



The burden of occupational ill-health related to dangerous substances – an EU-OSHA perspective

Elke Schneider, European Agency for Safety and Health at Work
Helsinki, 03 October 2012



This presentation

- **EU-OSHA perspectives**
 - EU-OSHA presentation
 - Different statistical sources
 - Issues:
 - Dermal exposure
 - Combined exposure
 - Cancer at work
 - Vulnerable groups

EU-OSHA

Established in 1996 in Bilbao, Spain

Mission:

To help **improve working conditions** in the European Union by **collecting, analysing and communicating technical, scientific and economic information related to OSH** to Community bodies, Member States, the social partners and all those involved in the field of OSH

EU-OSHA is **a tripartite organisation** and brings together representatives from:

- governments, employers' and workers' organisations
- as well as from the European Commission



A network of Focal Points to support the agency's activities



Dangerous substances – EU-OSHA’s activities

- **Website information online and paper publications**
 - Occupational exposure limits
 - Good practice examples and case studies
 - Links to Member state information
 - Fact sheets in all official languages
- **EU Risk observatory:**
 - Expert surveys, targeted studies, e.g. on nanoparticles
- **Campaigns:**
 - European Week 2003 activities and products
 - Support to SLIC campaigns on asbestos and workplace risk assessment of dangerous substances
 - “Dangerous substances” mainstreamed into our campaigns (noise, construction, young workers, risk assessment, maintenance, worker participation)
- **Mainstreamed into other activities**
 - Sectors, such as cleaners, health care, construction, transport, etc...
 - Groups: young, female, migrant, older workers
 - Emerging risks
 - statistics

EU-OSHA cooperation with ECHA

- Memorandum of understanding
- Institutional collaboration to avoid duplication and enhance complementarity e.g. following model agreements with other agencies
- Exchange of information on work programmes

COUNCIL REGULATION (EC) No 2062/94 of 18 July 1994 and amendments

The Agency shall work as closely as possible with the existing institutions, foundations, specialist bodies and programmes at Community level in order to avoid any duplication.

REACH already
discussed during
EU-OSHA's 2003
campaign



FORUM
European Agency for Safety and Health at Work
12
OSHA 1981-4246

Working with dangerous substances: The European policy challenge
Results of the closing event of the European Week for Safety and Health at Work 2003,
Bilbao, Spain, Monday 24 November 2003

Contents

- 1 Introduction
- 2 Key facts
- 3 Workshops — Presentations and conclusions:
3.1 Workshop 1: Successful substitution:
The EU's top priority risk reduction strategy
3.2 Workshop 2: Setting the safety message across communication of information about dangerous substances
3.3 Workshop 3: Strategies and policies
- 4 Colloquium: keynote speeches and round table discussions
- 5 Overall conclusions and perspectives
- 6 Good practice awards
- 7 Further information

1. Introduction

The European Week for Safety and Health at Work in 2003 focused on reducing the risks arising from the use of dangerous substances. It was launched in May 2003, and spread out across the European Union Member States and EU candidate and EFTA countries with national campaigns promoted under the slogan: 'Dangerous substances — handle with care!'

This was the first pan-European campaign to combat the occupational risks of dangerous substances, including chemical, biological agents and fibres. The closing event as the highlight of the campaign was jointly organised by the European Agency for Safety and Health at Work and the Italian Presidency of the European Union on 24 November in Bilbao.

The closing event of the European week 2003 started with three workshops dealing with successful examples of substitution, occupational safety and health communication, and strategies and policies to manage dangerous substances effectively. Consequent colloquium discussions tackled the situation with keynote speeches and three round table discussions on the topics considered at the workshops.

The forum publication is based on the speeches given at the workshops, the following communication of the keynote speakers and the round table discussions during the colloquium.

2. Key facts

- Global production of chemicals is now running at 400 million tonnes each year and there are more than 100 000 different substances registered for sale in the European Union⁽¹⁾.
- Dangerous substances are found in nearly all workplaces from farms and factories to households and hospitals. Twenty-eight million workers inhale fumes and vapours for at least a quarter of their working time (2), while between 6 and 9 million people are exposed to biological agents at work. Skin complaints, lung disorders and cancers are just some of the risks.
- Occupational skin diseases cost an estimated EUR 600 million per year and occupational asthma EUR 400 to 600 million per year alone.
- Ninety-six percent of all businesses in the chemical industry — some 36 000 firms in total in the EU area — are small to medium-sized with little or no toxicological expertise. The high percentage of small and medium-sized enterprises (SMEs) is the same as in other industries that use chemicals in their processes and work operators such as the construction sector or the metal industry.
- A UK study demonstrated that only 12 % of EU enterprises complied with their regulatory duties in risk prevention with regard to dangerous substances (3).

Objectives of the closing event

The closing event brought together an audience of representatives of social partners, leading European health and safety experts, labour inspection authorities, the European Parliament, the European Economic and Social Committee, the European Commission and European employers to exchange knowledge and experience on effective management of dangerous substances, and to discuss related policies and strategies. The main objective of the closing event was to promote the collaboration of these major players to address the risks arising from dangerous substances. Since 1989, the Agency has encouraged companies or organisations that have made outstanding and innovative contributions to the prevention of occupational safety and health risks. The annual 'good practice award' aims to demonstrate, by example, to all European employers and workers the benefits of following good safety and health practices to prevent risks at work. Each workplace is different. Therefore work practices and solutions to problems must be tailored to the particular situation by carrying out an assessment of the risks at the actual workplace concerned. Nevertheless, risks from dangerous substances are widely unique and solutions can be transferred across various sectors and sizes of enterprises, and Member States. This year, the awarded examples have successfully coordinated against the risks from dangerous substances, including both chemical and biological substances.

(1) Global figure for industry for a future REACH policy impact assessment, 2004, 400.
(2) Staff survey survey methodology includes cross-contamination for the measurement of long and working conditions, 2004.
(3) Report on 'dangerous substances in the workplace' — assessing the risks, European Agency for Safety and Health at Work, 2004.

EN <http://osha.europa.eu>

CLP awareness-raising, EN version available



EU-OSHA materials

- a poster and a leaflet
- Frequently asked questions on REACH
- Frequently asked questions on CLP
- update of the Web section on dangerous substances
- Napo films

Promotion via Website and Newsletter (40,000 subscribers)

Cooperation:

- Info sheets with ETUI-IndustriAll-ECHA
- DG EMPL guides on CLP and how to use information from labelling at workplaces (guide, powerpoint and notes, leaflet, pocket card)
- ACSH working party chemicals document on REACH and OSH
- Link to ECHA CLP information

Focal Point request:

- National information addressing the links between REACH and OSH/CLP and OSH
- will be made available to SLIC Chemex
- Campaigns/initiatives to promote CLP/REACH or explain the links
- Any labour inspection initiatives to access/use information from REACH

Promoting guidance on OSH, REACH and CLP

REACH 2013 - Call to action

Workers' reps in companies manufacturing, importing or using chemicals

The REACH Regulation requires the registration of all chemical substances that are manufactured or imported into the EU, Iceland, Norway or Liechtenstein in quantities of one tonne or more per year. If information on the hazardous properties of the chemical is unavailable, it should be generated and the safety data sheets should be updated.

Substances already on the market have to follow specific registration deadlines, based on their volumes and on their health and environmental hazards. New substances must always be registered before they are placed on the market.

IS YOUR EMPLOYER READY?

Companies manufacturing or importing chemical substances into the EU in quantities of 100 tonnes or more per year have to register them by the second REACH deadline of **31 May 2013**.

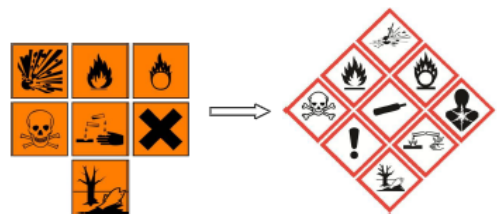


Remember the deadlines 

First registration 30 November 2010 ≥ 1000 tonnes/year	Second registration 31 May 2013 ≥ 100 tonnes/year	Third registration 31 May 2018 ≥ 1 tonne/year
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Occupational Safety and Health and the Chemical Classification, Labelling and Packaging Regulation

Guidance to Help Employers and Workers to Manage the Transition to the New System




