



New and emerging occupational risks

Jelena Bakusic, Annet Lenderink, Charlotte Lambreghts,
Sofie Vandebroek, Jos Verbeek, Stefania Curti, Stefano
Mattioli, Lode Godderis^{1,2}

¹ KULeuven, Center Environment and Health

² Idewe



Background

Continuous changes in work and working conditions give rise to **new work-related diseases (WRDs)**



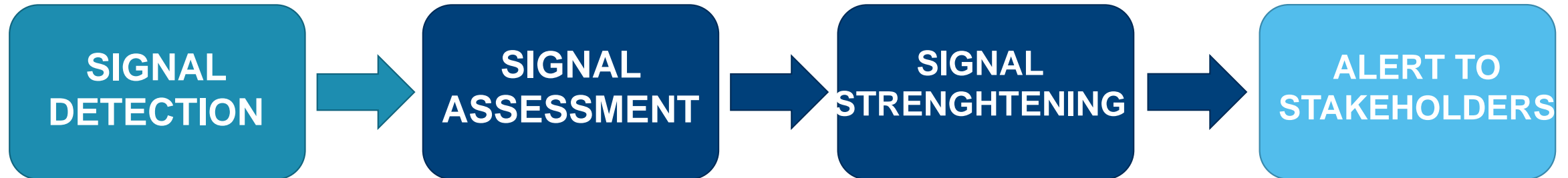
Previously unknown exposure-disease combinations in a specific work setting



Background

Alert systems

- **Collect information** on new WRDs
- **Raise alert** to stakeholders
- Use collected data to trigger timely **preventive actions**



Background



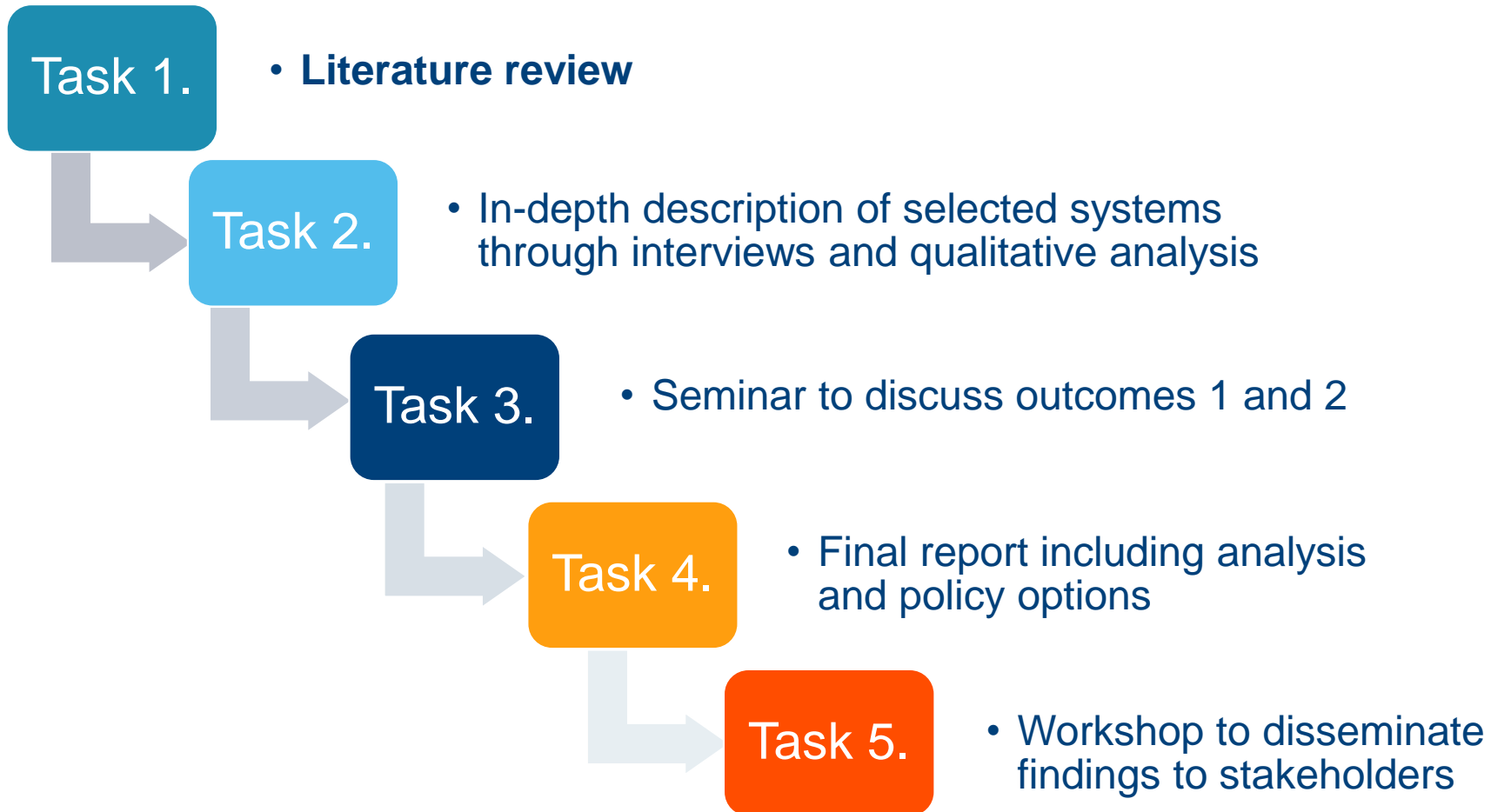
Aim: Provide an **overview** and basic **typology** of the existing alert systems for new WRDs.

Overall project



ALMA MATER STUDIORUM
UNIVERSITA DI BOLOGNA

KU LEUVEN



Background



Scientific literature

Databases:

- MEDLINE (PUBMED)
- Embase
- Web of Science

Grey literature

Databases: OpenGrey, OSH-update

Existing data from 3 surveys

Websites

Extracted data on each system: **general aspects (country, organization/ institution maintaining the system, website), aim of data collection, coverage, reporting mechanism, evaluation of work-relatedness, alert on new WRDs, link with prevention**

Background



- **Expert workshop** to discuss outcomes of Task 1 and 2 of the project
- Gathered system's owners and users, researchers and actors in the disease recognition area
- **Objective:** to gain more insight on the drivers and obstacles to the implementation of systems

- **Policy workshop** to discuss and consolidate results of the project
- Gathered representatives of ministries of health and labor, national insurance bodies, institutes of public health, etc.
- **Objective:** disseminate findings derived from the project



Results

Alert systems

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graph TD; A[Alert systems] --- B[Compensation-based]; A --- C[Comprehensive]; A --- D[Sentinel]; A --- E[Public health]
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Compensation-based

Comprehensive

Sentinel

Public health

Compensation-based systems



Compensation-based systems

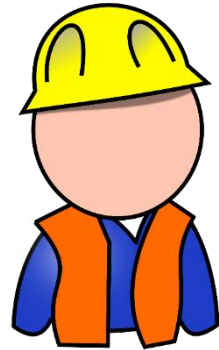


Compensation-based systems



	Patient 1		Patient 2	
	D2	D6	D2	D6
Resins				
Epoxy resin bisphenol A 1%	-	+	+	+
Epoxy resin bisphenol F 0.25%	-	-	+	+
Resins 'as is', semi-open	-	++	NT	NT
Aromatic urethane diacrylate 0.05%	+	+	-	-
Diluents				
Triglycidyl- <i>p</i> -aminophenol 0.5%	++	++	+	+
2-Phenyl glycidyl ether 0.25%	-	-	+?	+
1,6-Hexanediol diglycidyl ether 0.25%	-	-	+	++
1,4-Butanediol diglycidyl ether 0.25%	-	-	+	++
Hardener				
4,4'-Diaminodiphenylmethane 0.5%	-	-	-	+
NT, not tested.				

