Sentinel and alert system (detection of new WRDs), by the network of French Occupational Diseases Clinics, rnv3p

(« French Network for Occupational Diseases Vigilance and Prevention Network »)

Vincent Bonneterre, Isabelle Vanrullen, on behalf of rnv3p
OBJECTIVES: TO PRESENT

1. French OD Clinics (= aims & referral issues)
2. rnv3p network
3. rnv3p approach for the detection, investigation and handling of potentially New Work-Related Diseases

***

• We remain available afterwards for demonstration of:
  – rnv3p Information System
  – Thesaurus used, especially for exposures
  – Data mining tool used for signal detection

• Appendice : preliminary answers to the 18 “Workshop questions to be discussed in groups”
PATIENTS’ REFERRAL TO OD CLINICS IN FRANCE

= Handling of patients and their **individual data** (medical files with medical exams available in each OD Clinic).

Patient / Worker

symptoms or disease

Physician: occupational, specialist, GP

Question / work-relatedness or work-fitness....

Question(s) & Answer(s) on individual issues

30 OD clinics located in the teaching Hospitals (orange)
OD CLINICS SHARE INDIVIDUAL & ANONYMOISED INFORMATION AT NATIONAL LEVEL

Patient / worker

symptoms or disease

Physician: occupational, specialist, GP

Question / work-relatedness or work-fitness....

Question(s) & Answer(s) on individual issues

All cases since 2001

Individual anonymized data at the national level

30 OD clinics located in the teaching Hospitals

It remains possible to go back to medical file to investigate cases, if OD clinics agree
THE WHOLE RNV3P SYSTEM ALSO INCLUDES SOME REPORTING OCCUPATIONAL HEALTH SERVICES (OHS)

**Patient / worker**
- symptoms or disease

**Physician: occupational, specialist, GP**
- Question / work-relatedness or work-fitness....

+ Some OHS report all incident WRDs

**rnv3p**
- Individual anonymized data at the national level

**30 OD clinics located in the teaching Hospitals**
- All cases since 2001

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
<tr>
<td>30 OD clinics located in the teaching Hospitals</td>
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</table>
# RNV3P PARTNERS

<table>
<thead>
<tr>
<th><strong>anses</strong></th>
<th>National Agency for <strong>Health Safety</strong> in Food, <strong>Work</strong> &amp; Environment (<em>rnv3p Network coordination</em>)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Société Française de Médecine du Travail</strong></td>
<td>French Society of Occupational Medicine (<em>all leaders/members of OD clinics belong to</em>)</td>
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<tr>
<td><strong>l’Assurance Maladie RISQUES PROFESSIONNELS</strong></td>
<td><strong>Health Insurance</strong> for <strong>salaried workers</strong> « of the general regime » by its Occupational Risks Department</td>
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<td><strong>MSA santé famille retraite services</strong></td>
<td><strong>Health Insurance</strong> for <strong>agricultural workers</strong></td>
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<td><strong>RSI Régime Social des Indépendants</strong></td>
<td><strong>Health Insurance</strong> for <strong>independant workers</strong></td>
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<td><strong>Inrs</strong></td>
<td>Reference body for occupational health <strong>prevention</strong></td>
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<tr>
<td><strong>Santé publique France</strong></td>
<td>National <strong>Public Health Agency</strong> (includes previous InVS)</td>
</tr>
</tbody>
</table>
RNV3P ORGANISATION

- Steering committee (representatives of all partners)
- 2 Working Groups (Emergence; Methodology)
- Scientific board

- + forum on the Information System
- + Coding school / club (once every 2 years)
- + General Assembly
RNV3P: YEARLY NUMBER OF: CONSULTATIONS OF OD CLINICS + Incident cases of WRD by OHS
REASONS OF REFERRAL TO OD CLINICS IN 2015

- Work-relatedness assessment
- Work-fitness, …
- Systematic search of exposures for some diseases
- Follow-up
- Diagnosis of Environmental diseases
- Other

