

adjusting for smoking and lung cancer risk factors identified using directed acyclic graphs. The ORs were then pooled using a random-effects model.

Results Compared with low occupational PA as reference, subjects with medium and high occupational PA had ORs of 0.64 (95% CI: 0.38–1.07) and 0.73 (95% CI: 0.39–1.34), respectively. The ORs were similar by sex and by smoking status (never vs. ever smokers).

Conclusion Our findings suggest that, like recreational PA, occupational PA may protect against lung cancer risk.

0-415 CHANGING TRENDS FOR MESOTHELIOMA IN CANADA AND THEIR IMPLICATIONS

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Introduction Canada was once the world's largest producer of asbestos, but exposure has been decreasing since the 1970's due to restrictions on use, lower occupational exposure limits, closing of mines, and a ban in 2018.

Objectives The objectives of this study were to evaluate how rates of mesothelioma in Ontario and British Columbia (BC), which together constitute over 50% of the Canadian population, have changed over time, by sex, age, geographical region and tumour site.

Methods The Ontario and BC Cancer Registries were used to identify 4,146 and 1,659 malignant mesothelioma cases between the years 1993–2017 and 1992–2016, respectively. Time trends were examined by sex, age, and anatomical site. Birth cohort models for Ontario were fit using US National Cancer Institute's age-period-cohort analysis web tool.

Results Ontario incidence rates for mesothelioma climbed from 1.0/100,000 in 1993 until 2012 when rates plateaued at approximately 1.6. In BC the rate climbed from 1.1 in 1993 to 1.7/100,000 in 2003, when it began to plateau. Although female rates are much lower than male, they continue to steadily rise in both provinces. Rates among people over the age of 70 rose dramatically over time, while rates were steady or dropped among people below the age of 50 in both provinces. Peritoneal rates continue to rise in Ontario, but not BC. Relative to the 1921–25 birth cohort, male incidence rate ratios increased until peaking in 1936–40. Rate ratios for subsequent male cohorts decreased. In contrast, using the same reference period, the risk in women rose slowly with successive birth cohorts, though confidence limits were wide due to the low case counts.

Conclusion These complex changes over time may be due to major reductions in exposure in the 1970's, longer latency periods associated with lower levels of exposure, and the growing importance of environmental exposures.

Methods

0-15 OCCUPATIONAL HEALTH: A MULTI-COHORT JOB TITLE CLEANING PROJECT BY ALGORITHM

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Introduction Occupational data in prospective cohort studies is often underutilized due to the human and financial resources required to code open-ended text, such as job titles. Recognizing the value of occupational data in health research, as well as potential errors associated with manual coding, an Automated Coding Algorithm (ACA)-NOC algorithm was developed utilizing a Natural Language Processing approach.

Objectives We tested the ACA-NOC algorithm on two regional cohorts of a pan-Canadian cohort study, which represents the largest dataset an algorithm of this kind has been applied to. This process will harmonize and greatly expand the utility of the occupational data, enrich the research platforms, and further refine the efficiency of the algorithm.

Methods The ACA-NOC algorithm was tested on data from the Canadian Partnership for Tomorrow's Health (CanPath), a longitudinal cohort examining the role of genetic, environmental, lifestyle, and behavioural factors in the development of cancer and chronic disease. Using an iterative and interactive approach, the algorithm was applied to job title data from 111,000 questionnaires from two regional cohorts, coding the data to the Canadian National Occupation Classification (NOC) system. The algorithm was further refined based on each round of analysis, increasing the quantity of accurately coded data.

Results Results from this research demonstrate the ability to refine the ACA-NOC algorithm with a 10% overall improvement in exact matching from the baseline algorithm. There were also instances where the algorithm performance was superior to the manual coding. The utilization of the algorithm offers significant savings in time, human resources and cost compared to a singular manual coding approach.

Conclusions The coding and harmonization of this multi-cohort data demonstrates the value of the ACA-NOC algorithm, while increasing the utility of the CanPath data and research related to occupational health. Future research may involve comparisons between CanPath and international cohorts.

0-299 AN APPLICATION OF A PSEUDOLIKELIHOOD APPROACH IN A COUNTER-MATCHED STUDY OF BLADDER CANCER IN A COHORT OF STEEL WORKERS EXPOSED TO METALWORKING FLUID MISTS

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Objectives To compare partial likelihood and pseudolikelihood approaches in a nested case-control study under counter-matching design in the presence of time varying-covariates.

Methods Within a prospective cohort of 17603 French steel workers, cases were newly diagnosed with a histologically-confirmed carcinoma of the bladder in 2006–2012. Three controls per case matched on age at diagnosis were randomly selected following a counter-matched sampling scheme using a four-strata surrogate time-varying exposure to metalworking fluid (MWF) mists covariate, assessed by a job-exposure matrix. Cases (n=84) and controls (n=251) provided information during questionnaire interviews concerning smoking history and occupational exposures history that were compiled by experts to assess occupational exposure to straight MWFs,

soluble MWFs, synthetic MWFs and polycyclic aromatic hydrocarbons (PAHs) not included in MWFs. Three quantitative time-varying metrics were used in the models: the duration, the frequency-weighted duration and the cumulative exposure index. Cox models were fitted with the standard partial likelihood approach using only the 3 counter-matched controls for each case as well as by maximizing the pseudolikelihood which uses all the controls sampled for each case with calibrated weights.

