

## WORKSHOP ON THE OCCUPATIONAL BURDEN OF DISEASE

10 October 2014, Brussels, Belgium

The workshop was convened in Brussels on 10 October 2014, and was organised by the European Agency for Safety and Health at Work (EU-OSHA) to support a constructive dialogue between stakeholders and to stimulate debate on the burden of disease linked to work. The research on burden of disease is part of a large-scale activity that the Agency is undertaking to address work-related diseases. **EU-OSHA's intention is for its activities to be complementary to those of the European Commission and other stakeholder organisations. The workshop aims to contribute to the scoping of EU-OSHA work on occupational diseases in the context of its multiannual strategic programme and the related large-scale occupational safety and health (OSH) overview planned for 2015, 2016 and 2017; the intention is that this overview will have a strong focus on prevention.**

30 participants from 17 Member States, Iceland and Turkey attended (see attendance list and speaker's biography as separate attachments).

The audience was made up of a broad mix of experts nominated by EU-OSHA's focal points — mainly occupational physicians and occupational hygienists — and experts from the International Labour Organisation (ILO), the European Commission's Scientific Committee on Occupational Exposure Limits (SCOEL), the Senior Labour Inspectors Committee (SLIC) and the European Commission. Expert presentations were complemented by opinions from representatives of the European social partner organisations the European Trade Union Confederation (ETUC) and BusinessEurope. A wider perspective on OSH research and action was gained through presentations from the international bodies active in the prevention of work-related disease and from a representative of a Canadian OSH research organisation.

The representative of the World Health Organisation (WHO) had to cancel his attendance because of the acute Ebola crisis; however, a written version of his presentation and the accompanying documentation were made available to participants.

### 1 Welcome and introduction to the workshop

The first half-day of the seminar was kicked off with a presentation of EU-OSHA's activities. The Agency's work on work-related diseases aims to contribute to providing an evidence base for prevention and better overview information on the extent of the occupational burden of disease. EU-OSHA's tasks and network structure were described, based on its multiannual strategy <sup>(1)</sup> and six main areas of work, as were the links to current EU policy developments. The EU Strategic Framework on Safety and Health at Work 2014–2020' <sup>(2)</sup> identifies three major OSH challenges, of which one is to improve the prevention of work-related diseases by tackling new and emerging risks without neglecting existing risks.

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(1) EU-OSHA, Multi-annual Strategic Programme 2014–2020. Available at: <https://osha.europa.eu/en/publications/corporate/eu-osha-multi-annual-strategic-programme-2014-2020/view>

(2) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on an EU Strategic Framework on Health and Safety at Work 2014–2020, COM(2014) 332 final. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0332>

## 2 EU-OSHA activities on work-related diseases

- Research results on the burden of disease from a review commissioned in 2010 were presented by Elke Schneider from EU-OSHA. They included an assessment of missing information, an examination of the link to costs assessment and an evaluation of whether or not burden of disease studies had been targeted at prevention and priority setting for action.
- A large proportion of the studies reviewed dealt with high-prevalence diseases in Europe and globally, such as cancers and pulmonary diseases (asthma and chronic obstructive pulmonary disease (COPD)). The most studied health outcomes were cancer and accidental injuries. The reason may be that the determinants of those outcomes are mainly mechanical factors and chemical exposures at work.
- The burdens of other diseases with high prevalence in occupational settings, such as cardiovascular diseases and musculoskeletal disorders (MSDs), were not adequately estimated. Noise-induced hearing loss, although the fourth most common occupational disease (Eurostat, 2004), was only estimated in a small number of studies. The same is true for skin diseases.
- Estimates of mental and neurological diseases' burdens were scarce in global and national studies. However, they are very relevant: mental disorders accounted for 4 % of work-related mortality in a Finnish study (3) and constitute an increasing problem in industrial countries, with strain and shift work reported as causes (4). Post-traumatic disorders are emerging risks in some professions, such as the police, transport and home care, and there is an ongoing discussion about whether to include them in occupational diseases lists.
- If a good estimate of recent burden already exists, future burden can be assessed based on exposure trends and knowledge on the latency period of the disease or the relationship between exposure and outcome. However, such information is not usually readily available. Epidemiology-based exposure–response data are available for, for example, silica dust (silicosis), radon radiation (lung cancer) and asbestos (mesothelioma, lung cancer), but are lacking for many emerging issues. This may be why half of the prospective studies analysed focused on mesothelioma.
- Exposures underassessed in the studies include:
  - work organisational factors, such as repetitive work, lack of control, disruption, shift work, night work;
  - emerging ergonomic risk factors, such as prolonged sitting and standing, static postures; and
  - multiple exposures.
- Health problems that are emerging risks and poorly covered are:
  - lower-limb disorders;
  - neurological disorders linked to chemicals exposure;
  - tinnitus, voice disorders;
  - reproductive disorders linked to work organisation or chemical exposures;
  - cardiotoxicity; and
  - health problems linked to combined exposures.

The studies were also assessed for their contribution to prevention and priority setting, for example by labour inspections; the following conclusions were drawn:

- Recommendations tended to be rather general by nature and therefore did not provide direct guidance on practical action. It was difficult to find, among the studies identified, any examples where the results could have been used for a situational description, strategic planning, setting a work programme, campaigning or targeting inspections.

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(3) Nurminen, M., & Karjalainen, A., 'Epidemiologic estimate of the proportion of fatalities related to occupational factors in Finland', *Scandinavian Journal of Work Environment and Health*, 2001, Vol. 27, No 3, pp. 161–213.

(4) Hämäläinen, P.V., Saarela, K.L. & Takala, J., 'Global estimates of fatal work-related diseases by region and disease group', 2002, *International Journal of Occupational and Environmental Health*, 2011, Vol. 17, No 1, pp. 49–56.

- Many studies reported only total numbers of attributable fractions and cases. From the point of view of prevention, this is not useful enough, because exposure levels and related risks vary very widely among different workplaces.

Burden of disease assessments have been used for cost estimates. A recent EU-OSHA report <sup>(5)</sup> summarised different approaches, drawing the general conclusion that most of the cost of occupational disease and work-related injury is borne by the workers. To give an idea of the scope of the problem of poor or non-existent OSH, the United Kingdom, Health and Safety Executive (HSE) and Safe Work Australia, reported, respectively, costs to the United Kingdom economy (excluding costs resulting from occupational cancers) in 2010–11 of GBP 13.4 billion (or approximately 1 % of GDP), and costs to the Australian economy of AUD 60.6 billion in 2008–09 (4.8 % of GDP). In the Netherlands, the costs of poor or non-OSH were estimated by another study<sup>(6)</sup> at EUR 12.7 billion in 2001, or 3 % of GDP. The variation in these estimates leads us to caution against placing too much emphasis on headline figures taken alone, but they give a good impression of the size of the cost of poor or non-OSH.

In addition, the EU-OSHA presentation looked ahead to future activities, as well as providing an overview of current activities and past activities.

As early as 2002 (at the OSH monitoring workshop, summarised in *Forum 11* <sup>(7)</sup>), EU-OSHA was asked to contribute to the policy discussion on work-related diseases. EU-OSHA set up a web feature <sup>(8)</sup> on monitoring systems in the Member States, with information provided by national expert groups on OSH monitoring.

A number of reports on major diseases were published, for example a policy and practice overview on skin diseases and dermal exposure <sup>(9)</sup>, dedicated chapters in the European risk observatory reports on 'emerging chemical risks' <sup>(10)</sup> and 'emerging biological risks' <sup>(11)</sup>, and an OSH in figures report on musculoskeletal disorders <sup>(12)</sup> which called attention to lower limb disorders, which are not currently assessed or recognised, and the need for prevalence data (that is the total number of people affected) rather than incidence data (meaning new cases recorded). An OSH in figures report on noise and hearing loss <sup>(13)</sup> highlighted voice disorders and tinnitus as issues of concern.

EU-OSHA has also conducted several large campaigns on noise, stress and musculoskeletal disorders (two campaigns on each of the last two topics) and has integrated the topic of work-related diseases into its work on vulnerable groups, sectors and risk factors.

EU-OSHA has been participating in the Eurostat working groups on occupational accidents and diseases and has used these statistics extensively.

EU-OSHA activities to contribute to better evidence on occupational cancer and its causes include a Member States survey and report on occupational exposure limits for carcinogens, mutagens and reprotoxicants (published in 2009 <sup>(14)</sup>) and a seminar with major stakeholders on work-related cancer that focused on vulnerable groups, monitoring methods and prevention in the workplace (summary published in 2012 <sup>(15)</sup>). Following on from this, a report on exposure assessment methods will be published in 2014 and a report on rehabilitation related to cancer in 2015. Through these activities, gaps were identified in research, monitoring and workplace solutions, and at policy level.