![Bar chart showing reasons for referral to OD clinics in 2015]

- Work-relatedness assessment: 57.6% (17,489 cases)
- Systematic search of exposures for some diseases: 32.7% (9,939 cases)
- Follow-up: 12.1% (3,666 cases)
- Diagnosis of Environmental diseases: 12.0% (3,629 cases)
- Other: 1.4% (541 cases)

Total cases: 30,353
2015 Activity Report: Some Figures

**Consultations**

- **Total number in the whole database**: 384,351 consults in the database.
- **Mean yearly number**: 25,623 consults in each year.
- **% of work-relatedness assessment**: 53.8% of the consultations concern the aid to the diagnostic of diseases of professional origin.

**Patients**

- **Total number in the whole database**: 236,426 patients registered in the database.
- **% of new patients**: 78% of the patients are new patients.
- **Total number of work-related issues in the whole database**: 232,983 problems of health at work are identified.
TYPOLOGY OF WORK-RELATED ISSUES RECORDED IN RNV3P BY OD CLINICS vs OHS in 2015

Figure 7: Répartition des nouveaux problèmes de santé au travail (PST) 2015 selon les premiers chapitres de la CIM-10

Dans les CCPP
- Maladies du système ostéo-articulaire, des muscles et du tissu conjonctif (M00-M99) + Syndrôme canal carpien (G56)
- Troubles mentaux et du comportement (F00-F99) + Surmenage (Z73.0) + Stress (Z73.3)
- Maladies de l'oreille et de l'apophyse mastoïde (H60-H95)
- Maladies de l'appareil respiratoire (J00-J99) + Dyspnée (R06) + Toux (R05)
- Maladies de la peau et du tissu cellulaire sous-cutané (L00-L99)
- Maladies de l'appareil digestif (K00-K93)
- Maladies de l'appareil circulatoire (I00-I99)
- Maladies du système nerveux (G00-G99) (sauf G56)
- Autres chapitres CIM-10
- Certaines maladies infectieuses et parasitaires (A00-B99)
- Maladies du sang et des organes hématopoïétiques et certains troubles du système immunitaire (D50-D89)
- Tumeurs malignes ou in-situ (C00-D09)
- Maladies de l'œil et de ses annexes (H00-H59)
- Symptômes, signes et résultats anormaux d'examens cliniques et de laboratoire, non classés ailleurs (R00-R99)
- Tumeurs bénignes (D10-D48)
- Facteurs influant sur l'état de santé et motifs de recours aux services de santé (Z00-Z99) (sauf Z73.0, Z73.3)

Dans les SST
- MSD (511) 50%
- MSD (341) 33%
- MSD (29) 4%
- MSD (19) 4%
- MSD (40) 3%
- MSD (4) 1%
- MSD (8) 0%
- MSD (10) 2%
- MSD (1) 0%
- MSD (11) 2%
- MSD (5) 0%
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Information recorded for each case

Information coded by administrative:
- Administrative data: Identification, GP, occupational physician, who referred, Entreprise, + addresses etc
- Consultation date, specific medical investigations...

Coded by the physician:
- Disease(s) (ICD-10)
- Activity sector (NAF code)
- Job (ILO code)
- Exposures (chemical, physical, biological, organizational and psychosocial) & circumstances of exposures (“TEP CODE”)
- Imputability (attributability) for each exposure
- Free text zone
-> all variables available for queries
USE OF INTERNATIONAL CODES WHEN THEY EXIST.
Ex: DISEASES with ICD-10

The image shows a thesaurus page with a code search for ICN 10. The code X99.99 is searched, and the text related to lesions of the lips, mouth, and pharynx is displayed. The text is in French.
A FRENCH THESAURUS FOR EXPOSURES & CIRCUMSTANCES OF EXPOSURES
ALL KIND OF EXPOSURES MIGHT BE CODED, INCLUDING PSYCHOSOCIAL & ORGANISATIONAL FACTORS
rnv3p’s approach for the detection, investigation and handling of potentially new WRD
SEEKING **NEW** WORK-RELATED DISEASES

