05D.3 METHODS OF ESTIMATING LIFETIME OCCUPATIONAL EXPOSURE IN THE GENERAL POPULATION, BASED ON JOB-EXPOSURE MATRICES

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10.1136/OEM-2019-EPI.129

Objectives To estimate proportion of pathologies attributable to occupational exposure, lifetime occupational exposure prevalence (LOEP) and relative risk are necessary. LOEP estimates are commonly used but often estimated with different methods. The method choice and the impact on estimates are rarely discuss in the literature. This study present and discuss the most widely used means of estimating LOEP and their respective impacts on estimates.

Methods A sample of individuals representative of the French population from 2007 was linked with four Matgéné job-exposure matrices: flour dust, cement dust, silica dust and benzene. LOEP and the 95% confidence interval were estimated using five methods: the maximum exposure probability during the career (Method 1), four using individual exposure probabilities, three of which subdivide careers into job-periods (Methods 2–4) and one which subdivides them into job-years (Method 5). To quantify differences between methods, percentage of variation were calculated for prevalence values on Results 2 to 5 versus Method 1.

Results For each agent, LOEP estimated from the maximum probability during the career (Method 1) was consistently lower than prevalence taking account of job-periods or job-years. LOEP on Method 1 for flour dust, cement dust, silica dust and benzene were respectively 4.4%–95% CI [4.0–4.7], 4.3% [3.9–4.6], 6.1% [5.7–6.5] and 3.9% [3.6–4.2]. Percentage of variation ranged from 0% to 25.0% for flour dust, from 11.6% to 55.8% for cement dust, from 11.5% to 49.1% for silica dust and from 0% to 53.8% for benzene.

Conclusions The present study provides a description of several LOEP estimation methods in the general population based on job-exposure matrices. It specifies the strong and weak points of each of the five chosen methods. For health monitoring purposes, LOEP should be reported as intervals, with low and high estimates obtained on different methods using job-periods (Methods 2–4).

05D.4 EXPOSURE PROFILES OF WORKERS IN INDIUM-TIN OXIDE POWDER MANUFACTURING, TARGET MANUFACTURING AND RECYCLING FACTORIES IN TAIWAN

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10.1136/OEM-2019-EPI.130

We aimed to investigate indium exposure profiles and the relationship between ambient exposure and internal dose of

indium among workers with different job characteristics in order to improve the work environment and protect workers from overexposure.

We recruited 329 workers from indium-tin oxide (ITO) powder and target manufacturing and recycling factories. The workers were categorized into six groups, as powder, ITO target, bonding, processing, recycling process and administration department as reference group. Field and personal air sampling were performed to monitor indium concentrations of work environments and breathing zones of workers. Cumulative exposure were evaluated by respirable dust concentrations in personal sampling, exposure duration and work duration. Plasma indium (P-In), urine indium (U-In) and U-In adjusted for creatinine (U-In/creatinine) were used as internal dose.

One-fourth of air indium concentrations of ITO manufacturing and recycling factories were exceeded permissible exposure limit (PEL) in Taiwan. Thirty-six percent of workers in this study exposed to unacceptable airborne concentration of indium. Over one-fifth of workers had P-In higher than Japanese biological exposure index (BEI) of 3 µg/L. After adjusting for potential confounders, significant positive were found between indium cumulative exposure and P-In ($\beta=0.56$, $p<0.001$), U-In ($\beta=0.38$, $p<0.001$), and U-In/creatinine ($\beta=0.34$, $p<0.001$) in bonding process. A significant positive were found between indium cumulative exposure and P-In ($\beta=0.53$, $p=0.003$), U-In ($\beta=0.39$, $p=0.047$) and U-In/creatinine ($\beta=0.34$, $p=0.01$) in processing process.

We suggest that U-In was an useful biomarker to assess indium exposure of indium manufacturing workers. The distribution and elimination of indium differed by its chemical form, which lead to characterization of the chemical form of indium is important for biomonitoring. Notably, although workers were exposed to indium below PEL, P-In still exceeded Japanese BEI. An appropriate exposure index need to be specified.

05D.5 CONSTRUCTION OF FINNISH ISCO-88 JOB EXPOSURE MATRIX: EXAMINATION OF DATASET WITH TWO DIFFERENT CLASSIFICATION OF OCCUPATIONS IN CONSECUTIVE CENSUSES

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10.1136/OEM-2019-EPI.131

Finnish Job exposure matrix (FINJEM) assesses occupational exposure for 84 factors in 311 FINJEM occupations. Finnish version of ISCO-88 International Standard Classification of Occupations 1988 (F-ISCO-88) occupational codes (n=445), used in population censuses from 1995 to 2009, often split into more than one FINJEM code. We describe the construction of a crosswalk between F-ISCO-88 codes and FINJEM codes and the resulting F-ISCO88 job exposure matrix (F-ISCO-88-JEM).

In total, we found 1144 conversion candidate pairs from two sources: 1) Statistics Finland crosswalks from three sequential classification of occupations (2001–1997, 1997–1987, 1987–1980) combined with crosswalk between the classification of occupations in 1980 and FINJEM, and 2) preliminary expert judgement-based conversion of F-ISCO-88–FINJEM.

