Healthy Workplaces Campaign 2018-19

Manage dangerous substances in the workplace
HWC Summit 2019 Bilbao

European Agency for Safety and Health at Work

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Development of exposures at European work places in the past 10 years and prospects for the future

Dr Ioannis Basinas

Senior Scientist

Institute of Occupational Medicine (IOM), UK

Email: Ioannis.basinas@iom-world.org

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Safety and health at work is everyone's concern. It's good for you. It's good for business.

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

Information sources (1)

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

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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

Project database

Experts
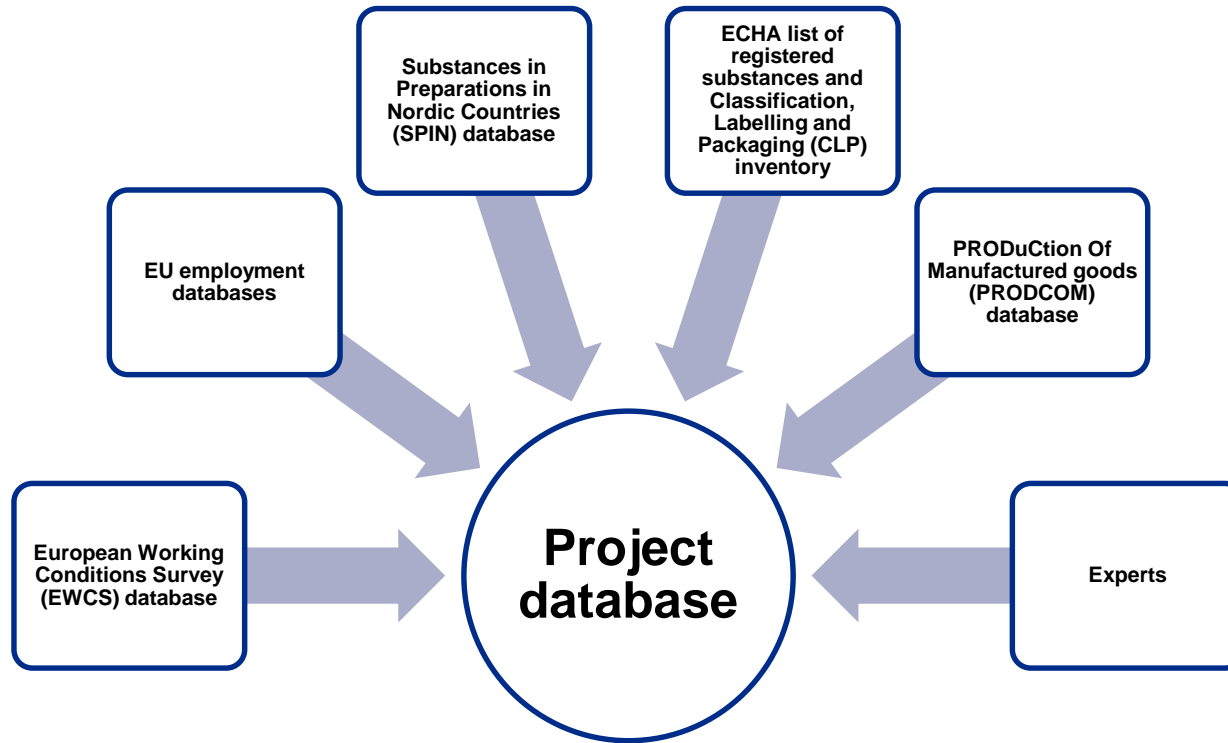
Data linkage:

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

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Working methodology

Flow	Description	Working step
EWCS database	Identifying industries where exposure to DS is relevant	**ST1**
EU employment databases	Selecting industries based on size and EU presence	**ST2**
ECHA list / CLP inventory	Identifying DS relevant for each of the selected industries	**ST3**
PRODCOM database ↔ SPIN database	Identifying DS with production / use data	**ST4**
Experts	Rating identified DS based on importance identifying substances missing from lists	**ST5**
Experts	Selecting the most important DS within industries	**ST6**

