Method A pooled analysis of 10 case-control studies was conducted within the Interlymph Consortium. Overall, the study population included 10786 NHL cases and 12069 controls. Each occupation of study subjects was coded using the 1968 ISCO classification. Risk of NHL, diffuse large B cell lymphoma (DLBCL), follicular Lymphoma (FL), chronic lymphocytic leukaemia (CLL) and T-cell Lymphoma, associated with having been working for one year or more in specific health occupations was calculated as the Odds Ratio (OR) and its 95% confidence interval (95% CI) with unconditional logistic regression, adjusting by age, gender and study area. Risk was also calculated for duration of employment > 10 years.
Results Health workers employed 10 year or more showed a significant 19% excess risk of FL, which was restricted to male workers (OR = 1.62; 95% CI 1.02, 2.59). FL risk was highest (OR = 2.23, 95% CI 1.17–4.26) among the medical staff, and it was consistent in both genders. Male personal care workers also showed an increase in NHL risk (OR = 2.52; 95% CI 1.18–5.36). Risk was not increased among nurses. No consistent patterns of increasing risk was observed for the other NHL subtypes.
Conclusions Shift work, ethylene oxide, and viral agents are well known NHL risk factors among health workers. Our results suggest that risk might be more elevated among the medical staff and among men.

0399 EFFECTIVENESS OF A MULTIDISCIPLINARY INTERVENTION AMONG DUTCH CONSTRUCTION WORKERS ON RESPIRABLE QUARTZ EXPOSURE: RESULTS FROM THE 'RELIEVED WORKING STUDY'

[1,2]Erik van Deurssen, [2]Karen Oude Hengel, [2]Suzanne Spaan, [2]Henk Goede, [2]Tim Meijster, [2]Erik Tielemans, [1]Dick Heederik, [2]Anjoeka Pronk. *[1]Institute for Risk Assessment Sciences, Utrecht University, Utrecht, The Netherlands; [2]TNO, Zeist, The Netherlands*

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Objectives A multidisciplinary intervention study aimed at reducing quartz exposure in the Dutch construction industry was performed. We aimed to assess the effect of the intervention on exposure level and psycho-social and organisational factors.
Method Eight participating construction companies were randomly allocated to an intervention (n = 4) or control group (n = 4). Following the Intervention Mapping approach, the intervention aimed at engineering, organisational and psycho-social factors. Pre and post-intervention respirable quartz measurements (n = 300) were taken from workers from all eight companies. Questionnaires and observation forms were used to assess pre and post psycho-social and organisational factors.
Results Pre-intervention assessment demonstrated highest respirable quartz levels for concrete drillers, tuck pointers and demolishers (GM respectively 0.20, 0.18 and 0.12 mg/m^3), exceeding the Dutch occupational exposure limit (OEL) in 62% of the measurements. Identified control measures resulted in 30% reduction in quartz exposure. More social influence was associated with a 1.5 fold increased use of control measures. The post intervention assessments will become available early 2014.
Conclusions High exposure levels exceeding the Dutch OEL were observed. Associations between organisational, psycho-social and use of control measures found during the pre-intervention, were taken into consideration when developing the intervention strategy. A comparison between pre and post intervention outcomes will be presented during the conference. The effect of changes in exposure levels as a result of the intervention will be assessed with a health impact assessment model incorporating population dynamics.

0403 AN EXPOSURE ASSESSMENT MODEL FOR LONG WORKING HOURS

[1]Sadie Conway, [1]Lisa Pompeii, [2]David Gimeno. *[1]The University of Texas School of Public Health, Houston, Texas, USA; [2]The University of Texas School of Public Health, San Antonio, Texas, USA*