We counted frequencies for all 9900 F-ISCO88 (in 1995) and FINJEM (1990) occupational code pairs from a study of

neurodegenerative disease (n=103,969). Correctness of every candidate pair and prevalent non-candidate pairs was checked using occupational coding manuals of FINJEM and F-ISCO88, including occupational titles. Final list of accepted pairs was agreed by the authors.

The number of verified F-ISCO-88–FINJEM conversion pairs was 835, including 88 pairs from non-candidates. In total, 397 (34.7%) candidate pairs were incorrect. We could solve FINJEM occupation for 84 252 (81.0% from total population) persons with direct conversions or verified conversion pairs. Occupation of the remaining 19 717 persons changed between 1990 and 1995. Direct conversions totaled 27 716 (26.6%) solutions and split F-ISCO-88 codes 56 536 (54.4%) solutions. The resulting F-ISCO-88–JEM comprises original FINJEM exposure estimates for direct conversions and estimates for split F-ISCO-88 codes, calculated using proportions of corresponding FINJEM codes as weights.

A quarter of F-ISCO-88 codes can be converted to FINJEM codes in data with F-ISCO-88 occupational codes. This proportion could be tripled in a dataset including FINJEM and F-ISCO88 codes in consecutive censuses, resulting in more accurate exposure estimates.

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O5E.1 DATA ON ACKNOWLEDGMENT AND COSTS OF WORK-RELATED MENTAL DISEASES IN FRANCE

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10.1136/OEM-2019-EPI.132

Objective To report data concerning the reality of work-related mental diseases (WRMD) in France, their acknowledgment as occupational diseases and some socio-economic data.

Methods Data were collected from the French National Health Insurance Fund (NHIF) and from the database of the French national occupational surveillance and prevention network (rnv3p). Rnv3p collects data from French Occupational Disease Centers to identify and describe risks and/or emerging work-related diseases.

Results Data from NHIF indicate that the number of requests for acknowledgment of WRMD has increased significantly from 2012 to 2017 (200 to 1500). About 50% are acknowledged and compensated as occupational diseases. Within these affections, the share of depressions is the majority. Durations of work stoppages (more than 400 days on average) were much longer than for other occupational diseases.

Mental disorders related to psychosocial risk factors may also be compensated as work injuries. In 2016, NHIF compensated over 10 000 mental disorders as work injuries, mostly caused by external events or inadequate working conditions. The proportion of people with permanent disability was 4.6%. Finally, the management of WRMD acknowledged will have represented € 230 million for the Work Injuries-Occupational Diseases branch of the NHIF.

Rnv3p data are globally consistent with NHIF concerning compensated occupational mental diseases, highlighting the increase of WRMD in some sectors such as public

administration, health and social action, retail business and education. Over 18000 WRMD (33% men, 67% women; mean age=46.0±8.9) were recorded in the database between 2010 and 2016, and 1833 cases of burnout situations currently non acknowledged as occupational diseases by the NHIF. Rnv3p data also illustrate the importance of under-reporting of WRMD as occupational diseases.

Conclusion Then, RNV3P provides important data to assist in the acknowledgment of WRMD and to carry out preventive actions in the sectors and enterprises most concerned.

O5E.2 A HOSPITAL OCCUPATIONAL DISEASES UNIT: AN EXPERIENCE TO INCREASE THE RECOGNITION OF OCCUPATIONAL DISEASE

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10.1136/OEM-2019-EPI.133

Background Under-reporting and recognition of occupational diseases is a problem in countries with workers' compensation schemes.

Aims To describe the role of a public hospital Occupational Disease Unit (ODU) in Barcelona that resulted in improved reporting and official recognition of occupational diseases from 2010 to 2017.

Methods Hospital physicians referred possible cases of work-related disease to the ODU, where in-depth medical evaluations were then performed, and a detailed report addressing causation was generated. Patients with confirmed cases of occupational disease were counselled and followed while pursuing official recognition and benefits claims by the Spanish Social Security System.

Results Between 2010 and 2017, 149 cases were referred to the ODU for evaluation. Of these, 80 (53.7%) were confirmed to have an occupational disease, 54 (67.5%) patients pursued official recognition, and to date 26 (48.1%) were accepted by the Social Security System. The predictive positive value varied by diagnosis group ($p=0.003$), and was highest for skin diseases (71.4%) and cancer (66.7%), and lowest for hearing loss (29.4%) and musculoskeletal disorders (16.7%).

Conclusions A hospital ODU can improve reporting and official recognition of occupational diseases, that otherwise might not have been recognized. Expanding this experience to other Spanish and European hospitals could improve the efficiency of workers' compensation schemes and better support preventive policies.

O5E.3 OCCUPATIONAL DISEASES AMONG WORKERS IN DIFFERENT SOCIOECONOMIC POSITIONS

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10.1136/OEM-2019-EPI.134

Introduction To determine differences between workers in lower and higher socioeconomic positions (SEP) in: i)