Compensation-based systems



Case reported for compensation



Evaluation by experts



Alert to new WRD

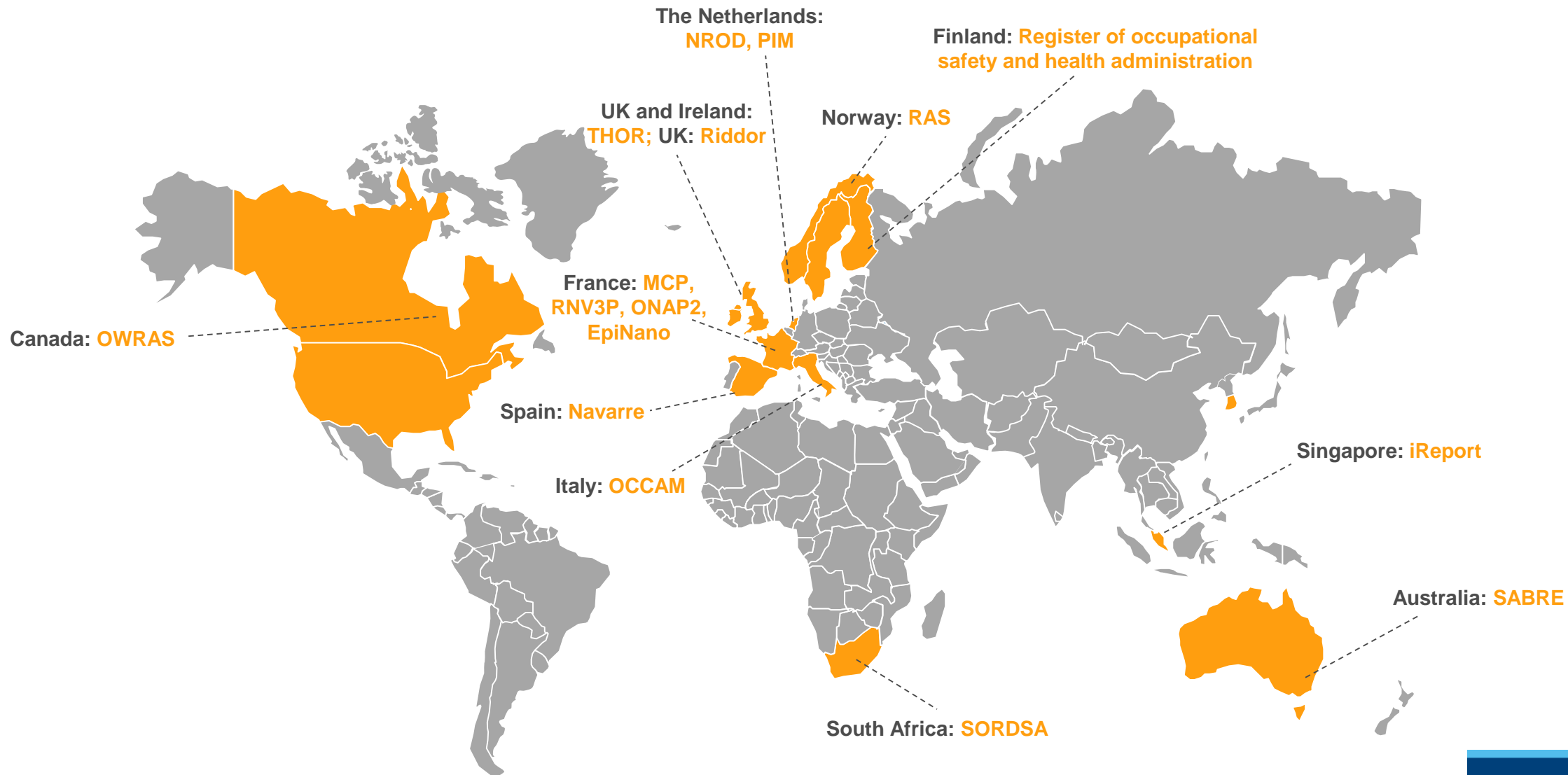


Workplace interventions

Compensation-based systems

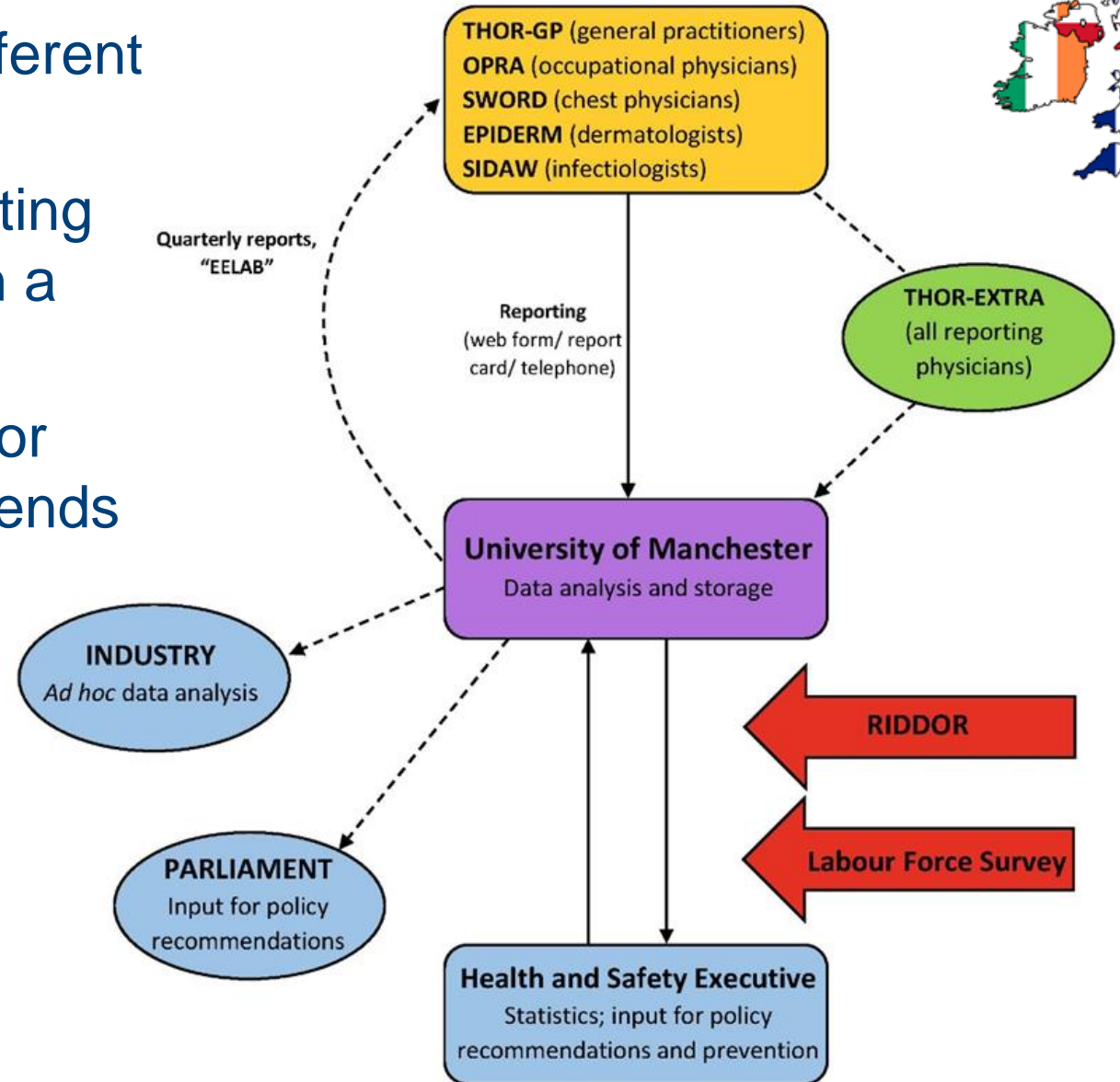
- + Built on the existing infrastructure and resources
Stable funding
- Criteria for reporting can limit identification of new WRDs
Reporting is insurance-driven

Comprehensive systems

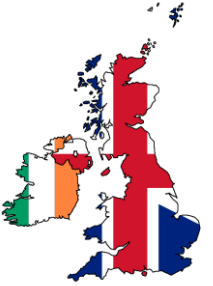


