OCCUPATIONAL SAFETY AND HEALTH
INNOVATIONS AND PEROSH

Nancy, 29 March 2017
Innovation technologique changements organisationnels. Quels enjeux pour la prévention?

Dietmar Reinert, Chairman of PEROSH
PEROSH INTRODUCTION

Founded in 2003 in Rome the network has expanded over nearly 15 years now.


13 member institutions from 12 European countries = large pool of European OSH experts > 2000

Main objectives of the partnership:

- Strengthen cooperation on OSH research and accelerate the generation of knowledge in key areas of OSH (8 joint research projects)

- Disseminate new findings on OSH issues and act as an EU ‘think tank’
Steering Committee
Chair: Dietmar Reinert
(DGUV-IFA, D)
Vice-chair: Paulien Bongers (TNO, NL)
Institutes’ Directors General

Executive Committee
Chair, vice-chair, scientific chair, manager international affairs

Scientific Steering Group
Chair: Mary Trainor (HSL, UK)
Institutes’ Scientific Directors

Project Leaders and Project Members

Perosh Manager International Affairs
Jan Michiel Meeuwsen
Who we are...

- Executive Committee
- Coordinator

Project leaders

SC and SSG
PEROSH JOINT RESEARCH PROJECTS- CLOSED

Survey development & cross culture methodology

Nanodustiness

Clearing house OSH evidence

Zero accident vision

Ageing workforce

Respiratory protective devices

NANoREG

Occupational respiratory diseases

Click on hyperlinks to access PEROSH website
PEROSH JOINT RESEARCH PROJECTS - ONGOING

Comparative review physical working conditions in EU surveys

Dose-Response Relationships

UV indirect

FUTURES

Well being and work

Procedures to measure physical activity and workload

Nano Exposure & Contextual Information database (NECID)

Ambient intelligence for OSH in smart factories

Click on hyperlinks to access PEROSH website
CLEARING HOUSE OSH EVIDENCE

Aim:
To promote the use of evidence through high quality systematic reviews. Done by collecting systematic reviews on occupational health topics and exchanging experiences on any aspect of systematic reviews.

Methods:
In order to assess the quality of the systematic reviews selected from literature searches, a grading system was developed. The OSH Evidence working group took standard checklists used in evidence based medicine and adapted them for usage for systematic reviews in OSH. The checklists used for OSH Evidence are: R-AMSTAR and SIGN

Results:
The OSH Evidence working group developed a database for easy access to systematic reviews on topics in occupational safety and health. The topics were defined as research questions ( e.g. „Do occupational risks lead to the carpal tunnel syndrome?“) and the referring systematic reviews were searched and graded according to the quality assessment in the method paper. Systematic reviews on 27 topics were collected and are presented in the database.

CLEARING HOUSE OSH EVIDENCE

OSH EVIDENCE DATABASE of Systematic Reviews

Here you can find answers to your question by type of question (intervention, etiology etc), type of worker involved, type of intervention or exposure or type of outcome involved. By clicking on the number of reviews you get access to the full references and documentation.

<table>
<thead>
<tr>
<th>Question</th>
<th>Question Type</th>
<th>Type of workers</th>
<th>Intervention</th>
<th>Exposure</th>
<th>Prog.</th>
<th>Outcome</th>
<th>Reviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>What factors predict prognosis of sick leave in workers with musculoskeletal disorders?</td>
<td>Prognosis</td>
<td>Musculoskeletal Disorders</td>
<td>Any</td>
<td>Sick Leave</td>
<td>13 reviews</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What are the effects of telework on employee’s well-being and health?</td>
<td>Etiology</td>
<td>Teleworkers</td>
<td>Telework related exposures</td>
<td>Any health problems</td>
<td>2 reviews</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do economic incentives prolong the working life of ageing workers?</td>
<td>Intervention</td>
<td>Ageing workers (55+)</td>
<td>Economic incentives</td>
<td>Early retirement</td>
<td>0 review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is ventilation effective in reducing nanoparticles?</td>
<td>Intervention</td>
<td>Workplaces with nanoparticles</td>
<td>Ventilation devices</td>
<td>Exposure to nanoparticles</td>
<td>0 review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To what extent differs the risk of employed persons with a mainly sedentary gainful employment from a mainly non-sedentary gainful employment to suffer from low back pain?</td>
<td>Intervention</td>
<td>Working population with sedentary work</td>
<td>Mainly sedentary gainful employment</td>
<td>Low back pain</td>
<td>5 reviews</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PROMOTION OF ZERO ACCIDENT VISION

