was largely localized to miners who had the majority of employment in nickel mines (SIR=2.09, CI=1.37–3.06). Nasopharyngeal cancer was similarly elevated (44 cases, SIR=1.42, CI=1.03–1.91) but in contrast the excess risk was limited to gold mining (SIR=2.70, CI=1.57–4.33). A small elevation was observed for larynx cancer (307 cases, SIR=1.26, CI=1.12–1.40), but was not limited to one ore type. Bone cancer was clearly elevated (58 cases, SIR=1.91, CI=1.45–2.47), with ore-specific elevations seen among uranium (SIR=2.46, CI=1.22–4.40) followed by nickel mining (SIR=2.04, CI=1.29–3.06). Salivary gland was only slightly elevated (54 cases, SIR=1.09, CI=0.82–1.42), but the risk among uranium miners exposed to radon was high (SIR=2.97, CI=1.81–4.59) and increased monotonically with employment duration.

Conclusion This analysis demonstrated the power of this cohort to identify associations for rare cancers. Although the association of nickel with nasal cancer was expected, some other associations were surprising and warrant further investigation.

Reproductive effects/Outcomes

EXPOSURE TO PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) DURING PREGNANCY AND MALE REPRODUCTIVE FUNCTION IN YOUNG ADULTHOOD

Introduction Women of reproductive age may be exposed to per- and polyfluoroalkyl substances (PFAS) in a wide range of occupations. During pregnancy, PFAS may cross the placental barrier and disrupt fetal development with potential consequences for long-term health. In this study, we examined associations between maternal plasma levels of PFAS during early pregnancy and male reproductive function in young adulthood.

Materials and methods The study population consisted of young men (n = 864, age 18–21 years) from the Fetal Programming of Semen Quality (FEPOS) cohort. The mothers of these young men participated in the Danish National Birth Cohort (DNBC) between 1996 and 2002 and provided a blood sample in early pregnancy. Among the 15 PFAS measured in maternal plasma, seven compounds were quantified above the limit of detection in at least 80% of the samples. From 2017 to 2019, the young men completed an online questionnaire, a clinical examination and provided a blood and semen sample. We applied weighted quantile sum (WQS) and negative binomial regression to assess associations between combined and single substance exposure to PFAS and measures of semen quality, testicular volume and reproductive hormones. The study was approved by the Scientific Research Ethics Committee for Copenhagen and Frederiksberg, Denmark.

Results Higher maternal plasma levels of PFAS were associated with lower sperm concentration (WQS -8% difference, 95% CI -16, -1), total sperm count (WQS -10% difference, 95% CI -17, -2) and a higher percentage of non-progressive/immotile sperm (WQS 5% difference, 95% CI 1, 8) in the young men.

Conclusions Exposure to a range of common PFAS during pregnancy was inversely associated with key aspects of reproductive function in young men. Given the present concerns for reproductive toxicity of PFAS, continued awareness of exposures and efforts to limit these are needed.

Disease surveillance

INCIDENCE OF OPIOID-RELATED HARMs BY OCCUPATION IN ONTARIO, CANADA: FINDINGS FROM THE OCCUPATIONAL DISEASE SURVEILLANCE SYSTEM

Introduction The opioid crisis continues unabated in Canada, yet current health surveillance systems that monitor opioid-related harms have limited or no employment information. The limited opioid overdose fatality data available suggest certain occupational groups have been disproportionately affected among those with known employment, namely those in construction and trades occupations, but little is known beyond these data. The Occupational Disease Surveillance System (ODSS), designed to detect work-related disease in a large cohort of workers in Ontario (Canada), was recently expanded to identify opioid-related hospitalizations and emergency department visits. We sought to estimate associations between occupation and risk of opioid-related harms in the Ontario, Canada workforce.

Materials and Methods The ODSS was established through linkage of Workplace Safety and Insurance Board accepted workers’ compensation lost-time claims data to hospitalization and emergency department data. Workers aged 18–65 were followed from 2006 to 2020 to identify incident opioid-related poisonings (p) and mental and behavioural disorders (mb). Cox proportional hazards models were used to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) for each of the opioid-related harms by occupation, adjusted for sex, age, and birth year.

Results We identified 10,066 poisoning cases and 11,762 mental and behavioural disorder cases during follow-up among 1.7 million workers. Preliminary findings
Occupational epidemiology in unorganised sectors: agriculture, construction, service sectors

O-147 OCCUPATIONAL HEALTH AND SAFETY IN THE CALIFORNIA, USA CANNABIS (MARIJUANA) INDUSTRY

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Introduction Cannabis (Cannabis sativa, marijuana) is the most valuable crop in California. Approximately 10% of cannabis is grown and sold on the legal market, with combined legal and illegal revenues exceeding $10 billion per year. There are approximately 58,000 legal cannabis jobs in the state, but the total size of the workforce is unknown. There has been little research on the health and safety of cannabis workers; none includes seasonal immigrant workers.

Material and Methods We performed a qualitative study of Northern California cannabis cultivation and processing workers’ experiences and perception of workplace hazards based on four focus group discussions including 32 cannabis workers and nine key informant interviews. Transcripts were analyzed to identify major themes of exposures and health effects. We briefly report results of a pilot study of respiratory and dermal symptoms among 29 workers at two legal cannabis farms in the Sacramento, California area.

Results Most (56%) focus group participants were Latino, and 50% were women. They were exposed to physiological hazards including respiratory and dermal exposures, 10–12 hour work shifts of repetitive tasks at uncomfortable workstations, and substandard worker housing. Immigrant workers reported experiences of discrimination and violence due to immigration documentation status, race, and gender. Psychosocial stress due to production pressure and geographic and social isolation was common. Pilot study participants were mostly white (58%) men aged ≤30 years. Work-related symptoms of any type were reported by 38% of participants, and 38% reported symptoms suggestive of asthma.

Conclusions This is the first study of seasonal cannabis worker health. Some physiological exposures were consistent with previous studies of cannabis worker health, but other concerns were identified that have not previously been characterized including structural and interpersonal violence and stress. The high proportion of pilot study with work-related symptoms including those suggestive of asthma raises concern.

Cardiovascular disease

O-150 MYOCARDIAL INFARCTION INCIDENCE RATES AMONG NIGHT WORKERS IN THE DANISH HEALTH CARE SECTOR: EXPOSURE-RESPONSE RELATIONS

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Introduction Night shift work has been associated with cardiovascular disease. We examined the exposure-response relation between number of monthly night shifts, other quantitative night work characteristics and myocardial infarction.

Material and Methods We followed a cohort of 100 784 nurses, physicians and other health care workers working night shifts at Danish public hospitals in Denmark (80% women), 2007–15, with day-by-day work hour information from a national payroll register. First time hospital admission rates for myocardial infarction were identified. We analysed data with Poisson regression adjusting for register-based potential confounders (age, diabetes, obesity, hypercholesterolemia, hypertension, family-history of cardiovascular disease, occupation, education, and evening work).

Results and Conclusions During follow-up, 397 night workers (56% women) were diagnosed with first time myocardial infarction. For female night shift workers, we observed exposure-response relations for number of monthly night shifts, cumulative night shifts, and consecutive night shifts, but not for years with rotating night shifts or years with any night shifts. For male night shift workers, we observed no exposure-response relations. Several measures of increasing extent of night shift work were among women night workers related to an increasing risk of myocardial infarction. No such patterns were observed among men. This may indicate a sex specific effect of night shift work.