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<sup>(5)</sup> Estimating the cost of accidents and ill-health at work: A review of methodologies. Available at:

<https://osha.europa.eu/en/publications/reports/estimating-the-costs-of-accidents-and-ill-health-at-work/view>

<sup>(6)</sup> Koningsveld, E. A. P., Zwinkels, W., Mossink, J. C. M., Thie, X. and Abspoel, M., 'National costs of working conditions of labourers in the Netherlands 2001 [in Dutch: Maatschappelijke kosten van arbeidsomstandigheden van werknemers in 2001]', Werkdocument 203, Ministry of Social Affairs and Employment, The Hague, The Netherlands, 2003. Available at: <http://www.eurofound.europa.eu/ewco/2004/12/NL0412NU01.htm>

<sup>(7)</sup> <https://osha.europa.eu/en/publications/reports/11/view>

<sup>(8)</sup> <https://osha.europa.eu/en/topics/osm>

<sup>(9)</sup> [https://osha.europa.eu/en/publications/reports/TE7007049ENC\\_skin\\_diseases/view](https://osha.europa.eu/en/publications/reports/TE7007049ENC_skin_diseases/view)

<sup>(10)</sup> [https://osha.europa.eu/en/publications/reports/TE3008390ENC\\_chemical\\_risks/view](https://osha.europa.eu/en/publications/reports/TE3008390ENC_chemical_risks/view)

<sup>(11)</sup> <https://osha.europa.eu/en/publications/reports/7606488/view>

<sup>(12)</sup> <https://osha.europa.eu/en/publications/reports/TERO09009ENC/view>

<sup>(13)</sup> <https://osha.europa.eu/en/publications/reports/6905723>

<sup>(14)</sup> <https://osha.europa.eu/en/publications/reports/548OELS/view>

<sup>(15)</sup> <https://osha.europa.eu/en/seminars/workshop-on-carcinogens-and-work-related-cancer>

Reproductive risks at work were the focus of a study prepared in 2012–13 and updated after a 2014 seminar, with recommendations on testing methods, awareness raising and monitoring reproductive risks to male workers and across generations.

The Agency will continue its activities to assess the true burden of ill-health by addressing a number of work-related diseases currently not or insufficiently covered by the national recognition and compensation-centred systems. These include neurological and sensory disorders. It intends to highlight possible synergies with other policy areas that may help to improve workers' health, with a particular focus on a diverse workforce, vulnerable groups and the service-driven economy, and taking into account the current dynamics of work biographies, multiple jobs and multiple working sites (for example as a consequence of the growth in subcontracted work, short-term contracts, changing work organisation and personal services). The project will focus on instruments to identify emerging work-related diseases, rehabilitation and back-to-work strategies for specific diseases, reviews on specific diseases, and case studies on practices and policies. Qualitative research and awareness raising among national OSH actors, social partners and intermediaries at enterprise level, as well as actors from different policy fields, such as public health, and from the medical community, will accompany the review of policy and practices.

The project will also build on experiences from the large-scale activity on ageing workers and previous EU-OSHA campaigns (e.g. MSDs and return to work, rehabilitation policies).

### 3 Future European Commission activities on occupational diseases under the new EU strategic framework

Mr Jorge Costa-David of the European Commission's safety and health at work unit (B3) of the Directorate-General for Employment, Social Affairs and Inclusion (DG EMPL) reported on future plans under the new strategic framework, provided they are agreed by the new Commission(er). He informed the audience that research on mental health<sup>(16)</sup> and nanomaterials<sup>(17)</sup> had been commissioned and two draft guidance documents on these topics are being finalised. A study report on mental health is being finalised, aiming to establish the situation in EU and European Economic Area (EEA)/(European Free Trade Association) EFTA countries on mental health in the workplace, evaluate the scope and requirements of possible modifications of relevant EU safety and health at work legislation and elaborate a guidance document to accommodate corresponding risks/concerns, to ultimately ensure adequate protection of workers' mental health from workplace-related risks. A draft position document for adoption by the tripartite Advisory Committee on Safety and Health at Work (ACSH) on practical guidance for dealing with nanomaterials had been discussed in the Committee's Working Party on Chemicals subgroup on nanomaterials at a meeting at the beginning of October and an opinion on them by the ACSH would be adopted (in the meantime issued at its plenary of the 27th of November).

A report on the systems for recording and compensating occupational diseases in the Member States<sup>(18)</sup> had also been commissioned; it was presented and discussed at a major conference<sup>(19)</sup> in December 2013. Following the discussions at the conference, DG EMPL B3 will concentrate efforts on the one hand on occupational diseases statistics, the idea being to make it coherent vis à vis the

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<sup>(16)</sup> Call for Tenders VT/2012/028. Study service contract to establish the situation in EU and EEA/EFTA countries on mental health in the workplace, evaluate the scope and requirements of possible modifications of relevant EU safety and health at work legislation and elaborate a guidance document to accommodate corresponding risks/concerns, with a view to ultimately ensure adequate protection of workers' mental health from workplace-related risks. Available at: <http://ec.europa.eu/social/main.jsp?catId=625&langId=en&callId=356&furtherCalls=yes>

<sup>(17)</sup> Call for Tenders VT/2011/039. Study service contract to establish the potential impact of nanomaterials & nanotechnology at the workplace, evaluate the scope and requirements of possible modifications of relevant EU safety & health at work legislation. Available at: <http://ec.europa.eu/social/main.jsp?catId=624&langId=en&callId=311&furtherCalls=yes>

<sup>(18)</sup> *Report on the current situation in relation to occupational diseases' systems in EU Member States and EFTA/EEA countries, in particular relative to Commission Recommendation 2003/670/EC concerning the European Schedule of Occupational Diseases and gathering of data on relevant related aspects.* Available at: <http://ec.europa.eu/social/BlobServlet?docId=9982&langId=en>

<sup>(19)</sup> Occupational Diseases in the EU: The system(s) and their role, 'Way forward, presentations and conclusions'. Available at: <http://ec.europa.eu/social/main.jsp?langId=en&catId=88&eventsId=940&furtherEvents=yes>

European Occupational Diseases Statistics (EODS) system, and on the other on an update of the 2003 European schedule of occupational diseases recommendation.

The timetable for EODS statistical office of the European Union (Eurostat) proposed is as follows:

- 2014–16: DG EMPL Diagnostic Criteria Expert Group (DCEG) and EODS Working Group to work on and propose:
  - a list of diseases recognised in all Member States under similar conditions and in accordance with the 10th revision of the International Classification of Diseases (ICD-10 (starting with the shortlist in Annex I of the European schedule of occupational diseases (ESOD) Recommendation (Commission Recommendation 2003/670 EC)); and
  - a shortlist of causal agents.
- 2016: agreement on the final lists by DCEG and EODS (including their feasibility).
- 2016: agreement on the modalities of the simplified data collection by EODS.
- 2017–18: pilot data collection (microdata or tabular data to be decided later) to test the feasibility and quality of the new data collection.
- 2019: evaluation of the pilot data collection.
- 2019: on the basis of the evaluation report, the Commission will make a proposal about the future of EODS.

There are three expert groups carrying out or monitoring this work:

1. the EODS group, nominated by the Member States, made up of representatives of social security and statistical institutes on the one hand and ministry bodies and institutes (public health or occupational health) on the other hand.
2. the DCEG (responsible for information notices), which also has links to ILO expert groups through members who are in both EU and ILO groups; and
3. the ACSH Working Party on Occupational Diseases, that advises on policy options. It is expected that it will be active again by the second half of 2015 when the Commission will start its revision activities of Recommendation 670/2003/EC.

EODS data collection has its legal basis in the new regulation on health and safety statistics <sup>(20)</sup>, which specifies what data should be collected on occupational accidents. Annex V of the regulation, 'Domain: Occupational diseases and other work-related health problems and illnesses (a)' defines the aims of and scope for the provision of statistics on recognised cases of occupational disease and other work-related health problems and illnesses. What used to be a voluntary provision of data is an obligatory provision under the new statistical regulation. Member States will have to agree on the collection method they wish to use and provide the data.

The 2003 schedule of occupational diseases <sup>(21)</sup>, information notices <sup>(22)</sup> and the Commission report on occupational diseases systems in EU Member States and EFTA/EEA countries were made available to participants on USBs.

## 4 Views from the social partners

### 4.1 Tackling occupational and work-related diseases through prevention

Rebekah Smith from BusinessEurope, which is a recognised social partner at European level, representing the employers' side, insisted on the difference between occupational diseases (cases of recognised or compensated diseases) and work-related diseases. The position of the employers' side at the European level was that the improvement of the prevention of work-related diseases is a key

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<sup>(20)</sup> Regulation (EC) No 1338/2008 of the European Parliament and of the Council of 16 December 2008 on Community statistics on public health and health and safety at work.

<sup>(21)</sup> Commission Recommendation 2003/670/EC of 19 September 2003 concerning the European schedule of occupational diseases. Available at: <https://osha.europa.eu/data/links/commission-recommendation-concerning-the-european-schedule-of-occupational-diseases>

<sup>(22)</sup> *Information notices on occupational diseases: A guide to diagnosis*. Available at: <https://osha.europa.eu/data/links/information-notices-on-occupational-diseases-a-guide-to-diagnosis>

challenge for employers and that that should be the focus of EU-OSHA's work in this important area. The role of the Agency is to provide credible, high-quality facts, which is a challenge in an environment where it is difficult to find comparable figures. She expressed doubts about whether or not a harmonisation of criteria would be easily achievable. While it might be difficult with regard to the collection of harmonised data on occupational diseases, it might be unachievable for compensation, a national competence under social security systems.