December 2011

Social Europe

Guidance for employers on controlling risks from chemicals

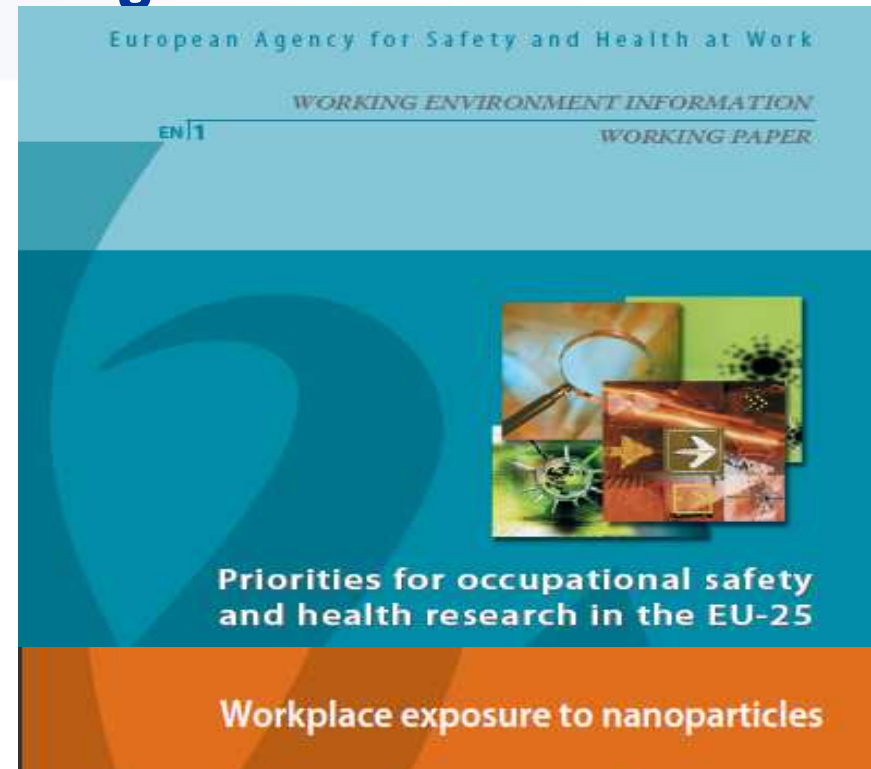
Interface between Chemicals Agents Directive and REACH at the workplace



Relevant publications related to dangerous substances

Downloadable from
www.osha.europa.eu

- Literature review and links collection on nanotechnologies
- Expert survey about chemical and biological emergings risks
- Member State survey on OELs for CMRs
- Literature review on noise & ototoxic substances
- Report on skin diseases and dermal exposure
- Input to FP 7 – Priorities for EU research
- Risk communication on nanotechnologies
- Large-scale foresight on OSH risks linked to green jobs (2009-2012), includes nanomaterials



84
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FACTS
European Agency for Safety and Health at Work

Expert forecast on emerging chemical risks related to occupational safety and health

There are an estimated 167,000 work-related fatalities in the EU27 every year. About 159,000 are attributable to work-related diseases, of which 74,000 may be linked to workplace exposure to hazardous substances (1).

What are emerging risks?

An 'emerging OSH risk' is any risk that is both **new** and **increasing**.

New means that:

- the risk was previously non-existent, or
- a long-standing issue is now consolidated to be a risk due to new scientific knowledge or public perceptions.

The risk is **increasing** if:

- the number of hazards leading to the risk is rising, or

By courtesy of INAIL, Spain





Healthy Workplaces Campaign 2012-13 “Working together for risk prevention”

Information materials available for you!



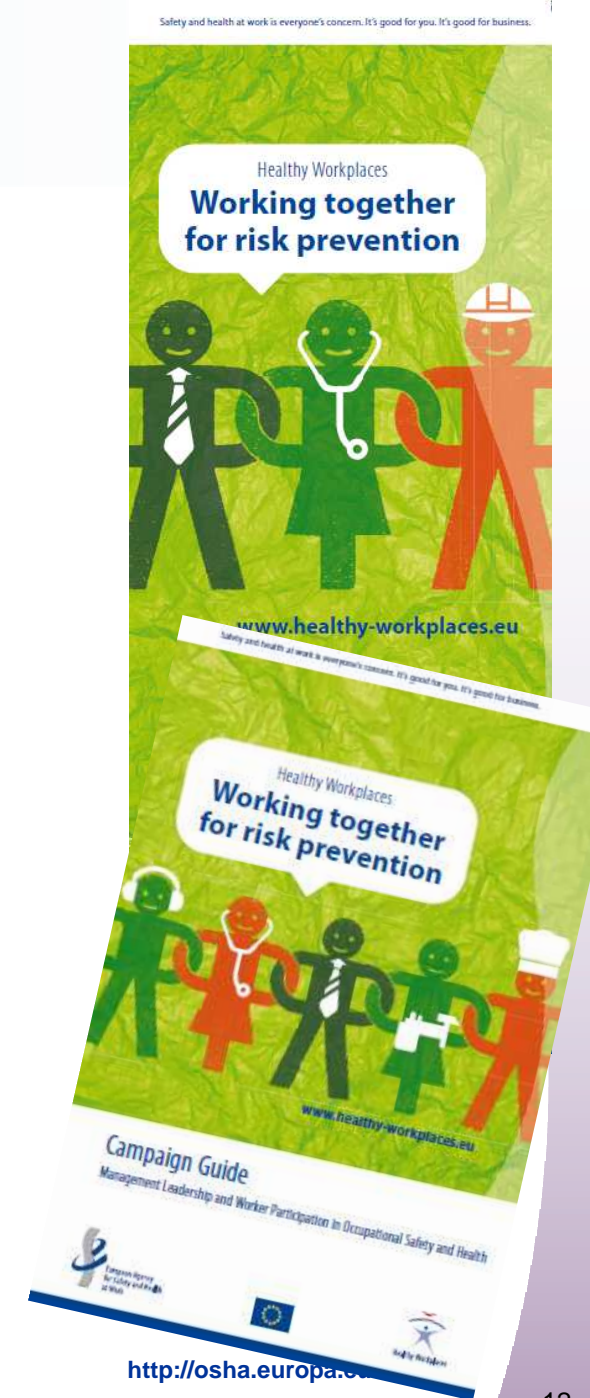
Strategic aims

- **Promotion of core message that workers and managers must work together**
- **Giving clear guidance to employers and workers on how to manage work-related risks**
- **Provision of practical guidance to promote a risk prevention culture**



Promotional material

- Logo, slogan, poster
- Campaign website www.healthy-workplaces.eu
- Campaign Guide
- Campaign leaflet
- Good Practice Award Flyer
- NAPO DVDs and other audiovisual material
- PowerPoint presentations, internet banner, email-signature
- I-Pad application
- Give-aways
 - e.g. USB-Sticks, T-shirts, key ring with coin for supermarket trolley



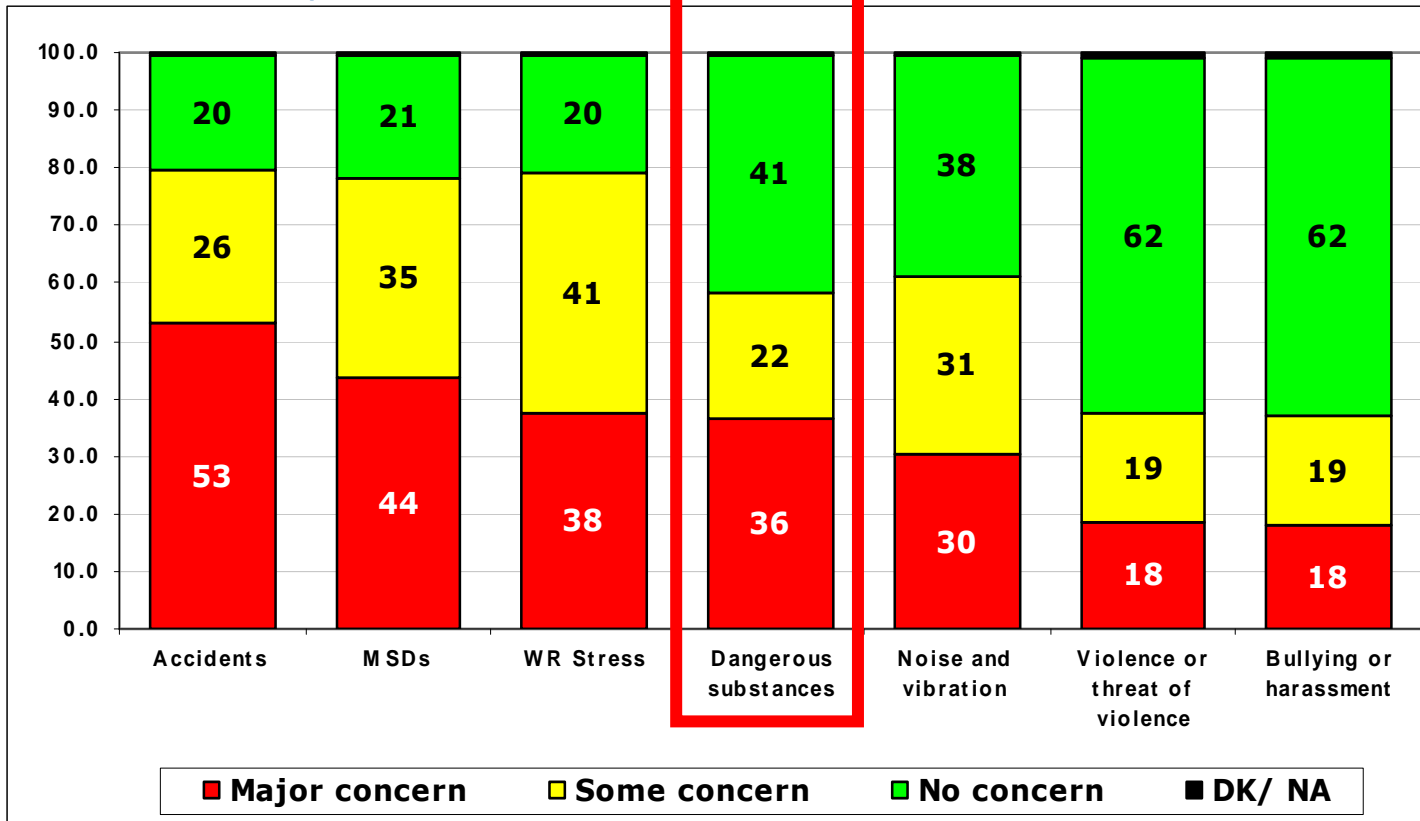
The enterprise perspective

"For each of the following issues, please tell me whether it is of major concern, some concern or no concern at all in your enterprise"