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

- **3 experts involved**
- **1-3 scale system (3 indicating highest importance)**
- **Overall score of importance (OSI) calculated**

Results: Industries were exposure is relevant

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

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

Excluded

- 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

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Results: Relevant DS for each industry selected (ST3/ST4)

Excluded

DS with data available

- 2820 entries across 24 industries

DS identified by experts and the literature

- 24 entries across 10 industries

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

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

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Results: Rating and selecting DS based on importance (ST5)

- **Expert rating results**

Overall expert score	Number of DS/industry combinations	%
3	120	37
4	34	11
5	50	16
6	74	23
7	22	7
8	10	3
9	9	3
Total	319	100

- 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

Heavy metals – i.e. cadmium, chromium, lead, arsenic etc	Microbial cell wall agents, mostly endotoxins
Pesticides and fungicides	Solvents
Wood dust	3-Isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate, oligomers
Asbestos	Stoddard solvent
Mineral dust containing crystalline silica (or Quartz)	Sulphuric acid
Lubricating oils (petroleum), C24-50, solvent-extd., dewaxed, hydrogenated	Allergens incl. animal allergens
Nickel	Ammonia, aqueous solution
Fungi and fungal spores	

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Results: Identifying and selecting the DS of outmost importance (2)

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

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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
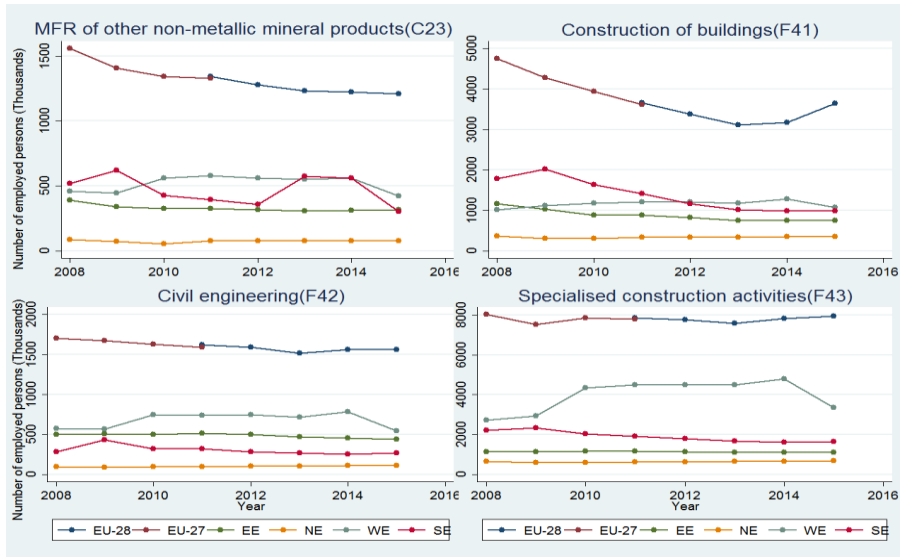- Construction not part in European Network for Silica

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

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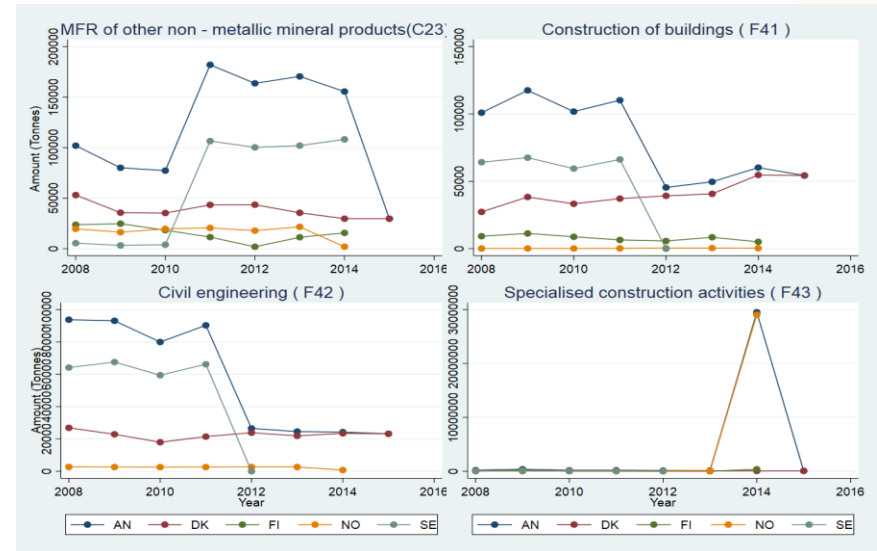
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Crystalline silica in construction, mining, and manufacturing

