Methodologies to identify work-related diseases: Review on sentinel and alert approaches

Drivers and obstacles, recommendations

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<th>Drivers / obstacles</th>
<th>Recommendations</th>
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<td><strong>Visibility of the system:</strong> some systems are poorly described in the literature</td>
<td>• Raise awareness about the existence of the system</td>
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<td>• Publish results derived from the system</td>
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<td>• Share success stories, make the “business case”</td>
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<td><strong>Motivation of reporting parties:</strong> difficulties in engaging physicians to report</td>
<td>• Simplification/automation of reporting</td>
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<td>• Two-way communication and feedback</td>
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<td>• Legal obligation</td>
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<td>• Provide a reward for reporting</td>
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<td><strong>Exposure assessment:</strong> lack of adequate exposure assessment seen as one of the</td>
<td>• Include exposure description in reporting</td>
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<td>• Exposure assessment during the evaluation procedure of reported cases</td>
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<td>• Use tools for more standardized reporting of exposure (such as hierarchical</td>
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<td>codes for all types of exposures)</td>
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<td><strong>Standardization and quality control:</strong> important for data quality improvement,</td>
<td>• Clear case definitions,</td>
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<td>• Sensitivity versus specificity</td>
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<td>• Clear coding system,</td>
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<td>• Training and guiding in coding,</td>
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# DRIVERS AND OBSTACLES OF THE SYSTEMS

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<th>Drivers / Obstacles</th>
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| **Awareness and detection on new/emerging WRDs:** one of the main conditions for capturing new WRDs is that the reporting parties who can identify them and experts who assess work-relatedness are aware of these diseases and reporting lines are clear | • Raise awareness and expertise  
• Publish on new/emerging health risks  
• Offer expert help with establishing work-relatedness  
• Low reporting threshold  
• Data mining in existing databases                                                                 |
| **Different levels of links with prevention:** prevention can be established at several different levels, which involves different groups of stakeholders and could be linked to the typology of the systems | • Collaboration with governmental bodies  
• Contact with companies/sectors/ workers’representatives/labour inspectorate  
• Follow-up and follow-back activities  
• Enable link with policies                                                                 |
| **Financial support and resources:** stable, long-term funding is crucial for maintenance of a system; linked to the issue of human resources and data quality; depends on the level of significance given to OSH by the government | • Raise awareness,  
• Publish case reports in journals  
• Constantly demonstrate the significance of the work performed by these systems,  
• Develop smaller projects that target specific areas of OSH |
RECOMMENDATIONS FOR IMPROVEMENT OF SENTINEL SURVEILLANCE IN THE EU – GENERAL RECOMMENDATIONS

- **Implementation** of sentinel and alert systems in Member States:

  1) **De novo** development of a sentinel system designed specifically to detect new/emerging work-related diseases;
  2) **Integration** of a sentinel aspect into an existing system, primarily designed for other purposes (e.g. compensation, statistic, public health surveillance).

- **In countries where these systems already exist:**

  **Improvement** of their sentinel function;
  Provide useful tools to **enhance the quality** of the different steps in the data flow: from identification and reporting of cases to the link with prevention and policies.
Built on:

- **Thorough analysis** of a number of systems, performed in the previous phases of this project (literature review, in-depth description of good practice examples) and
- By looking upon **drivers and obstacles** of the existing systems and possible means to strengthen the drivers
- Experts’ opinion shared during the workshop organised on 18th of May 2017. During this workshop, experts from different countries discussed important features of a good sentinel system, listed stakeholders involved in different stages of development and maintenance of a sentinel system and specified their roles.

- **New concepts have been introduced:** “individual sentinel signals” and “population-based sentinel signals”
RECOMMENDATIONS FOR IMPROVEMENT OF SENTINEL SURVEILLANCE IN THE EU – GENERAL RECOMMENDATIONS

- Integrate the system into the national OH context
- Initiate actions to motivate reporters
- Use "low threshold" principle
- Consider implementation of existing approaches from other countries
- Establish collaboration with the national occupational health/public health body

CASE DESCRIPTION
- Require detailed exposure assessment while reporting
- Standardisation of coding procedure
- Implementation of coding for exposures and description of job tasks
- Perform data quality control
- Enable both access to reported case and data security

WORK-RELATEDNESS EVALUATION
- Create (multidisciplinary) team of experts who will assess reported cases
- Use statistical methods to identify new exposure-WROs correlations in specific industries
- Classify identified signal and determine the most relevant level of dissemination