European Survey of Enterprises on New and Emerging Risks (ESENER) - Managing safety and health at work

http://osha.europa.eu/en/publications/reports/esener1_osh_management/

% establishments, EU27



European Agency for Safety and Health at Work
European Risk Observatory Report

European Survey of Enterprises on New and Emerging Risks

ESENER
European Survey of Enterprises on New and Emerging Risks

Summary

EU-OSHA's Europe-wide establishment survey aims to assist workplaces to deal more effectively with health and safety and to promote the health and well-being of employees. It provides policy makers with cross-nationally comparable information relevant for the design and implementation of new policies in this field.

Contents

- Background 1
- Risk management 3
- Psychosocial risks and their management 7
- Others and further 8
- Employee participation 13
- Survey methodology 15

Background

Through the Framework Directive 89/391/EEC and its individual directives, European Union legislation provides the Framework for workers in Europe to enjoy high levels of health and safety at the workplace. Representatives of those concerned differ from one country to another and their practical application varies, according to sector. Category of worker and size of enterprise. The increasing importance of emerging risks, such as stress, violence and harassment, poses a challenge to policy makers in their development of effective prevention measures.

In this context, EU-OSHA's European Survey of Enterprises on New and Emerging Risks (ESENER) asks both managers and workers health and safety representatives about the way health and safety risks are managed at their workplace, with a particular focus on psychosocial risks. It was released in 2009, following the Framework, in spring 2009 a total of 28,640 managers and 7,226 health and safety representatives were interviewed in the 11 countries covered: the EU27 as well as Croatia, Turkey, Switzerland and Norway.

Developed with the support of governments and social partners at European level, ESENER aims to assist workplaces across Europe to deal more effectively with health and safety and to provide policy makers with cross-nationally comparable information relevant for the design and implementation of new policies. As well as existing management practices, ESENER explores in detail how workers are involved in the management of safety and health at work, which is an important factor in the successful implementation of preventive measures at workplace level.

Key findings

As our society evolves under the influence of new technology and of shifting economic and social conditions, so our workplaces, work practices and production processes are constantly changing. These new work situations bring with them new and emerging risks and challenges, which in turn demand scientific, administrative and technical approaches that ensure high levels of safety and health at work.

The findings from ESENER suggest that European enterprises have a good record of preventive measures to address both general occupational safety and health (OSH) risks and psychosocial risks, but also one less formal just two actions, especially when it comes to psychosocial risks.

1. ESENER data set includes establishments with fewer than 10 workers, not those in lower agriculture, forestry and fishing (NACE A), nor services (NACE J) and non-manufacturing (NACE K).

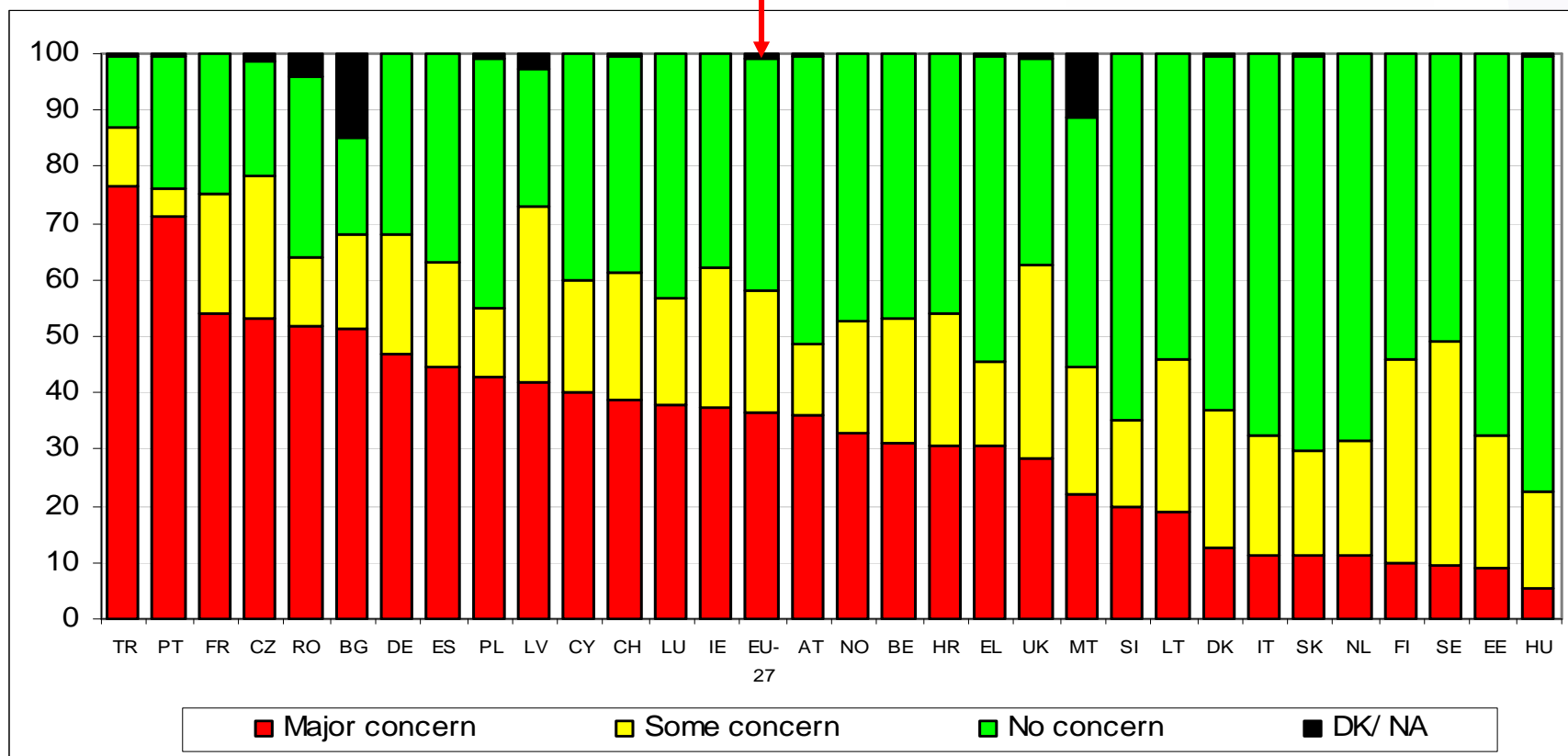
http://osha.europa.eu

Source: 2008 European Survey of New and Emerging Risks
European Agency for Safety and Health at Work

"Dangerous substances: please tell me whether it is of major concern or no concern at all in your country"



% establishments



Chemical emerging risks forecast: Poor management of chemical risks in SMEs

- 99.8% of enterprises are SMEs (EU-25, 2003)
- Employ 66% of EU private sector workforce
- 82% of reported occupational injuries in SMEs
- Fatal accident rate twice higher
- In France: CMRs risks assessed by 20% of micro enterprises, 38% of small companies, 57% of medium companies, and 67% of companies with > 200 workers.
- Lack of awareness/internal expertise/time/resources; poor contact with OSH bodies; poor worker consultation/training
- ☞ SMEs want to be told exactly how to control chemicals so as to meet all regulatory requirements
- ☞ Easy-to-use instruments to assess chemical risks exist – need to be shared and made available/known to SMEs
- ☞ Need to make SMEs' owners aware that OSH is worth it.