1. Definition: a potential new WRD is…

   • Either a **NEW COUPLE** associating a well defined **DISEASE** to a well documented **EXPOSURE**
     • (NEW means scientific literature is «silent » or non conclusive, whereas there seem to be a rather strong evidence for the expert)
   
   • Or a **NEW TRIO** « Disease x Exposure x Occupational setting »
     • means a couple disease x exposure *already known in the literature*, but observed in a different occupational setting

2. A 3-steps Methodology was elaborated
   • Detection
   • Investigation
   • Action
DETECTION

= SUSPICION OF NEW PAIRS / NEW TRIOS THROUGH:

« CLINICAL EMERGENCE »
= Suspicion of NEW WRD by a physician of a rnv3p OD clinic

DATA MINING
Data Mining of rnv3p database with disproportionality metrics

+ EXTERNAL SOURCES identifying new WRD
Publications (bibliographic watch), Modernet, NIOSH...

Search for similar cases in rnv3p (create new codes if relevant) + OD clinics information
CLINICAL EMERGENCE  
Ex. Green Jobs (V Bonneterre)

• New process of catalytic doping of industrial combustion (decrease fouling of ovens and particules emissions)

• Use a highly toxic organo-metallic compound (confidential)

• This compound is usually used in a very low % (some ppm), but here at 100% and up to 30 kg. Has a strong absorption through the skin
• 1st salaried workers had strong cephalagia and left the job.
• 2nd one showed liver cytolysis, reversible alteration of kidney clearance after maintenance + high content of the corresponding metal in urines after maintenance vs before testifying on the insufficiency of protection

-> advises for prevention++. Green process for environment does not mean safe handling for human
CLINICAL EMERGENCE
Ex. Silicosis and petrified wood
(=fossil wood = permineralized wood = silicified wood)
(V Bonneterre, F Arbib, M Catinon, M Vincent)

- 58 years old. Exposed since 1990
- Silicosis and obstructive lung disorder.
- Large amounts of silica, silicates and cerium [use for polishing] in his broncho-alveolar lavage
CLINICAL EMERGENCE
Ex. First case of COPD in a never smoker manufacturing countertops with composite solide surface materials
(M Catinon, C Chemarin, AS Blanchet Legens, V Bonneterre, M Vincent)

Solid surface made of aluminium trihydrate + acrylic resin. Very high content of these particles in his bronchoalveolar lavage.
## SOME OTHER (POTENTIALY) NEW WRD FROM CLINICAL EMERGENCE. Miscellaneous

<table>
<thead>
<tr>
<th>DISEASE</th>
<th>EXPOSURE</th>
<th>N=</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergic Contact Dermatitis</td>
<td>New hydroalcoholic solution for healthcare workers with extract from Asteraceae</td>
<td>&gt;10</td>
</tr>
<tr>
<td>Skin cancer (baso)</td>
<td>Supermarket employees under sodium lights with no protection</td>
<td>3</td>
</tr>
<tr>
<td>NHL (Non Hodgkin Lymphoma)</td>
<td>methylene chloride among welders (anti-splashing aerosols)</td>
<td>4+1</td>
</tr>
<tr>
<td>Tongue cancer</td>
<td>perchloroethylene</td>
<td>2</td>
</tr>
<tr>
<td>Atypical mycobacteriosis</td>
<td>Workers under inhaled corticosteroid therapy + exposed to water damaged materials or water-based aerosols</td>
<td>3</td>
</tr>
</tbody>
</table>
### SOME OTHER (POTENTIALY) NEW WRD FROM CLINICAL EMERGENCE.