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Objectives To operationalize a definition of long working hours that overcomes limitations of existing heterogeneous definitions and to examine the temporal trends of long working hours across worker characteristics in the US.
Method We examined 25 years (1985–2010) of repeated working hour measures from a representative sample of workers in the US Panel Study of Income Dynamics. Self-reported working hours included total annual hours worked, total annual overtime worked, jobs worked, and weekly hours worked by job. An exposure assessment model was produced through the creation of a directed acyclic graph, and a corresponding multivariate model was constructed for purposes of examining long working hours as an independent risk factor for various health outcomes, including cardiovascular disease.
Results An improved measure of working hours was produced in the form of a model that included dimensions of working hour intensity and duration. Descriptive analyses evaluating the frequency and temporal trends of long working hours across demographic and occupational strata were calculated on 31 136 participants employed during this study period, with 66.8% and 32.0% who worked more than 40 and 50 h per week on average, respectively, for any year.
Conclusions The longitudinal nature of this study in a large representative sample of US workers using repeated measures of working hours allowed us to operationalize a more comprehensive definition of long working hours, addressing methodological issues identified in previous research and providing enhanced generalizability. We examined the relationship of long working hours with health outcomes while considering participants demographic and occupational characteristics.

0405 INFLUENCE OF FLUORIDE AND HARD MANUAL LABOUR FOR PREVALENCE OF SHOULDER PAIN SYNDROME IN ALUMINIUM POTROOMS

[1]Vasiliy Shirokov, [1]Vladimir Gurvich, [2]Anatoliy Varaksin, [1]Tatyana Derstuganova. *[1]Federal State Scientific Institution "Ekaterinburg Medical Research Center for Prophylaxis and Health Protection of Industrial Workers", Ekaterinburg, Russia; [2]Institute of Industrial Ecology, The Ural Branch of the Russian Academy of Sciences.*

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Objectives To evaluate relative contribution of hard manual labour, fluorides' influence, co-morbid pathology on the prevalence and incidence of shoulder pain syndrome (SPS).
Method One-stage cross-sectional observation of prevalence SPS was investigated. The observed 6094 workers were divided into four groups. The first group was formed by 407 workers of an aluminium plant (elektroliz aluminium), whose professional activity (hard manual labour) is connected the quite big shoulder region loading and fluorides' influence. The 2-nd group consisted of 369 workers with fluorides' influence without manual

labour. The 3-rd group consisted of 2078 workers, hard manual labour without influence of bone-seeking toxic factors (metal-worker, painters, moulders etc.). The 4-th group - 3240 workers and employees of auxiliary departments not subjected to the influence of unfavourable industrial factors (engineer, command, economists etc.). The observed were divided into four age groups and three working experience groups.

Results In the observed population the prevalence of SPS was 9,6 (95% CI 8,9–10,7), among male - 8,6 (7,8–9,4), among female - 1,9 (10,5–13,5). The highest rates of SPS were aged 40 to 49 years - 11,0 (9,6–12,4) and older than 50 years - 11,9 (10,5–13,3). The highest prevalence index of SPS were registered in the B first group - 32, 9% (workers exposed to toxic effects of fluoride and physical strain), the lowest - in the 3-rd group - 6,9% (without the impact of toxic action). Rate of shoulder pain prevalence is authentically higher among the workers of hard manual labour and under the toxic influence of fluoride. The prevalence of SP in the 3rd group was similar to the index of the 4th group.

Conclusions The highest RR of SPS progress was observed in the 1st group in the relation to 4th (5,6) and 3rd groups (5,2), at the same time etiological fraction (EF) was 77.5% and 78,7%, it indicates very high influence of labour conditions on prevalence of SPS. Influence without the manual labour index of RR and EF is much higher in the 2nd group, than in 3rd and 4th groups.

It's worth noting that the highest prevalence of SPS was found among patients with broncho-pulmonary system diseases - 24,8 (20,1–29,4), it is higher than among patients with neck pain - 23,4 (21,5–25,3). Among the analysed "nonmanufactoring" data co-morbid pathology of the respiratory system and neck pain increase the risk of the shoulder pain syndrome development.

The relative risk of SPS was higher among patients with neck pain (7,0) than with comorbidity of broncho-pulmonary system (2,6).

