

## Poster presentation

noise exposure levels, hearing levels, depression, anxiety, burn-out symptoms, work-related stress and tinnitus will be analysed by use of multiple logistic regression analysis, taking *a priori* selected potential confounders into account.

**Results** Preliminary results show that of the 554 participants, 77% were males and the mean age was 43 years, ranging from 20–64 years. Among the participants, 17% reported tinnitus, 16% had a hearing handicap (WHO-definition), 3% anxiety disorder, 14% burn-out symptoms, 4% depression, and 8% reported work-related stress.

**Conclusions** Tinnitus is expected to represent a heterogeneous group of underlying disorders. We aim at contributing to a better understanding of the relative importance of the possible underlying factors in a population of occupationally noise exposed workers. Risk analyses are in progress, and results will be presented at the conference.

### 0070 THE TREND IN THE PREVALENCE OF CHILDHOOD HEARING IMPAIRMENT IN TAIWAN AND ITS IMPLICATIONS

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**Objectives** Childhood hearing impairment (CHI) is a major developmental disability, but data at the national level are limited, especially those on the trends over time. We conducted a study to assess the time trend of CHI prevalence in Taiwan and explore its associated factors.

**Method** The Taiwan government certifies disabled residents for providing various services and maintains a registry of certified cases. We analysed the registry data on cases under 17 years old from 2000 to 2011 to estimate the prevalence of CHI and assess the time trend.

**Results** Each year, registered cases ranged from 3427 to 4075. The prevalence increased from 2000 to 2006, and then decreased till 2011. In general, the prevalence increased over the years in the age groups < 3 years, 3–5 years, and 6–11 years ( $p < 0.05$ ), but decreased in the age group 12–14 years ( $p < 0.05$ ). The largest increase was observed in the age group < 3 years, particularly after the promotion of screening by the government in 2003. The decrease after 2006 was mainly attributable to decreases in the age groups 12–14 and 15–17 years, and similar decreases had been observed in countries with rubella vaccination programs.

**Conclusions** In Taiwan, the prevalence and proportion of CHI in the age group < 3 years had increased from 2000 to 2006 after the implementation of hearing screening programs. The overall prevalence decreased from 2006 to 2011, which might be attributable to the improvements in medical care and the nationwide rubella vaccination program.

### 0071 A STRUCTURAL EQUATION MODELLING METHOD TO DESCRIBE WORK ENVIRONMENT RISK FACTORS AND MUSCULOSKELETAL SYMPTOMS AMONG HOSPITAL NURSES

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**Objectives** Epidemiological studies have shown that musculoskeletal symptoms are frequent occupational injury and disability among nurses in developing countries. Preventive measures were not able to reduce musculoskeletal disorders significantly in nursing profession. This study was performed to provide a comprehensive assessment of the association among risk factors in developing musculoskeletal symptoms.

**Method** A structural equation model was applied to describe and analyse complex causal relationships from sets of occupational variables involved in musculoskeletal symptoms. A questionnaire was applied to nurses at hospitals affiliated to Semnan Medical Sciences University to collect data on personal and occupational factors and musculoskeletal symptoms. An ergonomic rapid entire body assessment measured work posture risks.

**Results** Physical work demand and mental pressure increased the risk of musculoskeletal disorders significantly. Musculoskeletal symptoms increased in nurses who worked for extended hours and experienced frequent unstable work posture. Structural equation model showed that musculoskeletal symptoms were associated directly and indirectly by physical and mental job variables, employment status, age and lifestyle.

**Conclusions** Covariance structural analysis is useful to describe and understand both the direct and indirect effects of variables with complex relationship between risk factors on the prediction of musculoskeletal symptoms.

### 0073 PTSD AND COGNITIVE IMPAIRMENT AMONG RESCUE AND RECOVERY WORKERS EXPOSED TO THE 9/11 WORLD TRADE CENTRE DISASTER

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**Objectives** The 9/11 World Trade Centre Disaster (WTCD) has resulted in many chronic health problems among survivors. Rescue/recovery workers (RRW), having the highest exposures, would likely be at the highest risk for these problems. We sought to evaluate cognitive impairment among RRW with and without prevalent posttraumatic stress disorder (PTSD) which may act as a mediator.

**Method** The World Trade Centre Health Registry is a voluntary longitudinal cohort study. Surveys collected demographics as well as 9/11 related exposures and health outcomes. We limited analysis to RRW workers only. WTCD exposure among RRW was classified from low to very high based on a sum of twelve 9/11 exposures. Cognitive impairment was defined by the frequency of trouble remembering things over the prior 7 days, and presence and/or worsening of memory loss or confusion over the prior 12 month period. A PTSD checklist score of 44 or greater was used to assess the presence of probable PTSD.

**Results** Of 18 932 RRW, 2436 (12.9%) had PTSD while 16 506 (87.1%) did not have PTSD. Among those without PTSD, 7.9% in the low exposure group were cognitively impaired, 8.9% with medium exposure, 10.3% with high exposure, and 14.4% with very high exposure. Among those with PTSD, 33.6% in the low exposure group were cognitively impaired, 33.5% with medium exposure, 32.5% with high exposure, and 38.1% with very high exposure.