On the other hand, the development of tools is key to the identification of emerging issues and, moreover, for prevention at enterprise level. A preventive approach should be seen as a benefit for business and workers, preventing the loss of a skilled workers from the workforce. While she recognised the challenge of developing practical advice and identifying the major issues for small and medium-sized enterprises (SMEs), she stated that the many SMEs in Europe need support for the prevention of ill-health and pointed out that the Agency's campaigns are focused on raising awareness and providing such support. When considering new technologies, the benefits for OSH prevention, not only the possible risks, should be assessed.

There should also be more cooperation with other policy fields.

## 4.2 Turning research into reality- How we can deliver on prevention

Hugh Robertson from the TUC (Trades Union Congress), workers' representative and chair of the ACSH Working Party on Occupational Diseases, challenged the European Commission to do more on the prevention of diseases, arguing that it is important to link research on the causes of ill-health and the many examples of successful prevention, including at enterprise level. He mentioned exposure to diesel exhaust and shift work as emerging issues, and additionally wood dust, to which exposures are also increasing because of new ways of processing composite materials. The risks were increasing as a result of greater job insecurity and less inspection. He made the link to the REFIT, the European Commission's Regulatory Fitness and Performance programme: the Commission is starting to try to define low-risk jobs, and talks of offices, shops and schools. Yet these workplaces bear 58 % of work-related sickness absence due to stress and MSDs. Agency figures show that stress is most prevalent in education, health and public administration, and that the highest number of work-related MSD complaints are in the service sector, and among shop workers and salespeople. New directives on carcinogens and MSDs had also been cancelled under REFIT, and there will be no directive on stress. The Commission was also considering reducing protection for those working in SMEs by cutting back on risk assessment requirements, putting the emphasis on 'reducing the burden on low-risk' by removing risk assessment requirements for them. However, SMEs employ 66 % of the workforce but are responsible for 82 % of injuries and 90 % of fatalities. He concluded by stating that there should be no two-tier protection; workers in SMEs and so-called 'low-risk' enterprises need equal protection.

## 5 ILO activities on occupational and work-related diseases

Francisco Santos O'Connor of the ILO started his presentation by stating that the prevention and control of occupational diseases is a priority under the ILO Plan of action (2010–2016). The ILO World Day for Safety and Health at Work on 28 April 2013 focused on the prevention of occupational diseases <sup>(23)</sup>. The ILO Governing Body, at its March 2013 session, called for an intensified global effort on the prevention of occupational diseases. The ILO's means of action include the development, promotion and supervision of international labour standards, including those regarding occupational cancer, asbestos, chemicals, radiation and occupational health services; the development of labour inspection systems to support Member States' efforts to strengthen their capacities for prevention, recognition and compensation of occupational diseases; the development and promotion of codes of practice and other instruments; and joining efforts with other institutions (e.g., WHO, the International Social Security Organisation (ISSA), the International Commission on Occupational Health (ICOH)) for the prevention

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<sup>(23)</sup> Campaign page with promotional materials:

[http://www.ilo.org/safework/events/meetings/WCMS\\_204594/lang-en/index.htm](http://www.ilo.org/safework/events/meetings/WCMS_204594/lang-en/index.htm)

of occupational diseases. Between 1919 and 2012, the ILO adopted 189 conventions, 5 protocols and 2002 recommendations. Many of these instruments relate to OSH.

▪ **The challenges:**

- Many developing countries lack resources for diagnosis, recognition and reporting of occupational diseases; the situation is further complicated by increasing migration flows, ageing workforces and the growth in temporary work. Additionally, workers in SMEs and the informal economy are often outside national OSH systems.
- Work-related diseases are the main work-related cause of death in all world regions.
- While diseases caused by traditional occupational hazards, such as pneumoconiosis, are still widespread in many countries, new occupational diseases, such as mental disorders (stress, anxiety and depression) and musculoskeletal disorders (MSDs), caused by emerging risks are on the rise globally. Most official statistics cover only a fraction of occupational diseases. Over the last years, there were increases in reported diseases in many countries, for example in stress-related disorders in Japan and in MSDs in Korea.
- Non-communicable work-related diseases account for about 90 % of the global fatal work-related disease burden: work-related cancers and circulatory diseases are the main causes of death in all regions.
- To guide policy and decision making, the ILO has been publishing estimates of occupational injuries and work-related diseases based on existing occupational injury data from selected ILO member states and WHO global burden of disease data.
  - Based on 2010 statistics, occupational accidents and work-related diseases cause over 2.3 million fatalities every year. Every day, 6,300 people die: occupational accidents kill nearly 1,000 people and work-related diseases cause the deaths of approximately 5,400 more individuals. There were over 313 million non-fatal occupational accidents (requiring at least four days' absence from work) resulting in injury or ill-health for approximately 860,000 people every day.
  - Major economic losses for enterprises include lost productivity and reduced work capacity. The ILO estimates losses of around 4 % of the world's gross domestic product (GDP), or about USD \$2.8 trillion.

▪ **ILO actions:**

- **Universal access to affordable health care** of adequate quality and financial protection in case of sickness, including financial protection and basic income security for all in need, is a goal defined in **ILO Recommendation No 202 concerning national floors of social protection, 2012**.
- The **importance of occupational health services** was emphasised.
- Regarding workers' health, **medical surveillance and exposure monitoring** should be ensured by a nationwide service network, setting up a national compensation scheme and securing enforcement by the labour inspectorate.
- The Convention and Recommendation No 187 on the **promotional framework for occupational safety and health** are a new type of instrument and **promotional rather than prescriptive**. They do not address actions at enterprise level, well covered in the existing OSH instruments, but focus on developing a national OSH system that entails: OSH legislation; compliance assurance, including inspection; a national tripartite advisory body on OSH; OSH data collection mechanisms; an OSH service network; an OSH training and information network; and arrangements to promote management–worker collaboration at enterprise level.
- **The new ILO list of occupational diseases** was revised in 2010 **(24)**. **For the first time, mental and behavioural disorders were included.**

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<sup>(24)</sup> [http://www.ilo.org/safework/info/publications/WCMS\\_125137/lang-en/index.htm](http://www.ilo.org/safework/info/publications/WCMS_125137/lang-en/index.htm)

- In collaboration with the WHO and other international organisations, the ILO is currently working on the development of **practical guides on the identification and recognition of occupational diseases**, including guidance on diagnostic and exposure criteria for occupational diseases, and practical tools for prevention, protection and health promotion in the workplace.
- A **practical guide for recording and notification of occupational diseases** has been prepared to help Member States to establish and improve their national systems. It includes detailed guidance on compiling and analysing data through national disease surveillance systems. It explains basic principles, for example the involvement of social partners and the need for a single integrated system for occupational accidents and diseases, and discusses the economic dimension of targeted prevention strategies and the need for reliable data. In order to develop standardised instruments, such as report forms and coding systems, practical examples from long-established systems are included. It recommends the extension of the reporting system to cover workers who are often excluded, such as those in small and micro enterprises and in the informal economy.
- **Recent ILO publications related to the prevention of MSDs and stress** at work include *Ergonomic Checkpoints in Agriculture* and *Stress Prevention at Work Checkpoints*.

#### National actions foreseen:

- build capacity for recognition of occupational diseases;
  - improve mechanisms for collection and analysis of occupational disease data;
  - collaborate with work injury compensation schemes;
  - integrate the prevention of occupational diseases into OSH inspection programmes;
  - improve capacity for health surveillance and exposure monitoring;
  - update national lists of occupational disease; and
  - establish the related legislative framework.
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- Recently, the ILO has updated the training package SOLVE (25). It focuses on integrating **workplace health promotion into OSH policies** through the prevention of drug and alcohol abuse, HIV/AIDS, workplace stress, violence at work, and the promotion of tobacco-free workplaces. It provides tools for action at enterprise level and includes a ‘train the trainer’ scheme.
  - The University of Turin, Italy, in partnership with the International Training Centre (ITC) of the ILO, is offering a **Masters course in occupational safety and health, which includes distance learning**. It also offers a **course on national governance of occupational safety and health**. Another course covers employment injury schemes and the prevention of occupational accidents and diseases.
- **Future work:**
    - An **interregional study on workplace stress** in collaboration with ICOH will be published in 2014.
    - **Guidelines for labour inspectors on dealing with psychosocial risks at work** will be prepared. The tool will consist of four short booklets on, respectively, the concept of psychosocial risks, the applicable legislation, proactive actions on work-related stress, and violence and bullying.

<sup>(25)</sup> [http://www.ilo.org/safework/info/instr/WCMS\\_178438/lang--en/index.htm](http://www.ilo.org/safework/info/instr/WCMS_178438/lang--en/index.htm)

## 6. WHO activities on the burden of disease

Ivan Ivanov from the WHO had to cancel his participation. However, a PowerPoint presentation and some documents were made available to the participants.

