises represent 19.1 % of total employment in transport goods and their total number has diminished, down to 12,450 between 2000 and 2004.

On the other hand, the average number of employees in railway organisations is very high (over 2,000). In air transport it is 95, and in transport over sea 30. The average number of workers is the lowest in organisations from road transport (3.8) and inland water transport (3.9).

The share of self-employment in transport was lower than on average, making up 20.8 % of the total workforce in transport of goods.

Part-time work has gradually increased over time in transport. The growth has been particularly significant in the 2000s, starting around the 9 % mark and doubling up until reaching the 18.1 % in 2006.

In transport and communication, workers from outside the EU represented 8.6 % of the sector workforce in 2005, following a significant increase (17.2 %) with respect to 2004 ⁽⁷¹⁾.

Poland

According to the Labour Force Survey (LFS), there has recently been an increase in employment in transport in Poland, from 578,000 in 2004 to 641,000 people in 2006. Regarding enterprise size, about half of workers in transport, storage and communication in Poland are employed in big enterprises (over 250 employees), while 37 % worked for small enterprises (under 50 employees) in 2006. By age groups, the share of young workers (under 25) in transport is lower than in total employment: 4.9 % and 9.7 %, respectively. The percentage of part-time workers in transport has increased from 1.9 % in 2004, while in the total it has gone down.

⁽⁷⁰⁾ ISTAT, Il trasporto in Italia, 2005.

⁽⁷¹⁾ Caritas/Migrantes, Immigrazione. Dossier Statistico, 2006.



In Slovenia, the share of workers aged 50 to 64 has more than doubled in 10 years (1996/2006), from 10.5 % to 25 %.

There was also a triplication of the number of temporary workers.

In Spain, the number of part-time workers has practically doubled in 10 years (from 1995–2006). The number and share of migrant workers in transport has also increased strongly since 2000, from 0.9 % to 6 %. As opposed to other countries, the number of young workers is increasing slightly.

Slovenia

In 2006, approximately 84 % of workers in transport were men. However, since 1996 the reduction in employment in transport has exclusively affected male workers. By age, between 1996 and 2006 the share of workers aged 50 to 64 increased from 10.5 % to 25 % of all transport employment.

The share of self-employment in transport has gone down between 1997, when 34.2 % of workers in transport were self-employed, and 2005, when there were 21 % self-employed workers in transport. In any case, it is still clearly higher than the corresponding share in the overall Slovene workforce across all sectors, where only 11 % of workers were self-employed in 2005. Regarding the type of contract, the number of temporary workers in transport increased from 2,300 in 1996 to 6,900 in 2006.

Spain

In 2006, about 626,000 Spanish workers were employed in the transport sector. Between 1995 and 2006 the number of workers rose by over 128,000 people. However, the growth in the period under consideration has been smaller than that of the total working population and, hence, the share of transport within the whole economy has decreased over the last 10 years, from 4 % to 3.2 %. About 90 % were employed in land transport, about 8 % in air transport and only 2 % in transport over water. In 2006, about 57 % of enterprises in the sector employed less than 50 workers (small enterprises), while 14 % employed between 50 and 249 (medium sized enterprises) and about 29 % more than 250 (large enterprises).

The transport sector is made up primarily of male workers. In 2006, there were 552,240 men and 73,360 women employed in transport, which leads to an 88 % share of male employment in the sector. However, the proportion of female workers in the sector has increased from 8 % in 1995 to 12 % in 2006.

In Spain, as opposed to other countries, young workers have reported a more constant proportion, with an increasing trend in the last three years.

Part-time work has strongly increased in transport in the last decade, from 3 % in 1995 to 5.9 % in 2006. The number and share of migrant workers in transport has also increased strongly since 2000, from 0.9 % to 6 %.



EXPLORING THE EVOLUTION OF THE TRANSPORT SECTOR AND THE REASONS BEHIND IT

1.6.



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The following chapter summarises a number of European studies that have attempted to identify the drivers of change that support a clearer vision of the future of the transport sector.

Some of the conclusions regarding their impact on the OSH of transport workers and recommendations for prevention are provided at the end of this chapter.

1.6.1. Studies to scope the European transport policy

The TRANSVISIONS forecasting study ⁽⁷²⁾



The purpose of the study was to provide technical support to a debate on transport scenarios with a 20- and 40-year horizon, inter alia, by collecting and analysing information on transport long-term scenario forecasting, by developing long-term transport scenarios including modelling work and case studies, and by suggesting long-term objectives for the European transport policies.

A comprehensive discussion of the drivers related to transport has been carried out in the study and resulted in a subdivision into:

- drivers external to the transport sector: population, economic development, energy, technology development and social change;

⁽⁷²⁾ Petersen M.S., Enei R., Hansen C.O., Larrea E., Obisco O., Sessa C., Timms P.M., Uljed A. (2009): Report on Transport Scenarios with a 20 and 40 year Horizon, Final report, Funded by DG TREN, Copenhagen, Denmark. Available at: http://ec.europa.eu/transport/strategies/doc/2009_future_of_transport/20090324_transvisions_final_report.pdf



- drivers internal to the transport sector: e.g. infrastructure, vehicles and fuel development and transport impact on environment and society; and finally
- policy drivers: that is broad policy responses which affect the evolution of the transport system, and in particular the governance of the transport sector.

In 2001, the Commission issued a White Paper setting an agenda for the European transport policy throughout 2010. This programme was updated in the mid-term review of 2006. A Communication ⁽⁷³⁾, adopted in 2009, summarises the results of a stakeholder consultation and a wider reflection. The European Commission has also recently launched a consultation process preceding the adoption in 2010 of a White Paper on the Future Transport Policy for the next decade up to 2020.

The Commission had launched a reflection on the future of the transport system, comprising an evaluation study on the European Transport Policy (ETP), a debate within three 'Focus Groups', a study — 'Transvisions' — identifying possible low-carbon scenarios for transport, and a consultation of stakeholders, notably through a High Level Stakeholders' Conference on 9–10 March 2009.

Transport is a complex system that depends on multiple factors, including the patterns of human settlements and consumption, the organisation of production and the availability of infrastructure. However, some aspects of the 'long term transport problem' are reasonably well understood, for example some of the issues concerning different types of challenges outlined below:

Impact of ageing on transport

- An ageing society will place more emphasis on the provision of transport services involving a high level of perceived security and reliability, and which feature appropriate solutions for users with reduced mobility.
- Through its effect on public finances, ageing will put a strain on the supply and maintenance of transport infrastructure and set a limit for funding available to public transport. A scarcity of labour and skills may arise, further aggravating the shortage of skilled labour already experienced in some segments of the transport sector.

Migration

- Net migration to the EU might add 56 million people to the EU's population in the next five decades. Migration could play an important role in mitigating the effect of ageing on the labour market. Migrants, generally young and mainly living in urban areas, are expected to intensify Europe's ties with neighbouring regions, by creating cultural and economic links with their country of origin. These links might entail more movement of people and goods.
- Mobility of workers within the Union is also expected to increase with the gradual removal of administrative and legal barriers and further deepening of the internal market. Transport is still expected to increase with enlargement and intensified relations with neighbouring countries.

⁽⁷³⁾ A sustainable future for transport: Towards an integrated, technology-led and user friendly system. Available at: http://ec.europa.eu/transport/strategies/doc/2009_future_of_transport/2009_comm_future_of_transport_policy_en.pdf



Road transport will remain predominant

- The demand for freight transport in the EU grew on average by 2.7 % per year, due to the strong increase in global trade and the deepening integration of the enlarged EU. The growth of freight transport is also linked to economic practices — concentration of production in fewer sites to reap economies of scale, de-localisation, just-in-time deliveries, wide-spread recycling of glass, paper, metals — that allowed reduction of costs and, possibly, of emissions in other sectors at the expense of higher emissions from transport.
- Transport outside Europe is expected to increase much more than inside Europe and EU external trade and transport are likely to keep growing rapidly in the coming years. The EU's transport relations with eastern countries, as well as Belarus, also include ambitious plans for the extension of transport networks.
- Total passenger motorised transport with origin and/or with destination in EU-27 (measured in passenger-km) will keep growing along existing patterns. While daily commuting trips may remain stable, business, personal visits or leisure trips abroad will show more variation.
- There has also been limited progress in shifting transport to more efficient modes, including through the development of short sea shipping, although a certain rebalancing has taken place and the relative decline of rail transport appears to have stopped. However, road traffic is still expected to remain the dominant transport mode in passenger transport although it will lose some market share to the benefit of railways.
- It is expected that Short Sea Shipping will continue to grow in Europe in line with overseas traffic. Therefore transhipments hubs and secondary ports in Europe may become more important in their regional hinterlands.
- However, transport itself will suffer from the effects of climate change and will necessitate adaptation measures. Global warming resulting in a rising sea level will amplify the vulnerability of coastal infrastructures, including ports. Extreme weather events would affect the safety of all modes. Droughts and floods may pose problems for inland waterways. Also, in the coming decades, oil and other fossil fuels are expected to become more expensive as demand increases and low-cost sources dry up. Transport still depends to 97 % on fossil fuels. The immediate consequence of such transformation may be the reduction in the need to transport fossil fuels, which currently represent around half of the volume of international shipping.

Increasing urbanisation

- In the past 50 years, the growth of urban areas across Europe was even larger than that of the overall population. Since the urban population is predicted to rise from 72 % of total population in 2005 to 78 % in 2030, the 'urban dimension' of growth is clearly significant. This brings about greater need for individual transport modes, thereby generating congestion and environmental problems. Science and industry are already very active in searching solutions for transport safety, fuel dependency, vehicle emissions and network congestion. However, the skills of the labour force will have to be upgraded to cope with intelligent highly automated systems.

Policy actions to cut energy consumption and greenhouse gas emissions will have a significant impact on the transport sector's evolution

Fast growing emissions from transport are one of Europe's biggest challenges in the fight against climate change. In 2004, transport was responsible for 23 % of world energy-related greenhouse gas emissions with about three quarters coming from road



vehicles. Over the past decade, transport's emissions have increased at a faster rate than any other energy using sector ⁽⁷⁴⁾. Aviation, which currently generates just three per cent of all European carbon dioxide emissions ⁽⁷⁵⁾, is causing major concerns as it is growing so fast. At this pace, its CO₂ emissions, according to the IPCC, are expected to be multiplied by 2.5 by 2030. The United Nations Framework Convention on Climate Change reported that international aviation emissions from developed countries rose by 65.8 % between 1990 and 2005 ⁽⁷⁶⁾. In a 2007 communication ⁽⁷⁷⁾, the Commission assessed that current energy and transport policies would have meant EU CO₂ emissions would increase by around 5 % by 2030 and global emissions would rise by 55 %. Therefore, the European Union agreed in 2008 to cut emissions of the main global warming gas, carbon dioxide, to a fifth below 1990 levels by 2020.

However, significant growth in the total demand for transport should be expected, as a result of the extension of the European single market and of further increase in the short-distance and international transport of goods. Transport predominantly relies on a single fossil resource, petroleum, that supplies 95 % of the total energy used by world transport.

In its European Strategic Energy Technology Plan ⁽⁷⁸⁾, the EU Commission estimated that to achieve a sustainable, interconnected European energy system will require massive energy infrastructure change as well as organisation innovation. Very diverse sectors would be affected, not only energy, environment and transport, but also information and communication technologies, agriculture, competition, trade and others. This will require a multidisciplinary approach to issues that are increasingly interconnected. It is therefore recommended that industry and governments work together to keep track of the OSH impact of these changes.

⁽⁷⁴⁾ IPCC Fourth Assessment Report: Working Group III Report 'Mitigation of Climate Change', Intergovernmental Panel on Climate Change, 2007. Available at: http://www.ipcc.ch/publications_and_data/ar4/wg3/en/contents.html. The Intergovernmental Panel on Climate Change (IPCC) was formed in 1988 by the United Nations and the World Meteorological Organization (WMO). The IPCC released research and forecasts into the evidence and possible results of climate change.

⁽⁷⁵⁾ Climate change: Commission proposes bringing air transport into EU Emissions Trading Scheme, IP/06/1862, Brussels, 20 December 2006.

⁽⁷⁶⁾ United Nations Framework Convention on Climate Change, "National greenhouse gas inventory data for the period 1990–2005. Available at: <http://unfccc.int/resource/docs/2007/sbi/eng/30.pdf>

⁽⁷⁷⁾ Communication from the Commission to the European Council and the European Parliament. An energy policy for Europe. Brussels, 10.1.2007, COM(2007) 1 final. Available at: http://ec.europa.eu/energy/energy_policy/doc/01_energy_policy_for_europe_en.pdf

⁽⁷⁸⁾ Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. A European Strategic Energy Technology Plan (SET-PLAN) 'Towards a low carbon future'. Brussels, 22.11.2007, COM(2007) 723 final. Available at: http://ec.europa.eu/energy/res/setplan/doc/com_2007/com_2007_0723_en.pdf





Exploring and managing the external drivers of transport demand (EU)

A study commissioned by the European environment agency (EEA) ⁽⁷⁹⁾ looked at the drivers of change in the transport sector. Following a literature review of approximately 90 publications, the factors that were identified included socio-demographic changes, economic growth and globalisation, physical changes to urban form/land use, organisational changes at workplaces and schools, socio-cultural changes and technological developments. The key sectors consisted of retail, leisure/tourism, business, education, and industry. Both passenger and freight transport demand were examined, though it is understood that those fields of transport have different drivers of transport demand. The study used a case-study based approach, in order to focus efforts on a few issues of particular importance.

The study focused on three examples of relations between societal activities and transport demand:

- effects of food production and consumption on shopping journeys and freight traffic;
- increasing use of air travel for business and leisure;
- effects of education-based travel on transport demand.

Summary of the findings:

Air transport:

- aviation is the fastest growing mode of transport in Europe in terms of passenger volume. According to Eurocontrol (2008), air transport volume in the ESRA area grew by roughly 75 % between 1990 and 2005. The spread of air travel has drastically changed the way in which Europeans conduct business, visit family and friends, and spend their holidays;
- the growth of the aviation sector in Europe has in large part been driven by the rise of low-cost airlines. The low cost carriers are served by regional airports which typically offer lower landing charges. UK airports, the main seats of low-cost carriers in Europe, have experienced growth rates of 200– 1200 % in passenger numbers in a time span of 8–10 years;
- the growth in aviation demand is attributable to the increased use of aviation for leisure trips, such as ‘city breaks’ over the weekend, and workers flying back to meet parents over holiday seasons. The movement and relocation of people is a key factor underpinning demand for air travel. As people decide to live and work away from their region of origin, there is likely to be an increase in travel to meet friends and family;
- as air travel becomes the preferred mode of travel for leisure and business, pressure is placed on local and national governments to supply necessary infrastructure in the form of airports, extra runways and access roads. Offices and whole business estates are developed around airports to benefit from the increased physical accessibility to various regions in Europe and beyond.

⁽⁷⁹⁾ Beyond transport policy — exploring and managing the external drivers of transport demand, European Environment Agency (EEA), 2008. Available at: http://www.eea.europa.eu/publications/technical_report_2008_12



Airports themselves are not only seen as transport hubs, but as retail centres, conference/meeting venues and even accommodation facilities;

- a self-enforcing cycle is hereby created, where developments outside the aviation sector induce changes within it, allowing for further changes in the outside sectors.

Education based travel:

- the demand for school travel is influenced by a number of factors that can be split into social, spatial and economic. Generally, secondary schools tend to be at a further distance than primary schools and involve more travelling;
- to address the increase in car usage as a mode for travelling to school, one measure increasingly being used in a number of European Countries is the school travel plan. It usually combines a package of measures, increased usage of cycling, walking, car sharing and walking bus; increased road safety and travel awareness; and increased awareness of alternative car parking arrangements. School travel plans have an impact on the development of school transport and public transports systems.

Food production and its impact on transport:

- transport is an important element of the logistical chain from 'farm-to-fork', with the potential to influence change throughout the whole process of producing and consuming food;
- major drivers for the consumer decisions and their impact on transport of foodstuff are: the globalisation of the food industry, the concentration of suppliers (as an example, over 70 % of UK groceries are sold by four supermarket chains), major changes in delivery patterns, less frequent shopping, the concentration of sales in supermarkets, and the demand for year round supply of uniform produce. All of these drivers can be influenced by policy measures and have in turn influenced the way transport is organised and the transport demands.

From these observations, the study concluded that there was a knowledge gap and a need for more research on the transport consequences of non-transport decisions. European experience of managing transport demand by non-transport sectors was often found to be undocumented, insufficiently highlighted or stayed within the national boundaries of the EU Member States.



Trends in rail transport

In 2000, Eurofound undertook to analyse structural changes in the EU rail sector.

The European rail sector had been affected by major restructuring, mainly affecting the traditional main operators ⁽⁸⁰⁾. In all countries, since the early 1990s, the national railway companies had undertaken a process of reorganisation.

⁽⁸⁰⁾ 'Industrial relations in the rail sector, European industrial relations observatory online' European Foundation for the Improvement of Living and Working Conditions (Eurofound). Available at: <http://www.eurofound.europa.eu/eiro/2000/03/study/tn0003402s.htm>



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In accordance with EU transport regulations, the separation of network management and transport service provision had been carried out in countries such as Denmark, France, Germany, Italy, Norway, Portugal, Spain and Sweden, often in connection with the creation of product divisions (passenger, cargo, ancillary services, etc). Under the pressure of institutional and economic factors such as the separation of transport services and network management and of increased competition, national state-owned railway companies had made important efforts to improve efficiency and reduce costs. This has had an important impact on labour costs, work organisation and company structures. In general, there have also been important reductions in employment levels within the main operators.



Trade Union Vision on Sustainable Transport (TRUST) Project

TRUST⁽⁸¹⁾ was an 18-month European Transport Workers' Federation EU-funded project that ran across four phases, with a particular focus on the social dimension of a long-term outlook of the transport future in Europe.

- A preparatory information gathering phase, sectoral workshops — corresponding to ETF sections: Civil Aviation, Fisheries, Ports, Road, Railways, Maritime Transport, Inland Waterways —, cross conclusions from the sectoral workshops, compiled in policy papers, were discussed in three cross-sectoral conferences aimed at building a common view on the core topics.
- Results of the whole exercise were presented in a closing event, where trade unions made public their final contribution on Sustainable Transport for a Sustainable Social Europe.

The results of the discussions with regard to the social aspects are described below. They are extracted from the Background paper and served as input to the TRUST Conference in Lisbon, 14–15 November 2007.

⁽⁸¹⁾ Trade Union Vision on Sustainable Transport (TRUST) Project, <http://www.itfglobal.org/etf/trust.cfm>



Railway

The sector has undergone serious restructuring and the number of railway workers decreased. The pressure on working time has increased, but workers experience higher individualisation of their contracts, job insecurity as well as more flexibility in working time and shifts. Due to the huge employment reduction in the sector, work intensity such as permanent overtime, multitasking and stress have increased. Furthermore, workers experience an increasing lack of safety. Newly employed people often receive lower wages and certain wages elements such as for overtime, night work or Sunday work were cut (latter applies for older personnel, too). Furthermore, studies showed that restructuring of companies and the introduction of competition resulted in less investment in training and in particular training of young workers in the sector. Women's participation in the sector is very low.

Road transport

Drivers have always known long working hours, which do not favour a positive work-life balance; in freight transport, fatigue, stress and the lack of decent and affordable parking places give further arguments to the idea that the profession, especially, that of the international transport driver, is a risky and unhealthy one. Due to the restructuring in the sector and the emergence of logistics, new jobs were created, in particular with warehousing operators. Only a small part of them are covered by specific collective agreements. Their career and training perspectives are much reduced. Furthermore, companies increasingly exploit the possibilities of an internal transport market using the huge wage gap between drivers of the new and old Member States. As a result, they employ cheaper labour from new Member States through cabotage and cross trade. Such situation by no means contributes to upgrade the working conditions in the sector.

Civil aviation

As a result of the need to increase productivity, the EU's air transport industry has been faced with many breakdowns and/ or mergers, which caused job losses, wage cuts, poor working conditions, the need to increase productivity and increased flexibility. Atypical work contracts, i.e. fixed-term or part-time work, moreover often not concluded voluntarily, are on the rise. Especially young workers and women find themselves in these kinds of contracts offering little security and no perspective for occupational advancements, which provides for no or little basis to build a future for themselves and their families.



Maritime transport



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The number of EU seafarers is diminishing due to their gradual replacement by third country nationals. Many European ship owners decide to flag out their ships with the aim to cut manning costs, often avoiding international and European standards on working conditions and safety on board and thereby looking for further competitive advantages. The objective of having 'better jobs' at sea as set out in the Lisbon strategy could be reached only if issues such as discriminatory practices, social dumping, increased flexibility as well as bad working and living conditions on board are really tackled by the competent authorities at national and European level.

Inland navigation

With respect to 'better jobs' and despite the fact that inland navigation is shown as a safe and environment-friendly mode of transport, working conditions are not attractive. Work-life (im)balances, old vessels, uncomfortable sleeping cabins, do not contribute to attract young workers to the sector. Although there is a set of European social regulations to protect workers, it is not always clear which national legislation will be applicable to the crew and what is more, enforcement is practically non-existent.

1.6.2. Some considerations from an OSH point of view

The rapid growth of the sector is difficult to keep pace with

This is the case, for example, in air transport, with mainly low-cost travel and infrastructures newly set up under high time pressure — for example, one airport experienced a passenger increase by the factor 10,000 in only 10 years (from about



1,500 to several 100,000 passengers), especially when having to adapt working conditions. In practice, the consequence may often be that fewer workers have to attend more clients in premises that constantly have to be adapted to changing demands, with all the effects that this may have from a work organisational, and physical workload point of view.

The increasing number of migrant workers is an important feature of the transport sector

OSH prevention would have to address this as regards training, consultation and adapting the conditions to an increasingly diverse working population.

It is important to consider all influences of an ageing population on the workforce

Socio-demographic factors, such as an ageing population of travellers, need to be taken into account when addressing the workload on the workers concerned. The attendance and demands of the clientele warrant specific OSH and training measures as well as adequate equipment to attend to clients who may have special requirements.

The increasing proportion of women in the transport sector may have contributed to the trend to part-time work

The increasing feminisation of at least some the transport professions, such as school transport and service professions (catering on ships and trains, ticketing, cleaning in transport) observed in some of the Member States should stimulate measures of flexibilisation, that support the integration of female workers. Such measures are the adaptability of equipment (seat adjustment, noise protection, etc.), but also work organisational measures regarding working times and schedules, how to organise replacements in case of absence, break and hygienic facilities. Introducing such measures would also benefit all other workers, men, older workers and migrant or young workers with less experience or training, as would remote-controlling and monitoring devices to prevent and address violence.

The speed of change and growth and the particular conditions are a particular challenge to OSH prevention

Transport 'workplaces' are not easily definable and other features such as working time schedules are also very 'non-standard' in the traditional sense of the term. In rapidly expanding sectors such as transport, fewer workers may have more work under rapidly changing conditions, and under short-term contracts. If workers, workplaces and conditions are under constant variation, it is difficult to set up a set of sustainable OSH prevention routines and measures and to monitor developments.

Transport workers and the sectoral social partners should be informed and consulted on the development, application and monitoring of transport policy and related measures, both at sectoral and at enterprise level.



2.

EXPOSURE TO RISKS



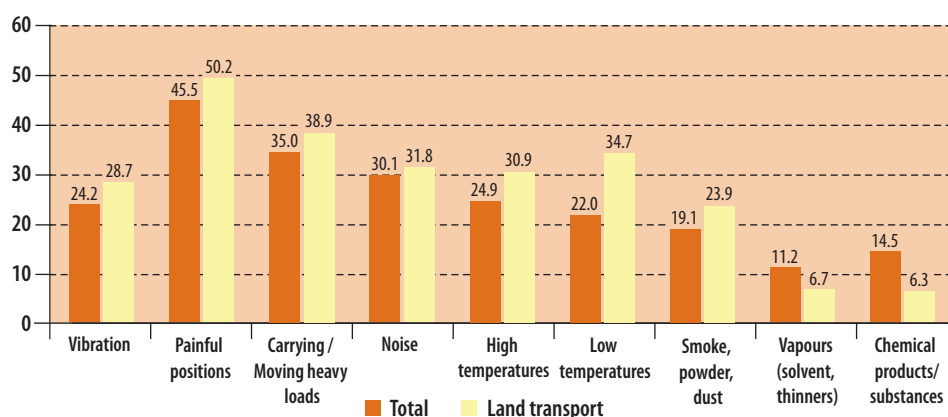
Transport workers are not a homogenous group, they represent, within one sector, many different occupations with specific sets of working conditions and risks, and very varying demands. For example, in air transport, the workforce includes ground handling staff, technicians, pilots, air controllers, flight attendants, customer desks and check-in workers, while in rail transport tasks include catering, driving, maintenance, shunting, loading, and ticketing, and road transport may be very different depending on whether it is long- or short-distance, passenger or goods transport, courier or freight transport services. Recent changes in the transport sectors have contributed to a change in risks and exposures. But there are some common issues. The following section of this thematic report addresses the main hazards and risks that transport workers may face. These risks are often better described for certain groups. Therefore, case studies and additional research information add depth to the general figures.

Research difficulties

Studies looking at occupational risks (vibrations, pace of work, etc.) in transport workers have an important methodological problem: Statistics broken down for transport workers in the different sub sectors (NACE Rev. 1.1. codes I.60, I.61 and I.62) can be limited or lacking, or the numbers available for analyses in some fields can be small. Therefore, clear indications are made in the different parts of this section to specify the described group of workers. Also, as mentioned above, non-comparable data, examples from one Member State only, one-off studies and studies from outside national official data all help to fill in gaps and present some of the complexity of the situation of transport workers' exposure to risk rates.

2.1. PHYSICAL WORK FACTORS

Figure 11: Overview of the physical work factors, EWCS 2005 (all the time) ⁽⁸²⁾



Source: EWCS

A number of OSH risks are relevant to transport workers, as can be seen in the figure above. It is important to consider that many of these physical risks appear together, and in combination with work organisational risks, such as long and non-standard

⁽⁸²⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound), Data extracted by Prevent for OSH Data Collection 2007, Available at: <http://www.eurofound.europa.eu/working/surveys/index.htm>



working times, shift and weekend work, regular night work, monotonous tasks, high demands and low control, and little training and support. The opportunity for transport workers to avoid exposures or invest in health promotion for themselves is also much reduced, as they often work in changing workplaces or in the field with limited access to appropriate infrastructures. This specific set of working conditions is described more in detail below. Case studies and prevention examples complement information from European and national sources, mainly worker surveys.



Exposure to risks — trade union gender perspective

During 2006–07, the ITF encouraged women road transport workers around the world to join in a survey about their health and safety at work. A form was made available, on paper and via the ITF website, in five languages: English, French, Spanish, Russian and Portuguese. Some 380 women replied from 14 countries: Bangladesh, Barbados, Belgium, Bermuda, Brazil, Canada, Germany, Guinea, India, Italy, Lithuania, Mauritius, Spain and the UK. Further interviews were carried out in South Africa. Women attending the ETF women's conference in October 2007 also gave information, particularly on violence at the workplace. Nearly three-quarters of the women said they were concerned about health and safety issues. Some of the issues identified: top problems were their employers' failure to deal with stress and violent attacks, and bad sanitation.

- Safety. As many as 43 % said they were 'very worried', the highest level of concern.
- Safe parking.
- Length of time away from home (up to 6 weeks).
- Lack of toilet and washing facilities.
- Noise: 73 % said that no steps have been taken to minimise noise.
- Vibrations: 55 % said that vehicles are not checked for vibrations; yet these too are a risk to the foetus.

2.1.1. Exposure to vibrations

A recent European Risk Observatory report brought together specialists from eight leading European institutes to produce an overview as regards management of occupational vibration risks. The situation in six Member States – Belgium, Germany, Spain, Finland, France and Poland – was examined, and research information was presented covering all Member States⁽⁸³⁾. The report highlighted the changes in working life that may lead to increased exposures to vibration.

Increasing workload, fewer breaks and longer shifts, as well as increasing productivity, higher efficiency and short-term production, combined with greater mechanisation exposes workers to greater doses of vibration. The report identified branches where the number of people that are exposed is rising, e.g. in airport transport and city traffic.

⁽⁸³⁾ Workplace exposure to vibration in Europe: an expert review, European Agency for Safety and Health at Work 2009, available at: http://osha.europa.eu/en/publications/reports/8108322_vibration_exposure/view

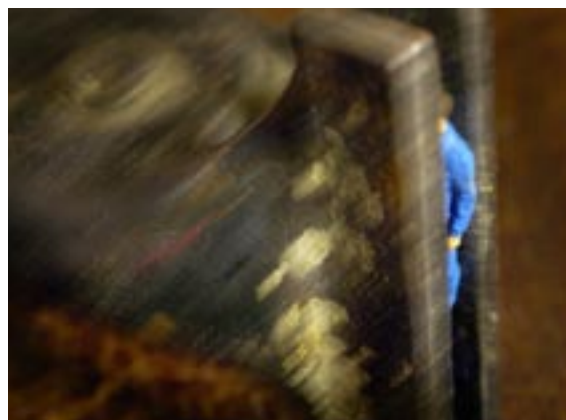


Full body vibration, for example caused by the driver's cabin, may also affect the vision, coordination and the overall functional ability of the drivers and contribute to increased accident risk.

Additionally, poorly qualified workers and heavy traffic can be seen as changes in the world of work which cause additional vibration exposure and the effect of globalisation is contributing to this tendency in Europe.

Surveys suggest that transport workers are more exposed to vibrations (i.e. vibration of cabin) than the average working population.

Full body vibration, for example caused by the driver's cabin, may also affect the vision, coordination and the overall functional ability of the drivers and contribute to increased accident risk.



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According to the results from the EWCS 2005 ⁽⁸⁴⁾, European workers in transport over land and through pipelines seem to be more exposed to vibrations from tools and machinery than the average working population, about 8.1 % against 5.6 % in general. Also, fewer transport workers declared they had never been exposed to vibration than on average (58.8 % as compared to 63.9 %).

Vibration effects on drivers

Several studies demonstrate the detrimental consequences of sustained sitting and being exposed to whole body vibration: exposure to vibrations may lead to back disorders ⁽⁸⁵⁾ ⁽⁸⁶⁾. Based on the information available on heavy machines, the significance of the seat is important when steps to reduce full-body vibrations are taken. Full body vibration, for example caused by the driver's cabin, may also affect the vision, coordination and the overall functional ability of drivers, and contribute to increased accident risk ⁽⁸⁷⁾.

National studies

Belgium

According to the WBM 2004, almost one out of four transport workers report to always being exposed to vibrating tools and machines at work against 7.3 % of the average Flemish working population.

⁽⁸⁴⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound). Data extracted by Prevent for OSH Data Collection 2007, available at: <http://www.eurofound.europa.eu/working/surveys/index.htm>

⁽⁸⁵⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: work and employment conditions — Belgian Survey, 2003.

⁽⁸⁶⁾ Connections between the safety, logistics, working conditions and professional attractiveness of road transport, FIOH 2006.

⁽⁸⁷⁾ Work and health survey: a telephone interview survey which is done every three years from 1997 onwards by the Finnish Institute of Occupational Health. The sample is based on random sample of 25–64 years old Finns. NOTE: the sample on workers on road transport sector is only 187.



Spain

According to the Spanish 'Encuesta Nacional de Condiciones de Trabajo' ⁽⁸⁸⁾ (National Survey of Working Conditions), transport workers have a higher level of exposure to vibrations than the rest of the workers, with 10.4 % against 5.6 % on hand and arm and 8.1 % against 2.6 % on other body parts.

Greece

According to the transport sector survey ⁽⁸⁹⁾, about 76.6 % of transport workers are exposed to vibrations occasionally or constantly during work, 31.3 % often and 45.3 % always.

According to the results from questionnaires from the TRIA project ⁽⁹⁰⁾, about 56 % of Greek transport workers report exposure to vibrations from machinery or tools during work.

Denmark

Based on results from the 2005 DWECS ⁽⁹¹⁾, it was found that taxi-, bus-, and truck drivers are exposed: 25 % of the bus drivers, 20 % of the taxi drivers and 27 % of truck drivers are exposed to whole vibrations. This is significantly higher than the average for all occupations (4 %). Similarly, respectively 39 %, 13 % and 11 % of bus-, taxi- and truck drivers experience hand-arm vibrations, significantly more than the average for all occupations (5 %) (NRCWE ⁽⁹²⁾, DWECS, 2005).

Finland

According to Work and Health Survey 2006 ⁽⁹³⁾ 36 % of the workers in the transport sector reported being exposed to vibrations in their work. Some 4 % reported that they had been exposed to vibration in their work a lot or quite a lot. The corresponding figures were 41 % and 7 % in 2003.

Germany

The exposure to vibrations is a higher risk for workers in the transport sector than for workers in other sectors. According to the results from the BIBB/BAuA survey

⁽⁸⁸⁾ The survey is carried out in work places with more than 2 workers and is designed to be representative by main activity sector not by activity or branch. For this reason, the information provided is not statistically representative of the transport sector and should be used with caution, although the information can be indicative of the sector problem.

⁽⁸⁹⁾ The Hellenic Institute for Occupational Health and Safety (ELINYAE) has conducted a number of sectoral surveys on Occupational Health and Safety. Among them, the transport sector survey.

⁽⁹⁰⁾ Development of a comprehensive training course for assessing the risk at workplace (TRIA project).

⁽⁹¹⁾ The 2005 Danish Work Environment Cohort Study (DWECS) is limited to only including bus drivers, taxi driver and people transporting goods by trucks (truck drivers).

⁽⁹²⁾ Study conducted by the Danish National Research Centre for the Working Environment (NRCWE) and does not include all types of transportation workers. It focuses on bus-, taxi- and truck drivers, essentially transporting passengers or goods.

⁽⁹³⁾ Work and health survey: a telephone interview survey which is done every three years from 1997 onwards by the Finnish Institute of Occupational Health. The sample is based on random sample of 25–64 years old Finns. NOTE: the sample on workers on road transport sector is only 187.



2005/06 ⁽⁹⁴⁾, 30.3 % of the respondents in the transport sector are often or sometimes exposed to vibrations compared to 9.2 % in other sectors.

2.1.2. Painful positions

Surveys suggest that transport workers are more exposed to painful positions (i.e. sustained sitting) than the average working population.

According to the results from the European working conditions survey 2005 ⁽⁹⁵⁾, European workers in the sector transport over land and through pipelines seem to be more exposed than the average working population: about 10.9 % of workers in the sector transport over land and through pipelines declared that their job involves tiring or painful positions all the time against 8.9 % for the average working population. Fewer workers (28.7 % vs. 33.3 % on average) declared that their job never involves tiring or painful positions.

National studies

Belgium

According to the WBM 2004, almost one out of ten transport workers (8.5 %) report always being exposed to uncomfortable or tense working positions compared to 4.3 % of the average Flemish working population. Fewer transport workers, 40.8 % compared to 44.9 % of the average Flemish working population, never face uncomfortable or tense working positions at work.

Spain

According to the ENCT 2003, transport workers suffer slightly more from painful postures than the average working population: 10.8 % of transport workers suffer more than half of the workday against 9.8 % on average.

According to the transport survey ISCIII ⁽⁹⁶⁾, the figures were higher: 32 % suffered from painful positions for more than half of the working day.

Greece

According to the TRIA project, about 9.8 % of respondents report maintaining one position for too long in terms of their job tasks.

Denmark

Based on the DWECS, transport workers are no more exposed to painful working positions than the average working population when all painful working positions

⁽⁹⁴⁾ The BIBB/ BAuA surveys are large representative surveys of 0,1 % of the labour force in Germany concerning qualifications, career history and current occupational situations. These surveys are conducted jointly by the Federal Institute for Vocational Training Affairs (BIBB), and the Federal Institute for Occupational Safety and Health (BAuA) at intervals of 6–7 years.

⁽⁹⁵⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound), Data extracted by Prevent for OSH Data Collection 2007. Available at: <http://www.eurofound.europa.eu/working/surveys/index.htm>

⁽⁹⁶⁾ 'Health and working conditions survey of the truck transport' (ISCIII) is only focused on the truck transport (more than 6 tons of whole authorized load and more than 3,5 tons of load and more than 200 kilometres journey) a very important sector due to the number of workers in Spain.



are included — hand and neck being twisted, neck and back being bent, kneeling, or with arms lifted above the head. However, transport workers (in general) spend much of their workday sitting. Accordingly, for taxi- and truck drivers, it was found that 94 % and 73 % respectively work in a sitting position for more than three quarters of their workday, a significantly higher proportion than for the average working population (37 %).

Finland

Road transport workers reported a number of physical stress factors. A monotonous sitting posture ranks as number one in Finland. Having to sit for long periods at the wheel in an unergonomic seat without knowing how to adjust it, increased the risk for work-related injury ⁽⁹⁷⁾.

Germany

Among the different painful positions, sitting for a long time is the position most frequently mentioned. More than 86 % of transport workers work in a sitting position. It is obvious that this high percentage is based on professional drivers.

Musculoskeletal risk factors in transport (The Netherlands)

In 2006 almost 40 % of all workers (15–64 years) regularly or very often reported working in the same position for a sustained period of time. In transport the percentages were higher. Within transport, the highest share was found in land transport: 61 % in 2006. In transport over water exposure decreased substantially from 49.4 % in 2005 to 38.4 % in 2006, while in air transport there has been a substantial increase from 37.7 % to 44.4 % in the same period of time.

Over one third of all employees (32.1 %) report having to stand for a sustained period of time. As may be expected, the percentages are somewhat lower in transport: 18.1 % in 2006. By subsector, the highest shares were found in air transport.

Almost a quarter of all workers (21 %) report having to work bent forward or turned with their upper body or head and neck for a sustained period of time. The percentages in transport were slightly lower except for air transport, which again reports the highest shares: 32.3 % bent forward/turned position with upper body and 26.9 % bent forward/turned position with head/neck.

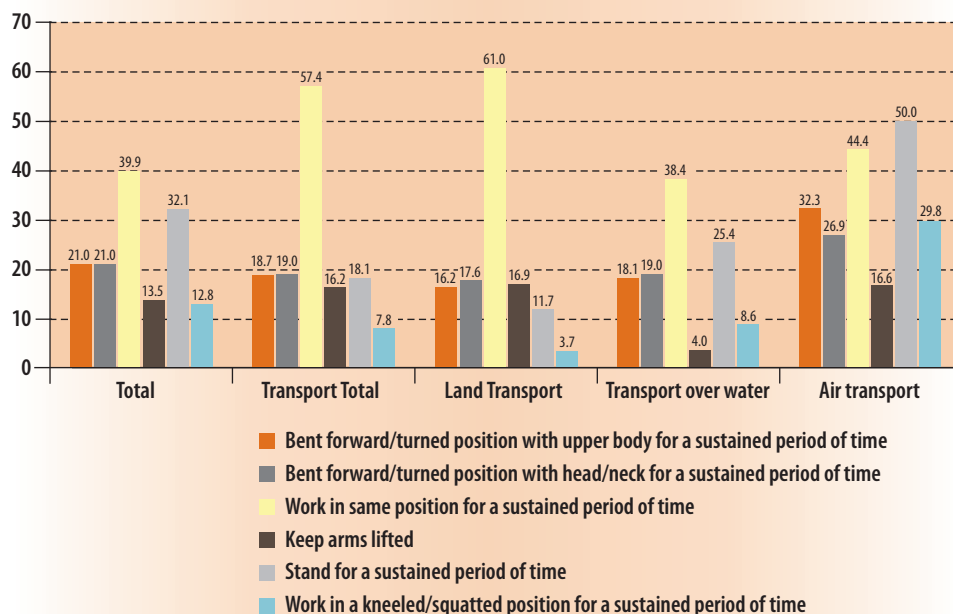
The share of workers that report having to keep their arms lifted or working in a kneeled or squatted position for a sustained period of time also decreased in the same period: from 14.3 % to 13.5 % and from 13.2 % to 12.8 %, respectively. In transport the percentage of workers that report having to keep their arms lifted is higher than the total (16.2 %) and it is highest among workers in land transport: 16.9 %. Meanwhile, the share of transport workers working in a kneeled or squatted position for a sustained period of time is lower than the national average, except for air transport, where it was 29.8 % in 2006.



⁽⁹⁷⁾ The national report on working conditions in road transport in Finland.



Figure 12: Percentage share of workers exposed to painful positions (regularly/very often), in transport and total, 2006



Source: TNO

2.1.3. Heavy loads

According to the results from the European working conditions survey 2005 ⁽⁹⁸⁾, European workers from the sector transport over land and through pipelines seem to be more exposed to carrying or moving heavy loads than the average working population. About 8.4 % of workers in the sector transport over land and through pipelines declared carrying or moving heavy loads all the time against 5.7 % of the average European working population. Fewer transport workers declared never carrying or moving heavy loads (42.4 against 45.3 % for the average European working population).

Specifically when loading and unloading, transport workers are exposed to heavy lifting tasks. In many service occupations in transport, for example catering and cleaning, lifting and handling of loads is also common.

It often depends largely on the arrangements with clients if lifting aids or ergonomic equipment are available or not. Therefore it is necessary that transport workers are also trained in correct lifting and carrying techniques to prevent low back disorders and other MSDs ⁽⁹⁹⁾.

⁽⁹⁸⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound), Data extracted by Prevent for OSH Data Collection 2007. Available at: <http://www.eurofound.europa.eu/working/surveys/index.htm>

⁽⁹⁹⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.



National studies

Belgium

According to the WBM 2004, almost one out of ten transport workers (8.5 %) report always being exposed to physically arduous tasks at work compared to 5.5 % of the average Flemish working population. Fewer transport workers (42.2 % vs. 53.2 % of the average Flemish working population) never face physically arduous tasks at work.

Spain

According to the ENCT, rates of raising or shifting heavy loads and suffering over-exertion are similar for transport workers and the average of workers:

- 4.1 % of the transport workers handle heavy loads more than half of the workday (vs. 4.3 %),
- 6.4 % between half and quarter of the workday (vs. 7.7 %),
- and 25.5 % less than quarter of the workday (vs. 23.6 %);
- 2.1 % of transport workers suffer of over-exertion more than half of the workday (vs. 3.6 %),
- 8.1 % between half and quarter of the workday (vs. 6 %),
- and 22.2 % less than quarter of the workday (vs. 21.7 %) of the average Spanish worker.

According to the transport survey ISCIII, figures were comparable regarding the factor 'raising or shifting heavy loads' (5 % more than half of working day, 27 % less than quarter of the day, and 61 % never exposed).

Hungary

According to the working conditions survey of Hungary ⁽¹⁰⁰⁾, transport via waterways is one of the sectors most affected by exposure to heavy lifting. In total 36.4 % of the average Hungarian working population is affected by exposure to heavy lifting.

Denmark

According to results from the DWECS only truck drivers are more exposed to handling heavy loads than the average worker. Some 26 % of the truck drivers reported that they lift items (weighing more than 10 kg.) for more than a quarter of their workday. On average, 15 % of the respondents in all occupational groups experience this. Similarly, truck drivers spend more than quarter of their workday pushing and pulling items. Some 39 % of the truck drivers reported this, compared to only 20 % of the average working population (NRCWE, DWECS, 2005).

Finland

Manual lifting and moving of loads is a problem in cargo and coach transports. While working at terminals workers may use poorly functioning equipment or none at all. Loading and unloading a bus especially in charter transport, leaning forward and twisting in confined spaces, handling of refuse containers and bags, and installing and

⁽¹⁰⁰⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), European Working Conditions Survey — Hungarian Survey, 2001.



removing snow chains on timber trucks are some of the reported strenuous operations ⁽¹⁰¹⁾.

According to the Work and Health Survey 2006, 28 % of the respondents in the transport sector experienced that their work was physically demanding (very or quite heavy). The proportion of those reporting that their work is physically demanding has increased 7 % since 2003, even though reporting of heavy work load (for example lifting without instrument/vehicle or difficult working postures) has decreased for the same period ⁽¹⁰²⁾.

Germany

There is no clear trend concerning the risks of carrying heavy loads. In 1992, 32.5 % of transport workers reported carrying heavy loads. In 1998/99 the percentage decreased to 19.3 % and increased again to 31.0 % in 2005.



Ergonomic risks to courier workers and prevention practices (France) ⁽¹⁰³⁾

This study focused on the ergonomic risks to workers in two-wheel and four-wheel courier services. Especially for two-wheel services, the sector was composed of micro, sometimes one-person enterprises, with low degrees of formalisation. The initiators of this intervention study proposed a positive approach to training and prevention, based on the assumption that most of the time the actors/workers are informed of and able to prevent accident risks. It was centred on capacity-building in inexperienced workers and work organisational measures to prevent overload situations in experienced workers when the level of prevention is lowered under time pressure.

The rapid growth of the sector was found to be determined by increasing outsourcing, just-in-time management, the general increase in services, an increase of short-distance, urgent transport activities (now covering different types and sizes of parcels and loads), an increasing fragmentation of administrative tasks, and singling out courier activities.

Actions taken covered interviews with managers, workers and prevention experts, analysis of work situations and debating the results with different actors.

Important impacting factors were found to be:

- urgency, by nature of the service provided;
- the profile of the drivers, which seems to follow some common characteristics;
- type of contract and payment based partly on bonuses for quick delivery;
- level of experience and training of drivers;

⁽¹⁰¹⁾ The national report on working conditions in road transport in Finland.

⁽¹⁰²⁾ Work and Health Survey 2006.

⁽¹⁰³⁾ Van Belleghem, L. Bourgeois, F., Le métier de coursier et ses pratiques de prévention. Étude ergonomique pour la prévention des risques professionnels. 2004. Available at: http://www.risquesprofessionnels.ameli.fr/atmp_media/METIER%20DE%20COURSIER.pdf

- state of vehicle, and whether it is owned by the worker himself or the employer;
- size of the enterprise, involving differences in work organisation and resources available (logistics, communication means, etc.);
- non-foreseeability of activities;
- the urban environment.

The study identified specific risks and constraints to courier workers that should be addressed by prevention:

- risk of 'pneumothorax' in young two-wheel courier workers, due to the combination of vibration, forced postures and cold;
- risks linked to clothing (helmet with reduced vision, time needed to put on/take off helmet, weight of helmet, protective clothing e.g. in motorcycle couriers);
- competition between two- and four-wheel drivers, for example at traffic lights;
- use of mobile phones, a necessary communication tool for these workers; some work procedures foresee that the driver should be reachable to respond to changes in routes and other information; this may divert the attention of the driver or put him under additional strain, for example if he has to take notes or consult a map;
- climatic risks leading to ergonomic risks or modified behaviour in other drivers (two-wheel vs. cars);
- demands of the clients (for example regarding objects to be transported);
- parking possibilities;
- unforeseen traffic changes and other deviations;
- having to suppress fatigue due to time pressure;
- infringements to traffic regulations (for example using pedestrian lanes) to overcome problems;
- having to react when the client does not accept the parcel or is not present.

As well as 'classical' prevention measures concerning protective clothing and equipment, the study proposes work organisational measures and gives in-depth recommendations on how to train courier drivers and enhance their skills to address these risk factors, with a special focus on the specificities of the courier task, maintaining their vigilance and alertness, finding a balance between constraints and resources, and responding to high demands on problem-solving competence. Work organisational measures include advance planning of foreseeable changes and flexibility in attribution schemes, tailoring the tasks to the drivers, their physical condition and the environment, and taking into account the specific conditions at a certain moment in time. It also explores the links between remuneration schemes and risk-taking of workers.





Developing ergonomics of display unit work in wood and tank trucks (Finland) ⁽¹⁰⁴⁾

The goal of the project was to develop the ergonomics of display units in wood and tank trucks. Display unit work has become a frequent aspect in heavy vehicles as part of the steering systems of transport enterprises. The project covered the work tasks, the strain symptoms, the content and design of the display unit and the ergonomics of the cabin. Information was gathered by a questionnaire survey and by interviews. The response rate was 48 %, all respondents being male workers, their mean age being 43 years and having worked in the field 22 years on average.

According to the results, respondents devoted about one hour per day to display unit work, part of which was done while driving. Most respondents did irregular working time, 90 % of them working over 10 hours per day. Over 50 % had eye symptoms, 55 % had a bad position of shoulders and neck while driving and 67 % had a bad position while using the display unit. Also lighting during driving was felt to be insufficient.

2.1.4. Exposure to noise

According to the results from the European working conditions survey 2005 ⁽¹⁰⁵⁾ European workers in the sector transport over land and through pipelines seem to be slightly more exposed to noise than the average European working population, about 6.4 %, against 5.6 % of the average European working population. Fewer workers declared they had never been exposed to noise, 47.1 % against 53.5 %.

Different noise sources are present in transport means. Some of the loudest noise levels are measured at workplaces in or near planes and on ships, as well as in road traffic. When loading and unloading, boarding and performing maintenance, transport workers may be exposed to loud noise. The older the vehicle, the louder noise production may be. Furthermore, since it is necessary to telecommunicate by radio, the use of noise reduction measures (e.g. the use of noise absorbing materials) or development of other techniques is important ⁽¹⁰⁶⁾.

According to a European Risk Observatory overview report on noise at work ⁽¹⁰⁷⁾, highest rates of workers exposed were in construction, industry, agriculture and transport. The report highlighted the very high levels of noise produced by vehicles and transportation means and the possible impact on cognitive abilities of workers and potential to increase accident risks.

⁽¹⁰⁴⁾ Kärmeniemi ym. Puutavara- ja säiliöautojen päätetyöergonomian kehittäminen- hankkeen loppuraportti, Lappeenrannan aluetyöterveyslaitos 21.12.2004.

⁽¹⁰⁵⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound), data extracted by Prevent for OSH Data Collection 2007, <http://www.eurofound.europa.eu/working/surveys/index.htm>

⁽¹⁰⁶⁾ De Vriendt, J., Studie van de geluidsbelasting in een vrachtwagencabine (afstudeerwerk Gespecialiseerde Studies Veiligheidstechnieken, K.U.Leuven): K.U.Leuven: Leuven, 1994.

⁽¹⁰⁷⁾ Noise in figures, European Agency for Safety and Health at Work, EU-OSHA, 2006. Available at: <http://osha.europa.eu/en/publications/reports/6905723>



National studies

Belgium

According to the WBM 2004, twice as many transport workers (20.3 %) report always being exposed to noise at work as on average (10.7 %). Some 35.1 % of the transport workers never face noise nuisance at work (against 44.9 % of the average Flemish working population).

Spain

In the case of loud noise that prevents from following a conversation, transport workers are exposed to noisier environments than the average working population. Some 1.6 % of the transport workers report being exposed to very loud noise ⁽¹⁰⁸⁾, 13.9 % report being exposed to loud noise ⁽¹⁰⁹⁾ and 30.3 % report being exposed to annoying noise ⁽¹¹⁰⁾ compared to respectively 1.8 %, 7.5 % and 29.6 % of the average Spanish worker.

In the transport survey ISCIII, when workers were asked if the noise in the working environment was annoying; only 8 % answered 'a lot' or 'quite a lot', 10 % 'regularly', 18 % 'a little' and 63 % answered that it was 'not annoying'.

Greece

Regarding the transport sector in particular, according to the transport sector survey, about 78.7 % of the respondents report frequent or constant exposure to noise during work.

Additional information comes from TRIA project: About 56 % of respondents report working in an environment which is considered too noisy.