Comprehensive systems

- Different reporting schemes for different types of WRDs
- **THOR-EXTRA** – scheme for reporting of interesting cases or WRDs with a potentially novel cause
- Sophisticated statistical methods for determination of incidences and trends in WRDs
- Data quality constantly improved
- Strong link with authorities



Comprehensive systems



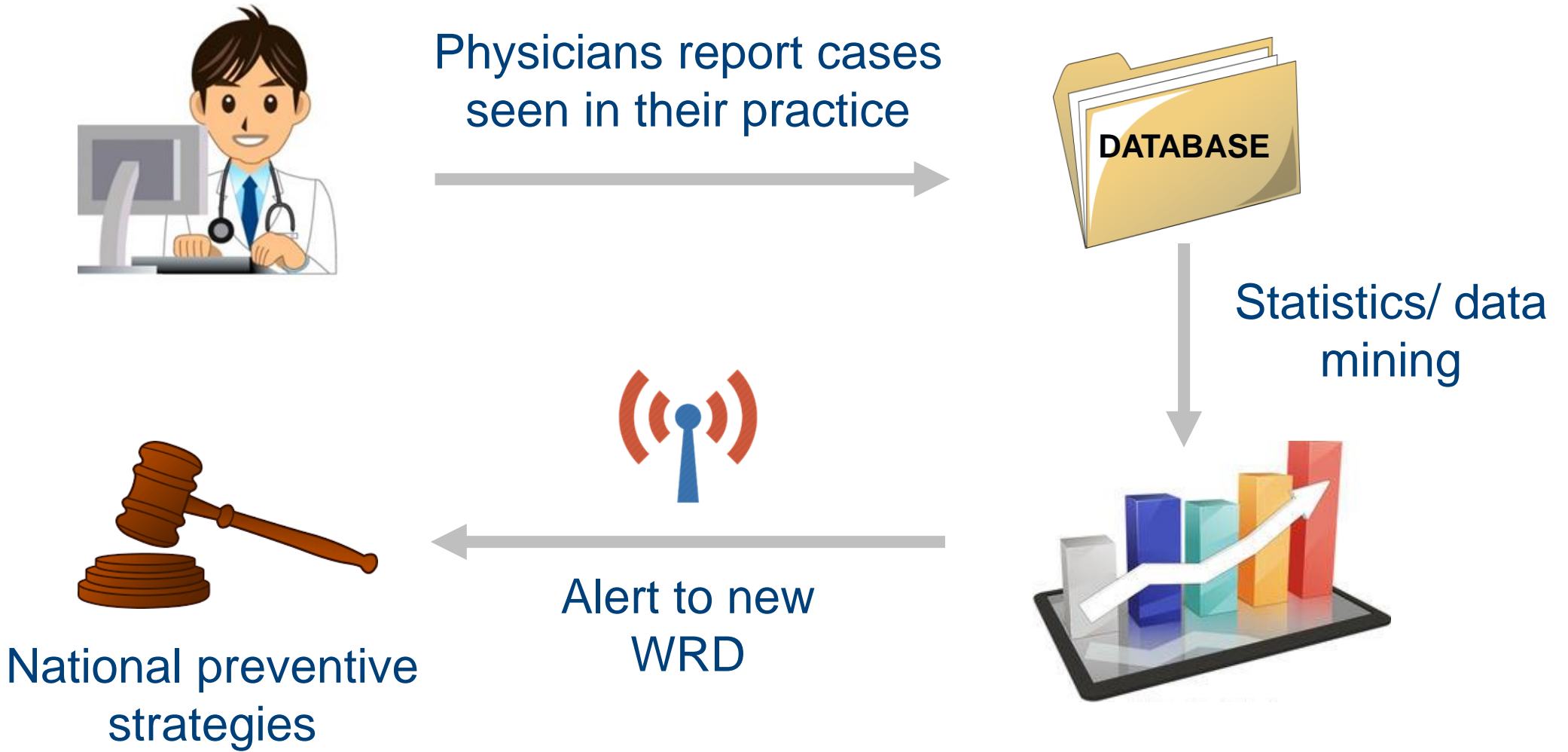
Occupational skin disease reported to THOR 2002-2005.