SECUNDARY PREVENTION
- Perform necessary interventions and follow-up aimed towards the worker

LEVEL 2 ALERT
- Dissemination towards a larger group of experts and workplaces at risk

LEVEL 1 ALERT
- Dissemination towards a smaller number of internal experts

LEVEL 3 ALERT
- Dissemination towards national OSH and public health authorities for policy interventions

OWNERS
- Signals
- Stable funding, both-way input

RESEARCHERS
- RESEARCHERS

WORKPLACES
- Policies

PUBLIC HEALTH AUTHORITY
- OSH AUTHORITY

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SETTING UP A SENTINEL APPROACH
RECOMMENDATIONS FOR DEVELOPERS

- Clearly define the position of a system in the national OH context (organization of OH service, coverage and number of OH providers, accessibility of the OH service to different groups of workers, economic sectors and SMEs);
- Design the system in cooperation with OSH/Public health authorities and owners of other monitoring systems already in place;
- Use already tested systems from other countries with a similar organization of OH;
- Most preferably, reporters of a sentinel system should be occupational physicians they have the necessary expertise in the field of WRDs and safety at work and are more likely to be aware of new WRDs; general practitioners can be a good supporting source;
- Implement actions to motivate reporting physicians to participate and keep participating (several good examples are described);
- Balance between data quality control and a ‘low threshold’ approach;
- Too strict systematization such as clear case definition can lead to a loss of sensitivity and a risk of missing cases of new WRDs;
- When determining the most suitable approach, experts should look at the existing data sources in the country to ensure that signals provided by these systems are complementary.
SETTING UP A SENTINEL APPROACH
RECOMMENDATIONS FOR DEVELOPERS

Complementary signals are:

- ‘Individual sentinel signals’ - individual cases of new WRDs and new exposure-WRDs correlations;

  Systems designed to detect these signals capture a smaller number of cases and therefore can afford a more sensitive approach and high expertise in terms of work-relatedness evaluation (such as systems termed as ‘Sentinel systems’ in the report)

- ‘Population-based sentinel signals’ – allow to identify new exposure-WRDs links, but rely on a more comprehensive approach by focusing on identification of groups of workers or economic sectors at risk;

  These signals can be captured by different approaches (Non-compensation-based systems for data collection and statistics; survey-based Public health systems; Compensation-based systems with data mining), some of them being described in this report, and others being out of the scope of this research (epidemiological studies, occupational health surveillance)

- These two types of signals should be integrated on the national level
SETTING UP A SENTINEL APPROACH
RECOMMENDATIONS FOR DEVELOPERS

INDIVIDUAL SENTINEL SIGNALS
- Identification of individual cases of new WRDs or new exposure-WRD links

Signal strengthening

POPULATION-BASED SENTINEL SIGNALS
- Identification of specific groups of workers/economic sectors at risk
- Identification of new exposure-WRD links

WORKPLACES
PUBLIC HEALTH AUTHORITY

Non-compensation-based systems
- Public health systems with a sentinel aspect
- Compensation based systems with a sentinel aspect

Alternative approaches
- Non-compensation-based systems with a sentinel aspect

Survey-based Public health systems
- Epidemiological studies
- Compensation based systems with data mining
- Occupational health surveillance

Sentinel systems
ASSESSMENT OF THE SIGNALS
RECOMMENDATIONS FOR RESEARCHERS

 Request a clear exposure description from the reporters, by including in the reporting form the minimum of requested information necessary for establishment of exposure-WRD correlation (suspected exposure, duration of exposure, steps taken to quantify it, other possible exposures, etc.)

 Assessment of sentinel signals should be clearly structured (a clear definition of exposure variables that should be reported as well as the coding procedure)

 Nature and characteristics of certain groups of exposures and diseases make their monitoring more or less difficult (diseases related to exposure to chemical substances vs. musculoskeletal and psychosocial ill-health); the establishment of clearer assessment criteria could be of particular importance, especially in the case of work-related mental health problems, which seem to be on the increase
Signal strengthening of ‘Individual sentinel signals’

- Work-relatedness evaluation performed by (a group of) experts
- Can take place parallel to the secondary prevention (medical interventions to stop further progression of the medical condition affecting the worker whose case has been reported)
- Based on characteristics of the signals, different levels of alert should be triggered

**Level 1** is the lowest level of alert and refers to dissemination of warning towards an internal group of experts;

**Level 2** involves a wider dissemination of warning signals – possibly towards a larger group of experts or workplaces at risks;

