Objectives We aimed to build upon these findings and elucidate the underlying potential causal agents.

Methods We applied the ALOHA+ job-exposure matrix (JEM) based on ISCO-88 codes in which exposure to 12 selected agents was rated as 0 (no exposure), 1 (low), and 2 (high). Agents highly correlated (>85%) were combined. COPD was spirometrically-defined as forced expiratory volume in 1 s (FEV1)/forced vital capacity (FVC) < lower limit of normal (LLN). We calculated semi-quantitative cumulative exposure (CE) estimates for each agent by multiplying duration of exposure and squared intensity. Prevalence ratios (PR) and 95% confidence intervals (CI) for COPD were estimated using robust Poisson regression adjusted for centre, sex, age, smoking, and co-exposure to the other JEM agents. Only associations confirmed among never-smokers and never-asthmatics were considered reliable.

Results Out of 116,375 participants with complete job-histories, 94,514 had acceptable/repeatable spirometry data and smoking information and were included in the analysis. Pesticides exposure showed increased COPD risks (PR=1.00, 95% CI 0.85–1.17 for low CE, PR=1.32, 95% CI 1.12–1.56 for high CE; P-trend=0.004), that were confirmed among never-smokers (P-trend=0.005) and never-asthmatics (P-trend=0.001). Results remained unchanged when never-exposed to any of the JEM agents were used as reference category.

Conclusion Focussed preventive strategies in workers exposed to pesticides are warranted to prevent the associated occupational COPD burden.

0-71 OCCUPATIONAL INHALANT EXPOSURES AND LONGITUDINAL LUNG FUNCTION DECLINE

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10.1136/OEM-2021-EPI.125

Background Airborne exposures at the workplace are believed to be associated with lung function decline. However, results from longitudinal studies are conflicting.

Methods Participants from two general population-based cohorts, the Copenhagen City Heart Study and the Copenhagen General Population Study, with at least two lung function measurements were followed for an average of 9 years, range 3–27 years. Occupational exposure was assigned to each year of follow-up between two lung function measurements by a job exposure matrix. Associations between mean occupational exposure per year and mean annual decline in forced expiratory volume in 1 second (FEV1) were investigated using linear mixed effects models according to cohort and time period (1976–1990 and 2003–2015). We adjusted for sex, height, weight, education, baseline FEV1, and pack-years of smoking per year during follow-up.

Results A total of 16,144 individuals were included (mean age 48 years and 43% male). Occupational exposure to mineral dusts, biological dusts, gases & fumes, and a composite category were not associated with FEV1 decline in analyses with dichotomized exposure. In analyses with an indexed measure of exposure, gases & fumes were associated with a FEV1 change of -5.8 mL/unit/year (95% confidence interval:-10.8; -2.3) during 1976–1990, but not during 2001–2015.

Conclusion In two cohorts from the Danish general population, occupational exposure to dusts, gases, and fumes was not associated with excess lung function decline in recent years but might have been of importance decades ago.

0-133 STYRENE ASSOCIATED RESPIRATORY OUTCOMES AMONG REINFORCED PLASTIC INDUSTRY WORKERS.

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10.1136/OEM-2021-EPI.126

Introduction Fibreglass reinforcement industry employees are exposed to both fibreglass and the agents used in the reinforcing process. Adverse respiratory outcomes have been associated with fibreglass resins and agents in the reinforced plastic workplace.

Objectives The aim of this study was to determine the exposure-related adverse respiratory outcomes among employees in the reinforced plastic workplace.

Methods A cross-sectional study was conducted in the fibreglass reinforcement industry based in KwaZulu-Natal, South Africa. Personal monitoring of styrene and spirometry were conducted. Total cumulative exposure was calculated for each participant's lifetime of employment in the company. The 254 employees were interviewed by completing a detailed questionnaire based on respiratory health and occupational exposures. Lung function tests were conducted for all employees according to South African Thoracic Society (SATS) standards.

Results The geometric mean of styrene exposure level for the General Laminating Department was 48.2 mg/m³ (95% CI 36.3–64.1 mg/m³) and the Fitting Department was 20.7 mg/m³ (95% CI: 15.6–27.5 mg/m³). The total styrene cumulative exposure odds ratios for chronic cough, phlegm, wheezing and breathlessness in the high exposure category was 3.1 (95% CI 1.1– 8.6), 5.3 (95% CI 1.7– 16.6), 3.3 (95% CI 1.2– 9.1) and 5.5 (95% CI 1.15–26.4), respectively. The cumulative exposure associated reduction, adjusted for smoking and doctor-diagnosed TB, in FEV1/FVC ratio, percent predicted FEV1 and FVC was 0.01, 0.04% and 0.05%, respectively.

Conclusion Styrene exposure increases the risk of respiratory symptoms and is associated with reduced lung function.

0-266 CHRONIC RESPIRATORY DISEASE IN THE ONTARIO MINING INDUSTRY

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10.1136/OEM-2021-EPI.127

Introduction Mining involves many exposures associated with increased respiratory disease risk, including crystalline silica, diesel engine exhaust, arsenic, nickel, and other metal compounds.

Objectives To investigate the risk of non-malignant respiratory disease (NMRD) in a cohort of Ontario mixed-ore miners.

Methods The Ontario Mining Master File (MMF) contains 90,000 work histories collected during mandatory annual medical exams from 1928 to 1988. Record linkages with provincial hospital and outpatient databases (1999–2017) were performed to ascertain respiratory disease incidence. Incidence

rates were compared to provincial rates using standardized incidence ratios (SIR). Internal comparisons were made using Poisson regression to estimate age and birth year-adjusted incidence rate ratios (RRs) and 95% confidence intervals (CIs) for NMRDs. Stratified analyses were conducted for types of mining and ore mined.

Results The linked cohort of 30,413 males displayed significantly increased risks for COPD (SIR=2.65, CI=2.58–2.71), pulmonary fibrosis (SIR=2.02, CI=1.85–2.20), and silicosis (SIR=15.72, CI=14.55–20.65). Excesses of silicosis were observed for underground miners (SIR=17.41, CI=14.55–20.65), surface miners (SIR=19.58, CI=15.20–24.82) and mixed-ore miners (SIR=25.52, CI=20.98–30.76). Surface miners had an increased risk of silicosis compared to never surface miners. This risk increased with increasing duration of employment with the highest employment duration (≥ 10 years) yielding an RR of 3.49 (CI 1.69–7.21).

Conclusion Results are consistent with previous findings of an excess risk of respiratory disease (NMRD) among Ontario mine workers. This study provides increased understanding of these risks in relation to occupational factors and highlights a potentially overlooked increased risk of silicosis among surface mine workers in Ontario that bears further scrutiny. These results are supported by the unexpectedly high respirable crystalline silica exposures measured in Ontario mines surface operations as part of the related Ontario Mines Exposure Database (OMED). Together with the MMF the OMED exposure data provides future opportunities to test new hypotheses, including the impact of combined exposures among miners.

O-302

A POPULATION PERSPECTIVE FOR THE PREVENTION OF OCCUPATIONAL ASTHMA (EUROPEAN COMMUNITY RESPIRATORY HEALTH SURVEY-ECRHS)

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10.1136/OEM-2021-EPI.128

Introduction About 15% of adult-onset asthma is attributed to occupational exposures.

Objectives We examined whether prevention policies focusing on high-risk occupations adequately identify occupational asthma risks at a population level. We estimated, in a prospective population-based study, the distribution of asthma risk by occupation, and examined whether asthma risk in prior defined high-risk occupations were distinguished from those of prior defined non-high-risk occupations.

Methods ECRHS is a multicentre cohort study; 9409 participants (52% female) from 13 countries were followed for 10 to 20 years. Incident asthma was assessed by repeated questionnaires on asthma symptoms and medication. We examined the incidence of asthma for each occupation relative to all other occupations during follow-up using Generalized Estimating Equation Poisson regression. On the basis of prior evidence, we classified occupations during follow-up into two asthma risk groups (high and non-high risk). All high-risk occupations had documented exposure to at least one high-risk asthmagens (Occupational Asthma-specific Job Exposure Matrix [JEM]). We compared the distributions of the estimated log Relative Risks (logRR) for each group limiting the

main analysis to 90 occupations with more than five incident cases.

Results The median logRR for the 14 prior defined high-risk occupations such as bakers, cleaners, and welders was higher (logRR=0.37) than the non-high risk occupations (logRR=0.06) (Mann-Whitney p-value=0.02). There was considerable overlap in the distributions of the logRRs by risk group (high risk, InterQuartileRange logRR 0.14–0.49; non-high risk IQR -0.21 to 0.36). Several non-high risk group occupations had significantly increased logRRs, including architects and receptionists.

Conclusion The significant overlap in risk curves by prior risk indicates that asthma-related exposures are prevalent and occur in multiple occupations. Current programs for occupational asthma prevention focus correctly on occupations at higher risk, but should also consider exposures in occupations not identified, a priori, as high risk.

Return to Work

O-146

ASSOCIATIONS OF EMPLOYMENT SECTOR AND OCCUPATIONAL EXPOSURES WITH FULL AND PART-TIME SICKNESS ABSENCE: RANDOM AND FIXED EFFECTS ANALYSES ON PANEL DATA

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10.1136/OEM-2021-EPI.129

Introduction The contribution of work-related factors – such as employment sector and occupational exposures – to sickness absence is known to be strong. In addition to the potential causal mechanisms, the associations may also be affected by selection, i.e. individuals with characteristics associated with a high likelihood of sickness absences ending up in particular types of jobs.

Objectives We aimed to investigate the influence of unobserved individual characteristics in explaining the effect of work-related factors on full (fSA) and part-time sickness absence (pSA).

Methods We used register-based panel data for the period 2005–2016 on a 70% random sample of the Finnish working-age population. The relationships between employment sector and occupational exposures (% exposed to physically heavy work and job control score based on job exposure matrices) and the annual onset of fSA and pSA were investigated among men and women. First random effects (RE) models were applied controlling for observed sociodemographic factors and then fixed effects (FE) models, that examine within-individual changes over time and thereby further account for unobserved time-invariant individual characteristics.

Results In the RE analyses, public employment sector, physically heavy work and lower job control each increased the use of fSA and pSA among both genders. When unobserved individual characteristics were controlled for with the FE models, the effects on fSA attenuated. With pSA the effects of employment sector and physical heaviness of work among women even became reverse. The effect of lower job control on pSA remained specially among women.

Conclusions The role of individuals' unobserved characteristics in explaining the effect of work-related factors on sickness absence should not be neglected. The effects of work-related