200
180
160
140
120
100
80
60
40
20
0



■ Average annual number of cases ■ Incidence rate per 100,000 employees

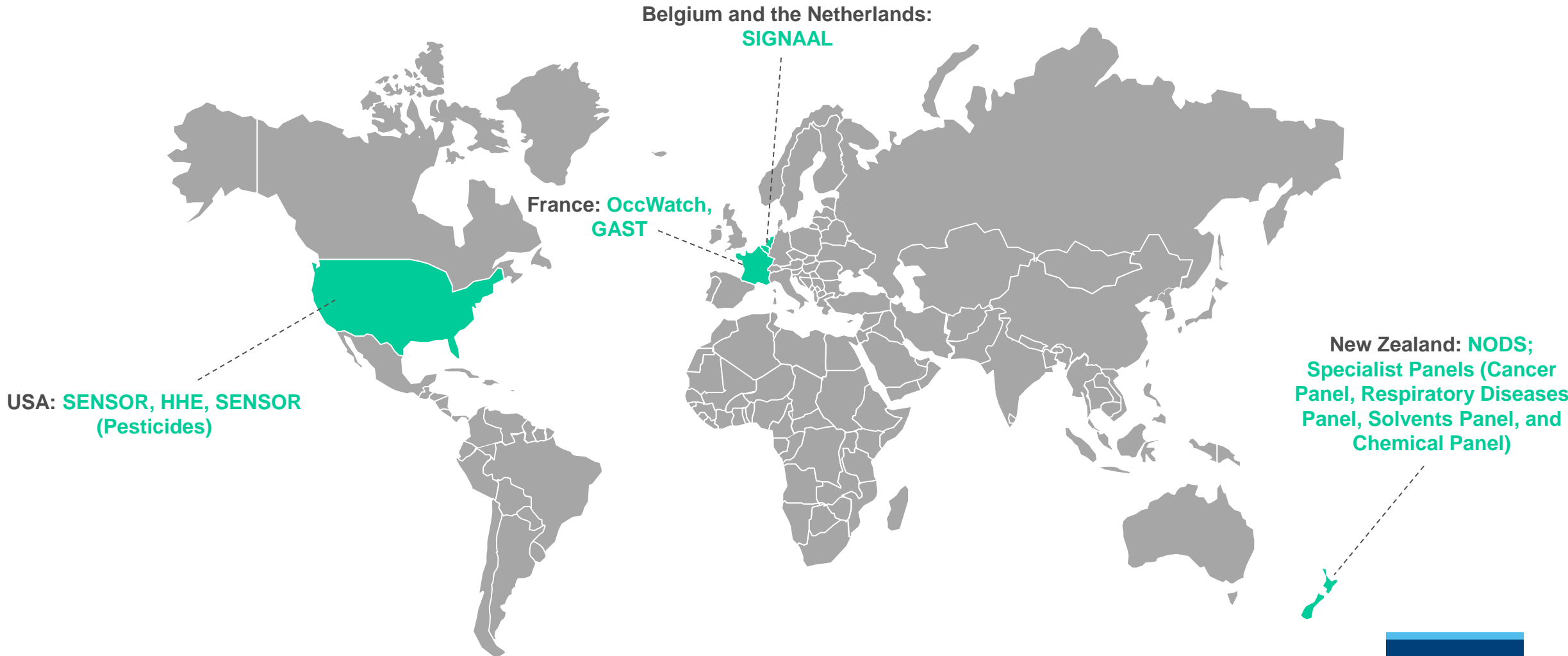
Comprehensive systems



Comprehensive systems

- + Large set of data
 - Nation-wide scope and interventions
- Motivation of reporters to participate
 - Lack of exposure assessment
 - Resources, funding

Sentinel systems



Sentinel systems

Mysignal.be

Signal.info

FEDRIS KU LEUVEN
SIGNAAL
Signalering Nieuwe Arbeidsgerelateerde Aandoeningen Loket
NL FR
Login Sitemap
HOME OVERZICHT MELDINGEN OVER ONS CONTACT HELP

Signaal pilot project
idewe Nederlands Centrum voor Beroepsziekten
Signalering New Occupational Diseases Counter
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Home About us Contact Help

Contact eczeem
Contact eczeem na contact met planten of bloemen, bijvoorbeeld de tulpen vinger

Meldingsformulier SIGNAAL
Via dit web formulier kunt u melding maken van door uesignaleerde gevallen waarbij het zou kunnen gaan over nieuw verbanden tussen gezondheidsproblemen en blootstelling in het werk.
Vraag hier [een account](#) aan om te melden.

Popcorn longumb
Bronchiolitis obliterans after exposure to butter flavouring in the production of popcorn

SIGNAAL NOTIFICATION FORM
Through this web form you can submit your identified cases which might have new links between health problems and exposure at work.
Request here [an account](#) to register yourself.

SIGNAAL

SIGNAAL staat voor **Signalering Nieuwe Arbeidsgerelateerde Aandoeningen Loket**

SIGNAAL is een nieuw online loket waar u vermoedens over nieuwe verbanden tussen gezondheid en werk kunt voorleggen aan een panel van beroepsziekt specialisten: in Nederland aan de beroepsziekt specialisten van het Nederlands Centrum voor Beroepsziekten (NCvB) en aan Belgische zijde aan deskundigen van Centrum Omgeving en Gezondheid van de KULeuven.

[Lees verder](#)

SIGNAAL

SIGNAAL is the acronym for **Signalering Nieuwe Arbeidsgerelateerde Aandoeningen Loket (Signaling New Occupational Diseases Counter)**

SIGNAAL is a new online service where suspicions about new relations between health and work can be reported and reviewed by a panel of occupational specialists: in the Netherlands the Occupational Health Specialists of the Dutch Centre for Occupational Diseases (NCOD) and in Belgium to Occupational Health Experts of the Centre for Environment and Health from KULeuven and the External Service for Prevention and Protection IDEWE.

[Read more](#)

Sentinel systems

- Female, 22 years old, student
- Experienced three car crashes
- Each time, she **suddenly fell asleep while driving the car**
- **No other complaints**
- Good general health, no history of any medical condition, including sleep problems/sleep deprivation
- Medical checkup with somnologist did not show any abnormalities



Sentinel systems

- The reporting physician suspected that the trigger could be the **car refresher**, enhanced by the heat (this happened during winter)



Sentinel systems



Literature review

➔ Grey literature article (2016):

How To Use Essentials In The Car To Make Journeys So Much Better (& Safer)¹

- Overview of smells to be **avoided in the car** because of their soothing effects

(e.g. lavender, bergamot, sandalwood, etc.)

How To Use Essential Oils In The Car To Make Journeys So Much Better (& Safer)

May 24, 2016 by [Susan Patterson](#)

This post may contain affiliate links. Read our [Affiliate Disclosure here](#).