Denmark

Unlike taxi or truck drivers, bus drivers report experiencing noise at a level that may induce hearing loss (39 %), a proportion significantly higher than the average of all occupational groups (9 %) (NRCWE, DWECS, 2005).

Germany

According to the BIBB/BAuA survey 2005/06, 43 % of the transport workers answered to be 'often' (25.7 %) or 'sometimes' (17.3 %) exposed to noise compared with 38.8 % in the other sectors (23.9 % often and 14.9 % sometimes).

⁽¹⁰⁸⁾ Noise that prevents hearing a colleague from 3 meters away even if the voice level is raised.

⁽¹⁰⁹⁾ Noise that prevents following a conversation with a colleague within 3 metres.

⁽¹¹⁰⁾ Not very loud but slightly annoying.





SURDIPOSTE study (France)

According to a study in the French railway industry ⁽¹¹¹⁾ the prevalence of bilateral audiometric impairment differed widely according to the position occupied by the worker, varying from 2 % to 21 % among exposed subjects in comparison to 1.9 % among non-exposed subjects. Among the 21 occupations studied, nine were identified at high risk of hearing loss, seven at moderate risk and five were considered at low risk.



Noise in aviation sector (Denmark)

Obviously noise is also a major issue for people working in the aviation sector. Whether one is a pilot, a cabin crew member, flight controller or flight mechanic, noise is a very big part of the everyday work life. As part of a campaign 'Stop Støj' ['Stop the Noise'], the Danish Civil Aviation Administration (CAA-DK) has published five pamphlets about noise and noise reduction. The pamphlets consist of personal accounts of experiences with noise in the aviation sector ⁽¹¹²⁾. What to do with noise? How to reduce the noise? And how to live with tinnitus? These questions — among others — are answered in the pamphlets.

2.1.5. Exposure to heat and cold

Especially during loading and unloading activities, transport workers may be exposed to extreme climate conditions. Some transport occupations imply work outdoors (on ships, dockyards, airports, in maintenance and parking areas of large vehicles).

Workers in many transport occupations have limited influence on the climatic conditions of their working environment, as it is influenced strongly by ambient conditions and, even indoors, by constant coming and going of passengers and workers. Although a lot has been done to improve conditions in road and rail transport, a lot still remains to be done in other subsectors.

Fishing boat engineer dies of heatstroke

The 38-year old engineer of a Spanish fishing boat was found to have died by heatstroke by Cypriot authorities investigating the incident, while the ship's 53-year old cook was transferred to intensive care in hospital by helicopter with a very high body temperature and fever.

⁽¹¹¹⁾ Cambou, J.P.; Cothreau, C.; Cantet C. Place du bilan audiométrique dans la maîtrise du risque d'exposition à des bruits supérieurs à 85 décibels: résultats de l'étude SURDIPOSTE. Archives des maladies professionnelles, Vol. 64, No 7-8, décembre 2003, pp. 486-494.

⁽¹¹²⁾ Danish Civil Aviation Administration, 2005, available at: <http://www.slv.dk/Dokumenter/dscgi/ds.py/View/Collection-1314>

Cypriot authorities had initially quarantined the shrimper, suspecting an infectious disease as cause of death; however the autopsy result indicated heat-stroke. The remaining 11 crew were advised of the risks incurred while working in the ongoing local heatwave ⁽¹¹³⁾.

Fatal fall at Danube shipyard ⁽¹¹⁴⁾

A shipyard worker was killed in a fall into water at the shipyard on the Danube while he was checking frozen installations.

Especially during loading and unloading activities, transport workers may be exposed to extreme climate conditions. Some transport occupations imply work outdoors (on ships, dockyards, airports, in maintenance and parking areas of large vehicles).

Although transport work may imply a substantial exposure to ambient high or low temperature, according to the EWCS 2005 ⁽¹¹⁵⁾, workers in land transport on average report less exposure to high and low temperatures than the average working population. These results are in contradiction with some results from national surveys as presented below. This may also be due to the fact that transport workers see exposures to ambient climatic conditions and temperature changes as inherent to their job.

Belgium

According to the WBM 2004, less transport workers of the never faced extreme temperatures at work, 46.3 % compared to 54.6 % of the average Flemish working population. About twice as many (7 % of the transport workers) report always being exposed to extreme temperatures at work vs. 3.3 % on average.

Spain

In the transport survey ISCIII, when workers were asked if temperature and humidity were annoying, more than 15 % answered 'a lot' or 'quite a lot', 14 % 'regular', 16 % 'a little' and 53 % answered that it was 'not annoying'.

Denmark

Based on the DWECS, it was found that truck drivers (unlike bus and taxi drivers) experience working in a draft. Some 34 % of the truck drivers reported this, which is significantly higher than the average of 22 % in all occupations (NRCWE, DWECS, 2005).

Finland

According to the national report on working conditions in road transport in Finland, drivers reported poor temperature conditions. Draught and temperature fluctuations prevail in loading and unloading areas situated outside buildings. The level of exposure

⁽¹¹³⁾ <http://www.safetynews.co.uk/August%202007.htm>

⁽¹¹⁴⁾ <http://www.safetynews.co.uk/January%202008.htm>

⁽¹¹⁵⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound), data extracted by Prevent for OSH Data Collection 2007, available at: <http://www.eurofound.europa.eu/working/surveys/index.htm>



depends on the season, but also on the type of loading, e.g. the cranes of lorries are not usually equipped with an operator's cabin. Loading usually took 30 minutes, and the number of loads was typically 5-8 per working day. The time for unloading varied, as some drivers handle both the strapping and unstrapping of loads themselves, whereas others do the unstrapping, while the factory truck does the unloading. Cold and draught are also a problem in terminals and in bus transport.

Germany

The exposure to heat, cold and wetness is a higher risk for transport workers than for others. In 2005, 56.6 % of the transport workers reported that they had been exposed to heat, cold or wetness at work, among them 37.4 % often and 19.2 % sometimes. This compares with 20.8 % and 14.4 % in workers from other sectors.

Greece

According to the transport sector survey conducted by ELINYAE, about 80 % of Greek transport workers report exposure to high temperatures during the summer (37.7 % often and 42.3 % always), while about 78.2 % report exposure to low temperatures during the winter (35.2 % often and 43 % always).

According to TRIA project, almost 56 % of respondents report working under hot, humid and uncomfortable conditions. Similarly, a proportion as high as 55 % of transport workers report working under cold and damp conditions.

2.1.6. Exposure to dangerous substances, vapours, or fumes



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Handling dangerous substances is more common within the transport sector than usually perceived. Obviously, in goods traffic dangerous substances are handled frequently when loading and unloading. Packaged dangerous substances are not usually a risk, but in case of an accident or leakage they may cause considerable risk, and have been at the origin of serious accidents and fires in all subsectors of transport.

There are many other situations where transport workers may be exposed, while using chemical products intentionally, or as a side exposure, for example from exhaust fumes and solvents. Many of the service and maintenance tasks undertaken by transport workers, in catering, cleaning and servicing also involve the use of dangerous substances. The prevention measures normally applied, such as substitution, ventilation and protective equipment, may be applied less under the circumstances in which they work (on vehicles, under constantly changing conditions, on mobile workplaces) and exhaustive risk assessment should be preformed.

Awareness of exposure to biological agents and infection risks is low, although it is common in cleaning, maintenance and other service tasks, and in contact with passengers, goods and animals. High transiting rates at airports, train stations and ports and long-distance travelling and hauling may also lead to exposures to unusual infectious organisms. Infectious agents and insects may be transported with passengers, goods and animals.

Finally, while earlier studies suggested that a substantial proportion of transport workers were exposed to environmental tobacco smoke, this study found that the situation may have improved lately with the wider introduction of smoking bans.

According to the EWCS 2005 ⁽¹¹⁶⁾, workers in land transport (6.9 %) report to be more exposed to smoke, fumes, and vapours than the average European worker (6.9 % compared to an average of 4.2 %). Transport workers are exposed to exhaust fumes at terminals, stops, when having to stop behind another vehicle, when loading and unloading, when accompanying passengers, and when performing maintenance work. Exposure to other harmful chemicals also result from loading and unloading containers, when preparing the vehicle for duty, from chemicals for on-board toilets on buses, chemicals for cleaning refuse disposal vehicles, and chemicals used in refuse disposal, and volatile organic chemicals (VOC). Cleaners and maintenance workers, as well as workers in catering tasks, may use chemicals at work.

Drivers, cargo and maintenance workers may also be exposed to carcinogenic substances when exposed to diesel exhaust particulate matter and to carcinogenic chemicals loaded on their vehicles, for example during the loading process of tanks and when refuelling.

Ambient exposures may also contribute. The European White paper on transport policy highlighted the high contribution of transport to the emission of PM10 particulate matter, and accordingly, because of their proximity to the source, the risk of exposure is higher to transport workers. Other particulate exposures include ambient dust, dust from loads and goods, and from refuse ⁽¹¹⁷⁾.

A further risk stems from unforeseen incidents during the transport of goods and fumigated containers. This may lead to highly toxic exposures and to fire and explosion. Serious incidents with a high number of fatalities on roads and rail, such as the series

⁽¹¹⁶⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound), data extracted by Prevent for OSH Data Collection 2007, available at: <http://www.eurofound.europa.eu/working/surveys/index.htm>

⁽¹¹⁷⁾ The national report on working conditions in road transport in Finland.



Serious incidents such as the series of tunnel fires in the early 1990s or the Viareggio derailment of a freight train that killed more than 30 people, have raised awareness of explosion and fire risks in transport.

of tunnel fires in the 1990s or the derailment of a freight train and subsequent fire which occurred on 29 June 2009 at the railway station of Viareggio in Italy, killing more than 30 people, have raised awareness of such risks. Similar incidents may occur on ships, buses and airplanes.

The combined inhalation of vapours and fumes with smoke increases the risk for respiratory problems to transport workers ⁽¹¹⁸⁾. Previous studies have reported that transport workers have potentially high exposure to tobacco smoke, but the recent implementation of wide-reaching smoking bans has contributed to reducing exposures ⁽¹¹⁹⁾.

Table 13 provides an overview of potential exposures of transport workers to dangerous substances. National surveys below also confirm these results:

Table 13: Potential exposures of transport workers to dangerous substances, dusts, vapours and fumes

Substance	Source	Circumstances	Occupation, task
Solvents, VOCs	Cleaning products	Cleaning work	Service workers on ships, trains, buses
	Fuels	Maintenance	Drivers who attend their vehicles
	Ambient air	Refuelling	Maintenance workers, for example when de-icing wings of planes or repairing vehicles
	De-icing and degreasing fluids		Cleaners
Exhaust fumes Diesel exhaust and particles	Exhaust from combustion engine, incl. diesel and other engines on trucks, ships, trains and buses	Unintentional contact when loading and unloading	Maintenance workers
		Maintenance	Drivers, delivery and cargo workers
		Refuelling Parking areas of vehicles	
Road dust, ambient dust	Ambient	Passenger transport	Drivers and attendants
		Loading and unloading	Maintenance and cleaning workers
		When working outdoors	
Dusts, particles	Dangerous goods	Loading and unloading	Drivers, delivery and cargo workers
	Textile fibres (e.g. cotton)	Accidents and spills	Maintenance and cleaning workers
Disinfectants	Cleaning products	Cleaning vehicles, containers, mobile toilets, work areas	Cleaners Maintenance workers
			Drivers attending their vehicles
Asbestos	Insulation materials	Repair and maintenance of trucks, trains, ships and buses	Maintenance workers
	Brakes (buses, trucks)		Drivers attending their vehicles
	Waste		Delivery and cargo workers

⁽¹¹⁸⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.

⁽¹¹⁹⁾ Connections between the safety, logistics, working conditions and professional attractiveness of road transport, FIOH 2006.



Table 13: Potential exposures of transport workers to dangerous substances, dusts, vapours and fumes

Substance	Source	Circumstances	Occupation, task
Fumigation and storage chemicals	Cargo loads and foodstuff on long-distance transport	When opening containers	Cargo workers
		Accidents and incidents	Workers who handle goods from containers
Flammable and explosive substances	Cargo loads	Loading and unloading	Drivers attending their vehicles
	Dangerous goods	Accidents and spills	Maintenance workers
	Fuels	Maintenance Refuelling	Emergency workers Cleaners
Sensitising substances	Foodstuff, perishable goods		Catering, cooks
	Cleaning agents		Cargo workers
Biological and infectious agents	Animals	Cleaning	Cleaners
	Foodstuff, perishable goods	Contact with foodstuff	Service and maintenance workers
	Insects and other vectors	Contact with infected travellers and goods	Catering staff
	Contact with passengers	Contact with infectious agents when travelling abroad	Cargo workers
	Confinement on boats, long/distance travelling	Contact with animals Cuts and stings	Drivers and attendants
Other substances	Dangerous goods	Loading and unloading	Drivers and attendants
		Accidents and spills	Cargo workers

Another risk potentially under assessed is the exposure to biological agents and infection risks, although it is common in cleaning, maintenance and other service tasks, and in contact with passengers, perishable goods and animals. Long-distance travelling and hauling may also involve exposures to unusual infectious organisms. Airports, train stations and ports are workplaces where millions of passengers, but also hundreds of thousands of tons of goods transit, and all may carry potentially dangerous infectious agents. Minor injuries such as cuts and stings may also contribute to the risk of infection.

A recent report from the Hamburg Port Health Centre ⁽¹²⁰⁾ finds that health risks on board of ships are still high, due to traditional problems like infectious diseases endemic in ports visited during the ship's voyages. Another study ⁽¹²¹⁾ aimed to assess the relevance of communicable disease occurrence on cargo ships. Confinement of a group of people on a longer trip on board may favour the spread of diseases. It found that respiratory illness was the most common cause of presumably communicable diseases aboard cargo ships and may cause outbreaks of considerable morbidity. In the

⁽¹²⁰⁾ Baur, X., Oldenburg, M., Hüsing, U.-P., The Hamburg Port Health Centre: History, organisation, activities, *Internat. Marit. Health*, 2005, 56, 1–4. Available at: <http://www.imh.mug.edu.pl/attachment/attachment/5295/R16.pdf>

⁽¹²¹⁾ Schlaich, C. C., Oldenburg, M., Lamshöft, M., Estimating the Risk of Communicable Diseases aboard Cargo Ships.



confined areas of boats where groups of people travel together for weeks or months, infections easily spread.

Containers, goods and vehicles may carry insects or microorganisms not usually encountered in the countries they are destined to that in turn transmit diseases. Again, the Hamburg Port Health Centre together with the Central Institute of Occupational Medicine (ZfA) conducted a specific project on risks of infections and allergies by cockroaches on board (in cooperation with the Port and Airport Health Authority), as well as a study on sensitising foodstuffs. The first study found that the risk of infections and other health problems transmitted by the insects may be even higher in airports than in ports.

Other health risks arise from sensitising goods transported on ships and other means of transport. Respiratory reactions to sensitization by coffee or cotton dust are well-known in cargo workers.

National surveys below also confirm these results:

Belgium

According to the WBM 2004, 5.5 % transport workers reported always being exposed to dangerous substances at work, compared to 3.2 % of the average Flemish working population. Less transport workers than on average never face dangerous substances at work (60.9 % as compared to 70 %).

Denmark ⁽¹²²⁾

Some 17 % of truck drivers report having to handle hazardous chemicals on a regular basis, meaning substances are required to be labelled according to the European Union labelling system (orange warning symbol, indicating that this is a dangerous substance). This compares to 11 % in all occupational groups.

Finland

According to Finnish Work and Health Survey 2006, 56 % of the participants reported that in their work they are exposed to gases, for example from the traffic, rising from 38 % in 2003. Also, the proportion of those who report that these gases cause harm at work has increased by 9 % in the same period. In the transport and traffic sector 33 % of the workers handle solvents at work whereas in other sectors the corresponding figure is 21 %, while approximately 10 % report that these solvents cause them harm.

The drivers reported exposure to exhaust fumes from vehicles as a serious problem: as many as 70 % of the drivers (n = 300) experienced fumes to be a problem in their job.

Spain

About 36.2 % of the Spanish transport workers report inhalation of vapours and fumes at work compared to 22.3 % of the average Spanish working population, and 23.8 % against 19 % report handling dangerous substances.

In Spain, about a quarter of the transport workers report cuts or stings, a major cause of infections.

⁽¹²²⁾ National research centre for the working environment, NRCWE, Danish working environment cohort study DWECS, 2005.



In the transport survey ISCIII⁽¹²³⁾, workers were asked about the frequency of exposure to inhalation of vapours and fumes at work or on handling dangerous substances: more than 8 % answered 'very frequently' or 'frequently', 14 % 'occasionally' and 76 % answered 'never'. Regarding causes of accidents, about a quarter of the transport workers report cuts and stings, a major cause of infections.

Greece

According to a transport sector survey conducted by ELINYAE, about 81 % of respondents report exposure to dust, of which 30 % often and 51 % always. On the other hand, another 78 % report breathing in smoke or fumes during work, of which 39 % often and 39 % always.

Additional information regarding transport workers comes from the TRIA project⁽¹²⁴⁾: about 54 % of the respondents report exposure to smoke, gas, fumes or sprays during work. In addition, another 46 % of respondents report working in a stuffy, dusty and poorly ventilated environment. Also according to results from the TRIA project, 40.2 % of the respondents report perceived risk from contact with liquids and contamination by spills at the workplace. The drivers reported exposure to exhaust fumes from vehicles as a serious problem: as many as 70 % of the drivers (n = 300) experienced fumes to be a problem in their job.

In Greece, in a transport worker survey, almost half reported working in a stuffy, dusty and poorly ventilated environment.

Germany

Smoking is a notable risk: 34.2 % of transport workers were exposed to smoke at the workplace in 2005 compared to 26.2 % in other sectors.

Some 14.9 % of the employees in the transport sector report to having to handle dangerous substances, slightly more than the average in other sectors (13.4 %), and 29.4 % of employees in the transport sector have to work often or sometimes with oil, soil or dirt. This corresponds to the 28 % in other sectors.

Working with micro-biological substances seems to be perceived as a lower risk: only 10.5 % of the transport workers work with them often or sometimes compared to 13.3 % in other sectors.

2.1.7. Exposure to dangerous substances — case studies and initiatives

Whether considering chemical or biological agents, in either case protecting transport workers from their effects may be more difficult to achieve, because of the nature and the circumstances of their work, the mobility of their workplaces and the many

⁽¹²³⁾ Salud y Condiciones de Trabajo en el Transporte de Mercancías por Carretera, Escuela Nacional de Medicina del Trabajo, Instituto de Salud Carlos III, 2007. Available at: http://www.isciii.es/htdocs/centros/medicinadeltrabajo/pdf/Salud_y_Condiciones_de_Trabajo_Transporte_de_Mercancias_por_Carretera.pdf

⁽¹²⁴⁾ Development of a comprehensive training course for assessing the risk at the workplace, TRIA. Available at: http://www.aulbremen.de/triatria/en/en_modules/en_m05/en_module_05-00.html



possibilities to be exposed. The traditional measures may not always be applied. However, exposure can be prevented by providing adequate ventilation, proper rest and eating facilities and the possibility to apply hygienic measures, keeping their work environment clean and free of contamination, assessing the toxicological properties of all the products used and replacing them with less dangerous ones, preventing injuries and addressing the many sources of unintended exposure. The studies below illustrate some of the risks and provide some examples of effective prevention.



© Florent Ribet, EU-OSHA Photo Competition 2009



Railway transport and maintenance of traction and drawn vehicles (locomotives and carriages) (Slovenia)

In 2004 Slovenske Železnice (Slovenian Railways) started removing asbestos from the insulation system of the locomotives and gradually fitting them (locomotives) with air conditioning. The removal of asbestos was performed by authorised companies with a licence for handling dangerous asbestos material. There still remains the problem of improving working conditions at auxiliary premises, like changing rooms and toilets, as these are outdated and often poorly maintained ⁽¹²⁵⁾.

⁽¹²⁵⁾ Labour Inspectorate Annual report for 2005.



Inhalation of exhaust gases by urban bus drivers (France)

The continuous inhalation of exhaust gases by urban bus drivers has led INRS to undertake measurement campaigns of these pollutants inside the buses. The study aimed at assessing the occupational exposure of drivers through the measurement of six pollutants in the breathing zone at their workplace, and at comparing the quality of air sampled outside, either in front of the bus (near the ventilation intake) or on the bus roof. The results clearly indicate that the occupational exposure of urban bus drivers to the six pollutants considered was lower than the exposure limit values, but CO, NO₂ and lead concentrations at least reached the exposure levels recommended from international air quality standards ⁽¹²⁶⁾.



© David Tijero Osorio



Health risks by bromoethane and other toxic gases in import cargo ship containers ⁽¹²⁷⁾

Containers are increasingly used for the worldwide transport of all kinds of goods. Consistent with national and international regulations on pest controls, a growing proportion of these containers undergo fumigation. Frequently, the prescribed labelling is missing. According to literature and practice, this situation

⁽¹²⁶⁾ Diebold, F.; Hubert, G.; Limasset J.C. Autobus urbains. Exposition des conducteurs à la pollution produite par les gaz d'échappement des autres véhicules. Note documentaire ND 1900-149-92, No 149, 4e trimestre 1992, pp. 515-523.

⁽¹²⁷⁾ Baur, X., Yu, F., Poschadel, B., Veldman, W. Knol-de-Vos Health risks by bromoethane and other toxic gases in import cargo ship containers, *Internat. Marit. Health*, 2006, 57, 1–4. Available at: <http://www.imh.mug.edu.pl/attachment/attachment/5252/R05.pdf>



may lead to accidents and represents a significant health risk to dock workers, inspectors and custom workers.

This study presents data on measurements of commonly used fumigation chemicals.

According to the reviewed literature and the measurements, gaseous pesticide concentrations and other toxic gases in undeclared freight containers represented an increasing health risk during transportation, inspection and unloading. Recent investigations in different countries had shown at least 5 % of all import containers to have concentrations of bromomethane, phosphine and/or other fumigants above the respective OEL. The predominant one was bromomethane. Follow-up measurements of fumigants in imported containers in Rotterdam port showed an increase in positive bromomethane results from 6 % in 2002 to 31 % in 2005. In first informative measurements in Hamburg port predominantly bromomethane and phosphine were identified in undeclared fumigated import containers. In comparison to the preceding year, 40 % more fumigation procedures were recorded in 2004 necessitating an increasing surveillance of registrations, declarations and fumigant measurements of entering containers gased in transit.

Nearly all import containers with detectable levels of fumigants did not display the required International Maritime Organisation warning sticker, although according to the IMO Recommendation for the Safe Use of Pesticides in Ships (IMO 267E) fumigated containers or cargo transport units and ship cargoes have to be labelled and appropriately certified.

Widely used methyl bromide should be phased out because it is ozone depleting ⁽¹²⁸⁾; because continued use of the previously widely used fumigant methyl bromide has been banned under the Montreal Protocol, phosphine could be more widely used ⁽¹²⁹⁾. While this would enhance environmental protection, the risks for workers remain: Phosphine is extremely flammable and explosive; it may ignite spontaneously on contact with air. It is also a severe respiratory tract irritant.



Dangerous goods transport — guidelines (Austria)

This brochure should support dangerous goods merchants and all those who are involved in the transportation of dangerous goods to optimally fulfil the dangerous goods legislation.

The Austrian Chamber of Commerce has published these practical guidelines ⁽¹³⁰⁾ to support companies with the regulations in dangerous goods legislation. With an industry-specific overview of the most important regulations regarding the

⁽¹²⁸⁾ <http://www.epa.gov/ozone/mbr/index.html>

⁽¹²⁹⁾ http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1194947329429

⁽¹³⁰⁾ Leitfäden ADR 2007 (3.4.1), Gefahrguttransport — Branchenleitfaden, Praktische Hinweise zu ADR/RID 2007, Wirtschaftskammer Österreich 2007. Available at: http://portal.wko.at/wk/dok_detail_file.wk?AnglID=1&DocID=370586

transportation of dangerous goods by road and rail, above all, the small and medium sized companies should be supported to find their own way around the many hundreds of pages of comprehensive, detailed regulations which threaten high administrative penalties when not complied with.

The social partner organisations chamber of workers (Bundesarbeitskammer) and chamber of commerce (Wirtschaftskammer) have together with the statutory insurance organisation AUVA developed a training DVD on the same topic ⁽¹³¹⁾.



ECDC Risk assessment guidelines for infectious diseases transmitted on aircraft ⁽¹³²⁾

In the closed cabin environment of modern airplanes, passengers and staff are frequently exposed to various infectious diseases. This report looks at 12 infectious diseases and, by systematically evaluating literature on on-board transmission, attempts to assess the risk of infection via air circulation in airplanes.

In order to assist national authorities in European Member States in the assessment of risks associated with the transmission of various infectious agents onboard airplanes, the European Centre for disease prevention and control (ECDC) commissioned the production of this set of guidelines on infectious diseases and their transmission onboard aircraft. The guidelines provide an overview of the available evidence in this field and are based on a systematic review of scientific literature, disease-specific guidance material, and expert opinions. They provide a basis for Member States to individually assess in-flight transmission events.

In June 2009, ECDC facilitated a technical expert workshop entitled 'Risk assessment guidelines for diseases transmitted on airplanes', which focused on tuberculosis, new emerging airborne diseases (e.g. SARS) and meningococcal infections. Results were published in November 2009 ⁽¹³³⁾.

2.1.8. Information on risks

According to the EWCS 2005, workers in land transport and pipelines seem to be slightly better informed about occupational risks than the average worker in the EU-27. As shown in the table below, in 2005, 37 % of workers in land transport declared to be very well informed about risks against 36.1 % in the overall workforce, and 46.5 % reported being well informed (42.2 % in the total workforce). Some 4.2 % of land

⁽¹³¹⁾ Chemie an Bord! See <http://wien.arbeiterkammer.at/online/page.php?P=68&IP=18223>

⁽¹³²⁾ Schenkel, K, et al., Risk assessment guidelines for infectious diseases transmitted on aircraft, for the European Centre for Disease Prevention and Control (ECDC), 2009. Available at: http://www.ecdc.europa.eu/en/publications/publications/0906_ter_risk_assessment_guidelines_for_infectious_diseases_transmitted_on_aircraft.pdf

⁽¹³³⁾ PART 2: Operational guidelines for assisting in the evaluation of risk for transmission by disease. Available at: http://ecdc.europa.eu/en/publications/Publications/0911_GUI_Risk_Assessment_Guidelines_for_Diseases_Transmitted_on_Aircraft.pdf



transport workers declared to be not at all informed about risks against the 6.1 % average of the EU-27.

Table 14: Information regarding health and safety risks, EU27, 2005

	Total	Land transport, pipelines
Very well informed	38.7	41.1
Well informed	44.5	44.3
Not very well informed	10.4	9.8
Not at all well informed	4.0	4.1
Not applicable	2.5	0.7
Total	100.0	100.0

Source: EWCS

2.1.9. Case studies and initiatives — physical risks ⁽¹³⁵⁾



Summary of the Labour Environment objective measurement results in transport enterprises (Latvia)

Between 1996 and 2005, the Laboratory of Hygiene and Occupational Diseases at the Riga Stradiņš University performed measurements of risk factors in the sector of transport, storage and communications. The measured risk factors were lighting, noise, micro climate indicators — humidity, temperature and speed of air movement — full body vibration, manganese, welding sprayer, abrasive particles, wood and cotton dust, and asbestos performed in the sector, and they were picked following a risk assessment exercise in the sector.

Out of the 1,070 measurements carried out in the sector, almost half (48.1 %) exceeded the permissible or recommended standards. By type of risk factor,

- microclimate indicators
- humidity (67.3 % of measurements exceeded recommended standards)
- temperature (54.4 %)
- speed or air movement (78.3 %).

However, it was the exposure to abrasive particles that most exceeded the limits: 84 % of the time. Furthermore, welding sprayer exceeded occupational exposure limits in 53.3 % of evaluated workplaces, cotton dust in 50 % of workplaces and manganese in 28 % of workplaces. Findings for other risk factors: lighting (35.5 %), full body vibrations (28.2 %) and noise (21.2 %).

⁽¹³⁴⁾ Gør noget ved dit arbejdsmiljø — 64 eksempler som kan inspirere til at forbedre buschaufføres sundhed og arbejdsmiljø, National Research Centre for the Working Environment (NRCWE), 2003. Available at: <http://www.arbejdsmiljoforskning.dk/upload/Goer-noget-ved-dit-arbejdsmiljoe.pdf>

⁽¹³⁵⁾ Chauffeurs-livreurs — Aide à l'évaluation et à la prévention des risques professionnels. CRAMIF 2003. Available at: http://www.cramif.fr/documentations/doc_entreprise_detail.asp?num_pub=103



Do something about your work environment — 64 examples as inspiration to improving bus drivers' health and work environment (Denmark) ⁽¹³⁵⁾

'Gør noget ved dit arbejdsmiljø' is a report published by the NRCWE as part of a research project called 'SundBus' ('Healthy Bus'). The report is meant to provide information and examples of 'good practice' for companies and people working on work environment issues. Over 200 intervention programmes were conducted at the 20 sites, some of which are listed below:

- there was a workshop where chauffeurs experienced themselves what it was like to create work schedules and holiday plans. This increased their understanding of why their own personal requests and needs were not always met. A 'vacation exchange programme' allowed employees to swap their work schedule and vacation plans with other chauffeurs. Both of these interventions led to increased satisfaction;
- improved communication through different means, such as meetings with management, written information, i.e. newsletter and communication courses for management;
- courses in conflict management were offered and chauffeurs were provided with mobile phones as a means to create a fast and safe alert system between buses and chauffeurs.

The conclusion of this project was that if improvements are to be made, both the company and employees needed to show a genuine will and determination to make changes.



Guide for risk assessment and prevention for workers in the delivery service (France)

Following a survey in five enterprises in the Ile-de-France district, this guide for risk assessment and workplace prevention was designed by a multidisciplinary group of OSH experts, including occupational physicians, labour inspectors, ergonomists and professional trainers. The brochure is intended for use in a social dialogue context. It consists of a series of questionnaires built on the process of delivery from collection and loading of parcels to final delivery and provides recommendations regarding work organisation as well as from an ergonomics point of view.





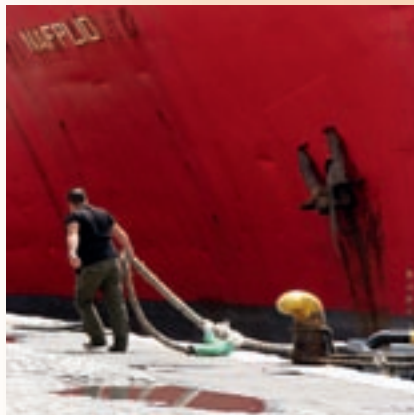
Mortality patterns in air cabin crew ⁽¹³⁶⁾

There is concern about the health effects of exposure to cosmic radiation during air travel. To study occupational exposures and their potential health effects, the authors investigated mortality patterns among more than 44,000 airline cabin crew members in Europe. A cohort study was performed in eight European countries, yielding approximately 655,000 person-years of follow-up. Observed numbers of deaths were compared with expected numbers based on national mortality rates. Among female cabin crew, overall mortality and all-cancer mortality were slightly reduced, while breast cancer mortality was slightly but not significantly increased. In contrast, overall mortality and mortality from skin cancer among male cabin crew were somewhat increased. The authors noted excess mortality from aircraft accidents and from acquired immunodeficiency syndrome in male workers.

Among airline cabin crew in Europe, there was no increase in mortality that could be attributed to cosmic radiation or other occupational exposures to any substantial extent. However, the authors concluded that the risk of skin cancer among male crew members requires further attention.



Reducing ultraviolet radiation exposure among outdoor workers (USA) ⁽¹³⁷⁾



© Nafsika Kokkini, EU-OSHA Photo Competition 2009

This paper described a review of 1) descriptive data about outdoor workers' sun exposure and protection and related knowledge, attitudes, and policies, and 2) evidence about the effectiveness of skin cancer prevention interventions in outdoor workplaces.

The studies showed that the vast majority of outdoor workers studied in the United States, Canada, and the Mediterranean region — the regions for which there were multiple publications — were still exposed to

⁽¹³⁶⁾ Zeeb, H.; Blettner, M.; Langner, I. Mortality from cancer and other causes among airline cabin attendants in Europe: a collaborative cohort study in eight countries. *American Journal of Epidemiology*, USA, Vol. 158, No 1, July 2003, pp. 35-46.

⁽¹³⁷⁾ Glanz, K., Buller, D. B., Saraiya, M.; Reducing ultraviolet radiation exposure among outdoor workers: State of the evidence and recommendations, *Environmental Health*, 6 (2007): 22. Available at: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1995198>



the sun without adequate protection. Workers found it difficult to practice some commonly recommended sun safety techniques such as avoiding being outdoors, using shade, and wearing protective clothing without changes to work procedures. Individual workers cannot alter outdoor work hours without a change in workplace policy or actions by employers.

In one of the studies, an observational study, about two-thirds of transportation workers compared were observed to be wearing adequate sun protection, but likely due to required clothing policies that were enforced by the employers.

The review concluded that there was considerable room for improvement in occupational sun protection. A systematic evidence review of the effectiveness of interventions to reduce exposure to UV radiation among outdoor workers was recommended.



A healthy driver can cope' (Finland)

'A healthy driver can cope' was a three year project (2001–2004) focused on drivers' health and welfare awareness and habits. The project partners were Rahtirit ry, an organisation of professionals in freight traffic and a member of the international organisation, UICR (Union Internationale des Chauffeurs Routiers), the Finnish Health Association and the Dairy Nutrition Council in Finland. The objective was to stimulate positive and healthy habits in drivers with the aim to improve their occupational and road traffic safety and life quality. The project activities consisted of:

- fit-to-drive events for freight vehicles (information, expert services) around the country;
- co-operation with the organisations (Rahtirastit) rendering services at rest areas (over 500 rest areas in Finland), with the aim to provide healthier food and information on health and well being to drivers. Health education materials were available at these rest areas;
- articles about eating, exercising, resting, intoxicant products, mental work load, healthy habits, working ability, welfare at work and community spirit were published in the company magazine and on its website.

The results were published in 2004 and a merit rating research was carried out by the Department of Health Sciences of Kuopio University.



2.2. HARASSMENT AND VIOLENCE

Violence is a source of occupational risk in the transport sector that has attracted increasing attention over recent years. Staff working in transport services — including airline and airport services, ferry, train, bus, and taxi services — potentially belong to those most at risk of physical or psychological violence.

There are a variety of occupations in the transport sector that may be exposed to violence and harassment. Although they may have very different tasks, a set of specific conditions (lone work, supervision role, prolonged contact with clients) exposes them more than other workers to the risk of being insulted, aggressed or robbed.

Changes in work organisation, such as the reduction in customer services and automatic ticketing, or the trend to non-standard working hours and 24-h service, may have increased the risk for transport workers to be exposed to violence and bullying. Equally, work organisational measures and policies as well as awareness-raising beyond the sphere of the enterprises can help prevent violence to transport workers.

Violence, bullying and harassment go largely underreported in many transport jobs and thus they persist and deepen in gravity and incidence. Reasons for the lack of reporting are mainly: the lack of confidence that the cases will be adequately dealt with, limited procedures for reporting incidents and fear of the consequences on job and career.

2.2.1. Definition of violence at work

The concept of violence at work is extensive and complex, which is why it has numerous definitions. The ILO defines violence as ‘any action, incident or behaviour that departs from reasonable conduct in which a person is assaulted, threatened, harmed, injured in the course of, or as a direct result of, his or her work’. The World Health Organisation (WHO) definition of workplace violence is: ‘The intentional use of power, threatened or actual, against another person or against a group, in work related circumstances, that either results in or has a high degree of likelihood of resulting in injury, death, psychological harm, bad development, or deprivation’.

The European Commission defines workplace violence as: ‘Incidents where staff is abused, threatened or assaulted in circumstances related to their work, including commuting to and from work, involving an explicit or implicit challenge to their safety, well-being or health’. Violence includes both physical and non-physical violence. Violence and harassment may come from co-workers or members of the public and clients.

Following rising concern on increasing violence and harassment to workers, EU-OSHA has conducted a number of studies related to psychosocial issues and violence and harassment at work, in particular:



- an expert survey on emerging psychosocial and organisational risks⁽¹³⁸⁾, where violence and harassment was identified as one of the top emerging risks;
- a more in-depth literature survey and policy and practice overview on the topic⁽¹³⁹⁾.

In more in-depth studies of the European Risk Observatory, the following broader definitions are used:

There is no single uniform definition of what is meant by workplace violence or harassment. Violence is a generic term that covers all kinds of abuse; behaviour that humiliates, degrades or damages a person's well-being, value and dignity.

There is a variety of behaviours which may be covered under the heading of general violence at work, and the perception in different contexts and cultures what constitutes violence is diverse. Classifying different forms of violence is difficult and classifications used are often overlapping.

In the ERO studies, the phrases work-related violence or workplace violence, are generally used to refer to all kinds of violent incidents at work, including third-party violence and harassment (bullying, mobbing) at work. The phrase third-party violence is used to refer to threats, physical violence, and psychological violence (e.g. verbal violence) by third parties such as customers, clients, patients receiving goods or services.

As mentioned above, a more in-depth study of violence at work addresses the OSH issues related to this emerging risk including exposures in the transport sector.

The following chapter is dedicated to transport workers' exposure to violence at work, and includes a few examples of effective prevention.

2.2.2. Violence and harassment in transport — an overview

The different psychosocial factors taken into account in the EWCS 2005 — on violence, harassment and discrimination — reveal a higher exposure among workers in land transport than that of the EU-27 average. In this sense, land transport and pipelines reported a higher share of workers being subject to threats of physical violence than the EU-27 average: 14.7 % and 6 %, respectively. When it comes to physical violence from colleagues, land transport reports a 2 % share, slightly above the 1.8 % recorded in the EU-27 average, while physical violence from other people than workers is higher too in land transport: 11 % vs. 4.3 % in the EU-27 average.

Workers in land transport and pipelines seem to be more subject to unwanted sexual attention than the EU-27 average: 4.2 % and 1.8 %, respectively. They also report a higher share of bullying/harassment (7.8 %) than the overall workforce (5.1 %) while the gap is narrower when it comes to sexual/gender discrimination: 1.5 % among transport in land transport vs. 1.2 % in the overall EU-27 workforce.

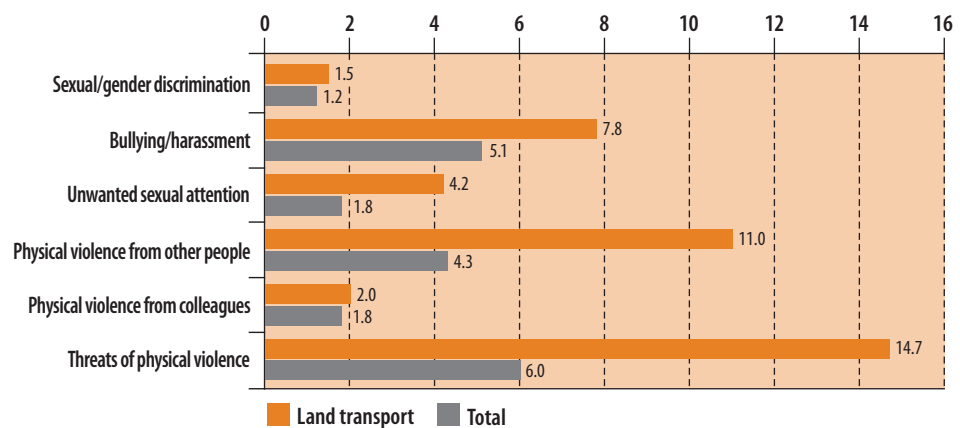
Workers in the transport sector are more exposed to violence, sexual abuse and harassment than others. Incidents are increasing in number and seriousness.

⁽¹³⁸⁾ Expert forecast on emerging psychosocial risks related to occupational safety and health, (OSH), European Agency for Safety and Health at Work, EU-OSHA, 2007. Available at: <http://osha.europa.eu/en/publications/reports/7807118/view>.

⁽¹³⁹⁾ Workplace violence and harassment: a European picture, European Agency for Safety and Health at Work, EU-OSHA, available at: <http://osha.europa.eu/en/publications/reports/violence-harassment-TERO09010ENC/view>



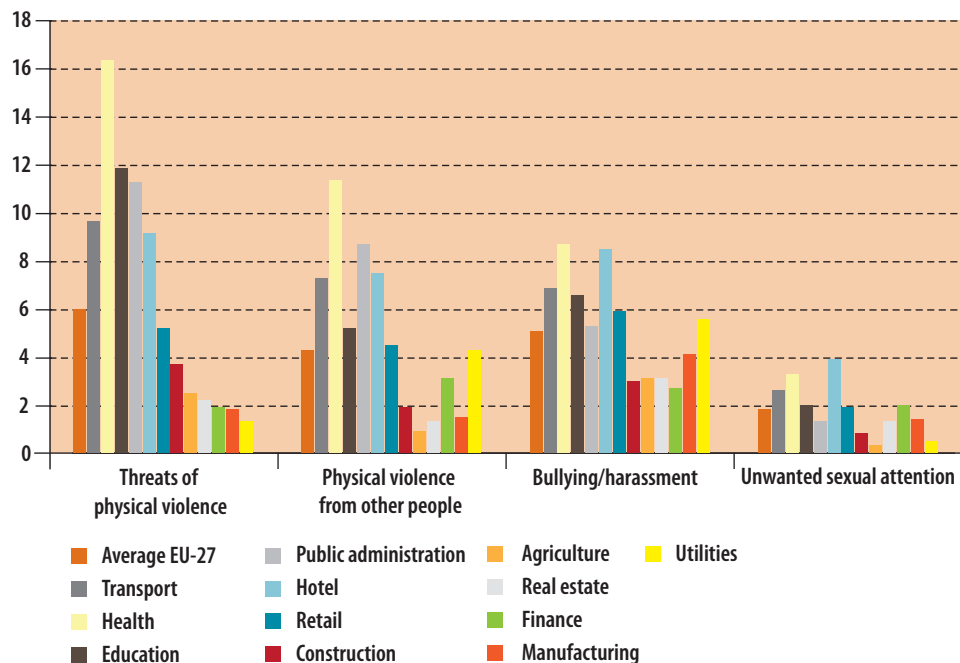
Figure 13: Psychosocial factors, in percentage share of workers, land transport and total, EU-27, 2005



Source: EWCS

Compared to other sectors, transport scores third on unwanted sexual attention and harassment and fourth on threats of and actual physical violence from other than colleagues. The most affected sectors appear to be service sectors: Health care, education, public administration, real estate and transport.

Figure 14: Overview, percentage of workers reporting violence, harassment and discrimination, by sector, EWCS 2005



Source: EWCS

Violence is a source of occupational risk in the transport sector that has attracted increasing attention over recent years. There are also indications that the frequency and the severity of incidents have been increasing.

Staff working in transport services — including airline and airport services, ferry, train, bus, and taxi services — are potentially among those most at risk of physical or psychological violence. By nature of their work, transport workers may be exposed to many sources of conflict leading to violence. For example, in public transport, their



work includes taking care of complaints, supervising the safety of travellers, the control of tickets and the prevention of vandalism and violent behaviour. Truck, public transport and taxi drivers are also often at risk because they work alone and carry money, and their safety is not remotely monitored. When an incident happens, quick help is often not available. Transport workers may also sometimes be dealing with specific groups of members of the public whose behaviour is sometimes erratic and unpredictable, such as fare evaders, beggars, hooligans, people who do not comply with smoking or other restrictions, and people who have consumed excessive amounts of alcohol or drugs ⁽¹⁴⁰⁾.

Violence, bullying and harassment go largely underreported and thus they persist and deepen in gravity and incidence. Reasons for the lack of reporting are mainly: the lack of confidence that the cases will be adequately dealt with; the lack of systems and procedures to report, monitor and record incidents; and fear of the consequences on job and career of workers ⁽¹⁴¹⁾.

A review from the ILO sectoral activities department ⁽¹⁴²⁾, one of the background studies prepared for a tripartite Meeting of Experts on Violence and Stress at Work in Services, in October 2003 specifically addressed the transport sector. Based on a number of reviews and the discussions at the expert meeting, a 'Code of Practice on Workplace Violence in Services Sectors and Measures to Combat this Phenomenon' was adopted. The code of practice is presented in Section 2.2.3 of this report.

Generally, organisations and services which experience high levels of workplace violence were found to respond to certain external and internal characteristics:

- providing face-to-face service to members of the public;
- handling cash transactions in one form or another;
- employing staff who work alone or in small numbers;
- providing services early in the morning or late at night;
- operating from relatively unsecured premises; and
- being located in disadvantaged areas.

The ILO transport review considered existing studies on the extent of violence and the underlying factors. It exploits a number of change factors that have contributed to the increase in violence in the transport sector. It also addresses specificities of the different subsectors.

Some of the findings:

- workers in other services sectors may be more frequently victimised than transport workers. On the other hand, transport workers are robbed at a higher rate than workers in any other occupational field;
- demands on service and service attitudes of transport staff have increased;

⁽¹⁴⁰⁾ ILO, Fact sheet: Violence and stress in transport sector, Available at: <http://www.ilo.org/public/english/dialogue/sector/sectors/transp/socprot-violence.htm>

⁽¹⁴¹⁾ Conclusions and action plan for gender equality for 2005–2009, ETF Women's Conference, Mariehamn, 24 May 2005 <http://www.itfglobal.org/etf/women.cfm>

⁽¹⁴²⁾ Essenberg, B., Violence and stress at work in the transport sector, Working paper, International Labour Office, 2003. Available at: <http://www.ilo.org/public/english/dialogue/sector/papers/transport/wp205.pdf>



- organisational practices, such as over-booking in air travel, less staff attending customers, automatic ticketing or rationalisation in rail transport, may lead to increased aggression from customers. For example, the study cites a strike of French workers:

In France, ground workers with Air France went on strike in August 2000 demanding that the company review its overbooking policy as they increasingly face verbal and physical attacks by passengers bumped off flights. 'Last week, someone threw a computer at an (customer) agent, every week it is getting more violent.;

- some workers, such as controllers on public transport or drivers, are particularly exposed;
- non-native or female drivers are more exposed to discriminatory, abusive and violent behaviour. A report on London underground drivers reported a particularly high harassment rate for female black drivers;
- the increase in black or grey travelling and fare evasion also results in an increase in aggression and violence against transport workers, for example in public transport or taxis. The more efficient control measures are, the more violence is to be expected;
- rape may be a highly underestimated risk for female drivers: for the small, but increasing, number of women who drive taxis, rape is an additional risk. An in-depth study of workers' compensation claims data in Washington, DC, over a 10-year period found that female taxi drivers had the highest risk of rape. The authors concluded that their study substantially underestimated the incidence of work-related rape. In a Sydney study, female taxi drivers reported constant verbal abuse and physical harassment from customers;
- long-distance truck drivers live in constant fear that their trucks can get stolen during rest periods or overnight stops or simply at gun point somewhere along the road;
- problems linked to illegal migration: a case study reported that UK truck drivers returning from the European mainland are increasingly subject to violent attacks by asylum seekers hiding in their vehicles; and drivers are increasingly fined when illegal immigrants are found on their vehicles, and they might be stopped from travelling on until the fine is paid.

Taxi drivers

- Because taxi drivers usually work 12-hour shifts, night driving is inevitable, and they are at even higher risk then.



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- Violence is a common experience for taxi drivers, although most incidents are verbal attacks. Many incidents go unreported: taxi drivers are 'popular' targets because they work alone, are unprotected, accept passengers whose attitudes to violence are unknown — and they carry cash. Assaulting a cabdriver carries little risk to the assailant. First, there is a very good chance it will not be reported to the police, and if it is reported, there is very little chance of the perpetrator getting caught and if he is caught he may dispute the allegation.

Public transport

- Violence on public transport was found to be strongly determined by the presence of situational opportunities for violence in vehicles, stations and bus terminals. In addition, over the past decades, public transport companies have reduced the number of guards and revenue control agents, restricted the number of hours that service employees are available, closed the ticket counters earlier and relied heavily on technical solutions such as automatic ticket dispensing machines, computers and video cameras. In the event of an incident, there are fewer staff to deal with the problem or alert someone. By some observers, the reduction in staff in public transport companies is called the ‘dehumanization of transport’.
- Perceived insecurity may lead to further reduction in frequency on public transport, for example at certain hours, and this may reduce the effect of ‘safety in numbers’ which can lead to a reduction in real levels of safety.
- Inadequate, overcrowded or delayed public transport may also fuel passenger frustration and lead to aggressive acts against transportation staff and others. A distinct aspect of violence in the transport sector is that it is often directed against passengers and staff alike.

Air and railway transport

- Railway and airline staff may be at greater risk than other service workers because of the length of time that they remain in contact with the customer.
- Long-distance travel, with its increasing no smoking and limited alcohol consumption policies may lead to drug withdrawal in some passengers and related aggressive behaviour towards other passengers or flight staff.

The study also focused on reasons for underreporting.

Reasons for underreporting of violence in transport

- Many non-fatal incidents, especially threats, simply go unreported because there is no coordinated data-collection system to process this information or because the workers involved, such as taxi drivers, cannot afford to lose the time to report the incident.
- Many service workers are encouraged to defuse customer hostility, with a ‘the customer is always right’ approach, meaning that verbal abuse may have to be absorbed.
- Because some drivers, for example taxi drivers, may work under unusual contractual arrangements (‘independent contractors’), it may be difficult to collect data on incidents.
- To prevent outbreaks of fear or decreases in frequenting the services, or stimulating similar behaviors, violence reports may be withheld by some companies.
- Surveys are unlikely to provide a total ‘picture’ of the incidence and severity of violence because of the ‘healthy worker’ effect: only workers who are well remain in the job, and those who are ill or injured leave.
- One study concluded that ‘the level of underreporting may suggest that drivers feel isolated and left on their own to deal with the dangerous nature of their own workplace’.



How to prevent violence

The report also exploits prevention It recommended general approaches to preventing workplace violence and stress:

- **environmental:** adjusting lighting, entrances and exits, security hardware, and other engineering controls to discourage would-be assailants;
- **organisational/administrative:** developing programmes, policies and work practices aimed at maintaining a safe working environment;
- **behavioural/interpersonal:** training staff to anticipate, recognise and respond to conflict and potential stress and violence in the workplace.

It defined good practice criteria for prevention policies and recommends that the policy also be communicated to users, clients and the general public.

Another conclusion of the study was that policies, prevention measures and monitoring needed to be targeted and specific to the conditions. Worker training and support responsive to incidents and worker stress episodes, at a level as local as possible, were also found to be most effective in reducing workers' stress and traumatic reactions. A study among Australian taxi drivers had found that no general pattern of prevention measures was preferentially chosen and effective, but that certain adaptability to preferences was most effective. Ironically, the legally prescribed prevention measures were found to be the least popular among taxi drivers. An important conclusion would therefore be a more tailored and inclusive approach to prevention of violence in the transport business.

2.2.3. Violence and harassment — data from the Member States

According to the EWCS 2005, as mentioned above, workers in the sector transport over land seem to be more subjected to bullying or harassment than the average worker: about 8 % of the transport workers compared to 5.1 % of the average working population. Generally, about 5 to 6 % of all workers declared being subjected to some form of violence, bullying or harassment. Over the period 1995–2005, the level of violence has increased slightly in the EU-15 (from 4 % to 6 %).