Emerging chemical risks identified in the EU-OSHA survey

BACKGROUND

- **Expert survey - Delphi studies**
- **Questionnaire for chemical and biological agents**
 - Risks-substances-products-procedures
 - Health effects-diseases
 - Supporting references
- **Part of an overall assessment incl. also**
 - Physical and mechanical
 - Human, social and organisational

RESULTS

Replies from 21 EU countries
(19 Member States + 2 EFTA)

- **Exposure to nanoparticles and ultrafine particles**
- **Sensitisers and allergens**
- **CMRs, and in particular lack of information on reprotoxicants**
- **Combined exposures**
- **Exposure in waste treatment activities**
- **Difficulties in managing chemical risks especially in SMEs and outsourced activities**

Chemical emerging risks: Five main groups identified

- 1. Nanomaterials, ultrafine particles (e.g. diesel exhaust, metal welding fumes, silica), fibres (e.g. man-made mineral fibres)**
- 2. Allergenic and sensitising substances, and in particular skin diseases and dermal exposure**
- 3. Carcinogenic, mutagenic and reprotoxic substances**
- 4. Sectors specifically highlighted**
 - Waste treatment, home nursing/caring, cleaning and wet work
- 5. Combined exposures**
 - Combined chemicals (even when each taken separately is not toxic)
 - Dangerous substances in SMEs and sub-contracted activities
 - Ototoxic substances and noise

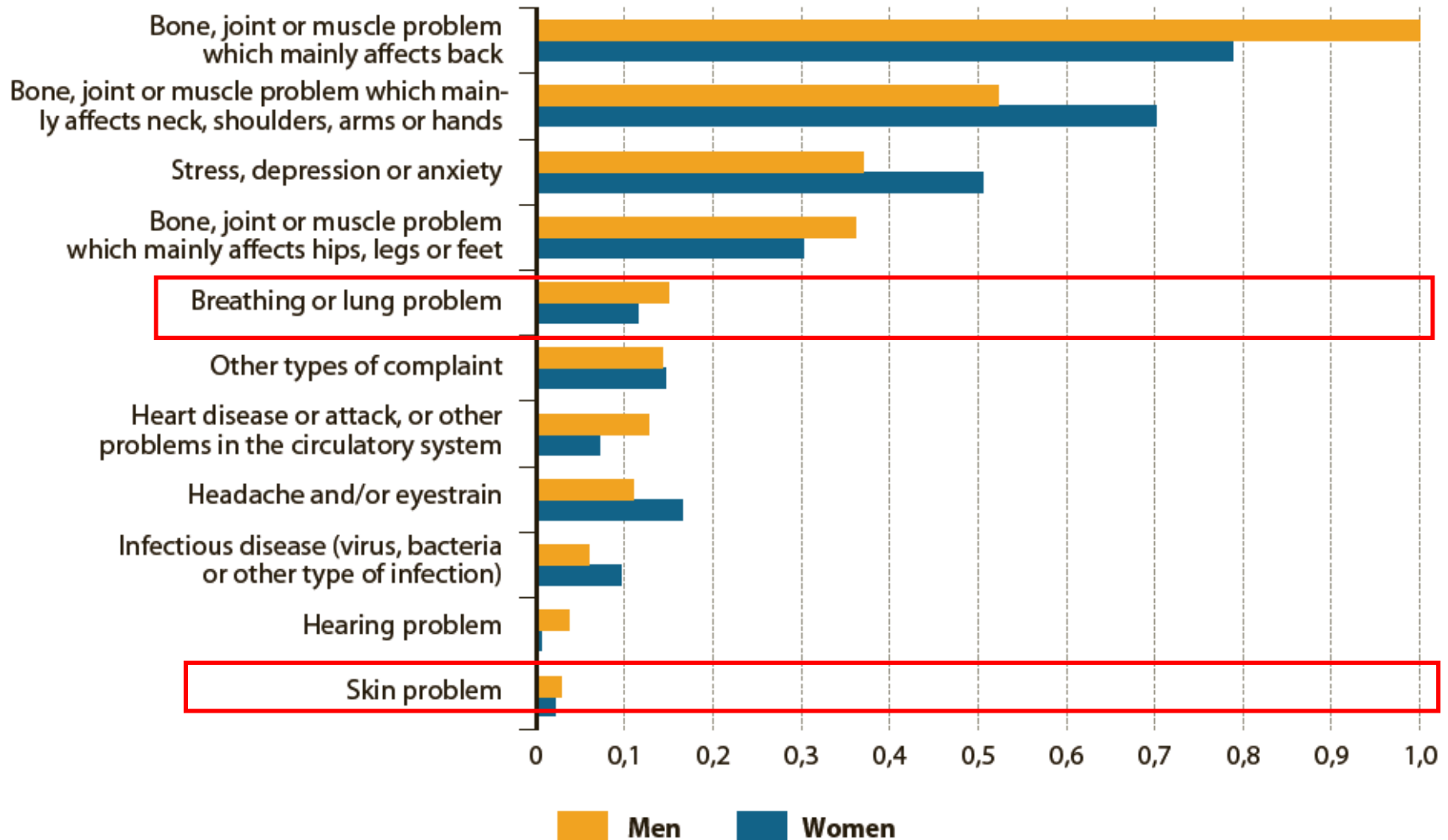
Occupational exposure to chemicals in the EU

- **Still high exposures of workers (ESWC 2010):**
 - More workers handled infectious materials (11% vs. 9% in 2005)
 - 15% either breathe in smoke, fumes, or dust, or handle dangerous chemicals –, the same proportion as 10 years before.
 - nearly 1/3 exposed to loud noise, heavy work (e.g. 33% carrying heavy loads), ¼ exposed to vibrations, unchanged since 2000.
 - Time pressure, tight deadlines, pace increasing
 - Unfavourable working conditions tend to cluster disproportionately in some groups. Therefore policy solutions should be multidimensional
- **Occupational diseases in EU (EODS harmonised figures):**
 - about 50 % related to dangerous substances
 - skin diseases are decreasing, but respiratory diseases still recognised for 14-15% of workers
 - 5% are occupational cancers
- **Big differences between genders in the distribution of occupational diseases, incl. the ones related to dangerous substances**

The worker perspective – health problems

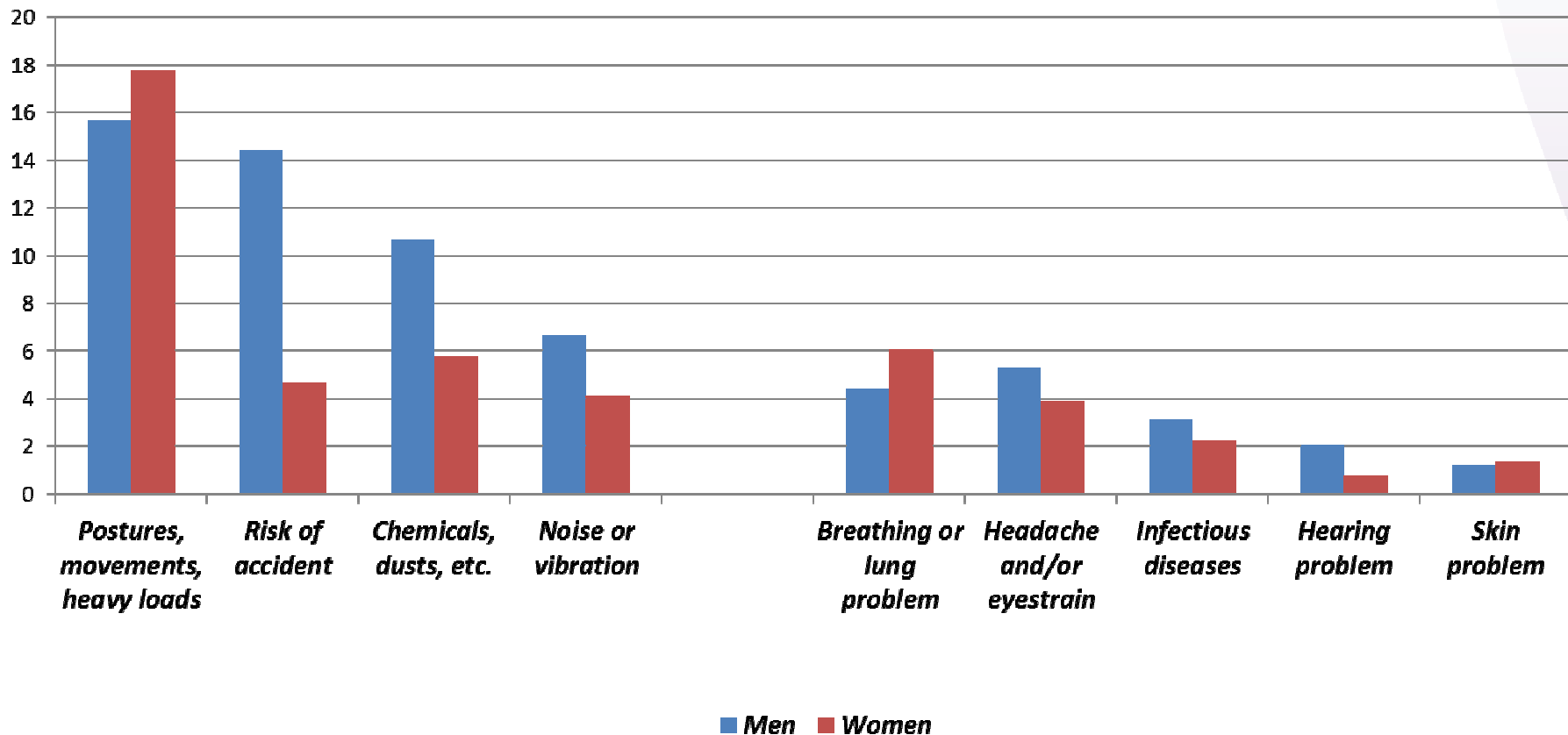
(Eurostat -LFS ad hoc module 2007)