The documents included six reports from WHO occupational burden of disease research (on occupational airborne particulates <sup>(26)</sup>, sharps injuries <sup>(27)</sup>, work-related hearing impairment <sup>(28)</sup>, comparative quantification of health risk <sup>(29)</sup>, occupational carcinogens <sup>(30)</sup> and the prevention of disease through healthy environments <sup>(31)</sup>).

## 7. An initiative for SLIC activities on long-latency diseases

Kären Clayton, Chair of the Senior Labour Inspector's Committee's Working group Chemex, reported on an initiative on long-latency diseases. The SLIC plenary agreed in Vilnius, in November 2013, to proposals for a collaborative approach on long-latency diseases. In Athens, in May 2014, SLIC agreed to focus on respirable crystalline silica (RCS). There may be a second topic later, possibly welding fume. The SLIC Chemex Working Group is to lead, liaising with the SLIC Enforcement Working Group. SLIC is hoping to improve the prevention of occupational disease across EU Member States, through:

- greater access to learning from the successful approaches used by national labour inspectorates and their partner organisations;
- having easy-to-use knowledge sharing arrangements, to enable such shared information to be accessed and searched;
- potential to influence the supply of machinery standards and/or the design of equipment; and
- potential for a collaborative project on developing a particular approach or product.

There is a particular interest in equipping inspectors to improve compliance and risk control, thereby reducing exposure by promoting sustainable behavioural change in employers and workers.

This includes providing **suitable guidance and training for inspectors to help improve protection against risks from crystalline silica exposure in the workplace** and compliance, and improving the design of work processes and equipment. The primary need is to give general inspectors the confidence to address RCS dust. The emphasis should be on control of exposures, following a 'Hygiene without numbers' approach. Risk assessment should be carried out just to give controls to follow-up not as 'end point' and unnecessary measurements should be avoided. Respiratory protective equipment and local exhaust ventilation are fundamental to adequate control in many workplaces. The focus will probably be on construction, using the work of the European Network for Silica (NEPSI) <sup>(32)</sup> to support activities in other sectors.

The working group will produce short guidance sheets for inspectors (not books which remain unread!) and probably an overarching document giving the background, including compelling facts under the heading 'Why RCS?'. The number of guidance sheets is yet to be discussed, but the aim is to address common problems from inspector's point of view. There is likely to be extensive use of visual images,

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<sup>(26)</sup> [http://www.who.int/quantifying\\_ehimpacts/publications/9241591862/en/](http://www.who.int/quantifying_ehimpacts/publications/9241591862/en/)

<sup>(27)</sup> [http://www.who.int/quantifying\\_ehimpacts/publications/ebd11/en/](http://www.who.int/quantifying_ehimpacts/publications/ebd11/en/)

<sup>(28)</sup> [http://www.who.int/quantifying\\_ehimpacts/publications/9241591927/en/](http://www.who.int/quantifying_ehimpacts/publications/9241591927/en/)

<sup>(29)</sup> [http://www.who.int/occupational\\_health/publications/quantification/en/](http://www.who.int/occupational_health/publications/quantification/en/)

<sup>(30)</sup> [http://www.who.int/quantifying\\_ehimpacts/publications/9241591471/en/](http://www.who.int/quantifying_ehimpacts/publications/9241591471/en/)

<sup>(31)</sup> [http://www.who.int/quantifying\\_ehimpacts/publications/preventingdisease/en/](http://www.who.int/quantifying_ehimpacts/publications/preventingdisease/en/)

<sup>(32)</sup> NEPSI was formed by the EU sectoral associations that signed the Social Dialogue 'Agreement on Workers' Health Protection Through the Good Handling and Use of Crystalline Silica and Products Containing it' on 25 April 2006, representing 15 industry sectors and more than 2 million workers. The 17 initial signatory organisations represent the aggregates, cement, ceramics, foundry, glass fibre, special glass, container glass, flat glass, industrial minerals, mineral wool, natural stones, mining, mortar and pre-cast concrete sectors. The application of the Agreement and Good Practices is monitored; every two years, a summary report informs the EC, the Member States and the authorities responsible for health and safety on the application of the Agreement. See <http://www.nepsi.eu/>.

to catch the user's attention and show what is 'good' and 'bad'. The guidance sheets should also include case studies, with costings, and be complemented by inspector training materials.

There is an **ongoing discussion on a possible binding occupational exposure limit (OEL) at EU level (0.1 mg/m<sup>3</sup>)**.

The sectors and industries affected include construction, quarries, stonework, brick making and foundries. Emerging risks linked to new materials and work processes include silica exposure through **cutting artificial stone and cleaning roofs, and exposure of carpenters to composite materials**.

Significant exposure to RCS may lead to silicosis or COPD, and heavy and prolonged exposure may lead to lung cancer.

The vision is to 'make tackling RCS as common as the hard hat on construction sites'.

In the longer term, other topics could be covered, and a campaign has been envisaged, although it has not yet been agreed by the SLIC plenary.

The knowledge-sharing efforts include **creating on the Commission's intranet, CIRCA-BC, a space for an SLIC Long Latency Interest Community (SLIC LLIC)**. Initial folders (spaces) created cover working group documents, inspector guidance and other useful information. Access is for the moment restricted to Chemex and its subgroup.

The next steps for the subgroup are to make contact with NEPSI to gain a better understanding of the background and the sensitivities, and to share labour inspection information via the CIRCA-BC LLIC.

A short paper for the SLIC plenary in Rome in November 2014 is being prepared.

The group was also considering inviting an EU-OSHA representative to have input and contribute expertise on dissemination and communications.

## 8. SCOEL's views

Professor Len Levy of Cranfield University, vice chair of the European Commission's Scientific Committee on Occupational Exposure Limits<sup>(33)</sup>, explained the SCOEL's role in the prevention of ill-health caused by chemical exposures. It supplies the Commission with opinions on any matter relating to the toxicological evaluation of chemicals for their effects on the health of workers and gives advice on OELs based on scientific data for substances prioritised by the Commission (DG EMPL). It does this through the preparation of scientific recommendations for the Commission, which are used to underpin regulatory proposals on occupational exposure limit values (OELVs) for chemicals in the workplace. Draft recommendations from SCOEL undergo a stakeholder consultation to allow interested parties to submit health-based scientific comments and further data. SCOEL is currently composed of a maximum of 21 independent experts selected by DG EMPL and having a range of scientific expertise and experience. There are also observers from EFTA countries.

Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work (the Chemical Agents Directive, CAD) sets indicative and binding OELs and biological limit values in a wider framework of risk management. Under this directive, a number of lists of indicative occupational exposure limit values (IOELVs)<sup>(34)</sup> have been developed (Directives 2000/39/EC, 2006/15/EC and 2009/161/EU). Work is ongoing on candidate substances for a fourth list of IOELVs.

<sup>(33)</sup> See <http://ec.europa.eu/social/main.jsp?catId=148&langId=en&intPagId=684>

<sup>(34)</sup> IOELVs are defined based on the relationship between the health effects of hazardous chemical agents and the level of occupational exposure by means of an independent scientific assessment of the latest available scientific data.

In addition, Directive 2004/37/EC on the protection of workers from the risks related to the exposure to carcinogens or mutagens at work (the Carcinogens and Mutagens Directive, CMD) refers to the procedure for setting limit values for those carcinogens and mutagens for which this is possible.

SCOEL has also developed procedures for assessing different effects, for example a procedure for assessing neurobehavioural effects.

The recommendations, based on the critical effect identified by SCOEL, may include concentrations in air (ppm, mg/m<sup>3</sup>), eight-hour time-weighted average, for chronic effects and short-term exposure limits (15 minutes) and for acute effects; biological limit values (where appropriate); a carcinogenicity evaluation (where appropriate); and supplementary notations on skin uptake, respiratory sensitisers, and mixture effects with noise.

Each substance is evaluated following a general procedure <sup>(35)</sup>, applying the key principles outlined in the methodology document (last updated 7 June 2013).

When, according to the judgement of SCOEL, a highest level of exposure at which one could have confidence that there would be no adverse effects on health can reliably be identified, the SCOEL recommendations have been proposed to Member States by the Commission as prospective IOELVs.

#### Setting workplace OELs:

- SCOEL evaluates each substance using the best available scientific data (all acute and chronic effects). It prepares a draft recommendation (SCOEL/SUM) and submits to DG EMPL.
- DG EMPL initiates a six-month external public consultation period with national contact points (around 40) to get comments on scientific aspects only (not compliance or socioeconomic issues).
- SCOEL considers all comments and new data, amends the draft if necessary and adopts a recommendation.
- DG EMPL accepts SCOEL's final recommendation and publishes it.
- DG EMPL consults the Working Party on Chemicals of the ACSH, as well as other relevant DGs.

All documents, agendas and minutes of meetings, and final criteria documents are available from the Commission's website <sup>(36)</sup>.

Where a 'no-effect' level of exposure cannot be reliably identified, SCOEL is asked to attempt to estimate the risk of adverse health effects at specified levels of exposure; the Commission takes account of such views in developing proposals for binding occupational exposure limit values (BOELVs).

