Methods We performed a cohort study among HCWs of a large University hospital in Milan, Lombardy, Italy by merging routinely collected data on demographics, COVID-19 vaccination, and polymerase chain-reaction (PCR) tests performed on nasopharyngeal swabs. Follow-up started on December 27, 2020 (start of vaccination campaign). We included HCWs never PCR-positive before the start date and with at least a PCR test afterwards. Vaccination was treated as a time-dependent variable by calculating person-years (PY) at risk before and after vaccine doses. Subjects contributed PY until first positive PCR test (cases) or last test for never positive HCWs (to avoid immortal time bias). We calculated infection rates (cases per 1000 PY), rate ratios (RR, with a Poisson regression model adjusted for gender, age, occupation and 30-day periods), vaccine effectiveness (VE = $(1 - RR) \times 100$) and 95% confidence intervals (CI) taking never vaccinated HCWs as reference.

Results As of May 10, there were 3,152 vaccinated (97% with BNT162b2, 140 with one dose, 2,679 with two doses) and 333 non-vaccinated. We counted 29 infected cases (rate 385) among non-vaccinated, 6 (rate 65) from day 14 after the first dose (VE 79%, CI 49–92%), and 24 (rate 65) from day 7 after the second dose (VE 89%, CI 80–94%). Most cases after vaccination were asymptomatic or mildly symptomatic.

Conclusion In these preliminary analysis we found high effectiveness of COVID-19 vaccine in HCWs in our hospital. Further work is needed to assess long-term effectiveness and to better plan future preventive strategies among this high-risk occupational group.

P-196

PREVALENCE OF NIGHT/SHIFT WORK AND ITS ASSOCIATION WITH EXITING THE WORKFORCE AMONGST OLDER UK WORKERS FROM THE HEAF STUDY

¹Gregorio Bevilacqua, Stefania D'Angelo, Georgia Ntani, Martin Stevens, Cathy Linaker, Karen Walker-Bone. ¹University of Southampton, United Kingdom

10.1136/OEM-2021-EPI.229

Introduction Night/shift work is increasing but there are few data about the prevalence amongst older workers. Night/shift work has been associated with a number of adverse physical and mental health outcomes, including cardiovascular disease, cancer, anxiety, and depression. With governments encouraging people to work to older ages, it is important to know how feasible night/shift work is for older workers and whether it is associated with prematurely exiting the workforce.

Objectives Amongst current older workers (aged 50–64 years), to explore the prevalence of night/shift working and evaluate its associations with early exit from the workforce over 4 years of follow-up.

Methods Data from the Health and Employment After Fifty (HEAF) cohort were used to describe the demographic, job and health characteristics of men and women undertaking night/shift work. Longitudinal data from annual follow-ups were used to examine the number and nature of exits annually thereafter.

Results Amongst the 5409 working at baseline, 32% reported night/shift work but the sectors differed by sex. Night/shift workers were more likely to be: current smokers; doing physically-demanding work; struggling to cope at work

physically and mentally; dissatisfied with their hours; depressed; sleeping poorly; and/or rating their health poorly. Men (OR 1.4, 95%CI 1.1–1.8) and women (OR 1.3, 95%CI 1.0–1.6) working nights/shifts were slightly more likely to exit the workforce over 4 years. A greater proportion of those exiting the workforce who were night/shift workers attributed their exit to ill-health compared with those working conventional hours.

Conclusion In our study, almost one in three workers reported night/shift work. We found some evidence of adverse impact on health, sleep and wellbeing and higher rates of job exit in shift/night workers. More research is needed, but night/shift work may be challenging to sustain for older workers and could be detrimental to health.

P-199

LONG TERM EXPOSURE TO AIR POLLUTION AND COVID-19 INCIDENCE IN THE CITY OF VARESE, NORTHERN ITALY: A COMPLETE-YEAR, INDIVIDUAL-LEVEL ANALYSIS

¹Giovanni Veronesi, Sara De Matteis, Giuseppe Calori, Nicola Pepe, Marco Ferrario. ¹University of Insubria, Italy

10.1136/OEM-2021-EPI.230

Introduction Studies on air pollution and COVID-19 are limited to the first pandemic wave (April/June 2020) and by their ecological design.