**Conclusions** In WTCD RRW without PTSD, there is a dose-response for cognitive impairment with increased exposure.

However, approximately one-third with PTSD have cognitive impairment regardless of exposure level.

#### 0075 LEVERAGING MULTIPLE DATA SOURCES TO ASSIST OSHA IN ENFORCEMENT: EXAMINING ILLINOIS WORKERS' COMPENSATION DATA ON AMPUTATIONS

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**Objectives** The US Occupational Safety and Health Administration (OSHA) relies on survey data to target high risk employers for safety inspections and enforcement. However, OSHA has limited resources and randomly targeting employers for safety inspections as a general strategy is inefficient. In this study, we explore the use of an alternative data source to assist OSHA with a more targeted inspection program.

**Method** We summarised Illinois Workers' Compensation Commission (IWCC) court filings for amputations from 2007 through 2012 and identified the industries and companies that are the top offenders for amputations in Illinois within this dataset.

**Results** In total, there were 1260 amputations, of which 27.1% were severe amputations (not restricted to digits). The industrial sectors with the highest proportion of severe amputations were the mining (50.0%), government (40.6%), and personnel/employment services (temp employment) (40.0%) sectors. The analysis identified a short list of companies and their corresponding worksites, comprising nearly 20% of the amputation claims filed through the court system.

**Conclusions** Using alternative datasets that provide a specific list of the worst offenders in a region can guide a more efficient use of OSHA resources and create a system that targets the companies with a poor safety record. Random inspections using industry level data from the US Bureau of Labour Statistics does not differentiate between companies that invest in safety within high risk industries from the poor actors. Workers' compensation data is only one resource among many that can be utilised to assist OSHA with targeted inspections of high risk companies.

#### 0077 RECONSTRUCTION OF EXPOSED COHORT AND CUMULATIVE DOSE OF RADIO-CONTAMINATED BUILDING RESIDENTS FOR EPIDEMIOLOGICAL STUDY - UPDATED INFORMATION

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**Objectives** The purpose of this study is to reconstruct of RCB cohort and to survey occupancy factors for estimation of

cumulative dose in study of health risk of Radio-contaminated building (RCB) occupants.

**Method** The cohort of RCB occupants was established based on household, school and labour registration. Survey of current and retrospective occupancy factors in each age stratum was conducted to estimate the cumulative dose. Risk-period adjusted cumulative dose was generated in this study.

**Results** There were totally 32 622 in this study cohort, including 13 120 residents of RCBs, 15 368 students in RCB schools, and 4328 labours in RCB business workplaces. The mean and maximal dose in the year of RCB built was 32.7 and 998.56 mSv, respectively (Table 2). The main difference between retrospective (RCB residents) and current (general population) occupancy factors was RCB residents in the past had 2 more hours in living room, while current general population had 2 more hours in bed room. When bedroom was subdivided into bed and desk, we found current general population had 2 more hours in the desk of bed room. In total, the mean cumulative dose was 7.06 mSv with range of 0–1751 mSv. The mean cumulative dose for residents, labours, and students were 16.08, 2.91, and 0.48 mSv, respectively.

**Conclusions** We have established a new RCB cohort and provided new information of cumulative dose estimation. These data could provide valid information on the risk of cancers and non-cancer diseases at low dose and low dose-rate radiation exposure.

#### 0078 WORK ORGANISATIONAL CHARACTERISTICS AND PSYCHOLOGICAL DISTRESS IN FRENCH CALL-CENTRES. IS THERE A DIRECT EFFECT?

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**Objectives** In cross sectional studies, relationships between perceived stressors and self-reported health are suspected of mono-method bias related to negative affectivity. The purpose of this work was to test if work organisational characteristics (WOC) reported by managers were related to psychological distress (PD) reported by call-handlers, taking into account their perception of work conditions (perceived strain) and usual individual confounders.

**Method** Managers of 107 call-centres were queried by occupational physicians on their call-centres' WOC. 4002 call-handlers (2,929 women were considered here) of these call-centres completed self-reported questionnaires in order to evaluate perceived work strain (Karasek and Siegrist questionnaires) and PD (12-items General Health Questionnaire). A 2-level analysis tested the relationships between 14 WOC and PD score, with and without adding perceived strain as confounder, assuming that unchanged coefficients between WOC and PD score flag a direct effect of WOC on psychological distress. We also analysed perceived strain as an effect modifier for WOC using interactions.

**Results** Five of 14 WOC were significantly related to the PD score: type of calls, call-centre size, number of activity parameters displayed on screen, instructions for client relationships, and required control role of supervisor. In adding perceived strain, the relationship only remained for the type of call.

**Conclusions** Main results of this study are (1) existence of relationships between WOC reported by managers and psychological distress reported by call-handlers (2) most of effects of WOC are moderated by the perception of work strain.