Improving exposure assessment methodologies for epidemiological studies on plant protection products

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Project aims

- Better understand performance of exposure assessment methods used in previous epidemiological studies
- Recommend improvements in practice for future studies
- Assess reliability and external validity of surrogate measures used to assign exposure within individuals/groups and evaluate size/effects of recall bias on misclassification

How will we do this?

We will:

- Use previously collected exposure data from existing epidemiological studies and historical records
- Assess current exposure (using biomonitoring) in various populations to examine performance of exposure assessment approaches
- Compare and contrast performance of exposure assessment methods within existing epidemiological studies

Independent Advisory Board convened:

- Prof Aaron Blair (Chair), National Cancer Institute (USA)
- Prof Len Levy, Cranfield University (UK)
- Dr Mark Montforts, RIVM (The Netherlands)
- Prof Silvia Fustinoni, University of Milan (Italy)

Main project outcomes:

- Validation of an accepted and adaptable semi-quantitative individual-based exposure assessment method against measured levels of urine pesticide metabolites in a broad range of settings
- Comparison of reliability and performance of several group- and individual-based exposure assessment methods

Timeline

- 1st September 2017 – project started
- 3-year project

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WP1: Review the methods and techniques of exposure assessment (EA) used in occupational epidemiology

- Inventory of exposure assessment/assignment methods
- Inventory of determinants of PPP exposure

WP2: Assess the reliability of recalled information

- Compare agreement between the original data and those from the reliability questionnaires/interviews
- Review the available measurement data and, if resources and quality allow, evaluate the reliability of self-reports against measurement data in WP3 and WP4

WP3: Assess the reliability and validity of individual-based EA methods

- Collect biological samples from a sample of workers in different populations and farming systems
- Validate the exposure assignment methods against actual bio-monitoring (BM) data

WP4: Compare the performance of alternative EA methods

- Compare the congruence in assigned exposure using different group-based EA methods using the same job history information
- Apply alternative group- and individual-based exposure classifications in existing epi studies to study the dependence of reported associations on EA methods and to examine potential improvements

WP5: Project Dissemination

Inventory of exposure assessment/assignment methods
Inventory of determinants of PPP exposure

WP6: Project Management

- Original data: Questionnaire / Job history
- New data: Reliability questionnaire

Existing epidemiological studies:

- Current UK workers (Prospective Investigation of Pesticide Applicators’ Health)
- Historical UK workers (Study of Health in Agricultural Work)
- Ethiopian farm workers
- Thai farmers families
- Malaysian farm workers

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