dimensions and operation-subsystem ranking were considered for design modification. Design methods such as concept generation, selection and design development were performed for the intervention. Usability testing on laboratory condition was performed on 5 loco pilots.

Results Greater than 50% of loco pilots reported discomfort in upper back, lower back and neck regions. The control operations involving use of throttle, brake handle and foot switch had ranks 1, 2 and 3 respectively. These operations were found to majorly cause MSDs in most of the body regions, with highest percentage of reports in upper back (67%), followed by lower back (54%), neck (54%), and shoulders (49%) during the operations of brake system ($p<0.001$), which has high importance, having the highest matrix entries in the control systems. Usability testing on the prototype by 5 loco pilots in control laboratory condition was found to be highly effective.

Conclusion This study reveals poor ergonomic issues in the existing control panel design responsible for MSD and effectiveness of design intervention to overcome the existing problem.

Return to work/Work capability assessment

0-36 RETURN TO WORK AFTER AN EPISODE OF ABSENCE DUE TO MUSCULOSKELETAL DISORDER OR INJURY

[1]João Silvestre Silva-Junior, [2]Maria Carmen Martinez, [1]Felipe Seiti Sekiya, [3]Cristiano Barreto de Miranda, [4]Frida Marina Fischer. *[1]University of São Paulo Medical School, Brazil; [2]WAF Informatics and Health, Brazil; [3]Ministry of Health, Brazil; [4]School of Public Health, University of São Paulo, Brazil*

10.1136/OEM-2023-EPICOH.189

Introduction Musculoskeletal Disorders and Injuries (MSDI) are conditions that affect the locomotor system and are typically characterized by pain and impairment, representing the main cause of years lived with disability. MSDI are the leading cause for grant sickness social security benefit in Brazil. This study aims to analyze factors that influence return to work (RTW) among workers on sickness absence due to MSDI.

Material and Methods A longitudinal study was conducted in São Paulo city, Brazil, from 2022–2021. Participants included 216 workers requiring social security compensation due to MSDI. At baseline, participants filled questionnaires about sociodemographic, health risk behaviours, work characteristics and health conditions. They were followed for 365 days after the first day of sickness absence. A Cox regression was performed to identify factors influencing the first RTW. Results &

Conclusions Most participants were males (53.0%), married (50.7%), school education higher than 11 years (60.4%), mean age 39.5 years (sd + 10.6), BMI 27,9 kg/m2 (sd + 4.9), did not smoke (85,2%), abstemious (52,5%), working less than 05 years (59.4%), morning shifts (73.2%), and underwent physiotherapy (53.9%). RTW occurred for 70.4% participants over 1-year follow up. Mean duration of absence was 192.6 days. The risk factors to remaining absent for a period longer than one year were: 40 years old and older (hazard ratio – HR 0.54; 95% confidence interval – CI 0.39–0.76) and the interaction between the perception of need for improvement in the physical and psychological domains (HR 0.67; 95%CI 0.48–0.94). These findings can contribute to discussion about disability prevention and interventions to assure health care. Companies' health service professionals should start the process of return to work at the first day of absence, in order to reduce the time of reintegration and to promote a sustainable return.

Acknowledgments CNPq Grants 423231/2018–9, 304375/2017–9, 306963/2021–3.

Carcinogens/Cancer

0-41 FIREFIGHTING AND CANCER: A META-ANALYSIS OF COHORT STUDIES IN THE CONTEXT OF CANCER HAZARD IDENTIFICATION

[1]Nathan DeBono, [2]Nathan L DeBono, [3]Robert D Daniels, [4]Laura E Beane Freeman, [5]Judith M Graber, [6]Johnni Hansen, [7]Lauren R Teras, [8]Tim Driscoll, [9]Kristina Kjaerheim, [10]Paul Demers, [11]Deborah C Glass, [12]David Kriebel, [10]Tracy Kirkham, [2]Roland Wedekind, [2]Adalberto Miranda-Filho, [2]Leslie Stayner, [2]Mary K Schubauer-Berigan. *[1]Monographs Programme, International Agency for Research on Cancer, France; [2]International Agency for Research on Cancer, France; [3]National Institute for Occupational Safety and Health, Cincinnati, USA; [4]National Cancer Institute, Bethesda, USA; [5]Rutgers School of Public Health, Piscataway, USA; [6]Danish Cancer Society Research Centre, Copenhagen, Denmark; [7]American Cancer Society, Kennesaw, USA; [8]University of Sydney, Sydney, Australia; [9]Cancer Registry of Norway, Oslo, Norway; [10]Occupational Cancer Research Centre, Toronto, Canada; [11]Monash University, Melbourne, Australia; [12]University of Massachusetts Lowell, Lowell, USA*

