



| 2016

Measuring Impacts: Young Workers' Injury Prevention Interventions in Canada

Project Team: The Sandbox Project, Parachute Leaders in Injury Prevention, MySafeWork, The CIHR Team in Child and Youth Injury Prevention, Sunnybrook Health Sciences Centre P.A.R.T.Y. Program, The Institute for Work and Health

Table of Contents

SUMMARY	2
DELIVERABLE 1: AN ANALYSIS OF THE FACTORS THAT MAY IMPACT YOUTH INJURIES IN WORKPLACES (I.E. ENVIRONMENT, TRAINING AND EXPERIENCE).....	2
DELIVERABLE 2: AN ENVIRONMENTAL SCAN OF YOUTH INJURY PREVENTION STRATEGIES.	3
A. PREPARING THE METHODOLOGIES FOR LOCATING, ASSESSING AND SUMMARIZING CURRENT YOUTH INJURY PREVENTION STRATEGIES IN CANADA AND OTHER RESOURCES RELEVANT TO YOUNG WORKER SAFETY	3
B. LOCATING AND DOCUMENTING INFORMATION ON THESE NATIONAL INJURY PREVENTION PROGRAMS AND OTHER RESOURCES	4
C. SELECTING RESOURCES BASED ON ASSESSMENT OF THE CONTENT OF THE PROGRAMS AND OTHER RESOURCES	4
DELIVERABLE 3: A LITERATURE REVIEW OF METRICS THAT COULD BE USED TO MEASURE YOUTH INJURY PREVENTION STRATEGIES.	5
CONCLUSION	6
OBJECTIVE 1: AN EVIDENCE-BASED STRATEGY FOR THE USE OF METRICS TO MEASURE YOUTH INJURY PREVENTION INITIATIVES FOR FEDERALLY REGULATED WORKPLACES.....	6
OBJECTIVE 2: A FINALIZED FRAMEWORK THAT CAN BE USED TO IDENTIFY KEY INDICATORS OF YOUTH RISK OF OCCUPATIONAL INJURY	9

Summary

Measuring Impacts: Young Workers' Injury Prevention Interventions in Canada

The goal of this project is to develop a continuum to measure and assess workplace interventions for youth occupational injury prevention. The continuum is comprised of an evidence-based strategy for the use of metrics to measure young worker injury prevention initiatives, and a framework that can be used to identify key indicators of youth risk of injury in the workplace.

Objective 1: To develop an evidence-based strategy for the use of metrics to measure youth injury prevention initiatives for federally regulated workplaces.

This project details a framework for measuring and assessing these wide-ranging initiatives in the federal arena. This information, consolidated into an evidence-based strategy, forms a foundation for injury prevention initiatives for federally regulated workplaces.

Objective 2: To develop a framework that can be used to identify key indicators of youth risk of occupational injury and illness. By analyzing the factors that may impact youth injuries in workplaces, this project provides impactful conclusions and recommendations in prevention.

Deliverable 1: An analysis of the factors that may impact youth injuries in workplaces (i.e. environment, training and experience).

The analysis of factors identified a workplace injury database with sufficient representation of young worker injury in workplaces as well as potential contributing factors. In consultation with project team members, data analysis was used to identify those factors contributing to young worker injury. Analysis considered different contributing factors for different types and causes of injury.

Summary of Findings:

In 2013, an Institute for Work & Health research team published a systematic review of risk factors for non-fatal injury among young workers. The review addressed two questions:

- What risk factors account for young workers' elevated risk for work injury compared to older workers?
- Among young workers, what are the risk factors for a work injury?

Compared to older workers, 10 of 14 population-based descriptive studies found a higher risk of work injury among young workers. Three of four population-based studies based on multivariate analysis found an elevated risk of young worker injury risk. Multivariate analyses reduced the magnitude of the risk estimate, indicating that factors other than the age of workers were responsible for a portion of the higher observed injury risk among

young workers. Work-related factors accounted for the largest share of the elevated risk experienced by young workers.

In multivariate analysis, differences in the risk of work injury among young workers were explained by job and workplace factors. These characteristics inform the finalized framework for objective number two and include tenure of employment, perceptions of work demands, occupation and industry of employment and perceptions of supervisor attention to worker health protection.

The overall conclusion of the review was that the observed elevated risk of work injury among young workers is due to the concentration of hazardous employment exposures among young workers. There is very weak evidence for vulnerability attributed to the individual characteristic of being young (for example, immature socio-emotional development or weak risk assessment competency).

A full copy of the original review is included as Appendix 1.

Deliverable 2: An environmental scan of youth injury prevention strategies.

