in the workplace, it has achieved remarkable results. Therefore, we will expand this system further throughout incentives in reduction of Preventive rates, exemption of supervision, and facility improvement fund support, etc.

1235

HOW TO MANAGE THE IMPACT OF MEGATRENDS ON THE WORLD OF WORK? – CHALLENGES AND PROSPECTS

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10.1136/oemed-2018-ICOHabstracts.67

Introduction New trends like globalisation, digitalization, demographic change and social changes characterised by increasing migration and diversity are changing the world of work rapidly. This leads to new demands on employees, with the emergence of new safety and health risks. What are the new risks associated with current and imminent changes in the working environment? And how can occupational safety and health address them?

Methods Work 4.0 will need a Prevention 4.0. DGUV has therefore started research into new forms of work and risks caused by different megatrends on the one hand and monitoring possible future risks for safety and health at work in order to prevent or at least minimise them on the other hand.

Results The following examples show the development observed by the experts

- New forms of work and flexibility of work
- New technologies
- Communication between humans and communication between humans and robots
- New expectations of leadership
- Forms of learning and learning locations
- Skills and behaviour

In addition, DGUV identified prevention priorities with its Risk Observatory at an early stage. In October 2016, as a result of a consultation with some 400 inspectors of the social accident insurance institutions, ten topics were identified which will be important for the prevention work of the social accident insurance in the next five years. Sector-specific measures to face the risks were also identified. The Risk Observatory will start the next survey in 2017.

Discussion The presentation wants to show megatrends and their impact on the future world of work and the challenges for safety and health to avoid occupational accidents and injuries in future with focus on the results of the above mentioned research.

1256

A PILOT STUDY TO IDENTIFY THE FACTORS FAVOURING HYPOVIGILANCE BY DROWSINESS MEASURED BY A NON-INVASIVE MONITORING DEVICE UNDER REAL CONDITIONS

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10.1136/oemed-2018-ICOHabstracts.68

Introduction Every year, more than one million people die on the road worldwide, 20% of these deadly accidents being caused by hypovigilance due to drowsiness.

Methods Our study tested the feasibility of monitoring the level of sleepiness under real driving conditions, using the non-invasive Phasya monitoring device. Data were collected in 24 bus drivers' records, from November 3 to December 15, 2016.

Continuous measurement of the level of drowsiness with Phasya device, allowed to scale this level from 0 (awake) to 10 (drowsy) by analysing ocular movements extracted from images of the eye.

In addition, we determined individual and occupational risk factors potentially associated with drowsiness. Individual variables included, biometric, health-related data and the sleep profile. Occupational factors included the duration and distance travelled.

Diurnal sleepiness was self-assessed with the Epworth Sleepiness Scale.

Results We recorded 31 journeys for a total of 6070 kilometres and 193 hours of driving.

The drowsiness monitored was greater than or equal to 5 over 10 in 11.98% of the data collected, which is equivalent to more than 23 cumulative hours and more than 700 kilometres travelled being drowsy.

Health behaviours such as regular physical activity and the absence of overweight showed non-significant protective patterns.

However, diurnal sleepiness was highly associated with the level of drowsiness ($r=0.74$) ($p=0.02$). Likewise, the duration of journeys was also highly associated with increasing sleepiness ($r=0.25$, $p<0.0005$).

Conclusion This study demonstrates that the Phasya monitoring device is able to measure drowsiness under real driving conditions. Our results emphasise the need for prevention campaigns to include early detection of risk factors, as well as optimising the care of drivers suffering from drowsiness.

We suggest that imposition of breaks based on drivers' drowsiness level and driving time. Giving a break after 2 hours of driving appears reasonable in terms of safety.

1266

OCCUPATIONAL SAFETY AND CONCUSSION INJURY AWARENESS OF IRISH PROFESSIONAL AND SEMI-PROFESSIONAL FOOTBALLERS

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10.1136/oemed-2018-ICOHabstracts.69

Introduction The purpose of the study was to investigate the occupational safety awareness of a cohort of professional athletes; specifically looking at the risk of concussion, reporting rates, and practices amongst professional and semi-professional footballers.

Methods The study was an empirical quantitative study, in the form of a census, of a particular cohort ($n=250$) conducted in 2015. Participants were professional or semi-professional footballers playing in the League of Ireland. Footballers undertook a questionnaire on safety awareness and self-reported concussion over the previous five playing seasons. 149 footballers participated (60% response rate, $>90\%$ CI). Data was analysed using SPSS.

Results Over two thirds of respondents were unaware if their football club had a formal safety programme. Results indicated footballers had little occupational safety awareness, though they felt that both management and teammates employed good safety practices. 32% of respondents stated they had

sustained a concussion between 2010–2013. 84% of respondents noted they had not sustained a concussion during 2014. However, there were a significant number of semi-professional defenders who sustained a concussion that year. There was a higher rate of self-reported concussion amongst League of Ireland footballers in 2014 than in a similar study carried out on professional footballers in Italy in 2009. Respondents were more likely to report a concussion to a physiotherapist or doctor. Respondents were asked to identify a reason for not reporting a concussion, the most prominent being that players lacked unawareness of concussion impacts.