Ex : Neurodegenerative Diseases

<table>
<thead>
<tr>
<th>DISEASE</th>
<th>EXPOSURE</th>
<th>N=</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parkinson</td>
<td>Mn-based fertilizers</td>
<td></td>
</tr>
<tr>
<td>Parkinson</td>
<td>Solvents including chlorinated ones</td>
<td>3</td>
</tr>
<tr>
<td>MSA (multisystemic atrophy)</td>
<td>Metal polishers (aeronautic alloys)</td>
<td>3</td>
</tr>
<tr>
<td>ALS (amyotrophic lateral sclerosis)</td>
<td>Metal polishers (brass, copper alloys, ...) and other sources of metal exposure</td>
<td>&gt;3</td>
</tr>
<tr>
<td>Severe motor troubles associated with Chronic Solvent Encephalopathy</td>
<td>Solvents</td>
<td>1</td>
</tr>
</tbody>
</table>
Selection of variables to identify the corresponding couples. Ex disease « X » to identify all couples exposure x disease « X »

Free text zone for each case of the couple identified

Number of cases per couple

Sorting of the couples according to the disproportionality measure

OD clinics which reported such cases
Ex. Bibliographic Watch: New WRD with artificial stones

Artificial Stone Silicosis
Disease Resurgence Among Artificial Stone Workers
Mordechai R. Kramer, MD, FCCP; Paul D. Blanc, MD, MSPH, FCCP;

Worker Exposure to Silica during Countertop Manufacturing, Finishing and Installation
Friedman et al. Silicosis in a Countertop Fabricator — Texas, 2014. MMWR / February 13, 2015 / Vol. 64 / No. 5 / p 129

Outbreak of silicosis in Spanish quartz conglomerate workers
Aránzazu Pérez-Alonso¹, Juan Antonio Córdoba-Doña²,³,

Exposição a altos níveis de Silica e ocorrência de Silicose – novas roupagens de um velho problema
Ex. Bibliographic Watch: Lung fibrosis and exposure to composite solid surface material

- Fibrosis (UIP) in a 64 years old man which was exposed from 16 years to Corian particles (aluminium trihydrate + acrylic resin), that were indentified in his lung. Same material as previous case

APPRAISAL of new couple or new trio by the “Emergence” WG

- **For each case**
  - Confirmation of diagnosis
  - Coding of Severity (S)
  - Discussion of Exposure
  - Coding of Imputability (I)

\[ (= \text{intrinsic and extrinsic attributability})\]

- **For each pair or trio (composed of 1 to n validated cases)**
  - Attribution of an ‘emergence score’
  - \((= \text{sum of individual cases})\)

Several algorithms have been tested on previous new WRD (PubMed). Cf rnv3p scientific report

Réseau National de Vigilance et de Prévention des Pathologies Professionnelles
**GRADUATED (+) ACTIONS**

**according to decisional algorithm**

<table>
<thead>
<tr>
<th>LEVEL 0</th>
<th>no action</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEVEL 1</td>
<td>Information to OD clinics <em>(only)</em></td>
</tr>
<tr>
<td>LEVEL 2</td>
<td>+ search for similar cases outside the network + exchanges with some rnv3p partners</td>
</tr>
</tbody>
</table>

**Transitional zone**: LEVEL 2 or 3 according to bibliography (ie for toxicological issues: biological plausibility, animal data, etc)

**LEVEL 3**: + wide dissemination / necessary actions to be taken

For admissible cases: Tracability and tracking of alerts + optimization of thesaurus if necessary
Example: Asthma among coffee-machines maintenance workers due to the fungus Chrysonilia Sitofila

- Number of RNV3P cases: $n=2$
- Calculated Work-attributability for each case: $I4$ (Specific IgE)
- Acute Severity for each case: $S1$
- Emergence Score: $2 \times 27 = 54$ : transitional zone
- Bibliography: High Extrinsic Imputability
  - C. Sitofila already an asthma risk factor in wood workers
  - cases published at the same time in Spain and Italy