Under certain circumstances, biological monitoring offers advantages over air monitoring in assessing risk to health, for example for substances with a significant skin uptake. For such compounds, biological monitoring may be preferable, if suitable methods are available. SCOEL evaluates the need to recommend biological monitoring for particular substances on a case-by-case basis and recommends biological values based on the currently available scientific data.

Points for discussion:

<sup>(35)</sup> Scientific Committee on Occupational Exposure Limits (SCOEL), *Methodology for the Derivation of Occupational Exposure Limits*, Key Documentation (version 7), June 2013. Available at:

<http://ec.europa.eu/social/BlobServlet?docId=4526&langId=en>

<sup>(36)</sup> <http://ec.europa.eu/social/main.jsp?catId=148&langId=en&intPagId=684>

- It is important to consider that SCOEL OEL recommendations are generally lower than existing Member State values (reducing worker exposure in the EU).
- Current challenges include discussions of IOELVs/BOELVs versus derived no-effect levels (DNELs)/derived minimal effect levels (DMELs) (from the REACH process); collaborative meetings are taking place. There is increasingly a better understanding and more interaction with ECHA, the ACSH Working Party on Chemicals and other stakeholders. However, access to REACH information is still limited, especially when it is in the ownership of companies and does not figure under research.
- SCOEL should be involved in better targeting of substances of greatest concern and ensuring that DG EMPL prioritises chemical substances of greatest real concern (number exposed, toxicity, etc.). New DG EMPL research on a database of exposure data (37) is expected to contribute to a better knowledge base.
- Do we know that SCOEL OELs are complied with in Member States? This is part of the SLIC's remit.

In the second part of the meeting, four presentations focused on specific research topics. Speakers were researchers and representatives of labour inspectorates.

## 9. New techniques for tracing newly occurring work-related diseases: sentinel and alert systems

Vincent Bonneterre from the Modernet network started by describing a number of examples of identification of new work-related diseases through clinical observations during the last 30 years, for example textile sprayer's lung, bronchiolitis obliterans in popcorn factory workers and other food industry workers, and progressive inflammatory neuropathy among swine slaughterhouse workers. The main objective of the Modernet network is to create an 'intelligence network' by creating facilities for exchanging knowledge on new techniques for enhancing information on trends in occupational diseases (i.e. record linking, surveys), on discovering and validating new OSH risks more quickly (data mining, workers' reporting) and on use of modern techniques to discuss and disseminate information to all stakeholders (platforms, social media).

His presentation focused on a national sentinel approach, the French RNV3P database, and a Modernet (38) initiative at EU level.

The French National Network for Monitoring and Prevention of Occupational Diseases (RNV3P) is an occupational health network, consisting of 32 occupational disease consultation centres (Centres de consultation de pathologie professionnelle, CCPPs) and a sample of occupational health services. These centres pool their consultation data (which is stored anonymously) in a common national database on work-related diseases. Cases are recorded in a web-based information system, with coded variables (patient's demographic data, disease (ICD-10), business sector and profession (i.e. occupation (ISCO code)), activity sector (NAF code (39)), exposure (according to a defined French thesaurus), imputability, company, which type of physician referred the patient). It is up to the network's experts, based at various teaching hospitals to investigate the diseases and attribute them, if necessary, to an occupational origin (this 'expert' (causality) assessment is also registered in the database). The contributors are epidemiologists, physicians, people working in health agencies and oncologists. More than 200,000 consultations have been recorded, and 15,000 are added each year.

Hypotheses about new emerging diseases are generated using statistical methods employed in pharmacosurveillance and by modelling an exposome (40) to analyse multiple exposures.

(37) Call for Tenders VT/2013/079. Service contract to create a database and develop a model to estimate the occupational exposure for a list of hazardous chemicals in the Member States of the European Union and in the EFTA/EEA countries; technical description. Available at:

<http://ec.europa.eu/social/main.jsp?catId=624&langId=en&callId=396&furtherCalls=yes>

(38) <http://www.costmodernet.org/>; [http://www.cost.eu/domains\\_actions/isch/Actions/IS1002](http://www.cost.eu/domains_actions/isch/Actions/IS1002)

(39) NAF stands for Nomenclature des Activités Françaises (official register of business branches in France)

(40) The exposome can be defined as the measure of all the exposures of an individual in a lifetime and how those exposures relate to health.

Disproportionality metrics used in pharmacovigilance help to retrieve and highlight similar cases reported only a few times and by different physicians (early identification).

The sentinel clinical approach (reporting cases) is complemented by a data-mining approach combining pairs (disease x exposure) or new triads (disease x agent x circumstance of exposure) and comparing with external sources of information (extrinsic imputability), such as published articles, etc. These pairs or triads are analysed by an algorithm in three dimensions providing a 'score of emergence'. First, for each case, the variables 'Seriousness of the case' and 'accountability/imputability' (work-relatedness/intrinsic imputability = likely accountability of cases to exposure) are calculated using defined scales. These two variables are used to assign a score to each case. Accountability has a greater relative weighting than seriousness. The third dimension taken into account is the number of occurrences of the pair or the triad (the number of similar cases reported).

There are five defined categories of case: excluded, doubtful, possible, probable/likely and very likely. Depending on the score, different levels of action are defined (ranging from data sharing within the network to alert and publication).

The French Agency for Food, Environmental and Occupational Health and Safety (ANSES) has been the network operator since July 2010. Its mission is to coordinate activities with the health insurance funds for salaried and agricultural workers, the French institute for Public Health Surveillance (InVS), and the French Occupational Medicine Society (SFMT).

The RNV3P's main aims are to:

- improve and harmonise practices for diagnosing work-related diseases;
- identify emerging and re-emerging risks in occupational health;
- identify and describe at-risk occupational situations in France;
- guide choices in terms of risk assessment and prevention, at workplace, regional and national levels, and stimulate research; and
- be a platform for dialogue between clinicians and other occupational health professionals.

The Modernet approach has similarities with RNV3P.

Their Sentinel Clinical Watch System, the OccWatch project, takes the following steps:

- CAPTURE case-reports of a potentially new work-related disease;
- EXCHANGE AND ANALYSE the relevance of clinical signals, challenge diagnoses, exposure, work-relatedness, hypotheses on causative agents, physiopathology and prevention issues; seek similar cases;
- SUMMARISE: produce an expert opinion, if possible within two months of the case being posted. Reach a conclusion regarding medical data – but, before this, include information on risk assessment (population potentially exposed, severity) – and make proposals for actions to be taken if necessary;
- DISSEMINATE (not done currently). Possible dissemination of this expertise to relevant institutions, such as national agencies and EU-OSHA (these institutions might decide to raise alerts or not, take specific actions, and so on)

Further developments include data mining in related databases, linking these data to knowledge on quantitative structure–activity relationship (QSAR) models <sup>(41)</sup> (specifically linked to asthma), and applying techniques of text mining.

The Modernet approach increases validity by sharing knowledge across countries and institutions and increasing the number of cases that may provide information on exposure–effect relationships currently unidentified. They may also allow data to be corrected, as was illustrated by the cases of fingerprint

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<sup>(41)</sup> QSAR models are regression or classification models used in the chemical and biological sciences and engineering. In QSAR modeling, the predictors consist of physicochemical properties or theoretical molecular descriptors of chemicals; the QSAR response variable could be a biological activity of the chemicals. QSAR models first summarise a supposed relationship between chemical structures and biological activity in a data set of chemicals. Second, QSAR models predict the activities of new chemicals.

technicians who had developed a rare health condition linked to cyanoacrylate exposure, which was falsely attributed to aluminium dust in two instances.

National sentinel systems with similar approaches integrated into the Modernet network include the French RNV3P; the United Kingdom THOR Surveillance Scheme, based on the reports of specialist physicians (formerly SWORD), and on GPs (THOR-GP), and including one scheme open to any work-related disease of interest, including new ones (THOR-EXTRA); the Italian MALPROF (INAIL database); and other databases that could be searched to generate or confirm signals, such as IDEWE (Belgium). Belgium and the Netherlands are currently developing a clinical watch system (SIGNAAL), based on the OccWatch structure (reporters are occupational physicians) to sort and investigate cases at national level first.

#### ▪ **Conclusions**

Tracing newly occurring work-related diseases is a societal challenge; it is difficult to capture the cases and the two examples presented here are voluntary schemes, so progress is slow.

Sentinel systems aim to contribute to taking appropriate actions in a timely manner, through a 'diseases-first approach' complementary to the 'risks-first approach' followed by, for example, EU-OSHA's European Risk Observatory (*a priori* risks identified by expert focus).

The sentinel approach's efficiency depends on many factors, among which are:

- the identification of clusters (an important element that needs to be examined is the work-relatedness);
- the link between the disease and work, which is easier to prove when dealing with acute toxicity (irritant dermatitis, burns, etc.) and immuno-allergic diseases;
- knowledge about the risk fraction attributable to the suspected occupational exposure and frequency of exposure to other risk factors for the disease; and, most of all;
- collection of the cases by experts who are able to assess the plausibility of work-relatedness. It is therefore important to raise awareness among general practitioners and specialists, and encourage them to make secondary referrals to occupational health specialists.