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¹ <https://www.naturallivingideas.com/how-to-use-essential-oils-in-the-car/>

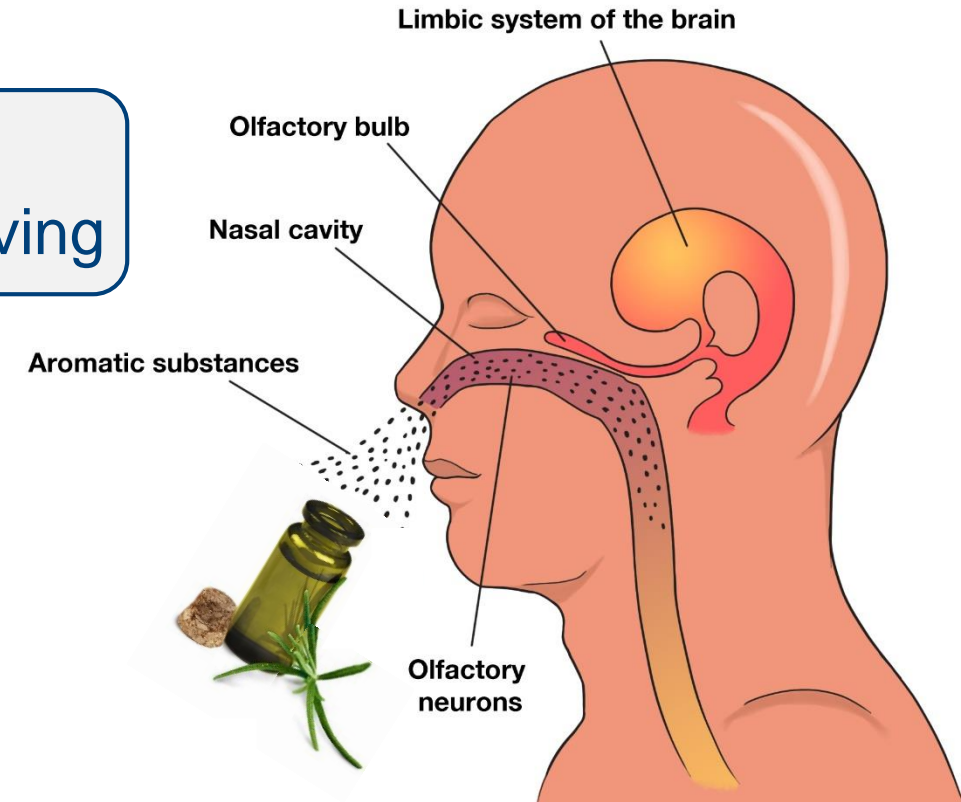
Sentinel systems

Literature review

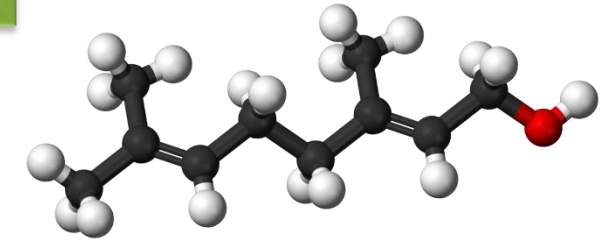


Scientific literature: investigation of the influence of odours on alertness during driving

- Fragrances consist of molecules with low weight that can pass blood-brain barrier and **affect nervous system**
- Effects on brain were mapped out with EEG
- The main active component are **essential oils**
- Essential oils contain 2-3 main components and dozens of others in small quantities



Sentinel systems



GERANIOL



List of compounds in the car perfume

Plant Name	Major Components	Effects on Brain Functions and Psychophysiological Changes
Geranium	citronellol, geraniol , citronellyl formate, linalool	Lowered state and trait scores
Jasmine	benzyl alcohol, linalool, benzyl acetate, jasmine, geraniol	Suppressed muscle sympathetic vasoconstrictor activity, sedative effect
Lavender	geraniol , linalool, linalyl acetate, β -caryophyllene	Increased drowsiness, sedative and relaxing effects, reduced mental stress
Rose	citronellol, geraniol , β -pinene, rose oxide	Suppressed muscle sympathetic vasoconstrictor activity
Ylang-Ylang	geranyl acetate, benzyl benzoate, eugenol, germacrene-D, geraniol	Decreased alertness, impaired memory, increased relaxation, sedative effect

Table 1. Common essential oil-bearing plants containing geraniol and their physiological effects

