Healthy Workplaces Campaign 2018-19

Manage dangerous substances in the workplace
HWC Summit 2019 Bilbao
Development of exposures at European work places in the past 10 years and prospects for the future

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Background

Monitoring/surveillance of trends in exposure

- Allows identification of emerging issues (early warning)
- Assists making of (informed) decisions
- Better planning and policy development
- Increased effectiveness of (targeted) interventions

A very important process, but is it possible?
Background

Study aims:

- Develop and pilot a scientific method that may be utilised to assess and monitor trends in exposure to dangerous substances (DS) in EU workplaces.

- Use the methodology to identify the DS and related industrial sectors that are of greatest concern regarding the exposure and health protection of workers at present.
There is a breadth of “public” data available (EU/country level)

Some examples:

- Employment and business characteristics
  - European Working Conditions Survey (EWCS)
  - Structural business statistics (SBS)
  - Joint Forest Sector Questionnaire (JFSQ)
  - Labour Force Survey (LFS)

- Substance attributes
  - ECHA list of registered substances
  - Classification and Labelling Inventory (CLP)

- Substance and article use characteristics
  - Downstream: Substances in Preparations in Nordic Countries (SPIN) database
  - Upstream: The PRODuCtion Of Manufactured goods (PRODCOM) database
Information sources (2)

Substances in Preparations in Nordic Countries (SPIN) database

ECHA list of registered substances and Classification, Labelling and Packaging (CLP) inventory

EU employment databases

PRODuCtion Of Manufactured goods (PRODCOM) database

European Working Conditions Survey (EWCS) database

Data linkage:

- Occupation/industry code (ISCO or NACE)
- Substance identification number (CAS no)
Working methodology

- Identifying industries where exposure to DS is relevant
- Selecting industries based on size and EU presence
- Identifying DS relevant for each of the selected industries
- Identifying DS with production/use data
- Rating identified DS based on importance, identifying substances missing from lists
- Selecting the most important DS within industries

Working step

ST1

Criteria for rating:

- **Population**: the number of workers potentially exposed within the specific industry
- **Exposure**: the likelihood of exposure occurring during use/processing within industry
- **Health and socioeconomic impact**: the impact of exposure on the health, working and social life of the worker

ST2

- 3 experts involved
- 1-3 scale system (3 indicating highest importance)

ST3

ST4

ST5

ST6

ST7

ST8
### Results: Industries were exposure is relevant

- **EWCS analysis:** 33 industries with >30% of workers reporting exposure

<table>
<thead>
<tr>
<th>Industry</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forestry and logging</td>
<td>Manufacture of furniture</td>
</tr>
<tr>
<td>Other mining and quarrying</td>
<td>Repair and installation of machinery &amp; equipment</td>
</tr>
<tr>
<td>Manufacture of leather and related products</td>
<td>Waste collection, treatment &amp; disposal</td>
</tr>
<tr>
<td>Manufacture of wood products except furniture</td>
<td>Construction of buildings</td>
</tr>
<tr>
<td>Printing and reproduction media</td>
<td>Civil engineering</td>
</tr>
<tr>
<td>Manufacture of coke and refined petroleum products</td>
<td>Specialised construction activities</td>
</tr>
<tr>
<td>Manufacture of chemicals</td>
<td>Trade and repair of motor vehicles</td>
</tr>
<tr>
<td>Manufacture of rubber and plastic</td>
<td>Water transport</td>
</tr>
<tr>
<td>Manufacture of non-metallic mineral products</td>
<td>Veterinary activities</td>
</tr>
<tr>
<td>Manufacture of basic metals</td>
<td>Services to buildings and landscape</td>
</tr>
<tr>
<td>Manufacture of fabricated metal products</td>
<td>Human health activities</td>
</tr>
<tr>
<td>Manufacture of machinery and equipment</td>
<td>Residential care activities</td>
</tr>
<tr>
<td>Manufacture of other transport equipment</td>
<td>Other personal service activities</td>
</tr>
</tbody>
</table>

- Present in ≤14 of the EU countries
- Total EU workforce ≤100,000 persons
- In decline within EU (e.g. coal mining)
- Heavily regulated (e.g. manufacture of pharmaceutical products)