There is a need for EU-wide cooperation, to set up, if possible, an EU-wide system for detection, expertise and handling of potential new work-related disease. The founding regulation of the European Food Safety Authority contains an Article (34) regarding the identification of emerging risks. This could serve as an example for building a dedicated unit with human resources (Emrisk unit), which would use expert panels, with integrated processes for detection, expertise and summarising evidence that could build on the French national experience and OccWatch.

## **10. The gender dimension in burden of disease assessments: mental health and cardiovascular disorders**

Tuula Oksanen of the Finnish Institute of Occupational Health (FIOH) summarised the results of several studies considering socioeconomic status and work organisational factors and their influence on the onset of cardiovascular diseases, diabetes, hypertension and mental health disorders, as well as links to sickness absence and early retirement. Parameters considered also included age and gender, as well as occupation, context and the contribution of non-work factors.

Based on the Global Burden of Disease Study 2010 (GBD 2010) <sup>(42)</sup> and the DALY (disability-adjusted life years) <sup>(43)</sup> concept, the **main differences between men and women were the higher prevalence of mental health disorders, diabetes and MSDs, and the lower prevalence of transport injuries, and CVDs among working age women.** Overall, the global disease burden has continued to shift away from communicable to non-communicable diseases and from premature death to years lived with disability.

**Age at onset of some mental health disorders is much earlier than median working age,** as was demonstrated by a US nationally representative face-to-face household survey <sup>(44)</sup>. Median age at onset is much earlier for anxiety (11 years) and impulse-control (11 years) disorders than for substance use (20 years) and mood disorders (30 years). Half of all lifetime cases start by age 14 years and three-quarters by age 24 years. **On the other hand, half of all cases may be associated with or worsened by work circumstances and occur in people of working age.**

The Finnish Public Sector Study compared work organisational factors and their effects on different groups of workers in the public sector: doctors, teachers, special teachers, social workers, nurses, practical nurses and cleaners. It included 10 municipalities and 21 hospitals in Finland. In several surveys, data have been gathered and have been linked to data in employers' registers on job contracts, sickness absence and workplace characteristics. Data from national health registers that have been linked include: compensation payments for severe and chronic illnesses; annual number of prescriptions for medicines; sickness absence and related diagnoses; rehabilitation granted; early retirement and related diagnoses and work histories; onset of cancer, cancer morbidity and related diagnoses; overall and cause-specific mortality; and dates of hospitalisations and related diagnoses from hospital discharge registers. Repeated measurements over an extended period allow the identification of long-term health effects in individuals.

Some of the differences between professions were highlighted:

Exposure:

- Low autonomy and high demands were reported, especially by cleaners and practical nurses, at the lower end of the socioeconomic scale.
- Organisational injustice was reported by nurses and social workers.
- Excessive workloads were reported by one third of all respondents, and especially by social workers.
- Effort–reward imbalance was reported, especially by social workers, but the proportion was diminishing over time.
- High rewards from work were reported, especially by nurses, teachers and doctors, at the upper end of the socioeconomic scale.

Effects on health observed were linked to the different work organisational features and physical stressors:

- All but social workers, who scored highly for many of the stressors, reported that they would carry on in their work until retirement. Mental health disorders as a cause for sickness absence also scored most highly among social workers.
- Effort–reward imbalance was identified as a risk factor for disability pension and therefore an issue especially for social workers.
- MSDs were more of a factor for cleaners and practical nurses, workers with a higher physical workload.

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<sup>(42)</sup> C.J.L. Murray *et al.*, 'Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: A systematic analysis for the Global Burden of Disease Study 2010', *The Lancet*, 2012, Vol. 380, No 9859, pp. 2197–2223. The goal of the GBD 2010 was to synthesise available data on the epidemiology of all major diseases and injuries to provide a comprehensive and comparable assessment of the magnitude of 291 diseases and injuries and their associated sequelae in 1990, 2005 and 2010.

<sup>(43)</sup> DALYs are an absolute measure of health loss; they count how many years of healthy life are lost due to death and non-fatal illness or impairment. They reflect the number of individuals who are ill or die in each age–gender group and location. Population size and composition influences the number of DALYs in a population.

<sup>(44)</sup> R.C. Kessler *et al.*, 'Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication', *Archives of General Psychiatry*, 2005, Vol. 62, No 6, pp. 593–602.

- Sickness absences were highest at the lower end of the socioeconomic scale, among cleaners (about 30 days per year) and nurses, and lowest among doctors (about 9 days per year) and teachers.

This study illustrates that, in addition to specific work organisational conditions, socioeconomic factors need to be considered when assessing the health effects of work organisational factors. **Different patterns of stressors combined with the specific socioeconomic situation may lead to different consequences (prolonged sick leave versus early retirement).**

The study group also used the Finnish Public Sector Study to examine the **risk of hypertension as a function of workplace social capital** (networks, together with shared norms, values and understandings that facilitate cooperation within or among groups). Given that the workplace is an increasingly important source of social relationships and networks, studies on workplace social capital are highly relevant. The study found that **male workers in work units characterised by low workplace social capital were 40–60 % more likely to develop chronic hypertension, partly linked to unhealthy lifestyle.**

Seventeen European cohort studies from Finland, Sweden, Denmark, Germany, Belgium, France and the United Kingdom ( $n = 160,000$ ) were included in the IPD-Work (individual-participant-data meta-analysis of working populations) project to obtain reliable information on the effects of psychosocial work-related factors on chronic diseases, disability and mortality in specific worker groups, such as those with low-income jobs or pre-existing diseases. In this study, the association between job strain and coronary heart disease was found to be significant and broadly similar for men and women, for those younger and older than 50 years and at all levels of socioeconomic status <sup>(45)</sup>.

In another IPD-work study, self-reported job insecurity was found to be associated with a small elevated risk of coronary heart disease. The risk was partly attributable to lower socioeconomic status. There was no evidence of significant differences in this association between men and women<sup>(46)</sup>.

A review <sup>(47)</sup> on the **effects of long working hours on type 2 diabetes** found that **workers with jobs with low socioeconomic status** — such as jobs involving manual labour — **who worked 55 hours or more each week were 30 % more likely to develop type 2 diabetes**, compared with those who worked 35–40 hours a week. The data involved 222,120 men and women from the US, Europe, Japan and Australia, followed up for about 7.6 years. The association in the low socioeconomic status group was robust to adjustment for age, gender, obesity and physical activity, and remained after the exclusion of shift workers.

Health 2000, a health interview/examination survey carried out in Finland, examined the contribution of non-work and work factors to the association between income and depressive and anxiety disorders in a working population <sup>(48)</sup>. Adverse life events, financial hardship and psychosocial life stress are among the factors that have been shown to have a role in explaining the social gradient in mental health. Of the work-related factors, psychosocial work stress has been shown to predict mental health problems. The study found that **low income is associated with frequent mental disorders among the working population**. The combinations of work factors and low income among men and non-work factors and low income among women contribute to the socioeconomic differences in mental health. **Work and non-work factors should therefore be taken into account when developing policies to reduce socioeconomic mental health differences.**

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<sup>(45)</sup> M. Kivimäki *et al.* Job strain as a risk factor for coronary heart disease: a collaborative meta-analysis of individual participant data, *The Lancet*. Oct 2012; Vol. 380, No. 9852, pp. 1491–1497

<sup>(46)</sup> M. Virtanen *et al.*, Perceived job insecurity as a risk factor for incident coronary heart disease: systematic review and meta-analysis, *BMJ*. 2013 Vol. 8; No. 347:f4746

<sup>(47)</sup> M. Kivimäki *et al.* Long working hours, socioeconomic status, and the risk of incident type 2 diabetes: a meta-analysis of published and unpublished data from 222 120 individuals, *Lancet Diabetes Endocrinol* 2014, Early Online Publication, 25 September 2014 .

<sup>(48)</sup> M. Virtanen *et al.*, Contribution of non-work and work-related risk factors to the association between income and mental disorders in a working population: the Health 2000 Study. *Occupational and Environmental Medicine* 2008; 65(3), pp.171-178.

Another study among teachers<sup>(49)</sup> in different working and living environments indicated that working and living in a socioeconomically disadvantaged neighbourhood is associated with an increased likelihood of sick leave among female teachers.

A Finnish study looked at the factors that led workers to extend their employment by more than 6 months beyond the pensionable date and concluded that **good mental health in combination with the opportunity to control work time seem to be key factors in extended employment into older age**. In addition, high work time control might promote work–life participation irrespective of employees' chronic somatic diseases. These findings are novel, however, if proven causal, policies to enhance work participation among older employees should include mental health promotion measures and the improvement of older employees' potential to influence their work time.

## 11. Tackling occupational disease: working together to make a difference

Kären Clayton, Director of the United Kingdom Health and Safety Executive's Long Latency Health Risks Division, presented **HSE's current priorities in the area of occupational diseases, which are the prevention of cancer and respiratory disease**.