The following section provides additional information from some of the EU Member States.

Spain

According to ENCT 2003, 0.7 % of the transport workers declare to be exposed to violence from colleagues, compared to 0.5 % of the average Spanish workers. Also, 3.5 % declare to be exposed to third-party violence compared to 1.9 % on average.

Greece

According to the transport sector survey conducted by ELINYAE, about 71.8 % of the respondents report having been subject to physical violence at least once during work (20.5 % sometimes and 51.3 % rarely).



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Finland

According to Work and Health Survey 2006, the proportion of respondents — both those who had been subjected to mental violence (7 %) at work and those who have been threatened with physical violence (5 %) — has increased by 3 % in Finland as compared to 2003.

The Netherlands

According to the NEA (Netherlands Working Conditions Survey (Nationale Enquête Arbeidsomstandigheden)), sexual harassment has remained relatively stable in the total working population, whereas in transport it has increased. Intimidation is more often reported in transport than in the total working population, while there are no substantial differences between the total and transport regarding different kinds of discrimination.

Concerning intimidation, in 2006, 23.5 % of the working population reported having been exposed to intimidation from customers, while 14.2 % reported intimidation from their boss or colleagues. The corresponding shares of workers being exposed to intimidation from customers or colleagues in transport in the same year are somewhat higher: 30 % and 17.4 %, respectively. Both kinds of intimidation most often occur in air transport.

The prevalence of bullying and the share of workers that report absence due to aggression and violence are higher in transport than in the total working population. In air transport this percentage has increased substantially from 0.9 % in 2005 to 3 % in 2006. The percentage of workers reporting decreased working ability due to aggression is also higher in transport (12.4 % in 2006) than in the total (10.1 %).

2.2.4. Case studies — violence and harassment

This section presents a few case examples and initiatives on violence and harassment in the transport sector. The examples illustrate the dimension of the problem and what can be done to prevent violence.



Aggressions in public transport — OGBL-ACAL awareness campaign (Luxembourg)

OGBL-ACAL launched this campaign after transport workers were subject to aggressions from customers. Although in 2006 only one case was reported, OGBL-ACAL argues that the situation in the private sector is more serious than what the statistics suggest and that the number of cases of aggression is higher. In this context, OGBL-ACAL launched an awareness campaign in 2006, engaging private bus drivers and taxi drivers, who were requested in December 2006 to fill out a questionnaire concerning aggressions at work.

The survey results ⁽¹⁴³⁾ suggest that violence against bus and taxi drivers happens daily. Two thirds of the 130 surveyed drivers mentioned that they had been subject to violence from customers in the previous months. Most of the time (90 %) it was verbal violence, but 30 % of the surveyed drivers reported having been subject to physical violence, too.

⁽¹⁴³⁾ Sondage de ACAL confirme: Violence contre chauffeur de bus et de taxis à l'ordre du jour; 29 janvier 2007. <http://www.acal.lu/fra/news/90/>, <http://www.acal.lu/fra/news/96/>



73 % of surveyed drivers indicated that the risk of aggressions was higher in late evening and during night shifts. Risks were also higher when driving in the city than in the countryside and in international services. A specific risk exists in school transport and in special events such as shuttle services for football matches.

Three in four drivers who suffered an aggression reported not having received any support from the employer.



© Nafsika Kokkini, EU-OSHA Photo Competition 2009



Aggression and violence in the transport sector (Belgium)

The Belgian Labourers Transport Union (BTB-ABVV) investigated the causes of stress in the transport sector, based on 1300 responses on their questionnaire. About 71 % of the truck drivers consider aggression of other drivers or passengers as an extra burden for their job and 69 % are annoyed by the behaviour of other drivers. Another important issue is the discrepancy in instructions received from the clients compared with their own company's instructions. A specific violence issue is the increasing number of truck thefts, as previous research had revealed that in 80 % of all truck thefts, it was the freight that the thieves were interested in ⁽¹⁴⁴⁾.

Prevention strategies proposed included a manual for drivers that mentions what to do to prevent thefts and clear instructions on how to react in case of thefts and clear instructions on how to handle the load, how to use safety systems, where to park trucks, etc.

⁽¹⁴⁴⁾ Vorst, J.L.H., Diefstal in het wegvervoer: niet alleen een Nederlands probleem, Handboek Schadepreventie: C5160-1 – C5160-11, 1999.



Accidents due to violence in public transport (Germany) ⁽¹⁴⁵⁾

The German statutory insurance organisation BG Bahnen carried out a detailed analysis of accidents and found third-party violence to be especially frequent in drivers, ticket controllers and staff of security firms. The proportion in all except commuting accidents was high: 6,5 % in 2000 and 7,9 % in 2001. Almost half of the more than 800 incidents affected bus drivers, another 38 % ticket controllers. There was a clear tendency for the accidents to occur in the evening or at night. Although BG Bahnen assumed a high underreporting rate, the cost for compensation of the accidents was over a million €. In five cases, the injuries lead to a compensated permanent incapacity.



Assessing and tackling external violence at work in public railway transport ⁽¹⁴⁶⁾ (Spain)



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Employees of EuskoTren are in constant contact with passengers and frequently exposed to external violence (verbal abuse, insults, threats or intimidation). The company decided to properly assess the psychosocial risks faced by its staff and put in place an external violence prevention policy. The project to identify and subsequently assess the psychosocial risks faced by staff was carried out with the

collaboration of a technical advisor. To obtain the required information, the following actions were taken:

- a coordination team was set up to carry out the project and to encourage staff participation;
- Individual interviews were held with people in positions of responsibility to gain information about the staff in their area;
- focus groups were held among staff (with voluntary attendance);
- an epidemiological analysis was conducted of absenteeism due to illness in recent years;
- a questionnaire was given to staff, with 165 questions on topics such as stress, psychological health, job satisfaction, vulnerability and social support;

⁽¹⁴⁵⁾ Unfallschwerpunkt im Fahrdienst (Accident main focuses in local public traffic), BG Bahnen 2003. Available at: http://www.vbg.de/risiko-raus/p_verkehr/fachinfo/D12_swk_unfall.pdf

⁽¹⁴⁶⁾ Prevention of risk in practice: Good practice related to risk assessment, European Good Practice Awards 2008-2009, p. 18, European Agency for Safety and Health at Work, EU-OSHA 2009. Available at: http://osha.europa.eu/en/publications/reports/TE7809580ENC_good_practice_award



- an analysis was carried out of corrective and preventive actions that might reduce the presence of risk factors and minimise their negative health effects.

Subsequently, an action plan was put in place to counter external violence at work. The following actions were planned:

- promotion of staff involvement in prevention activities through the setting up of two teams: the Multidisciplinary Improvement Team to coordinate the external violence action plan and the Zero Violence Team;
- through these teams, EuskoTren tries to identify specific solutions to the problems detected in the company services: bus, train, tramway, funicular transport and customer service. The following are examples of solutions: installation of video surveillance in the bus service, coordination with the police in sensitive areas, training staff in how to react to these situations, etc.;
- preparation and implementation of an incident log and a guide to the prevention of external violence at work.

The results achieved were:

- better knowledge of risk factors affecting each job category;
- staff involvement in prevention activities;
- reduction in the number of incidents recorded;
- improved working environment;
- collection of data on incidents of external violence;
- improvement in communication and staff information and training.

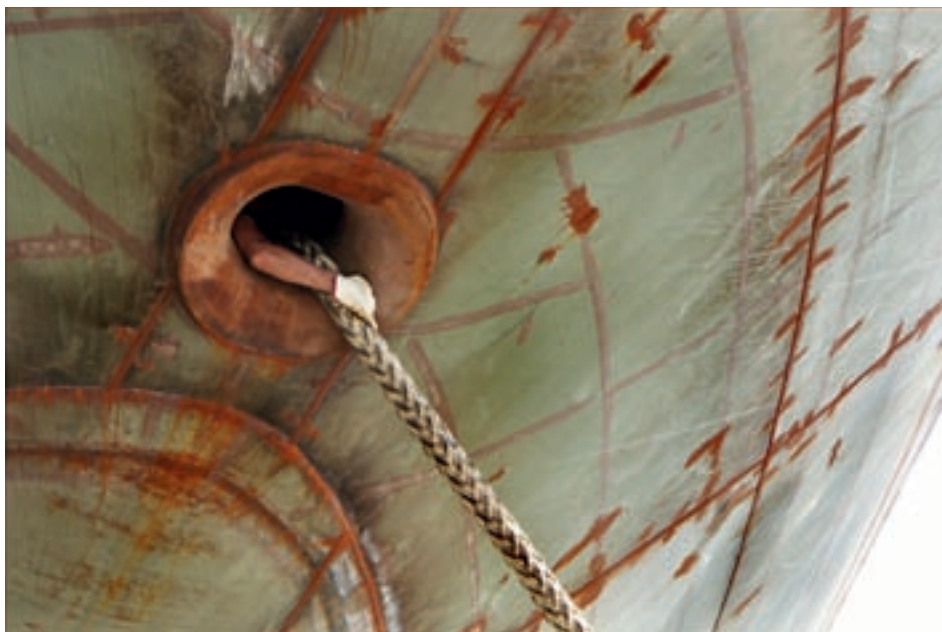
This example is one of the commended examples in the European Week for Safety and Health Good Practice Awards procedure 2008–2009 and was presented at the Closing Summit of the campaign.



‘Passenger aggression in air transport (France) (147)

In order to give a better answer to increasing passenger aggression against Air France employees at Paris Charles-de-Gaulle airport, new procedures were set up between mid-2000 and December 2001. At several meetings, the different actors (employer, unions, occupational physicians, social workers) were consulted to elaborate a procedure to address airport passengers’ violence. Staff was also provided with access to an assistance service — psychological cell (S.S.P.O.) of the French Ministry of the Interior — when the company’s medical department is closed. From May 2000 to May 2001, 29 events were registered: verbal insults, as well as physical aggression with injuries; from December 2000 to May 2001, 30 calls to S.S.P.O. were registered. Counter-measures are decided upon on board for crewmembers as well as for ground staff: the aim is, on the one hand, to avoid post-traumatic syndrome disorders among staff and to react quickly, and on the other to preserve aeronautical safety.

(147) Donne, J. P., Vallet, C., Agents Air France du centre de correspondance à l’aéroport de Paris Charles-de-Gaulle et violence des passagers. Archives des maladies professionnelles, vol. 64, No 1, février 2003, pp. 36-38.



© Michele Sponza, EU-OSHA Photo Competition 2009



ETF — ECSA Guidelines on Eliminating Workplace Harassment & Bullying (EU) ⁽¹⁴⁸⁾

The European Transport Workers' Federation and the European Community Shipowners' Associations published guidelines for the promotion of equality of opportunity and diversity in the European Shipping Industry and for eliminating workplace harassment and bullying. The background for the paper has been the major shortfall in the number of Europeans embarking on careers at sea and the need for the shipping sector to present itself as an attractive one to work in.

The guidelines were provided in the languages of all maritime states of the Union, and a video and CD-ROM training package have been made available in a number of additional languages. The guidelines include how to draw up a company policy on harassment and bullying, identifying incidents of harassment and bullying, measures to eliminate harassment and bullying, and give some case studies. A suggested text of leaflet for seafarers is included.

⁽¹⁴⁸⁾ [http://www.itfglobal.org/files/seealsodocs/412/Brochure %20English.pdf](http://www.itfglobal.org/files/seealsodocs/412/Brochure%20English.pdf)





‘Code of practice on workplace violence in services sectors and measures to combat this phenomenon (ILO) ⁽¹⁴⁹⁾

This code was drawn up by a Meeting of Experts held in Geneva from 8 to 15 October 2003.

The code is not a legally binding instrument and is not intended to replace national laws and regulations. It should be used to:

- develop practical responses at the workplace, enterprise, organization, sectoral, national, regional and international levels;
- promote processes of dialogue, consultation, negotiation and all forms of cooperation among governments, employers, workers and their representatives, as well as other concerned stakeholders as appropriate;
- give guidance in developing national laws, policies and programmes of action; in workplace, enterprise, organization and sectoral agreements; and in workplace policies and plans of action.

It sets out what a policy should address:

- the definition of workplace violence;
- a statement that no workplace violence would be tolerated, whether from within the workforce or from clients and customers;
- an engagement in support of any action targeted at creating an environment free from workplace violence and its direct adverse consequences;
- the provision of a fair complaints system that is free from retaliation and that protects against abusive or frivolous complaints;
- information, education, training and any other relevant programmes;
- measures to prevent, control and, as appropriate, eliminate workplace violence;
- measures relating to intervention and management of violent incidents;
- a commitment to effective communication of the policy;
- confidentiality.

It also exploits further which prevention measures can be taken. For example it recommends for worker training to include:

- improving the ability to identify potentially violent situations;
- improving the capacity of event appraisal, active coping and problem-solving;
- instilling interpersonal and communication skills that could prevent and defuse a potentially violent situation;
- enhancing positive attitudes towards creating a supportive environment;
- assertiveness training, as required, according to risk assessment;
- self-defence training, as required, according to risk assessment.

⁽¹⁴⁹⁾ Available at: <http://www.ilo.org/public/english/dialogue/sector/techmeet/mevsws03/mevsws-cp.pdf>

Guidelines for specific sectors and occupations should further identify the special training needs and skills required for preventing or coping with workplace violence under particular circumstances.

The code of practice also touches upon supervisor and manager training, government commitment (including financial resources to be allocated), and information to all, as well as wider communication, for example to customers and the general public. Such information should include:

- gender, multicultural diversity and discrimination to develop sensitivity to such issues, as appropriate;
- the services available to assist victims of workplace violence, and concerning assessment and referral, counselling, treatment and rehabilitation programmes;
- information on the laws and regulations covering violence which have general application, as well as those which are specific to a given workplace or service. It suggests a consistent and regularly updated violence management system documentation and access to this information, as well as how to include violence-related issues into risk assessment.

Further measures to tackle violence

Policy options and technical developments from other policy areas might help address the factors triggering violence in the transport sector.

Addressing customers

- If transport systems and services are to be used effectively, it is essential that people who need to travel are kept informed about what is available in terms of transport choices and, when they are using the system, kept up to date on the progress of their journey and of the choices and changes they may need to make. Real time information on arrivals and departures is the norm at airports and recent technological developments, particularly in the field of telematics and telecommunications (the information society), have created the scope for achieving major improvements in providing timely customer-friendly information for the urban transport user ⁽¹⁵⁰⁾. For example, there are systems which allow the time of arrival of trams and buses to be predicted and displayed at stops, or to advise car drivers of available parking spaces at a transport interchange. Such customer service may help protect transport workers who are often at the forefront and have to address customer dissatisfaction, from occurrences linked to customer reactions.

⁽¹⁵⁰⁾ The Citizens' Network: Fulfilling the potential of public passenger transport in Europe: European Commission Green Paper



Safety measures

- Telematics enables the public passenger transport operator to monitor the traffic situation, both in terms of network congestion, occupation rate and minor waiting time for the passengers. Monitoring to ensure safety is also possible and could be more widely used to prevent violence.
- Lone-workers safety systems are applied in other areas of industry. They could be adapted to the specific needs of transport branches.
- Efficient reporting systems should be put in place to address underreporting. These systems need to be linked with quick measures for action, whether to provide immediate support to workers in case of an event or counselling after the event.

Implementing policies and training

- Awareness-raising and a targeted policy to prevent and address violence should be implemented in transport organisations. When incidents occur, risk assessment and prevention measures should be revised.
- Managers and workers need training to know how they can most effectively address violence.
- Effective violence management also includes information to the customers and wider public.

2.3. WORK ORGANISATIONAL FACTORS

Staff unwittingly locked in hold during cargo flight

Two employees of a logistics company were unwittingly locked in the hold of a cargo flight from Roissy-Charles de Gaulle airport, Paris, to Vienna after a pilot closed the hatch to prevent rain ingress. The cabin was pressurised but, although the flight would have flown at lower altitude, both victims would have felt chilled on arrival.

2.3.1. Repetitive work

National surveys suggest that transport workers, at least in some professions, are more exposed to repetitive movements than the average working population.

Belgium

According to the WBM 2004, about one out of five transport workers (22.7 %) report always being exposed to repetitive hand/ arm movements at work compared to 14.8 %



on average. Some 37.9 % of the transport workers never face repetitive hand/arm movements at work (45 % of the average Flemish working population).

Spain

Transport workers consider their work slightly more repetitive than the total Spanish working population, for more than half of working day (32.6 % against 29.5 % of total workers).

Greece

According to ELINYAE transport sector survey, about 73 % of respondents report performing repetitive tasks constantly (38 %), or sometimes (35 %) in terms of their work.

Denmark

Based on the DWECS, it was found that taxi drivers experience that their job is very repetitive. They spend much of the day completing the same type of tasks and body movements. Some 11 % of the taxi drivers experienced this, which was significantly higher than the average for all occupational groups (6 %) (NRCWE, DWECS, 2005).

Finland

According to the national report on working conditions in road transport, transport workers are exposed to repetitive movements while driving, collecting bus fares, pulling and pushing of wheel racks and refuse racks, and getting on and off the vehicle. When computers are installed in confined spaces, the computers used for collecting fares on buses expose the workers, fare collectors and sometimes also the bus drivers to awkward postures of the upper body, head and upper limbs.

Germany

In 2005, repetitive work was mentioned by 76.3 % of the transport workers. Some 59.4 % said that the same work step often recurs in all details, 16.9 % sometimes. This compared to respectively 51.2 % and 20.3 % in the other sectors.

2.3.2. Pace of work, job control, job content and job support

Work pressure in the transport sector is often a result of 'just-in-time' management. A further element that impacts on workload is the introduction of a number of computer applications such as planning systems and mobile means of communication.

Several surveys reveal that transport workers, especially the drivers, are more involved in monotonous tasks and that they have less influence on their work than the average working population.

National data suggest that transport workers experience less social support from their superiors and colleagues.

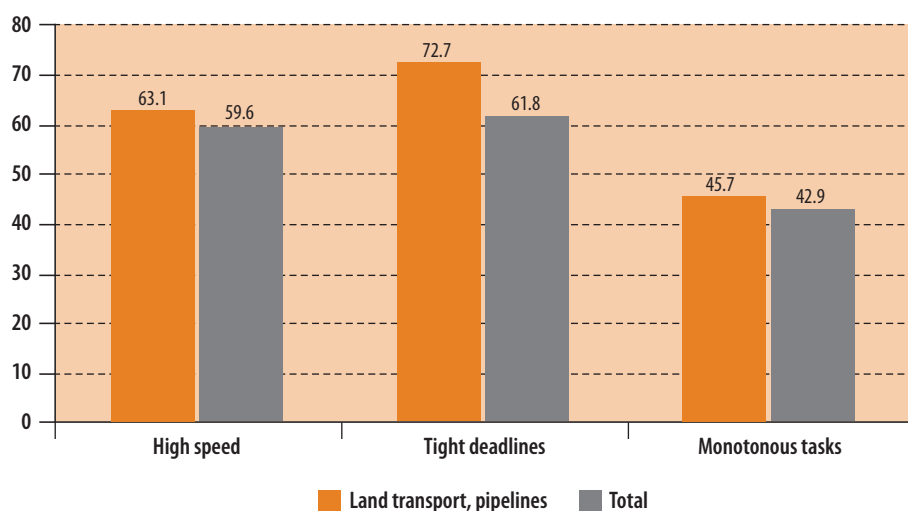


According to the EWCS 2005, as shown in the figure, the percentage shares of workers working at very high speed are slightly higher in land transport than in the overall workforce: 61.2 % of land transport workers reported working at very high speed at least 25 % of their working time, while the corresponding share for the EU-27 average was 59.6 %.

The gap is wider when it comes to work involving tight deadlines, and while 72.7 % of workers in land transport report working to tight deadlines at least 25 % of their time, the share is 61.8 % in the overall EU-27 workforce. Transport workers also scored second after construction workers on tight deadlines.

As far as the job content is concerned, in 2005, half of all workers in land transport and pipelines (49.3 %) reported carrying out monotonous tasks, while the EU-27 average was 42.9 %.

Figure 15: Overview, EWCS 2005, percentage of workers reporting monotonous work, working at high speed and to tight deadlines, EU-27, 2005 ⁽¹⁵¹⁾



Source: EWCS

Transport workers report monotonous work and work at high speed and to tight deadlines.

Workers in land transport and pipelines seem to attribute their pace of work less on the work done by colleagues than the average EU-27 workers do: 34.8 % and 42.2 %, respectively. Similarly, they also report lower than average shares of work being dependent on numerical production or performance targets (41.4 % vs. 42.1 % in the EU-27) and on direct control of the boss (32.6 % vs. 35.7 % in the EU-27).

Workers in land transport seem to attribute their pace of work less on the work done by colleagues than the average EU-27 workers. As opposed to this, they feel that their work depends more on direct demands from people and on the automatic speed of a machine/movement of a product.

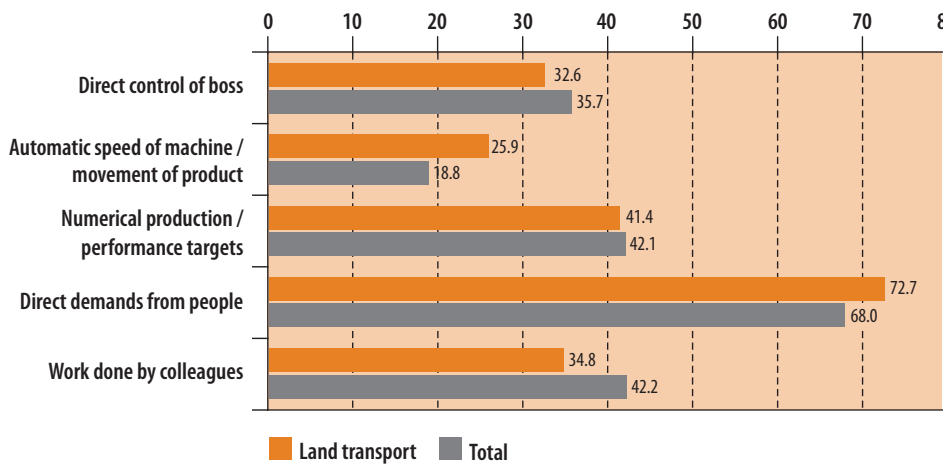
As opposed to this, land transport workers feel that their work is dependent on direct demands from people and on the automatic speed of a machine/movement of a product more frequently than the EU-27 average. As shown in the figure, 72.7 % of workers in land transport state that their work is dependent on direct demands from

⁽¹⁵¹⁾ Statistical annex EWCS 2005. Available at: http://www.eurofound.europa.eu/docs/ewcs/4EWCS/ef0698/statistical_annex.pdf



people, over the 68 % for the EU-27 average. Similarly, work being dependent on the automatic speed of a machine/movement of a product is mentioned by 25.9 % of workers in land transport, a higher share than the 18.8 % of the EU-27 average.

Figure 16: Percentage share of workers reporting work being dependent on a series of factors, land transport and total, EU-27, 2005



Source: EWCS

Work pressure in land transport is often a result of ‘just-in-time’ management. The just-in-time principle means that goods are delivered at the moment the company needs them in the production process. Because the stocks are being decreased to a minimum, a higher frequency of delivery of small amounts is necessary ⁽¹⁵²⁾.

The introduction of chain logistics is an important trend: as different transport systems work together there is an increasing need for the management of transport streams and a flexible organisation. Companies across all sectors are nowadays more concentrated on their core business, which leads to an increase in supply industries and, consequently, more transport streams as the increase in outsourcing increases the geographic spread of economic activities. Furthermore, the life cycle of products is shorter: they are replaced faster, which results in an increase in both consumption and transport.

A further element that is changing the content and workload of drivers is the introduction of a number of computer applications such as planning systems and mobile means of communication. These systems are used to organise work more efficiently and to increase quality and additional services: cost calculations may be more accurate and detailed, planning more efficient, less errors are expected and faster interventions when problems occur are possible.

Job control

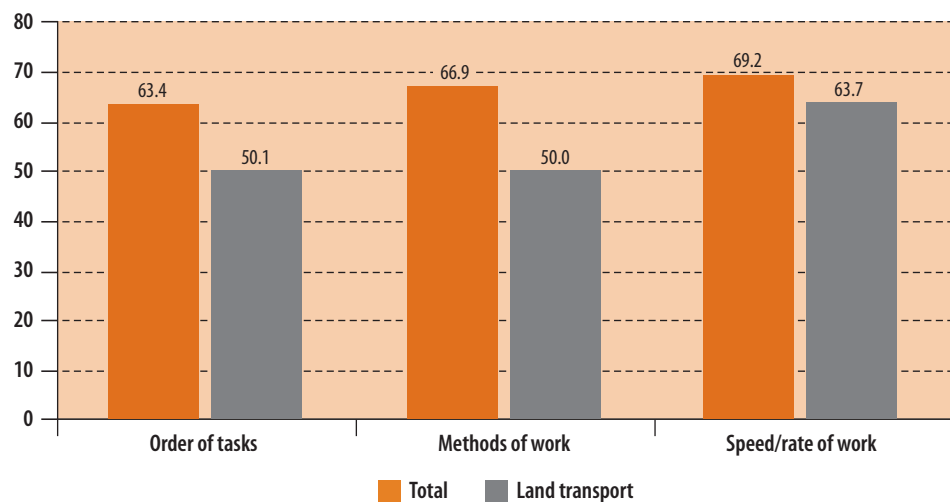
Transport workers also appear to have less job control than the average worker in the EU-27: on average, 63.4 % of workers in the EU-27 reported being able to choose/change the order of their tasks in 2005 while in land transport the corresponding share

⁽¹⁵²⁾ SERV, Onderzoek naar de kwalificatiebehoeften voor vrachtwagenchauffeur, Brussel: Sociaal-Economische Raad van Vlaanderen, 1998.



was 50.1 %. In line with this, workers in land transport too reported lower than average capability to choose or change their methods of work, 50 % and 66.9 %, respectively. Finally, when it comes to choosing or changing the speed or rate of work, again, the shares are also lower than the EU-27 average: 63.7 % and 69.2 %, respectively.

Figure 17: Percentage share of workers reporting job control over a series of factors, land transport and total, EU-27, 2005



Source: EWCS

National data

Belgium

According to the results of the WBM 2004, the figures for pace of work are slightly higher in the transport sector compared to the total working population: about 33.5 % of the transport workers report high work pressure when performing their job compared to 31 % within the total working population.

The figures for job content and autonomy are also unfavourable: about 29.3 % of the transport workers report a routine job compared to 23.8 % within the total working population and 29.1 % report insufficient autonomy when performing their job compared to 20.8 % on average.

According to the same source, workers of the transport sector more frequently report problems to do with support from the immediate management compared to the total working population. About 22 % of the transport workers report problems to do with support from the immediate management when performing their job compared to 16.1 % within the total working population.

In Belgium, about 29 % of the transport workers report a routine job and insufficient autonomy. They also work at a higher pace.





TRANSAM study — self-employment in the transport of goods sector (Belgium)

The Social Fund for Transport of Goods commissioned a market study on the sector (440 companies), called TRANSAM and performed by ECWS (see also Section 3.2.1.2). The study included both quantitative and qualitative data. Self-employed drivers mention the following as the most attractive aspects of their contract status:

- high degree of independence (47.4 %);
- having one's own truck is very important (16.4 %).

The least attractive aspects:

- driving — resting rules (32.3 %);
- social conditions (combination work/family life) (17 %) ⁽¹⁵³⁾.

Denmark

In Denmark, results were somehow in contradiction to the above:

The COPSQ ⁽¹⁵⁴⁾ asks whether it is necessary and/or important to work in a high pace and whether the pace is high throughout the day. For both bus drivers and truck drivers, it was found that their pace of work was significantly lower than the average for all occupational groups. The average index score for bus and truck drivers was 47 and 52, respectively, while overall (all occupations) it was 59. The average index score ranges from 0 to 100, with a high score indicating a highly paced job.

Some 55 % of the truck drivers report that they have to work at a high pace, which is lower than the average for all occupational groups (59 %). With regard to the work load, truck drivers also score significantly lower than the average of all groups. Some 36 % of the truck drivers report that they experience a high work load, compared to the average of 43 % in all groups. No data is available for taxi or bus drivers (NRCWE, DWECS, 2005).

The COPSQ found, not surprisingly, that bus drivers experience a low sense of variation in their job. The average index score for the bus drivers was 35, which was significantly lower than the average for all occupations (60). The index score is calculated as the average of a number of questions, and a low score indicates little variation in the job (NRCWE, COPSQ, 2004-2005).

The COPSQ indicates that both truck and bus drivers have lower influence at work than the average worker. Regarding the possibilities for development in the job, transportation workers score significantly lower than other occupational groups, indicating that their job does not necessarily teach them new things. It does not require initiative, and they do not need to use their skills or knowledge in order to do the job. The COPSQ also found that truck drivers experience a lower sense of meaningfulness in their job, than do others.

In Denmark, truck drivers have significantly less influence, lower possibilities for development and a lower sense of meaningfulness in their job.

⁽¹⁵³⁾ ECWS, TRANSAM: arbeidsmarktstudie m.b.t. de sector goederenvervoer en -behandeling voor rekening van derden, in opdracht van het Sociaal Fonds voor het goederenvervoer: Brussel, 2001.

⁽¹⁵⁴⁾ Copenhagen Psychosocial Questionnaire: national survey done by The National Research Centre for the Working Environment (NRCWE).



National surveys from Belgium and Denmark suggest that transport workers receive less social support from their colleagues and managers.

In Germany, transport workers are increasingly disturbed at work, while having very little job control. They seldom plan or organise their work themselves and a significantly higher proportion of transport workers has no influence on the amount of work.

Almost three quarters of the Finnish transport workers work at very high speed and to tight deadlines, almost half have to perform monotonous tasks.

Results from the DWECS indicate similar results. Truck drivers have significantly less influence, lower possibilities for development and a lower sense of meaningfulness in their job. Truck drivers also find less meaning in their job compared to other occupational groups.

Results from the DWECS also indicate that truck drivers experience less social support from their colleagues than other occupational groups. Some 66 % of the truck drivers, compared to 71 % in all occupational groups, indicated that they got this type of support. This result was significant, indicating that truck drivers do not get as much help and support from their colleagues as do others (NRCWE, DWECS, 2005). The COPSOQ found similar results, but for bus drivers. Asked about social support from their superiors, the bus drivers' average index score was 47, which is significantly lower than the average for all groups (62). The index score is based on questions related to receiving help, support and feedback from one's superiors (NRCWE, COPSOQ, 2004-2005).

Germany

Working under time and performance pressure has become a high risk factor in transport. In 2005, as many as 81.3 % (57.4 % often and 23.9 % sometimes) of the respondents from the transport sector have mentioned it. Workers are worried by the fact that small mistakes can cause high financial losses, possibly meaning that short moments of inattention of truck drivers can cause severe accidents. In 2005, 47.5 % of transport workers mentioned this risk compared to 35.7 % of respondents in other sectors.

More transport workers (59.3 % (40.8 % often and 18.5 % sometimes) compared to 48.3 % (22.4 % often and 25.9 % sometimes) in other sectors) report that their work is stipulated in detail. Less of the transport workers often decide about breaks (54.3 % as compared to 55.8 % in other sectors). On the other hand, transport workers (34.9 %) are less often but increasingly (up from 27.7 % in 1998/99), disturbed at work than workers in other sectors (46.4 %).

Compared to other sectors, the transport workers have less self-responsibility: 34.1 % of them never or seldom plan and organise their work. They also have less influence on the amount of work: 59.4 % of transport workers seldom or never decide compared to 41.3 % in other sectors.

Greece

According to the transport sector survey conducted by ELINYAE, about 73 % of respondents consider their job rather monotonous. According to TRIA project, some 40.2 % of transport workers report performing monotonous and routine tasks in terms of their job.

Finland

According to the report 'Work and health country profiles of twenty-two European countries' (Rantanen et al 2002) addressing national data for indicators of psychosocial factors, transport workers report the following related to working conditions:

- hasty work 44.8 %
- working at very high speed 71 %
- working a tight deadlines 72 %



- rate of work not changeable 28 %
- methods of work not changeable 26 %
- monotonous tasks 47 %

Almost three quarters of the Finnish transport workers work at very high speed and to tight deadlines, almost half have to perform monotonous tasks.

Spain

Most of the Spanish working population — and so do transport workers — point out a normal work quantity and time enough to do their job. Data also expose they need less speed on work pace during the working day. When high speed is required, it is mainly determined by deadlines to achieve and traffic.

About 74.5 % of the transport workers indicate they have always, almost always or often time enough to do the job compared to 73.1 % of the average Spanish worker. About 46.80 % report they have always, almost always or often tight deadlines compared to 45.70 % for the average Spanish worker.

32.6 % reports working at high speed for more than half of the work day compared to 40.10 % of the average Spanish worker. 13.9 % reports working at high speed between half and ¼ of the work day compared to 31.4 % of the average Spanish worker.

This is in line with the data collected in the transport survey ISCIII, where workers were asked if they have enough time to do the job, almost 46 % answered that 'always or almost always', 18 % that frequently, and 7 % answered that never.

43 % answered that they have to keep a high pace of work at least half of the day, 13 % that between a quarter and half their working time, 21 % than less than a quarter and 22 % that never. They were concerned about the level of attention because 87 % have to keep a high level of attention more than 1/2 of the day.

According to the ENCT 2003, most of the total Spanish workers (61.6 %) do not consider their tasks at work as monotonous. The same is true for the transport workers (62.9 %). In the transport survey ISCIII, workers were asked if monotony while driving was annoying, more than 24 % answered that 'a lot' or 'quite a lot', 17 % that it was regular, 14 % that little and 44 % answered that it was not annoying.

Transport workers report very low level of autonomy on their job.

- Almost twice as many than on average (35.6 % compared to 19.3 %) can never decide on task order;
- 43.0 % compared to 29.4 % not on their work method
- 34.8 % compared to 25.2 % not on pace of work,
- And 18 % vs. 10 % on average cannot decide over length or frequency of breaks.

In Spain, transport workers report very low levels of autonomy on their job: more than one third can never decide on task order and pace of work, almost half not on the work method, and 20 % have no influence over frequency and length of breaks.





Physical and mental workload of flight attendants (France)

Between 2000 and 2004 INRS carried out a study ⁽¹⁵⁵⁾ on the relationship between job requirements and the physical, mental and emotional loads on short and medium haul flight crews.

Results highlight the physical risks (noise levels, low humidity levels, spinal problems) and the psycho-social and organisational risks (multiple constraints in flight organisation, relatively high levels of physical load, high stress situations). Suggested actions are based on preventing occupational accidents, improving work spaces, reducing workloads, fatigue and stress and lowering sources of irritation in everyday life.

2.3.3. Skills, training, information

Data are scarce on the access of transport workers to training, but some surveys indicate that transport workers have less training opportunities, although the demands on them due to the increasing use of highly technical equipment are rapidly increasing.

The introduction of a number of computer applications such as planning systems and mobile means of communication changes the content and workload of drivers. Transport workers have to learn how to operate these computer applications — not a simple task. This increases the need for adapted and sufficient training.

Some national data:

Belgium

According to the results of the WBM 2004, 29.4 % of the transport workers report insufficient or no learning opportunities compared to 22.6 % within the total working population.

Spain

Most transport workers proclaim that there is no special knowledge required to do their job but rather professional training knowledge (53.8 %) compared to 37.4 % for the total of workers. Transport workers in many cases have the chance of applying knowledge and skills on the job (53.1 % in contrast to 38.7 % on average).

Greece

According to TRIA project, about 77 % of transport workers have undergone some sort of training in order to identify and evaluate risks at workplace.

⁽¹⁵⁵⁾ François, M., Liévin, D., Mouzé-Amady, M. Activité, charge de travail et stress du personnel navigant des compagnies aériennes. La situation dans les courts et moyens courriers. Documents pour le médecin du travail, TC 115, No 111, 3ème trimestre 2007.



Additionally, regarding the duration of received training, about half of respondents (49 %) have been subject to training on identifying and evaluating the risks of work for more than a week, while another 26.5 % have undergone training for a week or so.

Germany

About 78.8 % of the transport workers claim they cope with the requirements to scientific knowledge and abilities compared to 81.6 % in the other sectors. Some 23.7 % of the transport workers report that often or sometimes new tasks are required for which they are not skilled compared to 39.1 % in the other sectors. Some 35.5 % of the transport workers report that often or sometimes necessary information was held back compared to 37.3 % in the other sectors.

2.3.4. Technology applications in road transport

The introduction of a number of computer applications, such as planning systems and mobile means of communication is changing the content and workload of drivers. The following types of telematic applications are already partly present in the sector and will develop further in the future.

- On-board computer: computer installed in the vehicle and used for digital registration of data regarding the journey, the vehicle and the driver. The computer can be linked to a communication system (mobile phone, satellite). The advantages of this system are: less administration, precise management information, more efficient control of the driver, decrease in fuel and better client report. It also makes it possible to dedicate more attention to the driving task. However, disadvantages also exist: technical problems such as no linking of on-board computer software with the home software, how to select 'interesting' and 'necessary' information, input mistakes by the driver; manual input while driving can also cause disturbance to the driver and can therefore increase accident risk.
- Navigation systems: information regarding the route. Information is given visually on a computer screen and/or spoken. Advantages mentioned: time saving, decreased kilometres and less fuel consumption.
- A compulsory digital tachograph that monitors compliance with rules regarding driving and resting times, using a smart card that registers the individual driver's behaviour for the last 30 days.
- Planning systems used by a dispatcher to plan duration and costs of journeys. Disadvantages are unforeseen disturbances that are not calculated in the planning, e.g. traffic accidents can be partly addressed by simulations.
- Tracking, tracing and fleet-management systems to follow or search for vehicles or loads, often using barcodes for registration of loads. Using these systems would increase efficiency, provide better service to clients and decrease communication needs.
- Other planning systems: exchange freight systems, document change systems.

A mobile phone is the telematics application most often used because the main advantage is the possibility to communicate interactively at any time.

In general, the following advantages of new technologies are acknowledged by drivers: increased safety, reachable for family, correct and equal treatment of all drivers, less administration, less time-consuming. However, these applications are also creating a



certain degree of uneasiness, confusion and irritation amongst the drivers who raise a number of questions, such as:

- How do they find out about what exactly is logged by the computer?
- Are these data also used to calculate wages?
- Can the mobile phone be turned off during rest breaks?
- Can it also be used for personal use?

In addition, lorry drivers have to learn how to operate these applications — not necessarily a simple task, which may lead to extra stress. The risk of these systems is that they become more and more complex, which in turn increases the need for continuous adapted and appropriate training ⁽¹⁵⁶⁾ ⁽¹⁵⁷⁾.



Contributions of human factors in occupational injuries and their associations with job, age and type of injuries in railway workers (France)

In 2007 a study ⁽¹⁵⁸⁾ was carried out among railway workers aiming to assess the impact of environmental hazards, technical dysfunctions, lack of work organisation, know-how and job knowledge, and other human factors in occupational injuries and their relationships with occupation, age and type of accidents in railway workers. Results showed that environmental hazards were involved in 24.7 % of occupational injuries, technical dysfunctions in 16 %, lack of work organization in 13.7 %, lack of know-how in 17.6 %, lack of job knowledge in 5.2 %, and other human factors in 31.9 % of occupational injuries. Findings also revealed that:

- injuries caused by lack of know-how or job knowledge were more frequent among workers aged less than 30;
- those triggered by environmental hazards were more common in energy and electrical traction maintenance operators and train drivers;
- injuries caused by lack of work organisation were more frequent in mechanical maintenance operators and in energy and electrical traction maintenance operators.

The causes considered were strongly related with the type of injuries. This study found that the aspects considered — environmental hazards, technical dysfunctions, lack of work organisation, lack of knowledge and other human factors — had a significant influence in occupational injuries and they were related to the actual job performed, age and the type of injuries.

⁽¹⁵⁶⁾ European Foundation for the Improvement of Living and Working Conditions, EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.

⁽¹⁵⁷⁾ SERV, Flexibilisering van werk- en levertijden in het goederenvervoer: een aanbeveling van de Sectoriële Commissie Goederenvervoer, Brussel: Sociaal-economische Raad van Vlaanderen, 1999.

⁽¹⁵⁸⁾ Chau, N.; Chauchard, G.C.; Dehaene, D. Contributions of occupational hazards and human factors in occupational injuries and their associations with job, age and type of injuries in railway workers. International Archives of Occupational and Environmental Health, Germany, Vol. 80, No 6, May 2007, pp. 517-525.

2.4.

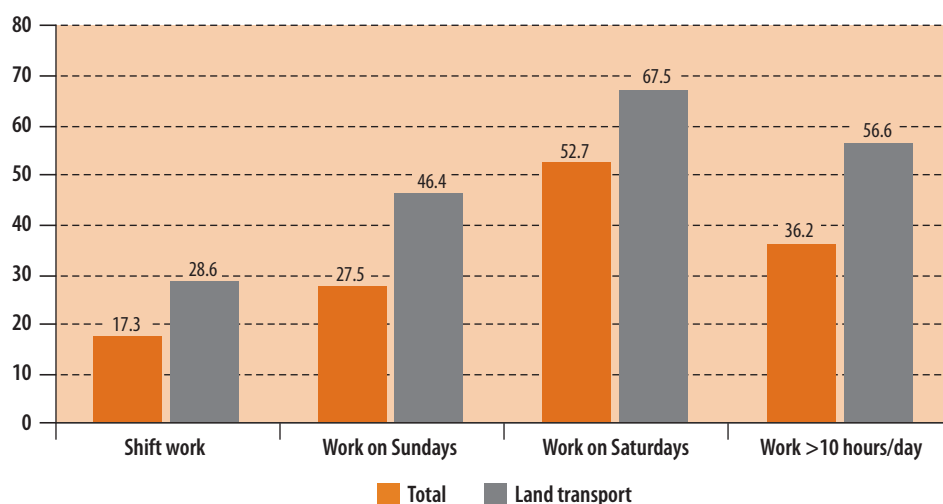
WORKING TIME

2.4.1. Working time — length, shift work, weekend work

Working in the transportation sector is not characterised by the typical '9 to 5' working hours. National and European studies indicate that transport workers consistently report long working days and weeks, working weekends and shifts. Working time patterns for transport workers are also more irregular and unforeseeable than for the average worker.

In several countries, at least twice as many transport workers than on average work night shifts, especially taxi and bus drivers, and the trend is increasing.

Figure 18: Overview working time — length and working time patterns, percentage share of workers, EWCS 2005 ⁽¹⁵⁹⁾



Source: EWCS

Working in this sector is not characterised by the typical '9 to 5' working hours. According to the EWCS 2005, 26.8 % of the transport workers reported they work shifts, against an average 16.1 %. Transport workers also seem to work more often on Saturdays and Sundays and more than 10 hours a day. According to the EWCS,

- 49.5 % declared never working on Sundays (against 67.5 % on average),
- 10.9 % declared working once a month on Sundays (against 7.4 %),
- 18 % twice a month (against 9 %),
- 4.7 % three times a month (against 2.6 %),

⁽¹⁵⁹⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound), data extracted by Prevent for OSH Data Collection 2007, Available at: <http://www.eurofound.europa.eu/working/surveys/index.htm>



Transport workers work more shifts, longer hours and more Saturdays and Sundays than workers across all sectors.

Statistics reveal that 45 % of the fatal accidents happen at night, although there is much less traffic.

- 11.1 % four or five times a month (against 10.9 %).

Likewise,

- 29.6 % declared never working on Saturdays (against 43.3 %),
- 8.8 % declared working once a month on Saturdays (against 9 %),
- 23.6 % twice a month (against 14.7 %),
- 7.3 % three times a month (against 4.3 %),
- 25 % four or five times a month (against 26.1 %).

Finally,

- 43.1 % declared never working more than 10 hours a day (against 59.7 %),
- 14 % declared working more than 10 hours a day 11–20 times a month (against only 5.9 %),
- and 6.8 % more than 20 times a month (against 4.2 %).

There are a number of scientific studies reporting the negative health effects of non-standard working hours and possible related psychosocial problems, both short-term and long-term associated health effects. Additional problems may also occur in specific risk groups. For example, with regard to female workers, problems concerning reproductive health have been observed. Since the attraction of female workers to the profession is mentioned as one of the solutions for the employment problem in the sector, attention must be given to this specific issue. Regarding older workers, increased fatigue problems may occur and, since the number of elderly workers in transport is increasing, even at a faster pace than in the average working population in some subsectors, more attention should be devoted to this issue too ⁽¹⁶⁰⁾.



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Regarding specific work risk-related accidents on the road, statistics reveal that 45 % of the accidents with fatalities happen at night, although there is far less traffic at night. It can be concluded that if an accident occurs at night, the risk for a serious accident is much higher ⁽¹⁶¹⁾.

Irregular and long working hours are also one of the most recognised causes for fatigue in transport workers and one of the main causes for accidents at night is fatigue. The link between non/standard working time patterns and fatigue is also underpinned by national studies as mentioned below and studies on fatigue-related accidents. However, policies on working time issues vary considerably depending on the subsector in question. While working times have been discussed extensively lately for road transport, due to the

⁽¹⁶⁰⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.

⁽¹⁶¹⁾ BIVV, Jaarverslag 2000: Verkeersveiligheid, 2000.

alarming figures of fatal accidents, a lot still remains to be done regarding the other transport subsectors and public transport.

Further details and in-depth studies on health effects, especially fatigue-related issues, are provided in Section 3.4.6 of this report.

Belgium ⁽¹⁶²⁾

Irregular working time patterns, i.e. night work and working overtime, are common in the transport sector. The results of the WBM 2004 show that about 6.9 % of the transport workers always work at night compared to 2.2 % within the average Flemish working population, and fewer workers report never working at night (61.6 % vs. 78.8 %). Also, 21.5 % of the transport workers report always working overtime compared to 9.9 % on average. Some 15.4 % of the workers in transport report never working overtime compared to 22.6 % on average.

Denmark ⁽¹⁶³⁾

Transportation workers report long working days and weeks in the DWECs. For both truck and taxi drivers this is significantly higher than the average for all occupational groups. Some 48 % of the taxi drivers and 42 % of the truck drivers report long work weeks, compared to an average for all occupational groups of 15 %. Similarly, 42 % of the truck drivers report long work days, which is also significantly higher than the overall average (10 %).

According to the same source, varying working hours are also an issue among transportation workers. Some 20 % of truck drivers, compared to 10 % within all occupations, report working evenings. Night work is another characteristic feature: for all three groups of transportation workers considered in the survey (bus, taxi, and truck drivers), it is significantly more common to work at night than for other occupations. Some 7 % of the truck drivers, 29 % of taxi drivers and 23 % of bus drivers report working at night. This is significantly higher than the overall average (3 %).

Spain

The majority of transport workers (66.2 %) work between 36–40 hours, compared to 59.56 % for the average Spanish worker. There is a small variation on the flexibility of the schedule: transport workers have a slightly better chance of accommodating or choosing their work schedule (27.6 % vs. 23.5 % for the whole working population).

In the transport survey ISCIII, workers were asked how many hours per week they drive: almost 48 % drive 45–50 hours and 22 % 40–45 hours.

According to the ENCT 2003, transport workers work shifts more often than the average:

- morning/afternoon shifts are applied for 14.7 % compared to 6.70 % of the total;
- morning/afternoon/night shifts for 6.3 % of the transport workers against 5.7 % of the total.
- working on weekends is very frequent among transport workers: 27.2 % work always or often on Saturdays (vs. 21.6 %) and 22.7 % on Sundays (compared to 10.8 %).

Irregular and long working hours are also one of the most recognised causes for fatigue in transport workers.

In Belgium, irregular working time patterns, i.e. night work and working overtime, are common in the transport sector: almost three times as many workers as on average, 7 %, always work at night. More than twice as many work overtime.

40–50 % of taxi and truck drivers in Denmark reported long working days or weeks. This is three times as much as on average. The number of working hours has increased in all sectors, but transport has experienced one of the highest increases, an average of 3.5 hours a week in 10 years.

In Denmark, in 2005, 7 % of the truck drivers, 29 % of taxi drivers and 23 % of bus drivers reported working at night. That is twice to 10 times more than on average.

⁽¹⁶²⁾ European Foundation for the Improvement of Living and Working Conditions, EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.

⁽¹⁶³⁾ NRCWE, Danish Working Environment Cohort Survey, DWECs, 2005.



In the transport survey ISCI, workers were asked if they drive at night: almost 10 % said 'always', 20 % 'only a few nights per week', 22 % 'exceptionally' and 32 % 'never'. Some 16 % couldn't give an average.

Workers were also asked if they work on Saturdays: almost 7 % said 'always', 10 % 'often', 37 % said 'sometimes' and 46 % 'never'. Questions about Sunday work give the result that almost 7 % said 'always', 8 % 'often', 35 % 'sometimes' and 48 % 'never'.

Greece

Some indication regarding working time patterns of transport workers is provided from the TRIA project: 12.7 % of respondents report working long hours or in poorly organised shifts. However, a large portion of 60.8 % appears to be satisfied with its daily work schedule. In addition to the above, according to the transport sector survey of ELINYAE, 79.5 % of Greek transport workers usually have standard 8-hour shifts. On the other hand, about 20.6 % of respondents report that they have to work more than normal working hours from time to time.

Finland

In the transport sector long workdays are common. In a survey among tank and wood drivers, over 90 % of the respondents (n=72) reported that they work over 10 hours per day.

According to Work and Health Survey 2006, 51 % of the workers in the transport sector reported doing night work at least once a month, and 50 % reported that they work during weekends. Both night work and weekend work has increased about 10 % since 2003.

Germany

There is a difference between the actual weekly working time and the weekly working time as contracted. Some 38.5 % of the transport workers report working between 40 and 47.9 hours, although the majority only hold contracts for 35 to 39.9 hours. According to the BIBB/IAB survey 1998/99, 37.6 % of the respondents of the transport sector regularly worked overtime.

There is also an increasing trend to shift work to be observed. In 2005, the percentage was twice as high as in other sectors. Some 51.5 % work shifts in the transport sector, compared to 24.9 % in other sectors. Also the percentages for work on Saturday, Sunday or holiday or for night work are extremely high:

- 77.9 % work on Saturday compared to 69.1 % in other sectors;
- 61.3 % works on Sunday compared to 42.4 % on average;
- 55 % of the transport workers work between 23.00 and 5.00 compared to 22.7 % in the other sectors.

In Finland, in transport, both night and weekend work have increased about 10 % since 2003.

In Germany, the percentage of transport workers working shifts is increasing: in 2005, it was twice as high as in other sectors. More than half of the transport workers work night shifts. Almost 40 % worked overtime.



2.4.2. Case studies and initiatives — working time issues and work organisation

To underline the abovementioned findings, this section presents some studies and initiatives regarding working time issues in the transport sector. Further studies and good practice examples regarding fatigue monitoring, technical and organisational measures to address related risks, and recommendations for monitoring and prevention are included in Sections 3.4.5 and 3.4.6 (fatigue) and 3.1.5 (accident prevention) of this report.



Connections between the safety, logistics, working conditions and professional attractiveness of road transport (Finland)

According to this review, from the drivers' point of view, working time is an important factor of working conditions. Irregular work, staying awake, driving during the night and long workdays are reported strain factors at work. Health hazards connected to unusual working times, like insomnia, long-term tiredness and symptoms of the digestive system were found to be common and to affect the health and well being of the workers. Results also showed that night work especially increased the risk of coronary disease and it had an effect on reproductive health disorders.

