

Identification of workstations with potential exposure to engineered nanomaterials within EpiNano program

L. Delabre¹, D. Jezewski-Serra¹, S. Ducamp^{1,2}, Y. Iwatsubo¹,
I. Guseva Canu¹

¹ French Institute for Public Health Surveillance, Occupational Health Department, Saint-Maurice, France

² University Bordeaux Ségalen – Essat, Bordeaux, France

The EpiNano program

- ✓ Designed by the occupational health department of the French Institute for Public Health Surveillance
- ✓ Prospective cohort to monitor medium and long-term potential health effects of engineered nanomaterial (ENM) and allow further research
- ✓ Targeted on workers likely to be exposed to powder of nanomaterials including their aggregated or agglomerated forms
- ✓ 2 nano-objects of primary interest : carbon nanotubes (CNT) and TiO_2
- ✓ Started in 2014

Multistep program

1. Identification of companies dealing with CNT and TiO₂ (Declaration of nanomaterials of the French Agency for Food, Environmental and Occupational Health & Safety, Anses)
2. Sending of the 'Company Questionnaire'
3. Onsite visit by epidemiologist and industrial hygienist : determine **without measurement** the workstations concerned with ENM to identify workers potentially exposed to ENM
4. Sending of the individual questionnaire and inclusion in the cohort

A tool for onsite visit

- Work group Quintet ExpoNano => 'Onsite technical logbook'

Organized in 3 parts:

1-Company: activity, process description, map, localisation of workrooms, H&S available data

2-Workrooms: dimensions, air flow, efficacy of the ventilation system, local maintenance, staff and workstations, potential sources of ultra fine particles emissions (background aerosols)

3-Workstations: processes used, if it is enclosed or not, equipment; details about incoming and outgoing products; presence of collective protection, individual protective equipment; operation of workstation, quantity of product handled per operation, frequency and duration of operation

=> Classification of the workstation as potentially exposed or not to ENM and numbers of people concerned and their job titles

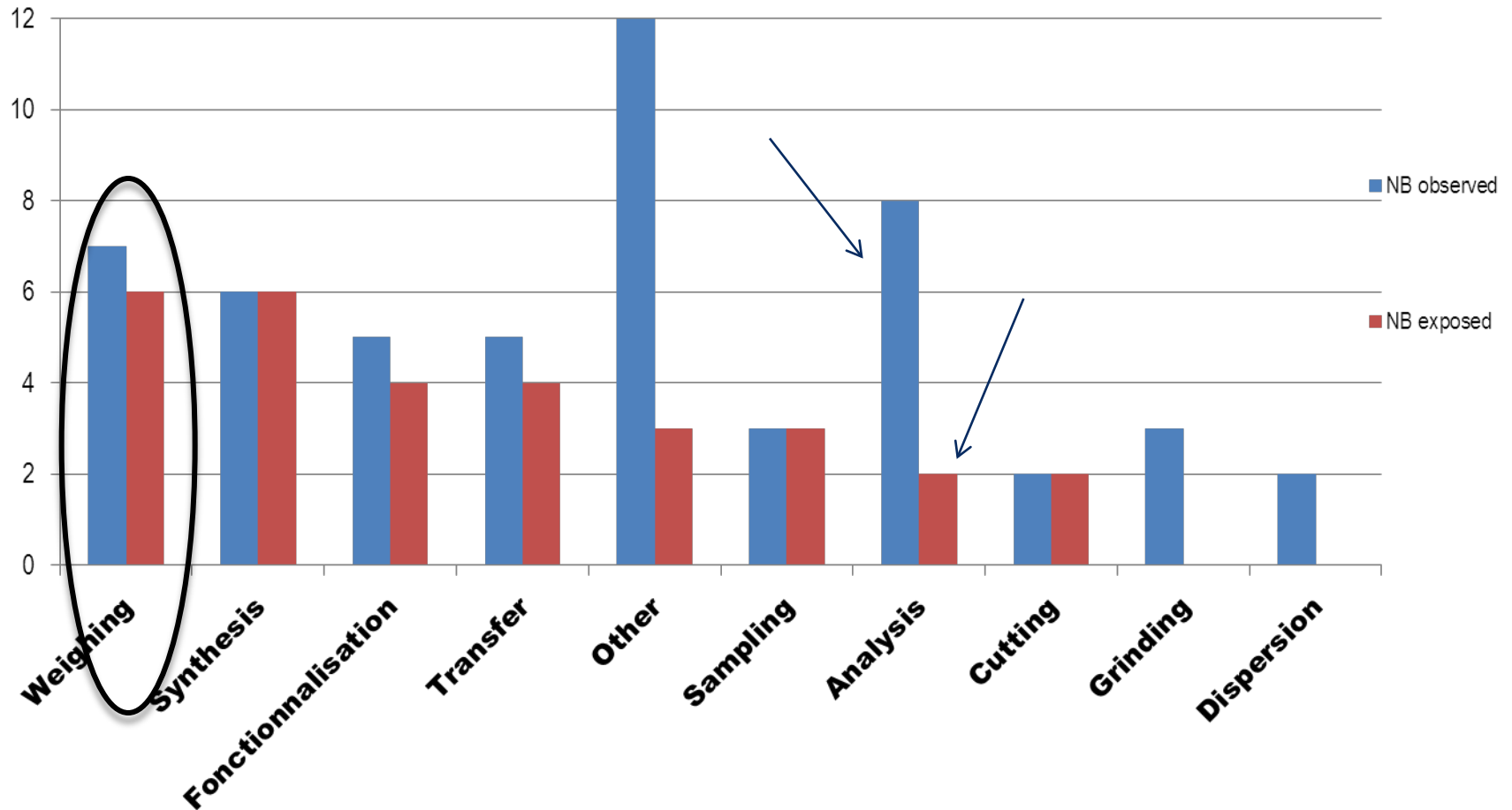
Onsite technical logbook

- **Non-instrumental tool :**
 - The logbook is filled in during the onsite visit with the help of all the people concerned : HSE managers, workrooms managers, workers etc...
 - Based on detailed observation (or explanation) of tasks and working conditions
- **A validated tool:**
 - Study of inter-method validation : results conform to the method of reference
 - Study of intra-method reliability : inter-evaluators reproducibility of results
- **Help for standardization of the onsite visit and data collection**
- **Available in French (Archives des maladies professionnelles et de l'environnement) and soon in English (Journal of Physics)**

Results from first ten onsite visits

Characteristics	NB
Visits performed	10
In private companies	2
In public institutions or labs	8
Workstations observed	53
Workstations dealing with TiO ₂	5
Workstations dealing with singlewall CNT	16
Workstations dealing with multiwall CNT	27
Workstations classified as potentially exposed	30

Operations observed at workstations : number and classification



Operation observed at workstations : surrounding details

- Three workers by workstation in average
- Frequency of intervention very different, depending on job title.
- Workstations classified as potentially exposed :
 - No general ventilation in the workroom (30% vs 20%)
 - No collective protection equipment (33% vs 21%)
 - Powder (76% vs 65%)
 - Strong dustiness (43% vs 22%)

Conclusion et Perspectives

Method

- Able to identify exposed workstation, essential to individual exposure assessment
- Operational character demonstrated
- Useful in high uncertainty conditions
- Could be combined and improved with IH measurement data
- Published and available on request at epinano@invs.sante.fr

EpiNano

- Link the individual data with the data collected in the logbook to estimate individual exposure
- Go on with onsite visits



THANK YOU FOR YOUR ATTENTION