

(Particulate Matters) in the history reached 1000 $\mu\text{g}/\text{m}^3$ (Chang, 2009). China's rapid industrial growth has led to steep increases of air pollutant emission. In addition to high increases in the density of PM₁₀ during the dust storms, mercury, copper, sulfur dioxide, sulfates levels have become more prominent in long-range transport of air pollutants. In comparison of daily dioxin level to the day of sand storm, the level has almost double in PCDD/F content (Chi et al., 2008). Chang et al. (2009) indicated that the concentrations of atmospheric PCDD/F and mercury could be as high as 69.8 fg-I-TEQ/ m^3 and 4.18 ng/ m^3 , respectively, during the Northeast monsoon episode. It reveals that the importance of hazardous atmospheric pollutants concentration via long-range transports in air quality management and health concern. Studies between 2003-2004 (Wu et al., 2007; Wu et al., 2004) indicated that there is also a higher density of fungus in Northern part of Taiwan during sand storms, including Non-sporulating Fungi, Cladosporium, Penicillium, Aspergillus and Curvularia. Some species have been found to only exist when sand storm attacked: such as Botrysporium and Trichothecium. Several studies indicated that the presence of sandstorms may be associated with increased risk of hospital admissions or even increase more respiratory death cases. Exposure to ambient air pollution may be associated with increased risk of respiratory and cardiovascular hospital admissions in Taipei and other regions with similar air pollution episode (Chen et al., 2004, Yang et al., 2005, Chan et al., 2008, Bell et al., 2008). How to prevent the sand storms impact the environmental and human health in Taiwan become a major issue in policy decision process for the Government. *The views expressed in this paper are author's and do not reflect official positions of the Taiwan Environmental Protection Administration.

Oral Track 24- Occupational & Environmental Health

OT24-1

Rising Concerns of Occupational Health in Mongolia: Analysis of Incidence Rates of Occupational Diseases During 1986-2006

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Objective: The industrialization of Mongolia over the last two decades has raised a concern on occupational health. The purpose was to determine the incidence rates and time trends of major occupational diseases in Mongolia.

Method: We retrieved information from all 4598 patients who were diagnosed and registered as having occupational diseases by the National Research Center of Workplace Condition and Occupational Diseases (NRCWOD) in Mongolia during 1976-2005.

Results: The annual incidence rate per million person-years of occupation-related respiratory diseases (ORD) was increased by almost 2 times, musculoskeletal diseases by 5 times, and skin diseases by 4 times during the study period. Pneumoconiosis decreased slightly, but asthma and dust related chronic bronchitis nearly tripled. Although the cumulative incidence rates in workers aged 30-59 years (CIR30-59) of ORD have been decreasing from 8.03% to 2.90% per year in the workers with high-exposures, total numbers of newly developed ORD has increased about 3 times, indicating more people employed in such industries and the need for proactive prevention. Moreover, the incidence rates of ORD for the non-exposed and low-exposed workers also increased.

Conclusion: Numbers of occupational diseases have increased during the last two decades because of expanded employment in industrial sectors. Actions must be taken immediately to allocate more resources for the development of health manpower on early recognition and prevention of occupational diseases, establishment of a comprehensive hazard communication system, and the enforcement of all regulations.

OT24-2

Birth Month, Mold, and Risk of Atopic Dermatitis in Early Infancy

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Background: Several studies have found the association between month of birth and the development of allergic diseases. Knowledge concerning the effect of the interaction between perinatal indoor conditions and seasonality on atopic dermatitis is limited.

Objects: To evaluate the seasonality of atopic dermatitis (AD) in Taiwan and find out the potential lead role of indoor conditions in the effect of seasonality

Methods: 21248 infants born in 2005, who had participated in the Taiwan Birth Cohort Study, were evaluated at 6 months of age by questionnaires completed by their parent or caregivers. Multivariate logistic regressions were used to adjust gestational age, maternal age, gender, parental education, family income, and parental atopic history. Two stage analysis was used to calculate adjusted incidence of AD in each month of birth.

Main Result: Total 1467(6.9%) infants had atopic dermatitis before six months of age. Month-of-births distribution of AD children was significantly different from non-AD references. In AD children, month-of-births distribution of AD children with mold on wall in their house was significantly different from those living without mold. After adjustment, fall, summer, and winter pose higher risks of AD compared to

spring, with odd ratio 1.45($p<0.001$), 1.2($p=0.03$), 1.16($p=0.08$), accordingly. Compared to spring-summer, fall-winter poses higher risk (OR 1.2, $p<0.0001$) to get AD.