According to this research, experience of tiredness is quite common among drivers. Approximately two out of three drivers have experienced tiredness more than once. The most common reason for tiredness is lack of sleep. Workers feel most tired between one and six o'clock in the morning and in the afternoon. Night work is thus a risk from the safety aspect, too. Tiredness and falling asleep while driving was found to explain almost 20 % of the traffic accidents causing deaths ⁽¹⁶⁴⁾.



Working hours in various occupational groups (Denmark) ⁽¹⁶⁵⁾

In 2006, the Economic Council of the Labour Movements investigated the development in working hours of various main occupational groups between 1995 and 2006. The average working hours were calculated based on national statistics of wage earners' factual working hours.

It was found that the overall average number of working hours has increased by 62 hours in the past 10 years. This equals approximately 1.5 hours a week. Basically, the number of working hours has increased in all sectors, but the transportation sector (which in this case also included post and telegraph workers), had experienced one of the highest increases, together with the building and construction sector, and the industry sector. In 1995, an average employee in the transportation sector worked 1 663 hours a year (weekly average of 36.9 hours for 45 weeks). In 2005, a transportation worker would work 1 800 hours a year, equalling 40 hours a week. Between 1995 and 2005, this adds up to 3.1 extra hours a week, more than twice as much as on average.

⁽¹⁶⁴⁾ Connections between the safety, logistics, working conditions and professional attractiveness of road transport, FIOH 2006.

⁽¹⁶⁵⁾ Economic Council of the Labour Movement, 2006. Available at: <http://www.ae.dk/files/arkiv/erhverv-samfund/2006/Arbejdstid-m-res-sha.pdf>





Night work and breast cancer risk ⁽¹⁶⁶⁾

The authors conducted a systematic review and meta-analysis of observational studies to assess the effects of night work on breast cancer risk. Based on 13 studies, including seven studies of airline cabin crew and six studies of other night shift workers, the authors found a similar significant elevation of breast cancer risk among female airline cabin crew, and female night workers separately. Light at night exposure reduces nocturnal melatonin levels, providing a mechanism by which such exposures could affect the development of breast cancer. Other studies on the effect of cosmic radiation and on cancer incidence among airline crew have found a possible enhancing effect of cosmic radiation.



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In Denmark, in 2008, in 38 out of 75 cases, breast cancer after night-shift work was recognised as an industrial injury after submission of the claim to the Occupational Diseases Committee. Compensation was granted in all recognised cases except one. The compensation is paid by the employer's industrial injuries insurance. The claims were recognised after the Occupational Diseases Committee, in November 2007, discussed a review of the epidemiological evidence between night-shift work and the risk of breast cancer and other cancers.

⁽¹⁶⁶⁾ Megdal S.P., Kroenke C.H., Laden F., Pukkala E., Schernhammer E.S., Night work and breast cancer risk: a systematic review and meta-analysis, *Eur J Cancer*. 2005 September; 41(13):2023-32.

European Agency for Safety and Health at Work

EUROPEAN RISK OBSERVATORY REPORT

3.

HEALTH OUTCOMES



The following part of this thematic report addresses the work-related health outcomes within transport workers. These outcomes are divided into:

- occupational accidents
- occupational diseases
- self-reported health problems.

These risks are often linked to certain groups (e.g. specific sub sector, older workers, etc.). Therefore, case studies and additional research information will complete the general figures.

3.1. OCCUPATIONAL ACCIDENTS

3.1.1. Occupational accidents — EU figures

In 2006, 194,734 non-fatal and 575 fatal accidents occurred in transport, according to ESAW. Therefore, transport represented approximately 6.1 % of all non-fatal and 15.5 % of all fatal accidents.

In recent years, the number of (non-) fatal occupational accidents in transport have slightly gone down but the percentage share of transport in the total has increased.



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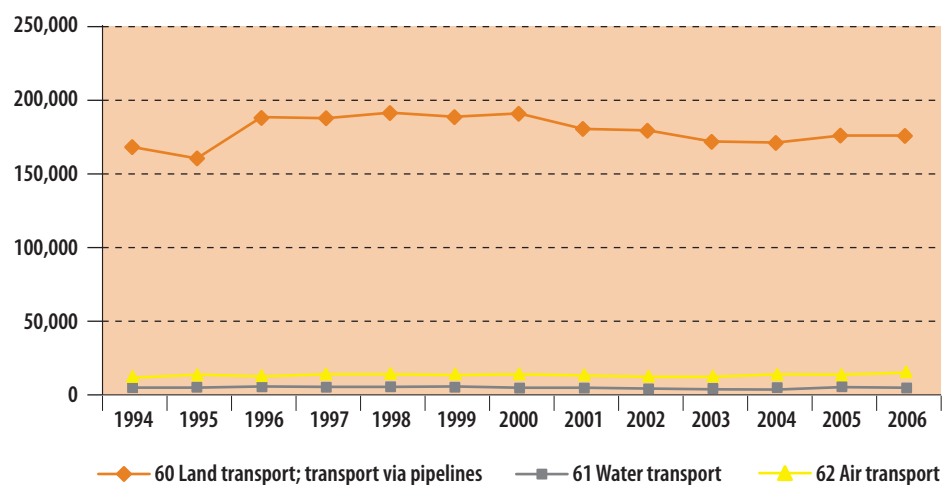
In 2006, about 194,734 non-fatal accidents occurred in transport and 3,217,882 in the total workforce, according to ESAW. Transport hence represented over 6 % of the total number of non-fatal occupational accidents (reported occupational accidents with more than three working days lost). In recent years, the number of non-fatal occupational accidents has remained relatively stable in transport but its percentage share in the total has increased due to the drop in the number of non-fatal accidents in the total workforce.

Most non-fatal accidents in transport occur in land transport and transport via pipelines, making up 90.1 % of all accidents in transport in 2006. This sub sector is followed by air transport, which represents 7.8 % of all accidents in transport, while transport over water concentrates the remaining 2.1 % of all non-fatal accidents in transport.

Table 15: Percentage distribution of non-fatal occupational accidents (more than three days lost) in EU-15 among transport subsectors and percentage share of non-fatal occupational accidents in transport in the total, 1994–2006

Year	60 Land transport; transport via pipelines	61 Water transport	62 Air transport	Total transport
1994	91.0	2.6	6.4	3.8
1995	89.9	2.7	7.4	3.7
1996	91.7	2.3	6.0	4.3
1997	91.3	2.2	6.6	4.5
1998	91.2	2.2	6.6	4.5
1999	91.4	2.3	6.4	4.3
2000	91.5	2.1	6.5	4.3
2001	91.5	2.0	6.5	4.2
2002	92.2	1.7	6.1	4.4
2003	91.9	1.7	6.4	4.5
2004	90.9	1.9	7.2	4.7
2005	90.7	2.5	6.8	4.9
2006	90.1	2.1	7.8	6.1

Source: ESAW - Codes according to NACE Rev. 1.1

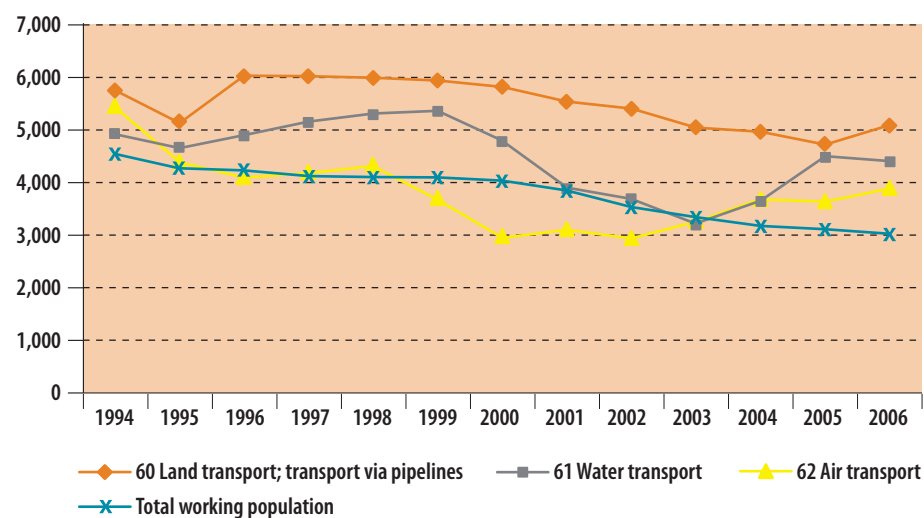
Figure 19: Number of non-fatal occupational accidents (more than three days lost) in transport subsectors in EU-15, by transport subsector, 1994–2006


Source: ESAW - Codes according to NACE Rev. 1.1



The incidence rate (ESAW) of non-fatal occupational accidents has decreased in the total working population between 1994 and 2006, as it has been the case in all three transport subsectors. However, while in the total working population the downward trend has been constant, in transport the evolution has been somewhat different. For instance, in water transport there was a reduction until 2003, after which the incidence rate of non-fatal occupational accidents has increased again. The same holds for air transport, with the increasing trend starting in 2002. The evolution in land transport has been more similar to that in the overall workforce, but in 2006 the downward trend witnessed since 1996 seems to have been broken, with an increase from 4,716 non-fatal occupational accidents per 100,000 workers in 2005 to 5,072 in 2006.

Figure 20: Incidence rate per 100,000 workers of non-fatal occupational accidents (more than three days lost) in EU-15, by transport subsector and total working population, 1994-2006



Source: ESAW - Codes according to NACE Rev. 1.1

As far as fatal accidents are concerned, in 2006 about 575 fatal accidents occurred in transport (about 3,715 in the total working population) according to the ESAW. Transport therefore represented approximately 15.5 % of the total number of fatal occupational accidents in 2006, up from 11.1 % in 1994.

Most fatal accidents in transport occur in land transport and transport via pipelines, making up 95.7 % of all accidents in transport in 2006. Water transport represents 2.6 % of all fatal accidents in the sector and air transport the remaining 1.7 %.

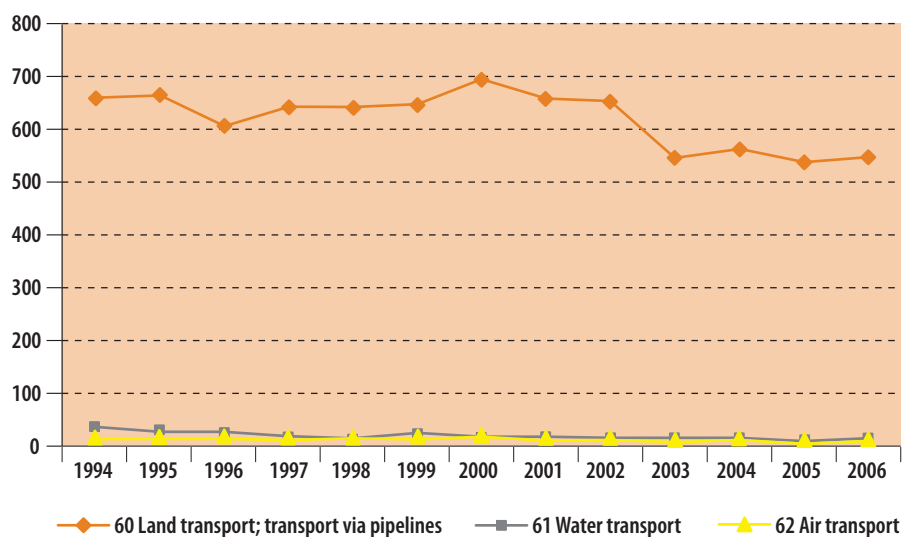


Table 16: Percentage distribution of fatal occupational accidents among transport subsectors in EU-15 and percentage share of fatal occupational accidents in transport in the total, 1994–2006

Year	60 Land transport; transport via pipelines	61 Water transport	62 Air transport	Total transport
1994	92.30	5.30	2.40	11.10
1995	93.30	4.20	2.50	11.50
1996	93.50	3.80	2.60	11.70
1997	95.30	2.70	2.10	12.10
1998	95.40	2.10	2.50	12.30
1999	94.50	3.30	2.20	13.00
2000	94.60	2.40	3.00	14.10
2001	95.80	2.30	1.90	14.00
2002	95.60	2.20	2.20	14.30
2003	96.10	2.50	1.40	12.40
2004	95.00	2.70	2.40	13.60
2005	97.30	1.60	1.10	13.80
2006	95.70	2.60	1.70	15.50

Source: ESAW - Codes according to NACE Rev. 1.1

Figure 21: Number of fatal occupational accidents in EU-15, by transport subsector, 1994–2006



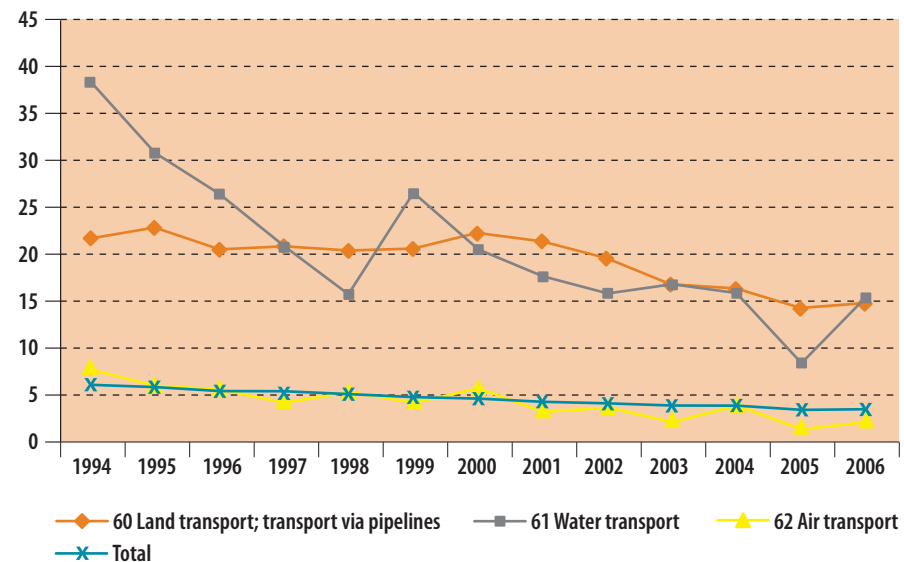
Source: ESAW - Codes according to NACE Rev. 1.1

The incidence rate of fatal occupational accidents has decreased in the total working population, from 6.1 per 100,000 workers in 1994 to 3.5 in 2006. All transport sub



sectors have seen a reduction, too, during this period of time, the biggest being recorded in air transport and water transport — despite the increase witnessed in the latter in 2006. Transport over land and via pipelines (14.7) and transport over water (15.3) reported a higher than average (3.5) incidence rate of fatal accidents in 2006, while the corresponding one in air transport (2.1) was below the average.

Figure 22: Incidence rate per 100,000 workers of fatal occupational accidents in EU-15, by transport subsector and total working population, 1994–2006



Source: ESAW - Codes according to NACE Rev. 1.1



Accident in a funicular tunnel (Austria) ⁽¹⁶⁷⁾

The Kaprun disaster was a tunnel-bound cable car fire that occurred in an ascending railway car in Kaprun, Austria, on 11 November 2000. The disaster claimed the lives of 155 people, leaving 12 survivors. The victims were skiers and transport staff on their way to the glacier.

On 11 November 2000, 161 passengers and the conductor boarded the funicular train for an early morning trip to the slopes. After the passenger train ascended into the tunnel shortly, the electric heater in the unattended conductor's cabin at the lower end of the train caught fire. The fire melted through plastic pipes carrying flammable hydraulic fluid from the braking system, and the resulting loss of fluid pressure caused the train to halt unexpectedly (this was a standard safety feature). The train conductor, who was in the cabin at the upper end of the train, realised a fire had broken out, reported it to the control centre, and attempted to open the hydraulically operated train doors, but the system pressure loss prevented them from operating. The train conductor then lost contact with the control centre because the fire burned through a power cable running the length of the track, causing a total blackout.

⁽¹⁶⁷⁾ Adapted from: http://en.wikipedia.org/wiki/Kaprun_disaster



The passengers, by this stage aware of the fire and unable to exit through the doors, attempted to smash the break-resistant acrylic glass windows in order to escape. Eleven passengers from the rear of the train who successfully broke a window followed the advice of another escaped passenger who had been a volunteer fire fighter for 20 years, and travelled downward past the fire and below the smoke.

Many of the still-trapped occupants had by now lost consciousness due to toxic fumes. Eventually, the conductor was able to unlock the doors, allowing them to be manually forced open by the remaining conscious passengers who spilled out into the tunnel and fled upwards and away from the fire. Apparently,



© Paco Ayala/Fotolia

in addition, emergency tunnel doors that were supposed to close during a fire — to prevent the air from feeding any flames — failed to operate. The tunnel acted like a giant chimney, sucking oxygen in from the bottom and rapidly sent the poisonous smoke, heat and the fire itself billowing upwards. All the passengers ascending on foot, as well as the train conductor, were asphyxiated by the smoke and then burned by the raging fire.

The conductor and the sole passenger on the railway's second train, which was descending in the same tunnel from above the burning carriage, also died of smoke inhalation.

The smoke kept ascending the tunnel, reaching the Alpine Centre located at the top end of the track 2,500 metres away. Two fleeing workers in the Alpine Centre, upon seeing the smoke, alerted employees and customers and escaped via an emergency exit. They mistakenly left the exit doors open, a factor which increased the chimney effect within the tunnel by allowing air to escape upwards more quickly and further intensifying the fire. Meanwhile, the centre was filled with smoke and all except four people escaped the centre. Firefighters reached the centre and saved one of the four, while the other three were asphyxiated.

The 12 survivors of the disaster were the passengers who travelled downhill past the fire at the rear of the train, escaping the upward-rising fumes and smoke.

Nearly one year after the fire, the official inquiry determined the cause was the failure, overheating and ignition of one of the electric heaters installed in the conductor's compartments that were not designed for use in a moving vehicle. A slow leak of highly flammable hydraulic oil was ignited by the burning heater, which in turn



melted the plastic fluid lines further feeding the flames, and also resulting in the hydraulic pressure loss which caused the train to stop and the doors to fail.

A number of organisations have since analysed the incident. One of the issues was that the designers complied with the regulations for a funicular. However, the regulations were designed for a funicular operated outdoors, not a train in a tunnel ⁽¹⁶⁸⁾.

A coordinated fire alarm and emergency plan tailored to the actual rather than to standard conditions, and regular training of the workers may also have helped prevent some of the tragic deaths.

Following a series of similar tunnel accidents, tunnel safety was also addressed in the Fifth EU research Framework programme ⁽¹⁶⁹⁾.

3.1.2. EU accident figures by gender

Female airline worker crushed in luggage elevator ⁽¹⁷⁰⁾

A 21-year female employee of an airline sustained fatal crush injuries in an accident in a baggage lift. The small elevator, owned by the airport, is located under the passenger jetway and transfers luggage to a loading ramp. The victim sustained blunt force injuries to the chest.

The analysis of the statistics on occupational accidents by gender reveals that male workers in transport suffer from more accidents than their female counterparts in the EU-15, which is somehow to be expected due to their higher employment figures. Data from 2006 show that 93.7 % of all non-fatal occupational accidents (leading to more than three days of absence from work) in land transport affected male workers, while the remaining 6.3 % involved women. The gender gap is slightly smaller in water transport, where women made up 11.3 % of all non-fatal occupational accidents in 2006 while in air transport, almost one third of all non-fatal occupational accidents (32.2 %) in 2006 involved women.

The overall figures for transport are very much determined by the findings in land transport, the biggest transport subsector, with 91.6 % of all non-fatal occupational accidents affecting male workers and 8.4 % involving female workers. As far as the overall workforce across all activity sectors is concerned, the difference between genders is narrower than in transport but still, men reported a significantly larger share than women in the total of non-fatal occupational accidents in 2006: 81.7 % and 18.3 %, respectively.

⁽¹⁶⁸⁾ Beier, B. Principles of the single European market: Integrating fire safety and law, at the symposium 'Fire and Building safety in the single European market — does the CE compliance ensure fire safety?', Royal Society of Edinburgh, abstract and presentation available at: <http://www.see.ed.ac.uk/FIRESEAT/files08/Slides8Beier.pdf>, <http://www.see.ed.ac.uk/FIRESEAT/files08/08-Beier.pdf>.

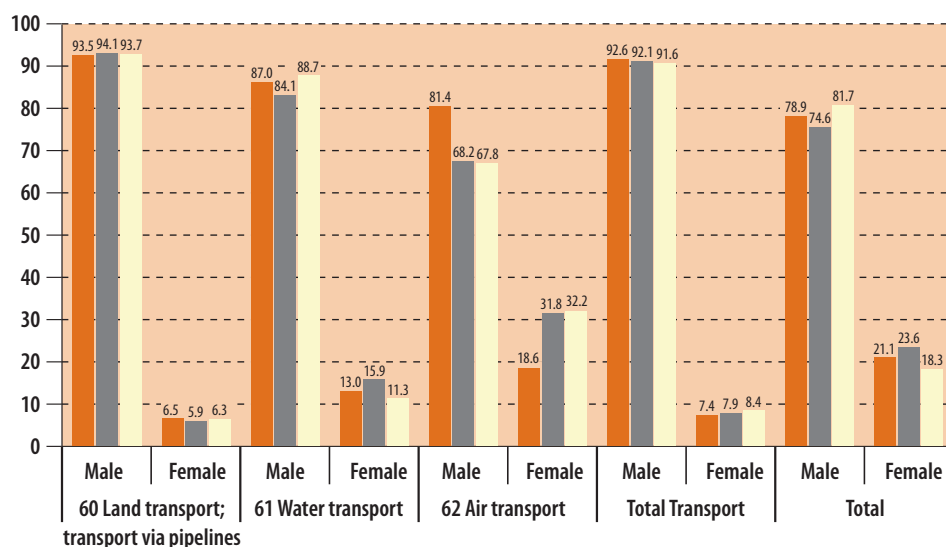
⁽¹⁶⁹⁾ Katalagianakis, G., European research projects and policy for safe and efficient tunnels. Available at: <http://www.ita-aites.org/cms/fileadmin/filemounts/ovion/doc/safety/prague/GK.pdf>

⁽¹⁷⁰⁾ [http://www.safetynews.co.uk/May %202007.htm](http://www.safetynews.co.uk/May%202007.htm)



The evolution in time shows that the shares mentioned above have remained pretty stable in time and that non-fatal occupational accidents have generally affected men much more than women. This has been the general trend except for air transport, where women have recently increased their share in the number of non-fatal occupational accidents across the EU-15: while in 2000 female workers in air transport made up 18.6 % of all non-fatal occupational accidents in the subsector, by 2005 this percentage share had risen to 31.8 % and to a slightly higher 32.2 % in 2006.

Figure 23: Percentage distribution by gender of non-fatal occupational accidents (more than three days lost) in transport subsectors, total transport and total working population, EU-15, 2000, 2005 and 2006



In air transport, women have recently considerably increased their share in the number of non-fatal occupational accidents across the EU-15.

Source: ESAW - Codes according to NACE Rev. 1.1

The incidence rate per 100,000 workers of non-fatal occupational accidents by gender shows higher figures among men than women — both in transport and the overall workforce — but the gap is not as wide as with the percentage distribution by gender of the occupational accidents. As shown in the figure, in 2006 male workers in transport reported 5,442 non-fatal occupational accidents per 100,000 workers, while the corresponding number for their female counterparts was 2,479. Compared with the overall workforce, the figures in transport are higher for both genders, as in the total working population men reported 3,856 non-fatal occupational accidents per 100,000 workers in 2006 and women 1,524.

The same picture holds by transport subsector, with a higher incidence rate of non-fatal occupational accidents among men than women across all three of them. The narrowest gap, again, is found in air transport, where the incidence rate per 100,000 workers was 4,499.8 among men and 3,042.5 among women in 2006.

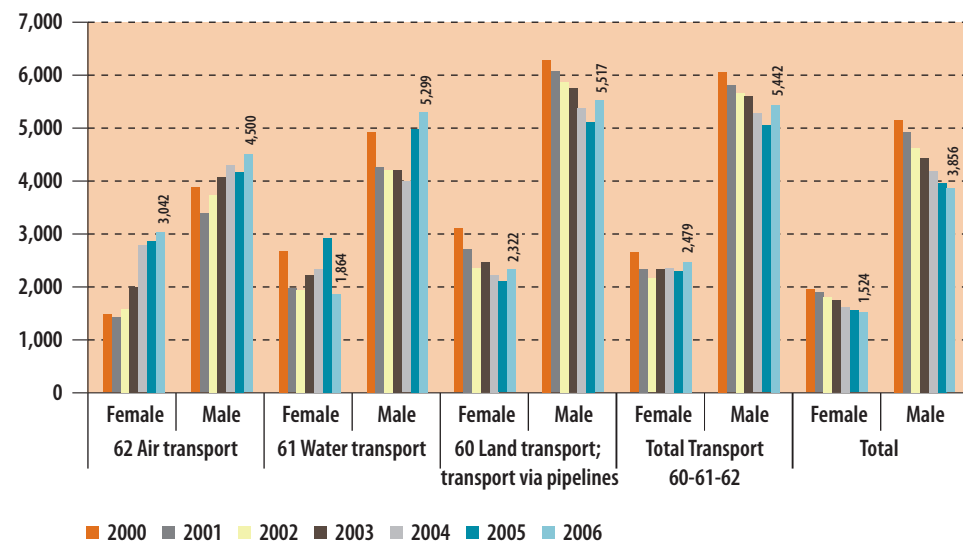
Regarding the evolution in time, the incidence rates per 100,000 workers of non-fatal occupational accidents have gone down, both in transport and the total working population, between 2000 and 2006. However, the reduction has been slightly more marked in the overall workforce across all sectors than in transport, where the incidence rate for female workers in 2006 has remained practically at the same level as in 2000 — 2,479 vs. 2,654.5, respectively — and the one for male workers has dropped less than in the total.



In air transport both genders have witnessed growing incidence rates per 100,000 workers of non-fatal occupational accidents between 2000 and 2006.

By transport subsector, the decreasing trend mentioned above has only been reported in land transport as in air transport both genders have witnessed growing incidence rates per 100,000 workers of non-fatal occupational accidents between 2000 and 2006, the increase being more acute among female workers. In water transport incidence rates of non-fatal accidents have gone up among male workers only between 2000 and 2006, as women experience a drop in their rate in 2006.

Figure 24: Incidence rate per 100,000 workers of non-fatal occupational accidents (more than three days lost), in transport subsectors, total transport and total working population, by gender, in EU-15, 2000, 2005 and 2006



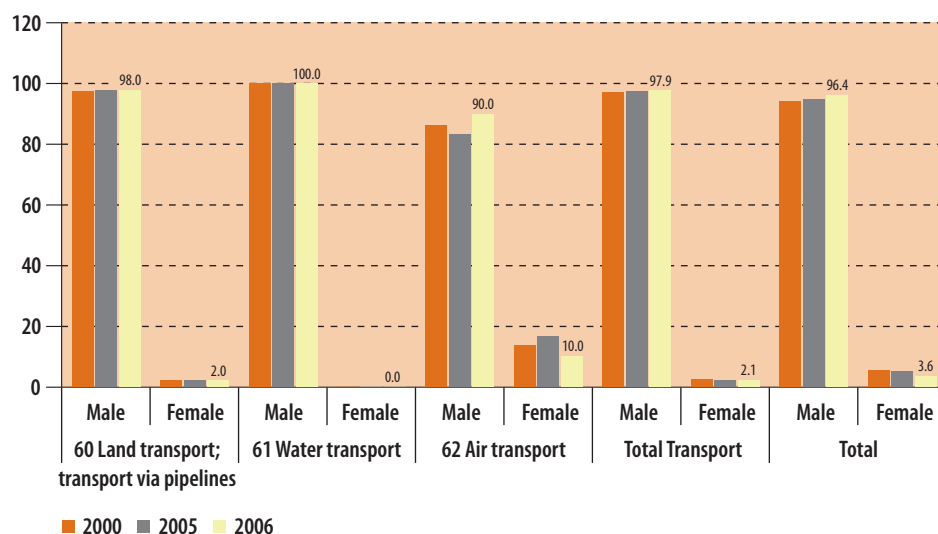
Source: ESAW - Codes according to NACE Rev. 1.1

Regarding fatal occupational accidents, the gender breakdown shows a clear dominance of male workers, both in transport and in the overall workforce across all sectors. In 2006, women represented 2.1 % of all transport workers who died as a result of an occupational accident while in the total workforce across all sector the corresponding share was slightly higher, at 3.6 %. By transport subsector women reported the highest share in air transport, making up 10 % of all fatal occupational accidents in 2006.

The evolution in time shows a very stable pattern with minor changes since 2000. If anything, there has been a slightly decreasing trend, both in transport and in the total workforce, in the share of female workers in fatal occupational accidents between 2000 and 2006.



Figure 25: Percentage distribution by gender of fatal occupational accidents in transport subsectors, total transport and total working population, EU-15, 2000, 2005 and 2006



Regarding fatal occupational accidents, the gender breakdown shows a clear dominance of male workers. The evolution in time shows a very stable pattern with minor changes since 2000.

Source: ESAW - Codes according to NACE Rev. 1.1

The incidence rates per 100,000 workers of fatal occupational accidents present a similar picture, with clearly higher figures for men than for women. In any case, the figures are higher in transport than in the overall workforce for both genders. In 2006, male workers in transport reported an incidence rate of 15.8 fatal occupational accidents per 100,000 workers, while among female transport workers the corresponding rate was 1.8 per 100,000 workers. In the overall workforce across all sectors male workers reported 5.3 fatal occupational accidents per 100,000 workers while the corresponding rate among women was 0.3 per 100,000 workers in 2006.

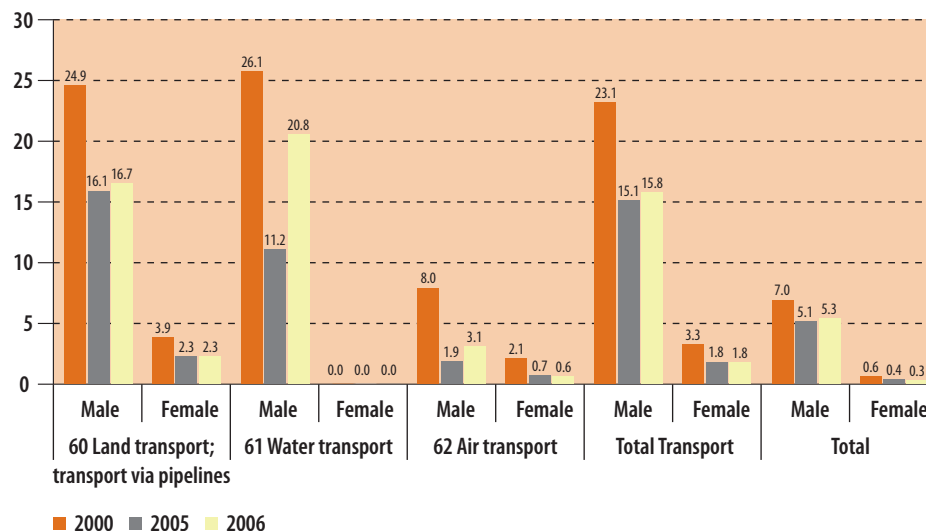
By transport subsector, male workers reported the highest incidence rates of fatal occupational accidents in water transport and land transport: 20.8 and 16.7 per 100,000 workers, respectively, in 2006. Meanwhile, women in land transport were the ones with the highest incidence rate of fatal occupational accidents in 2006: 2.3 per 100,000 workers.

The evolution in time shows a generally decreasing trend in the incidence rate of fatal occupational accidents across both genders and in all three transport subsectors and the total working population. This downward trend can be seen until 2005, as there seems to be an increase in 2006. In any case, it is important to bear in mind that the time of the data extraction — June 2009 — the figures for 2006 were still provisional.



The evolution in time shows a generally decreasing trend in the incidence rate of fatal occupational accidents across both genders and in all three transport subsectors.

Figure 26: Incidence rate per 100,000 workers of fatal occupational accidents, by transport subsector, total transport and total working population, in EU-15, 2000, 2005 and 2006



Source: ESAW - Codes according to NACE Rev. 1.1

3.1.3. EU accident figures by age

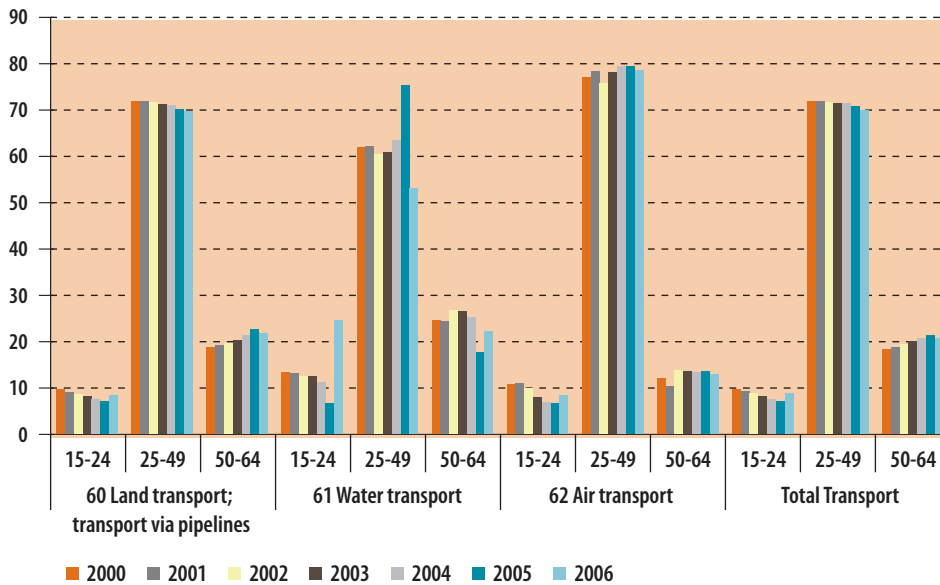
The breakdown by age of the data on non-fatal occupational accidents reveals that workers aged 25 to 49 make up the highest share in the total of non-fatal occupational accidents in the EU-15. According to the ESAW, in 2006 almost 70 % of non-fatal occupational accidents in transport affected workers aged 25 to 49, while the share of workers aged 50 to 64 was 21.2 % and that of young workers (15–24) was the lowest at 8.9 %.

These findings are similar by transport subsector, air transport reporting the highest share of workers aged 25 to 49 in non-fatal occupational accidents: 78.4 % in 2006. The age breakdown in land transport is very similar to that in total transport, which is only to be expected due its high employment figures, while in water transport, almost one in four workers (24.8 %) who suffered a non-fatal occupational accident in 2006 were aged 15 to 24, the highest share across all three transport subsectors.

The evolution in time shows a slight increase in the share of workers aged 50 to 64 in the total non-fatal occupational accidents in transport, from 18.5 % in 2000 to 21.2 % in 2006. The two other age groups have witnessed minor drops in their respective percentage shares between 2000 and 2006. By transport subsector, land transport has mirrored the evolution in total transport while in air transport the respective shares of each age group have remained relatively constant. Water transport, instead, has experienced some changes, by which the share of young workers increased in 2006 at the expense of that of workers aged 25 to 49. Nevertheless, this finding represents a break in the trend and it has to be interpreted with caution as 2006 data were still provisional at the date of extraction — June 2009.



Figure 27: Percentage distribution by age of non-fatal occupational accidents (more than three days lost) in transport subsectors and total transport, EU-15, 2000 and 2006



Source: ESAW - Codes according to NACE Rev. 1.1

The incidence rate per 100,000 workers of non-fatal occupational accidents by age shows a slightly different picture as young workers report the highest figures. In 2006 transport workers aged 15 to 24 reported the highest incidence rate per 100,000 of non-fatal occupational accidents: 8,065.3, well ahead of workers aged 25 to 49 and 50 to 64: 5,146.4 and 4,027.6, respectively. This result is consistent across all three transport subsectors and in 2006 young workers showed the highest incidence rates per 100,000 workers in land transport (8,190), water transport (10,014.2) and air transport (6,056.3).

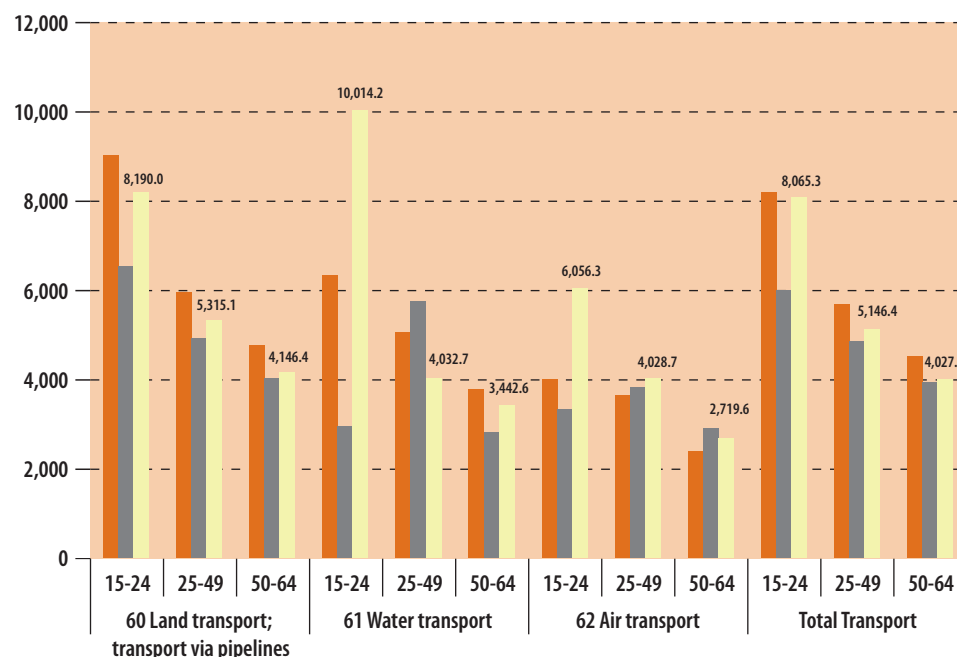
This has always been the case in land transport, and consequently, in total transport too, due to the predominant employment figures of land transport. But in 2005, in water transport and air transport the highest incidence rates per 100,000 workers of non-fatal occupational accidents were reported by those aged 25–49. In any case, young workers have had the highest figures across all three transport subsectors most of the time.

The evolution in time also shows that the incidence rates have generally gone down except for young workers (15–24), who in 2006 reported figures higher than those from 2000. In any case, again, 2006 data needs to be interpreted with caution due to its provisional status at the date of extraction.



In 2006 transport workers aged 15 to 24 reported the highest incidence rate per 100,000 of non-fatal occupational accidents: 8,190.0, well ahead of workers aged 25 to 49 and 50 to 64: 5,146.4 and 4,027.6, respectively.

Figure 28: Incidence rate per 100,000 workers of non-fatal occupational accidents (more than three days lost) transport subsectors and total transport, by age group, in EU-15, 2000, 2005 and 2006



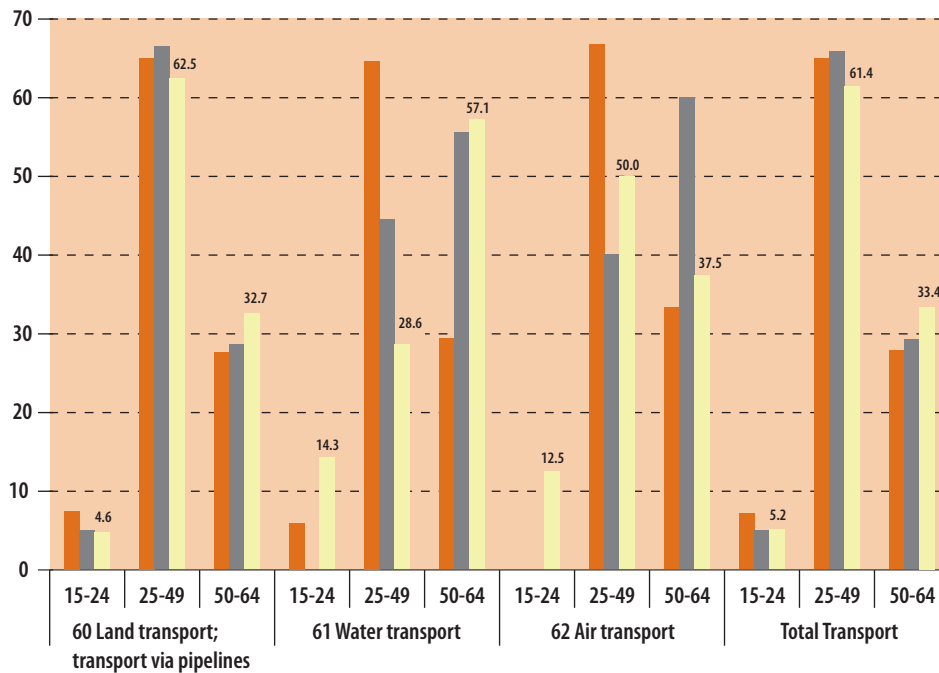
Source: ESAW - Codes according to NACE Rev. 1.1

Regarding fatal occupational accidents, the breakdown by age shows how in 2006 almost two thirds of fatal occupational accidents in transport (61.4 %) affected workers aged 25 to 49. One third (33.4 %) were aged 50 to 64 and the remaining 5.2 % were young workers aged 15 to 24. The situation varies by transport subsector and while land transport mimics the total transport age breakdown, in water transport 57.1 % of fatal accidents in 2006 affected workers aged 50 to 64. Workers aged 25 to 49 represented 28.6 % of all fatal occupational accidents in the sector while the share of young workers was 14.3 %, clearly above the sector average at 5.2 %. The age distribution in air transport shows half of fatal accidents (50 %) affecting workers aged 25 to 49, followed by those aged 50 to 64 (37.5 %) and young workers (12.5 %), again above the transport sector average.

The evolution in time appears to hint at an increasing share of workers aged 50 to 64 in the fatal occupational accidents in the total transport sector, in land transport and in water transport. Meanwhile, the share of young workers in fatal occupational accidents seems to have decreased in total transport and land transport, while it has increased in water transport and air transport.



Figure 29: Percentage distribution by age of fatal occupational accidents in transport subsectors and total transport, EU-15, 2000, 2005 and 2006



The evolution in time appears to hint at an increasing share of workers aged 50 to 64 in the fatal occupational accidents in the total transport sector, in land transport and in water transport.

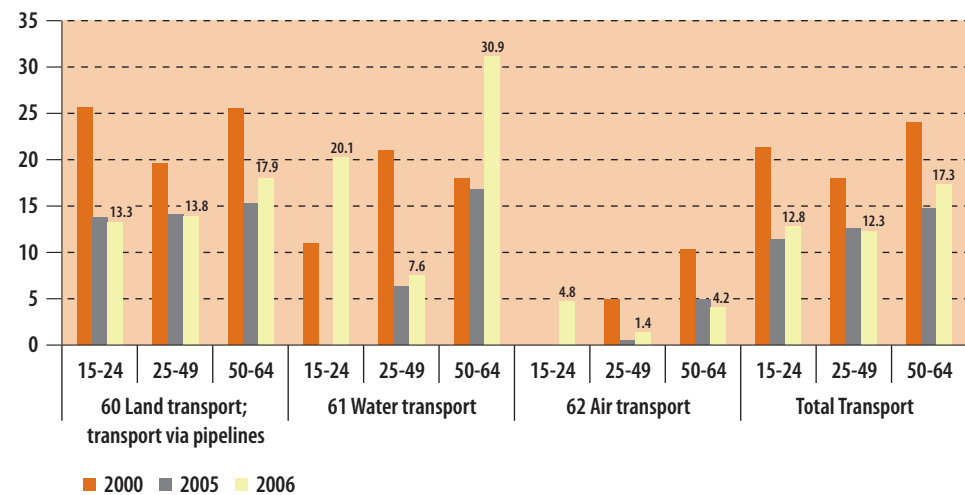
Source: ESAW - Codes according to NACE Rev. 1.1

The incidence rates per 100,000 workers of fatal occupational accidents are somewhat different, the highest rates in total transport corresponding to workers aged 50 to 64: 17.3 occupational accidents per 100,000 a workers in 2006. Young workers were next, with 12.8 fatal accidents per 100,000 workers, and finally, workers aged 25 to 49 reported 12.3 fatal accidents per 100,000 workers in 2006. These results, again, are similar to those in land transport while in water transport and air transport the findings vary slightly. In water transport workers aged 50 to 64 report, by far, the highest incidence rate per 100,000 workers of fatal occupational accidents (30.9 in 2006), followed by young workers (20.1), whereas in air transport it is young workers who report the highest incidence rate, 4.8 in 2006, followed by workers aged 50 to 64: 4.2.

The evolution in time shows a general reduction in the incidence rates of fatal accidents in transport and land transport, in spite of the slight increase reported in 2006, particularly among workers aged 50 to 64. The evolution is more unclear in the two other subsectors, as in water transport incidence rates of fatal occupational accidents seem to have increased among young workers and workers aged 50 to 64 while in air transport young workers too have seen an increase in their incidence rate of fatal occupational accidents while workers aged 25 to 49 and 50 to 64 have witnessed a clear reduction.



Figure 30: Incidence rate per 100,000 workers of fatal occupational accidents in transport subsectors and total transport, by age, in EU-15, 2000, 2005 and 2006



Source: ESAW - Codes according to NACE Rev. 1.1

3.1.4. Data from the Member States

According to the data of the Member States, the transport sector displays a high level of occupational accidents. Most accidents happen in the land transport sector.

The work environment in itself is the cause of most occupational accidents within the transport sector. Falling and slipping as well falling from a height were frequent causes of work accidents.

Within air transport, a big portion of the accidents happens during turbulence or landing, when the cabin crew is performing their service tasks. With regard to the type of accidents, falling and fallings object accounts for a major part of the accidents. The typical outcomes of the accidents are broken bones, sprains, soft-tissue injuries and teeth injuries.

A high proportion of accidents and injuries are also attributable to violence.

Steel fell from vehicle and killed driver ⁽¹⁷¹⁾

The assessment of a load's stability as it is placed on a vehicle on despatch is vital to the safety of persons involved in its removal at its destination, the neglect of this caused the death of a workman in October 2005. Steel fabricators, partially assisted by a driver employed by a sole trader, loaded steel on to a vehicle which arrived at a site where two of the company's employees arrived to help unload it. The driver began to remove the load's retaining straps but it became unstable and a 1-tonne steel beam fell to the ground and killed him.

⁽¹⁷¹⁾ <http://www.safetynews.co.uk/May%202007.htm>



Risk assessment

Investigation established that the fabricators had failed to fully assess the risks involved in loading and unloading steel, and to ensure that the steel was correctly placed upon the timber bearers on the vehicle. The employer of the deceased driver had failed to ensure that his employees involved in loading, unloading and transporting steel to site had been properly trained. The company was fined £30,000 and having pleaded guilty to a breach of legislation, the driver's employer was fined £7,500.

Belgium

According to the figures from the Fund for Occupational Accidents, the number and severity of occupational accidents in Belgium are highest in construction and manufacturing of wood and metal, followed by the transport sector. In 2004, about 8,665 accidents, of which 927 severe accidents, occurred within the land transport sector, accounting for 9.1 % and 7.8 % of the total number, respectively. Also, over recent years, a downward trend has been observed in the number of (severe) occupational accidents.

The incidence of occupational accidents and the number of related lost working days are higher within the land transport sector than within the total working population.

France

Accidents reported in transport accounted for 7 % of the total accidents registered in the four years observed (2000–2004). The 49,828 cases in 2004 broke down into 86 % for land transport, 10 % for air transport and 4 % for transport over water. The share of land transport in all reported accidents in transport decreased from 92 % in 2002 to 86 % in 2004, while for air transport it increased from 4 % in 2002 to 10 % in 2004. Concerning fatal accidents, in 2004, 89 fatal accidents were registered in transport (14 % of all fatal accidents in all sectors), mainly in land transport. The number of accidents both in all sectors and in transport decreased between 2000 and 2004, but more acutely in transport, since it accounted for 17 % of all fatal accidents in 2000.

Some 89 % of accidents reported in transport involved males, 11 % females. Among injured males in all sectors, 9 % worked in transport while among all injured females only 3 % worked in transport. The number of fatal accidents registered in transport decreased from 115 for males in 2000 (8 females) to 88 in 2004 (1 female). Among male workers, 15 % of fatal accidents corresponded to transport while among female workers 4 % concerned transport. Proportions for both genders have decreased since 2000.

By age group, most reported accidents in transport affect workers aged 25–49 (74 % of accidents in 2004), followed by the age-group 50–64 (14 %) and young workers (11 %). Proportions were similar in land transport as it employs 90 % of the transport workforce. The age-group 25–49 had a lower share in transport over water (65–70 %) and higher in air transport (75–83 %). In 2004 transport over water registered more accidents among young workers (15 %) and those aged 50–64 (19 %) than the other transport subsectors. Building on young workers, their share in all accidents increased in transport over water between 2000 (11 %) and 2004 (15 %). Air transport showed a downward trend (17 % in 2000, 7 % in 2004), while proportions were rather constant for the other age-groups.

Regarding fatal accidents in transport, the highest share in 2004 corresponded to workers aged 25–49 (56 %), followed by the age-group 50–64 (36 %) and finally young

In France, occupational road accidents are targeted by a multiannual action plan. A dedicated website gives access to statistics, research and good practice guidance on risk assessment and prevention.



workers (7 %). While the proportion increased for old workers (23 % in 2000 to 36 % in 2004), it decreased both for young workers (12 % in 2000 to 7 % in 2004) and those aged 25 to 49 (65 % in 2000 to 56 % in 2004). Among fatal accidents involving young workers across all sectors in 2004, 12 % were registered in transport, the same share as that for the age group 25–49.

Following similar trends in figures in recent years ⁽¹⁷²⁾, the committee for the prevention of occupational road risks ⁽¹⁷³⁾ (created in 2001 following an agreement between authorities and social insurance organisations, and enlarged to cover agricultural workers and self-employed in 2006 and 2008 respectively) set up a three-year plan 2006–2009 for the reduction of occupational road accidents. The national plan covers commuting as well as other road accidents. A dedicated website ⁽¹⁷⁴⁾ gives access to recent statistics and good practice guidance, for example for risk assessment and prevention of accidents, and for courier services. Light vehicles, which were found to be the cause of a high number of accidents, were also targeted in a multiannual campaign.

Recently, an agreement was signed between the national interministerial delegate for road safety and the national information office on education and professional training to raise awareness of the road safety risks in different professions. The intention is to inform parents and teachers about the importance of these risks and train future workers in schools, universities and apprenticeship ⁽¹⁷⁵⁾.

Finland

In Finland, the work environment in itself is the cause of most occupational accidents. Falling and slipping (24 %) as well falling from a height or jumping (12 %) were frequent work accidents in transport.

Even though the frequency of occupational accidents has slightly decreased over the past 10 years, in 2003 it was still 30 % higher in transport than in the all sectors in general. It was at the same level as in industry, and at about half of the frequency in the construction sector. The differences were at the same level when occupational accidents causing more than three days absence were compared.

