

For developing the Strategy, workshops were organized to bring stakeholders across HSE to review existing systems for conducting population surveys, collecting exposure intelligence and occupational health surveillance, which have contributed to forming a long-term vision of fit-for-purpose measurement systems.

We will present the development of the Strategy and the plans to implement it with the H&W program, which requires close collaborations between epidemiologists and social researchers, policy makers, and other multidisciplinary regulatory specialists. The lessons learnt will help HSE towards building the right evidence base for monitoring and evaluation of a range of national level intervention programs for work-related ill health prevention.

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07C.3 EFFECTIVENESS OF A MULTI-FACETED INTERVENTION TO PREVENT MUSCULOSKELETAL PAIN IN NURSES AND AIDES: RESULTS OF A CLUSTER-RANDOMIZED CONTROLLED TRIAL

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Background Health workers are at high risk of developing musculoskeletal pain (MSP). This study aimed to evaluate a multi-faceted intervention in two public tertiary hospitals, encompassing three levels of prevention and health promotion to prevent and manage MSP.

Methods A two-armed cluster randomized controlled trial, with a late intervention control group was performed. Clusters were independent hospital units, and participants were the nursing staff. The intervention comprised three components: participatory ergonomics, case management, and health promotion. The control group received usual occupational health care. The intervention lasted one year and data were collected at baseline, 6 and 12 months follow-up. Primary outcomes were self-perceived MSP and its associated sickness absence. The process evaluation included recruitment, context, reach, dose administered and received, fidelity, satisfaction, implementation strategy, and discussion groups of experts and participants.

Results Eight clusters, including 445 participants, were randomized. In the intervention group a 20% statistically significant reduction of neck, shoulders and upper back pain compared to the control group (OR=0.37; 95% CI=0.14–0.96) was observed at 12 months follow-up. We found no significant differences in incidence and duration of sickness absence. Organizational culture (secondary outcome) improved significantly in the intervention group in the domains of ‘formal safety audits’, ‘availability of information for safety at work’, and ‘involvement of workers in decisions that affect their safety and health’ compared to the control group. The intervention was implemented with 96.6% fidelity, and participants’ adherence was 75.5%. Participant’s satisfaction was 9.1/10.

Conclusions This intervention showed effectiveness to reduce MSP and improve organizational culture, through to an integral

management of MSP. Although our results are modest, strategies should focus on multi-faceted interventions, and occupational health services might be excellent opportunity for.

07C.4 USE OF CONTROL MEASURES AMONG CONSTRUCTION WORKERS WHEN PERFORMING DUSTY WORK

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Respirable dust, including respirable crystalline silica (RCS), is a common risk to health for construction workers. New Zealand and international literature has shown that construction workers are likely exposed to high levels of dust in the performance of their work. However, very little is known about the prevalence of controls used to minimise the dust exposure. An on-site survey of 250 construction workers was undertaken in Hamilton, New Zealand. Respondents were asked how frequently they completed any of six common high-risk activities for dust exposure: [1] cutting or drilling concrete, [2] grinding or polishing concrete, [3] jackhammering, [4] crushing concrete, [5] cutting or sanding wood, [6] cutting or sanding plasterboard or fibre cement board. For each activity completed more than once a month, workers were asked about the controls they used to minimise exposure to dust and their consideration of the risks to their health. Low levels of controls were reported across the high-risk activities. The majority of workers did not usually use water suppression when jackhammering (79.6%) or crushing concrete (56.3%). Nearly two thirds (62.8%) of workers did not use dry dust extraction when cutting or sanding wood, and over a quarter of respondents used neither water suppression nor dry dust extraction when cutting/drilling concrete (30.1%) or grinding/polishing concrete (25.0%). Half of the workers (50%) often or always wore respirators when performing dusty work but fewer than half of ever-wearers were fit-tested or clean-shaven. Younger workers (<25 years) were significantly less likely to consider risks to their health or wear a respirator compared to older workers (≥25). This study provides an insight into the use of dust controls in the construction industry in New Zealand. Future work should investigate how to encourage or enable uptake of stronger dust controls.

07C.5 ASSESSING THE IMPACT OF INTERVENTION ON FUTURE LUNG CANCER BURDEN AMONG CONSTRUCTION WORKERS

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Background and objectives Construction workers are exposed to several carcinogens at work. Implementing intervention methods may reduce workers’ exposure, which should subsequently reduce the number of cancer cases attributable to the

exposure. The current study estimates the future lung cancer burden due to respirable crystalline silica (RCS) exposure among Ontario construction workers, and assesses the impact of implementing interventions on this burden.