Relative occurrence of the type of work-related health problem indicated as most serious health problem in the past 12 months in employed persons in the EU27



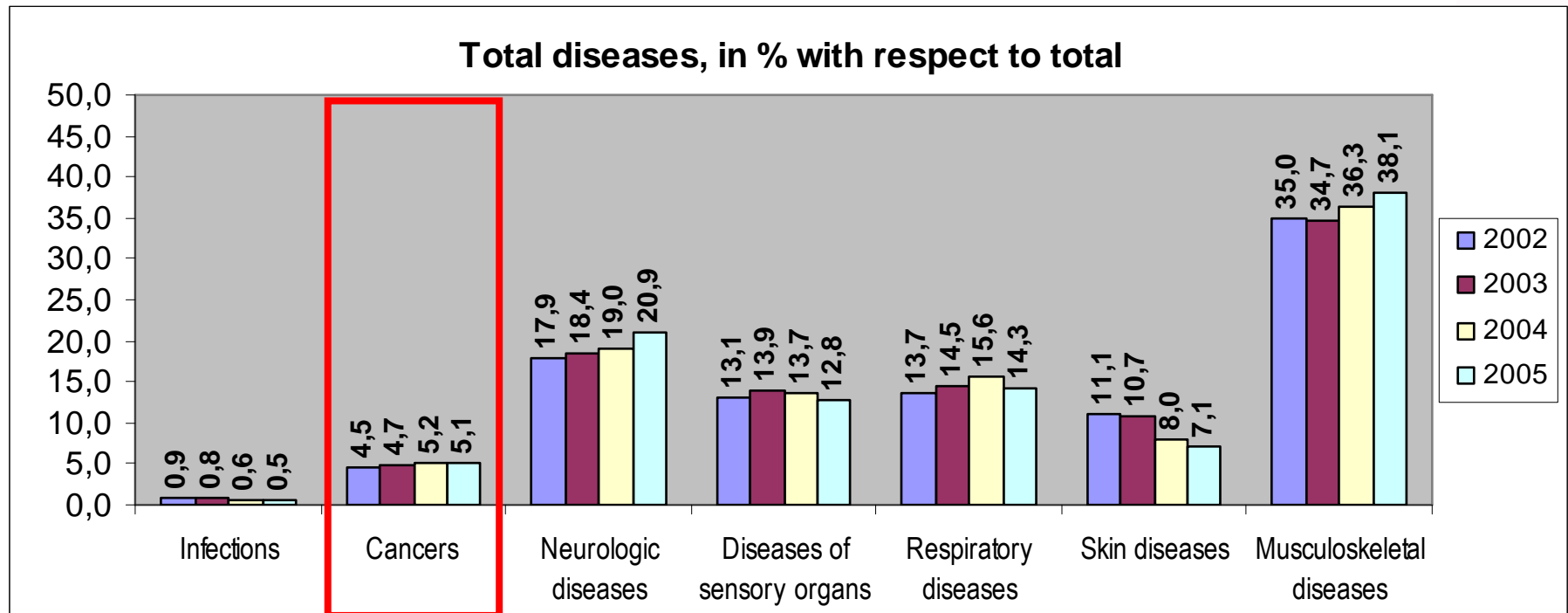
The Worker perspective:

Main factor adversely affecting physical health (in %) and work-related health problems experienced in the past 12 months (LFS ad hoc module 2007)



Occupational diseases in Europe:

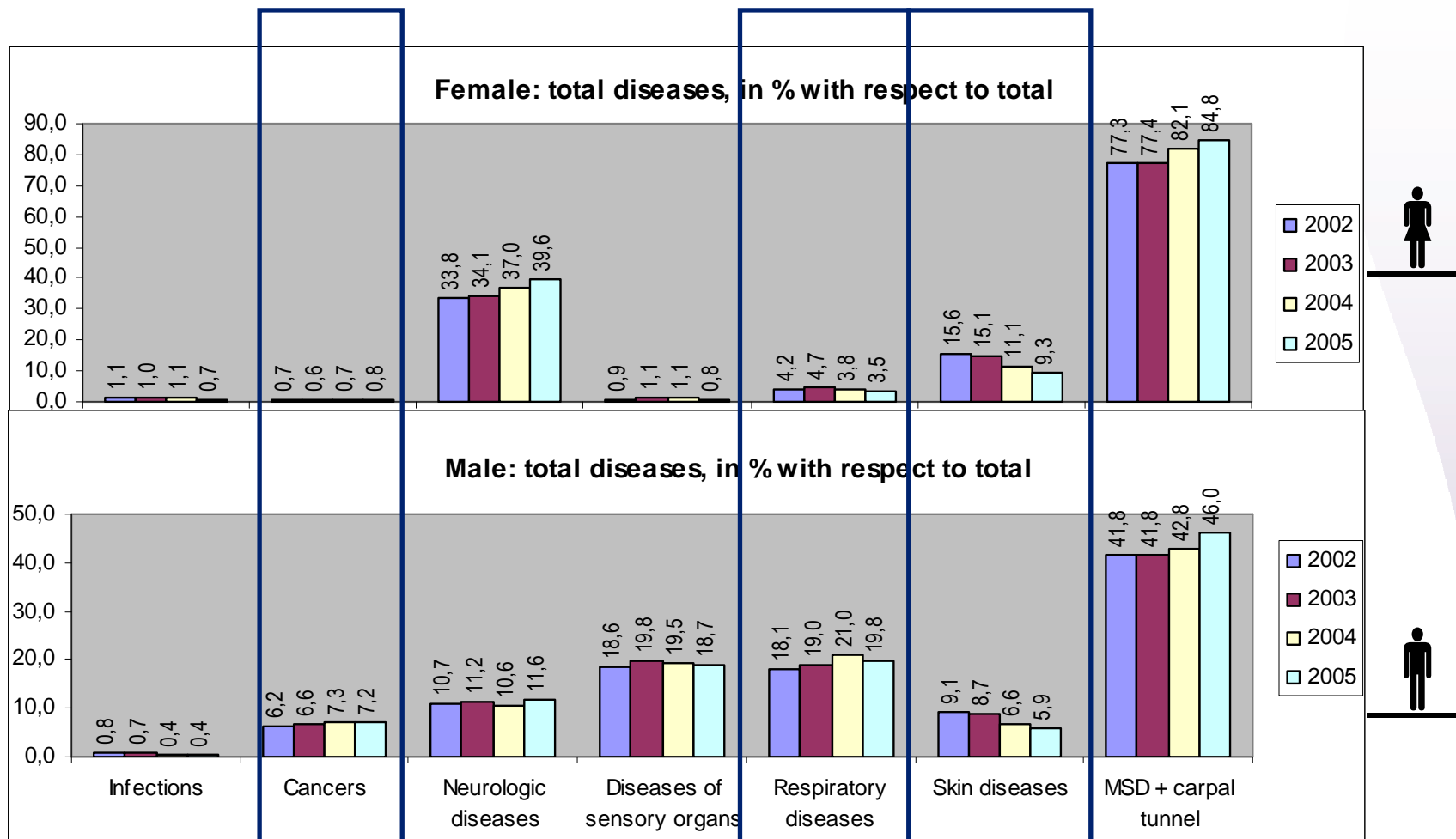
About 5% annually recognised occupational cancer



(% of total ODs , EODS 2002-2005. EU15, except Germany, Greece and Ireland)



Occupational diseases – big gender differences, emerging diseases and those relevant to women not all reflected (e.g. cardiovascular, depression, reproductive)