Conclusion Concussion reporting by mainstream media coupled with an introduction of concussion awareness programmes has resulted in a general increase in personal safety knowledge and awareness of concussion amongst Irish footballers. Further studies are needed focussing on safety culture and occupational safety and health awareness is raised in the professional sporting sector.

1347 HAZARDOUS WORK: A LOOK AT THE SAFETY AND HEALTH AT WORK OF GARBAGE COLLECTORS IN ASUNCION, PARAGUAY, 2013–2014

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10.1136/oemed-2018-ICOHabstracts.70

Introduction Garbage collector is a high-risk job, with exposure to a variety of occupational and non-occupational factors. Total injury rates of occupational accidents in these workers are not known in Paraguay, the aim of the study was to estimate and to compare the prevalence of accidents at work in formal and informal garbage collectors of Asunción, Paraguay.

Methods A cross-sectional study was conducted among 186 formal and 123 informal garbage collectors (response 84.5%, 56%). The 12-months-prevalence of occupational accidents and its association with socio-demographic factors (age, gender, education), employment and working conditions, work shifts, safety (exposure to unprotected openings and holes, ladders, slopes, a lack of cleanliness, clutter, poor lighting, lack of protection, and tools in poor condition), alcohol consumption, mental health, use of personal protective equipment (PPE) and manual handling of waste were examined using a structured questionnaire. Descriptive statistics, bivariate analysis (chi square test) and adjusted logistic regression models were carried out.

Results Formal workers were younger (57% over 40 years old), all male and better educated (82% completed the first grade), compared to the informal group (7% over 40 years old, 68% males and 30% completed the first grade). The 12-months-prevalence of occupational accidents among formal garbage collectors was 37.5% vs 29.5% among informal garbage collectors ($p=0.1$). Likewise, after adjustment for potential confounders no statistically significant difference between the two groups was found (Odds 1.8; 95% CI: 0.82 to 3.88). Significant risk factors for 12 months prevalence of accidents were lack of gloves (1.84; CI: 1.01 to 3.05) and poor safety conditions at the workplace (2.44; CI: 1.3 to 4.7).

Conclusion Prevalence of accidents at work among garbage collector is high. Workplace safety measures and use of gloves decrease the risk of accidents, therefore researches and interventions on occupational health related to this activity are necessary.

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IMPACT OF PSYCHOSOCIAL AND ORGANISATIONAL FACTORS IN A 12 YEARS ACCIDENTOLOGY FOLLOW UP ANALYSIS IN A GAS COMPANY

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10.1136/oemed-2018-ICOHabstracts.71

Introduction Different deficiencies contribute to the occurrence of accidents or safety incidents, so detecting, analysing and modifying them will be decreasing worker's unsafe conditions and behaviours that increase the probability of an accident. Studies indicate that, in a high percentage, 85% to 90% of accidents, the human factor is present.

Methods Retrospective analysis of work accidents reported by the Company was made in the period between 2003 and 2015. An accidentology analysis is presented in a natural gas transportation company with 956 employees with a 9,000 km pipeline. Different factors involved in the production of accidents were considered, caused by 'failures in the security system' of the organisation. These failures include: defects in the design of technology, preventive measures in operations to be carried out, worker protection, inadequate work planning and lack of risk controls, and specially associated with 'human factors'.

Result During the period 2003–2015, there were 272 accidents, at a rate of 22.6 accidents per year. 51% of accidents do not show unsafe conditions. Among the personal and organisational factors were involved in the accidents specially lack knowledge and/or lack of ability, deficiency in supervision and leadership, shortcomings in work procedures, lack of control in the use of tools or equipment.

Discussion It is often observed that the human factor (such as workers who are going through personal crises, partners, relatives, etc.) is often a fundamental variable for understanding accidents and designing preventive programs.

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HARMONISING THE LAW AND PRACTICE: OSH PRINCIPLES AND FUNDAMENTALS IN THE PHILIPPINES

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10.1136/oemed-2018-ICOHabstracts.72

Introduction In 2015, the Philippine Statistics Authority (PSA) reported that there are 900,914 establishments in the Philippines. To ensure the safety and health of workers in these establishments, the Department of Labour and Employment (DOLE) is mandated with the overall administration and enforcement of OSH in the country.

However, while the Philippines has a concrete legal framework on OSH as well as a central government agency tasked to implement it, the annual accident and medical reports based on Work Accident and Illness Report (WAIR), the Annual Medical Report AMR), and the nationwide sampling survey of the Bureau of Labour and Employment Statistics (BLES) put to question the effectivity of the programs of DOLE as well as other government agencies in implementing OSH standards. This study looked into the challenges, issues and concern in managing OSH in the Philippines.