0407 AN OLD TRADE WITH AN UNANSWERED QUESTION: DOES ARC-WELDING FUME EXPOSURE INCREASE THE RISKS OF OBSTRUCTIVE PULMONARY DISEASES? FIRST FINDINGS FROM THE WELSHIP CROSS-SECTIONAL STUDY

[1]Andrea Marongiu, [2]Omer Hasan, [2]Anila Ali, [2]Sharoon Bakhsh, [2]Bobby George, [2]Nabeel Irfan, [1]Cristina Canova, [1]Susie Schofield, [1]Joana Szram, [1]Cosetta Minelli, [1]Paul Cullinan. *[1]Imperial College London, London, UK; [2]Drydocks World Dubai, Dubai, United Arab Emirates*

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Objectives Increasingly, global manufacturing is shifting to emerging economies and with it the use of arc-welding for applications in different industries. The chronic respiratory adverse effects resulting from exposure to gases and ultrafine metal particles in welding fume are incompletely understood.

We aimed to measure the prevalence of arc-welding related pulmonary obstructive outcomes by analysing data collected in a shipyard in the Middle East.

Method Between January and December 2013, through cross-sectional survey, we collected spirometry data and behavioural, occupational and respiratory symptoms information from a random sample of male shipyard workers; 397 were exposed to welding fume and 127 were non-exposed. The sample was selected from a total population of about 8000 employees, by frequency matching for ethnicity and age relatively to full-time welders ('highly' exposed).

Results Of the 580 workers invited, 26 subsequently left their job; of the remainder, 95%(524) agreed to participate. The participants, from the Indian subcontinent (90%) or Philippines (10%), had a median age of 38 years. Ever smoking was reported by 37%, with full-time welders reporting the lowest proportion of current smoking, 18%(24/131).

Overall, 13% reported respiratory symptoms with a higher prevalence in the winter months. Post-bronchodilator spirometry data were available for 91% of workers. Mean values for FEV1 and FVC were 2.87L and 3.48L, with no statistically significant differences across exposure groups (p-values: 0.71 and 0.48).

Conclusions These preliminary results need to be explored further in relation to smoking, past and current occupational exposure. This population, it is hoped, will form the basis for a longitudinal study.

0408 PUBMED SEARCH STRINGS FOR THE STUDY OF PUTATIVE ENVIRONMENTAL DETERMINANTS OF DISEASE

[1]Stefano Mattioli, [2]Davide Gori, [2]Valentina Di Gregori, [1]Andrea Farioli, [2]Maria Pia Fantini, [3]David Christiani, [1]Stefania Curti, [1]Francesco Violante. *[1]Department of Medical and Surgical Sciences, University of Bologna, Bologna, Italy; [2]Department of Biomedical and Neuromotor Sciences, University of Bologna, Bologna, Italy; [3]School of Public Health, Harvard University, Harvard, USA*

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Objectives Several optimised search strategies have been developed in Medicine, and more recently in Occupational Medicine. Aim of this study is to identify efficient PubMed search strategies for the study of putative environmental determinants of a disease.

Method We compiled a list of search terms (either Medical Subjects Heading [MeSH] or non-MeSH) seeming pertinent to exposure to pollutants as determinants of diseases in general population. We estimated proportions of potentially pertinent articles to formulate two search strategies (one "more specific", one "more sensitive"). We applied these strategies to retrieve information on the putative environmental determinants of three diseases: autoimmune disease, sudden death and congenital heart defects. We evaluated the number of needed to read (NNR) abstracts to identify one potentially pertinent article in the context of these pathologies.

Results The "more specific" search string was based on the combination of terms that yielded the highest proportion (≥ 40%) of potentially pertinent abstracts, including the MeSH terms *'air pollutants'*, *'air pollution'*, *'disorders of environmental origin'*, *'environmental exposure'* and *'particulate matter'*. The "more sensitive" string was based on use of broader search fields and additional coverage provided by other search terms under study. Using the "more specific" string, the NNR to find one potentially pertinent article were: 2.7 for autoimmune disease; 3.2 for sudden death; 1.1 for congenital heart defects. Using the sensitive strategy, the NNR were 4.0, 6.1 and 3.4, respectively.

Conclusions The proposed strings could help health care professionals investigate environmental determinants of medical conditions that could be related to pollution.