**Level 3** refers to the highest level of alert and includes an input for occupational health and public health authorities.
ASSESSMENT OF THE CAPTURED SIGNAL
RECOMMENDATIONS FOR RESEARCHERS

Signal strengthening of
‘Population-based sentinel signals’

- No work-relatedness evaluation of individual cases
- More suitable to produce Level 2 and Level 3 of alert

**Level 2**: use the database to perform investigation on emerging work-related health risks in specific sectors/types of workplaces and prioritize preventive actions; communicate directly with workplaces in such a way that workplaces can request obtaining some specific data gathered by the systems

**Level 3**: support long-term policies and prevention plans, by identifying emerging trends in WRDs
VISIONS FOR FUTURE – DEVELOPMENT OF A EU-WIDE SENTINEL SURVEILLANCE

- Harmonisation of data on the EU level

  Development of an EU-wide sentinel system

  Establishment of better cooperation and exchange of data between the existing systems from Member States
VISIONS FOR FUTURE – DEVELOPMENT OF A EU-WIDE SENTINEL SURVEILLANCE

Benefits:

- Aid strengthening the existing sentinel systems in place or development of new sentinel approaches in the countries where such are still to be implemented:
  - Promote guidance documents on how to implement these approaches (based on the existing good practice examples);
  - Support collaboration between the national occupational health authorities and developers of systems

- Harmonisation of recorded data:
  - Implementation of a uniform thesaurus to create hierarchical codes for different types of variables (exposure);
  - Harmonization of case definitions and work-relatedness evaluation procedure
VISIONS FOR FUTURE – DEVELOPMENT OF A EU-WIDE SENTINEL SURVEILLANCE

Benefits:

- Forming a group of international experts on new/emerging WRDs, who can aid assessment of cases reported on the national level:
  - MODERNET network and OccWatch platform could be used as a starting point, and be further supported and internationalized
  - Development of an EU-wide database for reported cases
  - Particularly important for new WRDs with a small incidence (higher chances to identify similar cases on the EU level)

- Enhancement of alert function of systems:
  - Promote guidance for a systematic determination of an adequate level of alert based on reported data
  - Level 2 and Level 3 alert on the EU level: promote actions aimed at employers and workers, development of long-term policy plans
CONCLUSIONS

- No ideal surveillance system for new/emerging WRDs. Several different approaches have been described in this report and each has its strong points and disadvantages. The approach to be implemented depends on the national OH context and systems already in place.

- Some of the systems described in this report are designed to generate ‘individual sentinel signals’, i.e. individual cases of potentially new WRDs or new exposure-WRD correlations. Real sentinel systems are specifically designed to capture this type of signals (such as SIGNAAL, GAST, HHE and EpiNano)

- Alternative approaches to capture individual sentinel signals are:
  - Compensation-based systems with a sentinel aspect (SUVA)
  - Non-compensation-related systems with a sentinel aspect (RNV3P)
  - Public health systems with a sentinel aspect (SENSOR Pesticides)
CONCLUSIONS

- Some systems can provide ‘population-based sentinel signals’ - identify groups of workers at risk or economic sectors with an increased incidence of a WRD. Systems that are suitable to identify these signals are Non-compensation-related systems, which use data for statistics and data mining (such as THOR, OCCAM and RNV3P).

- **Alternative approaches** to identify population-based signals are:
  - Data mining in databases of Compensation-based systems (SHARP in Washington State)
  - Survey-based Public health systems (LFS)
  - Occupational health surveillance and epidemiological studies (not studied here)

- Population-based signals are mainly used as an input for occupational health or public health authorities, in order to support long-term policies and prevention plans, by identifying vulnerable groups of workers and emerging trends in WRDs.
CONCLUSIONS

- Some of the main common drivers are: visibility of the system, motivation of reporting parties, systematic and detailed exposure assessment, standardization and quality control of collected data, awareness and detection of new/emerging WRDs, communication with authorities to initiate prevention, financial support and resources.

- The main gap in terms of monitoring specific groups of WRDs is monitoring of multifactorial WRDs, such as mental diseases and musculoskeletal diseases. Possible solution: establishment of additional, clearly defined assessment criteria.

- Both-way communication between key stakeholders is essential for long-term maintenance of sentinel systems and their link with prevention.

- Improvement of sentinel surveillance at EU level in terms of collaboration on exchange of reported data, assessment of cases and raising alerts between the systems and Member States would be a significant achievement. Harmonization of reported data in Member States, increasing awareness and recognition of new WRDs, complementing existing official figures for monitoring ODs.