"Network on the Coordination and Harmonisation of European Occupational Cohorts" (OMEGA-NET)

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Report on inventory of European occupational cohorts

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In a recent count of cohort studies in Europe capturing information on occupation and/or occupational exposures, we estimated that there are at least 63 major studies with some type of occupational information that enrolled over 30 million persons! (Turner and Mehlum 2018). With few exceptions (Kivimäki et al. 2015) there have been no large-scale analyses systematically combining cohorts from this extraordinary resource. To a large extent this is likely due to a lack of knowledge and/or awareness of the availability of such data and even more so to the absence of systematic organization of the types of data available. OMEGA-NET has as its prime aim to support the use, at both the European level and abroad, of data generated by past and ongoing cohort studies. The development of an inventory is a ***first and important prerequisite*** for such exploitation. Among the key aims of OMEGA-NET is to create an inventory of selected cohorts with occupational information in Europe and implement an online interactive tool with detailed information on these existing cohorts.

Aims of the OMEGA-NET Inventory

The inventory aims to collect information on all "*active"* cohorts in Europe and eventually globally that have data which can be used to explore occupation, work related exposures and health relationships. The inventory is developed primarily for research purposes but will also be useful for policymakers to identify, for example, research capacities and knowledge gaps. Here we define cohorts that are "*active*" as those that could potentially contribute to future research and data analysis efforts. Therefore, the inventory is not intended to be a compendium of all occupational health cohorts that have ever been assembled. A cohort that is unable to recover the original data or, for confidentiality reasons for example, could not provide information to a new research proposal will not be considered here. "Accessibility" to data is not synonymous with sharing data. Several of the cohorts, for example those based on national registers, may not share the data but may participate in new joint projects applying protocols for remote analysis and sharing results rather than primary data.

Which cohorts will be included in the inventory?

The focus of the inventory will be European cohorts, but cohorts from other continents will be actively encouraged to register and participate. The inventory will include cohorts, case-control studies nested within cohorts and intervention studies that:

1. Are active or can substantiate that their data are potentially accessible
2. Collect data on occupation and/or industry or at least one occupational exposure
3. Have at least one follow-up either already conducted or planned (therefore excluding cross-sectional studies).

How will information be collected, stored and used?

All information to be included in the inventory will be collected from the cohorts using a web-based ***OMEGA-NET Inventory Questionnaire***. Cohorts will be identified through systematic web-based searches and personal records of OMEGA-NET researchers. Researchers responsible for the cohorts will be contacted through electronic means and will be asked to register and complete the web-based questionnaire. If

necessary, OMEGA-NET will work directly with cohort researchers, to complete the inventory questionnaire. Quality control of the completed questionnaires will be conducted by OMEGA-NET.

The published version of the inventory will be stored in a searchable web database. Users will be able to search for specific exposures and outcomes, and extract information on the cohorts that have data for specific topics as well as basic information on the methods used to collect data.

What type of information will be collected?
The design of the web-based questionnaire and specification of information to be collected was developed through an international effort involving researchers and Working Group members in Europe, North America and Australia (see acknowledgments).

Information will be collected for the following main subheadings:

- **Identification and Basic Description** including: Cohort name, country/ies, Principal Investigator, cohort website, key references, ethical approval, data access policy, study design, source population, comparators, inclusion and exclusion criteria, year(s) of enrolment, age range, number of participants, and participation proportion at baseline
- **Follow-up** including: Type of follow-up (e.g. active, record based), information collected in follow-up, participation proportion at follow-up, periods of follow-up
- **Occupational Exposures** including: Source of exposure data collected, occupational history/time frame, occupation and industry information, types of exposure measurements (e.g. personal, workplace), methods for exposure assessment and a detailed listing of occupational exposures assessed (see below).
- **Outcomes evaluated** including: Type of outcome data collected, main diseases (e.g. cancer), and other health related factors/outcomes e.g. work participation, sickness absence.
- **Biological samples and analysis** including: Type of biological samples collected (e.g. blood, urine, sputum, nails), biological processing (e.g. DNA, RNA), genetic and other lab analyses (e.g. Genomics, Epigenomics, Metabolomics, biomarkers etc.)
- **Other information** including: Sociodemographic, lifestyle, residential history, linkage with other data sources, and further data planned to be collected (a description of data collection efforts that are already or likely to be funded)

Occupational exposures
A large part of the inventory covers exposure information including the following main categories:

- Dusts and Fibers
- Solvents
- Pesticides
- Metals and Metal Oxides
- Other Chemicals
- Engineered Nanoparticles
- Biological Factors
- Physical Agents
- Ergonomics, Physical Workload, and Injury Related
- Psychosocial Domains
- Organization of Work including Working Time
- Other

Each of these headings has subheadings that further specify a detailed listing of exposures. For example, **Dusts and Fibers** have the subheadings: Fibers; Inorganic dusts; and Organic dusts, with Inorganic dusts capturing: carbon black; cement; clay; coal dust; granular talc; inorganic dusts, not specified; quartz (quartz or crystalline silica containing dusts); silica amorphous; silicates; stone; and other (specify).

In addition to the main inventory of occupational cohorts, a separate inventory is being constructed on occupational exposure assessment tools used by the cohorts (Peters et al. 2019).

Discussion

The main issues for the OMEGA-NET inventory is completeness of the information about included cohorts and quality of the submitted information. In addition, over the years, the initial information will have to be updated. The inventory does not incorporate primary cohort data, rather only cohort meta-data, and seeks to capture the majority of available cohorts with information on occupational exposures, many of them being non-occupational in their primary aim, and enough information to be informative when new research is being planned. Detailed information on each cohort, e.g. specific laboratory analyses, should be available by contacting the principal investigator of each cohort. The inventory seeks to incorporate information on both published and not yet published data. To this extent it overcomes one of the main limitations of meta-analyses that are based mostly on published data. In addition, by facilitating access to primary data, the inventory promotes a more detailed use of the data and possibility of harmonizing protocols. There are several examples in occupational health that have done this type of harmonization, such as the AGRICOH cohort (Leon et al. 2011), the breast cancer night-shift work pooled analysis of case-control studies (Cordina-Duverger et al. 2018) or the working time pooled analysis (Kivimäki et al. 2015). Research in other fields, for example on child health, has developed inventories (see www.birthcohorts.net) that led to the promotion of sharing of data between researchers and an impressive development of new collaborative

research. The development of an inventory of occupational cohorts is a first and important prerequisite for an exploitation of the extensive information that has been collected worldwide on occupation and health and will be a major step to further develop research in an underfunded area and, eventually, promote workers' health.

Call for cohorts to register

A call for cohorts to register will be opened within 2019.

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