The three top injury-leading agricultural machines were Gyeong-ungi, tractor, and bush cutter.

Conclusion Agricultural machines were the main cause of occupational injuries for Korean farmers. Priority for prevention efforts should be given to more vulnerable populations (i.e., older males). For effective prevention, comprehensive strategies that incorporate engineering safety and improvement of agricultural working environment (e.g., farm road) as well as safety training and education are needed.

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COMMUNITY-BASED FARM SAFETY INTERVENTION IN SOUTH KOREA

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Introduction Intervention strategies to reduce agricultural injuries for self-employed farmers have been sought and evaluated in many prior studies. The aim of this study is to introduce the characteristics and effects of several types of farm safety interventions in South Korea.

Methods This study reviewed reports and documents of community-based farm safety interventions conducted by Korean central government through RDA (Rural Development Administration). The frameworks, main contents, effects, and implications of the intervention programs were described.

Results Since 2006, three main community-based farm safety intervention programs have been conducted by RDA, which were 'Farm Safety Model (2006–2015, 133 farm villages)', 'Supporting Program of Farming Convenient Equipment (2008–2017, 1484 farm villages)', and 'Customised Farm safety Management Program (2015~current, 230 farmer's cooperative units in 2015)'.

- 'Farm Safety Model' where professionals facilitated various interventions including farm safety education, an evaluation of risk factors on farm worksites, and health examination were appraised as effective in enhancing safety consciousness and safety management capacity of farmers.
- 'Supporting Program of Farming Convenient Equipment' was proved to reduce symptoms of musculoskeletal disorders among farmers participated.
- 'Customised Farm safety Management Program' that consisted of safety education, evaluation of risk factors on farm worksites, and customised supporting for occupational health and safety was evaluated as effective in enhancing the level of safety management on farming environment and hazards.

Conclusion Based on experiences from the existing intervention programs, the following are recommended for future strategies for agricultural health and safety: the main stream of community-based interventions is better to be farmers or farm leaders; intervention programs are recommended to contain both safety education/training and working environment interventions at least; national training programs and system for farm safety managers and farm leaders are needed.

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HYDROFLUORIC ACID: UPDATE ABOUT KNOWLEDGE ON EYE/SKIN AND RESPIRATORY EXPOSURE DAMAGES AND DECONTAMINATION

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Introduction Hydrofluoric acid (HF) is very corrosive and toxic for humans by all routes of exposures.

Materials and methods Recent *ex vivo* studies have been conducted on eye, skin and respiratory track in order to determine the damages induced by HF. For respiratory effects, an experiment was designed to explore HF toxicological doses and effects on MucilAir™, a unique 3D Human Airway Epithelia reconstructed *in vitro*. Review of current available literature on clinical data was also performed.

Results For inhalation exposure, up to 1.5 mM HF, no toxic effect was detected. From 7.5 mM, damage to epithelia were observed but could be repaired 7 days after exposure. 75 mM HF and above caused severe non reversible damage to epithelia. *Ex Vivo* Eye Irritation Test (EVEIT) combined with OCT allowed to characterise HF ocular burn with a complete diffusion into the cornea within 240 s for a 2.5% concentration. *Ex Vivo* study on human skin explants showed a diffusion in full skin within 5 min after a 70% HF exposure. Decontamination on both eye/skin *ex vivo* models with water alone or with calcium gluconate limited the diffusion but did not prevent all damages, whereas decontamination with an hypertonic amphoteric exposure such Hexafluorine solution avoided the diffusion and damages. This result is in agreement with the analysis of the clinical results of the literature.

Conclusion Experimental models can help to understand chemical damages from HF exposures and design management based on new tools and devices in order to provide immediate and efficient decontamination to protect exposed workers.

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OBSTRUCTIVE SLEEP APNEA SYNDROME AND FITNESS TO DRIVE OF COMMERCIAL MOTOR VEHICLE DRIVERS – STATE-OF-THE-ART REVIEW

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Introduction Obstructive Sleep Apnea Syndrome (OSAS) is a very common disease with potentially severe health and social consequences. Untreated OSAS is associated with increased risk of motor vehicle accidents, caused by excessive daytime sleepiness (EDS). Sleepiness at the wheel is the cause of accident in 5 tot 7% of the cases. The overall risk of accidents for OSAS patients is elevated by a factor 2.4 to 3.7. OSAS is more common among commercial motor vehicle (CMV) drivers, due to obesitas for example.

Methods We performed a literature review regarding the fitness to drive among CMV drivers with OSAS.