Employment data for Europe

Source of data: Structural business statistics (SBS)

### Usage data for Quartz in Nordic countries

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

https://oshwiki.eu/wiki/Developing_a_data-driven_method_for_assessing_and_monitoring_exposure_to_dangerous_substances_in_EU_workplaces

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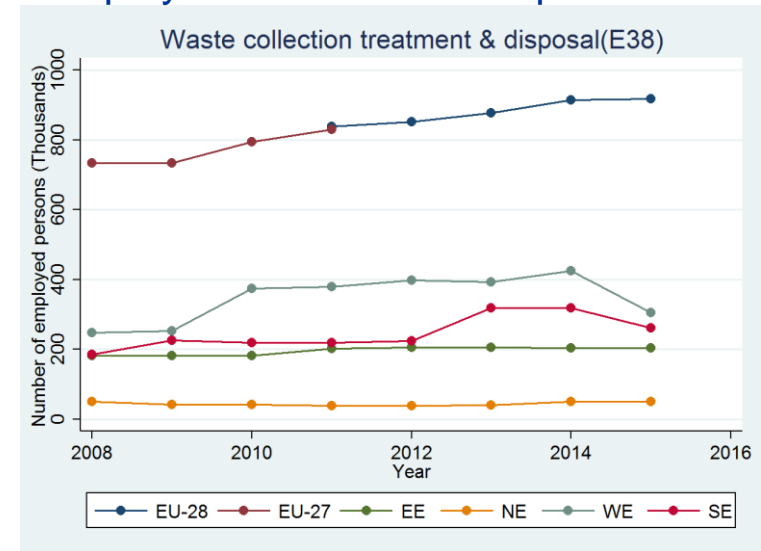**Crystalline silica in construction, mining, and manufacturing**

Employment data for Europe
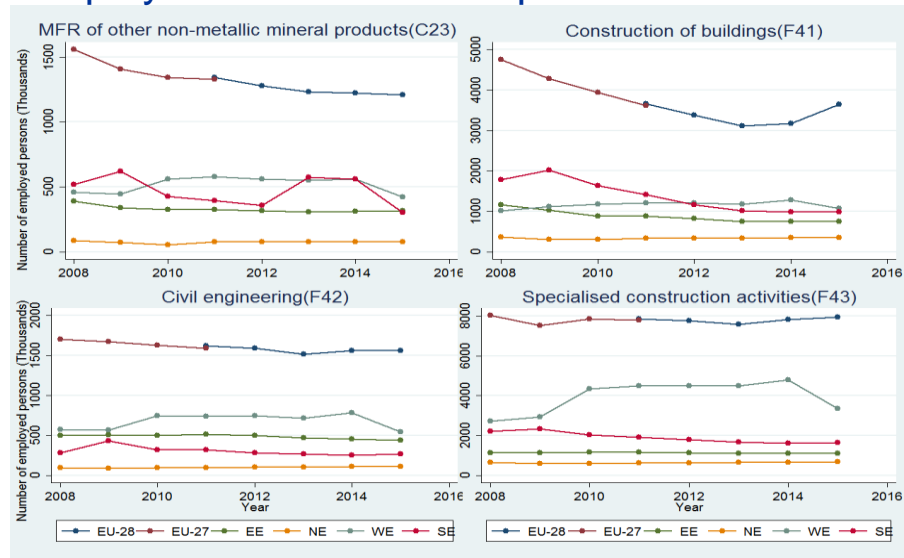
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Discussion

- 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

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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

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Thank You!

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