the US National Cholesterol Education Program (NCEP) Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (ATP III).

Results After an average follow-up of 6.0 years, the incidence rate of metabolic syndrome among workers who had been working in the same job category for five years was 32.42 per 1000 person-years. Moreover, the largest number of cases with metabolic syndrome appeared in the transportation industry.

Conclusion The results of this study should help the employers of various industries to better plan health education and monitoring programs of their employees to ameliorate the incidence of metabolic syndrome.

P.1.38 EFFECTS OF PARAOXONASE 1 (PON1) GENOTYPE AND NANOMATERIALS EXPOSURE ON HEART RATE VARIABILITY

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Background Although paraoxonase 1 (PON1) is a high-density lipoprotein (HDL) associated antioxidant enzyme that has beneficial effects on atherosclerosis and cardiovascular disease, whether PON1 Q192R polymorphism have any effect on cardiac autonomic function is yet to be investigated. Moreover, there is limited data regarding the influence of NPs exposure on HRV parameters in humans. The purpose of the study was to exam whether PON1 genotype or NPs exposure has an association with HRV levels.

Methods This cross-sectional study recruited 235 workers exposed to NM and 185 non-exposed controls from 14 NM handling plants in Taiwan from 2009 to 2011. For each participant, we collected blood specimens to determine the genotype of the PON1 Q192R polymorphism and PON1 paraoxonase and arylesterase activities. In addition, short-term HRV was tested.

Results The results showed that PON1 Q192R genotype and PON1 paraoxonase/arylesterase activities associated with HRV, and was particularly noteworthy in RMSSD and HF. The relationship between NPs exposure and HRV was only found in workers exposed to nano-Ag, but the apparent relationship between NPs exposure and HRV is lacking.

Conclusions It is a novel finding that both RR genotype of PON1 (Q192R) and activities of PON1 increased with HRV levels. PON1 Q192R genotype may play an important role in cardiac protection. Considering the global prevalence of NMs market, further studies of NPs-induced cardiac events and stresses still are required to establish.

P.1.40 FARMER'S SUICIDE WITH THE USE OF PESTICIDES IN DIFFERENT AREAS IN SPAIN

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Introduction There is considerable interest in the potential relation of suicide with the pesticide. Agriculture is the leading professional sector for pesticide use in the world

with a turnover of about 40 billion US dollars in 2010. According to the WHO report in 2014, autointoxication with agricultural pesticides contributes greatly to the global burden of suicide. The aim of this study is to evaluate whether suicide of farmers was associated with the use of pesticide in different areas during the period 2001–2011 in Spain.

Methods The cohort study followed 9.5 million men in Spain from 2001 to 2011. Participants aged 20–64 years were employed in 2001. The study subjects were grouped as farmers and non-farmers. We divided Spain into two areas depending on both geographical location and the mean annual amount of pesticides used: southeast Spain and the rest of Spain. The southeast Spain shows higher use of pesticides than the rest of Spain. For three major causes of death (suicide, unintentional accidents and rest of causes of death), we estimated the age-standardized mortality rates per 1000,000 person-years of follow-up, the ratio of age-standardized mortality rates with 95% confidence intervals (CI) between farmers and non-farmers in two areas were calculated.

Results With respect to the rest area of Spain, farmers in the southeast showed a lower mortality rate of suicide and unintentional accidents, which mortality rate ratios were 0.74 (95% CI 0.65–0.85) and 0.57 (95% CI 0.52–0.62).

Conclusion Our findings do not support a possible association between pesticide use and suicide of farmers in Spain.

P.2.01 EPIDEMIOLOGICAL STUDIES OF THE PORTON DOWN VETERANS: AN UPDATE OF CANCER INCIDENCE AND MORTALITY TO 2018

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Introduction An update to the Porton Down Veterans Cohort study is planned for 2018–2021.

Background Chemical warfare agents continue to be deployed by rogue states and terrorists, e.g. in Syria, Iraq, Tokyo, and Salisbury UK, yet their impact on long-term health is largely unknown. The Porton Down cohort comprises of 18 276 men who took part in the 'human volunteer programme' of chemical warfare agent research at Porton Down, UK, between 1941 to 1989, and a comparison group of 17 600 men who also served in the military. An original study linked veterans' records to national registry data on cancer incidence and mortality up to 2004. By the end of 2004, 7306 of the Porton Down veterans and 6900 of the comparison cohort had died. The results showed Porton Down veterans had no overall excess of cancers (rate ratio (RR)=1.00, 95% CI 0.95–1.05) and a small (6%) excess of all-cause mortality (RR=1.06, 1.03–1.10) when compared with non-Porton Down veterans. Porton Down veterans had higher rates of certain cancers (e.g. ill-defined malignant neoplasms, and *in situ* neoplasms) and specific causes of death (e.g. genitourinary, circulatory and external causes).