Result CMV drivers are a high risk, underserved occupational group. Occupational demands and working conditions result in a sedentary lifestyle and irregular sleeping patterns, contributing to overweight and fatigue. Occupational risks and morbidities include e.g. hypertension, metabolic syndrome and diabetes. Subjective EDS can be assessed by questionnaires (e.g. STOP-Bang, Berlin Questionnaire, Epworth Sleepiness Scale), unfortunately with reporting bias. Measurement of height and weight (body mass index), neck circumference and blood pressure during physical examination offers an opportunity to assess objective risk factors for OSAS without relying on the subjective report.

Discussion OSAS is both underdiagnosed and undertreated. Identifying CMV drivers, with OSAS and treating them effectively should decrease crash-related fatalities and injuries. There is a need for an active response from (occupational health) physicians, the sleep disorder specialists, the transport industry and the governments to create an effective OSAS screening among drivers and to accomplish patient compliance with the best treatment.

An objective evaluation is expensive, time consuming and not applicable on a large scale. New tools are necessary to assess the fitness to drive. There is a lack of such tools, as well as practical guidelines, so there is no consensus on the driving ability of untreated and treated OSAS patients.

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CHALLENGES FOR THE BETTER SCREENING OF SLEEP APNEA SYNDROME IN A RAILWAY COMPANY IN JAPAN

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Introduction SAS is known to cause drowsiness and lack of concentration at work and poses a serious job-fitness risk as a train driver. E company launched the initial screening program in 2003 using Epworth Sleepiness Scale (ESS) and induced pulse oximetry in 2007, and examined all train drivers every three years.

Methods Based on ESS and pulse oximetry the detailed examination using sleeping polysomnography (PSG). Crews who need medical treatment such as continuous positive airway pressure (CPAP) were subject to work restrictions until the improvement was confirmed.

Results According to the statistics for 9 years until October 2016, 5500 crews examined 151 crews were subject to work restrictions.

After treatment, more than 90% of the cases have recovered their AHI to less than 30% of previous level, and all drivers successfully returned to their original jobs in about 2 weeks.

Discussions Larger proportion of SAS patients (2.7%) than average Japanese population (1.7%, Guidelines for Diagnosis and Treatment of Sleep Disordered Breathing in Cardiovascular Disease), company is still experiencing false negative cases improve the drivenvironment to prevent daytime drowsiness and educations for crew members.

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FACTORS ASSOCIATED WITH SHARP DEVICE INJURIES IN DAMMAM HEALTHCARE WORKERS: IMPLICATIONS FOR PREVENTION

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Background Sharp devices injuries (SDI) expose workers to blood-borne pathogens. Despite implementation of preventive measures to reduce sharp injuries they continue to occur in every step of sharp devices usage, disassembly or disposal.

Aims To examine risk factors of SDI and explore implications for prevention.

Methods Retrospective study of SDI incidence among healthcare workers (HCW) at a hospital.

Results 8.4% of HCW reported an SDI over 26 months. Most occurred in wards (32%). Nurses were most affected category by SDI (52.5%), followed by physicians (24.9%). Disposable syringes are the main cause among nurses (58.9%), while surgical devices are the main cause among physicians (40%). Expatriates with SDI are less likely than Saudis to have had a complete hepatitis B vaccination series.

Conclusion SDI are common. Because characteristics of SDI differed according to job category and worksite, preventive strategies should be targeted for each category. Adequate hepatitis B vaccination is needed.

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OCCUPATIONAL HEALTH AND SAFETY PHILOSOPHY VISION ZERO AND WELLNESS PROGRAMS AT GRUPO PROGRESO

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Objectives Demonstrate how and why the wellness of each of our employees, is the reason to focus in OH and S at Grupo Progreso, in order to achieve our 'Zero Incidents' Vision.

Methods Our strategy regarding OH and S takes us first to achieve and meet the commitment with the board of directors, top management, bosses, supervisors and every operational staff. This means we lead with the example, allowing us to show genuine interest in the health and safety of every employee. The last stage is the application of the consequences scheme, where we encourage employees to repeat desired behaviours and sanctions those who break safety regulations. We count with a lead indicator, called Safety Gradient, that was designed by our team and it is monitored since the last 4 years every week in every team during group meeting all around the organisation. The top management, the CEO and the OH and S corporate manager also go through this tool each week. This indicator takes into account four elements: Safety moments, Safety observations, Corrective actions and Stopped unsafe acts. In addition, each week the OH and S team will perform inspections in different areas that provide the percentage of safe behaviour and safety conditions. Because this is a predictive tool, the incidents that involve injuries that need medical treatment without lost time and property damage will change the percentage of the Safety Gradient. This value allows us to know the safety level under which our organisation is run.