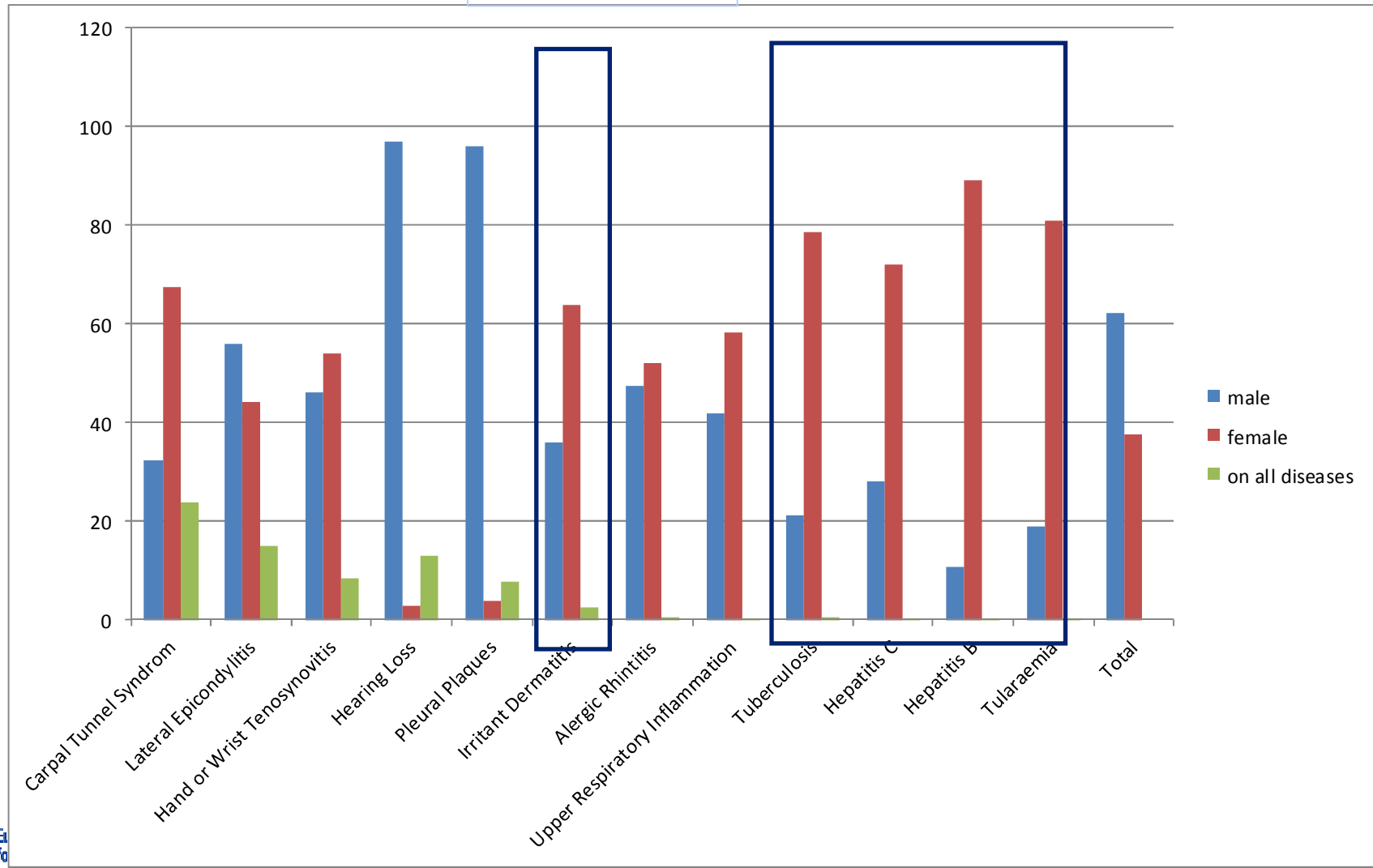


(% of total ODs , EODS 2002-2005. EU15, except Germany, Greece and Ireland)

The 5 most frequent diseases and diseases which are more frequent for women 2007 (EODS-data)

Skin diseases

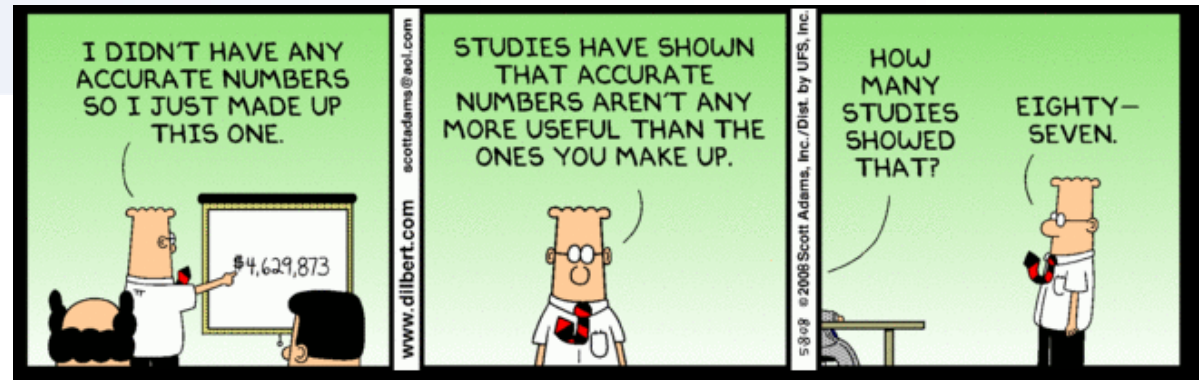
Infectious diseases



Occupational diseases - Which sectors and occupations?

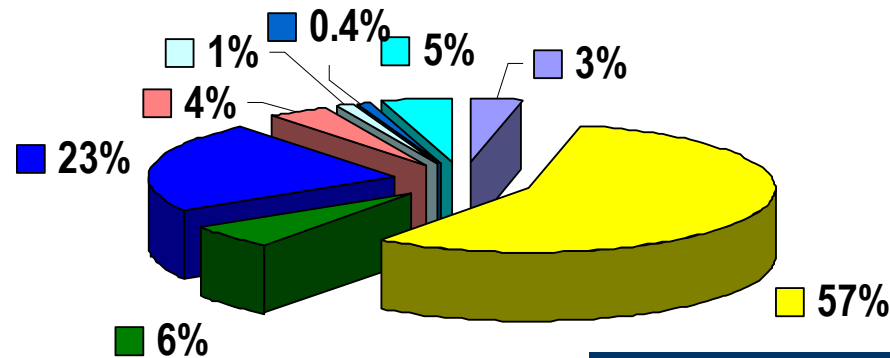
- **More than 80% of the occupational diseases (EODS) in:**
 - workers in craft and related trades (41%),
 - plant, machine operators, assemblers (21%), and
 - workers with elementary occupations (19%).
- **highest proportion in the sectors**
 - ↓ manufacturing, (38%),
 - ↑ construction (13%),
 - ↑ wholesale retail trade, repair (7%), and
 - ↑ health and social work' (5%).
- **for men: 'manufacturing' and 'construction',**
- **for women: 'wholesale retail trade, repair', & 'health and social work'.**

Estimation of work-related Fatalities – EU 27



- 205 million people in employment
- 167,000 fatalities attributed to work-related accidents and diseases in EU, and within that:
- 159,000 fatalities attributed to work-related diseases
- 7,460 fatalities caused by accidents at work
- 74,000 fatalities attributed to hazardous substances at work (asbestos included)
- 95,581 work-related cancer deaths annually (9.6% of all cancer deaths estimated to be attributable to work) (2002)

Deaths attributed to work, 167 000/year



Asbestos 31 000

- Communicable diseases
- Respiratory Diseases
- Mental Disorders
- Genitourinary system
- Cancers
- Circulatory diseases
- Digestive systems diseases
- Accidents and violence

Sources: Hämäläinen P, Takala J, Saarela KL; TUT, ILO, EU-OSHA

ILO Estimates Country	Total employment	Fatal accidents reported (ILO 2003)	Fatal accidents, estimate ILO 2003	Accident causing 3+ days' absence Estimate 2003	ILO Estimate Work-related diseases	ILO Estimate Work-related mortality	Deaths caused by dangerous substances
Austria	3,798,400	103	227	213,419	2,820	3,047	1,318
Belgium	4,070,400		84	78,974	2,893	2,977	1,353
Bulgaria	2,834,000	114	288	270,674	2,006	2,294	898
Cyprus	327,100	8	10	9,251	242	252	113
Czech Republic	4,733,000	199	245	230,128	3,648	3,893	1,706
Denmark	2,692,500		51	47,949	2,026	2,077	947
Estonia	594,300	31	38	35,849	683	721	309
Finland	2,385,000	43	49	46,068	1,862	1,911	871
France	24,630,900	661	782	735,214	19,279	20,061	9,014
Germany	36,172,000		901	847,094	28,568	29,469	13,358
Greece	4,103,900		68	63,932	3,203	3,271	1,498
Hungary	3,921,900	133	164	153,804	4,507	4,670	1,950
Ireland	1,836,000	65	80	75,167	1,333	1,413	623
Italy	22,133,000	916	991	931,709	16,987	17,978	7,943
Latvia	1,006,900	41	50	47,413	1,157	1,207	527
Lithuania	1,438,000	117	144	135,301	1,652	1,796	769
Luxembourg	293,400	16	7	6,581	139	146	65
Malta	147,042	12	15	13,877	113	128	53
Netherlands	7,935,000		104	97,778	5,949	6,053	2,782
Poland	13,617,000	515	633	595,557	10,357	10,990	4,637
Portugal	5,127,700		346	325,299	3,888	4,234	1,818
Romania	9,222,500	418	1,016	955,493	6,059	7,075	2,712
Slovakia	2,164,600	94	116	108,704	1,607	1,722	719
Slovenia	896,000	40	49	46,257	681	730	318
Spain	17,295,900	722	722	678,803	13,887	14,609	6,493
Sweden	4,234,000		56	52,650	3,163	3,219	1,479
United Kingdom	27,820,800	174	224	210,598	20,778	21,002	9,716
Total	205,431,242	4,422	7,460	7,013,545	159,485	166,945	73,989

Sources: Hämäläinen P, Takala J, Saarela KL; TUT, ILO, EU-OSHA

How to measure occupational burden

- The following metrics of risk or burden have been used in these studies: relative risk (RR), attributable fraction (AF) of disease due to specific exposure, incidence of disease due to occupational exposures, life years lost due to occupational factors, disability-adjusted life years (DALY) and costs of occupational diseases and accidents.
- The DALY concept has been favoured in recent years, because it takes into account not only the lost life years but also life with disability/disease.
- However, the use of DALY has also been criticised. DALYs are poor indicators of effectiveness of public health interventions. DALYs have also been claimed to regard life of disabled people as less valuable.