Improved safety management appears to have decreased the number of minor accidents, but the relative number of serious accidents is still high. In 1994 the frequency ⁽¹⁷⁶⁾ of occupational accidents causing fatalities was highest (3.4 fold) compared to the mean of all sectors. In 2000, it was lowest (1.4 fold) and in 2001, it was twice as high.

Regarding the circumstances of occupational accidents in transport, the work environment in itself is the cause of the most occupational accidents. Falling and slipping (24 %) as well falling from a height or jumping (12 %) were frequent work accidents. Most of the slipping happen in private yards, loading places, access ramps, stairs, on top of tanks and in machinery halls (for example due to oil on the floor). Other

⁽¹⁷²⁾ Données statistiques 2000–2006. Available at: http://www.risquesprofessionnels.ameli.fr/atmp_media/SINISTRALITE %20ROUTIER.pdf

⁽¹⁷³⁾ Comité de pilotage du risque routier professionnel. Programme d'action 2006–2009. Available at: http://www.risquesprofessionnels.ameli.fr/atmp_media/Programme-action-prevention-risque-routier-2006-2009.pdf

⁽¹⁷⁴⁾ <http://www.risquesprofessionnels.ameli.fr>

⁽¹⁷⁵⁾ La Sécurité routière et l'Onisep signent une convention pour mieux sensibiliser élèves, parents et professeurs au risque routier dans les différents métiers, 19 October 2009. http://www.securiteroutiere.gouv.fr/article.php3?id_article=3242

⁽¹⁷⁶⁾ Frequency of occupational accidents = number of accidents causing deaths compared to one million work hours done.



causes of accidents are strains, sudden movements, being compressed and hurting oneself with objects ⁽¹⁷⁷⁾.

In road transport the most worrying are still the fatal traffic accidents. Their incidence is only slightly higher in construction than in transport.

2m fall sufficient to kill ⁽¹⁷⁸⁾

On 15 May 2004, a driver sustained fatal injuries when he fell off a parked lorry, while attempting to free a worktop on the back of the lorry. The company was fined £120,000 with costs of £28,185 after pleading guilty to breaching the Health and Safety at Work Act. An HSE inspector commented: 'Even falling a short distance can be very serious, or even fatal. Employers and self-employed people operating lorries need to avoid the need for work at height on the lorry wherever possible. Where that is not possible, they must take measures to prevent falls. Companies should ensure staff is adequately trained in how to reduce the risks. Climbing on top of loads should be avoided wherever possible and permanent platforms or gantries may assist with this.'

Germany

The highest number of reported accidents occurred in the transport sector (36.1 % in 2003). Equally, the highest number of reportable accidents occurs in transport-related occupations (46.9 % in 2003). Between 1996 and 2005 an average 8.9 % of the fatal accidents occurred in the transport sector. In 2005, the percentage was particularly high at 13.2 %.

Luxembourg

In 2006 the sectors land transport and transport over water represented 6.7 % of the total number of occupational accidents in Luxembourg, with air transport reporting 1.7 % of the total number. The share of both sectors increased constantly by 1.5 % between 1998 and 2006. In air transport, the share increased by 0.5 % with some ups and downs over the years.

Spain ⁽¹⁷⁹⁾

The incidence rate in the transport branches is higher than the national average. Land transport has been reducing the incidence rate in the past years while air transport and transport over water, with a reduced number of workers, have more fluctuations. In 2006, the fatal incidence rate of transport branches was three times higher than the national average, and it has been reducing the incidence rate in the past years. In transport over land, over water and air transport most accidents happen to men from the age groups 25–34 and 35–44, and together they accounted for about 64 % of the accidents in the transport sector.

On average, the most common type of work accident, around one third, was due to physical stress on the muscular system in the three branches. The highest percentage was in air transport with almost 50 %. The most common fatal accidents were due to collisions, followed by heart attacks.

In Spain, occupational accidents involving transport means (including commuting accidents) amount to about 38 % for workers, or even 50 % when self-employed workers and the public sector are included. This figure is comparable to figures from France.

⁽¹⁷⁷⁾ Connections between the safety, logistics, working conditions and professional attractiveness of road transport, FIOH 2006.

⁽¹⁷⁸⁾ 18th October 2007, available at: http://www.safetynetscotland.co.uk/latest_news/art/74/

⁽¹⁷⁹⁾ Anuario de estadísticas laborales y de asuntos sociales, published by Ministry of labour and social affairs, and the occupational accidents and diseases database (INSHT elaboration).





© Иван тончев, EU-OSHA Photo Competition 2009

More recent figures show that fatal accidents in the transport sector make up about 19 % of all fatal accidents ⁽¹⁸⁰⁾, while accidents involving transport means (including commuting accidents) amount to about 38 % for workers, or even 50 % when self-employed workers and the public sector are included. This figure is comparable to figures from France.

Regarding groups of workers particularly at risk, young, migrant and workers under a temporary contract are particularly at risk of accidents with vehicles. Concerning sectors, mostly service workers, workers in the transport sector and manufacturing sectors where the use of vehicles is common, such as food manufacturing, were highlighted. Courier and delivery services and taxi drivers were also specifically mentioned. Migrant workers were also found to be at particular risk of commuting accidents, especially with minibuses.

Regarding time of the day, similar to other studies, accidents were found to peak at specific (early morning) hours, at the beginning of the working week and to a lesser extent the end of the week.

In Spain, fatal accidents in the transport sector make up about 19 % of all fatal accidents. Accidents involving a vehicle make up about half of all fatal accidents.

Following the high incidence of work accidents involving vehicles, a more extensive data exchange and an in-depth analysis of the accidents was agreed between different official data collectors (National institute INSHT and General Directorate for Transport DGT). It was also agreed to include specific training guidance in national training schemes for OSH, for example to enhance capabilities of preventive services in assessing the risks of having a transport accident. Furthermore, there are plans for elaborating good practice guidance. National campaigns on OSH prevention in 2009 also targeted road and vehicle safety ⁽¹⁸¹⁾.

⁽¹⁸⁰⁾ Casi 500 personas mueren al año en España en accidentes de tráfico mientras trabajan. Fundación MAPFRE 16. September 2009. <http://www.mapfre.com/portal/fundacion/estuvuda/not-casi-500-personas-mueren-al-ano-espana-accidentes-traffic-mientras-trabajan.html>

⁽¹⁸¹⁾ Jóvenes y con contrato temporal, más probable que sufran un accidente de tráfico en el trabajo, Fundación Mapfre, 13 October 2009, <http://www.seguridadvialenlaempresa.com/noticia-detalle.php?id=57>

Cyprus

Regarding occupational accidents in the transport sector, it is obvious that due to the small numbers involved in air and water transport, it is not possible to define a specific trend of some sort. As far as land transport is concerned, there appears to be an increased number of accidents in 2006 compared to 2001. However the overall tendency throughout the period 2001–2006 is highly uncertain.

The absolute number of occupational accidents in the transport sector presented a remarkable increase of 104.3 % during the time period 2001–2006. Accordingly, the respective incidence rate rose significantly from 207.2 in 2001, to 461.4 in 2006. However, it should be mentioned, that these figures include data from storage and communications sub sectors also. Fatality rates in transport in general as well as in individual transport sub sectors are extremely low, almost zero throughout the period 2001–2006. In 2006, 22 out of 25 occupational accidents in the sector transport over land involved men ⁽¹⁸²⁾.



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Denmark

In 2005, 3,168 accidents occurred in the transportation of goods sector, compared to 2,677 accidents in 2003. Fewer accidents occur in the passengers transport sector. In 2005, a total of 1,116 accidents were reported to the WEA, 191 less accidents than in 2000.

When comparing to all other sectors, it can be seen that the transportation sector (both goods and passenger transport) accounts for approximately 10 % of all occupational accidents.

In 2005 there were a total of 55 fatal accidents. Out of these, four occurred in the transportation sector, equalling 7 % of the total number of fatalities.

When grouping the accidents into 10 overall types, it can be seen that all types of injuries in the transportation sector (with the exception of sprains) accounts for less than 10 % of the overall total. Some 11 % of all reported injuries of sprains occurred in the transportation sector.

When transporting goods, the most common type of accident (by far) is sprains, which accounts for 52 % of all reported accidents. Soft-tissue injuries and wounds each accounts for approximately 12 %.

In Denmark, in the passenger transport sector, 42 % of the accidents are sprains, also the most common accidents in air transport, where falls and falling objects also cause broken bones, soft-tissue injuries and teeth injuries.

⁽¹⁸²⁾ Collected by the Labour Inspectorate.



In the passenger transport sector, 42 % of the accidents are sprains (almost by far the most common), followed by wounds (9 %) and soft-tissue injuries (9 %). Some 33 % of all accidents were either not specified or not among the 10 types ('other').

According to data from the Danish Civil Aviation Administration (CAA-DK), there has been a significant drop in the number of reported accidents in the aviation sector. In 2006, there were approximately 50 reported occupational accidents. This is down from more than 80 in 2005. According to CAA-DK a large proportion of the accidents happen during turbulence or landing, when the cabin crew is performing their service tasks. With regard to the type of accidents, the CAA-DK statistics indicate that falling and fallings objects account for a major part of the accidents. The typical outcomes of the accidents are broken bones, sprains, soft-tissue injuries and teeth injuries ⁽¹⁸³⁾.

Hungary

The number of reported injuries in all sectors has decreased in the last 10 years, but in the transport sector, storage, communication sector the number of injuries are still at the same level. In 2005, there were 2814 occupational accidents (fatal + non-fatal) in the transport, storage and communication sector together, which is 11.74 % of the total number of accidents ⁽¹⁸⁴⁾.

In 2005, there were 14 fatal accidents in the transport, storage and communication sector which is about 11 % of the total number. Traffic accidents by road represent the major proportion of the fatal accidents. It has to be mentioned that the number accidents by road is higher than reported in the transport sector, because accidents by transport caused by a worker employed in any other sector are not reported in transport sector statistics. The second important cause of fatal transport accidents is falling from height.

Italy

Although in absolute terms the number of injuries has diminished over the past five years, the amount of reported accidents as a proportion of the total number accidents has increased, with 69,840 accidents, equivalent to 8.35 % of the total. According to Eurostat data, it is in the land transport, transport via pipelines segment that most of the accidents in the transport sector occur. Accidents in transport also lead to longer absence periods from work than the national average: 32 days and 28 days, respectively.

Transport reports a higher than average rate of accidents, with at least 36.24 injuries per 1,000 workers compared to a total accident rate of 31.35. In particular, the rate of fatal accidents is twice the national average: 0.12 per 1,000 workers and 0.06, respectively. Transport also reports a higher than average share of accidents leading to permanent disability.

A comparison between Eurostat data with those produced by INAIL shows an underestimation of the European basic data. According to INAIL data mortal accidents in 2006 were 162, equivalent to 13.9 %. This sector is risky above all for non-EU workers: one injury out of five involves an immigrant worker ⁽¹⁸⁵⁾.

In Hungary, the second important cause of fatal transport accidents is falling from height.

In Italy, accidents in transport lead to longer absences from work and higher shares of permanent disability. The rate of fatal accidents is twice the national average. One injury out of five involves an immigrant worker.

⁽¹⁸³⁾ Please see: <http://www.slv.dk/Dokumenter/dscgi/ds.py/View/Collection-1082>; Danish Civil Aviation Administration, 2006.

⁽¹⁸⁴⁾ Source: ILO/LABORSTAT.

⁽¹⁸⁵⁾ Dati Inail', n.6, June, 2007.



If data are brought into relation with the workforce (Eurostat), it emerges that the highest accident rates are recorded in the younger age groups. Though accident rate declined sharply starting 1998, the 18 to 24 age group continues to record the highest incidence, followed by the 25 to 34 age group.

The principal injury causing agents are: work environments (22.7 %) and weight and transport equipment (16.8). Most injuries affect the hand (9,040 cases), or the backbone (8,828). The nature of the injuries mainly involves contusions and sprains.

Latvia

Between 2003 and 2005 there were 9 fatal accidents in transport over land, none in the transport over water and air transport subsectors. In the same period 283 non-fatal accidents happened in the transport over land sector, 45 in the transport over water sector and 9 in the air transport sector. Thus, in this period there were 337 non-fatal occupational accidents in the transport sector, which is about 8 % of the total number of non-fatal accidents in Latvia in that period. The largest part of the non-fatal accidents (65 %) involves men which is understandable as far more men work in these sectors than women. Most of the accidents involve workers in the age group 25–49. However, in transport over land the age group 50–64 accounts for almost as large number of accidents as the age group 25–49.

In Latvia, older workers account for high shares of accidents in transport.

3.1.5. Case studies — accident prevention

The following section presents selected studies and successful examples of transport accidents prevention initiatives.



Preventing road accidents involving heavy goods vehicles (EU)

The European Agency for Safety and Health at Work has produced jointly with the European Commission Directorate General for Energy and Transport a factsheet 'Preventing road accidents involving heavy goods vehicles' (2001) ⁽¹⁸⁶⁾. This factsheet recommends as the first step to put together a **preventive accident plan**. In particular, each business should appoint a company safety officer with specific responsibility for vehicles. This role should encompass carrying out a risk assessment, training staff — especially drivers, and ensuring all vehicles and associated equipment are properly maintained, among other issues. The plan should be formulated in conjunction with both staff and the local authority and there should be set objectives for both the employer and the drivers.

As an employer you should:

- establish a written safety policy and instructions for drivers, covering issues such as the use of mobile phones while driving, safety belts, and alcohol consumption;
- check the driving histories of any drivers you employ;
- provide safe, well-maintained vehicles;
- ensure schedules give drivers enough time to obey speed limits and avoid peak-hour driving;
- take into account adverse, seasonal weather conditions;
- specify safe routes, preferable motorways;
- if possible, use trained personnel to do any loading and unloading;
- adopt any local charter and codes for road safety;

⁽¹⁸⁶⁾ <http://osha.europa.eu/publications/factsheets/18/factsn18-en.pdf>.



- turn your vehicle strategy into a commercial advantage: promote it to your customers.

For drivers, 'good practice' is well known, although not always applied. Issues they must bear in mind range from the need to take breaks and avoid alcohol to ensuring loads are evenly distributed. Staff should be reminded of these and others through written guidelines.

Truck driver survey ⁽¹⁸⁷⁾ (Finland)



The study dealt with the assessments of professional heavy-duty truck drivers regarding the safety of their work environment, their own risk-taking tendencies, as well as their views on the efficacy and development of safety measures. The survey was commissioned by the Turku Road District, a subdivision of the Finnish Road Administration.

A questionnaire was sent to the participants by post in August and September 2004. The respondents regarded the safety level of their work environment to be relatively high and their own possibilities of influencing it to be good. Although safety was considered an important issue, cost-effectiveness was valued above everything. Haste and high stress levels were perceived as the most common safety risks. According to their own assessments the respondents rarely breached traffic regulations, but at the same time over a fifth of the respondents had a record of traffic violations taking place over the past year.

The transportation entrepreneurs had a more positive view of the safety of their field of employment than the drivers. Similarly, bus drivers were more likely to evaluate their work environment to be safe than truck drivers. Age and experience also constituted a factor when respondents evaluated their work environment as safe. Elements attributed to safety, such as good health, the regularity of work hours, a positive assessment of the present level of safety, as well as a disinclination to taking risks and a low number of previous traffic accidents, were all manifested in the responses of the same participants.

The survey shows that the heavy-duty truck drivers assess the safety level of their work as good at the moment. However, according to the survey, considerable improvement is still necessary with respect to several safety measures. Especially drivers' health and coping at work as well as the behaviour of other road users require improvement, all of which were perceived by the respondents as effective safety measures. Also slowing down timetables and reducing delivery deadlines are, according to the survey, the primary safety goals of heavy-duty traffic necessitating that the importance of safety should be elevated to the same level as cost-effectiveness.

It was interesting that the measures directed to drivers, such as the compulsory usage of safety belts or the follow-up of driving time, were not endorsed, even though they were considered to be effective factors in preventing accidents. The authors also concluded that it should be discussed how safety measures could be effectively adapted to the everyday work demands of heavy-duty truck drivers.

⁽¹⁸⁷⁾ Heinonen M., Keskinen E. & Sipiläinen P. The views of heavy goods drivers about work and traffic safety. Helsinki 2005. Finnish Road Administration, Turku Road Region. Finnra internal reports 18/2005. Available at: http://alk.tiehallinto.fi/julkaisut/pdf/4000455_rsluikkulj_tyoturv.pdf



PEDRO — Evaluation instrument for road accident risk (France) ⁽¹⁸⁸⁾

This interactive tool (Plan d'évaluation et d'actions du risque routier professionnel) is part of a series of actions and guidance support in the framework of the national plan on health at work (Plan santé au travail). The tool was developed by an enterprises' association (Centre Technique de l'Artisanat de Colmar) together with a local public administration (Préfecture du Haut-Rhin) and the social insurance organisation (CNAMTS-Risques Professionnels et la CRAM Alsace-Moselle) responsible for health and safety at work. It provides functionalities for monitoring accidents and safety situation in the enterprise, including documentation. It also provides recommendations based on the individual situation in the enterprise. The tool covers commuting (PEDRO TRAJET) as well as the prevention of transport accidents (PEDRO MISSION), with two streams of information collection, documentation and recommendations.

The tool also includes questionnaires covering worker participation and consultation, as well as information and training.



By courtesy of CTAI — Centre Technique de l'Artisanat — Pôle d'Innovation pour les Technologies de l'Information et de la Communication.



OSCAR — Interactive tool for the prevention of transport accident risks in construction ⁽¹⁸⁹⁾

A similar initiative was taken by an enterprises association of the construction sector (Confédération de l'Artisanat et des Petites Entreprises du Bâtiment (CAPEB)) in cooperation with the social insurance organisation la CNAMTS, the safety and health council of the construction sector OPPBTP and a large automotive company.

⁽¹⁸⁸⁾ Plan d'évaluation et d'actions du risque routier professionnel. Available at: <http://www.cram-pl.fr/risques/dossiers/routier/pedro.html>

⁽¹⁸⁹⁾ OSCAR, Organisation de la Sécurité routière au Chantier, à l'Atelier et sur la Route. Available at: <http://www.cram-alsace-moselle.fr/editorial/spip.php?article24>



This multimedial tool covers all activities related to transport and the use of vehicles in construction, whether road, on site (including mobile sites) or covering other transport activities. It includes card games for training purposes. The tool was also presented at the international film and multimedia festival at the World Congress on Safety and Health at Work in Seoul in 2008 ⁽¹⁹⁰⁾.

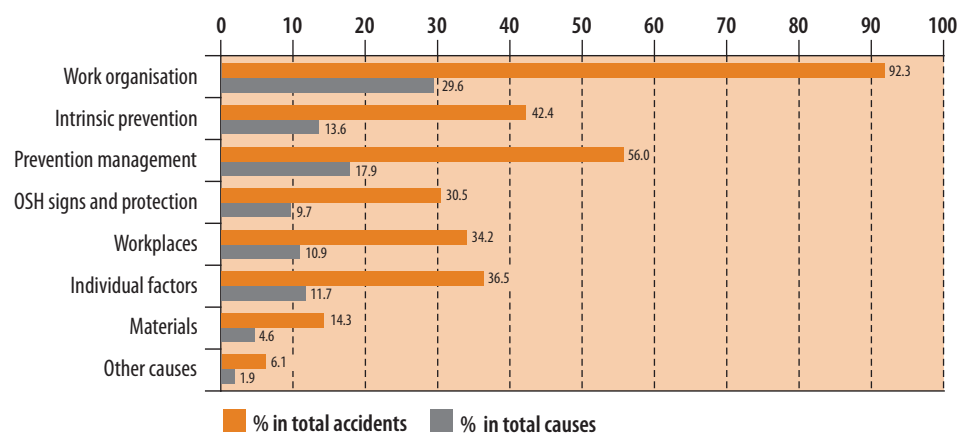


Analysing causes of transport accidents (Spain)

The Qualitative Analysis of Deadly Work Accidents in Spain 2003–2004 ⁽¹⁹¹⁾, published by the Spanish Ministry of Labour and Immigration and based on the occupational accidents and diseases database of the Spanish National Institute of Safety and Hygiene at Work INSHT presents the most important causes leading to occupational accidents in 2003–2004. When it comes to the causes of accidents, around 30 % of all the causes were work organisation deficiencies. However, when analysing the actual accidents, work organisation deficiencies were present in 92.3 % of the total accidents investigated. Approximately 17.9 % of the total causes were prevention management deficiencies, which are relevant to 56 % of the total accidents investigated.

An in-depth analysis of the causes and circumstances of transport accidents in Spain showed that for about a third work organisational deficiencies were a major cause, for over 90 % they were at least contributing.

Figure 31: Causes of occupational accidents investigated in Spain, all sectors, 2003–2004



Source: Qualitative Analysis of Deadly Work Accidents in Spain.

NB: The percentage shares of the total accidents exceed 100 % due to the multiple causes of each accident.

⁽¹⁹⁰⁾ Análisis cualitativo de la mortalidad por accidente de trabajo en España 2003-2004'. Report available at: [http://193.134.194.37/esl/content/download/77300/1512845/file/1,2,3,4 %20 %20Catalogue %20 International %20Film %20and %20Multimedia.pdf](http://193.134.194.37/esl/content/download/77300/1512845/file/1,2,3,4%20%20Catalogue%20International%20Film%20and%20Multimedia.pdf)

⁽¹⁹¹⁾ It has to be borne in mind that accidents may well be due to several causes at the same time. Hence, when adding up the % of total accidents, the total will exceed 100 %.





© By courtesy of ECTA



Development of an 'ECTA Responsible Care Scheme' and 'Best Practices Guidelines' in the transport and logistics of chemical goods (EU)

ECTA (European Chemicals Transport Association) was formed to improve the standards of efficiency, safety and quality as well as the environmental and social impacts of the transport of chemical goods in Europe. ECTA operates joint dialogue platforms between its members, logistics service providers, and the chemical industry and manages the European transport 'Responsible Care' scheme for its member companies.

ECTA working groups have developed, together with its shippers of the chemical industry, a series of best practices guidelines for transport and logistics of chemical goods in Europe. These include guidelines on safe loading and unloading of road freight vehicles, security guidelines, subcontracting, BBS training for safe driving, safety awareness in the supply chain and recommendations on safety, health and environmental (SHE) management practices for logistics.

As fall accidents (for example falls from heights when operating on top of trucks) are one of the most frequent causes for serious accidents, including fatalities, in the road hauling sector, safe working at height is a very important topic on the agenda of ECTA. Clearly, safety for working at height by drivers warrants careful risk assessment, taking into account site-specific lay-out and the tasks that workers have to do. It is important to consider circumstances not only at the loading sites but also at unloading sites (which are not necessarily chemical sites). The management of the site where loading or unloading takes place should provide safe conditions for working at heights including safe access to the top of vehicles (see: Guideline on safe loading and unloading published by ECTA and Cefic).

To address the issue, ECTA has proposed a risk assessment flow chart to prevent falls, including organisational and site-specific measures, as well as personal protection measures for fall arrest, which was sent to shippers in the chemical industry for further discussion.





Transport Van Dievel: safe driving linked to fuel consumption

Van Dievel Transport is a 'full-load' transport company, active in the Benelux, France and Germany that employs about 90 truck drivers. For several years now the company has been working on its safety culture. Van Dievel gives a lot of attention to safety and ergonomics in the selection of trucks, and has introduced a speed limit on trucks, specific safety requirements for trailers, the use of special mirrors and cameras, new communication techniques and computers, handsfree mobile telephones, strict maintenance programmes. Van Dievel has also assessed the lifting equipment and the unloading bays at companies where goods are delivered.

Van Dievel runs a dynamic training programme to develop and to promote a safe driving behaviour: Young and new drivers have to follow an intensive practical training. First, all the rules and principles for defensive driving are explained. Then a safety coach (a team of 10 safety coaches is available) accompanies the new driver and gives feedback about his/her driving behaviour. Some candidates may be rejected. Principles of safe driving are promoted in different ways (toolbox meetings, information sheets, safety messages and results in internal communication, individual feedback).

One of the most interesting initiatives is the company's 'Eco-proactive training programme'. The principle behind this programme is the relationship between safe driving and economical driving (fuel consumption). The advantages of this eco-proactive training programme are:

- more driving comfort and less stress;
- more possibilities for anticipation and defensive driving;
- less cost for fuel consumption;
- that this safe and ecologic driving style is not slower than any other style (even faster).

The programme was assessed against two measurable parameters: the quantity of consumed fuel and the number of accidents. Between 2001 and 2006, there was a strong decrease (with 70 %) in the number of accidents and the company is now far under the sectoral average.





PRAISE report on technology applications in the transport sector (EU)

PRAISE is a new project run by the European Transport Safety Council (ETSC ⁽¹⁹²⁾ on Preventing Road Accidents and Injuries for the Safety of workers ⁽¹⁹³⁾. The project was initiated under EU-OSHA's partnership programme for the European Week campaign on risk assessment 2008–2009 ⁽¹⁹⁴⁾.

A first project report on in-vehicle safety equipment addresses all employers managing all types of vehicle from public authorities, vehicle leasing suppliers, small two-car delivery companies to large international companies and also vehicle manufacturers. Apart from giving recommendations on how to assess risks and making the business case for a proper workplace risk assessment procedure, the report aims to present the most important in-vehicle technologies and give examples of their use:

	Passive (protect drivers automatically)	Active (involves driver participation)
Proactive/primary actions to avoid crashes	Speed limiter/intelligent speed adaption	Cruise control
	Electronic Stability Control (ESP)	Antilock braking systems (ABS)
	Wired-in daytime running lights	Daytime running lights
	Visible colour	High mounted rear centre brake lights
	Alcohol ignition interlock	Alcohol policy and testing
	Self checking/inflating tires	Tire check policy
	Stronger/safer seats	Ergonomic seat adjustment
	Mobile phones confiscated	Mobile phone use banned
	Automatic ventilation control	Air conditioning
	Automatic reversing brakes	Reversing warning devices and cameras
EDR vehicle monitoring	Driver near-hit reporting	

⁽¹⁹²⁾ ETSC is a Brussels-based independent non-profitmaking organisation dedicated to the reduction of the number and severity of transport crash injuries in Europe.

⁽¹⁹³⁾ www.etsc.eu/PRAISE.php

⁽¹⁹⁴⁾ A detailed description of the actions is presented at: <http://osha.europa.eu/en/campaigns/hw2008/campaigns/hw2008/partners/ETSC>





	Passive (protect drivers automatically)	Active (involves driver participation)
Reactive/secondary/at-scene	Bag including side/head protectors Seatbelt interlock/reminder Crashworthy vehicle (NCAP rating) Heavier vehicle Anti whiplash protection Crush zones and safety cages Fire resistant vehicle interiors Cargo barrier/load restraint Side and frontal impact protection EDR including crash recorders, forward/cab facing cameras and accelerometers	Quality front and rear seatbelts Seatbelt wearing Strong, easy to open doors Seat and head restraint positioning Correct head restraint use Child restraints Fire safety equipment

Source: reproduced from Praise 1 report ⁽¹⁹⁵⁾.

Several practical examples are also included in the report. One of them is presented here to illustrate: as part of its travel policy, the Swedish Road Administration has set up strict requirements for cars used on official business. Requirements are regularly updated and will continue to be in order to raise the standards on energy efficiency, vehicle emissions and safety ⁽¹⁹⁶⁾. Cars rented for less than six months must meet specific requirements such as:

- be awarded 5 stars for occupant protection by Euro NCAP;
- be equipped with Electronic Stability Control (ESC);
- be equipped with a seatbelt reminder on the driver seat that meets Euro NCAP requirements.

Cars rented for more than six months must also meet additional requirements such as:

- be awarded at least 2 stars for pedestrian protection by Euro NCAP;
- be equipped with an alcohol ignition interlock;
- be equipped with an informative or supportive Intelligent Speed Assistance system.

⁽¹⁹⁵⁾ How can in-vehicle safety equipment improve road safety at work?, ETSC 09/2009. Available at: [http://www.etsc.eu/documents/PRAISE %20Report %201.pdf](http://www.etsc.eu/documents/PRAISE%20Report%201.pdf)

⁽¹⁹⁶⁾ www.vv.se/Andra-sprak/English-engelska/Facts-about-the-Swedish-Road-Administration-/Policy-documents/Travel-policy/



Those requirements are also used by other public bodies and private companies. A brand new national law requires all government bodies to buy or rent only 5-star Euro NCAP cars for occupant protection ('government specification' as is the case for environment standards). This also has another overspill effect as rental companies, such as Hertz, Avis and Europcar, are upgrading their whole fleet to offer 'SRA recommended cars' to all their customers (PIN Vehicle Flash 13 ETSC 2009).

RECOGNISED OCCUPATIONAL DISEASES — EU OVERVIEW

3.2.

According to the European data collection on occupational diseases (EODS), the main occupational diseases observed in transport workers are musculoskeletal disorders, followed by hearing loss, and malignant neoplasms (cancer). Generally, incidence rates are considerably lower than for the general working population. Whether this is due to under-declaration or under-recognition is not clear. In any case, this is in contradiction with worker surveys, where transport workers are amongst the ones reporting higher exposures, for example to risk factors for musculoskeletal disorders.

Gender distribution different for transport workers

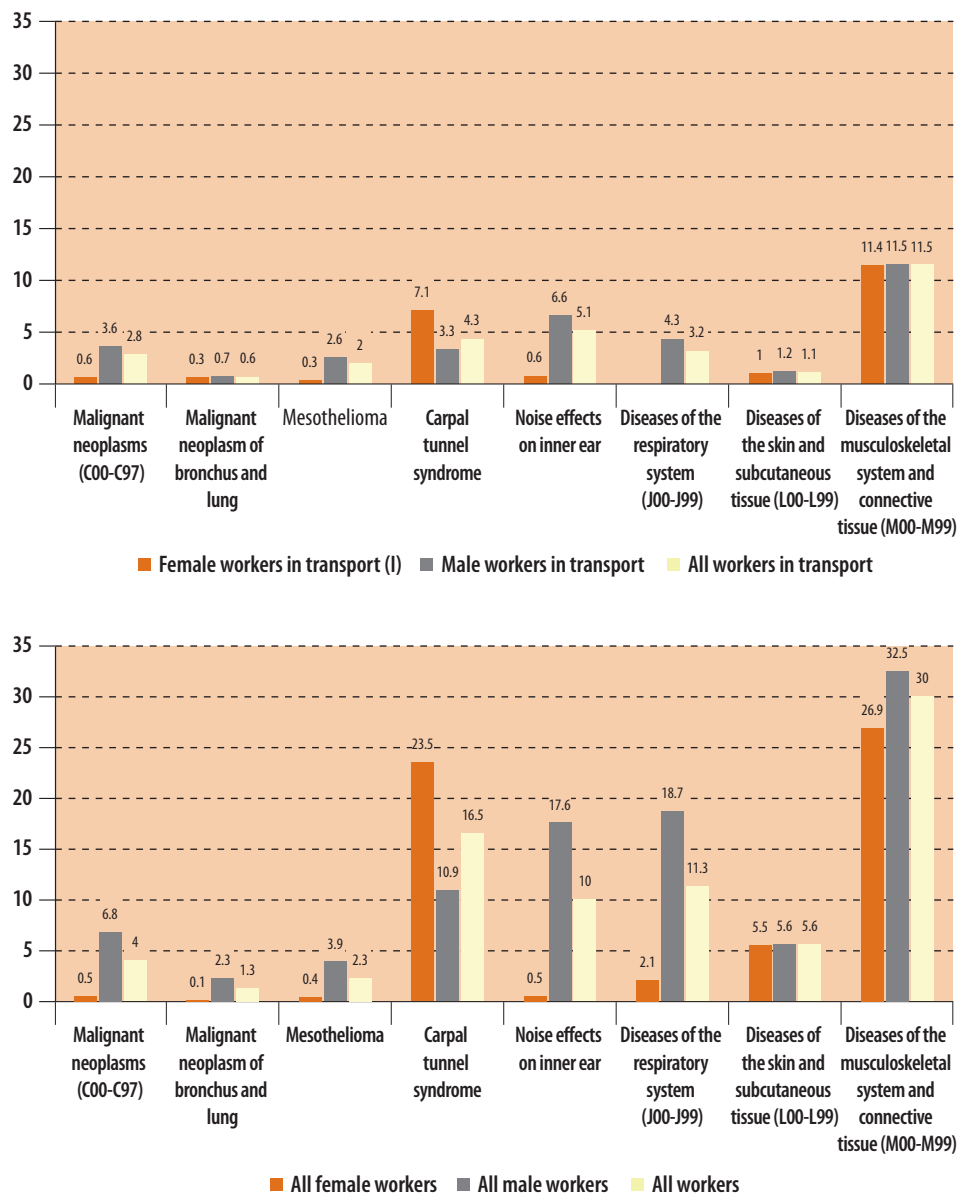
It is worth noting, however, that the incidence rates of hearing loss and cancer seem to be slightly higher for women in the transport sector than for the average female working population. This is confirmed by the relationship between female and male workers' incidence of these diseases: the ratio between men's and women's incidence rates is comparable with the general working population for skin diseases and for carpal tunnel syndrome, while it is higher for musculoskeletal disorders, hearing loss (1:10 = as compared to 1:30) and cancer (1:7 as compared to 1:16) for female transport workers).

Figure 32 illustrates the different distribution of occupational diseases for transport workers by gender.



Incidence rates of hearing loss and cancer appear to be slightly higher for women in the transport sector.

Figure 32: Incidence rate (per 100 000 workers) of occupational diseases, EODS obligatory list, for transport workers (NACE Rev. 1.2. Category I) and the general working population, 2005 ⁽¹⁹⁷⁾

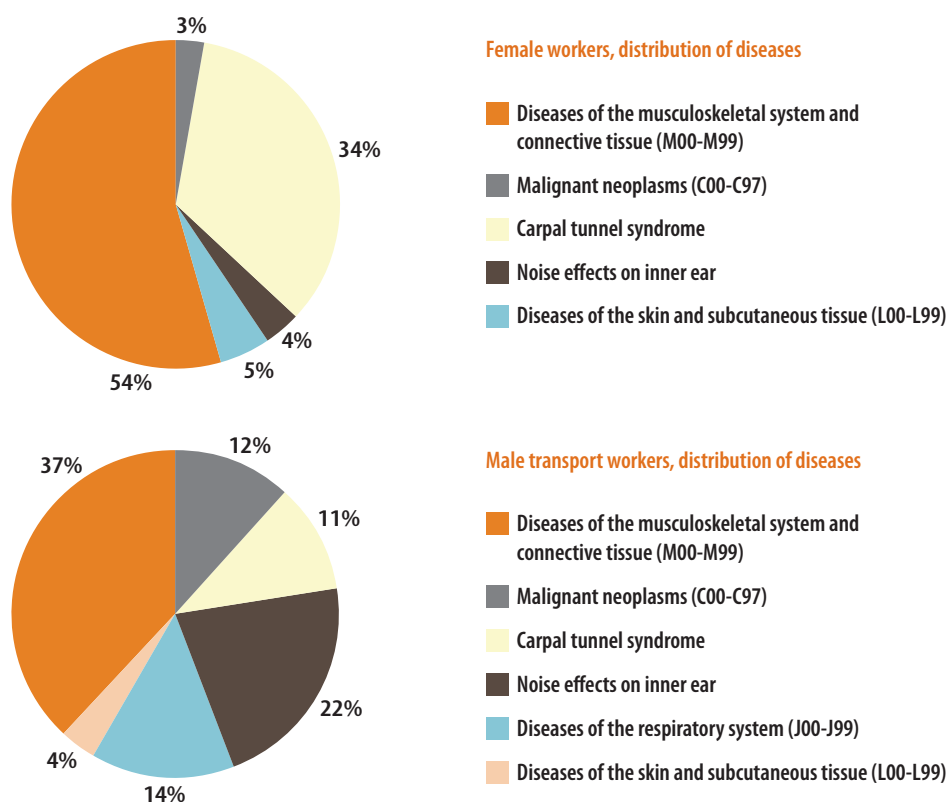


Source: EODS

⁽¹⁹⁷⁾ Available at: http://epp.eurostat.ec.europa.eu/portal/page/portal/health/health_and_safety_at_work/database. For incident occupational diseases the data refer to all old EU-Member States (EU-15) for the 1995 pilot data and to 12 Member States (Belgium, Denmark, Spain, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal, Finland, Sweden and United Kingdom) for the 2001 data. From 2002 onwards the data refer to the same countries, except for Ireland. For the deaths due to occupational disease, 2001 data refer to six Member States (Belgium, Denmark, Italy, Luxembourg, Austria, and Finland) and from 2002 onwards to seven Member States (Belgium, Spain, Italy, Luxembourg, Austria, Portugal, Finland). For each of the above data collections, only the EU-aggregate level data are published. Accessed on 28.9.2009.



Figure 33: Percentage distribution of occupational diseases in transport workers by gender, EODS 2005



Source: EODS

OCCUPATIONAL HEALTH PROBLEMS — SPOTLIGHTS FROM THE MEMBER STATES

3.3.

Denmark ⁽¹⁹⁸⁾

Men working in transport of goods have a 54 % higher probability of early retirement than men in general. Also, women working in goods transport have a 24 % increased probability.

Both male and female transport workers are at increased probability of being hospitalised due to various illnesses and diseases. For men these include — but are not limited to — acute myocardial infarction, vascular disorders in the brain, gastric problems, and diseases of the nervous system and sensory organs. For women, the list

In Denmark, men and women working in goods transport have much higher probability of early retirement.

⁽¹⁹⁸⁾ National data from the Danish Occupational Hospitalisation Register (OHR), available at: [http://www.arbejdsmiljoforskning.dk/Nationale %20Data/EHR.aspx](http://www.arbejdsmiljoforskning.dk/Nationale%20Data/EHR.aspx). The OHR is an exposure register monitored by the National Research Centre for the Working Environment, containing individual data on occupation, hospitalisation and health, and covering the activity sectors, industries and occupations that have a higher risk of health problems due to working conditions.



In Germany, the most relevant problems for workers in transport are general fatigue (50.6 %) and musculoskeletal disorders. In traffic/transport the average duration of sickness leave is also the highest of all branches.

In Latvia, women appear to be overrepresented in the occupational disease figures as they make up more than 40 % of the total, while their share in employment in the sector has fluctuated around 20–25 %.

includes — but is not limited to — chronic disease in the lower respiratory airways, asthma, stomach ulcers and diseases of the respiratory system.

Finland

Irregular working hours, having to stay awake, driving at nights and long working days are strain factors in transport. Health hazards connected to unusual working times, such as insomnia, long-term fatigue and digestive problems, are common and affect the health and well-being of workers. Results show that night work in particular increases the risk of coronary diseases, having an effect too on reproductive health.

Germany

The most relevant problems for workers in transport are general fatigue (50.6 %) and musculoskeletal disorders: 43.6 % complained of lower back pain. Stress-related health problems are also comparatively high (almost 30 %) and increasing, particularly headache (29.5 %), sleeping disorders (29.7 %) and nervousness (29.6 %). Other health problems reported more frequently are digestive, heart and respiratory disorders.

Compared with other branches in Germany, sickness absence figures for traffic/transport are always slightly above the average, for instance 4.7 % in 2005, as compared to 4.3 % for the national average. In traffic/transport the average duration of sickness leave is the highest of all branches: 14.1 days.

The most relevant reasons for confirmed cases of occupational diseases are noise-induced hearing loss, tropical diseases and asbestos dust-related lung disease (asbestosis) or pleural condition caused by asbestos dust. Most of these cases appear in transport and service occupations.

Italy

Among the reported occupational diseases, most — 90 % in 2005 — are not 'listed', meaning that it is up to the worker to prove that the illness is work-related. Among the listed illnesses, the ones caused by asbestos are the most common, followed by those affecting hearing that, in any case, have gone down in the past few years. A strong decline has also been recorded as far as osteo-articular illnesses are concerned.

Latvia

By type of disease it can be seen that of all 1,510 occupational diseases recognised in transport in Latvia between 1993 and 2005, the diseases of the musculoskeletal system and connective tissue (M) are the most frequent, with 786 recognised cases, which make up 52.1 % of the total. Of course, this does not mean that these are all the cases of occupational musculoskeletal disorders in transport in Latvia, as not all cases are recognised, but its big percentage share does give an indication of the extent of the problem. Next in line are 257 cases of injury, poisoning and other (T), representing 17 % of the total, and 245 cases of diseases of the nervous system (G), 16.2 % of the aggregate total between 1993 and 2005.

Women appear to be overrepresented in the occupational disease figures as they make up more than 40 % of the total, while their share in employment in the sector has fluctuated around 20–25 %. There were also more females with injury, poisoning and certain other consequences of external causes, 52.29 % compared to 47.71 %.



Poland

The most frequently recognised occupational disease in transport, storage and communication is hearing loss: 61 % of all recognised diseases in 2000–2005, as opposed to the 17 % share it (hearing loss) represents in the overall working population. This finding is striking when considering data on exposure to noise, which shows lower than average exposure rates to noise in transport.

Next in line in transport, storage and communication are pneumoconiosis (8.8 %) and chronic diseases of peripheral nervous system (8.8 %).

Spain

The Spanish definition of occupational accidents includes situations that are excluded in other national schemes, such as traffic accidents, heart attacks and other non traumatic accidents if they occur during working hours. It also includes accidents involving more than one day of absence, as opposed to three days in the EU data source ESAW. The most common type of accident in transport in Spain was due to physical stress on the muscular system, affecting 34 % of transport workers in 2006. All three transport subsectors reported this as their most important cause of accident, the highest share corresponding to air transport: 48.8 %.

Some 90 % of occupational diseases registered in transport between 2000 and 2005 have been musculoskeletal disorders, followed at a significant distance by skin diseases, which make up around 5 % of the total registered since 2000.

In line with this, in the transport survey ISCIII 2005–2006 workers were asked about visits to medical doctors concerning health problems related to work. Almost 30 % of the visits were related to backaches, while neck problems represented 13.5 % of the visits. Other causes to go to the doctor made up less than 7 %.

The Netherlands

The most common chronic diseases among transport workers are musculo-skeletal, cardiac and circulatory and respiratory problems: higher than average shares of workers in transport report leg and feet problems (7 %), back and neck problems (13.2 %), migraine (6,2 %), heart and circulatory diseases (5.3 %) and diabetes (3.6 %).

The percentage of workers reporting that the complaints leading to absenteeism were caused by their work is relatively higher in transport (38.8 % in 2006) than in the total (27.8 %). Flu/cold is the most common problem in all transport sectors, except in transport over water, where back problems are the main cause (33.5 %) for the last absence at work. In land transport, following flu/cold and back problems, neck and shoulder (11.5 %), stomach problems (8.1 %), psychological complaints (7.7 %) and hip, leg and knee complaints (6.5 %) are most commonly mentioned. In air transport almost half of workers (45.4 %) point out at flu/cold as the cause of their last absence from work, followed by psychological complaints (8.4 %).

In Spain, the most common type of accident in transport in Spain was due to physical stress on the muscular system, affecting 34 % of transport workers in 2006. Some 90 % of occupational diseases registered in transport between 2000 and 2005 have been musculoskeletal disorders.



3.4. WORK-RELATED HEALTH PROBLEMS

Most Member States indicate that the transport sector experiences a high number of musculoskeletal disorders (particularly back, neck and shoulder problems).

Other common diseases are stress-related health disorders, asbestos related diseases and noise-induced hearing loss.

Fatigue is one of the most reported health issues, confirmed by extensive studies at the subsector and national level. It also has a high impact on accident risks.

3.4.1. Musculoskeletal disorders

Train drivers compensated for carpal tunnel syndrome developed at work ⁽¹⁹⁹⁾

Three train drivers who alleged that an industrial injury left their hands permanently disabled have been awarded more than £22,000 in compensation between them. An employment lawyer has claimed that the decision could pave the way for more claims from train drivers.

All three drivers developed Carpal Tunnel Syndrome (CTS) while operating from a train depot. It was argued the symptoms were caused by repetitive work, adopting awkward wrist postures and operating brake and power controls in cramped conditions. The company denied liability, saying the injuries were not caused by working conditions and the union pursued the claim through the courts. The drivers had complained of inadequate seats with little or no adjustment and no arm rests. One driver said the condition forced him to take more than 10 months off work.

Following a five-day trial the judge found all three members suffered from CTS and he ruled it was work-related. He said the company had failed to assess the drivers' working conditions for risks to health and safety or to put preventative measures in place.

⁽¹⁹⁹⁾ <http://www.workplacelaw.net/news/display/id/25268>

Self-reported MSDs

According to the EWCS 2005 ⁽²⁰⁰⁾, workers in the sector transport over land seem to be more affected by muscular pains than the average: 32.2 % compared to 23.8 %. Also, 37.3 % of the workers in transport over land mention they are affected by backache compared to 25.6 % on average.

Recognised occupational MSDs

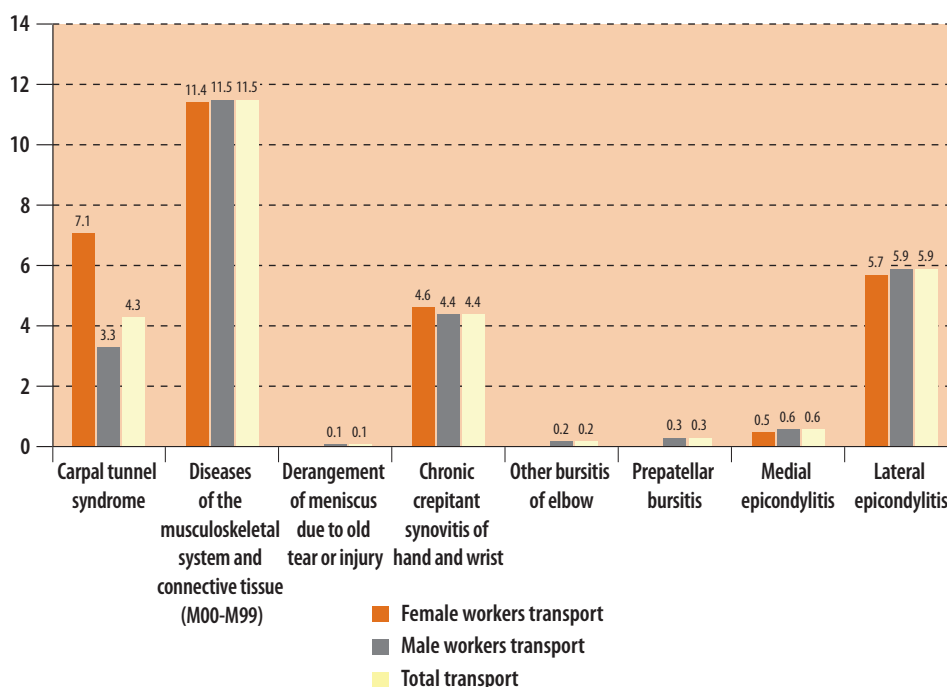
As mentioned before, MSDs show a slightly different pattern among female than among male transport workers: female workers report higher incidences of carpal tunnel syndrome.

As highlighted in a previous Agency report ⁽²⁰¹⁾, the pattern and distribution of recognised diseases in the different Member States differ considerably. It is therefore difficult to compare national figures with the EU-level statistics presented here. However, what can be mentioned, is that musculoskeletal disorders are expected to be an important issue for transport workers, as exposures of these workers to MSD risk factors (constrained postures, heavy lifting, static postures such as prolonged sitting, exposure to whole-body vibration, repetitive movements, etc.) are high (see Section 2 of this report).

This is in contradiction with the actual recognition of these diseases, which tend to be low when compared to other sectors.

In transport, across the EU female workers have higher incidences of carpal tunnel syndrome.

Figure 34: Incidence rates per 100,000 workers of the main MSDs, by gender, EODS 2005



Source: EODS

⁽²⁰⁰⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound), data extracted by Prevent for OSH Data Collection 2007, available at: <http://www.eurofound.europa.eu/working/surveys/index.htm>

⁽²⁰¹⁾ OSH in figures. Work-related musculoskeletal disorders — Facts and figures, European Agency for Safety and Health at Work, EU-OSHA, (2010). Available at: <http://osha.europa.eu/en/publications/reports/TERO09009ENC/view>



3.4.2. MSDs — data from the Member States

Belgium

Bone, discus and joint pathologies represent the largest part of the recognised occupational diseases in the transport sector with 74.62 %. The most common cause is mechanical vibrations. The part of the body that is mostly injured is the back. The highest shares concern the age group 45–54 years old, followed by the 55–64 and 35–44 olds, mostly men.

According to the WBM 2004, almost one out of two Flemish transport workers (41.8 %) reported neck-shoulder pain compared to 48 % of the average working population, about 41 % reported back pain compared to 45 %, and about 34 % reported muscular pain in arms and legs compared to 31 % in the last two weeks before the survey.

Spain

With 1,491 cases the road transport sector accounts for 91.42 % of the total number of diseases. Musculoskeletal disorders account for 91 % of all occupational diseases between 2000 and 2005 and their number has doubled in five years. The most common type of accident in transport in Spain was due to physical stress on the muscular system, affecting 34 % of transport workers in 2006. All three transport subsectors reported this as their most important cause of accident, the highest share corresponding to air transport: 48.8 %.

Germany

Musculoskeletal disorders are widespread and particularly increasing. The most relevant are lower back pain with 43.6 % compared to 42.5 % in other sectors and pains in neck and shoulder with 43.5 % compared to 46.3 %. Some 16.7 % report pains in arms and hands during or after work compared to 20.5 % in other sectors. Some 13.9 % report pain in the hip during or after work compared to 11.1 %. Some 24.2 % report pain in the knees during/after work compared to 18.3 %. Some 20 % have pain in the legs during or after work compared to 20.2 %.

In Germany, transport workers report higher shares of back pain and pain in the hip and in the knees.

Latvia

Between 1993 and 2005, 52 % of the total number of occupational diseases in the transport sector in Latvia were 'diseases of the musculoskeletal system and connective tissue', followed by 'injury, poisoning and certain other consequences of external causes' with 17 % and 'diseases of the nervous system' with 16.5 %. In total more men (57 %) than women (43 %) were affected by occupational diseases. There were more women with 'diseases of the musculoskeletal system and connective tissue' than men, 58 % compared to 42 %. And there were more men with 'diseases of the nervous system', namely 74.39 % compared to 25.61 %.





MSDs in bus drivers (France)

This monograph studied the risk of MSDs in bus drivers. Twenty articles were selected through bibliographic research based on key words or quoted authors. These were then studied using a qualitative analysis grid. Spinal MSDs in bus drivers are caused by a combination of biomechanical risk factors both chronic (trunk rotation, vibrations, etc.) and acute (awkward movements, carrying loads) plus psychosocial and driving position design factors. This connection is evident in the case of lower back, less so for upper back and neck pain. In addition, the risk factor typology was found to be consistent with models of comprehension for MSDs ⁽²⁰²⁾.



MSDs in ticket-takers / conductors (France)

This survey, started by CHSCT (French health, safety and working conditions committee), looks at the prevalence of MSD and spinal diseases among ticket-takers/conductors in an urban passenger transport company. The company's occupational physician and the occupational medicine department's ergonomist carried it out in 2002. It is the follow-up to a previous survey in 1985 by the same occupational physician. The results of the second study tend to indicate a decline in lower back problems. This could be related to improvements to the driving position. This is not true of cervical spine disorders which remain stable, and others that have either emerged or become more frequent, such as disorders affecting the shoulders, knees and carpal tunnel. The studies confirm that MSDs have a multi-factor origin ⁽²⁰³⁾.