Methods The annual number of new cancer cases attributable to RCS was estimated from 2030 to 2060 using Levin's equation based on the prevalence of exposure (PrE) and the risk of cancer (RR) associated with RCS exposure. The RR was selected from a review of the epidemiologic literature. The PrE was estimated using CAREX Canada's estimates of prevalence and level of exposure, combined with historical and projected employment data, labour force characteristics, and survival probabilities. The intervention methods (personal protective equipment, wet cutting) were assumed to be fully implemented from 2020, and incorporated into the model by adjusting prevalence and level of exposure downwards.

Results We estimated that without intervention, 107 lung cancers would be attributable to RCS exposure in Ontario construction workers in 2030. This number increased to 181 in 2060. If intervention methods were applied, the reduction in the attributable cases became evident from 2040 onward, with a maximum reduction of 51 cancers in 2060. Overall, 481 cancers would be prevented between 2030 and 2060, which is 11% of the total cases if the interventions were not implemented.

Conclusions Future work-related cancers can be prevented by reducing workers' exposure. Combining the economic assessment of both the cancer burden and the costs of implementing exposure controls will help to assess the cost-benefit of different intervention methods, which can be used to direct intervention strategies in construction workplace.

07C.6 EFFECTIVENESS OF AN AUDIT-BASED OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM CERTIFICATION ON FIRM INJURY RATES IN ALBERTA, CANADA

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Objectives To determine if achieving an audit-based occupational health and safety management system certification (OHSMS) is associated with lower firm-level lost-time injury rates.

Methods Firm-level workers' compensation claims and OHSMS audit data were extracted from eligible industry sectors for the years 2000 to 2015. OHSMS and non-OHSMS firms were matched on observable baseline characteristics using coarsened exact matching methods. A difference-in-difference observational research design using population-averaged negative binomial regression models estimated the effect (incidence rate ratios (IRR) with 95% confidence intervals) of OHSMS certification on firm lost-time injury rates, adjusting for confounders. Models were stratified by industry sector and type of OHSMS (certification for small versus large firms).

Results The cohort included 14,377 OHSMS firms matched to 11 338 non-OHSMS firms. Overall, OHSMS certification reduced lost time injuries (IRR: 0.86, 95% CI: 0.83–0.88), with a greater effect in 2011–15 (IRR: 0.79, 95% CI: 0.75–0.82). OHSMS certification was most effective in reducing injuries in the manufacturing (IRR: 0.75, 95% CI: 0.70–0.80), trade (IRR: 0.79, 95% CI: 0.73–0.86), and transportation

(IRR: 0.80, 95% CI: 0.72–0.89) sectors. No effect was found in oil and gas (IRR: 1.05, 95% CI 0.91–1.20), business (IRR: 0.89, 95% CI: 0.89–1.10) and forestry (IRR: 1.05, 95% CI: 0.83–1.33) sectors. OHSMS certification for small firms was not associated with a reduction in injuries (IRR: 0.98, 95% CI: 0.91–1.06.) in contrast to OHSMS certification for large firms (IRR: 0.84, 95% CI: 0.82–0.87).

Conclusions OHSMS certification is effective in reducing firm injury rates. Effectiveness varied by sector, time period, and small or large firm certification. Sectoral differences in OHSMS effectiveness suggest that the ability to prevent hazards targeted by certification may vary by work environment. Further, small firm OHSMS certification may not be identifying safer firms.

Health Inequalities

07D.1 INVESTIGATING THE DIFFERENCE OF WORK-RELATED HARMS IN NEW ZEALAND BY ETHNICITY

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In New Zealand about 10% of workers are harmed every year, with approximately 2 00 000 claims made to Accident Compensation Corporation (ACC) to cover the cost of injury and illness. Work-related injury and illness outcomes differ between ethnic groups. Māori (indigenous population) workplace fatality rates are 19% higher by industry and 10% higher by occupation than for non-Māori. According to Statistics New Zealand from 2002–2017, Māori were more likely to have higher rates of work-related claims than non-Māori. This study currently underway has used the Integrated Data Infrastructure (IDI) to look at different injury types and explore injury distribution between Māori and non-Māori in terms of age, sex, industry and occupation. WorkSafe applied to Statistics New Zealand (Stats NZ) for access to microdata in the IDI in July 2018 and was granted access in September 2018. In this study, data for people with accepted work-related ACC claims has been linked to 2013 Census to identify the industry that ACC claimants have worked in and their occupations. This data has then been linked to data on sex, age and ethnicity as recorded for the IDI population. Confidentiality of data in this study has followed Stats NZ's output rules including random rounding to base 3, suppression and aggregation.

07D.2 HEALTH-RELATED EDUCATIONAL DIFFERENCES IN DURATION OF WORKING LIFE AND LOSS OF PAID EMPLOYMENT: WORKING LIFE EXPECTANCY IN THE NETHERLANDS

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Objectives This study aims to provide insight into health-related educational differences in duration of working life by working life expectancy (WLE) and working years lost (WYL) through disability benefits and other non-employment states in the Netherlands.