Work-relatedness of common diseases

Disease	Attribution %, Overall: 6.7%	Reference: ILO, Decent Work-SafeWork, 2005
Asthma, adult males	30	Karjalainen et al. 2001
Lung cancer	25-30	Axelsson 2001
Cardiovascular disorders		
CHD	5-30	Leigh 1997
Stroke	5	Leigh 1997
Musculoskeletal disorders		
Upper extremities	15-40	EU OSHA
Low back	37	WHO 2002, Punnet et al. 2005
Mental health disorders	5-10	e.g. Toppinen et al. 1997
Diabetes II	+	
Breast cancer	+	

Work-related attributable fractions of various diseases. These fractions (%) are largely based on industrial country conditions while their application was adapted to selected developing countries

Causes	Attributable fraction	Attributable fraction, men	Attributable fraction, women
Communicable diseases	8.8	4.8	32.5
Malignant neoplasms	8.4	13.8	2.2
Respiratory systems diseases	4.1	6.8	1.1
Circulatory systems diseases	12.4	14.4	6.7
Neuro-psychiatric conditions	3.4	6.6	1.8
Digestive systems diseases	2.1	2.3	1.5
Diseases of the genitourinary system	1.3	3.0	0.4

Overall work-relatedness of mortality, ILO:	6.7%
GDP loss, Australian method	5.9%
Global Burden of disease and injury in Europe, WHO	5.0%

Coverage of work-related diseases in estimates

- Most studies reviewed dealing with high prevalence diseases in Europe and globally, such as cancers and pulmonary diseases (asthma and COPD).
- Burden of other diseases with high prevalence in occupational settings like cardiovascular diseases and MSDs not adequately estimated.
- Noise-induced hearing loss, although among most common diseases, only estimated in a small number of studies. The same is true for skin diseases.
- Unexpectedly large burden for diseases of the blood and blood forming organs and certain disorders involving the immune mechanism, attributable to occupation should be seen as challenges for future research (Tuchsen et al., 2004).
- Concern should be given to the burden of reproductive disorders
- A bias towards traditional (male jobs) for which there is more (exposure and epidemiological) information available – which leaves younger people and women out of the overall picture

Vulnerable groups - Gender issues



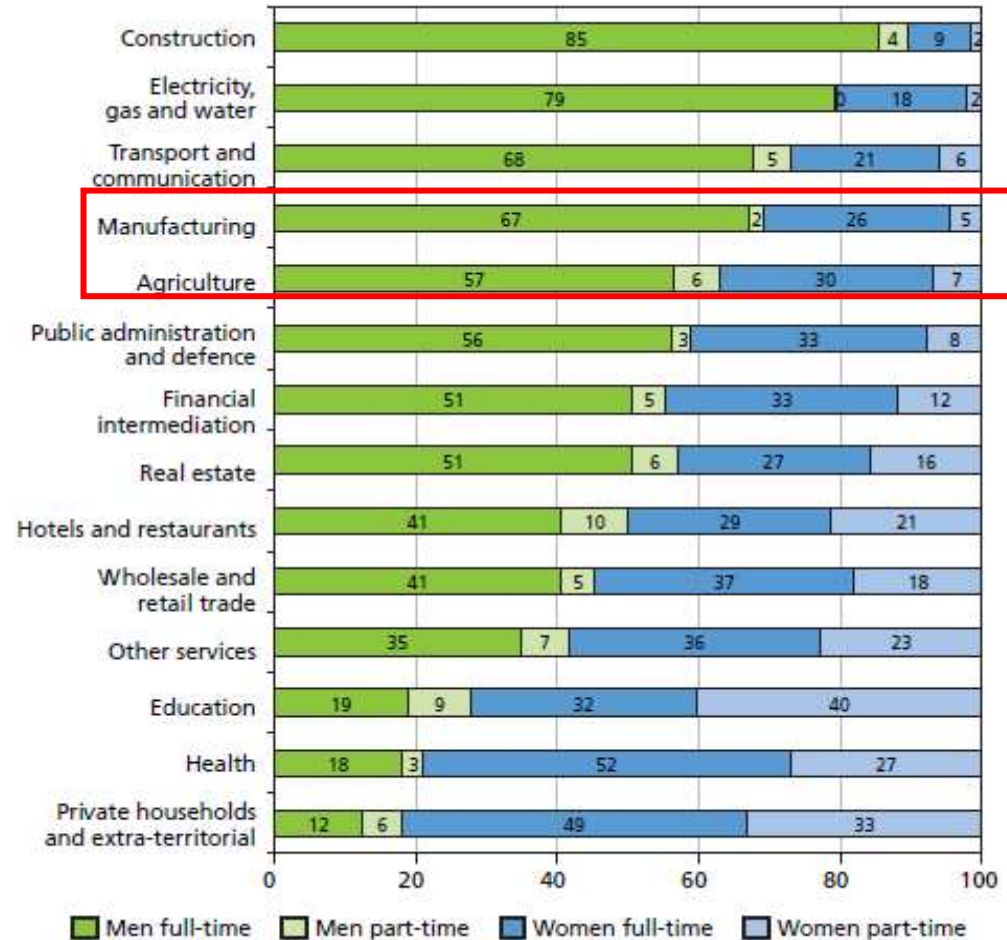
- Exposures underestimated and awareness low
- Men and women work in different sectors, and within one sector, in different jobs
- Risk assessment of exposure to dangerous substances needs to be targeted to women
- Occupational diseases reflect male industry jobs
- Personal protective equipment to be designed for women
- Identify combined exposures typical for female jobs
- How to ensure OSH for female workers in multiple jobs (e.g. cleaning, home care) and informal work

Female employment - segregation

Women concentrated in fewer sectors than men

- Women in services, men mainly in construction, utilities, transport and manufacturing
- Much more part-time for women
- Only one in five men (22%) and one quarter of women are employed in mixed-sex occupations.
- But: high proportion of women in agriculture and manufacturing

By sector, EU-27, %



Source: Eurofound

<http://osha.europa.eu>

Women's exposure to dangerous substances remains largely unexplored

Substance	Source	Circumstances	Occupation, task
Pesticides and storage chemicals	<ul style="list-style-type: none"> • Foodstuff • Storage • Plants • Animals 	<ul style="list-style-type: none"> • Agriculture and farming • Horticulture • Workers who handle goods from containers and in storage areas 	<ul style="list-style-type: none"> • Farmers, and agricultural workers • Gardeners • Retail • Cleaners
Exhaust fumes Diesel exhaust and particles	Exhaust from combustion engine, incl. diesel and other engines on trucks, ships, trains and buses	<ul style="list-style-type: none"> • Unintentional contact when loading and unloading • Maintenance • Refuelling • Parking areas of vehicles 	<ul style="list-style-type: none"> • Maintenance workers • Retail workers • Drivers, delivery and cargo workers • Workers on mission • Transport workers • Emergency workers



EU-OSHA publications highlighting chemical and biological risks to women

Combined exposures!

- **Noise in figures – OSH in figures report**
– highlights exposures in food and textile manufacturing, education, health care and other service professions
- **Combined exposures to noise and ototoxic substances – literature review**
- **Transport sector – OSH in figures report** – highlights overlooked exposures to women in general, in particular women in service tasks (restauration, cleaning)
- **Factsheets on respiratory and skin sensitisers**, highlight exposures to biological agents in service sectors, health care, etc.
- **Reports on cleaners** – highlight exposures to precarious workers and lack of training and information
- **Report on HORECA and effects on Dangerous substances in HORECA** – highlights multiple exposures and lack of information
- **Legionella and legionnaires' disease: European policies and good practices, Report and Factsheet 100**

Combined exposures – Noise and ototoxic substances

- Avicenna, first to describe the harmful effect of a chemical substance on ear function almost 1,000 years ago, mercury vapor to combat head lice
- **Sectors with high noise often also sectors with high exposures to ototoxicants**
- **Ototoxicants:**
 - **Pharmaceuticals:** antibiotics, cytostatic drugs
 - **Solvents** (Toluene, ethylbenzene, n-propylbenzene, Styrene and methylstyrenes, Trichloroethylene, p-Xylene, n-Hexane, Carbon disulfide)
 - **Asphyxiants** (carbon monoxide)
 - **Nitriles** (acrylonitrile; 3,3'-Iminodipropionitrile, 3-Butenenitrile, cis-2-Pentenenitrile, cis-Crotononitrile).
 - **Metals and metal compounds** (Pb & compounds, Hg (methyl mercury chloride, mercuric sulfide), Sn-organic compounds, Ge (germanium dioxide)).
 - **Suspected:** Cd (cadmium chloride), As, Bromates (sodium and potassium bromate), tobacco smoke, halogenated hydrocarbons (PCBs, Tetrabromobisphenol A, Hexabromocyclododecane, Hexachlorobenzene)
- **Policy measures – an example:**
 - FR, INRS proposed lowering the OEL for styrene 50 to 30 ppm in addition to the compulsory use of hearing protectors for 8-hour noise exposure to 80 dB(A)
 - Other measures: substitution, public risk communication, monitoring and assessment tools