In 2005, HSE commissioned a cancer burden study<sup>(50)</sup>, to provide an updated estimate of the current burden of occupational cancer due to exposure to cancer causing agents that occurred in the past and explores the future cancer burden due to occupation. This work has helped HSE to define priorities for the future, alongside knowledge of industry sectors, the strength of evidence of causal links, estimates of future cancer burden, the number of workers potentially exposed and the likelihood of successful intervention. HSE's current priorities are:

- asbestos
- shift work
- respirable crystalline silica
- welding
- painting
- diesel engine exhaust emissions
- solar radiation
- polycyclic aromatic hydrocarbons (PAHs, coal tars and pitches)
- tetrachloroethylene
- radon.

Work-related respiratory disease covers a range of illnesses caused by dusts, fumes and gases. The most prevalent are COPD, asthma and silicosis.

There are a number of industries and workplace activities with a high incidence of respiratory disease: construction, foundries, welding, quarries, agriculture, vehicle paint spraying and bakeries.

An event held in March 2013 (entitled Tackling Occupational Disease: Developing New Approaches) was designed to encourage others to work with and through HSE, through sector strategies and inspection/enforcement programmes. The focus is on improving compliance with the law by supporting **evidence-based targeted interventions in high-risk areas**.

A mix of interventions and resources is deployed to tackle each of the priority agents/occupations, and options for future cost-effective activities are currently being discussed. Businesses will be provided with a package of tools and information that steers and directs them to design and deliver their own interventions to tackle occupational disease.

<sup>(49)</sup> M. Virtanen et al. School neighbourhood disadvantage as a predictor of long-term sick leave among teachers: prospective cohort study. *American Journal of Epidemiology* 2010;7(171):785-92

<sup>(50)</sup> Rushton, L., Hutchings, S., Fortunato, L., Young, C., Evans, G., Brown, T., Bevan, R., Slack, R., Holmes, P., Bagga, S., Cherrie, J.W. & van Tongeren, M., 'Occupational cancer burden in Great Britain', *Br J Cancer* 107, 2012, pp.3–7. Available at: <http://www.nature.com/bjc/journal/v107/n1s/full/bjc2012112a.html>; <http://www.hse.gov.uk/cancer/research.htm>

A key feature of HSE's new campaign, called **Beware Asbestos**, is a free web app for phones, tablets and laptops that helps tradespeople to identify where they could come into contact with asbestos in their work. In addition, it gives them tailored help on how to deal with the risks. **Free asbestos safety packs** are also being distributed through the building supplies retailer TradePoint <sup>(51)</sup>. Asbestos-related diseases account for around 4,500 deaths every year and continue to be the single biggest cause of work-related death, with 20 tradespeople dying from an asbestos-related disease each week.

Amosite and crocidolite, also known as brown and blue asbestos, respectively, were banned in 1985, with chrysotile, or white asbestos, being outlawed in 2000. However, construction workers, carpenters and painters and decorators could come into contact with asbestos up to 100 times a year, according to a new survey.

Those who are **most at risk are workers who regularly disturb the fabric of buildings (putting them at risk of exposure to asbestos)** – in other words, tradespeople working on small sites and projects in the construction and maintenance industries, **around 1.8 million people across the United Kingdom**. The **target audience for the campaign is all those who do not need a license to undertake work with asbestos**, are unprepared to deal with asbestos and are often unknowingly exposed to it as part of their day-to-day work. A survey of 500 tradespeople <sup>(52)</sup> in September 2014 showed that, while 53 % knew asbestos could be in buildings built before 1970, only 15 % knew that it could still be found in buildings built up to the year 2000. Only 30 % of the people polled could correctly identify all the correct measures for safe asbestos working, while just over half made at least one potentially lethal mistake in trying to identify how to stay safe.

Beware Asbestos follows HSE's Hidden Killer campaign, which ran between 2008 and 2010. Post-campaign evaluation showed that it had a huge impact: it achieved 85 % awareness in the target audience, with 90 % saying they had been provoked to think about their own exposure to asbestos and 87 % saying they now had a better understanding of the risks.

HSE is also increasing collaboration with other organisations on the prevention of occupational diseases. An example of a new approach is the LOCHER (Learning Occupational Health by Experiencing Risks) project, which aims to engage with young people in innovative ways to get their attention.

## 12. Priorities in work-related disease research, cost considerations and the prevention of occupational diseases: Canada

Paul-Émile Boileau, scientific director of the Institut de Recherche Robert-Sauvé en Santé et en Sécurité du Travail (IRSST), presented on selected statistics on occupational diseases in the province of Quebec and in Canada, gave an overview of research on occupational diseases and discussed knowledge transfer activities. IRSST, Québec's occupational health and safety research institute, was established in Quebec in 1980 and has a board of directors made up of an equal number of trade union and employers' representatives.

It contributes to the prevention of industrial accidents and occupational diseases, and to the rehabilitation of affected workers; disseminates knowledge and serves as a scientific reference centre; and provides laboratory services and expertise to the public occupational health and safety prevention network. There are four research fields: chemical and biological hazards prevention; sustainable prevention and work environment; mechanical and physical risk prevention; and occupational rehabilitation.

In Quebec, an occupational disease is 'a disease contracted out of or in connection with work that is characteristic of that work, or directly related to the risks specific to that work'. There are differences in this definition between the Canadian provinces, making it difficult to compare figures. In British

<sup>(51)</sup> See more at <https://sm.britsafe.org/hse-launches-new-asbestos-behaviour-change-campaign#sthash.GeEncw6e.dpuf>

<sup>(52)</sup> Insight research to inform the Asbestos 2013–14 campaign. Available at: <http://www.hse.gov.uk/Asbestos/assets/docs/insight-research-2013-14.pdf>

Columbia, for example, a disease can also be defined as a disablement resulting from exposure to contamination. Occupational diseases (16,230), as opposed to traumatic accidents (280,813), represented about 5 % of all accepted injuries between 2008 and 2011. Overall, there was a decrease in the total number of accidents, and this is a tendency that can be observed in all provinces. However, the number of occupational diseases has a tendency to increase. Diseases of the nervous system or sensory organs are by far the most prevalent. Deafness and hearing loss, and carpal tunnel syndrome account for three-quarters of all accepted cases by year in Quebec. MSDs come next, mostly tendonitis, epicondylitis and bursitis. Asbestosis, asthma and silicosis are represented in the respiratory tract category. Mesothelioma is the most prevalent illness in the category of occupational cancers. There are also cases of contact dermatitis which are declared as occupational diseases. Overall, MSDs are the most frequently reported diseases.

To determine how much research was being done in Canada on occupational diseases, a search was performed among Canadian institutes that conducted research on the subject. IRSST identified 15 research institutes that were working on projects on occupational diseases, most of these in collaboration with each other. Five research institutes contributed to 85 % of the research on occupational disease in Canada: Worksafe BC, the Institut National de Santé Publique Québec (INSPQ), the IRSST, the Workplace Safety and Insurance Board Research Advisory Council (WSIB RAC) and the Occupational Cancer Research Centre (OCRC).

**The diseases with which most projects were concerned were cancer and asthma**, but various diseases of the respiratory tract, musculoskeletal disorders and asbestosis were also covered. Although deafness ranked first among recognised cases, there were only two studies on the subject. There were studies on noise, but very few on deafness itself. **Of the research carried out, 37 % was on lung issues**, for example on lung cancer, asthma, respiratory tract problems, asbestosis and berylliosis. The 12 respiratory tract studies were diverse, with projects on alveolitis, archaebacteria infections, SARS and other respiratory viruses.

Regarding cancer, most studies were on cancer in general, but lung cancer was predominant.

As for MSDs, the most studied was tendonitis.

Regarding the types of studies on occupational disease, **there was a wide variety of study designs, from fundamental research to literature reviews. The three main study types were epidemiology designs, exposure assessment and tool development**, and these accounted for 71 % of all studies.

In cancer research, a good proportion of the research consisted of epidemiology studies, exposure assessment studies and literature reviews. And, for example, there was recently a literature review published by the IRSST, in conjunction with investigators from the Netherlands, on cancer among shipyard workers.

**Differences in worker compensation costs between injuries and diseases were also assessed**, based on 2005–07 figures. The overall cost was estimated at CAD 850,331,968, with an average cost of CAD 7,058 per case (CAD 6,730 for injuries and CAD 14,374 for diseases), and CAD 108,382 per fatality (CAD 90,595 for death by injury and CAD 131,945 for death by disease).

Compensation costs (indemnities and medical costs) represent only a part of overall costs. The picture can be quite different when one looks only at compensation costs. The IRSST therefore developed a method to estimate the overall costs of occupational injuries and diseases.

Cost components include:

- medical costs: all expenses incurred to treat and rehabilitate an injured worker;
- funeral costs;
- salary costs (hours not worked but paid (salary and fringe benefits) to an injured worker);
- productivity losses (losses in wages and unpaid housework (human capital method));
- administrative costs (administration fees generated by the replacement of the injured worker);
- human costs: the value of the change in the quality of life of the worker and those in his circle for the duration of such changes and, in cases of death, the potential years of life lost (e.g. pain, suffering and loss of enjoyment of life), as DALY or value of a statistical life.