⁽²⁰²⁾ Aptel. M., Aublet-Cuvelier A., Waldura D. Le risque de troubles musculosquelettiques chez les chauffeurs de bus: une réalité. Documents pour le médecin du travail, TF 161, No 111, 3ème trimestre 2007.

⁽²⁰³⁾ Dartois, M.F; Gandibleux V. Troubles musculosquelettiques (TMS) et pathologies du rachis dans une population de conducteurs-receveurs d'une entreprise de transport urbain de voyageurs. Archives des maladies professionnelles et de l'environnement, Vol. 67, No 3, juin 2006, pp. 545-546.





EU — SLIC campaign to prevent MSDs in transport ⁽²⁰⁴⁾

In the wake of the campaign on musculoskeletal disorders (MSDs) by the European Agency for Safety and Health at Work, Europe's Senior Labour Inspectors' Committee (SLIC) organised in 2007 a campaign on manual handling in the Transport and Care sector. The overall goals of the campaign were:

- to increase compliance in the EU with the EU Directive 90/269/EEC 'Manual Handling of Loads' in order to reduce MSDs;
- to improve the inspection and communication methods of the labour inspectorates by learning from existing methods;
- to create a greater harmony in the enforcement of the manual handling of loads throughout the EU.
- A guide was also produced to support the campaign activities ⁽²⁰⁵⁾.

The transport sector was chosen because of its broad, internationally oriented issues on manual handling, in order to reach a level playing field and offer the same level of protection for workers internationally. Therefore a few main areas within the transport sector have been targeted as focal inspection areas:

- airports: baggage handling manually (especially passengers baggage);
- harbour: stevedoring manually;
- all other work activities, which involve loading, unloading and transhipment of goods and baggage.

Amongst other things, the SLIC published in collaboration with Prevent a brochure on the prevention of lower back injuries in the transport sector. The goal of this brochure is to inform stakeholders about the inspection campaign, the problems on manual handling of loads issues and possible solutions ⁽²⁰⁶⁾.

The French national report on the 2007 inspection campaign ⁽²⁰⁷⁾ exploited further the measures that had been taken at the enterprise level. A summary is included in the annual report of the French ministry of labour (Bilan conditions de travail 2007). Three sectors were in the national focus of the campaign: construction, transport and healthcare.

⁽²⁰⁴⁾ Website of the SLIC European inspection and communication campaign on manual handling of loads, available at: <http://www.handlingloads.eu/en/site/>

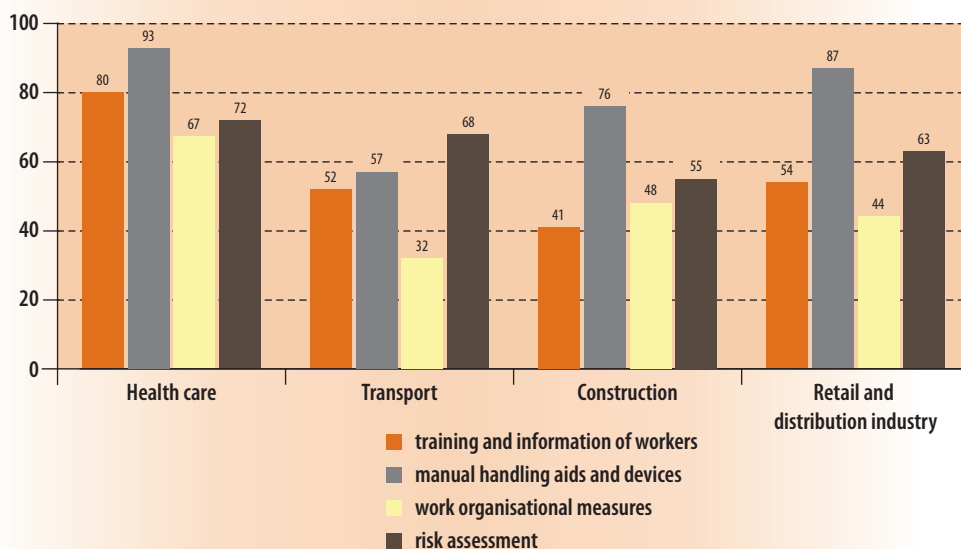
⁽²⁰⁵⁾ Senior Labour Inspectors' Committee (SLIC). Guide for the National Labour Inspectorates (NLI). 2007. Available in English at: http://www.handlingloads.eu/pdf_files/en/en-slic-guide.pdf.

⁽²⁰⁶⁾ SLIC. Lighten the load! The prevention of lower back injuries in the transport sector. 2007, p. 24. Available in English at: http://www.handlingloads.eu/pdf_files/en/gb-bro-transport.pdf

⁽²⁰⁷⁾ Bilan des conditions de travail 2007, chapitre 6, bilan de la campagne de contrôle manutention manuelle, pp. 159-170. http://www.travail-solidarite.gouv.fr/IMG/pdf/Chap_06.pdf

About two thirds of the enterprises had conducted and documented a risk assessment, with the healthcare sector taking the lead.

Figure 35: SLIC manual handling inspection campaign France — sectoral results (% enterprises who have introduced measures)



Source: Adapted from Bilan des Conditions de travail 2007, Chap. 6

The following issues were highlighted:

Regarding prevention measures, while enterprises generally put at the disposal of workers lifting and moving aids, work organisational measures were much less often implemented.

Some issues of concern mentioned identified in the report are the lack of awareness in air transport and the strongly growing courier (parcel) services sector.

3.4.3. Asbestos-related diseases

Asbestos exposures are expected to be relevant in selected occupations, for example where waste is handled or transported, or where work involves maintenance of older vehicles that may contain asbestos, such as ships or train wagons. Asbestos may also be found in brakes of older vehicles and transport means.

According to the EU figures on recognised occupational diseases, mesothelioma cases have been identified in transport workers, although at lower rates than in other occupations, for example in construction. This may well be due to underrecognition and lacking awareness on the issue in the sector.



Germany

One of the most relevant reasons for confirmed cases of occupational diseases are asbestos dust-related lung disease (asbestosis) or pleural condition caused by asbestos dust. Most of these cases appear in transport and service occupations ⁽²⁰⁸⁾.

Italy

Though its use has been banned in Italy since 1992, asbestos-related risks continue to be high among maintenance workers or among those involved in the scrapping of transport vehicles. Some 25 % of asbestos-related neoplasia cases — that were compensated by INAIL between 2001 and 2005 — occurred in the transport sector. Asbestosis continues to be one of the principal lung-related pathologies, and one out of four workers ill due to asbestos is employed in transport ⁽²⁰⁹⁾.



SLIC campaign on asbestos — asbestos a risk to workers in rail transport and maintenance

At its meetings in 2003 and 2004, the SLIC had agreed to launch an inspection campaign and to prepare a guide to good practice in cooperation with the Advisory Committee on Safety and Health at Work (ACSH). Under the slogan 'Asbestos is deadly serious. Prevent exposure!' the EU Member States carried out the campaign from September to December 2006.

The main challenges for labour inspectorates in the EU from asbestos arise in maintenance, removal and demolition work. There are practical problems with:

- identifying asbestos (Is it asbestos or not? Which type of asbestos?);
- drawing up an inventory of asbestos-containing material (location, amount, state);
- accidental exposure in refurbishment and maintenance work;
- risk assessment and appropriateness of working methods;
- removal and disposal of asbestos cement material, especially from private buildings;
- waste disposal and OSH;
- licensing and certification of companies specialising in removal and disposal of asbestos;
- information for the general public and training of inspectors, employers and workers.

⁽²⁰⁸⁾ Based on figures from BK-DOK of HVBG.

⁽²⁰⁹⁾ 'Dati Inail', No 6, June 2006.

A best practice guide was prepared for workers, employers and prevention experts respectively. It was translated into all official languages and aimed to:

- help identify asbestos and asbestos products during use, maintenance and servicing of plant, equipment and buildings and raise awareness of their presence;
- describe good practice for removing asbestos (including dust suppression, enclosure and protective equipment) and handling asbestos-cement products and waste;
- encourage an approach to protective equipment and clothing that takes account of human factors and individual variability.

Some countries published the guide as a booklet (e.g. PT, CZ, ES, SI) for experts and firms doing asbestos work; others distributed it to all inspectors.

Training was offered in nearly all Member States for asbestos specialist inspectors; in some countries all OHS inspectors were involved in the campaign and trained.

Another important feature of this campaign was its tripartite approach. Social partners were involved at EU level in the preparation of the campaign and national labour inspectorates were asked to actively involve social partners in training and information schemes in their countries.

Less known sources of exposure

During the campaign, railway trains and transport containers were revealed to be relevant sources of asbestos exposure and it was recommended to draw up specific good practice guidance for the relevant occupations.

EU-OSHA supported the campaign with a dedicated web section ⁽²¹⁰⁾ and will support to disseminate the results to its OSH audience.

During the campaign, railway trains and transport containers were revealed to be relevant sources of asbestos exposure and it was recommended to draw up specific good practice guidance for the relevant occupations.

3.4.4. Noise-induced hearing loss

According to the EWCS 2005 ⁽²¹¹⁾, about 33 % of the workers from the sector transport over land mention they are affected by hearing problems compared to 28.1 % of the average working population. Workers who report high exposure to noise also report higher rates of hearing problems.

Occupational diseases figures at the European level confirm that occupational hearing loss is an issue mainly for male, but also for female workers in the transport sector (see Figure 32, Section 3.2 of this report). Considering the high noise levels in some occupations in the sector (e.g. truck drivers, logistics workers, maintenance workers on ships), this does not come as a surprise.

⁽²¹⁰⁾ See EU-OSHA single entry point on dangerous substances (asbestos), available at: <http://osha.europa.eu/en/campaigns/asbestos>

⁽²¹¹⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound), data extracted by Prevent for OSH Data Collection 2007, available at: <http://www.eurofound.europa.eu/ewco/surveys/index.htm>



An earlier report on noise exposure and hearing loss in the EU highlighted the issue ⁽²¹²⁾.

As outlined in the next section, noise may act with other risk factors and increase accident risks, as it diverts attention, and leads to hearing loss (see also Section 3.4.5 on fatigue and cognitive problems).

Germany

One of the most relevant reasons for confirmed cases of occupational diseases is noise-induced hearing loss. Most of these cases appear in transport and service occupations ⁽²¹³⁾.



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ΑΔΑΜΟΠΟΥΛΟΣ, EU-OSHA
Photo Competition 2009

Finland

Occupational diseases are rare in the sector. In 2002, 46 occupational diseases were reported in truck and other special vehicles drivers. The second most frequent occupational disease was noise diseases 30 % (14 cases). The frequency of occupational diseases for 10,000 workers is about 11 ⁽²¹⁴⁾.

Spain

Hearing loss is the third most common occupational disease among transport workers.



Combined effects of noise and solvent exposures on aircraft maintenance workers ⁽²¹⁵⁾

This study focused on the combined effects of noise and organic solvents mixtures on hearing and balance in aircraft maintenance workers. Postural sway abnormalities were detected in about a third of the aircraft maintenance workers. This is in agreement with other research showing a significant association between solvent exposure and increased postural sway response.

The authors also elaborate on the findings of previous studies and highlighted the effect on other sensory functions: Toxic nature of solvents is well recognised and in particular their acute and chronic effects on the central nervous system.

⁽²¹²⁾ Noise in figures, European Agency for Safety and Health at Work, 2006. Available at: <http://osha.europa.eu/en/publications/reports/6905723/view>

⁽²¹³⁾ Based on figures from BK-DOK of DGUV.

⁽²¹⁴⁾ Connections between the safety, logistics, working conditions and professional attractiveness of road transport, FIOH 2006.

⁽²¹⁵⁾ Prasher D., Al-Hajjaj H., Aylott S., Aksentijevic A. Effect of exposure to a mixture of solvents and noise on hearing and balance in aircraft maintenance workers. *Noise Health* [serial online] 2005 [cited 2009 September 29];7:31-9. Available from: <http://www.noiseandhealth.org/text.asp?2005/7/29/31/31876>

Dizziness is a commonly reported feature of the effects but has not been extensively studied. Furthermore, the effect of solvent exposure on hearing has for some time been masked by the concomitant presence of noise in the workplace where solvent exposure occurred. It is beginning to emerge that not only are solvents ototoxic, but in the presence of noise can compound the effect on hearing. Recent studies examining the effect of solvent exposure alone and in combination with noise have begun to show synergistic effects on hearing.

A clear recommendation is to reconsider the current procedure for setting occupational exposure limits for solvents and noise: the effect on hearing or balance systems is rarely considered in the setting of limit values. Solvent exposure has been implicated in specific sensory impairment as for example colour perception or hearing damage, but again there is very little research which has examined damage of the senses in the same individual worker. Styrene, toluene, n-hexane and carbon disulfide have been shown to affect both colour vision and hearing.

A larger review on the neurotoxic effects of solvents and noise concluded that hearing loss and balance disturbances could occur at levels below permitted levels of exposure ⁽²¹⁶⁾.

3.4.5. Fatigue and other cognitive health problems

12 dead after HGV driver allegedly falls asleep at wheel ⁽²¹⁷⁾

A lorry driver fell asleep at the wheel, causing his vehicle to swerve into an oncoming minibus whose driver and 11 passengers were killed.

Trucking company fined for failing to limit drivers working times ⁽²¹⁸⁾

An Australian truck company pleaded guilty and was fined AUS\$ 165,000 for offences related to driver fatigue, reported the Australian Broadcasting Corporation on 5 May 2005.

Company directors and a number of drivers were charged with 306 offences, committed over a six-week period. Drivers were caught spending up to 18 hours a day behind the wheel, falsifying logbooks and failing to take breaks.

⁽²¹⁶⁾ Hodgkinson L., Prasher D., Effects of industrial solvents on hearing and balance: a review, *Noise Health*. 2006 Jul-Sep; 8(32):114-33

⁽²¹⁷⁾ [http://www.safetynews.co.uk/April %202007.htm](http://www.safetynews.co.uk/April%202007.htm)

⁽²¹⁸⁾ ILO press release, available at: http://www.ilo.org/global/About_the_ILO/Media_and_public_information/Press_releases/lang—en/WCMS_075542/index.htm



Overall fatigue is the most frequently mentioned work-related problem, and even more so for transport workers.

Extreme cases? According to an ILO report ⁽²¹⁹⁾, Australian estimates indicate that fatigue accounts for up to 30 per cent of single-vehicle crashes in rural areas. Australian research also indicates that fatigue is four times more likely to contribute to workplace impairment than alcohol or drugs.

According to the EWCS 2005, too, overall fatigue is the most frequently mentioned work-related problem but still, the share of affected workers is higher in land transport and pipelines than in the overall working population: 31.9 % and 22.5 %, respectively (Figure 35).

The Sectoral Activities Department of the ILO commissioned the report in order to draw attention to the links between fatigue and working time in the road transport sector, and to provide its constituents with information on this issue. In addition, it supported the International Transport Workers' Federation's (ITF) international campaign 'Fatigue Kills'. (see Section 3.4.6 for more detail on the campaign).

Definition of fatigue

Since fatigue is a common complaint, sometimes a potentially serious cause may be overlooked.

The following definition and explanation, adopted by the Medical Library, a service of the United States' National Library of Medicine and the National Institutes of Health is provided to demonstrate how comprehensive the term is.

The US Medical Library defines fatigue as a feeling of weariness, tiredness, or lack of energy. Synonyms of fatigue are tiredness, weariness, exhaustion and lethargy. It advises that it is different from drowsiness as this is a feeling of the need to sleep, whereas fatigue is a lack of energy and motivation. Drowsiness and apathy (a feeling of indifference or not caring about what happens) can be symptoms of fatigue. In addition, fatigue can be a normal and important response to physical exertion, emotional stress, boredom, or lack of sleep. However, it can also be a non-specific sign of a more serious psychological or physical disorder. Since fatigue is a common complaint, sometimes a potentially serious cause may be overlooked.

The ILO report mentioned above lists some of drivers' symptoms of fatigue:

- loss of alertness;
- difficulty keeping eyes in focus;
- frequent yawning;
- loss of concentration and wandering thoughts;

⁽²¹⁹⁾ Beaulieu, J.K., The issues of fatigue and working time in the road transport sector, International Labour Office, 2005.



- reduced awareness of surroundings — apparent sudden appearance of other;
- vehicles behind or in front of the truck;
- memory lapses;
- failure to check rear view mirrors as frequently as normal;
- unconscious variations in speed;
- erratic changing;
- driving too slow or too fast;
- drifting out of the lane;
- missing a turn-off.

Lack of sleep is considered to be one of the primary causes of fatigue.

Another larger review described more in detail in Section 3.4.6 ⁽²²⁰⁾, found that driver fatigue was a significant factor in approximately 20 % of commercial road transport crashes. Surveys had shown that over 50 % of long haul drivers have fallen asleep at the wheel.

More findings:

- fatigue affects drivers on long-distance driving, but can also affect drivers on short distances, because of long and non-standard working hours. For example:
- local/short-haul drivers had also been identified to have fatigue related accidents. In another study, the top five fatigue-related issues, ranked in order of importance by local and short haul drivers, were: not enough sleep, hard/physical workday, heat/no air conditioning, waiting to unload, and irregular meal times;
- driver fatigue, when increased by strain and uncomfortable or difficult positioning of the driver, is a common cause of bus accidents;
- taxi drivers, many of whom work extended shifts of up to 16 hours a day and with frequent night work, are also vulnerable to fatigue. They often start work the following day without sufficient recovery from the previous day's fatigue;
- the design of the driver's work area can influence driver fatigue. A poor design for the driver's area may cause more accidents and injuries to both the employee and the passengers than any other portion of the vehicle.

But fatigue, according to the report, was not just about accidents; for all commercial drivers fatigue can also impair a driver's ability to handle violence in the work environment, an issue of growing concern.

⁽²²⁰⁾ ETSC 2001.





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The time of day is known to be a significant factor in accidents among commercial drivers. Peak levels at night can be 10 times those of daytime levels.

The time of day was known to be a significant factor in accidents among commercial drivers. The effect of circadian rhythms (human performance in a 24-hour cycle) is important in analysing fatigue related accidents. The European Transport Safety Council's report notes that a recurring feature is that the maximum incidents of accident level occurs between 2 a.m. and 5 a.m., with a secondary, lower, peak at around 3 p.m. to 4 p.m. this is consistent with some studies reporting fatigue at similar times of the day, for example a study from Finland mentioned earlier in this report. The figures in the early morning hours are often 10 or more times higher than daytime levels. Increased crash risk occurs at night (peak levels at night can be 10 times those of daytime levels), the longer the working day and with irregular hours.

Rail transport

Working time schedules and limitations seem to be a major issue in rail transport too that has been controversially discussed in recent years. There are some exceptions allowed for in the working time Directive that seem to be applied in rail transport.

Rail transportation workers work nights, weekends, and holidays to operate trains that run 24 hours a day, seven days a week. Many work more than a 40-hour workweek, although minimum rest hours are foreseen. Engineers and conductors may be placed on an 'extra board' on which workers receive assignments only when a railroad needs substitutes for workers who are absent because of vacation, illness, or other reasons. Seniority usually dictates who receives the more desirable shifts, as do union agreements at large unionized railroads. Working conditions vary by the mode of rail transport.

While in road transport there is clear evidence of the effect of fatigue on accidents, evidence is still lacking in rail transport. An Australian review recommends monitoring and a fatigue management plan for all subsectors of transport.

Freight trains generally are dispatched according to the needs of customers; as a result train crews may have more irregular schedules. Jobs usually are assigned on short notice and often at odd hours. Working weekends is common in freight train transportation. Freight transport also tends to be more operated at night. Those who work on trains operating larger distances may spend consecutive nights away from home. Because of the distances involved on some routes, many railroad workers work without direct supervision.

Workers on passenger trains ordinarily have regular and reliable shifts. Also, the appearance, temperature, and accommodations of passenger trains are more comfortable than those of freight trains.

Rail yard workers spend most of their time outdoors and work regardless of weather conditions. These workers climb up and down equipment, which can be strenuous and dangerous if safety rules are not followed. The work of conductors and engineers



on local runs, on which trains frequently stop at stations or local rail yards to pick up and deliver cars, is physically demanding as well ⁽²²¹⁾.

An Australian review of rail transport has highlighted similar issues to those of road transport. While in road transport there is clear evidence of the effect of fatigue on accidents, evidence is still lacking in rail transport.

The Australian code of practice for fatigue management ⁽²²²⁾ recommends drawing up a fatigue management plan. While it does not recommend strict working time limitations and stipulate resting times, it does give a series of recommendations.

- The rest period between the end of one shift and the start of the next should be long enough to enable adequate sleep for recovery, usually eight hours. Some research shows that to achieve eight hours sleep, 12 hours rest is required before a 14:00 start, 14 hours before a 16:00 start and 16 hours before a 19:00 start.
- The length of any break should not be less than four minutes for each 30 minutes, or part thereof, since the last break or start of duty.
- However, all turns of duty in excess of five hours should include at least one break of 30 minutes, while no scheduled break should be less than 20 minutes long.
- No period of continuous duty should exceed five hours before either the provision of a break or the start of a period of off-duty.
- Rapidly rotating schedules, involving no more than two or possibly three night shifts are generally viewed as minimising the disruption of the individuals' body clocks. These systems have been associated with lower sleep disturbance, problems of circadian adaptation and performance decrements.
- Shifts can rotate in clockwise (morning, afternoon, night) or anti-clockwise directions (night, afternoon, morning). It has been shown that a clockwise direction (delaying system) has less ill-effects on shiftworkers than the anti-clockwise direction (advancing system) and the advancing system often results in rest periods of less than eight hours.
- For nightshift workers daytime sleep was, on average, two to four hours less per day than their dayshift counterparts. Even under controlled laboratory conditions, eliminating all environmental influences, day sleep was shortened in nightshift workers. This is primarily due to the fact that these workers are sleeping at times of circadian peaks when their bodies are primed for wakefulness.
- Successive night shifts result in a cumulative sleep debt that may get worse as more night shifts are worked. A number of studies done in industry have reported increases in accident risk over at least four successive night shifts. For safety-critical operations, such as public transport, it may be preferable to limit the number of consecutive night shifts worked to no more than two or three in order to restrict the accumulation of a sleep deficit associated with successive daytime sleeps.

⁽²²¹⁾ Rail transportation occupations, available at: <http://www.bls.gov/oco/ocos244.htm#nature>

⁽²²²⁾ National Rail Safety Guideline. Management of Fatigue in Rail Safety Workers. National Transport Commission 2008. Available at: http://www.ntc.gov.au/filemedia/Reports/NRSG_FatigueManagement_June2008.pdf



Simple questions that might help assess fatigue risk in rail workers

Is there a problem?

- Do the rail safety workers work at night?
- Do they work long periods at night or a number of continuous night shifts? (higher probability)
- Do they work alone at night?
- Do they commence work in the early hours of the morning?
- Are their hours of work likely to introduce a fatigue problem?
- Are the proposed schedules likely to increase the risk of occurrences from fatigue or have any particular feature that could give rise to fatigue risks?

If the answer to each of these questions was 'Yes', what risk is involved?

- What tasks are these workers undertaking — job design, workload and working environment, repetitive routes, etc?
- Has a task risk analysis been done?
- Have the relevant rail safety workers been identified from the task risk analysis?
- What could go wrong if one of these suffered an involuntary sleep episode of 1–5 minutes?

It was also recommended to set up a fatigue management program consisting of:

- a fatigue management policy;
- limits on hours of work, and provisions for adequate rest breaks;
- rostering design and management of work patterns;
- fatigue risk assessments and subsidiary assessments such as specific task/decompositions;
- 'competency based' education or 'awareness training' programs as appropriate;
- a rail safety worker fatigue reporting mechanism with associated feedback;
- procedures and measures for assessing/monitoring the fatigue management program;
- procedures for reporting, investigating, and recording incidents that are attributable wholly or in part to fatigue; and
- a process for review of the fatigue management program and its risk treatments/controls.

Such a fatigue management programme, although recommended for rail transport according to this specific study, could also be recommended in the other transport subsectors.





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The study also presents some instruments to assess fatigue risk, such as the UK Health and Safety Executive (HSE) Fatigue and Risk Calculator ⁽²²³⁾, or the United States Department of Transportation Work Schedule Representation and Analysis Software.

3.4.6. Case studies and initiatives — fatigue

The following studies and initiatives support the findings mentioned above: fatigue is one of the main problems in transport, and has a significant and dramatic impact.

Sleep apnoea is a sleep disorder characterized by pauses in breathing during sleep. Each episode, called an apnoea, lasts long enough so that one or more breaths are missed, and such episodes occur repeatedly throughout sleep, leading to a lack of oxygen. The standard definition of any apnoeic event includes a minimum 10-second interval between breaths. The patient wakes up, falls asleep again and the respiration stops again. This process can repeat itself hundreds of times a night, decreasing the quality of sleep drastically and leading to increased fatigue during the day. Clinically significant levels of sleep apnoea are defined as five or more episodes per hour.

⁽²²³⁾ Spencer, M.B., Robertson, K.A., Folkard, S., The development of a fatigue/risk index for shiftworkers Health and Safety Executive HSE. Research report 446 (2006). Available at: <http://www.hse.gov.uk/research/rrhtm/rr446.htm>.





Sleep apnoea as a cause for driver fatigue (Belgium) ⁽²²⁴⁾

A four-year research from the Katholieke Hogeschool Kempen on sleep disorders amongst truck drivers found that an important cause of fatigue was related to OSAS (Obstructive Sleep-Apnoea Syndrome). In recent years it has become clear that fatigue and driving are important causes of traffic accidents (almost 20 % of the accidents). Fatigue can be caused by different causes such as sleep deprivation, long working hours and irregular working hours, among others, but one of the most important causes is OSAS. According to this research, the higher prevalence of obesity among truck drivers is probably due to the occupational context, featuring little physical activity during the day and bad eating habits. The average body mass index (BMI) of this occupational group is 28.2, higher than the average for men: 25.4 according to the Nationale gezondheidsenquête 2001 — National Health Survey. There was also a high incidence of OSAS in the studied group, 13 % of them suffering from serious OSAS. The syndrome is combined with higher risk of traffic accidents and higher mortality risk.



The role of driver fatigue in commercial road transport crashes (EU) ⁽²²⁵⁾

The report, initiated by the European Transport Safety Council, an international nongovernmental organisation formed in 1993 and active in road transport safety issues, was prepared by a group of experts with financial support provided by Directorate of Energy and Transport of the European Commission and several large companies. It brought together the state of knowledge on fatigue while driving. Amongst others it provided statistics and results of research on fatigue-related accidents in commercial driving. Between 1997 and 2003, ETSC also published a yearly overview over road safety developments in Europe.

Findings and recommendations:

- research showed that driver fatigue is a significant factor in approximately 20 % of commercial road transport crashes. Surveys showed that over 50 % of long haul drivers have fallen asleep at the wheel;
- increased crash risk occurs at night (peak levels at night can be 10 times those of daytime levels), the longer the working day and with irregular hours;
- those fatigue factors that have been shown to influence road safety need to be better controlled in regulation policy and risk management;
- the most important factor that will ensure safety is to effectively implement and enforce regulation. Both working time and driving time need to be addressed under the same regulation;

⁽²²⁴⁾ Wuyts, B., Implementatie en effectmeting van een interventie bij truckers met een belangrijk gezondheidsrisico, Katholieke Hogeschool Kempen, Departement Gezondheidszorg en Chemie, Bachelor, Optie Voedings- en dieetkunde, 2007.

⁽²²⁵⁾ European transport safety council (ETSC), 2001. Available at: <http://www.etsc.eu/oldsite/drivfatigue.pdf>

- the framework for the regulation of working and driving time needs to be broadened to cover complementary measures including training for drivers and operators;
- a coordinated programme of research is needed to address knowledge gaps and to evaluate the effectiveness of regulation.

The ETSC has also published a report in 2009 ⁽²²⁶⁾ bringing together information about available driver fatigue detection systems (fatigue and drowsiness detectors) and examples of initiatives supporting, for example financially, the use of assistive technology in a private and professional context. The report is part of a larger project on transport safety, the PRAISE project. ETSC is also a campaign partner in EU-OSHA's 2008–2009 Healthy Workplace campaign on risk assessment ⁽²²⁷⁾.



Driver sleepiness-related problems, health status, and prolonged driving among professional heavy-vehicle drivers (Germany) ⁽²²⁸⁾

Questionnaire data concerning the frequency of prolonged driving, sleepiness-related problems while driving and personal health status were analysed from 567 professional drivers with five work descriptions. Of the drivers, 31 % had been regularly driving more than 10 hours, 19 % reported having dozed off at least twice while driving, and 8 % reported a near-miss situation due to dozing off during the past three months. Sleepiness-related problems while driving appeared across all driver groups, including drivers transporting dangerous goods and bus drivers, and were strongly related to prolonged driving, sleep deficit, and drivers' health status. The effects of the latter factors were interactive and cumulative: Frequent sleepiness-related problems occurred in more than one half of the drivers with the combination of prolonged driving, sleep deficit, and lowered self-perceived health. The authors concluded that the results give unreserved support for regulating driving hours and increase concern of the connection between professional drivers' health status and sleepiness-related problems while driving.

A 2006 study among 256 drivers in Germany ⁽²²⁹⁾ found similar results: 43 % reported having fallen asleep at the wheel during the previous year. Some 5.4 % of the drivers were assumed to suffer from sleep apnoea. The study concluded that the extent and kind of occupational-medical support of long-distance truck drivers should be improved.

⁽²²⁶⁾ How can in-vehicle safety equipment improve road safety at work?, 'PRAISE': Preventing Road Accidents and Injuries for the Safety of Employees Report No 1, European Transport Safety Council Sep. 2009. Available at: http://www.etsc.eu/documents/copy_of_PRAISE%20Report%201.pdf

⁽²²⁷⁾ <http://osha.europa.eu/en/campaigns/hw2008/partners>

⁽²²⁸⁾ Driver sleepiness-related problems, health status, and prolonged driving among professional heavy-vehicle drivers, Hakkanen, H., Summala, H., *Transportation Human Factors*, 2,(2000), pp. 151–171

⁽²²⁹⁾ Schlafverhalten und Schläfrigkeit bei LKW-Fernfahrern (Sleep behaviour and sleepiness in long-distance truck drivers), Müller, L.-D., Drysch, K., Brehme, U., Dietz, K., *Arbeitsmed.Sozialmed. Umweltmed.* 41 (2006) 464–474.





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Hours of Work and Rest Periods (Road Transport) Convention, 1979 ⁽²³⁰⁾

The ILO Hours of Work and Rest Periods (Road Transport) Convention, 1979 (No 153), concerns hours of work and rest periods in road transport. It is the only ILO Convention which deals exclusively with conditions of work in road transport. The main clauses of the Convention state that:

- every driver is entitled to a break after four hours continuous driving or after five hours continuous work;
- the maximum daily total driving time should not exceed nine hours;
- the maximum weekly total driving time should not exceed 48 hours;
- the daily rest period must never be less than eight consecutive hours.

As of August 2005, only eight ILO Member States (Ecuador, Iraq, Mexico, Spain, Switzerland, Turkey, Uruguay and Venezuela) had ratified this instrument.

⁽²³⁰⁾ <http://www.ilo.org/ilolex/english/convdisp1.htm>



Developing well-being of road transport drivers (Finland) ⁽²³¹⁾

The goal of the project was to develop the content of occupational health checkups for professional drivers, with the further aim to develop a model for occupational health checkups for this group. The strain factors and health risks identified in previous studies were confirmed. When it comes to the occupational healthcare of professional drivers, attention should be paid to alertness, sleep disorders and cognitive disorders. Attention should also be paid to risk factors of cardiovascular diseases and sleep apnoea, like overweight. Improving the eating habits and options of drivers is thus relevant. Other important areas are smoking, exercising, mental well-being and risk factors in the work environment.

Based on the results, a model for occupational health checkups for professional drivers was published by the Finnish Institute of Occupational Health ⁽²³²⁾.



Upper-Austrian pupilometre study (Austria)

A pupilometre study performed on 1,200 professional drivers between September 2005 and August 2006 ⁽²³³⁾ found that every second professional driver was not fit or only just fit to drive due to fatigue. A pupilometre is an eye-testing medical device used to test the pupil's reactivity to light. Handheld pupilometres are often used in preliminary examinations of patients who are suspected of being under narcotic influence, or for those who have sustained a significant head injury. One of the most interesting applications of the pupilometre is its use in the study of people with sleep difficulties. Those who are exhausted, or who suffer from narcolepsy frequently have either small, nonreactive pupils in the dark, or overly reactive pupils.

According to the study, older drivers showed less fatigue than younger ones, and truck drivers had higher fatigue scores than bus drivers, linked to longer working hours and more irregular shifts. The study found that driver fatigue has similar effects on drivers' reactivity than alcohol consumption.

Sleeping problems, fatigue and sleep apnoea are known problems in shift workers, including professional drivers. Following the test, the study recommended wider use of pupilometres in assessing driver fatigue.

⁽²³¹⁾ Paula Kärmeniemi ja Seppo Olkkonen (toim.). Maantiliikenteen kuljettajien työhyvinvoinnin kehittäminen. Työsuojelurahaston loppuraportti no 105257, 29.12.2006, Työterveyslaitos. Summary available on: <http://www.tsr.fi/tutkimus/tutkittu/hanke.html?id=105257>

⁽²³²⁾ Olkkonen, S. et al.; Safe and Healthy Professional Drivers-Recommendations for Occupational Health Care Services, presented at the International Conference on Road Safety at Work Washington, D.C., 16–18 February 2009, available at: <http://www.cdc.gov/niosh/programs/twu/global/>

⁽²³³⁾ http://www.oee.gv.at/cps/rde/xbcr/SID-3DCFCFC3-D3A06D8C/ooe/PK_Haider_11.5.2007.pdf





Research on seafarers' fatigue

Seafarers' fatigue is an OSH issue that is common and widespread. It implies several consequences such as environmental disasters, economic losses due to fines for accidents and/or increased insurance premiums, and serious health implications for seafarers. The problem is not being adequately dealt with by current legislation, management or working practices and there is an urgent need to improve the situation.

In the six-year research programme into seafarer fatigue, 'Seafarer Fatigue: The Cardiff Research Programme' ⁽²³⁴⁾, including a literature review, a survey of 1,856 seafarers, diary studies and objective testing on board, revealed that:

- one in four seafarers said they had fallen asleep while on watch;
- almost 50 % of seafarers taking part in the study reported working weeks of 85 hours or more;
- around half said their working hours had increased over the past 10 years, despite new regulations intended to combat fatigue;
- almost 50 % of seafarers taking part in the study consider their working hours present a danger to their personal safety;
- some 37 % said their working hours sometimes posed a danger to the safe operations of their ship.

Complementing the aims of the Cardiff Research Programme, the study 'Adequate Crewing and Seafarers' Fatigue: The International Perspective' ⁽²³⁵⁾ broadened the perspective by considering international findings and looking at comparable industries and their approach to the problem. The study concludes that there is overwhelming evidence of the existence of maritime fatigue even though the industry has been reluctant to invest resources into monitoring or preventing it. The potential for fatigue amongst seafarers appears to be high. The causes are well established in onshore jobs and many of the known risk factors are present offshore. In addition to the fatigue-inducing conditions present in other jobs, seafarers are exposed to specific problems that add to the risk of fatigue. Also, the workload of seafarers has greatly increased because of reduced manning levels, increased paperwork, faster port turnarounds and other pressures which reflect current economic demands. It is this combination of circumstances that leads to the high potential for fatigue in seafarers. The study not only shows that seafarers are exposed to many risk factors for fatigue, but that they also often report extreme fatigue (despite the 'macho' culture) and that they may have impaired performance, well-being and health due to fatigue. These facts are supported by several studies from different countries.

⁽²³⁴⁾ Smith A., Allen P. and Wadsworth E., *Seafarer Fatigue: The Cardiff Research Programme*. Cardiff University, Centre for Occupational and Health Psychology, 2006, p. 87. Available in English at: http://www.socp.org/Cardiff%20research_report.pdf.

⁽²³⁵⁾ Smith A. *Adequate Manning and Seafarers' Fatigue: The International Perspective*. Cardiff University, Centre for Occupational and Health Psychology, 2007, p. 74. Available in English at: <http://www.itfglobal.org/files/sealsodocs/3193/ITF%20FATIGUE%20REPORT%20final.pdf>.

Another conclusion is that there exist many more strategies (regulation, enforcement, awareness campaigns, training and guidance) aimed at preventing fatigue in other comparable transport industries (road, rail, air). One reason for the well developed approach in other sectors has been the knowledge base that now exists about fatigue in these industries. A second reason for developments in this area in other sectors has been the interaction of all the stakeholders to advance the understanding of what underlies fatigue and what can be done to prevent and manage it.



'ITF: fighting seafarers' fatigue' (EU)

Because of the serious problem of seafarers' fatigue, the International Transport Workers' Federation (ITF) had initiated a campaign to raise awareness and to address the fundamental issue of minimum levels of safe manning. A campaign package 'Fight Fatigue!' consisting of a brochure and poster designed to assist unions in lobbying their administrations is downloadable from the ITF website ⁽²³⁶⁾ ⁽²³⁷⁾. The ITF also makes the results of the above-mentioned research on seafarers' fatigue available on the website.



© By courtesy of ETF

Poster for ITFs 'Fight fatigue' campaign (also available in Russian, French and Spanish)

⁽²³⁶⁾ More information: <http://www.itfglobal.org/seafarers/fatigue.cfm>.

⁽²³⁷⁾ International Transport Workers' Federation. Fatigue poster. Available at: <http://www.itfglobal.org/seafarers/fatigue.cfm>.





Swedish Occupational Fatigue Inventory (SOFI) ⁽²³⁸⁾

The aim of the study was to analyse subjective qualities of fatigue. A questionnaire was answered by 705 persons employed in 16 different occupations. They rated the perceived fatigue during a task which they regarded as being typical of their occupation. Ratings of fatigue were made with regard to 95 verbal expressions, using a numerical 11-grade scale. The ratings were subjected to factor analyses, first exploratively then confirmatively. Five factors were extracted and these were named: (1) lack of energy; (2) physical exertion; (3) physical discomfort; (4) lack of motivation; (5) sleepiness. The strength of the five factors differed between the occupational groups.

The results offer a new qualitative and quantitative description of the physical (the factors 'physical exertion' and 'physical discomfort') and mental (the factors 'lack of motivation' and 'sleepiness') dimensions of perceived fatigue. In addition, one of the factors, 'lack of energy', seems to describe a general underlying quality of fatigue. On the basis of these results, a questionnaire was developed, the Swedish Occupational Fatigue Inventory (SOFI), in which each factor is represented by five expressions. The SOFI has since been improved ⁽²³⁹⁾, translated into other languages and used in different studies related to chronic diseases and work organisational factors such as shift work.

3.4.7. Fatigue, stress and related health problems

In the transport sector, some of the factors that contribute to stress are: working alone, lack of involvement, irregular work hours, violence and aggression, and work pressure.

Post-traumatic stress episodes, for example when workers are confronted with passenger suicide, may lead to permanent work disability.

Fatigue and stress-related health problems may interact and lead to higher accident risk and worse health.

According to the EWCS 2005 ⁽²⁴⁰⁾, workers in the sector transport over land seem to be more affected by stress than the average working population: 33.3 % compared to 23.7 % of the average working population report stress. As mentioned before, a similar

⁽²³⁸⁾ Åhsberg, E., Garnberale, F., Anders Kjellberg, A., Perceived quality of fatigue during different occupational tasks, development of a questionnaire, *International Journal of Industrial Ergonomics* 20 (1997), pp. 121-135.

⁽²³⁹⁾ Åhsberg, E., Dimensions of fatigue in different working populations, *Scandinavian Journal of Psychology* 41(2001), pp. 231-241.

⁽²⁴⁰⁾ European Working Conditions Survey 2005, European Foundation for the Improvement of Living and Working Conditions (Eurofound), data extracted by Prevent for OSH Data Collection 2007, available at: <http://www.eurofound.europa.eu/working/surveys/index.htm>



proportion, 30.5 % of the workers in transport over land also report overall fatigue (compared to 23.7 % on average) (see Section 3.4.5 of this report).

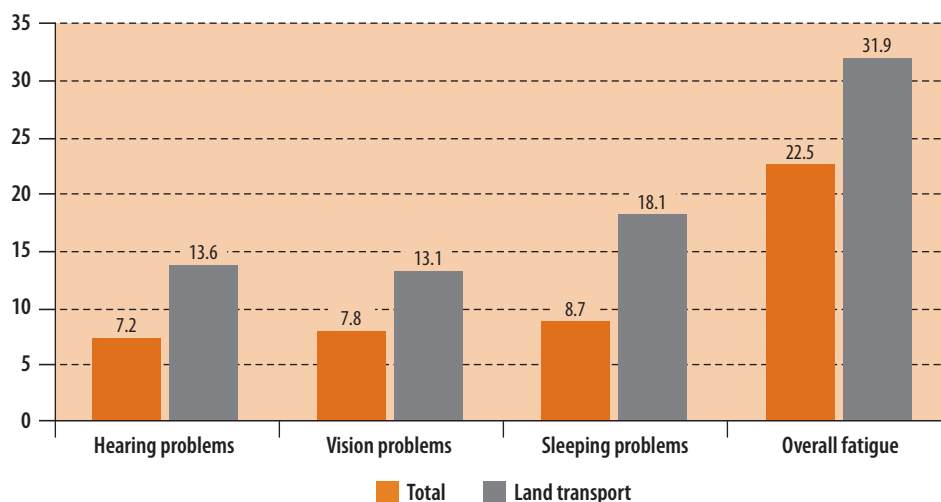
The EU survey figures also hint at a possible synergistic effect of different impairments regarding the cognitive abilities of transport workers. According to the EWCS figures, land transport reports a higher than average share of workers affected by other cognitive and working-time-related health problems too. In this sense, land transport and pipelines reports a higher percentage share of workers that are affected by hearing problems than the overall working population in the EU-27: 13.6 % and 7.2 %, respectively.

When it comes to vision problems, workers in land transport and pipelines (13.1 %) too seem to be more affected than the EU-27 average (7.8 %), while the gap is even bigger regarding sleeping problems: 18.1 % of workers in land transport report suffering from sleeping problems, as opposed to 8.7 % in the total working population.

Some of the national data presented below and the case studies in the previous section indicate that fatigue and stress may have similar causes as well as similar consequences. Work pressure, excessive and non-standard working times, lone work, lack of contact and support from colleagues and managers, violence and harassment may lead to sleep disturbances and headaches and may all interact with each other. Depending on the transport jobs they work in, the different factors might interact differently, but there are some common features in the working conditions of the different transport professions. There are also work organisational factors interacting. As demonstrated in Section 2.3. of this report, transport workers may have more repetitive work, have less influence over their work, and may be dependent on direct demands from clients and passengers, or external schedules; they also have to adapt schedules and have unusual working times. Finally, they have limited scope for adapting the conditions of their work, their workload and may have conflicting tasks.

About twice as many workers in transport suffer from hearing loss, vision problems, sleeping problems and overall fatigue as on average. All of these factors together may also contribute to accident risks.

Figure 36: Fatigue and other work-related health problems, in percentage share of workers, land transport and total, EU-27, 2005



Source: EWCS



National data:**Belgium**

According to the results of the WBM 2004, 29.7 % of the transport workers report work stress compared to 28.9 % of the average working population. These figures do almost not differ within the transport compared to the total working population; nevertheless it is an important problem.

However, transport workers less often report emotional problems such as anxiety, depression, irritability or feeling low, or emotionally stressful work.

Greece

Regarding transport sector in particular, according to ELINYAE sector survey, about 82 % of respondents report being subject to stress at work, sometimes (43 %) or always (39 %).

Germany

Compared to the other sectors (43.8 %), transport workers consider themselves less stressed by work. Some 39.2 % of the transport workers report to be often or sometimes stressed compared to 43.8 % of the other sectors. However, the percentage of transport workers who complain about general fatigue is much higher with 50.6 % compared to 42.6 %. Accordingly, stress and fatigue-related health problems are increasing among transport workers: particularly headache with 29.5 % compared to 29 % in other sectors, nightly sleep disorders with 29.7 % compared to 19.6 % and nervousness with 29.6 % are worth mentioning.

Finland ⁽²⁴¹⁾

Occupational diseases are rare in the sector. The main occupational diseases were stress diseases (caused by repetitive work) at 34.7 % (16 cases). The frequency of occupational diseases for 10 000 workers is about 11.

Some of the factors that contribute to mental fatigue are: working alone, irregular work hours, and lack of work-mates. Surveys also indicate that problems are seldom discussed at work, and the supervisor is not there to give support or encouragement. Of the three sectors covered in the two consecutive surveys mentioned here, road transport scored the worst in terms of incidence of overall fatigue. One of them, the LOGHO-project ⁽²⁴²⁾, aimed to clarify the relationship between safety, logistics, working conditions and professional attractiveness of road transport. This was done by carrying out interviews and using earlier research findings. The goal was to get an overall picture of the relevant connections. Openness, communication, improvement of team spirit and management practices were found to be key factors in the effort to improve functioning of teams. One third of the transport entrepreneurs who responded reported fatigue to some extent and a poor work atmosphere in their companies. They also recognised problems in the way that the work is organised.

On the other hand, drivers reported that the following factors add to the strain of working alone: having to work alone most of the time; not being able to communicate

⁽²⁴¹⁾ The national report on working conditions in road transport in Finland.

⁽²⁴²⁾ I. Salanne, E. Keskinen, P. Kärmeniemi & al. Työ ja ihminen, Connections between the safety, logistics, working conditions and professional attractiveness of road transport, LOGHO-project Research report 30, FIOH 2006.



with anyone; not having influence over their work; remaining alert during night duty; and fear of an accident when loading and unloading chemicals. The work atmosphere in the transport enterprises was reported as being familiar and encouraging by some (37 %) but also as distrustful and tense (59 %) by others; relations between the workers were considered to be good by 63 %. On average, clerical staff felt that the work atmosphere was more encouraging than did the other groups of employees. The relations between workers in the terminals and in maintenance had deteriorated. Some 27 % reported that the work atmosphere had improved a little or a great deal, while 21 % reported that it had worsened a little or a lot. One half of the respondents continued to feel that problems are seldom brought up for discussion, and furthermore, that employees can rarely if ever turn to their superiors for encouragement or support. These observations came up in the drivers' response more pronouncedly than in the other groups. In the first survey, the employees saw a great deal to be improved in the management practices (48 %) and team spirit (45 %). In the follow-up survey, 13 % said that management practices and 25 % that the work atmosphere had been dealt with.

3.4.8. Case studies and initiatives — stress and work organisation



Post-traumatic stress — suicide in rail travel

Railway workers, in particular train drivers and (senior) conductors, are regularly confronted with suicides and violent death on the rails. These are a major cause of stress. The incidents often produce reactions ranging from mild anxiety to hallucinations and include nightmares, weeping, inability to relate to family and friends, guilt, hopelessness, flashbacks, anxiety and panic attacks and fear of returning to work.

A Berlin study ⁽²⁴³⁾ assessed that on average every driver will be confronted once in his/her life with running over a passenger. The doctoral thesis assessed the experiences of 54 underground drivers who had been confronted with such traumatic events. Some 70 % of them had a short- or long-term work incapacity. In the first four weeks, 40 % had signs of a post-traumatic disorder, for every tenth driver it became a permanent condition. Nevertheless, most of them return to work after a few days. Most drivers were disappointed with the service provided to them, mainly short-term attendance and medication.

The aims of a French study ⁽²⁴⁴⁾ were to investigate psychiatric disorders, somatic health, and professional effects in French train drivers having experienced a 'person under train' accident. A total of 202 train drivers were evaluated several times: immediately after the event, three months later, and one, two, and three years later. These drivers were compared with 186 train drivers not exposed to that psychotraumatic shock. In the exposed group, at the first evaluation, the prevalence of post-traumatic stress was 4 %; drivers were assessed for somatic symptoms, anxiety and sleep, and psychosocial functioning. Most of the psycho-

⁽²⁴³⁾ Denis, D. Die Angst fährt immer mit. Wie Lokführer traumatisierende Schienenunfälle bewältigen, doctoral thesis, Heidelberg und Kröning: Asanger Verlag 2004.

⁽²⁴⁴⁾ Cothureau, C., De Beaurepaire, C., Payan, C., Professional and medical outcomes from French train drivers after 'person under train' accidents: three year follow up study. Occupational and Environmental Medicine, 61(6), 2004, pp. 488-494.



behavioural disorders were observed in the immediate aftermath of the accident and disappeared within a year. The authors concluded that the drivers' occupational future does not seem to be affected by the 'person under train' accident. However, they found that consideration of a traumatic accident as a job related risk and close psychological support of drivers after an accident probably increase the subject's ability to recover from the event.

An HSE review ⁽²⁴⁵⁾ summarised 20 studies on post-traumatic stress. This research was mainly conducted in Scandinavia, France, the USA and the London Underground. Person under train (PUT) events emerged as the primary cause of posttraumatic stress disorders in the rail industry. A number of recommendations for good practice were made. There appears international consensus that a train driver can expect to experience at least one PUT event in their career. Prevalence rates for acute PTSD in the month after an incident ranged from 4 % to 17 %. However, the prevalence of acute psychological distress, including PTSD and other stress reactions such as Acute Stress Disorder (ASD) and phobic avoidance, was found to approximate 40 %.

A line manager's approach in the immediate aftermath of an incident was identified as pivotal in influencing recovery, but it appeared to be left largely to their discretion.

The study recommendations:

- apply to all types of trauma-induced psychological distress besides PTSD, and encompass rail employees, their family and other bystander witnesses;
- ensure support provision for at least one year post incident, particularly during inquests;
- make provision for obtaining family forgiveness, wherever appropriate;
- ensure that line managers offer employees the option of being relieved from duty, 'time out', escort arrangements and sanctioning sick leave, and maintaining contact with the employee in the immediate aftermath of an incident;
- ensure every effort is made to avoid drivers having to continue alone, particularly at night;
- make provision for a buddy support system. This is contingent on the efficacy of buddy support systems having first been formally evaluated and proven beneficial;
- offer formal counselling on a voluntary basis, approximately one month post incident to allow for natural recovery.

⁽²⁴⁵⁾ Lunt, J., Hartley, R., Literature review of post traumatic stress disorder amongst rail workers, Health and Safety Laboratory, UK, 2004. Available at: http://www.hse.gov.uk/research/hsl_pdf/2004/hsl0416.pdf.





Preventing post-traumatic stress following critical incidents in air traffic control work (Portugal)

This initiative was an award winner in a European competition, run as part of the European Week for Safety and Health at Work 2002 ⁽²⁴⁶⁾, which aimed to support the dissemination of good practice information about psychosocial risks and work-related stress and promote the application of 'practical solutions' in workplaces in Member States and across Europe.

A lot of attention has been paid to stress in the work of air traffic controllers, but this has mainly been related to the mental or cognitive workload involved in carrying out their work under considerable pressure without making errors. Much less attention has been paid to supporting air traffic control staff that have been involved in or witnessed a 'critical incident' and may suffer stress or trauma related to this. Critical incidents may be actual aviation accidents or near-miss accidents. Reactions may take the form of inability to remember certain aspects of the incident, flashbacks, irritability, difficulty concentrating, difficulty getting back to work, etc.

