A SWEDISH JOB EXPOSURE MATRIX FOR PHYSICAL EXPOSURE ASSESSMENT FOR U.S. CASE-CONTROL STUDY ON OCCUPATIONAL LIFTING AND RETINAL DETACHMENT: A COMPARISON OF METHODS. (TO BE PRESENTED IN AN ACCEPTED MINI-SYMPOSIUM)

Objectives To support a case-control study investigating the association between occupational lifting and retinal detachment (RD) in Massachusetts, we estimated and compared self-reported lifting exposures to those documented in O*NET, a government database that characterises physical exposures such as manual material handling and vibration for hundreds of U.S. job titles.

Methods Cases of RD were identified based on recent surgical treatment and controls based on a recent routine eye exam. All recruited participants were mailed a questionnaire including questions on the magnitude and frequency of lifting, pushing and pulling in all previous jobs. To help patients recall physical exertion across their lives, photos of lifting common objects were included. Participant responses were used to estimate occupational lifting exposures in three ways: 1) self-reports; 2) a job exposure matrix (JEM) linking job titles with O*NET exposure data; and 3) combining 1 and 2 with Empirical Bayes Estimators (EBE).

Results Study recruitment will continue through 2017, enrolling at least 150 cases and 250 controls. Preliminary analyses from half of the participants indicate an average of four jobs/person. Self-reports and job-title based exposures from O*NET were moderately correlated for lifting (Spearman rank correlation=0.48, p<0.0001). Frequent reports of whole body vibration exposures were uncommon (<5% of all jobs), suggesting the study will have less power to evaluate this exposure.

Conclusions By combining strengths of JEMs with personal recall, this study sought to improve on previous investigations. EBE provide a formal method for optimising the two types of data.
Background/Objectives We extended the mortality follow-up of a cohort of 25,460 workers employed at eight acrylonitrile-producing or using facilities in the U.S by 21 years. Based on 8,124 deaths and 1,023,921 person-years of follow-up, we evaluated the relationship between occupational exposure to acrylonitrile and mortality.

Methods Standardised mortality ratios using deaths through December 31, 2012 were calculated. Personnel records, work histories, and monitoring data were used to develop quantitative estimates of exposure to acrylonitrile. Adjusted hazard ratios (HR) were estimated by Cox proportional hazards regression.

Results All-cause mortality and mortality from all cancer was significantly less than expected compared with the general population. Internal analyses by cumulative and average exposure revealed elevated risk of cancer of the lung and bronchus (n=808 deaths) and bladder (n=55 deaths). The HR for lung cancer was significantly elevated in the highest quintile of cumulative exposure (1.40, 95% CI 1.11–1.78, p-trend=0.09) compared to unexposed workers, peaking at ≥20 years since first exposure/hire (HR=1.49, 95% CI 1.17–1.91); average exposure was associated with a small non-significant increased risk (HR=1.20, 95% CI 0.95–1.52). Average exposure was associated with a significantly elevated risk of bladder cancer; workers in the top tertile had an HR=2.89, 95% CI 1.35–6.18, p-trend<0.01 compared to the unexposed, while there was non-significant increase between cumulative exposure and risk (HR=1.37, 95% CI 0.63–2.90). Significant HRs were not observed for other smoking-related outcomes.

Conclusions Extended mortality follow-up of the largest cohort of acrylonitrile exposed workers provides some evidence of a possible association between high exposure to acrylonitrile and lung and bladder cancer.

Oral Presentation
Cancer

0329 OCCUPATIONAL EXPOSURE TO METALS AND WELDING FUMES, AND RISK OF GLIOMA IN THE INTEROCC STUDY

Background Brain tumour aetiology is poorly understood. Based on their ability to pass through the blood-brain barrier, it has been hypothesised that exposure to metals may increase the risk of brain cancer. Results from the few epidemiological studies on this issue are inconsistent.

Methods We investigated the relationship between glioma risk and occupational exposure to five metals - lead, cadmium, nickel, chromium and iron - as well as to welding fumes, using data from the seven-country INTEROCC study. A total of 1,800 incident glioma cases and 5,160 controls aged 30–69 years were included in the analysis. Lifetime occupational exposure to the agents was assessed using the INTEROCC JEM, a modified version of the Finnish job exposure matrix FINJEM.

Results In general, cases had a slightly higher prevalence of exposure to the various metals and welding fumes than did controls, with the prevalence of ever exposed ranging from 1.7% and 2.2% for cadmium up to 10.2% and 13.6% for iron among controls and cases, respectively. However, in multivariable logistic regression analyses, there was no association between ever exposure to any of the agents and risk of glioma with odds ratios (95% confidence intervals) ranging from 0.8 (0.7–1.0) for lead to 1.1 (0.7–1.6) for cadmium. Results were consistent across models considering cumulative exposure or duration, as well as in all sensitivity analyses conducted.

Conclusions Findings from this large-scale international study provide no evidence for an association between occupational exposure to any of the metals under scrutiny or welding fumes, and risk of glioma.