Objectives To investigate the association between airborne pollutants and SARS-CoV-2 incidence up to March 2021 in the Varese city (Lombardy region), with individual-level data on exposures, disease and confounders.

Methods Varese citizens aged 18+ years as of Dec31st,2019 were linked by residential address to 2018 average annual exposure to outdoor concentrations of PM2.5, PM10, NO2, NO and O3 modelled using FARM chemical-transport model (linkage coverage: 97.4%). Citizens were linked to Regional datasets for COVID-19 case ascertainment (positive nasopharyngeal swab specimens) and to define age, sex, residential care home living, population density and comorbidities. We estimated rate ratios and additional number of COVID-19 cases for 1 µg/m3 increase in air pollutants, from single- and bi-pollutant Poisson regression models.

Results Among the 62,848 residents, we observed 4408 COVID-19 cases. Yearly average PM2.5 exposure was 12.5 µg/m3. Cumulative incidence curves suggest an increased risk for PM2.5 > 13.5 µg/m3 in correspondence of downtrend periods in the pandemic curve. Age, residential care home living, history of stroke, medications for diabetes, hypertension and obstructive airway disease were independently associated with COVID-19 rate. In single-pollutant multivariate model, 1 µg/m3 increase in PM2.5 was associated with 5.1% increase in COVID-19 rate (95%CI: 2.7%–7.5%), corresponding to 294 additional cases per 100,000 person-years. These figures were confirmed in bi-pollutant models and after excluding subjects in residential care homes. Similar findings were observed for PM10, NO2 and NO. O3 was associated with a 2% decrease in disease rate, the association being reversed in bi-pollutant models.

Conclusions In our study, long term exposure to low-levels of air pollutants, especially PM2.5, positively affected COVID-19 incidence. Causality warrants confirmation in future studies;

meanwhile, governmental efforts to further reduce air pollution should continue.

P-200 'IMPAIRED KIDNEY FUNCTION DUE TO LEAD EXPOSURE AMONG MEXICAN CRAFTWORKERS'

¹Lourdes Martinez Ordaz, Cuauhtemoc Arturo Juarez Perez, Alejandro Cabello Lopez, Carmina Jimenez Ramirez. ¹Instituto Mexicano del Seguro Social (IMSS), Mexico

10.1136/OEM-2021-EPI.231

Objective Approximately 12.4% of the Mexican population is affected by chronic kidney disease (CKD). Leading risk factors for CKD are diabetes, hypertension, obesity and hypercholesterolemia. Other factors, including heavy metals and pesticides, are associated with decreased kidney function even at low exposure levels. Lead exposure in Mexico remains a public health problem and its effects on renal function remains unclear. The aim of the study was to determine the role of lead exposure on kidney function among Mexican craftworkers.

Methods A cross-sectional study was performed on 399 craftworkers and/or users of lead-glazed pottery. We obtained socio-occupational data and calculated creatinine clearance and glomerular filtration rate (GFR). A complete blood count, blood lead (BPb) and biochemical profile tests were performed. A multiple linear regression model was constructed to analyze GFR determinants.

Results 48.37% (193) of the participants were men. The mean age was 44.34 ± 14.54 [17–84] years old. GFR: $104.07 \text{ mL/min/1.73 m}^2 \pm 14.42$ [61.9, 144.2], BPb: $17.57 \text{ } \mu\text{g/dL} \pm 14.68$ [-2, 109], cholesterol: $181.38 \text{ mg/dL} \pm 38.05$ [87, 411], systolic blood pressure (SBP): $122.42 \text{ mmHg} \pm 14.75$ [89, 189]. CKD was present in 6.03% (24) of the population. The model explained 56.17% of GFR variability. The main determinants were: BPb $\beta = 0.125$ [0.055, 0.196]; age $\beta = -0.675$ [-0.751, -0.598]; males $\beta = -3.393$ [-5.458, -1.328]; CKD $\beta = -4.825$ [-9.165, -0.486]; cholesterol $\beta = -0.033$ [-0.060, -0.006] and SBP $\beta = -0.069$ [-0.147, -0.007].