- ACTION: large dissemination, and back to prevention with activity sector
1) **Nail technicians** and hypersensitivity pneumonitis associated with ethylmethacrylate

2) **Brazilian smoothing (hairdressers)** and worsening of obstructive lung disorders (due to irritation)

3) **Coffee machine maintenances workers** and asthma related to the mould *Chrysonilia sitophila*

4) **Artificial stones** and the increased risk of silicosis (the last one only from bibliographic watch)
SUMMARY OF RNV3P APPROACH FOR DETECTION AND HANDLING OF NRW WRD

1. DETECTION
   - CLINICAL EMERGENCE
   - DATA MINING
   - EXTERNAL SOURCES
     - IDENTIFYING NEW WRD
     - search for similar cases in the database
     - information of OD clinics
   - SUSPICION OF NEW PAIRS / NEW TRIOS

2. APPRAISAL
   - Transparency and reproducibility in the decision process
     - Analysis of each case: diagnosis, severity, exposure, intrinsic and extrinsic attributability, search for similar cases in the database, conclusion
     - For each pair or trio: attribution of an ‘emergence score’

3. GRADUATED ACTIONS
   - LEVEL 0
     - No action as cases not relevant
   - LEVEL 1
     - Information to OD Clinics only
   - LEVEL 2
     - Search for similar cases outside rnv3p
   - LEVEL 3
     - Dissemination
     - optimization of thesaurus if necessary + traceability
CONCLUSIONS

• rnv3p = Network of French OD clinics with a strong Anses support
• rnv3p’s information system offers a « Real-time database » available for queries anytime by all OD clinics
• Rnv3p’s database includes today more than 250,000 individual cases of work-related issues recorded (mostly WRD but also work-fitness issues)
• A procedure was set up in order to facilitate the identification and investigation of new WRDs
• Longstanding cooperation with Modernet’s actors. Among the projects : sharing expertise with EU colleagues through a web-based platform, « Occwatch »
**GEOGRAPHICAL PATTERN OF PATIENT’S REFERRAL TO OD CLINICS (1)**

- Red ellipses represent the main recruitment area for each OD clinic (2/3 of its patients).

- The highest density of patients correspond to the employment zones around the OD clinics (=which also correspond to the biggest French cities).

- Ex in Rhône-Alpes Region

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**Source:** Data from the [m-n.p]. Geographic data GEOPLAB from National Institute of Geographic and Forestry Information (IGN). Realisation: M. Deligny for Amiens and Grenoble teaching hospital - May 2018.
If patients are referred from all employment zones from metropolitan France, the recruitment of patients in OD clinics should not be considered as « homogenous » across the country, neither quantitatively, nor qualitatively, as OD clinics might have some differences in their recruitment according to their expertises and network of corresponding physicians.

Figure: Yearly rate of rnv3p Work-related issues by 100,000 inhabitants (patient adress, or if not available Entreprise adress)
Workshop questions (n=18) to be discussed in groups
(preliminary answers)

Vincent Bonneterre, Isabelle Vanrullen, on behalf of rnv3p
1. **Drivers for alert and sentinel approaches/monitoring systems suitable for the detection of new work-related diseases (WRDs)**

   1.1. Starting from your experience, and considering how your system works, what are the drivers for alert and sentinel approaches/monitoring systems suitable for the detection of new WRDs or work-related health problems?

   - We think one main driver is the large information of (all) physicians in the field (GP, OP, specialists) that:
     - all their questions (or the ones addressed by their patients to them) about work-relatedness might be worth being investigated, whatever the disease and the exposure, especially if diseases are not included in the list of compensable occupational diseases, for the purpose of vigilance.
     - OD clinics exist throughout the territory where they can seek help and advise for these investigations.
     - Even if there is no clear answer today... the information will be stored for the future in the OD clinics database, and might be retrieved, even automatically, if new similar cases are reported in the future.