10.1136/OEM-2023-EPICOH.190

Objective We performed a meta-analysis of epidemiological results for the association between occupational exposure as a firefighter and the occurrence of cancer as part of the broader evidence synthesis work of the IARC Monographs Programme.

Methods A systematic literature search was conducted to identify cohort studies of firefighters followed for cancer incidence and mortality. Studies were rated for the influence of key biases on results. Random-effects meta-analysis models were used to estimate the association between ever and duration of employment as a firefighter and risk of 12 selected cancers. The influence of potential biases was explored in sensitivity analyses, including those related to the use of general, uniformed service, and working population comparison groups.

Result Among the 16 cancer incidence studies that met inclusion criteria for one or more cancer sites, the estimated meta-rate ratio, 95% confidence interval (CI), and heterogeneity statistic (I2) for ever-employment as a predominantly male career firefighter compared mostly to general populations was 1.58 (1.14–2.20, 8%) for mesothelioma, 1.16 (1.08–1.26, 0%) for bladder cancer, 1.21 (1.12–1.32, 81%) for prostate cancer, 1.37 (1.03–1.82, 56%) for testicular cancer, 1.19 (1.07–1.32, 37%) for colon cancer, 1.36 (1.15–1.62, 83%) for melanoma, 1.12 (1.01–1.25, 0%) for non-Hodgkin lymphoma,1.28 (1.02–1.61, 40%) for thyroid cancer, and 1.09 (0.92–1.29, 55%) for kidney cancer. Ever-employment as a firefighter was not positively associated with lung, nervous system, or stomach cancer. Few cancer

sites showed increasing risks by employment duration. Results for mesothelioma and bladder cancer exhibited low heterogeneity and were largely robust across sensitivity analyses evaluating bias.
Conclusions There is epidemiological evidence to support a causal role for occupational exposure as a firefighter and certain cancers, especially mesothelioma and bladder cancer. Challenges persist in the body of evidence related to the consistency and quality of exposure assessment and control of confounding and medical surveillance bias.

Methodology

O-42 A NOVEL WEIGHTING APPROACH TO ADDRESSING HEALTHY WORKER SURVIVOR BIAS

[1]Alexander Keil, [2]Yi Li, [3]Kaitlin Kelly-Reif. *[1]Occupational and Environmental Epidemiology Branch, Division of Cancer Epidemiology and Genetics, National Cancer Institute (NCI), National Institutes of Health (NIH), Department of Health and Human Services (DHHS), Bethesda, Maryland, USA; [2]Department of Epidemiology, School of Population and Global Health, Faculty of Medicine, McGill University, Montreal, QC, Canada; [3]National institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC), Department of Health and Human Services (DHHS), Cincinnati, Ohio, USA*