Conclusions: There exists a seasonal variation of AD risk in Taiwan's infants at 6 months old. Indoor molds contribute to the different distribution of month of births within AD children.

OT24-3

Compliance of Universal Precautions by Emergency Surgical Health Care Workers; A Sri Lankan Experience

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Health care workers in emergency surgical units (ESHCW) are considered as a high risk category of acquiring infections by infectious blood and body fluids. Universal precautions (UP) are recommended to minimize this risk. Objective of this study was to understand the current compliance level of ESHCW with UP and identify factors affect the compliance. First 15 minute management of the first victim in 29 consecutive casualty incidents brought to Teaching Hospital Anuradhapura in 2009 was observed. Total encounters between ESHCW and patients were 359. UP were breached in 1033 occasions with average 2.87 per encounter. Average break rate was 2.91 in doctors. It is 2.78 and 2.93 among nurses and orderlies respectively. The lowest break rate was seen in senior residents and highest in interns. There is a significant reduction in breaking UP with increasing severity of incident (Pearson correlation -0.797, $P=0.203$) Wearing gloves were seen in 12.81%. Aprons were used by 4.45%. 22.84% of ESHCW remained at bed side without an apparent role. 82.17% attended other victims without hand washing or changing gloves. Compliance of the EHCW with UP remain low in the study population. Increasing the severity of incident reduce the non compliance significantly which is opposite of the general belief. Wearing apron is significantly lower than wearing gloves. Approximately 1/5 of the EHCW remain at bed side unnecessarily. Every 4/5 EHCWs attend other patients without hand washing or changing the gloves which can be a mode of transmitting infections between trauma victims.

OT24-4

Work Life Correlates of Burnout among Nursing Officers Working in Government Teaching Hospitals in Colombo

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Introduction: Burnout, which comprises a syndrome of emotional exhaustion, depersonalization and a sense of low personal accomplishment is an important negative outcome of chronic occupational stress. Information on correlates of burnout among Sri Lankan nursing officers (NO) is vital to initiate preventive measures.

Objectives: To describe work life correlates of burnout among NOs working in teaching hospitals in Colombo.

Methodology: A descriptive cross sectional study was conducted in six teaching hospitals in Colombo among a stratified cluster sample of 1356 nurses. A

self-administered questionnaire with questions assessing work life correlates (identified through a literature survey and key-informant interviews) and validated Sinhala version of Maslach Burnout Inventory-Human Services Survey (MBI-HSS) was used. Burnout status was determined using validated cut off values for the total score of MBI-HSS.

Results: Response rate was 90.4% ($n=1356$) and prevalence of burnout was 27.9%. In multivariate analysis, work life correlates explained 42.6% of variance of burnout. Shorter nursing experience of <5yrs (OR=5.6), high work demands (OR=2.6), low work resources (OR=2.4), poor physical work environment (OR=1.7), low work satisfaction (OR=2.2), working in paediatric units (OR=3.1), working in OPDs/other units (OR=0.3), shiftwork (OR=2.1) and difficulty with shiftwork (OR=5.1) were significant predictors of burnout.

Conclusions: Several correlates in the NOs' worklife contribute to burnout and minimizing these could be an important strategy in prevention.

OT24-5

Relationship between Drinking Water and Blood Arsenic Level and Skin Lesions in Buyat Village North Sulawesi Indonesia

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Arsenic contamination of groundwater is a severe public health crisis in Buyat Village Kotabunan Sub-district, Bolaang Mangondow Regency, North Sulawesi Province Indonesia, where the population is exposed to arsenic in drinking water through tube wells used for groundwater collection. In this study, explored the relationship between drinking water and blood arsenic levels with skin lesions on Buyat Communities. The research used of baseline data from subject 108, which as 54 case and 54 control who were recruited into the Health Effects (Skin lesions such as Keratosis, and hyperkeratosis). This study was Case control study on the health effects of arsenic exposure from drinking water in Buyat Village. We conducted analyses with Chi-Square and Odd Ratio. We found a strong dose-response association with all measures of arsenic exposure in drinking water and skin lesions. Arsenic levels in drinking water from tube well

of Buyat Village was about 0.01-0.104 mg/L (average 0.056 mg/L). A significance was observed between in drinking water and blood arsenic levels with $p=0.000$ (Odd Ratio = 19.44 95% CI: 6.52-58.00), blood arsenic levels and skin lesions with $p=0.000$ (Odd Ratio = 15.63, 95% CI: 4.94-49.40). Our study provides insight into potentially modifiable host characteristics and identifies factors that may effectively target susceptible population subgroups for appropriate interventions.