Combined risks - a major issue for women at work

Risk factors, conditions	Outcomes
<ul style="list-style-type: none">• Exposure to biological & chemical agents• Working in service sectors• Working at clients premises• Jobs not covered by OSH legislation• Monotonous and repetitive work• Multiple roles• Lack of information and training• Low control, autonomy and support• Prolonged standing and sitting• Static postures• Moving loads repetitively and moving people• Client and patient contact	<ul style="list-style-type: none">• Infectious diseases• Skin disorders, asthma• Stress and mental health problems• Different accidents: slips, trips and falls, violence-related, needlestick injuries, cuts and sprains• Fatigue and cognitive disorders• Musculoskeletal disorders

Transport

Dangerous substances

Substance	Source	Workers
<ul style="list-style-type: none">•Solvents, VOCs,•Exhaust fumes, Diesel exhaust and particles•Road and ambient dust•Disinfectants•Textile fibres (e.g. cotton)•Asbestos•Fumigation and storage chemicals	<ul style="list-style-type: none">•Dangerous goods•Cargo loads and foodstuff on long-distance transport•Cleaning products•Insulation materials•Brakes (buses, trucks)•Waste•Fuels	<ul style="list-style-type: none">•Cleaners, service and maintenance workers•Catering staff•Cargo workers•Drivers, delivery and attendants•Workers who handle container goods
Biological and infectious agents	<ul style="list-style-type: none">•Animals•Foodstuff, perishable goods, raw materials•Insects, other vectors•Contact with passengers•Confinement, long-distance travelling	<ul style="list-style-type: none">•Contact with foodstuff, infected travellers and goods•When travelling abroad•Contact with animals



Louisville-based Bella Energy worked with EMC Engineers on this photovoltaic installation for the Antonito School District in the San Luis Valley of Colorado.

Hazard Classification of Chemicals Typically Used in PV Module Manufacturing

Material	DOT Hazard Classification*
Arsenic	Poison
Arsine	Highly Toxic Gas
Cadmium	Poison
Diborane	Flammable Gas
Diethyl Silane	Flammable Liquid
Diethyl Zinc	Pyrophoric Liquid
Dimethyl Zinc	Spontaneously Combustible
Hydrochloric Acid	Corrosive Material
Hydrofluoric Acid	Corrosive Material
Hydrogen	Flammable Gas
Hydrogen Selenide	Highly Toxic Gas
Hydrogen Sulfide	Flammable Gas
Indium	Not Regulated
Methane	Flammable Gas
Molybdenum Hexafluoride	Toxic and Corrosive Gas
Oxygen	Gaseous Oxidizer
Phosphine	Highly Toxic and Pyrophoric Gas
Phosphorus Oxychloride	Corrosive Material
Selenium	Poison
Silane	Pyrophoric Gas
Silicon Tetrafluoride	Toxic and Corrosive Gas
Tellurium	Not Regulated
Tertiarybutyl Arsine	Pyrophoric and Highly Toxic Liquid
Tertiarybutyl Phosphine	Pyrophoric Liquid
Tetramethyl Tin	Pyrophoric and Highly Toxic Liquid
Trimethyl Indium	Pyrophoric Solid
Trimethyl Aluminum	Pyrophoric Liquid
Trimethyl Gallium	Pyrophoric Liquid
Tungsten Hexafluoride	Toxic and Corrosive Gas

*DOT, Department of Transportation

- **“Construction” hazards combined with electrical hazards**
- **Greatest risks: manufacturing**
 - Involves large quantities of chemicals - many are highly toxic
 - solvents and acids for cleaning the semiconductor parts
 - gases for depositing the ultra-thin layers of material
 - metals, depending on the type of PV module being made
- **Leaching hazard, including at the waste treatment stage**

Dermal exposure and skin diseases

Identification and control of risk factors very important

- Skin diseases are among the most often recognized occupational disease (EODS).
- Chemicals responsible for 80-90% of skin disorders – incl. soaps, detergents, solvents, fragrances
- Sector: 1/3 of all cases ‘manufacturing’, followed by ‘construction’ (14 %), & ‘health & social work’ (9.5 %).
- Occupation:
 - crafts and related trades workers, followed by the elementary occupations, service workers, shop and market sales workers, and plant and machine operators and assemblers.
- No harmonised approach to disease recognition and compensation
- Contact dermatitis the most common, also chemical burns, contact urticaria, photodermatitis, contact leukoderma, infectious dermatitis, skin cancer
- Not only hands – other skin parts exposed to airborne substances or touched with dirty hands
- No validated method to assess dermal exposure; no « dermal OELs » available
- Lack of data on health effects and dose-effect relationship
- Combined exposures (incl. humidity factor), repeated exposure, exposure to diluted preparations, etc. to be considered
- Gloves not (always) a solution: occlusive, wet atmosphere inside

What is not considered – work-related diseases

- The most popular health outcomes in studies have been cancer and accidental injuries. The determinants of those outcomes are mainly mechanical factors and chemical exposures at work.
- Health problems:
 - Neurologic disorders linked to chemicals exposure
 - Tinnitus, voice disorders
 - Reproductive disorders linked to work organisation and/or chemical exposures
 - Cardiotoxicity
 - Health problems linked to combined exposure
 - Asbestos and cardiovascular diseases
 - ...
- Factors underassessed:
 - Work organisational: Issues linked to lack of control, disruption, shift work, night work
 - Multiple exposures

Carcinogens and work-related cancer - workshop

- **Background:**
 - Major cause of death/disease in workers;
 - Legislation in place to address carcinogenic risk
- **Date:** 3 – 4 September 2012, Berlin
- **3 topics**
 - **Monitoring work-related cancer**
 - **Vulnerable workers, work ability, rehabilitation and back-to-work**
 - **Example(s) of prevention initiatives and campaigns**
- **Aim**
 - Scope further EU-OSHA activities
- **Output:** Workshop and online summary
- **To consider:**
 - Integraton with other policy areas, such as public health
 - Build on previous EU-OSHA research (emerging risks, vulnerable groups, gender, OELs CMR review, occupational burden of disease)

Work-related cancer – Workshop 3 – 4 September 2012, Berlin - preliminary conclusions

- **Monitoring:**
 - Take different approach (*occupation* → *disease* rather than *agent* → *disease*)
 - Use job-exposure matrices
 - Use cancer registers and other sources of data
- **Rethink concept of vulnerable workers:**
 - Young workers (e.g. in maintenance)
 - Migrant workers in low-skilled manual jobs – lack of training and access to preventive services
 - Women in service professions
 - Older workers
- **Rethink major causes and how to assess the burden of disease:**
 - NOCCA study looked at socio-economic determinants and occupations via cancer incidence
 - Combined exposures to several factors
 - Shift work and cancer

Work-related cancer - projects

- SUMER survey (France): data collected by occupational health doctors aimed at mapping workers' exposure to chemical, physical and biological agents
- GISCOP93 survey (France): data collected by researchers aimed at recreating the work history of patients diagnosed with cancer in 3 hospitals of Paris region & improving recognition and compensation
- OCCAM project (Italy): Occupational Cancer Monitoring by automatic linkage of cancer cases (and controls) identified in Hospitals with the information available in the Social Security archives (= name of employing firm and sector in which workers are employed for each year of employment)
- CAREX: assessing number of workers exposed using job-exposure databases and employment figures

Changes in the world of work

Issues to be addressed

- Part-time work and temporary work
- Trend to multiple jobs, how to assess exposures and protect workers
- Move from industry to services
 - Statistics insufficient (e.g. restricted coverage of sectors and diseases)
- Increasing number of female workers & insufficient knowledge
- Increasing number of migrant workers & insufficient knowledge
- Subcontracting
- Informal work. e.g. in home care, cleaning, agriculture
- Move away from the one worker/one workplace concept, how to work at client's premises
- Unsolved problems regarding combined exposures, including with physical risks, and dermal exposure
- Impact of new technologies – nano, green jobs, etc...

Proposals :

- an approach by sectors and occupations
- monitoring, information, prevention and awareness raising targeted at different groups – diversity approach
- an assessment of combined risks
- how to reach workers and employers in maintenance jobs
- how to reach workers and employers in outsourced work
- how to translate information to the workplace level
- share information from monitoring and practice
- exchange of information on exposures to occupational carcinogens
- unfavourable working conditions tend to cluster disproportionately in some groups. Therefore policy solutions should be multidimensional
- include diversity considerations into the design and implementation of monitoring and estimation methods
- explore the differences between Member states policies and identify what the success factors are for an effective integration of these issues



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