Aim:
Identify success factors that contribute to accident prevention of ZAV committed companies – including good practices and success stories. Focus on ZAV commitment, Safety communication, Safety culture and Safety learning.

Mixed Methods:
- **Survey (27 companies)**
  - N = 8,819
  - 13 Manufacturing
  - 7 Construction
  - 7 Other
  - 30% Managers / supervisors
  - 66% Workers
- **Interviews (24 companies)**
  - HSE
  - Team leader
  - worker, etc
- **Workshops (7 countries, 23 companies)**
  - NL, FI, DK
  - UK, PL,
  - DE, BE

Results:
Managers answered more positive.
GOOD PRACTICES

Commitment:
- Integrate ZAV into the global (safety) policy and strategy
- Create synergies of ZAV with other zero commitments
- Make safety an explicit, positive part of company mission, strategy & values
- Formulate and share a few guiding safety principles

Culture:
- Stimulate and empower people to take care of their own safety (responsibility)
- Empower 1st-line managers: visible leadership (examples), safety decisions
- Improve knowledge and skills → responsibility, empowerment
- Make sure people feel free to discuss safety, also with their superiors
Aim: To establish a database on occupational exposure to manufactured nanoparticles. The goal of the development of an exposure database on nano-objects is to permit the systematic and uniform documentation of operating, exposure and measured data so that they are available for research, exposure modelling and exposure scenario building.

Methods:
A consensus on data collection, analyses, and interpretation was developed. The contents of the database is based on future modelling options, the consistency is checked. The structure of the database depends both on the conditions related to the intended use, e.g. modeling, and the structure of existing (exposure) databases e.g. the IFA –database (MEGA), the INRS database (COLCHIC), the TNO database (STEAMbase), the NIOSH exposure data base etc.

Results: The database provides a general overview of occupational exposure levels of nanomaterials in different exposure situations, and
- is a key tool for building exposure scenarios and future exposure modeling.
- provides an ideal source of information for risk management, and development of occupational exposure benchmark levels/limits
- contributes to an improved and harmonized quantification of exposures assessment and encourage new measurements.
## Description

**Activity kind:** ENM  (No nano activity)

**Description activity:** TiO2 Production

**Time start:** 12.00.2017 09:30.00  
**Time stop:** 12.00.2017 17:00.00  
**Activity duration:** 07:30.00

**Total activity duration in shift:** 7 hours

**Use of ENM:** Commercial production of ENM

## Classification

**Activity code:** 1.01  
Point source or fugitive emission during the production phase (synthesis)

**Flame pyrolysis**

**Physical state:**

## Work and process

**Distance source to worker:** 3 m

**Automation level:** Automatic

**Working pattern:** Only manual

**Process temperature:** 850 °C

## Exposure

**Exposure pattern:** Continuous

**Exposure situation:** Normal

## Remarks

## List of activity

<table>
<thead>
<tr>
<th>Index</th>
<th>Activity kind</th>
<th>Activity code</th>
<th>Time start</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ENM</td>
<td>Flame pyrolysis</td>
<td>12.09.2017 09:30.00</td>
</tr>
<tr>
<td>2</td>
<td>ENM</td>
<td>Vacuum transfer of powders or granules</td>
<td>12.09.2017 10:00.00</td>
</tr>
<tr>
<td>3</td>
<td>ENM</td>
<td>Movement and agitation of powders or granules</td>
<td>12.09.2017 10:00.00</td>
</tr>
</tbody>
</table>

