trends in the statistics of occupational diseases to discover the real trends behind year-to-year fluctuations.

1475 MALIGNANT HEMOPATHIES DUE TO PROFESSIONAL EXPOSURE IN MOROCCO

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Introduction Malignant hemopathies are rare diseases whose professional origin is probably underestimated, despite the growing number of epidemiological studies on this subject. The important role of extraprofessional factors (especially genetic factors), the rarity of malignant hemopathies, their heterogeneity, and their significant onset after carcinogenic exposure, all contribute to explain the difficulties of etiological research in regards of occupational factors.

Methods The aim of this work is to study the various work related malignant hemopathies recognised by the legislator and their etiologies, based on data from the literature as well as the Moroccan occupational diseases charts.

Results Only benzene and ionising radiation are recognised as undisputable carcinogens for blood-forming organs. Thus, different types of leukaemia occurring in the context of occupational exposure to these toxic substances, are included in the occupational diseases charts and are, for this reason, compensable. Nonetheless, there are uncertainties regarding the induction of malignant hemopathies by exposure to certain pesticides, organic solvents, infectious agents and electromagnetic fields for which further epidemiological studies are required.

Discussion Since the only agents known for their induction of malignant hemopathies and are recognised by the Moroccan regulations are benzene and ionising radiation, it is necessary to push the interrogation to establish the causal link to influence the repair of other cancers due to alternate professional exposures and to put in place preventive actions.

Conclusion Prolonged conservation of medical records of the exposed employees and the appeal to the responsible committee are necessary for the improvement of knowledge and the evolution of regulation.

In terms of prevention, medical surveillance, the protection of employees and the use of less toxic alternatives as soon as possible are obviously essential.

61 THE IMPACT OF METABOLIC SYNDROME ON KAROSHI FROM OVERWORK

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Introduction Cardiovascular and cerebrovascular diseases (CVD) were found to be associated with overwork in Asia countries, as was death from overwork or known as karoshi. Emerging evidences pointed out a strong dose-response

association between working long hours and risk of CVD. However, there was little information concerning the effect of metabolic syndrome on CVD mortality in patients with overwork or without overwork. The aim of this study was to investigate the risk of karoshi from overwork among bus drivers with metabolic syndrome (MetS).

Method In the Taiwan Bus Driver Cohort Study during the period 2005–2012, 1014 professional drivers completed comprehensive studies. Working pattern questionnaire, job stress questionnaires, Swedish occupational fatigue inventory, stress satisfaction offset score (SSOS), biochemical measurements, and physical examinations were used to assess the overwork status and the presence of metabolic syndrome. This cohort was linked to the National Health Insurance Research Dataset to determine whether these workers had higher risk of karoshi from overwork.

Results There were 1014 enrolled bus driver with mean age of 41.05 ± 7.83 . The demographic characteristics, biochemical indices, and job stress scores of drivers were presented. For cardiovascular disease mortality, the unadjusted HRs for participants with MetS were 2.00 (95% CI: 1.47 to 2.73; $p < 0.001$) with comparison to those without MetS. After additional adjustment of pertinent variables, positive association remained essentially unchanged (HR=1.47, 95% CI: 1.04 to 2.09; $p = 0.030$). In terms of individual metabolic risk components for cardiovascular disease mortality, BMI, high blood pressure, and high fasting glucose were found to be statistically significant for risk of mortality. After adjusting for covariates, BMI and high blood pressure were two important predictors of CVD mortality.

Conclusion Our study highlighted that the incurrence of metabolic syndrome in bus driver combined with overwork was associated with increased cardiovascular mortality. Regarding metabolic components, BMI and high blood pressure were prognostic predictors of CVD mortality.

407 IMPORTANCE OF OCCUPATIONAL VISUAL SCREENING: JHAH MODEL

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Introduction Saudi Aramco is the national oil company of Saudi Arabia. JHAH is the healthcare provider for eligible Saudi Aramco employees and their dependents.

The JHAH vision conservation program provides quality assurance for prescription safety spectacles, visual assessment of cases referred from occupational medicine, eye examination for laser users, visual assessment for drivers and heavy equipment and crane operators, and a glaucoma screening program.

Glaucoma was the cause for the permanent disability of 38 staff members due to blindness between 1975–1984. As a result, Saudi Aramco decided to keep its glaucoma screening program in-house and not outsource it as other large companies do.

Methods Employees above the age of 45 are enrolled in glaucoma screening and are assessed once every 5 years.

During the screening examination, an employee is provided with a detailed history with symptoms, visual acuity assessment, an ocular health examination and intraocular pressure measurements. If a test comes back abnormal, the employee is scheduled for a detailed screening examination in the

Occupational Optometry Clinic, and if required is referred to an ophthalmologist.

Results Based on the screening criteria, 20 000 employees are eligible for the program. Approximately 3000 employees are scheduled for screening annually. Nearly 60% of enrolled employees are assessed per department. Many of those screened require health awareness related to ocular dryness and prescription-related changes. In addition early vision changes were found to be due to diabetes, cataracts, and glaucoma. About 50 annually require specialist referral.