Sentinel systems

REPORT

Tesla driver blames 'new car smell' in fatal cyclist crash



JONATHON RAMSEY ⁸⁺

Feb 10th 2014 at 10:15AM



subscribe



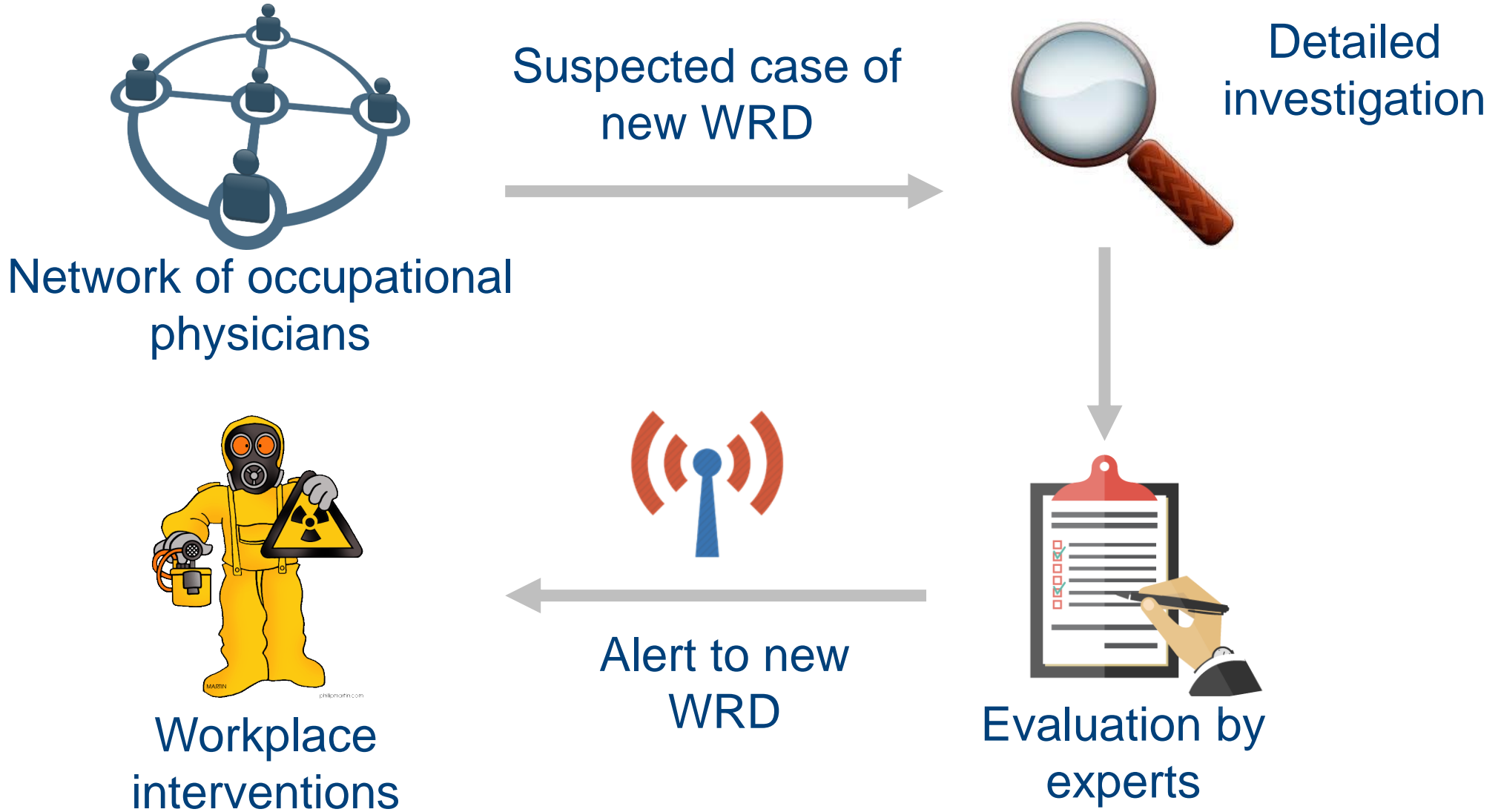
Sentinel systems

- If we compare this literature and the composition of the smell used in the car, it seems plausible that **some of the ingredients**, especially geraniol, may have a greater **sedative effect** than is desirable in a car
- It is also likely that if the **car warming** creates a greater spread of the smell, there may be "**overdosing**"
- It is therefore not so much that there are harmful health effects caused by components in the car perfume, but rather a **too strong intended effect** and a possibly wrong choice of the type of perfume

Sentinel systems

Some of the reports since July 2013		Work-related?	New combination?
Open angle glaucoma and playing saxophone (teacher)	NL	Yes	Not new, relatively unknown
Achilles tendon rupture in the assembly, dismantling and maintenance of cranes	NL	Yes	Not new, relatively unknown
Back pain in the care of dementia patients without available lifting aids	NL	Possible	Not new
Endotoxin fever after cleaning a polluted drain with high pressure	NL	Yes	Not new, not described in this work setting
Nosebleeds and formaldehyde exposure in aluminium production	B	Yes	New
Pulmonary alveolar proteinosis and exposure to hairspray in a hairdresser	B	Yes	Not completely new, but described rarely

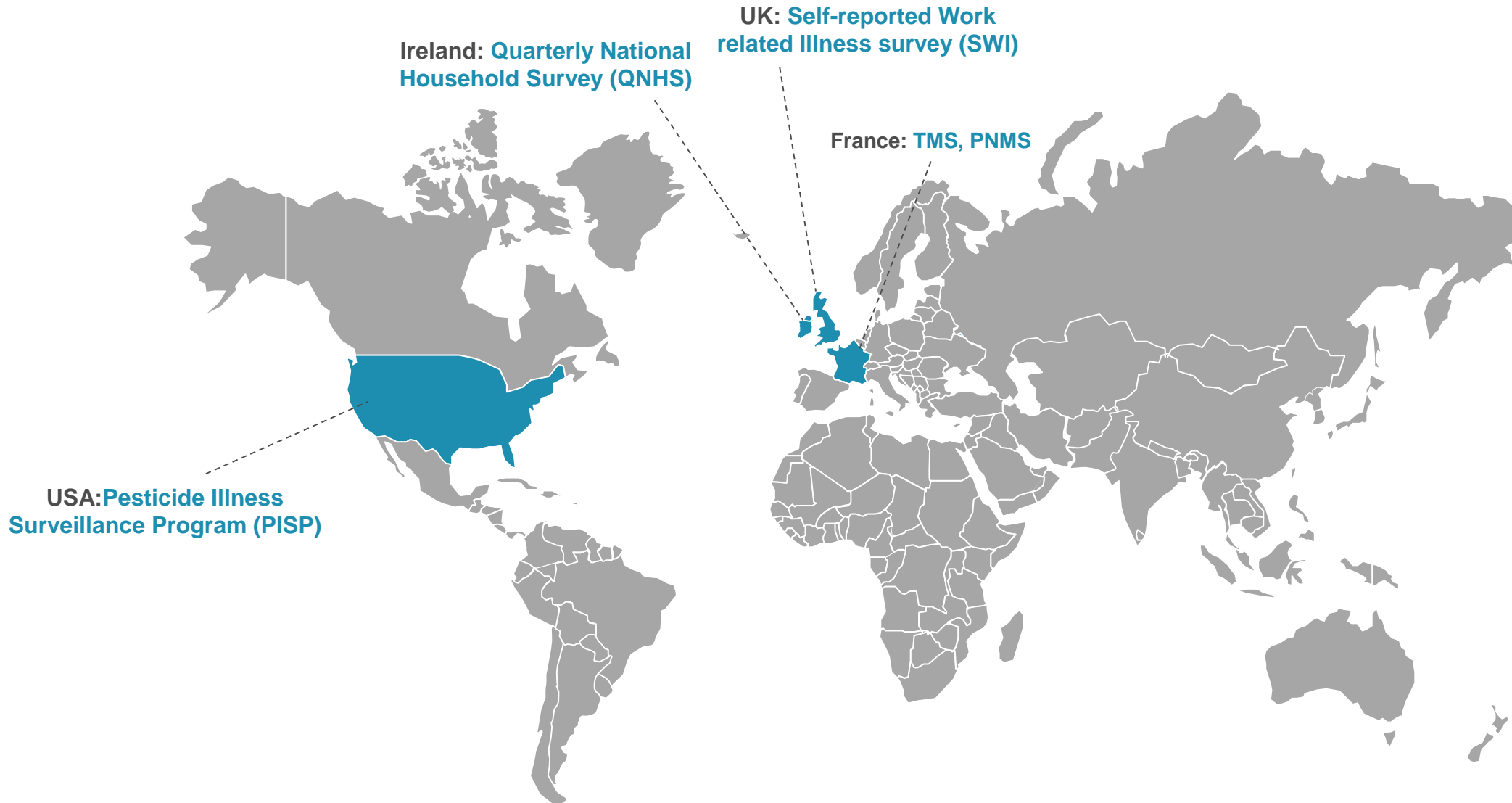
Sentinel systems



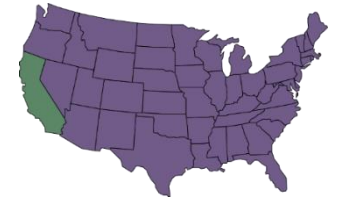
Sentinel systems

- ✚ Focus on new WRDs specifically
 - Detailed exposure assessment
 - Work-relatedness evaluation by (a group of) experts
- Motivation of reporters to participate
 - Resources, funding
 - Lack of visibility