OT24-6

Development of Wet & Bulb Globe Temperature (WBGT) Index Formula and Determination of Heat Strain Indicator for Worker Exposed by Heat Stress ***Denny Denny Ardianto***

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The objectives of the research were to determine heat strain indicator other than core temperature and to discover mathematical formula which could develop new indicator of WBGT Index and threshold limit value being appropriate for workers in Indonesia. The research was conducted in glass, steel, and home industries whose sample size were 122 workers. Workers who experienced heat strain were 26 persons (21.3%). Analysis showed that beside core temperature, pulse could be used as an indicator of heat strain. Its critical point was 7 pulses/minute if baseline pulse was known, and critical point was 105 pulses/minute. Based on confirmatory analysis, mathematical formula for WBGT index was got. The formula was $(0.32 \times \text{wet temperature}) + (0.37 \times \text{dry temperature}) + (0.31 \times \text{globe temperature})$. Based on regression analysis was derived threshold limit value of developed WBGT index was 37.1°C. However, the value of former WBGT index was 33.3°C. If wind velocity was

OT24-7

Arsenic Levels Exposure as Risk Factors to Skin Lesions at Peoples in North Sulawesi, Indonesia ***Daud Anwar¹, Nur Nasry Noor¹, H.J Mukono², Muh. Dali Amiruddin¹, Veni Hadju¹***

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Arsenic exposure can generate various skin lesions such as keratosis, hyperkeratosis, hyperpigmentation, hypopigmentation, and skin cancer. This study was intended to examine risk factors of rice, drinking water, urinary, and blood arsenic levels to skin lesions at peoples in North Sulawesi. This was a case control study whereas cases ($n=54$) were people suffering for skin lesion (keratosis or hyperkeratosis) living in Buyat Village (exposure areas) and controls ($n=54$) were normal people who were living in Buku Village (non exposure areas). Inclusion criteria was age more than 10 years and living at the areas more than 7 years. Arsenic levels was analyzed using AAS-GF while skin lesion diagnosed by a dermatologist. Data analysis was

performed using logistic regression. There was significant difference before groups for age, sex, education and occupation $p>0.05$. In the others, there were significant differences between case and control groups for arsenic levels in rice (0.61 ± 0.27 vs. 0.34 ± 0.12 mg/l, $p=0.00$), drinking water (0.04 ± 0.03 vs. 0.01 ± 0.01 mg/l, $p=0.00$), urine (0.13 ± 0.15 vs. 0.00 ± 0.01 mg/l, $p=0.00$) and blood (0.99 ± 0.08 vs. 0.02 ± 0.03 mg/l, $p=0.00$). Analyses with logistic regression showed that arsenic levels in rice, drinking water, urine and blood associated with skin lesions, respectively OR=4.14, (95%CI., 1.18-14.51), OR=36.79 (95% CI., 10.44-129.66), OR=5.94 (95%CI., 1.6-21.53), and OR=10.53 (95%CI., 2.66-41.75). We conclude that arsenic levels in rice, drinking water, urinary and blood were risk factors to skin lesions.

Oral Track 25- Occupational & Environmental Health

OT25-1

Associated Sociodemographic and Employment Characteristics with Return to Work Following Injury

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Background: Return to work following injury is an important end result of treatment and rehabilitation among workers who are injured. Apart from the nature of injury, other factors such as employment characteristics, social and demographic factors were found to affect return to work.

Aim: To determine the prevalence and factors associated with return to work among patients following long bone fractures of the lower limbs

Method: A cohort of patients who sustained long bone fracture of the lower limbs during the period of 24 months – 1st August 2004 to 31st July 2006 was identified from a teaching hospital in Kuala Lumpur. Subjects were identified through medical record registry and eligible patients were then contacted by phone. Subjects were followed up at 3, 6, 9 and 12 months post injury and stopped if a patient had returned to work or if 12 months had past since the onset of injury. Results: One hundred eighty five (185) subjects were recruited. Of these 166 (89%) had returned to work within one year. Return to work period was found to be significantly associated with gender, type of occupation and presence of compensation.

Conclusion: Return to work is associated with factors other than the injury itself, such as compensation issues, occupation type and gender. Looking at these factors may improve communication between caregiver, employer and patients to encourage safe earlier return to work for the benefit of all.