   - 2nd driver: we believe clinical and exposure expertise is one core driver to identify new WRD when it’s handle about potential new WRD
1. **Drivers for alert and sentinel approaches/monitoring systems suitable for the detection of new work-related diseases (WRDs)**

- 1.2. What are the specific features of your systems that make it work with regard to the identification of new WRDs?

  - Rather satisfying coverage of the national territory by OD clinics network (even if not optimal, nor homogenous)
  - Strong interaction between OD clinics physicians and the Anses Health Security Agency
  - Structuration of the approach
  - Coverage of several expertise fields by our experts
1. Drivers for alert and sentinel approaches/monitoring systems suitable for the detection of new work-related diseases (WRDs)

• 1.3. Which are the important actors needed to really make the systems work?

- Strong interaction between OD clinics physicians and the Anses Health Security Agency. Still there are a lack of ressources from the OD clinics, as their physicians have lot of different missions + have to face funding issues
1. **Drivers for alert and sentinel approaches/monitoring systems suitable for the detection of new work-related diseases (WRDs)**

- 1.4. Are there any WRDs or work-related health problems, types of exposures, sectors, workers’ groups, etc. where this works best in terms of identification and monitoring?
  - It’s easier to highlight new diseases when they are associated to sensitization (allergy) due to recurrence of symptoms for each new exposure. It’s a lot more difficult to highlight possible new causes for cancers, neurodegenerative diseases, or other systemic diseases.
  - Lung and skin are among the first organs affected by pollutants. So, lung diseases specialists, are used to think about environment (*cf.* pneumoconiosis, asthma, hypersensitivity pneumonitis, and some “idiopathic” diseases that sometimes are due to pollutants: sarcoidosis which are further identified as berylliosis, some pulmonary fibrosis, etc). It is the same for skin diseases.
2. **Obstacles** of alert and sentinel approaches/monitoring systems for the identification of new WRDs

- **2.1. What are the obstacles of monitoring approaches/systems for the identification of new WRDs that you have encountered?**
  - **Outside the network:** 1. many physicians do not show interest on these questions (so will not be able to highlight questions from the field). 2. still many physicians do not know they can rely on OD clinics expertise for investigation of potentially new WRD. 3. Our recruitment is not homogenous: some physicians are used to send patients to our clinics (sometimes very easily), some never send patients.
  - **Within the network:** Participation (sharing of new cases) is not as high as we had expected, outside the Emergence Working Group (even if the WG includes already several OD clinics such as Grenoble, Lyon, Marseille, Montpellier, Paris, Toulouse, Rennes, Strasbourg). Lots of questions rely to toxicology, but not all experts are toxicologists.
2. **Obstacles** of alert and sentinel approaches/monitoring systems for the identification of new WRDs

• 2.1. *What are the obstacles of monitoring approaches/systems for the identification of new WRDs that you have encountered?* 

(follow-up)

– **Methodology.** Finally, our design do not allow to identify new occupational risk factors that would account for only a small attributable fraction of the disease, especially if the relative risk is small. Only epidemiology can do that (for instance night work relation with cancer, especially breast cancer; long working hours and cardio-vascular diseases, etc. We shall know this is out of our scope.
2. **Obstacles of alert and sentinel approaches/monitoring systems for the identification of new WRDs**

2.2. **What are the specific features of your systems that hinder it?**

- **Lack of resources in OD clinics is a key point:**
  - The decreasing number of experts, especially Prof, due to demographic reasons (retirements) and financial constraints that are higher than ever.
  - The decreasing availability of experts: they usually have a lot of other missions within their teaching hospital (education, research, occupational health of health care workers), and involvement in many commissions (hospital, university and elsewhere)... with a lack of young doctors to help
  - The lack of attractiveness of our activity: Younger Occupational physicians prefer to work outside the hospital (work less and earn more... a better quality of life! All agree on that point...)
2. Obstacles of alert and sentinel approaches/monitoring systems for the identification of new WRDs