In this initiative, support was brought to staff through Critical Incident Stress Management, CISM. The technique aims to encourage workers to understand what is happening to them during and after critical incidents rather than remain in shock and confusion. It uses peer and specialist support.

After a critical incident, CISM provides one-to-one discussion with affected staff, group debriefing and defusing. The introduction involves an information stage, training two key managers, recruiting sufficient volunteers — CISM team peers — and providing them training, selecting three health professionals, who need sufficient knowledge and training in both CISM and air traffic services. It also involves having a service available at all times, providing sessions within 24 hours of the incident, ensuring that the peers can determine when the people they are helping require another type of (professional) help and provision of support as necessary to the peers themselves.

Where critical incidents occur, there will be the potential for a significant stress reaction in affected workers. This makes it particularly important for action to be taken to reduce the likelihood of post-traumatic stress problems. It is also important that this form of critical incident stress management should be part of a wider stress prevention programme that looks at the other causes of stress in the work. Knowledge in the area of critical incident stress management is developing all the time and programmes should therefore review the services they offer in the light of new information.

⁽²⁴⁶⁾ Prevention of psychosocial risks and stress at work in practice, European Agency for Safety and Health at Work, EU-OSHA, 2002. Available at: <http://osha.europa.eu/en/publications/reports/104>





Causes of stress in transport sector by BTB — ABVV (Belgium)

The Belgian Labourers Transport Union (BTB-ABVV) investigated the causes of stress in the transport sector, based on 1 300 responses on their questionnaire. Six different topics were investigated: work organisation, human resources, support, social aspects, 'on the road' (only for drivers), personal aspects.

The following items were considered the most stressful for sector freight transport by road:

- responsibility for material;
- lack of involvement;
- other traffic drivers and aggression;
- quality requirements;
- unsafe work conditions.

For other scheduled passenger land transport the main factors identified were:

- responsibility for material;
- lack of involvement;
- not enough personnel;
- other drivers, aggression and responsibility;
- no promotion possibilities ⁽²⁴⁷⁾.

Concluding from the results of their questionnaire, ABVV proposed specific actions to be taken in the future to reduce stress factors:

- just-in-time: mandatory black box that registers the planning (to avoid impossible client demands), training for dispatching, punishment of violations;
- dispatching of waste collection: more personnel, introduce prevention officers, ADR training, training in social skills;
- flexitime: clear collective agreements on flexibility;
- recognition of the profession of 'truck driver': recognition at national and European level based on a specific diploma.

⁽²⁴⁷⁾ ABVV-BTB, Wegwijs april/mei/juni 2002, 2002.



© Kalabiński Rafał, EU-OSHA Photo Competition 2009



Cardiovascular risk among occupations of the French railway transportation (France)

The objective of the study was to assess the cardiovascular risk in men among occupations categories of the French railway transportation (SNCF) based on the measurement of the absolute cardiovascular risk (RCVA), occurrence of a coronary event within a period of 10 years, and risk estimates from the Framingham study⁽²⁴⁸⁾. The study was interested in the prevalence of high-risk cardiovascular workers among eight groups of occupations: shunters, mechanical maintenance operators, maintenance workers in workshops, track maintenance operators, train inspectors, train drivers, administrative workers and other workers. A multivariate analysis (logistic regression) was used.

⁽²⁴⁸⁾ In 1948, the Framingham Heart Study was launched under the direction of the National Heart Institute (now known as the National Heart, Lung, and Blood Institute; NHLBI). The objective of the Framingham Heart Study was to identify the common factors or characteristics that contribute to CVD by following its development over a long period of time in a large group of participants who had not yet developed overt symptoms of CVD or suffered a heart attack or stroke. The researchers recruited 5,209 men and women between the ages of 30 and 62 from the town of Framingham, Massachusetts, and began the first round of extensive physical examinations and lifestyle interviews that they would later analyze for common patterns related to CVD development. Since 1948, the subjects have continued to return to the study every two years for a detailed medical history, physical examination, and laboratory tests, and in 1971, the study enrolled a second-generation group — 5,124 of the original participants' adult children and their spouses — to participate in similar examinations. In April 2002 the Study entered a new phase: the enrolment of a third generation of participants, the grandchildren of the original cohort. See: <http://www.framingham.com/heart/profile.htm>



The RCVA was analysed in 76,488 men from 30 to 54 years. The results show that the rate of workers at high risk for cardiovascular disease is 5 %. This percentage is variable according to the occupations. After multivariate analysis, the groups of workers characterised with a cardiovascular high-risk were found to be shunters, mechanical maintenance workers and track maintenance operators. Among these detected high-risk workers, shunters are affected more often by diabetes mellitus, mechanical maintenance operators by total cholesterol ≥ 6.2 mmol/L (2.4 g/L) and track maintenance operators by arterial hypertension ($\geq 140/90$ mmHg).

The authors of the study concluded that lifestyle and professional individual factors (shift work, handling operations, postural constraints, climatic constraints, socioeconomic category) could explain the results. The results suggested to implement targeted actions of prevention ⁽²⁴⁹⁾.



Stress management for engineers in regional traffic and for locomotive drivers ⁽²⁵⁰⁾

The statutory accident insurance for cable cars, underground railroads and railways and (Accident Insurance Railroad) offer special media packages for their member enterprises (Computer-based Training — CBT). Media packages were developed for engineers in regional traffic and for locomotive drivers with scientific support and in close cooperation with practitioners from railway companies. They put the enterprises in the position to independently carry out seminars on stress management in the railway operating service. They contain an informative part with a knowledge test and an exercise part. The informative part provides practical examples which explain the connections between the origin and the impact of stress and what people can do to prevent it. For engineers, for example, it describes situations at train stations and conflicts with the passengers and how to solve them.

In the practical part, users are confronted with situations that they know from their working practice. For example, engineers in regional traffic are supposed to learn to foresee critical traffic situations, to react appropriately to these situations and to better coordinate complex tasks. The practical part for locomotive drivers shows situations in which they come across difficulties, i.e. at loading points, or communication problems with the controller. Users should find out how disturbances are to be recognised in time, the alternative actions they have and how to react.

Sickness absenteeism and the risk of disability are significantly higher for bus drivers than in other professional groups. They leave their job at a younger age. The main conditions leading to disability relate to the back, tendons and joints, mental disorders and cardiovascular diseases. Studies report high stress hormone levels and high blood pressure.

⁽²⁴⁹⁾ Cothureau, C., et al., Risque cardio-vasculaire et métiers du transport ferroviaire, Archives des maladies professionnelles et de l'environnement 67 (5), 2006, pp. 737-743.

⁽²⁵⁰⁾ Berufsgenossenschaft der Straßen-, U-Bahnen und Eisenbahnen/Eisenbahn-Unfallkasse — EU <http://www.stresspraevention.de/eisenbahn/index.html>



Occupational stress and stress prevention in bus drivers (ILO) ⁽²⁵¹⁾

The ILO has commissioned a series of manuals on the prevention of work-related stress in various sectors and occupations (e.g. air traffic controllers, assembly workers, nursing, etc.) ⁽²⁵²⁾ One of them, 'Bus drivers: Occupational stress and stress prevention', reviews the findings of studies of stress suffered by bus drivers and gives recommendations for prevention.

Some of the findings:

- sickness absenteeism and the risk of disability for bus drivers are significantly higher than in other professional groups. Bus drivers who have to leave their job for medical reasons do so at a younger age than comparable groups of workers. The main conditions leading to disability relate to the back, tendons and joints, mental disorders and cardiovascular diseases;
- musculoskeletal disorders are a major work-related health problem for bus drivers. Frequently reported complaints relate to the lower part of the back, neck, shoulders, the upper part of the back and the knees;
- several authors studied the psycho-physiological costs of this occupation, during work and leisure. The studies indicate high blood pressure and high levels of urine-adrenaline among bus drivers, and showed that bus drivers under time pressure have high cortisol levels. These factors are suspected of being related to cardiovascular problems. In accordance, studies report more diseases of the heart and blood vessels among bus drivers than other professional groups;
- the driver's task is mentally demanding because of having to cope with conflicting requests: the demand for service by the individual passenger (providing information about timetables, routes, stops, fares, etc.), the need to keep to a tight schedule in dense traffic, and to drive safely according to traffic regulations. Whichever alternative the driver adopts, he or she cannot resolve the basic problem of conflicting demands. This is a low autonomy situation, an important cause of work stress;
- a bus driver's workplace is exposed by frequent opening of the doors, with inconvenience caused by draft, wind, change of temperature, dry or wet air, cold, heat, noise, and bad smells;
- many drivers reported a bad layout of the workstation: high level of vibration and forced seating position. The driver's seat, and also other cabin components, often lack sufficient adjustability.
- bus drivers reported bad illumination, blinding glare and reflection, primarily related to night driving, poor weather conditions and neon lights;

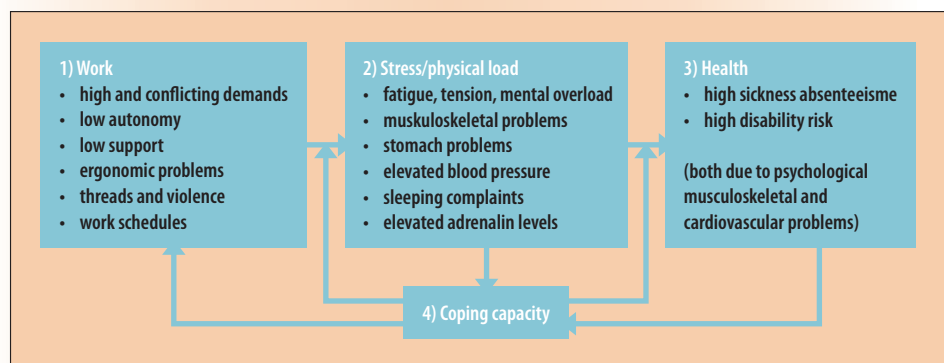
⁽²⁵¹⁾ Kompier, M., Bus drivers: Occupational stress and stress prevention, International Labour Office, 1996. Available at: <http://www.ilo.org/public/english/protection/condtrav/pdf/wc-mk-96.pdf>

⁽²⁵²⁾ See: <http://www.ilo.org/public/english/protection/safework/stress/iloactn.htm> for further information.



- it is more and more common for transport personnel (bus drivers, tram and train conductors, and subway operators) to have problems with disorderly and troublesome passengers. Sometimes drivers are robbed or assaulted;
- irregular working hours. Since the demand for commuter service and other journeys varies over the day and over days in the week, many drivers work complicated shift systems. Although break periods are provided for, they may be too short (e.g. 15 minutes for a lunch break), too few, too late and at inconvenient locations (for example at the terminus of bus lines or in badly designed company locations (e.g. with no possibilities for a proper drink or meal). Bus drivers considered the irregularity of their working and resting times to be an important inconvenience, as it affects family life and leisure activities negatively. It also causes sleep problems and provides insufficient opportunities for recovery and unwinding;
- some drivers are kept available to replace colleagues on sick leave or who have taken days off. Characteristic of these day-to-day assignments is the great uncertainty about the time and place of the next day's work. This is seldom notified before the afternoon of the day before.

Figure 37: OSH situation of bus drivers



Adapted from <http://www.ilo.org/public/english/protection/safework/stress/busdriver.htm>

Following these observations, several recommendations were made:

- ergonomics of the bus cabin: ensure that drivers of various builds and sizes can adopt comfortable driving postures, better adjustability for lumbar support, steering wheel, pedals, dashboard, heating and cooling systems, training and retraining regarding the devices;
- job rotation and 'combination' jobs: combination of the bus driver's task with other non-driving tasks (e.g. clerical or mechanical); although this approach is hard to manage on a collective basis, it has proved to be very successful in individual cases;



- timetables, shift schedules and the quality of break periods: Recommendations as to work and resting schedules and timetables, for example 20 minutes minimum length of breaks, guaranteed possibilities for breaks and meals, no split shifts, forward rotation: 'early-day-late' rather than backward rotation, at least two days off between blocks of working days, guaranteed possibilities to take days off;
- social work environment and management style: consultation and taking into account the wishes of individual drivers, a more supportive style of leadership; train supervisors and management, special facilities for the older drivers and for drivers with health problems, timely and active rehabilitation policy, proper information flow in the company, two persons on the bus instead of one on certain high-risk routes or during night shifts.



4.

LEGISLATION AND POLICIES



4.

LEGISLATION AND POLICIES

A selection of the most relevant regulations is presented in the table below. Directives or regulations regarding specific transport items are mentioned, social security and labour protection as well as occupational safety and health topics ⁽²⁵³⁾.

4.1.

TRANSVERSAL LEGISLATION AND POLICIES

4.1.1. Health and safety legislation and working conditions

This chapter gives an overview of the most relevant EU regulations regarding OSH in transport by road, railway, water and air ⁽²⁵⁴⁾. The Framework Directive 89/391/EEC ⁽²⁵⁵⁾ is essential, as it aims at ensuring a higher degree of protection of workers through the implementation of preventive measures to guard against accidents at work and occupational diseases, and through the information, consultation, balanced participation and training of workers and their representatives. EU legislation on health and safety at work applies to ‘all sectors of economic activity, both public and private’. Out of 28 directives governing this field, only two do not apply, the Directives on workplaces and on visual display screen equipment ⁽²⁵⁶⁾. The ‘Workplace Directive’ shall not apply to means of transport used outside the undertaking and/or the establishment, or workplaces inside means of transport; temporary or mobile work sites; extractive industries; fishing boats and fields, woods and other land forming part of an agricultural or forestry undertaking but situated away from the undertaking’s buildings.

The ‘VDU Directive’ shall not apply to:

- (a) drivers’ cabs or control cabs for vehicles or machinery;
- (b) computer systems on board a means of transport;
- (c) computer systems mainly intended for public use;
- (d) ‘portable’ systems not in prolonged use at a workstation;
- (e) calculators, cash registers and any equipment having a small data or measurement display required for direct use of the equipment;

⁽²⁵³⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.

⁽²⁵⁴⁾ Based on: http://europa.eu/legislation_summaries/transport

⁽²⁵⁵⁾ Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work (OJ L 183, 29/06/1989 p. 0001–0008).

⁽²⁵⁶⁾ Council Directive 89/654/EEC of 30 November 1989 concerning the minimum safety and health requirements for the workplace; Council Directive 90/270/EEC of 29 May 1990 on the minimum safety and health requirements for work with display screen equipment.



(f) typewriters of traditional design, of the type known as 'typewriter with window'.

The Commission White Paper — Sectors and activities excluded from the Working Time Directive ⁽²⁵⁷⁾ highlighted issues of concern regarding working time with specific emphasis on the transport subsectors and the maritime sector. Subsequently, agreements were reached between specific social partners implementing ILO resolutions, more particularly regarding certain mobile workers in air and rail transport.

Directive 2003/88/EC of 4 November 2003 concerning certain aspects of the organisation of working time aims to protect workers from negative health effects due to shift and night work. It lays down minimum general safety and health requirements for the organisation of working time with regard to maximum working time. In addition, the Directive sets out requirements for periods of daily rest, breaks, weekly rest and annual leave. It does not apply where other Community instruments contain more specific requirements relating to the organisation of working time for certain occupations or occupational activities. The Directive gives legal definitions of the terms 'working time', 'rest period', 'adequate rest', 'night time', 'night worker', 'shift work', 'shift worker', 'mobile worker' and 'offshore work'.

More details on specific OSH Directives, with a focus at working time, are given in the following sections.

4.1.2. European transport policy

Two documents regarding the transport policy in Europe touch also upon the safety and health of workers in the transport sector: the 'White paper: European transport policy for 2010' and the 'Communication on freight transport logistics in Europe'.

The 'White paper: European transport policy for 2010' (2001) ⁽²⁵⁸⁾ and its mid-term review 'Keep Europe moving — Sustainable mobility for our continent' (2006) ⁽²⁵⁹⁾, aim to strike a balance between economic development and the quality and safety demands made by society in order to develop a modern, sustainable transport system for 2010. The White Paper proposed almost 60 measures designed to implement a transport system capable of restoring the balance between different modes, revitalising the railways, promoting sea and waterway transport and controlling the increase in air transport.

The fast growth of freight transport contributes to the economy but also causes congestion, noise, pollution and accidents. The aim of the 'Communication on freight transport logistics in Europe' (2006) ⁽²⁶⁰⁾ is therefore to improve the efficacy of the European transport system through logistics and to promote multimodality ⁽²⁶¹⁾ as the way to make freight transport more environmentally friendly, safer and more energy

⁽²⁵⁷⁾ <http://ec.europa.eu/social/BlobServlet?docId=2930&langId=en>

⁽²⁵⁸⁾ White Paper submitted by the Commission on 12 September 2001: 'European transport policy for 2010: time to decide' [COM (2001) 370 final].

⁽²⁵⁹⁾ Communication from the Commission to the Council and the European Parliament of 22 June 2006 on the mid-term review of the Transport White Paper, 'Keep Europe moving — Sustainable mobility for our continent', published in 2001. Mid-term review of the Transport White Paper, published in 2001 by the European Commission' [COM (2006) 314 final].

⁽²⁶⁰⁾ Communication from the Commission on freight transport logistics in Europe, the key to sustainable mobility [COM (2006) 336 final].

⁽²⁶¹⁾ The carriage of goods by two or more modes of transport, irrespective of the types of freight, within a single transport chain.



efficient. Action in the following areas are proposed: extracting value from information and communications technology networks, establishing European certification, developing statistical indicators, using infrastructure more efficiently, recognising quality, simplifying multimodal chains and establishing European loading standards, etc.

This programme was updated in the mid-term review of 2006. A Communication ⁽²⁶²⁾, adopted in 2009, summarises the results of a stakeholder consultation and a wider reflection. The European Commission has also recently launched a consultation process preceding the adoption of a White Paper on the Future Transport Policy for the next decade up to 2020 ⁽²⁶³⁾.

The Commission had launched a reflection on the future of the transport system, comprising an evaluation study on the European Transport Policy (ETP), a debate within three 'Focus Groups', a study — 'Transvisions' — identifying possible low-carbon scenarios for transport, and a consultation of stakeholders, notably through a High Level Stakeholders' Conference on 9-10 March 2009.

An update on the developments in the transport sector and how they may impact on OSH is presented in Chapter 1.6. and the 'Conclusions' chapter of this report.

4.2. SPECIFIC LEGISLATION AND POLICIES

4.2.1. Road transport



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The growing number of drivers, often from third countries, being employed under 'non-Community' working conditions (low wages, virtually unlimited working time, poor welfare cover, etc.) leads to the distortion of competition and safety problems. In order to deal with the matter, the Commission has developed a global strategy for the sector, which can be found in the Communication 'Towards a safer and more

⁽²⁶²⁾ A sustainable future for transport: Towards an integrated, technology-led and user friendly system. Available at: http://ec.europa.eu/transport/strategies/doc/2009_future_of_transport/2009_comm_future_of_transport_policy_en.pdf

⁽²⁶³⁾ http://ec.europa.eu/transport/strategies/index_en.htm

competitive high-quality road transport system in the Community' ⁽²⁶⁴⁾. This Communication aims to indicate the measures necessary to deploy a coherent, global policy so as to ensure the development of a safer and more competitive high-quality road transport system. Strengthening the conditions of fair competition should minimise the impact of increasing competition due to the advent of the internal market. Moreover, ever-increasing safety requirements mean that measures must be taken to protect the safety of workers and road users. Finally, in order to deal with the 'social disquiet' caused by the use of illegally employed drivers, working conditions must be improved, monitoring strengthened and the image of the profession raised. The measures proposed come under four objectives:

- preparing legislation on the organisation of working time for drivers;
- fair conditions of employment for drivers;
- improving road transport monitoring;
- improving professional training for drivers ⁽²⁶⁵⁾ ⁽²⁶⁶⁾.

Another important Communication is the one on the Road Safety Action Programme. Of all modes of transport, transport by road is the most dangerous and the most costly in terms of human lives. For this reason, the Road Safety Action Programme (2003–2010) ⁽²⁶⁷⁾ proposes a series of measures such as stepping up checks on road traffic, deploying new road safety technologies, improving road infrastructure and measures to improve users' behaviour. The ultimate objective is to halve the number of people killed on the roads by 2010.

The Green Paper on urban mobility adopted by the Commission in 2007 ⁽²⁶⁸⁾ covers all urban transport modes and deals with both urban freight and passenger transport. The paper addresses objectives such as better accessibility of (public) urban transport, safe transport and better working conditions.

As regards working and social conditions, the Commission has profited from the collaboration of the social partners to develop the European legal framework. In the recent example on labour conditions for seafarers the social partners have played an exemplary role throughout the negotiation process at the ILO and for the European social partner agreement thereafter. This agreement was 'taken over' into Community law on 20 May 2008 (it coincided with the first European Maritime Day).

The transport sector can also boast of a solid basis of social legislation regarding, for example, harmonised maximum working hours for road transport. A road social package was presented in 2007 which provides a clearer definition of 'cabotage' and strengthens the conditions of access to the carrier profession.

⁽²⁶⁴⁾ Communication from the Commission to the European Parliament and Council of 21 June 2000 — Towards a safer and more competitive high-quality road transport system in the Community [COM(2000) 364 final]

⁽²⁶⁵⁾ Driver training is currently regulated by Directive 76/914/EEC on training for some road transport drivers, and Directive 91/439/EEC on driving licences.

⁽²⁶⁶⁾ Related Acts are the Directive 2006/1/EC of the European Parliament and of the Council of 18 January 2006 on the use of vehicles hired without drivers for the carriage of goods by road and the Directive 2006/94/EC of the European Parliament and of the Council of 12 December 2006 on the establishment of common rules for certain types of carriage of goods by road.

⁽²⁶⁷⁾ Communication from the Commission on the European Road Safety Action Programme. Halving the number of road accident victims in the European Union by 2010: a shared responsibility [COM(2003) 311 final].

⁽²⁶⁸⁾ Commission Green Paper on Urban Mobility. COM (2007) 551.



This proposal has been complemented in 2008 by a proposal on the working time of independent lorry drivers in order to better define the notion of false self-employment and to improve enforcement.

The most relevant EU Directives that relate to OSH in the road transport sector are presented in the table below in a chronological order ⁽²⁶⁹⁾.

Table 17: Legislation with relevance to road transport

Driving licenses ⁽²⁷⁰⁾

<p>Council Directive 91/439/EEC of 29 July 1991 on driving licences [Official Journal L 237 of 24.08.1991]</p> <p>Directive 2006/126/EEC of 20 December 2006 will replace directive 91/439 19 January 2013</p>	<p>To harmonise the conditions for issuing national driving licences in order to facilitate their reciprocal recognition and so facilitate the movement of persons within the Community or their settling in a Member State other than that in which they have passed a driving test.</p>
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Transport of dangerous goods by road ⁽²⁷¹⁾

<p>Council Directive 94/55/EC of 21 November 1994 on the approximation of the laws of the Member States with regard to the transport of dangerous goods by road [Official Journal L 319 of 12 December 1994].</p>	<p>This Directive is designed to lay down uniform safety rules for transporting dangerous goods by road (ADR regulations) ⁽²⁷²⁾ within the Community.</p>
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Amending acts:

Directive 2000/61/EC

Directive 2003/28/EC

Directive 2006/89/EC

Checks on the transport of dangerous goods by road ⁽²⁷³⁾

<p>Council Directive 95/50/EC of 6 October 1995 on uniform procedures for checks on the transport of dangerous goods by road [Official Journal L 249 of 17 October 1995]</p>	<p>The purpose of this Regulation is to see that Member States ensure that a representative proportion of consignments of dangerous goods transported by road is checked for compliance with the laws on the transport of dangerous goods by road.</p>
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Amendments:

Directive 2001/26/EC

Directive 2004/112/EC

⁽²⁶⁹⁾ Based on: http://europa.eu/legislation_summaries/transport/road_transport/index_en.htm and European Foundation for the Improvement of Living and Working Conditions (Eurofound). EU road freight transport sector: Work and employment conditions — Belgian Survey. 2003.

⁽²⁷⁰⁾ http://ec.europa.eu/transport/road_safety/behavior/driving_licence_en.htm

⁽²⁷¹⁾ http://europa.eu/legislation_summaries/transport/road_transport/l24051_en.htm

⁽²⁷²⁾ ADR — European Agreement concerning carriage of Dangerous Goods by Road. The ADR applies to transport of dangerous substances that are carried out in at least two countries (even if it only concerns transit) where the Agreement is in force. The aim of the regulations is to protect carriers and others from the dangers involved. The regulations ensure that the potential risks from the carriage of dangerous goods are identified and the dangers are limited as far as possible.

⁽²⁷³⁾ http://europa.eu/legislation_summaries/transport/road_transport/l24052_en.htm



Inland transport of dangerous goods ⁽²⁷⁴⁾

Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods.

This Directive applies to the transport of dangerous goods by road, rail or inland waterway within Member States or between several Member States. The international transport of dangerous goods is regulated by international agreements, the ADR *, RID * and ADN *. Such rules should also be extended to national transport in order to harmonise across the Community the conditions under which dangerous goods are transported and to ensure the proper functioning of the common transport market. The Annexes of the Directive refer to the texts of these agreements.

Appointment and vocational qualification of safety advisers (dangerous goods by road)

Council Directive 96/35/EEC of 3 June 1996 on the appointment and vocational qualification of safety advisers for the transport of dangerous goods by road, rail and inland waterway [Official Journal L 145 of 19.06.1996]

As a complement to Council Directive 89/391 on the protection of workers, this Directive aims at the adoption of measures to improve the prevention of the risks inherent in the transport of dangerous goods. Therefore the Member States need to take the necessary measures for the appointment of safety advisers who have received appropriate vocational training. Their mission is aimed at protecting persons, property and the environment. Vocational training and examinations need to be organised, and the certificates issued to those who succeeded need to be valid in all the EU Member States.

Dimensions and maximum weights authorised for both national and international journeys

Council Directive 96/53/EC of 25 July 1996 laying down for certain vehicles circulating within the Community the maximum authorised dimensions in national and international traffic and the maximum authorised weights in international traffic [Official Journal L 235 of 17.09.1996]

This Regulation aims to harmonise the maximum dimensions authorised for national traffic and the maximum weight authorised for international traffic of road vehicles intended to carry goods and passengers.

Admission to the occupation of road transport operator and mutual recognition of diplomas (transport of goods and passengers)

Council Directive 96/26/EC of 29 April 1996 on admission to the occupation of road haulage operator and road passenger operator and mutual recognition of diplomas, certificates and other evidence of formal qualifications intended to facilitate for these operators the right to freedom of establishment in national and international transport operations [Official Journal L 124 of 23.05.1996] ⁽²⁷⁵⁾.

This Directive harmonises admission to the occupation of road transport operator in national and international transport and to facilitate the effective exercise of the right of establishment of those operators.

⁽²⁷⁴⁾ http://europa.eu/legislation_summaries/transport/road_transport/tr0006_en.htm

⁽²⁷⁵⁾ Related act: Directive 2003/59/EC of the European Parliament and of the Council of 15 July 2003 on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers, amending Council Regulation (EEC) No 3820/85 and Council Directive 91/439/EEC and repealing Council Directive 76/914/EEC [Official Journal L 226 of 10.09.2003].



Motor vehicles with trailers: roadworthiness test

Council Directive 96/96/EC of 20 December 1996 on the approximation of the laws of the Member States relating to roadworthiness tests for motor vehicles and their trailers.

The European Union is merging Directive 77/143/EEC and its successive amendments in order to form a single text and to harmonise the frequency of roadworthiness tests and the parts of motor vehicles which must be tested.

Road safety: transportable pressure equipment

Council Directive 1999/36/EC of 29 April 1999 on transportable pressure equipment.

The purpose of this Directive is to harmonise the conditions for transporting pressure equipment by road and by rail throughout the Community. Harmonisation enhances the safety of transportable pressure equipment approved for the transport of dangerous goods and also ensures the free movement of such equipment within the Community.

Motor vehicles with trailers: roadworthiness testing of heavy goods vehicles

Directive 2000/30/EC of the European Parliament and of the Council of 6 June 2000 on the technical roadside inspection of the roadworthiness of commercial vehicles circulating in the Community

The European Union is taking measures to improve the safety of transport operations on Community territory and to ensure that these are more environmentally friendly.

Drinking and driving: Maximum authorised level of alcohol in the blood

Commission recommendation of January 2001 concerning the maximum authorised level of alcohol in the blood (AL) of motor-vehicle drivers [Official Journal L 43 of 14.02.2001]

The purpose of this recommendation is to combat drinking and driving by setting a uniform maximum level of alcohol in the blood (AL) and encouraging cooperation on this matter within the Community in order to reduce public-health hazards.

Organisation of working time in respect of road transport activities ⁽²⁷⁶⁾

Directive 2002/15/EC of the European Parliament and of the Council of 11 March 2002 on the organisation of working time of persons performing mobile road transport activities.

This Directive lays down minimum standards to protect the health and safety of road workers, avoid distortions to competition within the Community and improve road safety. The provisions of the Directive take precedence over the relevant provisions of the basic directive 2003/88/EC on working time because it contains more specific provisions. It applies to all mobile workers performing road transport activities employed by undertakings established in a Member State as well as to self-employed drivers from 23 March 2009 onwards.

⁽²⁷⁶⁾ <http://osha.europa.eu/en/legislation/directives/provisions-on-workload-ergonomical-and-psychosocial-risks/osh-related-aspects/directive-2002-15-ec>



Driver attestation (transport of passengers and goods) ⁽²⁷⁷⁾

Regulation (EC) No 484/2002 of the European Parliament and of the Council of 1 March 2002 amending Council Regulations (EEC) No 881/92 and (EEC) No 3118/93 for the purposes of establishing a driver attestation [Official Journal L 76 of 19.03.2002].

This regulation aims to establish a uniform Community attestation permitting the effective checking of the regularity of the employment status of drivers from third countries employed by hauliers in the Member States engaged in the international carriage of goods.

Minimum levels of safety in European road tunnels

Directive 2004/54/EC of the European Parliament and of the Council of 29 April 2004 on minimum safety requirements for tunnels in the trans-European road network [Official Journal L 167 of 30.04.2004].

Certain tunnels in Europe, which came into operation a long time ago, were designed at a time when technical possibilities and transport conditions were very different from today's. Recent accidents in tunnels emphasise the importance of adopting harmonis

Driving time ⁽²⁷⁸⁾

Regulation (EC) No 561/2006 of the European Parliament and of the Council of 15 March 2006 on the harmonisation of certain social legislation relating to road transport and amending Council Regulations (EEC) No 3821/85 and (EC) No 2135/98 and repealing Council Regulation (EEC) No 3820/85.

The Regulation adopts provisions concerning driving times for drivers of lorries and buses. It defines the responsibilities of transport undertakings and drivers as well as possible exceptions. It contains provisions on the monitoring and evaluation of the Regulation evaluation of the Regulation, and on penalties in the event of infringements.

National policy — road transport (France)

France has implemented specific directives/regulations on the improvement of quality of work and employment in the road transport sector. In 1994, social partners (employers and employees) reached an agreement, the Contrat du Progrès, which led to a far-reaching improvement of working conditions in road transport of goods. The Contrat du Progrès was gradually implemented, beginning in 1995 and it is featured by five key aspects. Some of the measures (such as maximum working hours) have been implemented into French law and brought into collective agreements.

The main features of the Contrat du Progrès are the following:

- gradual reduction in working time: 1994 (280–320 hours/month), 1995 (240 hours/month) 1996, 1997 and 2002 (230 hours/month);
- openness: recognition and payment of all hours worked (which was not necessarily the case before). Since 1997, recognition of all hours in which workers are available to the employer (e.g. waiting time, time for loading and unloading);



⁽²⁷⁷⁾ http://europa.eu/legislation_summaries/transport/road_transport/l24056_en.htm

⁽²⁷⁸⁾ http://europa.eu/legislation_summaries/transport/road_transport/c00018_en.htm



- increase in financial compensation (working and rest time): between 1995 and 1997, wage payment for drivers increased by about 11 %. Since 1998, the wages of long-haul lorry drivers have increased by a further 28 % and those of regional drivers by a further 23 %. Overtime pay too has improved. Working time up to 35 hours/week is paid at the normal rate (100 %). Between 35 and 43 hours/week, the rate is 125 %; while between 43 and 56 hours, the rate is 150 % plus a rest period equal to the number of hours worked over 43 in the week. Thus, every hour worked beyond 43 hours/week is rewarded 2.5 times the normal rate;
- compulsory initial and ongoing training: this takes on board European directives on training for road transport drivers, and the need for 'refresher' training;
- retirement scheme for drivers: since 1997 a retirement scheme is available for drivers. From 55 years of age on, drivers can retire receiving 75 % of their income until normal retirement age. Over the past five years, 7,800 drivers have retired under this scheme, after having worked 29 years on average.

4.2.2. Rail transport



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Railway safety is a new competence of the European Union, introduced by Directive 2004/49/EC on safety on the Community's railways ⁽²⁷⁹⁾. The Directive establishes a framework for the regulation and management of safety on the railways of Europe. It requires Member States to establish a national safety authority and an independent investigation body for accidents. Railway undertakings and infrastructure managers are

⁽²⁷⁹⁾ Directive 2004/49/EC of the European Parliament and of the Council of 29 April 2004 on safety on the Community's railways and amending Council Directive 95/18/EC on the licensing of railway undertakings and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification.

granted safety certificates and safety authorisations by their national authorities. Common safety targets and common safety methods will be developed to allow for stronger harmonization, in particular of national safety rules.

The European Railway Agency (ERA) ⁽²⁸⁰⁾ was set up to help create this integrated railway area by reinforcing safety and interoperability. Its main task is to develop economically viable common technical standards and approaches to safety, working closely with railway sector stakeholders, national authorities and other concerned parties, as well as with the European institutions. The Safety Unit is responsible for the realisation of the measures laid on the Agency in the Safety Directive, complemented by Regulation (EC) No 881/2004 ⁽²⁸¹⁾. It is organised in different teams referring to the tasks established by the annual Work Programme of the Agency.

A study carried out in 2002 highlighted the wide diversity of national legislation on certification conditions for train drivers, the resulting administrative complications for railway undertakings that wish to operate on the networks of the Member States, and the associated operational difficulties in organising cross-border services. The Commission is therefore proposing a single certification model for train driving personnel attesting both to their compliance with certain requirements, including basic fitness for the job, and to their driving skills ⁽²⁸²⁾.

Directive 96/49/EC ⁽²⁸³⁾ harmonises the rules applicable to the national and intra-Community transport of dangerous goods by rail. Harmonisation of the rules makes it possible to remove obstacles to the free movement of goods between Member States with regard to transport equipment. Such transport will therefore be carried out under the best possible safety conditions.

Another relevant regulation is Directive 2005/47/EC ⁽²⁸⁴⁾ which implements an agreement between the social partners in the various sectors at European level. The agreement aims at a balance between the need to ensure adequate protection of the health and safety of mobile workers in interoperable cross-border services and the need for flexibility in running rail transport enterprises in an integrated European railway network. Following the adoption of Directive 2005/47/EC, the Commission presented a socioeconomic analysis ⁽²⁸⁵⁾, COM/2008/0855 final, of the development of working conditions in the railway sector. Developing cross-border links have a positive economic impact, and employment in the railway sector should increase in the coming years. Favourable social conditions should be guaranteed for mobile workers, while taking account of the needs of railway undertakings.

⁽²⁸⁰⁾ <http://www.era.europa.eu>.

⁽²⁸¹⁾ Regulation (EC) No 881/2004 of the European Parliament and of the Council of 29 April 2004 establishing a European Railway Agency.

⁽²⁸²⁾ *Source:* http://europa.eu/legislation_summaries/transport/rail_transport/l24244_en.htm

⁽²⁸³⁾ Council Directive 96/49/EC of 23 July 1996 on the approximation of the laws of the Member States with regard to the transport of dangerous goods by rail.

⁽²⁸⁴⁾ Council Directive 2005/47/EC of 18 July 2005 on the Agreement between the Community of European Railways (CER) and the European Transport Workers' Federation (ETF) on certain aspects of the working conditions of mobile workers engaged in interoperable cross-border services in the railway sector [Official Journal L 195 of 27.07.2005].

⁽²⁸⁵⁾ Communication of 15 December 2008 from the Commission to the Council — Economic and social impact of the Agreement appended to Directive 2005/47/EC concluded on 27 January 2004 between the social partners on certain aspects of the working conditions of mobile workers engaged in interoperable cross-border services in the railway sector.



Directive 2007/59/EC ⁽²⁸⁶⁾ is designed to harmonise train driver certification within the European Union (EU) whilst maintaining a high level of safety. It lays down the procedures for obtaining and withdrawing licences and certificates as well as specifying the tasks to be carried out by the competent authorities in the Member States. These provisions facilitate the mobility of drivers and railway undertakings between Member States.

4.2.3. Waterborne transport

The most relevant EU regulations regarding employment, working conditions and safety in waterborne transport are presented in the table below in a chronological order ⁽²⁸⁷⁾.

The Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions — Reassessing the regulatory social framework for more and better seafaring jobs in the EU.

Table 18: Legislation with relevance to water transport

Inland waterways: access to the occupation of carrier of goods by waterway and mutual recognition of diplomas

Council Directive 87/540/EEC of 9 November 1987 on access to the occupation of carrier of goods by waterway in national and international transport and on the mutual recognition of diplomas, certificates and other evidence of formal qualifications for this occupation [Official Journal L 322 of 12 November 1987].

This Directive is intended to facilitate the implementation of the common transport policy by achieving better organisation of the market. To this end, it improves the coordination of the conditions for access to the occupation of carrier, encouraging achievement of the free provision of services and the effective exercise of the right of establishment.

Recommendation on the ratification of ILO Convention ⁽¹⁸⁰⁾

Commission Recommendation (EC) No 130/1999 of 18 November 1998 on ratification of ILO Convention 180 concerning seafarers' hours of work and the manning of ships, and ratification of the 1996 Protocol to the 1976 Merchant Shipping (Minimum Standards) Convention [Official Journal L 43 of 17.02.1999].

This Recommendation aims at encouraging Member States which have not yet done so to ratify ILO Convention 180 concerning seafarers' hours of work and the manning of ships and the 1996 Protocol on the Merchant Shipping Convention of 1976.

Organisation of seafarers' working time ⁽²⁸⁸⁾

Council Directive 1999/63/EC of 21 June 1999 concerning the Agreement on the organisation of working time of seafarers concluded by the European Community Shipowners' Association (ECSA) and the Federation of Transport Workers' Unions in the European Union (FST).

This Directive aims to protect the health and safety of seafarers by laying down minimum requirements with regard to working time.

⁽²⁸⁶⁾ Directive 2007/59/EC of the European Parliament and of the Council of 23 October 2007 on the certification of train drivers operating locomotives and trains on the Community's rail network.

⁽²⁸⁷⁾ Based on: http://europa.eu/legislation_summaries/employment_and_social_policy/employment_rights_and_work_organisation/l24266_en.htm

⁽²⁸⁸⁾ http://europa.eu/legislation_summaries/transport/waterborne_transport/c10819_en.htm



Organisation of seafarers' working time

Proposal for a Council Directive implementing the agreement concluded by the European community shipowners' associations (ECSA) and the European transport workers' federation (ETF) on the maritime labour convention, 2006 and amending Directive 1999/63/EC

Agreement ⁽²⁸⁹⁾ concluded by the European Community Shipowners' Association (ECSA) and the European Transport Workers' Federation (ETF) on the Maritime Labour Convention, 2006

Organisation of hours of work on board ships using Community ports

Directive 1999/95/EC of the European Parliament and of the Council of 13 December 1999 concerning the enforcement of provisions in respect of seafarers' hours of work on board ships calling at Community ports.

This Directive aims to improve safety at sea, combat unfair competition from third-country shipowners and protect the health and safety of seafarers on board ships using Community ports.

Minimum level of training of seafarers

Directive 2001/25/EC of the European Parliament and of the Council of 4 April 2001 on the minimum level of training of seafarers.

The training of seafarers plays a major role in maritime safety and in the protection of the maritime environment. It is therefore essential to define a minimum level of training for seafarers in the Community having regard to training standards agreed at international level.

Loading and unloading of bulk carriers

Directive 2001/96/EC of the European Parliament and of the Council of 4 December 2001 establishing harmonised requirements and procedures for the safe loading and unloading of bulk carriers [Official Journal L 13 of 16.1.2002].

This directive aims to enhance the safety of bulk carriers calling at terminals in the Member States to load or unload solid bulk cargoes in order to reduce the number of accidents.

Minimum safety and health requirements for improved medical treatment on board vessels

Directive 92/29/EEC of 31 March 1992 on the minimum safety and health requirements for improved medical treatment on board vessels

The objective of this directive is to improve medical assistance at sea since a vessel represents a workplace involving a wide range of risks. This Directive sets out the responsibilities of the owners and Member States with regard to health and safety on board vessels. It stipulates the precautions to be taken for the different types of vessels and voyages, particularly with regard to antidotes, information and medical training for workers on board, and medical assistance by radio.

⁽²⁸⁹⁾ http://ec.europa.eu/employment_social/dsw/public/actRetrieveText.do?sessionId=L4BwRYzDvp0NQYfpv88H4TwZrPZww7Vnnjths6nQLj8yJw5TfTD2!1871848580?id=8656



An important body in maritime safety is the European Maritime Safety Agency (EMSA) ⁽²⁹⁰⁾. The Agency's main objective is to provide technical and scientific assistance to the European Commission and Member States in the proper development and implementation of EU legislation on maritime safety, pollution by ships and security on board ships.

In 2006 a Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management (ISM) Code) was executed ⁽²⁹¹⁾. The purpose of this ISM Code is to establish a management system in shipping companies to ensure the safe operation of ships and the prevention of pollution. The Code was adopted by the International Maritime Organisation (IMO) and reproduced in Chapter IX of the International Convention for the Safety of Life at Sea (SOLAS). Implementation of the ISM Code is obligatory in all the Member States.

4.2.4. Air transport

The European Aviation Safety Agency (EASA) ⁽²⁹²⁾ is the centrepiece of the European Union's strategy for aviation safety. Its mission is to promote the highest common standards of safety and environmental protection in civil aviation. The main tasks of the Agency currently include:

- rulemaking: drafting safety legislation and providing technical advice to the European Commission and to the Member States;
- inspections, training and standardisation programmes to ensure uniform implementation of European aviation safety legislation in all Member States;
- safety and environmental type-certification of aircraft, engines and parts;
- approval and oversight of aircraft design organisations worldwide as and of production and maintenance organisations outside the EU;
- data collection, analysis and research to improve aviation safety;
- managing the European Community SAFA programme on behalf of the European Commission.

An important Directive regarding aviation safety is Directive 94/56/EC, aiming to facilitate investigations into civil aviation accidents in order to improve air safety ⁽²⁹³⁾.

⁽²⁹⁰⁾ <http://www.easa.europa.eu/>; Regulation (EC) No 1406/2002 of the European Parliament and of the Council of 27 June 2002 establishing a European Maritime Safety Agency.

⁽²⁹¹⁾ Regulation (EC) No 336/2006 of the European Parliament and of the Council of 15 February 2006 on the implementation of the International Safety Management Code within the Community and repealing Council Regulation (EC) No 3051/95 [Official Journal L 64, 4.3.2006]; also relevant: Regulation (EC) No 2099/2002 of the European Parliament and of the Council of 5 November 2002 establishing a Committee on Safe Seas and the Prevention of Pollution from Ships (COSS) and amending the Regulations on maritime safety and the prevention of pollution from ships [Official Journal L 324 of 29.11.2002].

⁽²⁹²⁾ <http://www.easa.europa.eu/>; Regulation (EC) No 1592/2002 of the European Parliament and of the Council of 15 July 2002 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency [Official Journal L 240 of 07.09.2002].

⁽²⁹³⁾ Council Directive 94/56/EC of 21 November 1994 establishing the fundamental principles governing the investigation of civil aviation accidents and incidents [Official Journal L 319 of 12.12.1994].



The Council Directive concerning the European Agreement on the Organisation of Working Time of Mobile Workers in Civil Aviation ⁽²⁹⁴⁾ concluded by the Association of European Airlines (AEA), the European Transport Workers' Federation (ETF), the European Cockpit Association (ECA), the European Regions Airline Association (ERA) and the International Air Carrier Association (IACA) lays down minimum requirements on working time, the European Agreement on the Organisation of Working Time of Mobile Staff in Civil Aviation implements points 7, 8 and 19 of the Community Charter of the Fundamental social Rights of workers. It also aims to strike a balance between the need to ensure adequate protection for the health and safety of mobile staff in civil aviation with regard to working time and the requirements to allow adequate operating flexibility to airlines engaged in commercial aviation operations and to maintain appropriate public safety standards.

⁽²⁹⁴⁾ Council Directive 2000/79/EC of 27 November 2000, available at: http://europa.eu/legislation_summaries/employment_and_social_policy/employment_rights_and_work_organisation/c11326_en.htm



5.

METHODOLOGY



The data collection is based on existing and available sources. All data have been collected from published and online available statistical sources. Existing tables and graphics have been used in this presentation. Not all sources present the data in a similar way or combine the same breakdown criteria, as a result of which the data are difficult to compare.

Statistics from these sources were complemented by analytical studies and literature reviews. The aim of the studies is to give some interpretation and background information on the statistical data. A number of research studies have been used to complement the European survey data, mainly originating from the European Foundation for the Improvement of Living and Working Conditions and the European Agency for Health and Safety at Work.

Where available, efforts have been made to use the raw data sources, which are then treated according to the expected output.

The sources are both statistical and analytical background documents. The statistical sources are a combination of administrative registers and statistics (occupational disease registers, exposure registers), surveys, voluntary reporting systems and inspection reports. A global risk picture can thus be presented by combining different sources.

The data collection mainly depends upon the availability of harmonised administrative data (occupational accident and disease registers) and self-reported data from worker surveys. These data sources are available both at European level and in most of the European countries.

A study on national and EU monitoring systems ⁽¹⁾ was commissioned by the Agency and is available for download from the Agency website. The Agency has also prepared detailed descriptions of national OSH monitoring systems on its website.

5.1. SURVEYS

5.1.1. Labour force survey

The European labour force survey (LFS) has been used to collect data on employment and related variables in Europe. Information has been obtained with regard to the labour market in the EU, the employment status, demographical characteristics and company size and turnover. Data are available since 1983.

Epidemiological surveys, as well as studies and research in occupational health and safety, are very useful approaches in the surveillance of diseases due to work. European data have been collected from two major sources: the European working conditions survey and the labour force survey.

⁽¹⁾ 'A review and analysis of a selection of OSH monitoring systems' (working paper), European Agency for Safety and Health at Work, EU-OSHA, 2003. Available at: <http://osha.europa.eu/en/publications/reports/406/view>



5.1.2. Surveys on work-related diseases and working conditions

The European working conditions survey, edited by the European Foundation for the Improvement of Living and Working Conditions, monitors trends in working conditions for employees and self-employed throughout the European Union. The survey provides information on the occurrence of exposure to risk factors and on perceived work-related health risks.

ADDITIONAL SOURCES

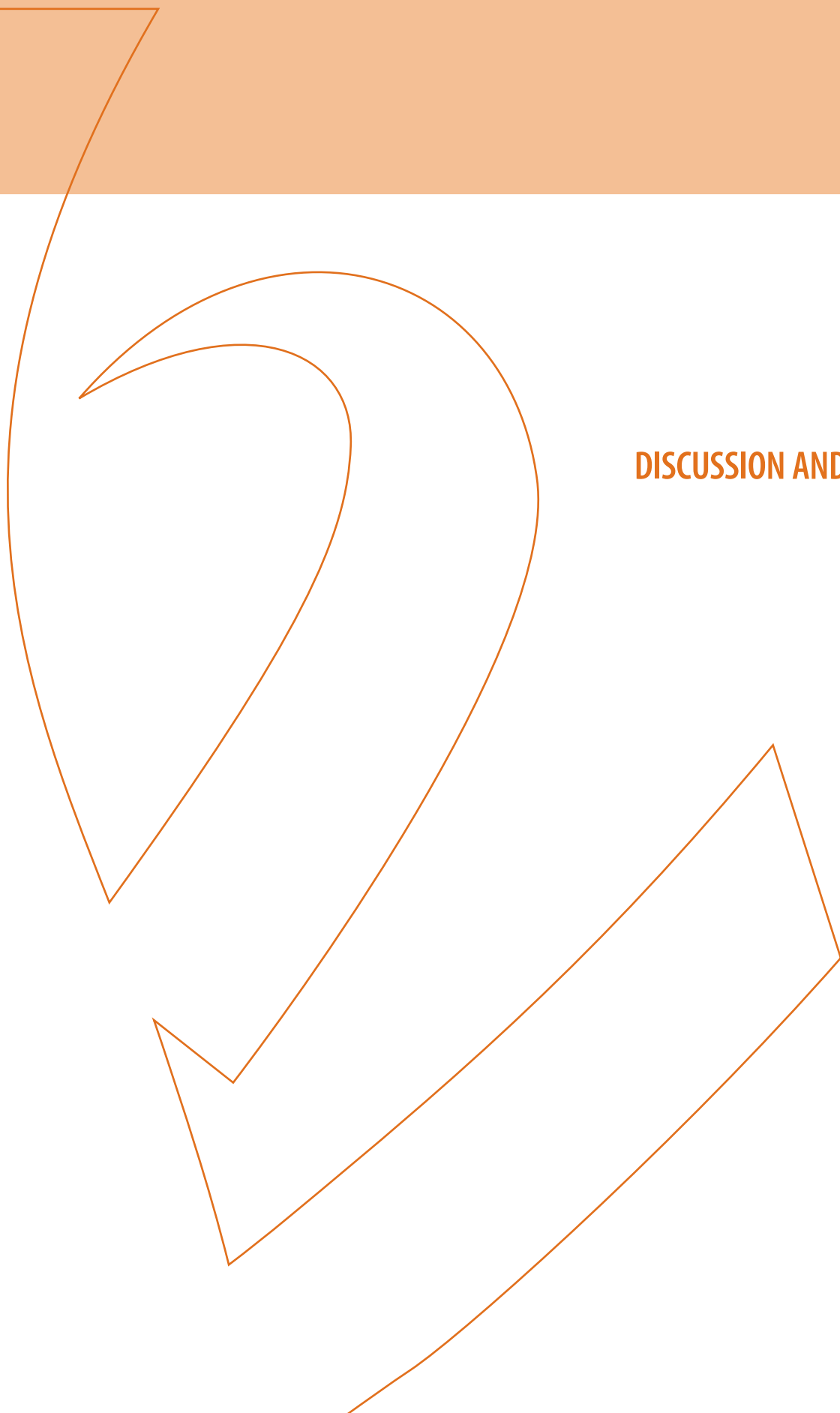
5.2.

Statistics from these sources were complemented by analytical studies. The aim of the studies is to give some interpretation and background information on the statistical data. A number of research studies have been used to complement the European survey data, mainly originating from the European Foundation for the Improvement of Living and Working Conditions and the European Agency for Health and Safety at Work.



6.

DISCUSSION AND CONCLUSIONS



6.1. CONTEXTUAL FEATURES IN TRANSPORT SECTOR (LAND (ROAD AND TRAIN), WATER, AIR)

The transport sector, including transport over land (by road and train), water and air, is essential to Europe's prosperity: not only does this sector facilitate the mobility of citizens and goods; it also has a significant impact on economic growth, social development and the environment ⁽²⁹⁶⁾.

