respirable crystalline silica (RCS) and the risk of lung cancer in pooled analyses of community-based studies.

Methods RCS was estimated using a quantitative general population job-exposure matrix ('SYNJEM') for 16 786 lung cancer cases and 20 818 matched population or hospital controls. 34.2% of the men were ever exposed to RCS, while 8.6% of the women were ever exposed. Odds ratios (ORs) and 95% confidence intervals (95% CI) were estimated stratified by gender using unconditional logistic regression models adjusted for age, study centre, cigarette pack-years, time-since-quitting smoking, and ever employment in an occupation with known lung cancer risk.

Results We observed a monotonic increase in risk of lung cancer associated with occupational exposure to RCS among men (unexposed versus 4th quartile among exposed 1.45 (95%CI, 1.31–1.60). Result did not differ by smoking status and remained significantly elevated among non-smokers. The association was stronger in squamous cell carcinoma and small cell lung cancer as compared to adenocarcinoma of the lung especially among former and current smokers. The effect of RCS on lung cancer in women was not detectable likely related to small numbers.

Conclusions The SYNERGY results show that occupational silica exposure is associated with an increased risks of all lung cancer types in a pooled analyses of community-based studies.

Poster Presentation Cancer

0476 THE BRAZIL-ITALY PROJECT ON ASBESTOS-RELATED DISEASES IN CURITIBA

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Brazil is one of the major producers of chrysotile worldwide, but few studies evaluated its effects on the health of Brazilians. Moreover, there are concerns of miscoding of mesothelioma cases. A joint project was started between the Federal University of Paraná (UFPR), Curitiba, Brazil, and the Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan, Italy to evaluate effect of chrysotile exposure. The project, supported by CAPES, Brasilia, include two main areas of research. The first is a cohort mortality study among asbestos-cement workers. From the Ministerio Público do Trabalho, Curitiba, we recently received lists of about 10 000 workers employed since the beginning of production (1974, 1974, and 1993) in three asbestos-cement factories in Curitiba and its Metropolitan Region. Data editing and evaluation of sources of information to perform the mortality follow-up are in progress. The second area involves the implementation of a registry of malignant mesothelioma cases in Curitiba based on the Italian model. For this reason, two post-docs are in Milan to study procedures of the Italian and Lombardy Region Mesothelioma Registry, to translate the Italian standardised questionnaire on asbestos exposure, and to

adapt the database. As a complementary study, we are analysing the records (1998–2012) related to mesothelioma of the Curitiba Population-Based Cancer Registry. Clinical documentation of 269 adult subjects with ICD-10 codes C45 (mesothelioma), C38 (mediastinal and pleural cancers), and C48 (peritoneal cancers) will be examined to identify potential false negatives (i.e., primary pleural/peritoneal cancers classified under incorrect cancer sites like mediastinum and retroperitoneum).

Poster Presentation Exposure Assessment

0478 INHALATION AND DERMAL EXPOSURE TO TOLUENE AMONG PRINTING WORKERS IN A PLASTIC BAG FACTORY

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Introduction The study was conducted in a plastic bag factory to explore the inhalation and dermal exposure to toluene of the printing workers who wore no PPE and the potential of a charcoal cloth pad (CCP) as a dermal sampler to assess the skin permeation of liquid toluene.

Methods Twenty-seven stationary air samples were collected on the same 9 days with the urine and dermal samples from 11 printing workers. The CCPs were wrapped on each of the workers' fingers. Air samples were collected and analysed according to NIOSH # 1501 and 65 post-shift urine samples were collected and analysed for toluene using GC-HS/FID. Multiple linear regression was employed to analyse the association of the variables.

Result T three urine samples contained toluene exceeding the BEI of 30 mg/L. Toluene on the CCP (TolCCP) is a meaningful predictor for the UTol (p-value=0.027), with r and r² of 0.441 and 0.195 respectively. The absorbed dose of toluene determined from TolCCP ranging in between 1.05–91.94 mg and counting for the maximum of 12.3% TLV.

Discussion The mean of TWA was above the TLV while that of the UTol was well below the BEI. This indicated that the TWA concentrations could be overestimated due to the size of the room and good general ventilation. The dermal exposure was not significant if the workers wear respirators, but if not the dermal absorption could contribute to the overall uptake and may cause the exposure above the TLV.

Oral Presentation Dusts and Fibres

0480 MEASUREMENT OF ASBESTOS FIBRE RELEASE DURING REMOVAL WORKS IN A VARIETY OF DIY ASBESTOS REMOVAL SCENARIOS

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