2.3. How to cope with these obstacles?

- We try to:
  
  - promote our activity and defend its interest in terms of public health (as well as its funding) in front of representatives of health and labour ministries
  
  - We shall recruit physicians at 100% to work in our clinic (not only individuals for which this activity is only one among many others)
  
  - to communicate outside the network (articles, communications in congress, ....) to put emphasis on this vigilance activity
2. **Obstacles of alert and sentinel approaches/monitoring systems for the identification of new WRDs**

• 2.4. Are there any WRDs or health problems, types of exposures, sectors, workers’ groups, etc. where this works least / could be improved?

The system could be improved by:

– **Better shedding the light on:**
  • New issues: nanoparticles, endocrine disruptors
  • Specific diseases very partly covered: infertility troubles, teratogenicity, ...

– **Better covering some populations:**
  • Agricultural workers are currently less covered (except for usual lung diseases as farmer lung disease), even if their insurance system (MSA) is a partner of rnv3p.
3. The link with prevention

3.1. What are the prerequisites that make alert and sentinel approaches/monitoring systems a real contribution to the prevention of the recorded work-related health problems and diseases? How does the link with workplace prevention work in your system?

– NB : prevention is not limited to new WRD which usually concern very specific and often rare situations

– the Emergence working group already includes :
  • HSE engineer representative of the health security system of salaried workers
  • Representative of INRS, the reference body for occupational risk prevention in France

– Several alerts have already been launched. They are sent to the occupational “preventionists”, including all members of occupational health services, via labour inspectorate (through labour ministry) and health insurances which have prevention departments or correspondants
3. The link with prevention

• 3.2. Which are the important actors needed to ensure that the information collected drives prevention at workplaces? Would you involve any one particularly to make the systems more efficient or more useful for prevention?

  – **Top-down information** (from national level to the field level): see answer to 3.1

  – **On the field**: our OD clinics give advise for individual situations they are investigated during their consultation, in line with the occupational physician of the worker. This often includes prevention issues.

  – **At local/regional level**: Another point is that each OD clinic has several meetings a year with the regional prevention engineer of the health insurance system for salaried workers. At that occasion, they share information on prevention issues and are authorized to mention the names of companies where some specific problems have been identified. *See 7 examples in the 2015 activity report (page 9)*
3. *The link with prevention*

- 3.3. Are there any WRDs or health problems, types of exposures, sectors, workers’ groups, etc. where this works best in terms of identification/monitoring and link with prevention?

  - Difficult to answer, because there is no traceability of these actions in our information system
3. The link with **prevention**

- 3.4. **How could the existing systems in your country be improved** to address **emerging WRD** and work-related health problems and better target prevention, one of the aims being to shorten the time between recognition of an issue and prevention at the workplaces?
  
  - **For new emerging WRD:** When the work-relatedness is demonstrated, there are no much difficulties
  
  - **For prevention issues related to all other WRD investigated in the rnv3p:** OD clinics currently not share their experiences/good practices at national level
3. The link with prevention

3.5. Would you change anything to how the systems work to improve and enable prevention?

- Prevention issues are not limited to new WRD. Especially one important mission of rnv3p, we just start to work on, is to describe « at risk situations [of WRDs]» in order to identify situations where prevention should be implemented. We are working on that point for cancers at the moment.

