

Preventing Occupational Disease: Designing a System that Works

Executive Summary

WorkSafeBC Research Project RS2014-IG26

March 2017

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*This research is supported with funds from WorkSafeBC
through the Innovation at Work program.*

1 Point Form Summary

1.1 Main research findings

- Primary prevention activities (i.e., legislation and regulation, exposure control, hazard/disease surveillance, education and training) play an important role in preventing occupational diseases.
- The success of the European Union's directive on chromium in cement (EU Directive 2003/53/EC) demonstrates that legislation, combined with an effective enforcement regime, can be effective at preventing occupational diseases.
- National or provincial surveillance systems make it possible to examine temporal changes in the incidence of occupational disease cases and to evaluate the impact of legislative or regulatory change.
- Linked population-based administrative databases are powerful tools for monitoring outcomes in vulnerable workers who may not be captured in conventional injury and disease surveillance systems.
- The effectiveness of education and training as a vehicle for changing behaviour appears to be context-dependent and influenced by the manner of delivery. Worker engagement and involvement is essential.
- Occupational health and safety outcomes are influenced by a constellation of factors and multi-faceted interventions appear to be more effective than ones with a single activity. The Québec Public Health Network in Occupational Health is an example of an effective multi-faceted program that has been implemented in Canada.

1.2 Implications for research, policy and practice

- Well-designed evaluative studies of preventive interventions are needed to inform evidence-based policy and practice decisions about which interventions are the most effective to implement nationally, provincially or at the workplace level.
- Investing in enhancements to linked population-based administrative datasets, in making the data more accessible and in developing research expertise to utilize the data would foster more policy-relevant research that would, in turn, enable better targeted prevention campaigns to be developed and implemented. This would benefit all workers and vulnerable workers, in particular.
- The impact of regulatory interventions depends on the context in which they are implemented, the presence/absence of a strong enforcement regime, and a process for keeping them up to date with current scientific knowledge.
- Adopting or legislating a "prevention by design" approach would prevent exposure from happening in the first place and would create opportunities for occupational health to become an economic engine that drives innovation and technology.
- There is an appetite in Canada for strategic action on occupational disease prevention at the provincial level, as well as for resourcing and harmonization of systems and strategies across the country. The absence of a national OHS legislative framework, combined with the inter-provincial differences in OHS across Canada, currently make it challenging to implement national level interventions.

2 Executive Summary

2.1 Introduction

Canadian stakeholders have expressed great interest in the primary prevention of occupational disease, but there is currently little systematic evidence to guide them in the search for effective approaches for Canadian contexts. The challenges of preventing occupational disease are global and are accentuated by changing industry structures and labour force demographics/dynamics, contributing to an increasing proportion of workers being precariously employed. In Canada, a political system that delegates jurisdiction for occupational health and safety to the provinces (i.e., there is no national OHS framework in Canada) exacerbates these challenges. Inter-provincial differences in industry sectors, OHS legislation and the organization of OHS services mean that strategic and programmatic requirements, approaches and resources to prevent occupational disease vary quite considerably across the country. This creates an uneven prevention landscape, presenting particular challenges for industries operating in more than one province and makes it difficult to monitor trends in occupational disease and exposure across the country as a whole, to design and implement prevention strategies and to document their effectiveness.

2.2 Purpose

The project had three primary objectives:

1. To identify strategies with a demonstrated capacity to prevent the following four occupational diseases: noise-related hearing loss, occupational cancers, occupational asthma and occupational contact dermatitis.
2. To assess whether these strategies are applicable in the Canadian context including in small and medium enterprises (SMEs) and among vulnerably situated labour forces including those that are precariously employed.
3. To involve key stakeholders in occupational disease prevention across Canada as members of the team, through key informant discussions and broader consultations.

2.3 Methods

A multidisciplinary team, with expertise in the four occupational diseases of interest, worked with a network of researchers, regulators and other prevention stakeholders to guide the project. Data were collected in three stages: 1) searches of the peer-reviewed and grey literature; 2) identification of the most promising strategies in both the English and French literature; and 3) consultation with key informants and other experts. Scoping review methods were used to identify and select the most promising primary prevention strategies identified from the English and French literature. Key informant interviews were conducted to collect feedback on the process and output, as well as to identify any gaps in the findings.

2.4 Key findings

For each of the occupational diseases, the scoping review identified a range of types of primary prevention interventions. These included: legislation and regulation, exposure control, hazard/disease surveillance, education and training, and multi-faceted prevention approaches.

Key findings from the scoping review, which were supported by discussions with our key informants include:

1. Some jurisdictions have incorporated primary and secondary occupational disease prevention into legislation. In some circumstances, legislation and regulations are effective at reducing (or eliminating) exposure, at changing behaviour and at reducing the prevalence of occupational diseases. However, regulations are insufficient on their own and their impact appears to be context-dependent and reliant on the degree of enforcement.
2. The hierarchy of controls is, in theory, an effective prevention strategy. However, there tends to be a reliance on personal protective equipment vs. engineering controls in practice. This is problematic for all workers (and particularly so for vulnerably situated workers) because this shifts the onus of risk awareness and protection to the worker.
3. Some hazard and disease surveillance systems were shown to be effective for helping to prevent the occupational diseases of interest, as well as for evaluating the health impact of changes in OHS legislation and policy.
4. The effectiveness of education and training as a vehicle for changing behaviour appears to be not only context-dependent but also influenced by the manner of delivery. Worker engagement and involvement is essential.
5. Occupational health and safety outcomes are influenced by a constellation of factors, including (but not limited to) regulatory frameworks, organizational and management structures, organizational and workplace safety culture, worker engagement and empowerment of health and safety committees.

2.5 Conclusions

Each approach to primary prevention (i.e., legislation and regulation, exposure control, hazard/disease surveillance, education and training) plays an important role in preventing occupational diseases. However, each has their limitations (e.g., in some cases, their impact appears to be context-specific) and each is insufficient on their own. Although this project does not incorporate a systematic weighing of the evidence, the literature suggests that multi-faceted interventions are often more effective than ones with a single activity.

A more general conclusion that has implications for future research is that there are few well-designed evaluative studies for many primary prevention interventions. Interventions to reduce hazardous exposures do exist for many occupational diseases. However, for practical and methodological reasons, few of them have been evaluated for impact. The lack of high quality evaluation studies limits our ability to make causal inferences and to draw conclusions about what actually works. Thus, there is a critical need for better evaluative studies of preventive interventions so that better evidence-informed policy and practice decisions can be made about which interventions are the most effective to implement nationally, provincially or at the workplace level.

Very few of the studies identified were undertaken in Canada or were specifically designed to examine the impact of primary prevention interventions on outcomes in vulnerable workers. While some of the workplace level interventions are likely transferable to Canadian workplaces, the absence of a national OHS legislative framework combined with the inter-provincial differences in OHS across Canada make it challenging to implement any of the national level interventions. That said, feedback from Canadian OHS policy makers and administrators indicates that there is an appetite for strategic action on occupational disease prevention at the provincial level, as well as for resourcing and harmonization of systems and strategies across the country.

2.6 Implications for future occupational health research

One of the scoping review's inclusion criteria was that studies should incorporate some measure of effectiveness, although articles about some non-evaluated programs or strategies were included if they appeared promising. In addition, the project focused on identifying programs or strategies that had actually been implemented (rather than being conducted solely for research), that are relevant to the Canadian context, and that take into account changing industry structures and labour force demographics. The relative lack of methodologically high quality studies evaluating the effectiveness of primary prevention strategies, particularly among vulnerably situated workers, was one of the gaps in the research literature identified by the scoping review. Better evaluative studies of prevention interventions, particularly in the vulnerable workforce, are required.

2.7 Applications for policy and prevention

This project showed that the impact of regulatory interventions depends on the context in which they are implemented (i.e., outcomes differ by industry), the presence/absence of a strong enforcement regime, and a process for keeping them up to date with current scientific knowledge. This has implications for the regulation/policy development and implementation process.

Other potentially effective ways to reduce levels of exposure and prevent occupational disease include: adopting or legislating a "prevention by design" approach (i.e., shifting from the requirement to control exposures to a focus on eliminating the hazard at source) and control banding. The former prevents exposure from happening in the first place and creates opportunities for occupational health to become an economic engine, driving innovation and technology. The latter may provide an easy to understand and easy to apply approach to controlling hazards in workplaces that have limited expertise in workplace health and safety, industrial hygiene, or chemical control. It also allows for control recommendations to be made for products that do not have occupational exposure limits. However, because control banding has not been fully validated and there is no universally accepted approach to banding, more research examining the validity of control banding and its applicability to the Canadian context is recommended.

The effective protection of the vulnerable or precariously employed workforce is a broad social issue characterized by their lack of social power. Because occupational diseases, particularly among vulnerable workers, may not be captured in conventional injury and disease surveillance systems (e.g., workers' compensation databases), it is important to invest in linked population-based administrative databases. However, a major challenge is the lack of occupation or industry information in administrative records, which could start to be addressed by the inclusion of this field in electronic medical records. Linking records in these types of databases and making them accessible to occupational health researchers and public health surveillance practitioners, as well as fostering policy-relevant research partnerships and developing research expertise to utilize the data, would enable targeted prevention campaigns to be developed and implemented in this population of workers.

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