10.1136/OEM-2023-EPICOH.191

Introduction Radon gas is a major source of ionizing radiation exposures in humans that contributes to the global burden of lung cancers. Human carcinogenicity of radon has been established, in part, in studies of exposed workers, including uranium miners. Impact estimates from occupational studies are subject to healthy worker survivor bias, which has been proposed to result in substantial underestimates of radon's health effects. However, existing analytic methods for addressing bias due to healthy worker survivor bias are sensitive to model misspecification.
Material and Methods We describe a new approach for estimating health effects of occupational exposures that addresses healthy worker survivor bias while reducing modeling assumptions. This approach utilizes inverse probability weighting and originates from the literature on dynamic treatment regimes. We use this approach to estimate impacts of hypothetical occupational standards on lung cancer mortality using data from 4124 miners from the Colorado Plateau Uranium Miners' cohort followed through 2005.
Results The estimated cumulative lung cancer mortality risk at age 80 was 14.9% (95% confidence interval [CI] = 13.7%, 16.1%). Under a hypothetical intervention to limit exposure to 20 working levels, we estimated a risk reduction (at age 80) of 2.7% (95%CI = 3.6%, 1.7%). Estimates at lower exposure levels were larger but subject to greater uncertainty than previous analyses in this cohort using modeling-based estimators.
Conclusions Our approach offers substantial strengths when addressing healthy worker survivor bias, namely regarding computational simplicity and reduced reliance on modeling assumptions. Use within this highly exposed cohort also highlighted challenges with using our approach to estimate effects at low exposure levels: model-based extrapolation with the parametric g-formula can be used to reduce uncertainty under stronger assumptions. The proposed approach provides a simple approach to addressing healthy worker survivor bias that provides promise for reducing modeling assumptions in studies of occupational exposures.

Healthcare workers

O-43 SURGEONS REPORT A HIGH PREVALENCE OF MUSCULOSKELETAL PAIN AND HOME, WORK CONFLICT

[1]Karen Walker-Bone, [2]Dan Wood, [3]Stefania D'Angelo, [4]Michael Whitmore, [5]Robert Slight. *[1]Professor, Monash Centre for Occupational and Environmental Health, Monash University, Australia; [2]Professor of Urology, Chief of Transition Surgery, Children's Hospital, Colorado; [3]Statistician, MRC Versus Arthritis Centre for Musculoskeletal Health and Work, University of Southampton; [4]Research Leader, RAND Europe; [5]Consultant Thoracic Surgeon and Honorary Senior Lecturer,Population Health Sciences Institute, Newcastle University*

10.1136/OEM-2023-EPICOH.192

Introduction Many surgeons in public health systems were deployed away from elective surgery during the COVID-19 pandemic and are now working under high pressure to reduce long waiting-lists including for people with malignancy.
Methods Using validated methodology, a questionnaire was circulated to surgeons via societies and social media. Anonymized data from voluntary respondents were collected via a centralized database.
Results 242 Surgeons responded amongst whom 170 (70.3%) were male. 14% were aged 25 to 34, 28% 35 to 44 years, 35% 45 to 54 years, 17% 55 to 64 and 5.8 % were aged 65 and over. 65.7% were urologists, 13.6% orthopaedics and trauma – others came from a range of surgical specialties. 46.3% suffered lower back pain in the prior month, 47.3% stated that this adversely affected work and recreational activities, 57.1% stated this had occurred > 5x in the previous year. Hip, neck and shoulder pain ranged from 6.2–43.8 % with up to 33.9% stating MSK symptoms had interfered with their work and (with the exception of shoulder pain (48.5%)) in each case >50% described symptoms > 5x pa. Only 8.7% reported receiving any ergonomic support to ensure comfort at work and 26.5% had ever received training in ergonomics. Surgeons reported 26% of the time they were often or always at work when required at home, with 48.8% reporting regular impact on private life. Many surgeons (84.4%) also report conflicting demands at work.
Conclusions Post-pandemic, surgeons report a high prevalence of musculoskeletal pain and work/life conflict. Surgeons could themselves take measures to mitigate these effects but planning and development of rotas and operating theatres could also be optimized. Maintaining the health of surgical staff is fundamental to patient safety and to retain highly-trained professionals within their discipline.

Occupational epidemiology in unorganised sectors: agriculture, construction, service sectors

O-44 PREVALENCE AND DETERMINANTS OF HYPERTENSION AMONG BLUE COLLAR JOBS: OBSERVATIONS FROM MULTICENTRE STUDY

[1]Rakesh Balachandar, [1]Soundarya Soundararajan, [1]Ankit Viramgami, [1]Ankit Sheth, [2]Ravichandran Beerappa, [2]Ravibabu Kalahasthi, [2]Raghavan Sampathraju, [2]Dhananjayan Venugopal, [1]Kamalesh Sarkar. *[1]Scientist, ICMR-National Institute of Occupational Health, Ahmedabad, India; [2]Scientist, ICMR – Regional Occupational Health Center – South, Bengaluru, India*

10.1136/OEM-2023-EPICOH.193