Conclusions These is the preliminary results of RUCAN Study, first Brazilian cohort of rural workers. After with the complete sampling and the follow up, we hope to identify the health endpoints due pesticides exposure, as well each pesticides effects in the health endpoints.

Radiation

O-269 AGE-AT-EXPOSURE AND TIME-SINCE-EXPOSURE IN CAUSAL INFERENCE: IONIZING RADIATION AND CANCER MORTALITY IN INWORKS

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Introduction Ionizing radiation is an established carcinogen. Previously, the International Nuclear Workers Study (INWORKS), a pooled cohort of 308,297 workers from the United States (US), the United Kingdom (UK), and France followed 1944–2005, yielded an estimated excess relative rate of 0.51 per Gy (90% CI = 0.23, 0.82) for cancer mortality (19,748 deaths). Prior analyses suggested potential for healthy worker survivor bias and modification by age-at-exposure and time-since-exposure.

Material and Methods We reanalyzed INWORKS data using the parametric g-formula, which can address healthy worker survivor bias. We estimated impacts of 2 hypothetical interventions: 1) reduce historical standards of worker equivalent doses to 5 mSv/year; and, 2) exposure to constant levels of 20 mGy/year vs. 5 mGy/year while at work. This approach requires models for exposure, employment and cause-specific mortality. Mortality models allow variation in the radiation-mortality association with age-at-exposure and time-since-exposure.

Results Conditional on prior exposure and covariates, employment in the prior year was inversely associated with mortality among French workers but positively associated in US and UK workers. Associations between dose and cancer mortality were largest for doses received after age 45, lagged 30+ years. Approximately 224 cancer deaths per 1,000 workers were expected by age 90 in the pooled cohort. Relative to historical exposure levels (10% of working-years > 5 mGy/year), we estimated that a hypothetical standard at 5 mGy/year would result in 6.9 (95% CI = -5.7, 19) fewer cancer deaths per 1,000 workers by age 90. A constant exposure at 5 mGy/year (relative to 20 mGy/year) would have resulted in 13 (95% CI = -1.1, 27) fewer deaths.

Conclusion Our results suggest that confounding by employment status was present, suggesting healthy worker survivor bias. The importance of doses at older ages and long times-since-exposure suggest continued need to assess potential impacts of occupational ionizing radiation exposures.

Carcinogens/Cancer

O-287 OCCUPATIONAL EXPOSURES OF FIREFIGHTING AND URINARY TRACT CANCER RISK AMONG MEN IN THE NORWEGIAN FIRE DEPARTMENTS COHORT

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Introduction We observed elevated incidence of urinary tract cancer (UTC; ICD10 C65–68) among Norwegian male firefighters in previous studies. Increased risk of bladder cancer (C67), alongside mesothelioma, was the main evidence for the recent re-classification of firefighting as carcinogenic (Group 1) by the International Agency for Research on Cancer. However, the exposure-response associations remain unclear.

Objectives We aimed to develop detailed indicators for exposures of firefighting and more closely examine the previously observed elevated risk of UTC, including bladder cancer.

Materials and Methods Indicators were developed for exposure to fire/smoke and diesel exhaust using data on fire and emergency responses from the Norwegian Directorate for Civil Protection, and on working conditions at 15 fire departments. Using work history data available for 4250 men in the Norwegian Fire Departments Cohort, the time-dependent sum of these exposure indicators was determined according to each individual's annual employment percentage and exposure potential of position(s) held. Incident UTCs occurring during follow-up (1960–2021) were obtained from the Cancer Registry of Norway, and Poisson regression was used to estimate incidence rate ratios and 95% confidence intervals. This study has been approved by the Regional Committee for Medical and Health Research Ethics South-East Norway.

Results During 125,090 person-years of follow-up, there were 76 cases of UTC. Exposure indicators hypothesized to be of greatest significance to UTC risk include those for polycyclic aromatic hydrocarbons and diesel exhaust, as well as the influence of improvements in protective equipment and working conditions. Preliminary results from ongoing regression analyses point to positive exposure-response associations and will be presented.

Conclusion Detailed exposure indicators were developed using information on working conditions that is rarely available in other studies. We hope to contribute to a better understanding of the potential roles of different exposures on the increased risk of UTC among firefighters.