Discussion Using a visual task analysis, the program has improved visual deficiency at Saudi Aramco. Prior to the program, many participants had not been aware of a problem. In the poster, three cases (early onset glaucoma, diabetic retinopathy, and retinitis pigmentosa) where early diagnosis and intervention prevented permanent visual impairment will be discussed.

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RISK OF PROSTATE CANCER AMONG FIREFIGHTERS: A REVIEW AND META-ANALYSIS OF STUDIES PUBLISHED AFTER 2007

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Introduction Prostate cancer is the most common cancer among men; however, little is known about its aetiology. Several studies have indicated that firefighters have an increased risk, but the results have not been consistent. Firefighters are exposed to many harmful substance in their work, some of which are carcinogenic. Two reviews with meta-analyses, including studies through 2003 and 2007, respectively, found that firefighters had approximately 30% elevated risk of prostate cancer. Our objective was to perform an updated review and meta-analyses of studies published after 2007.

Methods We performed a literature review of original articles of prostate cancer in firefighters, published between January 2008 and May 2017. For the meta-analysis, we selected relevant longitudinal studies and calculated summary risk ratios (sumRRs).

Result Six studies, published 2008–2016, with a total of 5097 prostate cancer cases, were selected for the analysis; four were cohort studies and two case-control. Eight risk estimates were included in the meta-analysis, seven incidence based, one mortality based. All showed weak to moderate positive associations between firefighting and prostate cancer, although some not statistically significant. Meta-analysis of five incidence based risk estimates from cohort studies, gave sumRR 1.20 (95% CI: 1.05 to 1.36). Results based on the two case-control incidence studies gave sumRR 1.24 (0.90–1.70). When all eight risk estimates were included in the meta-analysis, sumRR was 1.19 (1.08–1.32). Further analyses, however, showed significant heterogeneity between the studies.

Discussion The results showed that firefighters had approximately 20% increased risk of prostate cancer, somewhat lower than the previous two meta-analyses found. However, occupational title may be an inaccurate measure of carcinogenic exposures and thus lead to underestimation of the cancer risk. On the other hand, reasons other than a causal relationship, particularly surveillance bias, caused by regular health examinations among firefighters, cannot be excluded.

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POLYCHLORINATED BIPHENYLS AND DEPRESSION – FIRST HINTS FOR A PATHOMECHANISM VIA THE THYROID AND DOPAMINE SYSTEM IN HUMANS

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Introduction After PCB (polychlorinated biphenyls) exposure the development of depression has been described (Fitzgerald, *et al.* 2008). In general, depressive symptoms are associated with lower dopamine concentration and disturbed thyroid function. Thyroxine (T4) is necessary for dopamine synthesis in the brain (Hassan, *et al.* 2013). Bound to transthyretin (TTR); T4 is transported into the brain. Since PCB can displace T4 by binding to TTR itself (Hamers, *et al.* 2011); the concentration of free T4 (fT4) increases under PCB exposure. This study investigates the interaction of PCBs and fT4 related to the dopamine metabolite homovanillic acid (HVA) as well as to depression in humans.

Methods This study is part of the HELPCB (Health Effects in high Level exposure to PCB) surveillance program. Altogether, 109 occupationally exposed individuals [m=101 (92.7%); age: mean=44, SD=12.8] participated at three yearly assessments. Individuals with thyroid- or dopamine-relevant medication were excluded. PCBs were measured in plasma (µg/L), fT4 in serum, HVA in urine and depression was assessed with the PHQ-9 (Löwe, *et al.* 2002). PCB-congeners were summed up to LPCB (lower-chlorinated), HPCB (higher-chlorinated) and dlPCB (dioxin-like). A sum variable was generated for the PHQ-9. The interactions of PCBs and fT4 related to HVA and depression were tested with mixed models.

Result Significant interactions related to HVA were found for all PCB-subtypes (e.g. LPCB: B=−0.5, p<0.01). Under high PCB-exposure high fT4 levels are associated with a lower HVA concentration and vice versa. The interaction related to depression was only significant for LPCB (B=0.1, p<0.01). More depressive symptoms were found for high PCB-exposure with increasing fT4 level and vice versa.

Discussion The interactions related to HVA support the postulated pathomechanism via TTR. Individual and environmental factors may be a reason that the interactions for the behavioural outcome of depressive symptoms were only partially confirmed.

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ANNUAL CHECK-UP: A RELEVANT TOOL FOR WORKER'S WELLBEING AND WORKPLACE HEALTH PROMOTION

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Introduction Annual check-up is one important component of periodical medical examination legally instituted by labour code in workers' health surveillance. It allows the assessment of the health status of the worker in order to renew his/her medical fitness to his/her job and to detect any illness related or not to work. Thus the outcomes obtained help us to design appropriate action plan for both prevention of occupational hazards and health promotion.