

periods. Migrant workers are a particularly healthy group from within their home countries and if they develop cancer, it is likely to occur when they are older and have left Qatar. The impact of occupational exposures on cancer risk among industrial workers in Qatar can therefore not be estimated. It is however possible to measure exposures in these settings and establish adequate national regulations. Information on carcinogenic exposures in occupational settings from the European CAREX database is likely of limited use in Qatar and other Middle Eastern countries, due to use of different materials, processes and technologies.

0369 BREAST CANCER INCIDENCE AMONG FLIGHT ATTENDANTS

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Objectives Previous studies suggest that flight attendants have a higher incidence of breast cancer than the general population; however, the reason remains unclear. We evaluated the relation of breast cancer incidence with estimates of cosmic radiation dose and metrics of circadian rhythm disruption among a cohort of 6092 female former US flight attendants.

Method Cohort members (or their proxy) completed a computer assisted telephone interview that collected data on incident cancers and non-occupational risk factors for breast cancer. Incident cancers were also identified through linkage with state cancer registries. Life table analyses were conducted to compare breast cancer incidence among the cohort to that in the general population and to evaluate exposure-response relations.

Results Breast cancer incidence was increased compared to the general population (observed 343; standardised incidence ratio 1.37; 95% confidence interval 1.23, 1.52). Among flight attendants, breast cancer was not significantly associated with ten-year lagged cumulative estimates of absorbed cosmic radiation dose, time spent working during normal sleep hours, or time zones crossed in the cohort overall or in women who gave birth two or fewer times. A significant positive association was observed between breast cancer incidence and these exposures only in the small subset of women who gave birth three or more times.

Conclusions Our data suggest that the effect of occupational exposures on breast cancer risk among flight attendants may be modified by non-occupational risk factors for breast cancer. Future modelling analyses will further evaluate the role of occupational exposures and non-occupational risk factors.

0371 THE RELATIONSHIP BETWEEN WELDING FUME EXPOSURE AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN SHIPYARD WELDERS IN KOREA

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Objectives Welding fume is suspected to accelerate the decline of lung function and development of chronic obstructive pulmonary disease (COPD). The aim of this study was to examine the relationship between welding fume exposure and COPD in Korean shipyard welders.

Method 240 male welders who were working at two shipyards and took the annual health examination including pulmonary function test in 2010 participated in this study. A questionnaire about smoking habits and occupational history was administered. PFT was carried out with strict quality control measures. Exposed fume concentrations were estimated using 884 welding fume measurements taken 2002–2009 in one of the shipyards. Linear multiple regression was employed to evaluate the association between cumulative fume exposure and lung function parameters. Logistic regression was employed to test the excess risk of COPD by cumulative fume exposure. Age, height, the smoking amount, and cumulative fume exposure were incorporated as independent variables in those models.

Results Mean age was 48, and mean work duration was 18 years. The mean cumulative fume exposure was 7.7 mg/m³. The prevalence of COPD was 14.6%. FEV₁ and FVC showed negative correlations with cumulative fume exposure, but statistically non-significant. Odds ratios of COPD were significantly elevated for middle (5.02, 95% CI:1.27–33.55) and high exposure group (6.20, 95% CI:1.41–44.98) compared to the low fume exposure group.

Conclusions Our findings suggest a potential association between metal fume exposure and COPD. Further study with a prospective design is needed to investigate the excessive decline of lung function by welding fume exposure.

0373 POOLING CASE-CONTROL STUDIES FOR ENHANCED EVIDENCE ON OCCUPATIONAL RISK FACTORS IN LUNG CANCER RESEARCH – THE SYNERGY PROJECT

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Objectives Explore quantitative exposure-response association for exposure to asbestos, crystalline silica, nickel, chromium and polycyclic aromatic hydrocarbons in the general population; further study effects on specific cell types and potential interaction with smoking and co-occurring occupational exposures.

Method Fourteen studies from Europe and Canada were pooled including 17 700 lung cancer cases and 21 800 controls with detailed information on tobacco habits and lifetime occupations. A quantitative job-exposure-matrix (SYN-JEM) was developed based on more than 350.000 exposure measurements from the participating countries. Different model specifications were compared to predict historical job-, time-, and region-specific exposure levels. Individual exposure levels were calculated for each subject by linking the SYN-JEM with the individual occupational histories. Unconditional logistic regression models were fitted to estimate odds ratios, 95% confidence intervals, and trends.

Results We observed exposure-response relationships with increasing duration and cumulative exposure for all agents and