  - As an example, for bladder cancers, we identified application of « blackson /blaxon» by vehicle mechanics / car builders as a possible risk for bladder cancer. We investigate some other situations for which we were not aware of to identify if the risk can be confirmed
4. Alert function of systems

4.1. How do your monitoring system(s) contribute to alerting of new WRDs or health problems?

- Cf our approach with graduated actions: several alerts have been launched, including following bibliographic watch, as for example the case of artificial stones.
4. Alert function of systems

4.2. How can your system / existing monitoring systems be adapted to better alert of new WRDs or health problems?

1. Better integrate existing systems and databases
   - Take into account the geographical distribution of entreprises to capture new cases. This information is now freely available in France (Sirene database open-data since 01/2017). For instance, launch dedicated alerts to chest physicians in buffer zones of 25 (?) km of industries for which new lung diseases have been described
   - We could implement data mining on already existing databases that record at the same time information on health and entreprises (data of insurances databases: project currently launched in France considering agricultural workers (3.3 millions persons covered, including 1 million active)
     - later among data of the occupational health services
   - Better exchange at EU level+++
     - If possible develop a EU occupational vigilance system, as available for food safety, pharmacovigilance, etc.
4. Alert function of systems

4.2. How can your system / existing monitoring systems be adapted to better alert of new WRDs or health problems?

– 1. Better integrate existing systems and databases
  
  • Take into account the geographical distribution of entreprises according to their activity sector and number of employees to help strengthen signals (highlighting new cases). This information is now freely available in France (Sirene database open-data since 01/2017). If there is a new lung disorder for instance, in some type of activity, we could launch dedicated alerts to OP in charge of these entreprises and chest physicians in buffer zones around these industries
  
  • Data mining on already existing databases that record at the same time information on health and entreprises where the individuals work (data of insurances databases : project currently launched considering all French agricultural workers
  
  • ++ Harmonization of data collection of Occupational Health Services in France
  
– 2. Better exchange at EU level+++ (see 4.3)
4. Alert function of systems

4.2. How can your system / existing monitoring systems be adapted to better alert of new WRDs or health problems?

- Mine all Health expenses to access more information about work-related health issues

The only available information

All diseases truely related to occupation

WRD identified by a physician

Compensated OD

rnv3p

All Health Expenses
Illustration with a Project of data mining of health insurance databases (French agricultural workers) to look for signals of occupational risk factors

**Health Databases**
Include disease (ICD10) and proxy of diseases (medication)

**Administrative databases**
Include information about occupational activity

**Data-linkage and data-mining**
**Objective:** to search with no prior hypothesis, statistical associations between diseases and activity sectors taking into account observed factors (age, sex, ..) and latent ones, in order to help generate new hypotheses
4. **Alert function of systems**

4.3. Are any of the existing alert and sentinel approaches/aspects of monitoring systems suitable for the detection of new WRDs transferable between countries? Are there prerequisites that are needed for all systems?

- **Clinical Emergence**: we can share our signals through webtools as Occwatch. This does not require any existing infrastructure.

- **Databases Analyses**: we shall use the same thesaurus (especially for exposures) to share easily information++

- **Methods**: we can (and already) share some methods: data collection with MAREL project (Italy), methods for trends analyses (THOR system), interest in GIS (UK Leuwen), etc.

- We should be help by a H2020 project to help federate efforts.
4. Alert function of systems

• 4.4. What new/emerging risks and WRDs have your systems allowed to identify?
  – Cf list of potential new WRD studied (presentation)
  – Cf list of alerts (4.5)
4. Alert function of systems

- Alerts raised by our system:
  1) nail technician and hypersensitivity pneumonitis associated with ethylmethacrylate
  2) brazilian smoothing and obstructive lung disorders
  3) coffee machine maintenances workers and asthma related to the mould *Chrysonilia sitophila*
  4) artificial stones and the increased risk of silicosis (the last one only from bibliographic watch)

- Yes there remain gaps. An alert raise interest the first weeks, and then is often forgotten
4. Alert function of systems

- 4.5. Have your systems allowed to set priorities for the prevention of new/emerging risks and WRDs and which ones (specific priority sectors, exposures, types of diseases)? What are the gaps?

(Follow-up)
- Longstanding actions are needed. Cf the example for artificial stones: Anses launched a working group on silica, which include analyses of all kind of exposures
- We are currently not good enough for the follow up of our signals