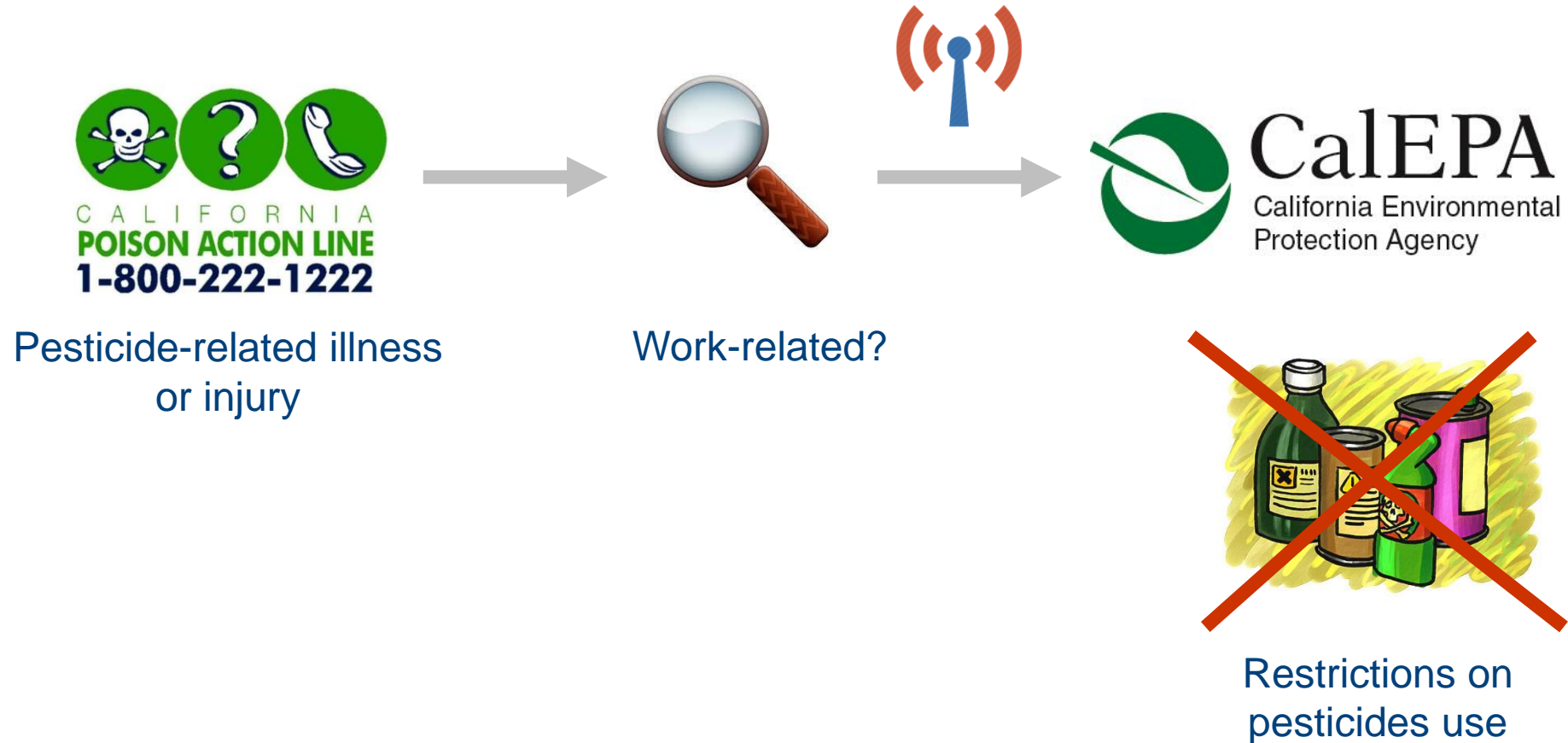
Public health systems



Public health systems

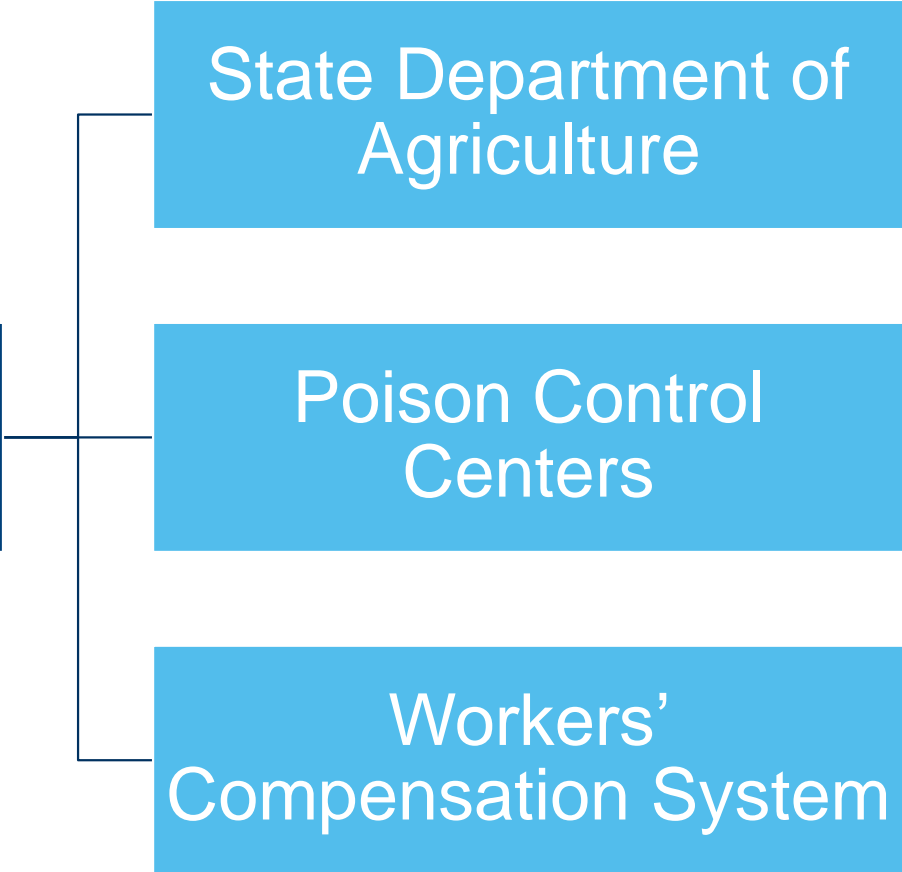


Pesticide Illness Surveillance Program (PISP)



Public health systems

Reporting sources



Public health systems

- 2001 to 2005 health risks related to **pyrethrins** and **pyrethroids**
- Several poisonings, of which $\frac{1}{4}$ **work-related cases**
- Clinical signs and symptoms revealed several **respiratory health effects**




Public health systems


EPA:

- 
- (1) Change product labels for unrestricted pesticides
 - (2) require commercial applicators to initiate mechanical ventilation for indoor applications of pyrethroid products;
 - (3) define optimal mechanical ventilation.


State agencies or health departments:

- 
- (1) Continue to monitor the health effects of indoor use of pyrethrins and/or pyrethroids;
 - (2) develop outreach to organizations that educate asthma and allergy patients on potential risks of these pesticides;
 - (3) educate applicators and consumers about the importance of reading pesticide product labels and directions.

