

impacts as a result of occupational injuries are estimated, including psychiatric diseases, psychological symptoms, disability from work, and suicides.

**Result** Psychiatric diseases worldwide are caused directly or indirectly by occupational injuries. The less severe forms of mental consequences are psychological symptoms or preclinical psychiatric conditions. Significant percentage of permanent disabilities are caused by psychiatric conditions related to injuries. In addition, delayed return-to-work, i.e., longer duration of temporary disability is found among injured workers with psychological symptoms. A special form of psychological/psychiatric condition, suicides and suicidal ideation are increased among injured workers. There are still limitations in this analysis due to a great varieties of psychological outcomes obtained, and to lacking of epidemiological assessment of these conditions after occupational injuries.

**Discussion** Generally, the psychosocial impacts of occupational injuries are greater than generally understood. In addition to preventing occupational injuries, secondary and tertiary prevention to minimise psychosocial impacts are warranted.

### 1755 'VISION ZERO' – FOR A WORLD OF WORK WITHOUT FATAL AND SERIOUS ACCIDENTS

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There is a growing international consensus that efforts to develop a global prevention culture should be reinforced in order to reduce the unacceptably high number of work accidents and occupational diseases worldwide. It is at the same time recognised that business performance is highly depending on a healthy and motivated workforce.

The ISSA has on this background developed a new prevention concept, called 'Vision Zero', which is based on the belief that all accidents and diseases at work can be prevented. The ISSA's Vision Zero approach is flexible and can be adjusted to any workplace, company or industry.

A global Vision Zero campaign was launched at the XXI World Congress for Safety and Health at Work in September 2017 in Singapore, which aims to mobilise business leaders to integrate safety, health and well-being at work in their core management function as well as company culture.

To this end the ISSA has developed a Vision Zero Guide that outlines a roadmap with 7 Golden Rules to help improve a company's safety and health performance as well as practical checklists and training materials.

More than 700 Companies and OSH-organisations from more than 90 countries have since its launch joined the campaign as Vision Zero Companies or Partners.

### 1766 GENE-ENVIRONMENT INTERACTION: PROMISES AND PITFALLS OF MOLECULAR EPIDEMIOLOGY AND TOXICOLOGY IN OCCUPATIONAL HEALTH

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Most Gene x Environment (G×E) studies focused on polymorphic variants in metabolism genes affecting metabolic

function of proteins that activate or detoxify exogenous and endogenous toxins. Examples include members of the cytochrome P-450 (CYP) superfamily of proteins, N-acetyltransferase 2 (NAT2), and glutathione S-transferases (GSTs) that are implicated in cancer, Parkinson disease (PD), and Alzheimer disease. For example, long before the first familial PD gene was identified, the 'poor metabolizer' enzymatic phenotype of the cytochrome P450 2D6 (*CYP2D6*) gene was the first PD candidate gene because the enzyme is active in the brain region linked to PD, metabolises relevant endogenous neural compounds, and inactivates neurotoxins known to cause Parkinsonism in animal models and humans. Many population studies have shown an increased risk of PD for *CYP2D6* poor metabolizers compared with all other metabolizer types, and some PD studies that include pesticide exposures also observed G×Es for poor-metabolizer variants of *CYP2D6*.

Incorporating individual susceptibility in risk assessment has been a challenging endeavour as there is the problem of low statistical power when testing for G×E in studies designed to uncover main effects of variables. There is also the problem of the complexity of measuring environmental exposures and the difficulty in assigning temporality, especially in case-control studies.

Other problems include the limited range of genetic and/or environmental variation, the redundancy of metabolic pathways, the limited scope of minor biotransformation reactions, scale dependence in the definition of statistical interaction, and a lack of biological data on the health impact of many genetic variants.

Risk management implying priority setting and sound resource allocation should rely on risk characterisation, which in turn requires deep understanding of mechanisms of action of individual risk factors and relevant dose-response relationships. Most often, however, primary prevention aimed at eliminating exposure and hence also G×E remains the most pragmatic approach and perhaps the most effective one.

### 1736 MIGRATION, WORK AND OCCUPATIONAL HEALTH AND SAFETY

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The number of people leaving their homes and crossing national borders has increased in recent decades. Today, there is an estimated 232 million migrants globally, half of whom work, and this number is anticipated to continue to increase. The migrant workforce is mixed, containing young unskilled workers, highly skilled and educated workers, and latterly females. Migrant workers from developing countries have a tendency to segment into jobs at the bottom and top of the occupational hierarchy, whereas professional migrants habitually move from one wealthy country to another. The literature is mixed about whether migrant workers experience more work-related injuries than their native-born counterparts and little is known about their exposure to carcinogens and/or other workplace hazards and whether that varies with that of their native-born counterparts. Drawing on the findings from the international literature and several studies comparing exposure to workplace hazards between migrant and native-born workers in Australia, I will address why and how migrant workers are vulnerable to adverse working conditions and how this impacts on their occupational health and safety.