**26 industries were included in the next step**
Results: Relevant DS for each industry selected (ST3/ST4)

DS with data available
- 2820 entries across 24 industries

DS identified by experts and the literature
- 24 entries across 10 industries

Final list contained:
- 319 entries across all 26 industries
- 40% of entries in manufacture of chemicals and/or trade and repair of motor vehicles divisions
- 142 individual DS

Substances excluded if:
- Not present in ≥ 3 countries
- Total volume of use was 0 (i.e. ≤100 kg) for all countries
### Expert rating results

<table>
<thead>
<tr>
<th>Overall expert score</th>
<th>Number of DS/industry combinations</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>120</td>
<td>37</td>
</tr>
<tr>
<td>4</td>
<td>34</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>50</td>
<td>16</td>
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<td>6</td>
<td>74</td>
<td>23</td>
</tr>
<tr>
<td>7</td>
<td>22</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>319</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

- OSI ≥ 6 = 115 combinations, 68 individual DS
Results: Identifying and selecting the DS of outmost importance (1)

- 15 unique DS (19 combinations) with an OSI ≥8

<table>
<thead>
<tr>
<th>Classification</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy metals – i.e. cadmium, chromium, lead, arsenic etc</td>
<td>Microbial cell wall agents, mostly endotoxins</td>
</tr>
<tr>
<td>Pesticides and fungicides</td>
<td>Solvents</td>
</tr>
<tr>
<td>Wood dust</td>
<td>3-Isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate, oligomers</td>
</tr>
<tr>
<td>Asbestos</td>
<td>Stoddard solvent</td>
</tr>
<tr>
<td>Mineral dust containing crystalline silica (or Quartz)</td>
<td>Sulphuric acid</td>
</tr>
<tr>
<td>Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated</td>
<td>Allergens incl. animal allergens</td>
</tr>
<tr>
<td>Nickel</td>
<td>Ammonia, aqueous solution</td>
</tr>
<tr>
<td>Fungi and fungal spores</td>
<td></td>
</tr>
</tbody>
</table>
Experts - five proposals for utmost important DS:

1. Asbestos (intentional and accidental exposure) in construction
2. Crystalline silica (Quartz) in construction, mining, and manufacturing industries
3. Non-infectious biological agents, particularly microbial cell wall and fungal agents, in the waste industry or more widely
4. Solvents in the printing industry and in a broader perspective
5. Wood dust in forestry, construction, and furniture industries
Results: Identifying and selecting the DS of outmost importance (3)

Crystalline silica in construction, mining, and manufacturing

- No EU occupational exposure limit (OEL) values in place (currently)
- Cross-industry issue
- SHECAN study results
  - ~5,300,000 workers exposed in 2006
  - >5000 annual deaths attributed to OE
- Construction not part in European Network for Silica

Non-infectious biological agents in the waste industry, or more widely

- No OEL values in place
- Agents with strong pro-inflammatory / allergenic potential
- Large socioeconomic impact
- Exposure is difficult to control
- Recycling – a new industry in constant growth

www.healthy-workplaces.eu
Crystalline silica in construction, mining, and manufacturing

Employment data for Europe

Usage data for Quartz in Nordic countries

Source of data: Structural business statistics (SBS)

Source of data: Substances in Preparations in Nordic countries (SPIN)

Results: Identifying and selecting the DS of outmost importance (5)

Crystalline silica in construction, mining, and manufacturing

Employment data for Europe

Non-infectious biological agents in the waste industry, or more widely

Employment data for Europe

Source of data: Structural business statistics (SBS)

Discussion

- Several limitations
  - Mainly Nordic data used
  - Data do not cover process generated
  - Short follow-up period (<10 years)
  - Strict selection criteria
  - Only UK based experts

- Developed methods can be further tailored and improved
Conclusions

- Yes, monitoring/surveillance of trends in exposure to dangerous substance in EU workplaces is possible

- The established methodology can form basis for establishing of a more permanent surveillance system concerning developments in exposure to DS within the EU
Acknowledgments

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Thank You!