Results Compared to the standard method, in the pseudolikelihood approach there is a reduction in the variance of the estimates for straight MWFs, synthetic MWFs and smoking but an increase for soluble MWFs and PAH. The hazard ratios that were > 1 with the standard method were attenuated when considering the pseudolikelihood approach. The hazard ratios for the straight MWFs in the pseudolikelihood approach were 1.10 (95% CI: 1.01 – 1.19) per year of exposure and 1.33 (95% CI: 1.05 – 1.7) per full-time equivalent year of exposure.

Conclusion Nested case-control study under counter-matching design would benefit from pseudolikelihood approach. Results from the current study suggest that occupational exposure to straight MWFs increases the risk of bladder cancer.

0-300

CORRECTING THE REFERENCE LIFE TABLE IN MORTALITY ANALYSIS: APPLICATION IN A COHORT OF SEWER WORKERS

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Objectives To apply correction in life tables in mortality analyses to address selection effect with respect to the reference population in a cohort of sewer workers.

Methods We used excess hazard model to assess the excess mortality from all-cause and from all-cancer in an historical cohort of 1898 sewer workers between 1960 and 2011. National and regional life tables were available to assess the all-cause and the all-cancer background mortality. The corrections of these life tables were modeled by spline functions in the logit of survival scale. The excess hazard was modeled using splines functions with the time since hiring as the time scale. The parameters of the model were estimated by maximizing the likelihood. The expected excess number of cases were estimated using both regional and national model-based corrected tables and compared to those obtained without correcting the life tables. In a simulation study estimates were obtained using the corrected life table with a known model of correction (i), using the uncorrected life table but applying the model of correction (ii), and without model of correction (iii).

Results The simulation study showed that applying the model of correction reduces the estimation bias in the excess rate model. In the cohort study, for all-cause mortality, the difference between the excess numbers of cases estimated reduced from 28.0 using the original life tables to 1.5 when a model of correction was applied. For all-cancer mortality, the difference reduced from 24.3 to 11.8. However, the standard error was doubled.

Conclusions The differences between estimates obtained using two reference life tables decreased when the model of correction was applied at a cost of larger confidence intervals.

Correction in life tables can be applied in mortality analyses when the life tables available are not fully suitable to the cohort studied.

0-304

CONCORDANCE BETWEEN THE CANADIAN JOB-EXPOSURE MATRIX (CANJEM) AND EXPERT ASSESSMENT IN OCCUPATIONAL EXPOSURE ASSESSMENT AMONG JOBS HELD BY WOMEN

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Introduction The Canadian job-exposure matrix (CANJEM) is a general population JEM built from expert assessment data of 31,673 jobs held by 8,760 participants from four Montreal case-control studies.

Objective To examine the validity of CANJEM for jobs held by women, by comparing exposure assessments using CANJEM and our expert assessment method to a selected list of 69 agents.

Methods We compared the exposure estimates for 69 agents within a population-based case-control study of lung cancer assigned by expert assessment to those derived from CANJEM. We linked the job histories of 998 women (3403 jobs) to CANJEM and thereby, derived probability of exposure to each of the 69 selected agents in each job. To create binary exposure variables (exposed/unexposed), we dichotomised probability of exposure using two cutpoints: 25% and 50% (referred to as CANJEM-25% and CANJEM-50%). Using the 3403 jobs as units of observation, we estimated the prevalence of exposure to each selected agent using CANJEM-25% and CANJEM-50%, and using expert assessment. Further, using expert assessment as the gold standard, for each agent, we estimated sensitivity, specificity and Kappa.

Results CANJEM-based prevalence estimates correlated well with the prevalences assessed by the experts. Sensitivity, specificity and Kappa varied greatly among agents, and between CANJEM-25% and CANJEM-50% probability of exposure. For some agents such as fabric dust and cooking fumes, the concordance between CANJEM-based and expert-based assessments was high and inspired confidence that CANJEM-based assessments will be adequate; however for many other agents, the concordance was low. We present concordance estimates for 69 agents.

Conclusion Exposure concordance measures between CANJEM and expert assessment differed greatly by agents. The results of this study could guide users of CANJEM as to which agents are most likely to provide results that mimic those that would be obtained with expert assessment.

0-467

EVALUATING THE IMPACT OF SEX AND GENDER ON THE PERFORMANCE OF MACHINE LEARNING FOR AUTO ENCODING OF JOB TITLES

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Introduction Ongoing studies into the use of algorithms for the automated coding of job titles to the Canadian National