153 MODELLING OF OCCUPATIONAL RESPIRABLE QUARTZ EXPOSURE FOR QUANTITATIVE EXPOSURE ASSESSMENT IN MULTINATIONAL COMMUNITY-BASED CASE-CONTROL STUDIES

Susan Peters,[1] Roel Vermeulen,[1] Lutzen Portengen,[1] Ann Olsson,[2] Benjamin Kendzia,[3] Raymond Vincent,[4] Barbara Savary,[4] Nick Williams,[5] Torill Woldbaek,[6] Jérôme Lavoué,[7] Domenico Cavallo,[8] Andrea Cattaneo,[9] Dario Mirabelli,[10] Nils Plato,[12] Dirk Dahmann,[11] Joelle Fevotte,[13] Beate Pesch,[3] Thomas Brüning,[3] Kurt Straif,[2] Hans Kromhout[1] *[1]Utrecht University, Utrecht, The Netherlands; [2]IARC, Lyon, France; [3]IPA, Bochum, Germany; [4]INRS, Nancy, France; [5]HSE, Bootle, UK; [6]NIOH, Oslo, Norway; [7]University of Montreal, Montreal, Canada; [8]Università degli Studi dell'Insubria, Como, Italy; [9]Università degli Studi di Milano, Milan, Italy; [10]University of Turin, Turin, Italy; [11]IGF-BG, Bochum, Germany; [12]Karolinska Intitutet, Stockholm, Sweden; [13]InVS, St Maurice, France*

10.1136/oemed-2011-100382.153

Objectives Quantitative exposure assessment in a multinational pooled-analysis of community-based lung cancer case-control studies can be reached via exposure modelling of occupational exposure measurements. We describe a modelling framework for respirable quartz exposure to create a quantitative job-exposure matrix (JEM).

Methods Personal measurements of respirable quartz exposure from Europe and Canada were obtained for exposure modelling. A mixed-effects model was used, with region and job titles (ISCO 1968 coding) as random-effect terms. The fixed-effect terms included time period (years), measurement strategy (representative or worst-case), sampler device (categorical), sampling duration (minutes) and a-priori intensity expert ratings for each job from an independently developed JEM (ordinal 0–2).

Results 30 393 respirable quartz exposure measurements covering the time period from 1976 to 2009 were used for modelling, showing an overall time trend of -7% per year. An effect of region was found with higher exposures in Canada and the UK and lower exposure levels in Northern and Southern Europe. The other fixed-effect variables influenced exposures in line with a-priori expectation, for example, estimates for worst-case scenarios were higher than for representative situations, samplers with PUF foam under sampled respirable quartz as compared to sampling with filters, and sampling duration was negatively associated with exposure level.
Conclusions The modelling exercise showed that quantitative data can be used to derive a quantitative JEM. The presented model will allow us to predict time, job, and region specific exposure levels of respirable quartz. These predictions will be used in the SYNERGY study, an ongoing international pooled community-based case-control study on lung cancer.