Objectives The updated study aims to replicate the original analyses but with an additional 15 years of follow-up – estimated to increase the number of deaths available for study to c 22 200. This will improve statistical power, allowing

exposures and outcomes of interest from prior literature to be examined at a level of detail not possible in the original study, e.g. nerve agent antidotes, riot control agents, neurological mortality, and rarer cancers.

Implications Greater understanding of the long-term risks associated with exposure to chemical agents could lead to raised awareness among policy makers and health care providers, leading to improved diagnosis and quality of care.

Conflict of interest None

P.2.03 DESIGN, DEVELOPMENT AND IMPLEMENTATION OF A NATIONAL MULTI-SITE FIRE FIGHTER CANCER COHORT STUDY

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Background and objective(s) Retrospective epidemiologic studies suggest a disproportionate burden in specific cancer incidence rates in U.S. fire fighters when compared to the general population. Exposure to hazardous chemicals and carcinogenic compounds during fire incident response may be contributing to these observed elevated cancer rates. Research studies that prospectively collect and integrate exposure, biomarker and health survey information within the fire fighter workforce are lacking. In the present study, we 1) describe the design and development of a multi-state prospective fire fighter cancer cohort study; and 2) discuss the collection of cancer biomarker data from the first fire department.

Methods In July 2016, through FEMA-funding a national multi-state prospective study was designed with biomarker, exposure and data collection cores. Each core is comprised of a team of multidisciplinary investigators across governmental, industry and academic institutions with instrumentation and resources to collect field measurements across fire service departments. An oversight and planning board was empaneled with fire fighter department and union leadership and subject matter experts to guide the design, collection and analysis of integrated data streams.

Results A total of 62 new recruits from a large U.S. large career Fire Department were consented and enrolled into the Fire Fighter Cancer Cohort Study in February 2018. Among consenting rookie firefighters 60 consented (response rate 60/62=96.8%) to the optional biomarker and exposure collection protocols as well as granted permission for follow up in the future. Two phlebotomists and an occupational health nurse at the training academy collected a total of 5 tubes from each firefighter (i.e., TEMPUS, PAXGENE RNA, Sterile Red Top, EDTA, and sodium citrate tube).

Conclusions The newly established national prospective cancer cohort study infrastructure supports the collection of electronic consent, biomarker, exposure and health survey data. Expansion of the research protocol to other firefighter subgroups is needed.

P.2.04 OCCUPATIONAL SKIN DISEASE IN A TERTIARY OCCUPATIONAL DERMATOLOGIC CLINIC: A RETROSPECTIVE ANALYSIS FROM 2010 TO 2017

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Background Occupational skin disease (OSD) is one of the most common occupational disorders in Taiwan. As reporting OSD was not compulsory, there was limited information on the exact causes and patient characteristics. The objective of this study was to investigate the causes and common allergens among OSD patients in Taiwan.

Methods We recruited patients from Occupational Dermatology Clinic in National Cheng Kung University Hospital, a tertiary referral center in Tainan city, between 1 January 2010 and 31 July 2017. Patch testing with European baseline series, additional occupation-oriented series, and personal material exposed at work or during daily life was carried out if the patients were suspected of allergic skin diseases.

Results Among the 273 patients who received patch testing, 51 (18.7%) patients had a final diagnosis of OSD. 82.4% of the 51 patients were diagnosed with allergic contact dermatitis (ACD), 11.8% with irritant contact dermatitis (ICD), while the rest 5.9% with both. Patient reported 3.0 years of skin problem prior to the clinic visit. The vast majority of patients suffered from hand eczema. Epoxy resin workers, food workers, hairdressers and beauty salon beauticians were the most common occupations related to OSD. The most important allergens were nickel, fragrance mix I, potassium dichromate and paraben mix. Around half of the patients showed allergic reaction to their personal material.

Discussion As worker compensation statistics may not accurately estimate the characteristics of OSD patients, our study was crucial to identify the high-risk groups as well as the common allergens related to their work. Although the results might not represent the proportion of patients of OSD in other clinic, drawing information from patch testing may reflect those patients of severer or longer duration of symptoms. Future occupational measures should be taken on these industries for the detection and prevention of OSD.

P.2.06 RISK AND PREVENTION OF SENSITIZATION AND ALLERGIC CONTACT DERMATITIS AMONG WORKERS HANDLING EPOXY RESINS

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High prevalences of sensitization and allergic contact dermatitis (ACD) have been reported among workers exposed to