Background/Aim In Australia the source of non-occupational mesothelioma cases is poorly described. Although some cases are due to living with former asbestos industry workers or living near former asbestos industries, many cases are not exposed to these risk factors. The incidence of cases due to do-it-yourself (DIY) home renovation or maintenance is unknown, primarily due to lack of exposure data. The aim of this simulation study was to measure asbestos fibre release during removal in a variety of DIY asbestos removal scenarios. **Methodology** Nine different exposure scenarios commonly undertaken in DIY home renovation were simulated. Asbestos fibre exposure was monitored for each location with static samplers located in the work area together with personal samples, using high flow rate pumps operating at 6 to 7 Litres per minute, with the analysis of filters undertaken by SEM and PCM. Simulations were designed to be representative of worst case exposure scenarios.

Results Personal sampling resulted in higher fibre release levels compared to static sampling in all nine scenarios. All static sample scenarios were below 0.15 f/ml. However, for personal sampling removal of asbestos cement (AC) sections (as would be required to accommodate a domestic air-conditioning unit) using an angle grinder, resulted in exposure of 13.23 f/ml. Dry cutting of holes for installation of flues in AC roofing was 2.79 f/ml.

Conclusions Exposure levels in DIY removal were found to be low for most scenarios. Use of power tools without wetting in a confined area was found to be the most exposed scenario.

Oral Presentation

Cancer

0482

EXPOSURE TO HEXAVALENT CHROMIUM AND NICKEL AND LUNG CANCER RISK: A POOLED ANALYSIS OF CASE-CONTROL STUDIES FROM EUROPE AND CANADA

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Background There is limited evidence regarding the exposure-effect relationship of exposure to hexavalent chromium (CrVI) and nickel (Ni) with lung cancer. We estimated the cumulative exposure for CrVI and Ni and assessed exposure-effect relationships for lung cancer risk by sex, smoking status, and histological subtypes.

Methods Fourteen case-control studies (1985–2010) from Europe and Canada were pooled, including 16 901 lung cancer cases (80% men) and 20 965 controls (78% men). Cumulative exposure to CrVI and Ni were estimated. Unconditional logistic regression models were fitted to estimate odds ratios (OR), 95% confidence intervals (CI), and exposure-effect trends adjusted for smoking and occupations with recognised lung cancer risk.

Results The OR for the highest quartile ($>98.95 \mu\text{g}/\text{m}^3\text{-years}$) of cumulative CrVI-exposure was 1.33 (95% CI 1.20–1.48) in men and 1.04 (95% CI 0.48–2.23) in women. In never

smokers, the OR for ever CrVI-exposure was 1.37 (95% CI 1.09–1.73) in men, and OR=1.09; 95% CI 0.70–1.69 in women.

The OR for the highest quartile of cumulative Ni-exposure ($>77.53 \mu\text{g}/\text{m}^3\text{-years}$) was 1.30 (95% CI 1.16–1.45) in men and 1.29 (95% CI 0.59–2.81) in women. The OR for ever Ni-exposure was 1.22 in never smokers for both sexes.

Conclusions Our results showed an exposure-dependent excess risk of lung cancer by occupational exposure to Ni in both sexes, and for CrVI in men. The pattern for CrVI in women was less clear. Analysis of an interaction between Cr- and Ni-exposure was impaired by a high correlation of these agents in metal fumes.

Invited

Methodology

0483

INVITED KEYNOTE: SIFTING THE WHEAT FROM THE CHAFF IN OCCUPATIONAL EPIDEMIOLOGY – NOVEL APPROACHES TO CAUSAL UNDERSTANDING

Debbie Lawlor. University of Bristol, Bristol, UK

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A key aim of epidemiology is aetiology – determining causal effects of variation in population health and wellbeing. However, the ability to distinguish causal effects from non-causal association in all branches of epidemiology, including occupational epidemiology, is difficult. In this talk I will outline some novel approaches to testing causality, including using genetic instrumental variables (Mendelian randomization) and negative control studies, and how these can be integrated with more conventional approaches (multivariable regression analyses in observational data, randomised controlled trials and natural experiments) in a triangulation framework. I will use examples from perinatal and cardio-metabolic health (the main area in which I work) but also from occupational health to illustrate how these can be used to improve causal understanding of how occupational exposures affect health.

Oral Presentation

Cancer

0484

EXPOSURE TO IONISING RADIATION AND RISK OF LYMPHOMA SUBTYPES: ANALYSIS OF THE EPILYMPH RESULTS

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Introduction The association between ionising radiation and risk of solid tumours and leukaemia is well established;