## List of Samples

<table>
<thead>
<tr>
<th>Index</th>
<th>Device No.</th>
<th>Sampling ID</th>
<th>Measure Point</th>
<th>Start</th>
<th>Stop</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Grimm SMPS</td>
<td>SMPS 001</td>
<td>Reactor</td>
<td>12.09.2014 12:00.00</td>
<td>12.09.2014 16:00.00</td>
</tr>
<tr>
<td>2</td>
<td>Grimm CPC 5.403</td>
<td>CPC 001</td>
<td>Reactor</td>
<td>12.09.2014 12:00.00</td>
<td>12.09.2014 16:00.00</td>
</tr>
<tr>
<td>3</td>
<td>DigiCrini</td>
<td>DigiCrini 001</td>
<td>reactor worker 001</td>
<td>12.09.2014 12:00.00</td>
<td>12.09.2014 16:00.00</td>
</tr>
</tbody>
</table>
WELLBEING AND WORK

Aim:
The project aims at developing a common understanding of wellbeing and the drivers for wellbeing research and interventions in the different countries, including the identification of similarities and differences between each country.

Methods:
In order to develop a consensus view between the PEROSH member institutes in relation to various aspects of well being at work, a Delphi exercise was carried out. An employer-focused ‘model’ for understanding well being was developed in order to capture a shared understanding of what wellbeing means. Case studies have also been collated as a way of boosting the business case for wellbeing and the development of an international wellbeing indicator tool.

Results:
One solution might be to find more innovative ways of communicating to employers what wellbeing at work really encompasses, where they should target their efforts, and why it should matter to them. With this in mind, the 'Wellbeing Tree', an interactive tool that helps employers visualize the different factors that feed into workplace wellbeing. Details are at: http://www.perosh.eu/research-projects/perosh-projects/well-being-and-work/
PHYSICAL ACTIVITY AND WORKLOAD

Aim:
There is a great need for technical measurement system capable of providing valid information of physical workplace exposure or physical activity patterns which later can be applied in larger epidemiological studies.

Methods:
Different technical measurement systems are compared and they are classified. A consensus will be developed on the critical exposure variables and physical activity patterns that needs to be addressed in comprehensive measurement systems and different technical measurement devices and modelling approaches required for an optimal assessment of all relevant exposures or risk factors. Gaps in current technology are identified and the development and validation of identified technological measurement devices and coordinated activities between the research institutes are initiated.

Results:
Comparison or merging of data on validity of physical exposure measurements between the countries (multi-center studies and meta-analysis)
Grant applications for large multi-center studies examining the association between valid (measurement based) physical exposure assessment data and selected health- and work-related outcomes.

<table>
<thead>
<tr>
<th>Cat 1</th>
<th>Small commercial systems, easy mounting at one body part (e. g. wrist, hip, ankle), very high wearing comfort.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat 2</td>
<td>Commercial functional wear, more complex, but still high wearing comfort</td>
</tr>
<tr>
<td>Cat 3</td>
<td>Scientific systems, multi-sensor systems covering all essential body parts</td>
</tr>
</tbody>
</table>
The PEROSH group has identified **7 key OSH challenges** to work on (2012 publication):

1. **Sustainable employability** to prolong working life
2. **Disability prevention and reintegration**
3. **Psychosocial well-being** in a sustainable working organisation
4. **Multifactoral genesis of work-related musculoskeletal disorders (MSDs)**
5. **New technologies** as a field of action for OSH
6. **Occupational risks related to engineered nanomaterials**
7. **Safety culture** to prevent occupational accidents
3 position papers to issue future OSH research challenges into European research agenda and programmes (2014):

1. Challenge of Europe in a changing world – inclusive, innovative and reflective societies → The changing world of OSH.
2. Leadership in Enabling and Industrial Technologies → Prevention through design.
3. Health, Demographic Change and Wellbeing → OSH in the context of demographic change.