Conclusions The Mexican population is exposed to multiple nephrotoxic risk factors, including pesticides and heavy metals. The results suggest that the increase in GFR is probably an early sign of kidney dysfunction due to lead exposure.

P-201 'OCCUPATIONAL NOISE, ORGANIC SOLVENTS AND LEAD EXPOSURE, AND ITS ASSOCIATION WITH HEARING LOSS AMONG PRINTING WORKERS IN MEXICO'

Alejandro Cabello Lopez, Cuauhtemoc Arturo Juarez Perez, ¹Lourdes Martinez Ordaz, Carmina Jimenez Ramirez. ¹Instituto Mexicano del Seguro Social (IMSS), Mexico

10.1136/OEM-2021-EPI.232

Objective Noise has been considered as the main risk factor for occupational hearing loss. In addition, ototoxic substances, such as organic solvents and heavy metals, contribute to this disease. However, conjoint exposures of these risk factors need further attention. Therefore, the aim of the study was to determine if there is an association between hearing thresholds

and exposure to organic solvents and lead, alone or in combination with noise, in Mexican workers.

Methods A cross-sectional study was conducted including workers at a printing press in Mexico City exposed to noise and organic solvents ($n=279$); and workers from Tlaxcala in central Mexico exposed to lead who produce glazed clay pottery at small workshops ($n=188$). Organic solvents exposure was assessed by questionnaire; noise was measured with a sound level meter. Moreover, lead exposure was defined according to blood lead levels. Individuals were categorized as exposed or non-exposed in both samples. Hearing thresholds were compared across exposure categories. Multiple linear regression models were built to explain changes in hearing thresholds.

Results Exposure to organic solvents >10 years and blood lead levels >30 micrograms per deciliter were associated with worse hearing thresholds. Compared to the non-exposed group, mean hearing thresholds in exposed workers increased as years of exposure to organic solvents increased (≤ 5 years: 2.7 dB [0.46, 5.01]; >5–10 years: 6.3 dB [3.87, 8.77]; >10 years: 8.2 dB [6.00, 10.4]). The same behavior was observed with increasing blood lead levels, compared to workers with >30 micrograms per deciliter: 3.26 dB [0.09, 6.42]). When analyzed altogether, there was no evidence of interaction between noise, organic solvents and lead on hearing thresholds.

Conclusion Occupational exposure to organic solvents and lead was associated with worse hearing thresholds among workers from different job settings.

P-205 'WHAT ARE THE EFFECT OF WORK-RELATED FACTORS ON THE DECISION TO RETIRE? A SYSTEMATIC REVIEW OF PUBLISHED STUDIES 2000–2017.'

¹Martin Stevens, Mary Barker, Elaine Dennison, E Clare Harris, Cathy Linaker, Karen Walker-Bone. ¹University of Southampton, United Kingdom

10.1136/OEM-2021-EPI.233

Introduction Ageing populations in high income countries, have the potential to greatly increase the proportion of retired people in relation to workers. Recent policy changes to extend working lives have focused on increases in state pensions ages. However, work-related factors may also present an opportunity for employers to design effective interventions to delay retirement.

Objectives We conducted a systematic review of published studies that investigated the relationship between work-related factors and the decision to retire.

Methods Studies that investigated retirement after 1st January 2000 at ages 50+ were included, whilst studies investigating intention to retire or transitions to unemployment and/or disability retirement were excluded. Six online databases were searched and results were independently screened against the inclusion criteria by two researchers. Data extraction and risk of bias checked were carried out independently by two researchers. Reference lists of eligible studies were screened for further studies.

Results Searches returned 4,995 references. Results were screened and 30 studies were identified that met inclusion criteria. 28 studies were assessed as low/medium risk of bias, however 19 of the studies had limited generalisability to