In 2006, about 6 million EU-25 workers were employed in the transport sector (land, water and air). The share within the whole economy accounted for about 3 %, which varied largely between the Member States: from about 1.9 % in Germany to about 6 % in Estonia and Latvia. According to the latest figures ⁽²⁹⁷⁾, the transport industry at large accounts for about 7 % of GDP and for over 5 % of total employment in the EU, of which 4.4 % corresponding to transport services and the rest to transport equipment manufacturing, while 8.9 million jobs correspond to transport services and 3 million to transport equipment.

According to the latest figures, the transport industry at large accounts for about 7 % of GDP and for over 5 % of total employment in the EU.

Land transport is far the largest sub sector in the EU-25. In 2006, about 88.2 % of the workers of the transport sector were employed in the land transport. As a consequence, research on safety and health aspects is often focused on this sub sector. However, it should be noted that the distribution of workers by sub sector (land, water and air) varies largely within the different countries. For example, in Malta the air transport is the sub sector with the highest employment figures. Therefore, future research should more include the specific hazards and risks within the other different sub sectors of transport (i.e. exposure of cabin crews to radiation, the quality of air board of aircrafts; handling of and exposure to asbestos by railway workers, etc.).

By gender, the transport sector employed around 5 million male workers in 2006, making up 84 % of the total transport workforce and 4.7 % of the whole male workforce across all sectors. There were 960,000 females, representing 15.9 % of the workforce in transport and 1.1 % of the overall female workforce across all sectors.

Among men employed in transport, 90 % worked in land transport, around 5 % in transport over water and 5 % in air transport. Women showed a higher share of employment in air transport (18 %), but a majority of them (76 %) still worked in land transport, while the remaining 5 % were employed in transport over water.

The gender difference is not as big in all sub sectors. In all Member States, with the exception of Cyprus, Lithuania and Hungary, the highest proportion of female workers can be found in air transport.



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⁽²⁹⁶⁾ European Commission — Directorate General for Energy and Transport, 'Transport Research in the European Research Area — A guide to European, international and national programmes and projects', 2006.

⁽²⁹⁷⁾ Future of Transport Communication, available at: <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/09/279&format=HTML&aged=0&language=EN#footnote-4>

Since the majority of jobs in transport with a visible risk for occupational accidents and illnesses are male-dominated, health and safety actions are male-centred. Even for occupations and sectors with a growing number of women workers, investment — when funds are available — in workplace ergonomics will still reflect the male-only work environment. Thus, women working in transport have to adjust to a male-centred organisation of work, workplace culture and working conditions.

In order to make the transport industry a more attractive workplace for women and to eliminate the risk of gender inequality at work, attention has to be devoted to solving main problems as the difficulty of combining work and family, high physical work load and the lack of female friendly facilities ⁽²⁹⁸⁾.

LFS data reveal that the highest number/ proportion of workers in the transport sector can be found in the age category 25–49 years, followed by the age category 50–64 and the young workers. An important trend in several Member States is the increasing number of workers in the age category 50–64 years, along with an above-average rate of reduction in the proportion of young workers in transport, that has been more than halved in several EU Member States over less than 10 years.

These demographic changes raise the question as to how the transport sector will develop the skills and employability of the older workers, while maintaining the health, motivation and capacities of workers as they age. In addition, the introduction of a number of computer applications such as planning systems and mobile means of communication changes the content and workload of drivers. Transport workers have to learn how to operate these computer applications — not a simple task. This increases the need for continuous, adapted and appropriate training, especially for the older workers. Besides, attention to ergonomics remains important, as it is known that MSDs become more frequent with age and work seniority. Attention should be given to sufficient and adequate prevention measures, ergonomic and adaptable equipment, active rest breaks and proper lifting devices.

In 2006, about 8 % of the EU-25 transport workers were working part-time in comparison with about one out of five within the total working population. Part-time work in transport strongly increased over the last decade in several Member States. Research reveals that employees with a part-time contract have less control over working time, have work requiring fewer skills, receive less training and have more monotonous jobs. As these risks affect transport workers more than others, they might have an even greater effect on part-timers.

Working conditions and training for part-time transport workers need to be improved. This includes several aspects. Firstly, the target employment agencies and inspection services need to raise awareness about the specific conditions of part-timers. Besides that, advice should be given to part-time workers on the health and safety aspects of the specific job. Finally, specific guidance should be provided to employers, inspectors and prevention services on part-time workers.

The transport sector is, together with the agriculture and horticulture, construction, healthcare, households, and food sectors one of the sectors which employs more (im)migrant workers. (Im)migrant workers are more occupied in the so-called three D-jobs (dirty, dangerous and demanding) within these sectors. Their work is often characterised by uncertainty, poor working conditions, part time jobs, and low wages. The increasing migration of transport workers from the acceding countries and from

As the proportion of older workers is increasing in transport, attention should be given to sufficient and adequate prevention measures, ergonomic and adaptable equipment, active rest breaks and proper lifting devices.

More and more women, immigrant workers and part-timers work in transport. Prevention and research needs to take into account a more and more diverse working population.

⁽²⁹⁸⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.



non-EU countries makes this an issue of concern and leads to increased distortion of competition and safety and health problems.

6.2. EXPOSURE TO RISKS

When looking at work-related OSH risks in the transport sector, the risk of accidents with material loss and damage and/or human victims as an outcome catches the eye. However, it should not be forgotten that several other safety risks (i.e. prolonged sitting, loading and unloading goods, handling dangerous substances, etc.) are also present when working in the transport sector and some of these risks seriously affect worker's health ⁽²⁹⁹⁾.



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6.2.1. Physical work factors

Despite the small sample, data from EWCS 2005 give information about exposure of the land transport workers. A sample of 866 cases in Land transport and pipelines is compared to a data set of 29,680 cases in EU-27. Among the different physical work factors considered, workers in land transport appear to be more exposed –at least 25 % of their working time– than the average to:

- vibration from hand tools and machinery: 28.7 % vs. 24.2 %;
- painful positions: 50.2 % vs. 45.5 %;
- carrying heavy loads: 38.9 % vs. 35 %;
- high temperatures: 30.9 % vs. 24.9 %;
- low temperatures: 34.7 % vs. 22 %;
- smoke, powder, dust: 23.9 % vs. 19.1 %.

⁽²⁹⁹⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.



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Surveys suggest that transport workers, especially drivers, are more exposed to vibrations (i.e. vibration of cabin) than the average working population. Also prolonged sitting is an important risk. Since drivers spend several hours in a static sitting position with little adaptation in posture possible, the risk for back muscle fatigue is present. When combined with the vibrations of the vehicle, the risk increases. The full body vibration caused by the driver's cabin may also have an effect on vision, coordination and the overall functional ability of the drivers. Ergonomic design of the driver's seat and a better location and development of controls and displays inside the truck are therefore important for the prevention of the development of back disorders. Whole body vibrations may equally affect transport workers in the other transport subsectors.

Heavy lifting tasks are another important occupational risk within the transport sector, especially during loading and unloading vehicles, in service tasks such as catering and maintenance of vehicles, ships and trains, and on delivery of parcels and goods. In addition, lifting aids and ergonomic and safety equipment may not be available or the workers may depend on the equipment at the site of delivery or on the unforeseen shape or weight of the loads, making it difficult to lift or carry them in an ergonomically acceptable way. This may be the case for professional drivers or courier services, but also for ground staff in airports or some of the workers in catering-related tasks, flight attendants or service workers on ships, whose ergonomic constraints may be overlooked. It often depends largely on the arrangements with clients and the awareness of OSH risks as to whether conditions are adapted or not. Care should also be given to foresee a certain individual adaptability of the equipment or the working environment by these workers (for example in service areas of planes or trains, or the work area of professional drivers, whether in the public or private sector) and it is equally important for transport workers to be trained on how to prevent MSDs in their specific situation.

Surveys suggest that transport workers are also more exposed to loud noise than the average working population ⁽³⁰⁰⁾. Different noise sources are present, either from the vehicles or other surrounding sources. Some of the loudest noise levels at work result from transport means — a good example of this being airplanes and large ships. The older the vehicle, the louder noise production may be.

Noise may contribute to fatigue or negative cognitive effects and it may also be distracting: attention to warning signals and general awareness may be reduced by background noise. Noise may also interact with exposures to exhaust gases or organic solvents. Furthermore, since for many transport workers it is necessary to

Exposures to transport workers include ergonomic risks, static postures and exposure to vibrations, noise and dangerous substances. However it is the combination of these risks with unusual working times, limited scope for adaptation and the constantly changing work environment that makes transport jobs particularly strainful.

⁽³⁰⁰⁾ De Vriendt, J., Studie van de geluidsbelasting in een vrachtwagencabine (afstudeerwerk Gespecialiseerde Studies Veiligheidstechnieken, K.U.Leuven): K.U.Leuven: Leuven, 1994.



telecommunicate, noise reduction measures (e.g. noise absorbing materials), adaptation of vehicles, or work organisational measures are equally important and need to be put in place.

Exposure to dangerous substances

Inhalation of vapours and fumes are another important risk for transport workers: Surveys suggest that these workers are more exposed than the average working population. Drivers are exposed to exhaust fumes at bus terminals, bus stops, when having to stop behind another vehicle at the bus stop, and idling in loading and unloading terminals. For workers loading and unloading vehicles, these exposures are inherent to their jobs. The same measures, for example regarding exposure from diesel exhaust, should be applied as for workers in other sectors, but awareness may be low, for example in water and air transport, where either heavy duty motors are used or the workplace situation is constantly changing, as in the cargo and unloading areas of air transport. At terminals and loading areas in terminals, inorganic and organic small-particle dust is a problem during refuse disposal ⁽³⁰¹⁾.



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Exposure to other harmful chemicals also takes place at sites, for example

- when loading, unloading, weighing and washing containers and vehicles;
- when preparing the vehicles for duty or on maintenance tasks, such as repair or deicing of planes;
- from chemicals for on-board toilets or cleaning products on buses, trains and planes;
- from products for decontaminating refuse disposal vehicles, and chemicals used in refuse disposal;
- and from volatile organic chemicals (VOC).

Exposure to road dust occurs in all subsectors, including public transport, for example at bus stops. At terminals and loading areas, inorganic and organic small-particle dust exposure is also relevant.

⁽³⁰¹⁾ The national report on working conditions in road transport in Finland.



Drivers are exposed to carcinogenic substances in a large number of chemicals, for example when refuelling vehicles, and when exposed to diesel fumes — an exposure that may occur in all subsectors, road, water, air or rail transport, whether public or private.

Intentional handling of dangerous substances is also common in goods traffic ⁽³⁰²⁾. A further risk for exposure comes from unforeseen incidents and spills involving dangerous substances. Recent waves of accidents on road and water resulting in serious fires should have raised awareness of the fire and explosion risks and the serious consequences such incidents may have.

Section 2.1.6 of this report presents an overview of these exposures, along with a few case studies.

Biological agents

Recently, attention has been given to the exposure of transport workers, especially in air and long-distance transport, to influenza and the potential for transmission of the disease by these workers. However, risks arise equally from other infectious diseases that may be endemic in areas they travel to. These risks may not only be relevant to flight attendants and drivers, but also to other workers who may get in contact with contaminated areas or loads, or animals. Furthermore, transport workers may be exposed to the same biological risks other workers are exposed to when cleaning or performing maintenance tasks.

Research in water transport has shown that infectious diseases of the respiratory and digestive systems are some of the main health problems leading to absence of workers. This is also related to the confinement of these workers on ships for longer periods of time. Guidance is available on the protection of transport workers to some infectious diseases, but a lot still remains to be done.

Guidance is available on the protection of transport workers to some infectious diseases, but a lot still remains to be done.

6.2.2. Road safety

Road safety is an important issue in the land transport sector. Obviously, drivers have a higher risk of being involved in a traffic accident because most of their working time is spent on the road. Driving at night, under bad weather conditions or in heavy traffic increases the risk.

In this report, we present a number of sectoral and national initiatives, for example from France and Spain, to address the high road accident rates. Social partners, trades associations, and public authorities in OSH and traffic control are increasingly working together to lower the death toll. Occupational safety and health is also an issue that has recently been mentioned in the discussions around the new Commission road safety



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⁽³⁰²⁾ Connections between the safety, logistics, working conditions and professional attractiveness of road transport, FIOH 2006.



Programmes to prioritise public transport and reduce average speed can have sustainably positive effects on the health and safety of workers, provided OSH is considered in the planning phase.

action plan (under the coordination of the European Commission's General Directorate for Transport and Communication). A new European road safety action plan is due to be published in the near future.

Programmes to prioritise public transport and reduce average speed in the different areas of urban transport, for example 'park and ride' concepts and 'shared space' policies can have sustainably positive effects on the health and safety of workers, provided OSH is considered in the planning phase; as an example, priority given to public transport by bus lanes may reduce stress levels to bus drivers, and the reduction of average speed in urban areas may help reduce the number of severe commuting and other work/related road accidents.

What is to be retained for effective occupational safety and health prevention is that it is important to address other policy areas. Urban planning, food trading or environmental measures can have a profound effect on the workers in public transport, long-distance hauling, maritime and air transport, respectively. For the prevention of road accidents or the effects of fatigue on the safety of workers and passengers, it is important to follow and analyse the OSH effects of policy measures in other areas that may have an influence on the health and safety of workers concerned.

6.2.3. Work organisation

According to the research presented in this report, an increase of work pressure and workload is to be observed in the transport sector. Work pressure in the transport sector is often a result of 'just-in-time' management. The just-in-time principle means that goods are delivered at the moment the company needs them in the production process. Because the stocks are being decreased to a minimum, a higher frequency of delivery of small amounts is necessary ⁽³⁰³⁾.

Training and ergonomic layout of workplaces need to take into account technological developments in the sector and the increasing use of remote monitoring and planning tools, telecommunication and telematics equipment.

Due to the open market and the increase in international transport, the job content of transport workers changed considerably. Knowledge on international codes and planning became more important, e.g. knowing the European traffic laws and signalisation (which may be different in several countries) or knowing the important traffic routes, customs rules, and speaking different languages. Furthermore, technology results in decreased expenditure, less noise, etc. but it also creates a need for more knowledge on the part of the workers. For example, road haulage drivers have to know how to work with automated systems like on-board computers, digital tachographs ⁽³⁰⁴⁾ or other telematics equipment ⁽³⁰⁵⁾. A Finnish study among truck drivers found that they have to work on average an hour a day with display units on board, while at the same time experiencing a number of ergonomic problems (perturbed vision, neck and shoulder problems, awkward postures, having to divide their attention between

⁽³⁰³⁾ SERV, Onderzoek naar de kwalificatiebehoeften voor vrachtwagenchauffeur, Brussel: Sociaal-Economische Raad van Vlaanderen, 1998.

⁽³⁰⁴⁾ A tachograph is a device that combines the functions of a clock and a speedometer. Fitted to a motor vehicle, a tachograph records the vehicle's speed and whether it is moving or stationary. The mechanical tachograph writes on a round piece of paper which constantly turns throughout the work day. The marker moves further from the centre the faster the vehicle is moving. An entire rotation encompasses 24 hours. Analogue tachographs record the driver's periods of duty on a waxed paper disc. However, these are vulnerable to tampering, and so are being replaced by digital tachographs which record data on smart cards. Tachographs are also used to improve road safety and ensure fair competition. They are also used in the maritime world.

⁽³⁰⁵⁾ SERV, Flexibilisering van werk- en levertijden in het goederenvervoer: een aanbeveling van de Sectoriële Commissie Goederenvervoer, Brussel: Sociaal-economische Raad van Vlaanderen, 1999.





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driving and other tasks) when using them. To avoid a certain degree of uneasiness, confusion and irritation among drivers, there is a need for proper education and training on the job.

Transport workers also report less control over their work, which is often determined by predetermined speed, time pressure and direct demands from customers, often unpredictable and monotonous. They also report less support from colleagues and management, which may also be linked to the high proportion of lone work and their high mobility.

6.2.4. Working time

Several studies indicate that transport workers report long working days and weeks and varying working hours (working in the evening, at night, at the weekend). Working in this sector is not characterised by the typical '9 to 5' working hours.

There are several scientific studies reporting the negative health effects of non-standard working hours and possible psychosocial problems, both short-term and long-term associated health effects. Additional problems may also occur in specific risk groups. For example, with regard to female workers, problems concerning reproductive health may occur. As mentioned above, increased breast cancer risk has been found to be linked to night work, that is typical for transport, and higher cancer rates have been observed among female transport workers. Since the attraction of female workers to the profession is mentioned as one of the solutions for the employment problem in the sector, attention must be given to this specific issue. Regarding older workers, increased fatigue problems may occur. Since the number of older workers is increasing — and it is expected that the trend will persist — more attention should be given to the adaptation of shift plans and working time patterns ⁽³⁰⁶⁾.



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⁽³⁰⁶⁾ European Foundation for the Improvement of Living and Working Conditions (Eurofound), EU road freight transport sector: Work and employment conditions — Belgian Survey, 2003.



Regarding specific work risk-related accidents on the road, statistics reveal that 45 % involving accidents with deaths, happen at night, whereas the business is far less at night compared with daily traffic. It can be concluded that if an accident occurs at night, the risk for a serious accident is much higher ⁽³⁰⁷⁾.

6.2.5. Psychosocial factors

In the transport sector, some of the factors that contribute to stress are: working alone, irregular work hours, lack of involvement, work pressure, customers' or co-workers' aggression, conflicting tasks and the constraints posed by having to comply with a number of strict regulations. Traumatic incidents such as aggression from customers or suicide attempts of passengers may lead to long-term absences and may require prolonged treatment and psychological support for workers. One study found that a high proportion of transport workers who suffered a post-traumatic stress syndrome following such a traumatic incident were suffering permanent incapacity because they were unable to return to work.

Violence

Third-party violence is an occupational risk in the transport sector that has attracted increasing attention over recent years. Violence at work can be defined as incidents where employees are abused, threatened, assaulted or subject to other offensive behaviour in circumstances related to their work. Violence includes both physical and non-physical violence.



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Staff working in transport services — including airline and airport services, ferry, train, bus, and taxi services — are potentially among those most at risk of physical or psychological violence. Truck and taxi drivers may be victims of assault and robbery and workers in passenger and courier services are often first in line to handle complaints and thereby the 'involuntary intermediates' for organisational changes and practices, such as systematic overbooking in air travel, reduction of personnel in ticketing, and automation and reduction in services at information counters. Their tasks are not limited to the transport of persons and goods, they also provide information to clients and are responsible for supervising the safety of passengers, the control of tickets and the prevention of vandalism and violent behaviour. There are other regulations impacting, for example non-smoking or limitations on alcohol-consumption or mobility for safety reasons, for example in airplanes. And they are sometimes dealing with specific groups whose behaviour may be erratic and unpredictable, such as fare evaders, beggars, hooligans, people who do not comply with smoking or other restrictions, and

⁽³⁰⁷⁾ BIVV, Jaarverslag 2000: Verkeersveiligheid, 2000.

people who consumed excessive amounts of alcohol or drugs ⁽³⁰⁸⁾. Violent incidents often happen at night and in early morning hours and when transport workers are alone on duty. Recent work organisational changes such as staff reduction on public transport have increased lone working, thus putting workers more at risk of being aggressed and assaulted.

Violence, bullying and harassment go largely underreported and thus they persist and deepen in gravity and incidence. Reasons for the lack of reporting are mainly: the lack of confidence that the cases will be adequately dealt with; fear of the consequences on job and career. Many service workers are encouraged to defuse customer hostility, with a 'the customer is always right' approach, meaning that in the process of their working day verbal abuse may have to be absorbed. Many non-fatal incidents, especially threats, simply go unreported because there is no coordinated recording system to process this information or because the workers involved, for example taxi drivers and courier services, cannot afford to lose the time to report the incident. To prevent outbreaks of fear or decreases in frequenting the services, or stimulating similar behaviours, violence reports may be withheld by some companies.

How to prevent violence:

An ILO report explains prevention measures against third-party violence:

It recommends the following approaches to preventing workplace violence and stress:

- **environmental:** adjusting lighting, entrances and exits, security hardware, and other engineering controls to discourage would-be assailants;
- **organisational/administrative:** developing programmes, policies and work practices aimed at maintaining a safe working environment;
- **behavioural/interpersonal:** training staff to anticipate, recognise and respond to conflict and potential stress and violence in the workplace.

It also defines good practice criteria for prevention policies and recommends that the policy also be communicated to users, clients and the general public.

HEALTH OUTCOMES

6.3.

Accidents

According to the data of the Member States, the transport sector displays a high level of occupational accidents. According to EU data (ESAW), 194,734 non-fatal and 575 fatal accidents occurred in the transport sector in 2006 ⁽³⁰⁹⁾. Transport therefore accounted for 6.1 % of all non-fatal accidents and 15.5 % of the total number of fatal accidents.

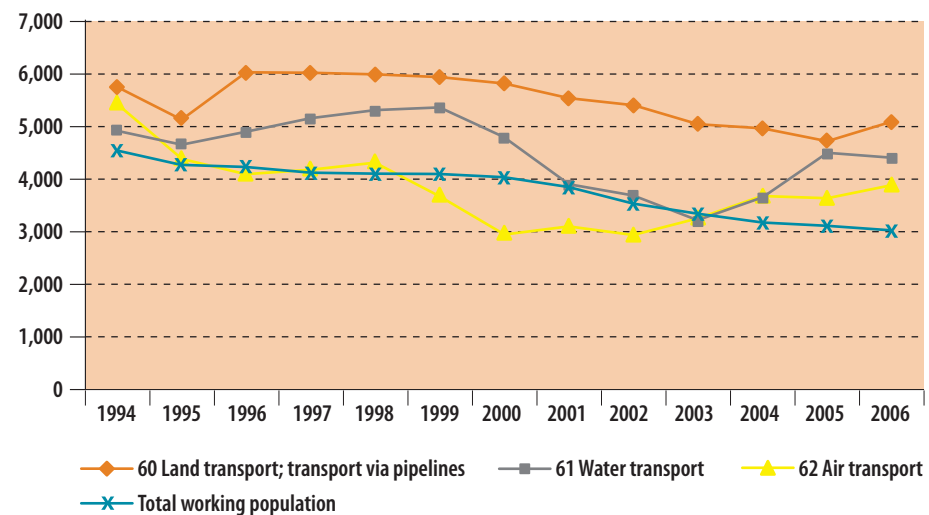
⁽³⁰⁸⁾ ILO, Fact sheet: Violence and stress in transport sector, Available at: <http://www.ilo.org/public/english/dialogue/sector/sectors/transp/socprot-violence.htm>

⁽³⁰⁹⁾ Provisional data at date of extraction, June 2009.



Among the transport subsectors, land transport and transport via pipelines accounted for the vast majority of registered accidents: 90.1 % of the non-fatal and 95.7 % of the fatal accidents. In recent years, the number of occupational accidents in transport has slightly gone down but the percentage share of accidents in transport in total accidents has increased.

Figure 38: Incidence rate per 100,000 workers of non-fatal occupational accidents (more than three days lost) in EU-15, by transport subsector and total working population, 1994-2006



Source: ESAW

The frequency rate is generally higher for this sector in comparison with other sectors. In most EU countries the transport sector approximately represents about 7 to 10 % of all occupational accidents, with the exception of Germany where the percentage is higher. The largest part of the occupational accidents involves men aged 25–45. The overall figures for transport are very much determined by the findings in land transport, the biggest transport subsector, with 91.6 % of all non-fatal occupational accidents affecting male workers and 8.4 % involving female workers. As far as the overall workforce across all activity sectors is concerned, the difference between genders is narrower than in transport. In 2006, male workers in transport reported 5,442 non-fatal occupational accidents per 100,000 workers, while the corresponding number for their female counterparts was 2,479. Compared with the overall workforce, the figures in transport are higher for both genders. Women have recently increased their share in the number of non-fatal occupational accidents across the EU-15: while in 2000 female workers in air transport made up 18.6 % of all non-fatal occupational accidents in the subsector, by 2005 this percentage share had risen to 31.8 % and to a slightly higher 32.2 % in 2006.

The work environment in itself is the cause of most occupational accidents in the transport sector. In road transport the main issue are still the serious traffic accidents, but falling and slipping as well as falling from a height appear to be frequent causes. In air transport, a big portion of the accidents happens during turbulence or landing, when the cabin crew is performing their service tasks, and when loading and unloading. With regard to the type of accidents, falling and falling objects account for a major part of the accidents. The typical outcomes are broken bones, sprains, soft-tissue injuries and teeth injuries.



Transport could benefit from policy measures in other areas — policy measures in public health on risk-taking prevention can help target young drivers, equality measures modelled on other areas introducing flexibilisation to adapt to an increasingly diverse working population, and safety measures to protect the general public from violence, are all examples to be retained. Equally, measures taken in other policy areas, such as urban planning, for example ‘shared spaces’ policies that reduce traffic speed and lead to raised alertness of drivers, the prioritisation of public transport, or school travel plans, may help to introduce targeted OSH policies or benefit the OSH of workers indirectly. They could help address areas where little progress has been made, such as commuting accidents or the increasing number of serious accidents in public transport, that, as mentioned above, is also expected to increase substantially.

Occupational diseases and work/related health problems

Most Member States indicate that the transport sector experiences a high number of musculoskeletal disorders (particularly back, neck and shoulder problems). It is known that back problems are also aggravated with age and seniority in work, due to longer exposure times and lack of prevention. Due to the demographic changes in the sector, specific measures aiming at better ergonomic conditions for older transport workers are needed. A recent European Risk Observatory report has highlighted the issue of lower-limb disorders linked to prolonged standing. For some transport jobs, for example flight attendants, luggage handlers or catering workers on ships, this is definitely an issue to be considered. Other common diseases are stress-related health disorders, asbestos-related diseases and noise-induced hearing loss.

Generally, incidence rates are lower than for the general working population. Whether this is due to under-declaration or under-recognition is not clear. In any case, this is in contradiction with worker surveys, where transport workers are amongst the ones reporting higher exposures, for example to risk factors for musculoskeletal disorders, such as repetitive work.

It is also worth noting, however, that the incidence rates of hearing loss and cancer seem to be slightly higher for women in the transport sector than for the average female working population. Recent studies have found a link between night shift work and breast cancer, the most common cancer in women, and incidentally this could be a reason for higher cancer rates in female transport workers.

In studies related to the maritime sector, but equally in other subsectors, diseases of the digestive system and respiratory diseases are frequently reported. A part of the digestive system diseases can be linked to shift working and unusual eating times, and bad eating habits due to insufficient rest times, limited capacity to have warm meals and inappropriate facilities for breaks and meals. Long/distance travelling entails infectious diseases of the respiratory and digestive systems, an effect that is enhanced by confinement on ships and airplanes or contact with exotic infectious agents.

Most Member States indicate that the transport sector experiences a high number of musculoskeletal disorders (particularly back, neck and shoulder problems). Other common diseases are stress-related health disorders, respiratory and digestive diseases, asbestos-related diseases and noise-induced hearing loss.

It is worth noting, however, that the incidence rates of hearing loss and cancer seem to be slightly higher for women in the transport sector than for the average female working population.

Specific measures aiming at better ergonomic conditions for transport workers are needed, amongst others to address the demographic changes in the sector.





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Fatigue / the most reported health problem in transport

Finally, fatigue is an OSH issue that is common and widespread, leads to serious accidents and may have serious health implications for the workers. The time of day was known to be a significant factor in accidents among commercial drivers. The effect of circadian rhythms (human performance in a 24-hour cycle) is important in analysing fatigue related accidents. Figures at night or in the early morning hours are often 10 or more times higher than daytime levels. Increased crash risk occurs at night, the longer the working day and with irregular hours. Fatigue has been shown to have similar effects on driver alertness than alcohol consumption and to be one of the main causes for serious accidents.

Multiple strategies (regulation, enforcement, awareness campaigns, training and guidance) aimed at preventing fatigue in transport industries (road, rail, air) exist, but need to be further implemented. In water transport, the problem appears to be least dealt with by current legislation, management or working practices and there is an urgent need to rectify the situation. One reason for the better-developed approach in other sectors has been the knowledge base that now exists about fatigue in these industries. A second reason for developments in this area in other sectors has been the interaction of all the stakeholders to advance in understanding of what causes fatigue and what can be done to prevent and manage it. Consequently, studies suggest to implement fatigue management plans and to introduce wider monitoring of fatigue in transport workers. Some methods of assessing worker fatigue are presented in this report.

Set up a fatigue management program consisting of ⁽³¹⁰⁾:

- a fatigue management policy;
- limits on hours of work, and provisions for adequate rest breaks;
- management of work patterns;
- fatigue risk assessments and subsidiary assessments such as specific task/ decompositions;
- 'competency based' education or 'awareness training' programs as appropriate;
- a fatigue reporting mechanism with associated feedback;
- procedures and measures for assessing/monitoring the fatigue management program;
- procedures for reporting, investigating, and recording incidents that are attributable wholly or in part to fatigue; and
- a process for review of the fatigue management program and its risk treatments/ controls.

Sleep apnea as cause and consequence of fatigue

Some studies presented in this report have found a clear link between fatigue and the occurrence of sleep apnoea in transport workers. Especially truck drivers have been found to be highly affected by sleep apnoea, a sleep disorder characterised by pauses in breathing during sleep, which in turn leads to daytime sleepiness and fatigue associated with significant levels of sleep disturbance. Shift work and irregular working times add to sleep disturbances as well as unhealthy eating habits leading to obesity, enhanced by lacking or inappropriate rest, meal and break facilities and insufficient breaks. Professional drivers may be caught in a vicious circle difficult to escape from without organisational changes.

It was proposed in several studies to set up occupational health monitoring of drivers taking account of sleep apnoea, along with measures of fatigue monitoring and effective prevention.

⁽³¹⁰⁾ Based on Australian National Rail Safety Guideline. Management of Fatigue in Rail Safety Workers. National Transport Commission 2008. Available at: http://www.ntc.gov.au/filemedia/Reports/NRSG_FatigueManagement_June2008.pdf



6.4. FURTHER RESEARCH

Land transport is the predominating subsector in most of the EU Member States. As a consequence, research on safety and health aspects is often focused on transport over land. One of the first conclusions to be drawn from this study is therefore that future research should include the hazards and risks characteristic in the other sub sectors of transport (for example the exposure of cabin crews to radiation, the quality of air board of aircrafts, handling of and exposure to asbestos by railway workers or fatigue in drivers in public service, and overall in transport specific interaction of psychosocial stressors, non-standard work schedules and ergonomic conditions leading to MSDs, etc.).

The EU transport policies aim at a broader distribution and combined use of the different transport means. As a result, combined use of rail and road transport is a reality in some of the Member States, such as Hungary. OSH research needs to take account of these changes. A recent major accident in rail transport in Italy with a number of fatalities has demonstrated what the risks may be for general public as well as for workers. Water transport is a growing sector, in the tourism industry as well as in transport of containers. The risks to service workers on ships and to workers in cargo handling should also be assessed.

Research needs to focus on what the most effective methods are to address the emerging OSH risks, such as fatigue, violence and the consequences of rapidly evolving technological development in the transport sector.

Regarding land transport, efforts are mainly put into the prevention of road accidents. Other issues to be addressed are the adaptation of working conditions to technological developments, how to monitor and prevent fatigue, and how to address increasing violence.

Research needs to focus on what the most effective methods are to address these emerging risks and the specific combination of difficult working conditions (working away from a base, far from home, in atypical work schedules, under pressure, with conflicting tasks, low support, and exposed to a variety of physical risks, from noise to vibration, dangerous substances and straining work) in the transport sector.

6.5. TRAINING

Increasing monitoring of drivers also puts higher demands on their skills and organisational abilities. Technological developments have to be kept up with. In addition, transport workers often have to deal with conflicting demands. Safety and health considerations may be conflicting with time pressure, demands from customers and the specific conditions at clients' premises.

Issues such as violence, dealing with customers, and the adaptation to the constantly changing conditions and safety requirements of the working environment are to be addressed by training and skills development.

Also, there are an increasing proportion of female, migrant workers and part-time employees in the transport sector. Moreover, the transport workforce is ageing. Studies have shown that workers who work in the field, migrant workers, part-timers and older workers often have less access to training.



Apart from continuously adapted technical and organisational prevention measures, continuous and adapted training that takes into account the diverse workforce and changing conditions is needed, and it needs to provide workers with the necessary means to protect their own safety and health.

A study requested by the European Parliament's Committee on Transport and Tourism analysed the multiplicity of factors affecting labour supply and demand in the road freight transport ⁽³¹⁾. It reported a progressive shortage of professional drivers, which has emerged as one of the most critical issues seriously affecting the competitiveness of the sector over the last 10 years. The shortage has progressively become structural across Europe, although its impacts have not occurred simultaneously and with the same severity and magnitude in all EU Member States, as more than half of total goods transport in tkm is accounted for by Germany, Spain, France and Italy. To conclude, the study defines this as 'labour mismatch', where the competences and skills required by firms do not tally (in general being higher) with those offered by the workers. Qualifications and skills requirements are not met, since technological innovation, globalisation, increased complexity of regulations and additional tasks have implied a substantial transformation of jobs in the transport sector, entailing new and more complex skills and training needs, and thus producing a shortage of qualified personnel.

As regards specific measures to tackle the problem of the shortage of qualified personnel in the road freight transport sector, so far specific and direct measures have not been taken at the EU level, although the European Commission recognises this has become a major problem. The EU Freight Logistics Action Plan ⁽³²⁾ is one of a series of recent policy initiatives jointly launched by the European Commission to improve the efficiency and sustainability of freight transport in Europe. Freight Transport Logistics focuses on the planning, organisation, management, control and execution of freight transport operations in the supply chain. The plan presents a number of short- to medium-term actions and one of the main issues identified for improvement was training. It was decided in its framework that the Commission will work with the European social partners and other relevant stakeholders to draw up a list of minimum qualifications and training requirements at different levels of specialisation to be incorporated into a framework that can ensure the mutual recognition of training certificates, and to find ways to improve the attractiveness of transport logistics professions.

The EP study mentioned above also concluded that the attractiveness of the profession and working conditions should be improved by increasing the number of, and enhancing the comfort and security of, truck parking areas, harmonising regulations and penalties across EU countries, and increasing the integration between employers' and employees' needs and objectives.

Continuous and adapted training that takes into account the increasingly diverse workforce and changing conditions is needed.

⁽³¹⁾ Lodovici, M. S., et al., Shortage of qualified personnel in road freight transport, study for the Policy Department Structural and Cohesion Policies of the European Parliament, IP/B/TRAN/IC/2008-169, 2009.

⁽³²⁾ Communication from the Commission. Freight Transport Logistics Action Plan. Brussels, 18.10.2007. COM(2007) 607 final. Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52007DC0607:EN:NOT>



6.6. MONITORING AND ASSESSING THE OSH RISKS TO TRANSPORT WORKERS

To evaluate the true proportion of risks to transport workers, proper measurement, monitoring and reporting tools are needed. Regarding the main risks to workers, there are still substantial gaps:

Many countries do not record accidents involving vehicles as occupational accidents.

Many countries do not record accidents involving vehicles as occupational accidents. The situation is different in the Member States regarding inclusion of commuting accidents, accidents

while on work mission, and accidents involving a vehicle on site. A wider inclusion of accidents involving vehicles would considerably improve possibilities to assess the situation across the EU; if it is true that almost half of the fatal accidents are vehicle-bound, then an important proportion of the accidents is omitted in the statistics.

Incidents linked to aggression and violence to transport workers still go widely unreported.

There is a clear discrepancy between survey results, estimations and actual reports of violence-related incidents in the transport sector. Surveys are unlikely to provide a total 'picture' of the incidence and severity of violence because of the 'healthy worker' effect: only workers who are well remain in the job, and those who are ill or injured leave. If transport workers fear that they would have to suffer disadvantages if they report such incidents, as reported for taxi drivers, then it can be assumed that figures are significantly underestimated. Because some workers may work under non-standard contractual arrangements ('independent contractors'), it may be difficult to collect data on such incidents.

The preconditions that support reporting need to be met: awareness-raising among workers and managers and clear definitions of the different levels of violence and aggression would help to improve reporting levels. Transport workers need to be trained adequately and encouraged to report such incidents, and effective reporting procedures, with a clearly supportive, non-blaming approach, complemented by effective prevention measures, need to be put in place. Reporting will only take place if the workers feel that help and support is offered, and quickly.

Fatigue is a major risk to transport workers and may lead to serious accidents, but there are no appropriate assessment methods in place.

Fatigue is recognised to be a significant risk to transport workers, and a main cause for serious accidents. Nevertheless, there are no commonly used instruments to assess fatigue, and very few systematic research reviews assessing the levels of transport worker fatigue exist. An investment into easy-to-use assessment methods for fatigue, such as self-assessment of drivers regarding their alertness and cognitive faculties, would help address the issue. Nevertheless, these measures need to be built into a general prevention plan, with appropriate working time regimes, possibilities to have breaks, and a clear will to adapt the conditions to the workers.

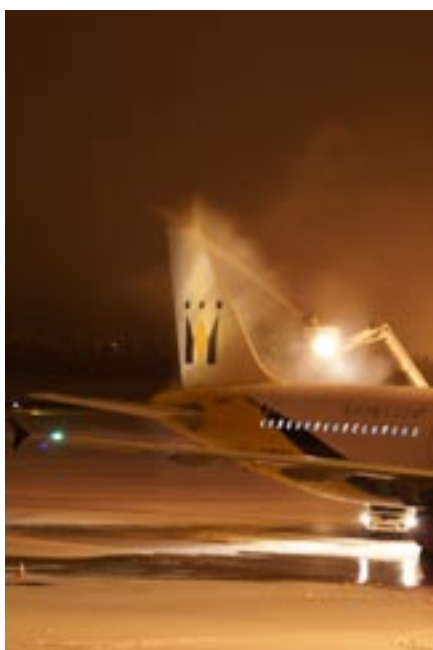
Exposure to dangerous substances in the transport sector is very variable depending on the occupations considered, but it is recognised that transport workers may be



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considerably exposed. Some exposures, such as exposure to exhaust fumes or dangerous goods in truck drivers, or pesticide and asbestos exposures to rail workers, have been recognised, although the levels are not assessed, and a lot still remains to be done. Mapping the exposures to workers in different occupations in the different transport subsectors could help unveil all the other risks that still remain unassessed. It is important that workers involved in services or tasks such as cleaning, catering or maintenance are included, as they are often regarded as not belonging to the 'core group' of transport workers and may work under more precarious conditions than the others. Apart from chemicals and substances generated while working, such as dusts and exhaust fumes, biological agents may also present a risk to transport workers. Examples are the exposures to infectious diseases on long-distance travelling, but also more common exposures when loading, delivering, cleaning or performing maintenance tasks.

The situation is even more unclear as regards physical and ergonomic risk factors. It is a wide-known fact that transport workers are considerably exposed to MSD risk factors, but the levels of these and other exposures, such as exposure to noise or (cosmic and other) radiation need to be further assessed. Additionally, the combination of physical risks may lead to dramatic health effects — for example the combination of vibration, awkward and static postures, and climatic conditions may lead to a spontaneous pneumothorax in young, healthy bicycle courier workers — and the situation still remains largely unassessed as regards type, level, extent, pattern and duration of exposures.



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Similarly to chemical and biological exposures, a mapping should be carried out to assess the situation and be able to design and prioritise prevention measures.

One main characteristic of the transport sector is the mobility of workers and their workplace. Their workplace may either move with them to different surroundings (when travelling in a vehicle to different locations) or the workers themselves may be constantly moving and working at different locations. What makes their work different for example from that of a construction worker is that their location may be even more variable, when it involves long-distance travelling, for example. As a result, due to their working conditions, a high proportion of the risks may be unforeseeable. This needs to be taken into account when assessing and monitoring their situation.

Many, but not all transport workers, also work in customer service activities, where risks are multiple, but awareness of safety and health issues is low. Many of these tasks are also considered within the sector as non-transport related, for example catering or cleaning tasks on trains, ships and buses, and may therefore be left out of risk assessment and prevention.

Another characteristic of work that they share with workers in other high-risk sectors such as construction is the limited adaptability of their working environment while a

Exposures to dangerous substances, including biological agents, and physical risks remain widely unknown for workers in many transport occupations.

Mapping physical and ergonomic risks to the different occupations in transport covering type, level, extent, pattern and duration of exposures may help target and prioritise prevention measures.



multiplicity of risks takes effect — organisational risks, time pressure, unusual and nonstandard working time and shifts, combined physical risks, reduced space, and limited scope for healthy behaviours. It is therefore particularly important in this area to look at the whole load on the person when assessing the situation and when designing prevention.

6.7. FINAL CONSIDERATIONS

Transport — a sector in evolution



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Working in the transport sector requires high levels of professional skill and competence. The workers must not only be capable in their core task, many have to troubleshoot technical problems, have certain language skills, carry out basic administration, telecommunicate, and act as 'ambassadors' for their company's services. If society wants motivated and highly skilled transport workers, more attention should be given to the working conditions of this sector.

A 2008 study commissioned by the EEA has analysed the drivers of change in the transport sector. Although the study

focused on issues with an impact on environmental protection, it identified a number of issues relevant for OSH:

- the rapid growth of air transport, mainly low-cost and with infrastructures newly set up a factor of under high time pressure; for example, one airport experienced a passenger increase by factor 10,000 in only 10 years (in practice, this may often mean that fewer workers have to attend more clients in premises that constantly have to be adapted to changing demands, with all the effects that this may have from a work organisational and physical workload point of view;
- the rapid growth of migration is linked to increased transport activities and has a back-effect on transport demand, as mobility of workers within the Union is yet expected to increase and migrant workers visit their families at home;
- the higher proportion of migrant workers may have many other consequences on the OSH of transport workers, as migrant workers tend to be segregated into certain jobs, but certainly an increasingly diverse working population will have different training needs;
- the impact of changing consumption habits, for example food consumption, on (food) industry infrastructures as well as on transport demands; both the food industry and transport have experienced profound structural changes that may impact on the occupational safety and health of the workers in both sectors;

- the changing patterns of travelling as regards distances, locations, destinations and length of the journey; this is confirmed by other studies, for example Eurostat data that have identified an increase of cabotage (short-distance transport);
- the impact of an ageing population on transport demands and infrastructures; an ageing society will place more emphasis on the provision of transport services involving a high level of perceived security and reliability, and which feature appropriate solutions for users with reduced mobility;
- through its effect on public finances, pension payments, health care and nursing, ageing will put a strain on the supply and maintenance of transport infrastructure and set a limit for funding available to public transport. A scarcity of labour and skills may arise, further aggravating the shortage of skilled labour already experienced in some segments of the transport sector;
- also, car use is more pronounced in an older population, as public transport is still mainly perceived as an alternative for cycling and walking, but not for car use. According to EEA's latest TERM report ⁽³¹³⁾, in passenger transport, car journeys remained the dominant mode of transport, accounting for 72 % of all passenger kilometres in the EU-27;
- the changing demands on short-term commuting and public transport, for example regarding the transport of school children. This is confirmed by national reports, for example from France, where an increasing need for school bus transportation has been identified. This is also one of the main areas where female workers are increasingly employed in the transport sector.



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⁽³¹³⁾ Towards a resource-efficient transport system — TERM 2009, EEA, 2010. Available at: <http://www.eea.europa.eu/publications/towards-a-resource-efficient-transport-system>. The EEA report, 'Towards a resource-efficient transport system' is the annual publication for the EEA Transport and Environment Reporting Mechanism (TERM), which monitors the progress and effectiveness of efforts to integrate transport and environment strategies. TERM reports have been published since 2000 and offer insights that can support the development of EU policies. The report aims to cover all EEA member countries.



The study presents policy options to influence some of the drivers of change, such as targeted taxation to reduce long-distance transport of goods. It is important to consider how these policy measures may be able to influence the occupational safety and health of workers and to explore possible synergies and limit detrimental effects.

The study also highlighted a knowledge gap and a need for more research on the transport consequences of non-transport decisions. It had observed that European experience of managing transport demand by non-transport sectors was often undocumented, insufficiently highlighted or stayed within the national boundaries of the EU Member States.

A growth in the total demand for transport should also be expected. This growth is the result of the extension of the European single market and of the further growth of international transport of goods. This will result in more traffic, so it is necessary that industry and government work together to analyse the impact of this growth.

Regarding sustainable mobility in the future, several solutions are mentioned: a good network of highways (avoid the silting up of roads and ‘forgotten’ parts of roads; the creation of specific truck roads (truck corridors) may relieve highways and the use of automatic road transport; more transport of goods during the night — a proposal that may lead to increased occupational road accident rates; increased use and development of telematics to bring important information to the driver and so doing increase safety, but also work complexity and additional tasks; the replacement of the traditional transport chain by eliminating the boundaries between different transport systems (rail and maritime transport); and network development between companies and their supply industries (companies that are located in the same industrial area could investigate if they could organise transport of goods together).

The impact these proposed mobility problem solutions may have on the employment situation of the transport of goods sector and the working conditions should be investigated.

The impact of possible mobility solutions and envisaged EU-wide transport policies on OSH needs to be assessed.

Recommendations for monitoring, research and prevention

- Enlarge the concept of what a transport worker is and cover the diversity of jobs and tasks, including the many service and administrative ones.
- Map the exposures and risks to transport workers, addressing all the subsectors and groups of workers.
- A wider inclusion of accidents involving vehicles would considerably improve possibilities to assess the situation across the EU; if it is true that almost half of the fatal accidents are vehicle-bound, then an important proportion of the accidents is omitted in the statistics of some Member States.
- Awareness of some risks, for example, exposure to dangerous substances or contracting infectious diseases, may be low. Attract attention to issues normally overlooked, and clarify whether they may combine to cause more harm.
- The transport workforce is ageing, especially in road and public transport. This needs to be addressed by work organisation, workplace adaptation and training — how to use their skills and maintain employability.



- Adapt research, monitoring, prevention and health surveillance to an increasingly diverse working population, addressing the specific needs of women, migrant, and part-time workers.
- Provide better access to infrastructure, rest and break facilities and to OSH prevention services and health surveillance for transport workers. Static work may lead to lack of physical activity and reduced access to healthy food, and short rest breaks in inadequate rest facilities may lead to unhealthy eating habits, thereby contributing to the risk of developing cardiovascular health problems and sleep apnea.
- Provide better reporting procedures for transport workers' health problems and occupational diseases.
- Many transport jobs involve ergonomic and complex work organisational risks. Adapt risk assessment and workplace prevention to cover these risks together and take a holistic approach. Care should also be given to foresee individual adaptability of the equipment or the working environment by workers (for example in service areas of planes or trains, or the work area of professional drivers).
- Address accident risks with a wider concept taking into account the multiplicity of factors interfering.
- Mainstream OSH into transport accident prevention in all subsectors, building on the experiences and knowledge from road safety measures.
- Make use of policies in other areas, such as speed reduction policies in urban transport, to further reduce risks to transport workers.
- Mainstream policy approaches addressing working time issues in road transport to other transport subsectors.
- Expand on the use of technological means to monitor and control risks, but also assess how these may negatively impact on the OSH of transport workers.
- Address emerging risks such as violence and fatigue, and cognitive impairments with specific monitoring, reporting and prevention measures. It is essential to monitor fatigue. Step-wise alarm levels and routines to prevent fatigue-related incidents in the event of unforeseen events, would also be needed.
- More efforts are needed to prevent and monitor violence in the transport sector. Transport workers need to be trained adequately and encouraged to report violence, and effective reporting procedures need to be put in place.
- Inform employment agencies on the specific OSH risks transport workers may incur.



Recommendations for monitoring, research and prevention

- Train employers and workers on how to better protect their health and safety.
- Raise awareness of OSH issues in policy areas that may impact on the health and safety of transport workers.
- Address major changes in the way transport is organised by analysing how this may impact on OSH.
- Promote cooperation between transport stakeholders and OSH stakeholders.
- Research and prevention need to cover the combination of very diverse hazards (ergonomic, unusual working times, noise, vibration, complex work situation and constant change). Build on effective examples

Specific issues to address in the transport subsectors

Subsector	Some issues highlighted
Rail transport	Work organisational changes and outsourcing leading to increased workload
	Lone work
	Working time issues, shift work and weekend work
	Increasing long-distance transport
Public passenger transport	Ergonomics and workplace design
	Climatic conditions
	Violence and harassment
	Increased customer contact, including translating organisational changes to customers, and at ticket counters
	Lone work
Taxi services	Shift work
	Conflicting demands (attending customers and driving), leading to high blood pressure and cardiovascular diseases
	Needs of an ageing workforce
	Violence and assault, lack of reporting systems and training
	Lone work
Taxi services	Working time and shift work issues
	Workplace design
	Having to use communication means while driving



Subsector	Some issues highlighted
Long-distance road haulage	<ul style="list-style-type: none"> Just-in time management leading to high work pressure Client pressures; working on sites of others Increasing use of remote monitoring and complex technology Workplace design Accessibility of facilities and services (hygienic, food and medical) Infectious diseases Violence and assault Lone work Prolonged sitting and exposure to vibration Accident risks, including when loading and unloading Needs of an ageing workforce
Dangerous goods transport	<ul style="list-style-type: none"> Accident risks, including fire and explosion risks Exposure to dangerous substances, especially when loading and unloading Risks of falls from vehicles and other transport means
Courier services	<ul style="list-style-type: none"> Unforeseeable conditions at customers' premises, e.g. availability of safe lifting aids Customer expectations and contact Accident risks and climatic conditions, e.g. for bicycle couriers Lifting and handling parcels/goods of unforeseeable sizes and shapes Work organisational issues — work pressure due to short-term changes in tasks, use of remote monitoring/contact systems (drivers receive orders while driving)
Water transport	<ul style="list-style-type: none"> Addressing migrant and diverse working population Gender segregation into very different jobs and tasks Infectious diseases Confinement and isolation Risks from fumigation gases in container transport Increasing use of inland water transport for goods Applicability of EU and OSH legislation when ships sail under foreign flags Increasing use in the tourism sector, service and administrative professions not regarded as transport jobs



Subsector	Some issues highlighted
Air transport	<p>Working time issues, shift work, irregular working times</p> <p>Ergonomic conditions, confined spaces, e.g. for flight attendants</p> <p>Heavy lifting and climatic conditions for luggage handlers</p> <p>Cosmic radiation, flying personnel</p> <p>Time/shift adaptation for long-distance flying, sudden climatic changes</p> <p>Increasing customer demands</p> <p>Time pressure and work organisational issues for air controllers</p> <p>Accident risks, including with vehicles and from falls</p> <p>Very loud noise and vibrations</p>
All	<p>The specific combination of risks and combination of factors such as ergonomic risks, work organisational stressors, noise, dangerous substances, vibration, unusual working times, working away from home and from a work base, lack of facilities, complex work situation, the need for constant adaptation, and the many structural changes that have occurred in the sector are a particular challenge for monitoring and prevention.</p>



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In order to improve the working environment, as regards the protection of the safety and health of workers as provided for in the Treaty and successive Community strategies and action programmes concerning health and safety at the workplace, the aim of the Agency shall be to provide the Community bodies, the Member States, the social partners and those involved in the field with the technical, scientific and economic information of use in the field of safety and health at work.

European Agency for Safety and Health at Work
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