The total annual costs based on recognised cases were estimated at CAD 4.6 billion (2006), 1.5 % of Quebec's GDP, with an average cost per case of CAD 38,355 (CAD 32,848 per injury and CAD 161,017 per disease, CAD 3,142,872 per fatality through injury and CAD 1,666,414 per fatality through disease).

Mostly, these are human costs (61%) and productivity losses (33%).

- In decreasing order of average cost, they are linked to exposure to noise, transportation accidents, exposure to harmful substances, falls and jumps to a lower level, being trapped or crushed, contact with temperature extremes, violent acts, repetitive motion, falls on the same level, slipping or tripping.
- By nature of the injury and average costs, the ranking is: disorders of the ear, multiple injuries, fractures, mental disorders, other injuries, other diseases, burns, dorsopathies, MSDs (except back disorders), open wounds, sprains/strains.
- By industry, in decreasing order of costs by case: mining, support activities for mining and oil and gas extraction, waste management and remediation services, specialist trade contractors, telecommunications, non-metallic mineral product manufacturing, support activities for agriculture and forestry, forestry and logging, petroleum product wholesalers/distributors, and local, municipal and regional public administration.

A closer look was also taken at the **knowledge transfer funded projects** that took place in Canada. Not only is it important to actually do the research, but there is also a need to transfer the information. This **could be for prevention, by producing recommendations, or for awareness campaigns**. Four of all the research centres and institutes carried out such activities, INPQ leading with seven projects on recommendations.

Some examples of knowledge transfer projects:

- The IRSST produced a brochure on asthma in the workplace as a prevention project.
- INSPQ produced recommendations on the removal of pregnant workers in schools, related to H1N1 flu.
- For an awareness campaign, a fact sheet was released by the OCRC to disseminate information about cancer risks factor in shift workers.

Points to retain:

- Canada is fairly active in research on occupational diseases.
- The five most active research institutes account for 85 % of projects over period 2007–2012.
- Cost considerations provide a different picture from prevalence of the relative ranking of occupational injuries and diseases.
- The most studied occupational diseases are cancer (29%) and asthma (14%).
- Epidemiology designs and exposure assessment studies account for more than 56 % of projects.

## 13. Conclusions

Elke Schneider of EU-OSHA concluded the seminar by summarising the main findings and highlighting the important issues. The seminar had figured under the heading 'prevention', and so addressed measures for better prevention, and the over-arching theme 'work-related diseases', and thus looked at the need for an evidence base on the contribution of work to ill-health. Some tools were presented in this workshop for both the improvement of the evidence base and better prevention at workplace level. It was also important to include the statements of major stakeholders and organisations active in the field.

Some points highlighted were:

- A new paradigm of prevention is required, one that focuses on work-related diseases and not only on occupational injuries.
- The prevention of occupational diseases and work-related ill-health is a major challenge in all countries. Official data/information is quite limited, particularly in developing countries.
- Recognition, prevention and treatment of both occupational diseases and accidents, as well as the improvement of recording and notification systems, are high priorities for improving the health of both individuals and the societies they live in. This can be achieved only by building national capacity.
- While the variety of work-related diseases in Europe and the rest of the world has not changed, and diseases such as hearing loss, skin diseases and respiratory disorders are still important factors, mental health disorders linked to stress at work, incidents linked to violence and musculoskeletal disorders are emerging issues all over the world.
- When addressing trends in work-related ill-health, not only the classical and well-defined lists of occupational diseases are to be considered; a much larger category of work-related illness, including neurological, musculoskeletal and mental disorders, must be taken into account. This category is currently poorly defined. A validated consensus on a methodology to measure these trends is needed.
- The distinction between accidents and diseases is not clear-cut. Suicide and sudden cardiovascular events (stroke) are recognised as occupational accidents in some Member States. This is why integrated recording systems recording both accidents and diseases are needed.
- According to studies on the global burden of disease, the rising burdens of mental and behavioural disorders, MSDs and diabetes will introduce new challenges for health systems and preventive capacity. There is growing evidence for the link between stress and MSDs.
- Some Member States (for example Austria, Belgium, Denmark, Germany, Hungary, Italy and Romania) have responded to these challenges by putting in place OSH regulations or initiating major action to address work-related mental health.
- Research on the burden of work-related diseases in Europe and Canada has focused mainly on some cancers and respiratory disease, and on a restricted list of factors, mainly because of the solid knowledge base on exposures leading to these diseases. Other instruments for the identification of health problems at work should be explored, as there is a need to complement the exposure–disease model with a model focusing on occupation/task and health outcome. Exposure profiles of specific occupations could be linked to data from disease registers and surveys to assess the probable burden of disease. This would also support finding the causal links between circumstances and exposures and the onset of disease.
- For the purpose of identifying long-term health effects and links to work, more diverse data sources should be explored and analysed together, including surveys, national health registers, social security data, and data on compensation payments for severe and chronic illnesses, prescriptions for medicines, rehabilitation granted, sickness absence registers and related diagnoses, early retirement and related diagnoses, and overall and cause-specific mortality, data from cancer registries on dates of cancer morbidity and related diagnoses, data from hospital discharge registers on hospitalisations and related diagnoses, data on work histories linked to employers' data on job contracts, and data on workplace characteristics. Job-exposure matrices including estimates of the prevalence and level of exposure by specific occupation could also be helpful for directing and prioritising preventive activities.
- Sentinel systems can help to identify cause–effect relationships previously unknown and raise awareness of emerging issues. The application of a diseases-first approach, complementary to the risks-first approach followed, for example, by EU-OSHA's European Risk Observatory (a priori risks identified by expert focus) contributes to the identification of emerging issues or issues previously not addressed. Attempts should be made and reinforced to promote exchange of information on sentinel cases across borders to reinforce the evidence base and support validation. This would also help in shortening the time between identification of an issue and effective prevention.

- Prospective studies based on present exposures and scenario-building studies that explore the options for prevention and their effects on the burden of disease could help to target and support prevention. An example is the study by Rushton et al. on the impact of prevention measures such as limitation of exposure to shift work to reduce the number of breast cancer cases. HSE is also currently working with Oxford University on practical guidance to reduce shift work. OCRC in Canada has published a short fact sheet on shift work.
- However, to carry out prospective studies, exposure information is needed, and it should also be collected on exposures related to emerging issues, such as mental health issues, multiple exposures to chemicals and biological agents, work organisational factors and ergonomic risks, and the links between these factors.
- Studies on recognition systems of occupational diseases and on recorded injuries from Europe and Canada demonstrate that their purpose is rarely to guide prevention. Research is often focused on exposure assessment and epidemiology, and it rarely addresses evidence-based prevention.
- Prevention actions in workplaces, while contributing to the reduction of disease, are rarely conducted with the express aim of reduction or prevention of disease. This is confirmed by research conducted by the European Commission that analysed the existing systems for registration and compensation of occupational diseases and found that the lists are rarely used to guide prevention, and by a benchmarking exercise carried out by the ACSH (Scoreboard 2009<sup>(53)</sup>), based on a survey among Member States.
- The studies also demonstrate that when prevention campaigns or other actions are taken, they are rarely assessed for their potential effects on reducing the burden of disease. The United K example of assessment and tailoring of asbestos campaigns could serve as a good practice example to guide other similar approaches.
- Likewise, the research and communication and promotion priorities of research institutes and OSH information providers and collectors rarely focus on knowledge transfer for the prevention of diseases.
- Research on the burden of disease and efforts on prevention of ill-health at work need to give more consideration to the needs and circumstances of a diverse workforce, addressing the gender and age dimensions and the importance of cumulated risk from work and non-work exposure. The concept of workplace hazard needs to be refocused to include work organisational factors, the increasingly varied exposure history of workers with subcontracting and frequent job changes and the socioeconomic status of workers. Otherwise, the root causes of some work-related health problems will not be tackled effectively.
- Awareness raising on all these among decision makers and other actors in the field of OSH is needed.

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<sup>(53)</sup> Advisory Committee on Health and Safety at Work Scoreboard - Executive Summary (2010), Available at: <http://ec.europa.eu/social/BlobServlet?docId=4671&langId=en>

What is needed:

- Improved statistical data collection and epidemiological research, as well as better estimation methods, to provide better evidence and allow the development of new monitoring tools. Data on recognised diseases are also needed.
- Information on the benefits of OSH action and long-term evaluation of actions.
- Knowledge transfer from assessment of exposures and effects on health to prevention at workplace level.
- Targeted prevention supported by:
  - systems to identify case studies of health problems and target prevention;
  - evaluation of prevention schemes and campaigns;
  - long-term evaluation of policies, e.g. noise reduction;
  - specific actions for the reduction of health problems, e.g. voice disorders; and
  - early assessment of health problems linked to new types of jobs (e.g. green jobs, call centres, home care, etc.).
- Better use of existing tools: job-exposure matrices and analysis of hospitalisation, disease and death registers.
- Linking occupations to specific health problems to identify 'hidden' causes and interaction between risk factors.
- Better awareness at enterprise level.
- Empowerment of workers.
- Coverage by preventive services.
- Cooperation between actors in different policy fields.