Emergency response workers:

- 
- (1) Evaluate protective equipment and response protocols
 - (2) know how to locate information on chemical hazards.

Health-care providers:

- 
- (1) Be aware that these chemicals are respiratory irritants with potential to cause asthmatic reactions;
 - (2) be aware that cases of pesticide exposure or poisoning are reportable conditions to public health authorities;
 - (3) obtain an adequate history of any exposures that could cause or exacerbate disease.

Public health systems



Monitoring health of general population

Extract work-related data



Alert to new WRD



Public health authority



Preventive strategies on the public health level

Public health systems

+ Large set of data

Ability to trigger interventions on the public health level

— Data on work-relatedness not always high quality

Motivation of reporters

Conclusions

Each group has **strong points** and **drawbacks**

Several **complementary systems** should be implemented

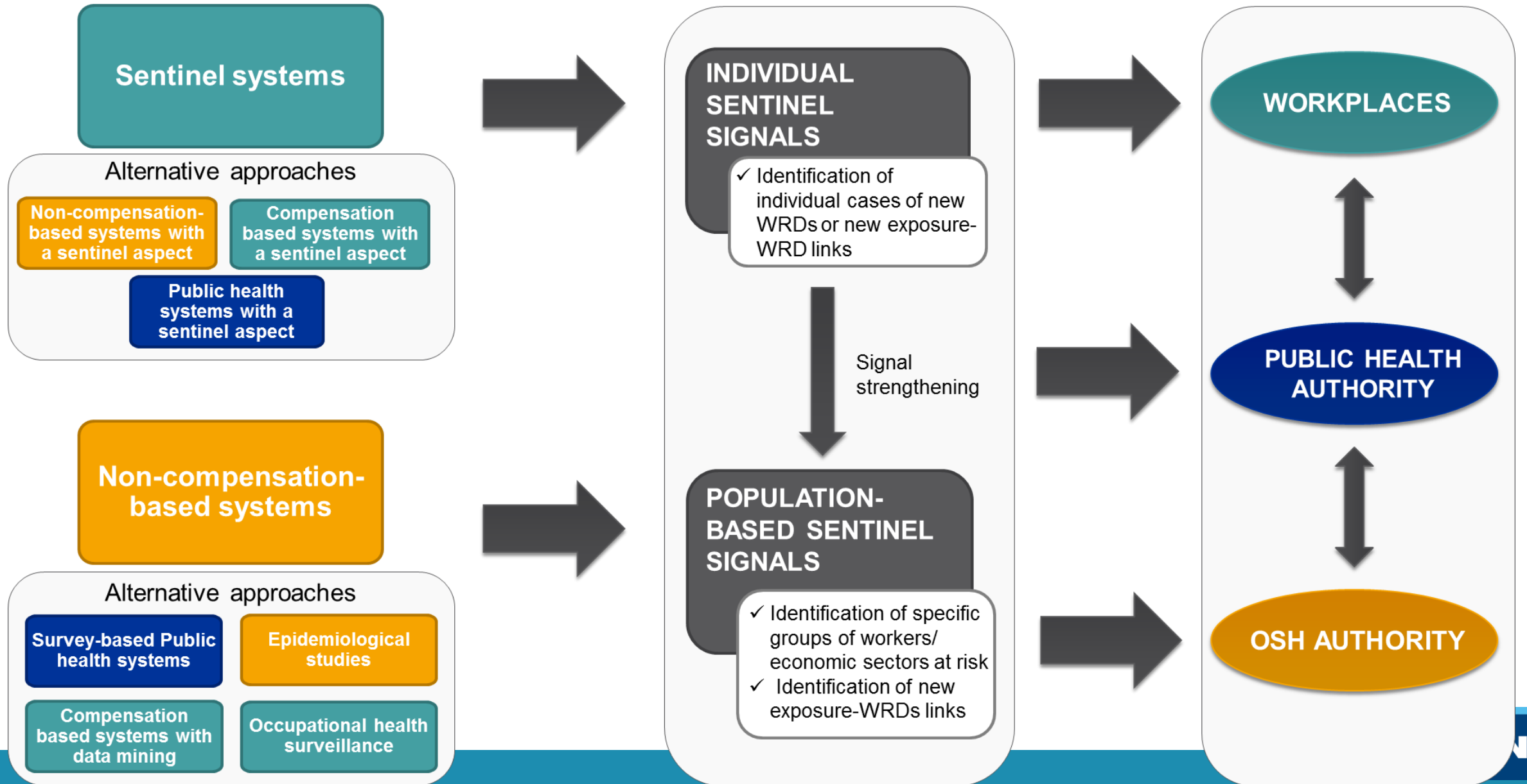
When implementing an alert system, stakeholders should take into account the **national occupational health context** and look at **examples** from other countries

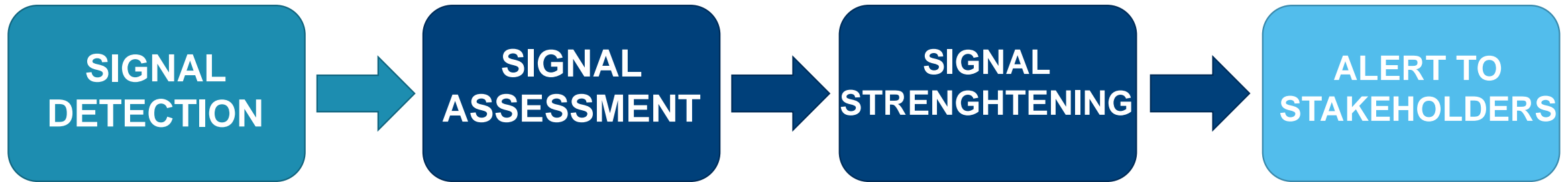
International exchange of data should be encouraged

➔ harmonization and comparability of reported data



Setting up a sentinel approach recommendations





National level

- Promote guidance documents on how to sentinel approaches
- Use EU-OSHA Focal Points to disseminate this guidance



National level

- Promote harmonization of recorded data
- Develop uniform criteria for assessment of work-relatedness



EU level

- Form a group of international experts on new/emerging WRDs
- Experts can aid to assess cases reported on the national level



National level

Level 1 alert



EU level

Level 2 and 3 alert







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22/08/2017

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



Alert and sentinel systems allow the early identification of work-related diseases and are useful to complement the official figures of occupational diseases and to set-up evidence-based prevention. However, there is only a limited number of such systems in place.

This report reviews existing alert and sentinel systems, as well as other monitoring systems presenting features also suitable to detect emerging work-related diseases.

The review identifies weaknesses, such as the often missing collection of workplace exposure assessment data, the poor coverage of some worker's groups and diseases like mental ill health; and the weak link to workplace prevention. It also gives good practice examples and highlights the importance of international cooperation and dissemination of data to achieve the maximum benefit from alert and sentinel approaches.

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Thank you for your attention!

Lode.godderis@kuleuven.be

