

high leverage in order to provide resistant (stable) results in the presence of outliers and high leverage.

Results Based on 8949 employments records, dosimetric measurements of gamma radiation were significantly correlated with radon exposure ($r = 0.499$), duration of employment ($r = 0.429$), year of exposure ($r = 0.239$), and ore production ($r = 0.230$). Age was inversely related to gamma dose. Regression analysis showed that individual dosimetric readings can be modestly predicted by individual work history and geological characteristics of Ontario uranium mines ($p < 0.001$, $R^2 = 0.374$). Additional sources of variation are likely related to individual variability that could not be accounted for in this ecological assessment.

Conclusions Reconstructed gamma dose provides modest agreement with individual dosimetric readings.

0313 AN ASSESSMENT OF THE IMPACT OF MISCLASSIFICATION ERROR ON AN ESTIMATE OF EFFECT FOR OCCUPATIONAL EXPOSURE TO TCDD-CONTAMINATED CHEMICALS AND ISCHAEMIC HEART DISEASE

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Objectives To quantify the effect of exposure and disease misclassification on the odds ratio (OR) for ischaemic heart disease (IHD) mortality in a retrospective cohort study of trichlorophenol workers exposed to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD).

Method Exposure and disease classification parameters were defined using specificity and sensitivity values either reported in the peer-reviewed literature or calculated from available published data. The distribution shapes for each parameter were constructed based on expert judgment and were varied to address the lack of published information on the parameter distributions. Probabilistic uncertainty analysis, which uses Monte Carlo simulation techniques, was then used to sample each parameter distribution, calculating ORs corrected for outcome and exposure misclassification.

Results Correction for exposure and disease misclassification produced lognormal probability distributions of ORs for IHD with a wider range of possible values than calculated in the traditional epidemiological analysis. The median $OR_{corrected}$ was larger than the $OR_{observed}$ of 3.05 for all seven scenarios evaluated and ranged from 5.34 to 11.86. Between 70% and 99% of the simulation trials yielded corrected ORs greater than the $OR_{observed}$.

Conclusions The application of uncertainty analysis to a mortality study of workers occupationally exposed to TCDD-contaminated chemicals provides valuable insight into the magnitude and direction of misclassification error and the impact on an estimate of effect. Further refinement of the parameter distributions and adjustment of the $OR_{observed}$ for other study limitations will be necessary to determine whether a true causal relationship between exposure and disease exists or if the effect observed in these workers is an artefact of systematic error.

0314 USING META-DATA FROM OCCUPATIONAL STUDIES TO INFORM HAZARD IDENTIFICATION AND CANCER CONTROL: THE IARC MONOGRAPHS AND BEYOND

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Objectives To present extensions to the International Agency for Research on Cancer (IARC) Monographs process, providing examples of application of meta-data to identifying carcinogenic hazard identifications and research gaps, and the potential use for guiding cancer control efforts. Qualitative and quantitative approaches will be contrasted.

Method The IARC evaluation process typically employs summary level meta-data, in the form of systematic reviews, and pooled- and meta-analyses.

Results IARC has heavily relied on published occupational epidemiological studies to identify specific carcinogens in the workplace and to form a scientific basis for the protection of workers worldwide. The evaluations of carcinogenic risk are made by international working groups of independent scientists and are qualitative in nature. Meta-analyses prepared for IARC working groups can complement the qualitative process and have been crucial in several instances; for example, in identifying sufficient evidence for lung and bladder cancer in painters and limited evidence for increased risk of bladder cancer among dry cleaners exposed to tetrachloroethylene and among professional drivers (bus, taxi, truck) with high exposure to outdoor air pollution. Since IARC does not provide recommendations for regulation or legislation, meta-relative risks can also be used to calculate attributable fractions to guide cancer control efforts, for agents in which a causal association is assumed and exposure prevalence has been well-characterised.

Conclusions The IARC Monographs Programme is an authoritative source for the identification of carcinogenic hazards in the environment. Applying meta-analyses to the IARC process can be a useful tool for informing hazard identification and providing guidance for cancer control efforts.

0316 ESTIMATING PERSONAL EXPOSURE TO TRAFFIC-RELATED AIR POLLUTANTS AMONG ON-ROAD WORKERS

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Objectives Many individuals in the U.S. work in close proximity to traffic-related air pollution. Often these jobs require physical activity which increases breathing rate and results in higher personal exposures to pollutants. The goal of this study was to systematically estimate and characterise personal exposure to traffic-related pollutants for those working on or near roadways.

Method Concentrations of elemental carbon, carbon monoxide, and $PM_{2.5}$ were measured along six traffic routes in the City of Chicago. These routes represent varying levels of exposure to traffic-related pollutants. Measurements were taken during peak and off-peak traffic hours during the summer and fall. All measurements were obtained from environmental monitoring equipment affixed to the back of a bicycle.

Results Air pollutant levels varied significantly across routes and time of day. Mean carbon monoxide levels ranged from 0.006–1.653 ppm across the sampling events. The geometric mean elemental carbon level was $1.75 \mu g/m^3$ and ranged from 0.23 to $8.38 \mu g/m^3$. The geometric mean $PM_{2.5}$ level was $39 \mu g/m^3$ and ranged from 16 to $270 \mu g/m^3$. Levels of elemental carbon and $PM_{2.5}$ were significantly higher during peak traffic samples than off-peak traffic samples.

Conclusions This study uses novel methods to estimate exposure to those who are physically active along roadways including