chronotype), yielding CD_{BN}hours. Total CDhours may be obtained by summing up CD_{BN}hours due to activities at and off work. As a more easily applicable metric, how much sleep overlaps with the individual biological day (BD) may yield CD_{BD}hours.

Conclusions Epistemologically, shiftwork epidemiology is lacking chronobiological and methodological rigour. CD - like smoking - must be assessed at and off work to consider cumulative doses in studies of carcinogenicity. Epidemiological research before and after IARC 2007, based on (night)shifts alone, may have delayed or disallowed detection/measurement of the existence/magnitude of possibly carcinogenic effects of cumulative CD.

Oral Presentation

Cardiovascular Disease

0313 MORTALITY AMONG NORWEGIAN SMELTER INDUSTRY WORKERS – A 55 YEAR FOLLOW-UP

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Ambient air pollution is associated with increased incidence and mortality of cardiovascular disease. Time-series studies have shown that a 10 µg/m3 increase in mean 24 hour PM2 concentration increases the relative risk for daily cardiovascular mortality by 0.4% to 1.0%. In recent years, increasing concerns have been levelled at the ultrafine component of PM. Ultrafine particles are formed during combustion of materials, and are therefore abundant in the furnace area of metal smelter plants.

In connexion with an ongoing project concerning occupational exposure to fine and ultrafine particles and risk of cardiovascular disease, an update of two large smelter worker cohorts has been performed. Mortality data were received from the Norwegian Causes of Death register for the period 1960–2014. The combined cohort consisted of 19 660 men, with nearly 650 000 person-years of follow-up. Preliminary analyses showed that both total mortality (SMR 1.09, 95% CI 1.07–1.11) and mortality from all cardiovascular diseases (SMR 1.03, 95% CI 1.00–1.06) were significantly increased compared to the Norwegian general male population. Workers with employment in furnace work had total mortality SMR 1.18 (95% CI 1.15–1.21) and cardiovascular mortality SMR 1.09 (95% CI 1.04–1.14). Smelter workers with no furnace work had total mortality SMR 1.01 (95% CI 0.99–1.04) and cardiovascular SMR 0.99 (95% CI 0.95–1.02). The further data analyses are currently in progress.

Oral Presentation

Musculoskeletal

0315 EFFECT OF MULTISITE MUSCULOSKELETAL PAIN ON HEALTH RELATED JOB LOSS: FINDINGS FROM THE HEALTH AND EMPLOYMENT AFTER FIFTY (HEAF) STUDY

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Background Musculoskeletal pain (MSP) at multiple anatomical sites differs from single site pain both in its risk factors and prognosis. Multisite MSP is more likely to cause sickness absence from work, but knowledge about its effect on health-related job loss (HRJL) is limited. To explore this association we analysed longitudinal data from participants aged 50–64 recruited to the Health and Employment After Fifty (HEAF) study.

Method Baseline information collected by postal questionnaire from 4333 employed participants included questions about MSP in the past year at three anatomical sites (spine, upper, and lower limb). Subsequent HRJL was ascertained through a follow-up questionnaire after one year. Associations between multisite MSP (pain at $\geq$2 anatomical sites) and HRJL were explored using Poisson regression with robust variance and summarised by prevalence rate ratios (PRRs).

Results Among 437 participants with multisite MSP at baseline, 7% left their job due to ill health, compared to 3% in 547 with single-site pain and 2% in 3349 without MSP. After accounting for potential confounders, the risk of HRJL was higher among those with multisite MSP than in those with single-site MSP (fully-adjusted PRRs 1.9 (95%CI 1.1–3.2) and 1.6 (95%CI 0.9–2.7) compared with no MSP). The population attributable fraction for single-site pain was 7%, while that of multi-site pain was 15%.

Conclusions This analysis suggests that multisite MSP carries a higher risk of HRJL than single-site pain. To develop future preventive strategies, efforts should focus on understanding the drivers of multisite MSP rather than concentrating on site-specific risk factors.

Poster Presentation

Injuries

0316 OBSTRUCTIVE SLEEP APNEA SYNDROME (OSAS) IN ROAD TRAFFIC ACCIDENTS OF COMMERCIAL BUS AND TRUCK DRIVERS IN CENTRAL IRAN

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The aim of this study assessment of OSAS role in occurrence of road traffic accidents in sleeping drivers of commercial heavy vehicles such bus and truck driver. This cross-sectional and case-control study was carried out on 760 truck and bus drivers that were involved in a road accident between 2009 and 2011 in Yazd - Iran. In this study we used the Polysomnography method for assessing patients with suspected sleep disorders, including sleep apnea. The stage of sleep is assessed by electroencephalography. The findings indicated that among 760 drivers, 91 drivers had more than 10 EES score. Among 91 drivers, 35 drivers involved in one accident and 38 drivers had no history of accident in study period. Driving in the night time had significant association with road accident occurrence in participated drivers (p=0.01). Drivers who have sleepiness and especially OSAS had more chance to involve an accident. But OSAS was not independent predictor of road accident.

Poster Presentation

Risk Assessment

0317 APPLICATION OF FAILURE MODE AND EFFECT ANALYSIS (FMEA) TO ASSESS OCCUPATIONAL RISKS IN OIL REFINERY

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Abstract Failure Modes and Effect Analysis (FMEA) is a systematic method for identifying the factors that a product or process encounter with them, and identifying their results and effects. The aim of this study is to evaluate the potential occupational risks in different parts of the one of oil refinery in central Iran by using risk assessment techniques. This cross-sectional study was conducted in Shiraz Refinery and relationship RPN(Risk Priority Number) with tasks e.g. milling, welding, transportation handling and etc. were studied in this company. The findings showed that transportation and handling and then external surface scraping achieved the highest of RPN before and after corrective measures (200,210) and (72, 84) respectively. While RPN for welding and drilling (punching the external surfaces) before and after corrective measures are (144,120) and (24, 36) respectively. But hazard severity curve show tasks with lower RPN in comparison with those have higher RPN are more important of injury severity. some of tasks e.g. handling, transportation and milling have high RPN and by using effective control measures can eliminate or control hazards. Then Failure Modes and Effect Analysis is a useful and efficient for hazard assessment.

Oral Presentation

Other

0318 OCCUPATIONAL EPIDEMIOLOGY RESEARCH IN THE NEW "LOW-CARBON" ECONOMY.

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10.1136/oemed-2017-104636.259

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Occupational health risks posed by climate change have focused on heat-related illness and mortality, and a growing body of evidence shows substantial risks to health and economic productivity for many countries. Since the 2015 Paris Agreement on climate change, the shift away from fossil fuel-based economies has accelerated. Potential population health benefits from improved air quality, more physically active urban communitng and reduced future heating of the planet are substantial. However, unquantified is the extent that technologies in renewable energy sources pose risks to workers. A comparision between fossil fuel-related job risks and those stemming from renewable energy-related jobs will be presented. Gaps in knowledge will be identified to help guide the safest path for workers in our evolving low-carbon society.

Note this abstract is part of the Mini-Symposium, **Climate Change impacts on Occupational Health via workplace heat (Tord Kjellstrom, organiser).**

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Poster Presentation

Pesticides

0320 INDIRECT PARENT-MEDIATED PATHWAYS OF CHILD EXPOSURE TO 2,4-D AND CHLORPYRIFOS IN FARM FAMILIES

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Background To reduce children's exposure to pesticides used on farms, identifying and interrupting exposure pathways is critical. We evaluated applicator (parent) exposure as a determinant of