FUTURE OSH TRENDS & RESEARCH AREAS 3

‘Futures’ PEROSOH collaboration project (2016):

- **General objective**: provide a shared knowledge framework to define appropriate and reliable forecasting scenarios related to 4 priority areas
- **A forecasting exercise**: modified Delphi technique, based on a **two rounds** survey of experts selected by each participating institute **for each of the four macro-areas**
- **Number experts involved**: 126 across all institutes; Response rate 76,2% (n.96)

<table>
<thead>
<tr>
<th>Questionnaires</th>
<th>Sent</th>
<th>Returned</th>
<th>%</th>
<th>number of priorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 - Demographic change - sustainable work for healthier and longer working lives</td>
<td>35</td>
<td>29</td>
<td>82,9</td>
<td>104</td>
</tr>
<tr>
<td>Q2 - Globalization and the changing world of work - OSH research contribution to sustainable and inclusive growth</td>
<td>26</td>
<td>20</td>
<td>76,9</td>
<td>72</td>
</tr>
<tr>
<td>Q3 - OSH research for safe new technologies as a prerequisite for sustainable growth</td>
<td>32</td>
<td>21</td>
<td>65,6</td>
<td>83</td>
</tr>
<tr>
<td>Q4 - Research into new or increasing occupational exposures to chemical and biological agents for the benefit of a smart and sustainable economy</td>
<td>33</td>
<td>26</td>
<td>78,8</td>
<td>101</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>126</td>
<td>96</td>
<td>76,2</td>
<td>360</td>
</tr>
</tbody>
</table>
### Top ten research topics

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects of working-time flexibilisation on health, wellbeing and productivity</td>
<td></td>
</tr>
<tr>
<td>Impact of prolonged precariousness on health of ageing workforce</td>
<td></td>
</tr>
<tr>
<td>Improve risk assessment for workers exposed to nanomaterials</td>
<td></td>
</tr>
<tr>
<td>Develop regulations, guidelines and good practices for safe nano handling</td>
<td></td>
</tr>
<tr>
<td>Investigate ways and tools to prevent disability and to facilitate RTW</td>
<td></td>
</tr>
<tr>
<td>OSH management in new forms of employment (crowdsourcing, zero hours contracts, internships)</td>
<td></td>
</tr>
<tr>
<td>Identify potential impacts of work organisation and job design of older workers’ H&amp;S and ways in which these can support individual workers health</td>
<td></td>
</tr>
<tr>
<td>Develop standardised sampling and measurement methods for nanos</td>
<td></td>
</tr>
<tr>
<td>Understand H&amp;S effects of precarious work and job insecurity</td>
<td></td>
</tr>
<tr>
<td>Define OELs for nanomaterials</td>
<td></td>
</tr>
</tbody>
</table>

SUSTAINABLE WORK IN HORIZON 2020

Together with the Advocacy Platform for Sustainable Work as a Resource for Health, Innovation and growth in Horizon 2020 we proposed four major research topics:

- **Novel technologies** and sustainable work.
- Workplace **health strategies** for sustainable and inclusive growth.
- Sustainable work and the **increasing work force diversity**.
- **Integrated health and safety concepts** for large infrastructure projects and new working environments.
PEROSH SUPPORTS NEW RESEARCH

- PEROSH supported topics for new Working Program (2018-2020) HORIZON 2020 through 8 NCP’s
- In general we asked for more attention to work and health in Societal Challenge (SC) 1 and 6
- More specific support under SC 1 was given to:
  - Endocrine disruptors (EDs)
  - Mental health in the workplace
  - The Human Exposome Project: PEROSH argued that in the scope of this topic also the impact of the working environment should be included
- More specific support under SC 6 was given to:
  - Migration, labour market diversity and sustainable work
  - Novel technology and sustainable work
MORE INFORMATION ABOUT PEROSH

Have a look at what we do 😊
Email: janmichiel.meeuwsen@perosh.eu

- PEROSH website & newsletter: http://www.perosh.eu
- Social media: Twitter @Perosh_EU, LinkedIn group PEROSH
- Research challenges publication & position papers: