

# 10139 OCCUPATIONAL EXPOSURE TO CHLORINATED SOLVENTS AND LUNG CANCER: RESULTS FROM THE ICARE STUDY

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**Objectives** We aimed to investigate the role of occupational exposure to chlorinated solvents in the aetiology of lung cancer. **Method** ICARE is a multicenter population-based case-control study conducted in France between 2001 and 2006. Information on subjects lifelong work history was collected by face to face interviews using standardised questionnaires. Occupational exposures were assessed using job-exposure matrices (JEM) relative to five chlorinated solvents including trichloroethylene (TCE), methylene chloride, perchloroethylene (PER), chloroform and carbon tetrachloride. Solvents were studied separately and since overlapping among exposures analyses for combined solvents exposure were performed. In the questionnaire, subjects also had to report if they were exposed to TCE or other substances (PER was among them). Odds ratios (ORs) were computed using unconditional logistic regression models adjusted for classical risk factors. **Results** A total of 2926 cases (2276 men and 650 women) and 3555 controls (2780 men and 775 women) were included. A statistically significant positive association for lung cancer risk was observed in both men (OR 1.47, 95% CI: 1.00–2.17) and in women (OR 3.86, 95% CI: 1.36–11.01) exposed to PER combined with TCE and/or methylene chloride. In contrast, no statistically significant associations were found for TCE or other solvent combinations. Finally for subjects, who reported the exposure to PER, the ORs were 3.25 (95% CI: 1.23, 8.59) and 3.12 (95% CI: 0.50, 19.28) among men and women respectively. **Conclusions** The results of this study suggest that PER alone or in combination with TCE and/or methylene chloride may increase the risk of lung cancer.

# 10140 RISK OF TOTAL HIP REPLACEMENT IN RELATIONSHIP TO CUMULATIVE EXPOSURES IN THE WORK ENVIRONMENT

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**Objectives** To investigate the risk of total hip replacement (THR) due to primary osteoarthritis (OA) in relation to cumulative occupational mechanical exposures and lifestyle factors. **Method** In a population of Danish employees, we identified first-time THR cases in the National Patient Register. For each case, two age- and sex-matched controls were drawn. In total 2500 randomly selected case-control sets were mailed a questionnaire entailing job history, weight (present and at age 25), height, smoking and sports activities at age 25. We used a job exposure matrix to calculate cumulative exposures in the work environment. Exposure estimates were expressed according to

the pack-year concept of smoking (cumulative lifting = ton-years). We used conditional logistic regression.

**Results** 71% of case-control sets contributed to the study. The adjusted odds ratio for exposure to at least 20 ton-years was 1.35 (95% CI 1.05–1.74) for men. When analysing frequent lifting as risk factor, the adjusted OR reached 1.26 (95% CI 0.99–1.61). There were no such increases for women. We controlled for body mass index, sports participation at age 25 and previous trauma towards the knees.

**Conclusions** When using a job exposure matrix we found a modest increased risk of THR in relation to cumulative lifting for men. For women no increased risk was seen.

# 0141 MEDIATING EFFECTS OF HEALTH ON THE ASSOCIATION BETWEEN NEGATIVE LIFE EVENTS IN CHILDHOOD ON FUTURE LABOUR MARKET PARTICIPATION. A 7-YEAR FOLLOW-UP STUDY

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**Objectives** The aim of this study was to investigate if effects of multiple negative life events in childhood on future labour market participation were mediated through 3 measures of mental, general, and psychosomatic health.

**Method** Of a cohort of 3681 born in 1989 in the county of Ringk    bing, Denmark, 3058 (83%) completed a questionnaire in 2004. They were followed in a register on social benefits for 12 months in 2010–2011. Logistic regression analyses were used to investigate associations between negative life events in early childhood and future labour market participation at age 21–22. Sobel-Goodman test for mediating effects was used to determine, if part of the effects were mediated through mental, general and psychosomatic health at age 14/15.

**Results** Labour market participation decreased with increase in negative life events, especially for females. However, for females, only a small proportion of this effect was mediated through health: 1% through psychosomatic symptoms, 4% through general self-rated health, and 4% through mental health. For males, a larger proportion of the effects were mediated through health: 1% through psychosomatic symptoms, 8% through general self-rated health, and 14% through mental health.

**Conclusions** Information on childhood conditions may increase the understanding of determinants of labour market participation for young adults. Only a small proportion of the negative effects of childhood adversities were mediated through health among females. For males, the results suggest that childhood adversities affect especially mental health to a degree where it threatens future labour market status.

# 0142 MENTAL HEALTH IN CHILDHOOD AS RISK INDICATOR OF LABOUR MARKET PARTICIPATION IN YOUNG ADULthood. A PROSPECTIVE BIRTH COHORT STUDY

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**Objectives** The aim of this study was to investigate if mental health status in childhood determined future labour market participation, and to identify if effects varied across gender and social strata.

**Method** Of a cohort of 3681 born in 1989 in the county of Ringkjøbing, Denmark, 3058 (83%) completed a questionnaire in 2004. They were followed in a register on social benefits for 12 months in 2010–2011. Logistic regression was used to investigate associations between mental health in childhood measured with The Centre for Epidemiological Studies Depression Scale for Children (CES-DC) and future labour market participation, taking into account effects of socio-economic position, school performance, educational plans and vocational expectations.

**Results** A total of 17.1% (19.9% males, 14.4% females) received social benefits for at least 4 weeks during follow-up. Girls scored significantly lower on mental health than did boys. Labour market participation in early adulthood decreased with poor mental health in childhood, but only for boys: Boys with a baseline CES-DC score in the lowest quartile had a 70 % excess risk of low labour market participation after 7 years of follow-up. The association persisted when taking into account socio-economic position, but became borderline significant when adjusting for school performance, educational plans and vocational expectations. The negative effect was even across social strata.

**Conclusions** Despite girls scoring significantly lower on mental health than do boys, the effects on future labour market participation was only present among boys. The effect of poor mental health on future labour market participation did not vary across social strata.

#### 0145 SURVEILLANCE OF MORTALITY BY SUICIDE AMONG FRENCH FARMERS

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**Objectives** An excessive risk of suicide among agriculture workers has been observed in several studies in France and abroad. Accordingly, French Institute for Public Health Surveillance and Social Insurance in agriculture sector launched collaboration with aim at producing indicators of suicide mortality among agriculture workers population on a regular basis.

**Method** The study population included all active farmers and their collaborating spouses. The study covered three consecutive years: 2007 to 2009. Mortality data by cause from death registrations were used to calculate standardised mortality ratios (SMRs) for both men and women.

**Results** The annual study population was around 500 000 subjects in average, including 68% of men. During the 3-year study period, 2769 men and 997 women were deceased. From these deaths, 417 deaths were due to suicide among men and 68 deaths among women. Suicides represented the third most important cause of death. The comparison of mortality among male study population with that of French national male population revealed a 28%-excess in mortality by suicide in 2008 and 22%-excess in 2009. This excess was particularly high among the 45–64 year age category and in cattle breeding-dairy and meat -sectors. These sectors presented the highest over mortality due to suicide in 2008 and 2009.

**Conclusions** The first results of this study confirm the necessity to continue the surveillance in this population. Especially, further analysis could provide more information to document risk factors of this excess.

#### 0149 MODELLING OF OCCUPATIONAL EXPOSURE TO HEXAVALENT CHROMIUM

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**Objectives** To assess level and trend of exposure to hexavalent chromium (Cr(VI)) in chromium-exposed occupations for the estimation of lung cancer risks in community-based studies.

**Method** This analysis was based on 3666 personal measurements and auxiliary data compiled in the German MEGA database from 1988–2009. Cr(VI) was determined spectrophotometrically at 540 nm after reaction with diphenylcarbazide. We assigned jobs tasks with known Cr(VI) exposure using coded and textual information about the workplaces. Measurements below the limit of quantification (LOQ) were multiply imputed according to their distribution above LOQ. Statistical modelling was performed to the log-transformed Cr(VI) concentrations to adjust for duration and reason of sampling.

**Results** Cr(VI) exposure could be assessed for eight out of 30 jobs tasks with known Cr(VI) exposure. The majority of measurements (53%) were collected in welders (N = 1930), which we further detailed by welding technique. Spray painting and the welding of stainless steel with shielded metal welding were associated with adjusted geometric means above 5 µg/m<sup>3</sup>, the permissible exposure level of the U.S. Occupational Safety and Health Administration. We could not detect an overall time trend in the Cr(VI) concentrations.

**Conclusions** Exposure to Cr(VI) varied by occupation and job task, particularly between welding techniques, but less across calendar time. Supplemental occupational questionnaires should be administered in community-based studies when estimating the lung cancer risk of Cr(VI).

#### 0150 RESPIRATORY EFFECTS OF AN EXPOSURE TO WHEAT DUST AMONG GRAIN WORKERS AND FARMERS: A LONGITUDINAL STUDY

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**Objectives** Agriculture is considered one of the occupations most at risk of acute or chronic respiratory problems. The aim of our study was to determine from which level of exposure to organic dust the respiratory function is chronically affected in workers involved in wheat grain or straw manipulation and to test if some of these working populations can recover their respiratory function after an exposure decrease.

**Method** 87 workers exposed to wheat dust: farmers, harvesters, silo workers and livestock farmers and 62 non exposed workers, were included into a longitudinal study comprising two visits at a six months interval with lung function measurements and symptom questionnaires. Cumulative and mean exposure to wheat dust were generated from detailed work history of each worker and a task-exposure matrix based on task-specific exposure measurements. Immunoglobulins (IgG and IgE) specific of the most frequent microorganisms in wheat dust have been determined.