The environmental scan was accomplished by:

A. PREPARING THE METHODOLOGIES FOR LOCATING, ASSESSING AND SUMMARIZING CURRENT YOUTH INJURY PREVENTION STRATEGIES IN CANADA AND OTHER RESOURCES RELEVANT TO YOUNG WORKER SAFETY

The inventory of programs and resources in each jurisdiction follows a common structure:

- **OHS regulatory standards: young workers** - To document applicable age restrictions in each jurisdiction and to document where specific training and competency requirements have been established for young worker entry-level employment.
- **OHS enforcement activities: young workers** - To document the extent to which inspection and enforcement activities give emphasis to the protection of young workers
- **Education and training** - To document the extent to which a jurisdiction has established secondary school curriculum standards for occupational health and safety in preparing adolescents for participation in employment. This component of the inventory also documents specific resources developed to inform young workers of their rights and responsibilities.
- **Information resources for young workers** -To document guidance materials specific to young workers
- **Information resources for employers** - To document guidance materials specific to employers of young workers
- **Information resources for parents** - To document guidance materials for parents

- of young workers
 - **Communication campaigns / social marketing / social media** - To document communication campaigns or social marketing programs that specifically address the needs of young workers
- B. Locating and documenting information on these national injury prevention programs and other resources

Please see Appendix 1-B.

- C. Selecting resources based on assessment of the content of the programs and other resources

British Columbia

WorkSafeBC has prepared comprehensive information resources for young workers and for employers and these resources have been continuously refreshed and updated. The province has developed primary and secondary school curriculum content concerning safety and safety at work. WorkSafeBC was an early innovator in the use of social marketing methods and has made continuous investments in this medium. To address the vulnerability of new workers, the province has adopted some regulatory reforms concerning the employers' obligations to train new workers.

Noteworthy content prepared by WorkSafeBC is the Young Worker Focus Report, published in 2011. The report provides a comprehensive look at the issues facing young workers in B.C.: what puts them most at risk, how they are getting injured at work and why, and the responsibility that everyone has in preventing young worker injuries. <http://www2.worksafebc.com/Topics/YoungWorker/Resources-FocusReport2011.asp>

Manitoba

The province of Manitoba has developed comprehensive information resources for young workers and for employers and these resources are continuously refreshed. SAFE Work Manitoba has established strong relationships with NGO intermediary organizations who deliver prevention services to workplaces. The province has made moderate and continuous investments in social marketing.

Ontario

Ontario made a very significant investment in young worker OHS programs and services in the 1998-2006 period. The coherence and comprehensiveness of these programs and services was distinctive. Ontario developed strong secondary school curriculum content and innovated in the adoption of the Passport to Safety program across the secondary school system. The use of social marketing was strong in the period 2002-2006 but was not continued. Of importance, the worker health protection priorities in Ontario re-oriented to a focus on 'vulnerable workers' in 2010.

a. Reporting on the findings of the environmental scan

Please see appendix 1.

Deliverable 3: A literature review of metrics that could be used to measure youth injury prevention strategies.

Results:

174 articles about occupational injuries were relevant to young workers. Overall, 84 percent of articles were primarily concerned with describing the characteristics of the worker and the injury incident. Many focused on injuries that occurred in agricultural, manufacturing or health care settings.

76 articles (44 percent) described the epidemiology of young worker injuries. This group of studies described in detail the demographic characteristics of the workers who suffered occupational injuries, as well as what they were doing at the time of the injury, what training they had received, what safety practices were violated, if personal protective equipment was used and the characteristics of the injury itself (severity, type, resulting time off work, etc.). The most frequent metrics used were medical/hospital records, compensation claims, surveillance databases (such as trauma registries or government records), and surveys (such as the National Health Interview Survey). Injury incidence, rates, and severity (including fatality counts) were the most frequent outcome measures.

68 articles (39 percent) described risk assessment practices applied to young workers and their workplaces. These studies outlined the degree of hazards faced by young workers (the overall safety climate, presence of hazardous materials, risk of workplace violence, etc.) as well as how well prepared the workers were to navigate these hazards (receiving safety training, level of supervision, availability of personal protective equipment, etc.). The commonly used metrics were questionnaires, surveys, interviews, focus groups and quantitative methods (such as directly measuring hazardous chemical exposure). The main outcome measures included exposure to hazards, risk perceptions, beliefs, attitudes or awareness, quality of safety training and injury incidence or rate.

A total of 21 articles (12 percent) described and evaluated a safety intervention. About half (N=11, 52 percent) evaluated an educational intervention. Two studies were conducted in Canada, 14 in the United States and the rest were international. Six studies evaluated the impact of the intervention in terms of injury reduction. Other impacts measured included hazard reduction, safety knowledge and behavioural intentions.

Findings:

The literature evaluating young worker injury prevention efforts is still in its infancy. The few studies found by this review provided some information about how to determine the quality of an intervention, but very few demonstrated effectiveness in terms of the ultimate goal of such efforts: reducing injuries. More studies are needed that will establish links between injury prevention interventions and concrete reductions in injury rates. In addition, future work is needed to explore the reasons why these interventions work or do not work. Based on the findings of this review, current literature suggests that

injury prevention interventions for young workers should include aspects from each of the educational, environmental and enforcement domains. Quality training, safer working conditions and safety inspections have been shown by the studies in this review to be concrete ways to reduce injuries and protect young workers. The results of a study by Wurzelbacher and Jin may be useful in developing a framework for evaluating future injury prevention programs.

A detailed breakdown of the literature review is available in Appendix 2.

Conclusion

Objective 1: An evidence-based strategy for the use of metrics to measure youth injury prevention initiatives for federally regulated workplaces.

With respect to measurement, we recommend:

- Having a sample of federally regulated employers complete an audit of organizational policies and procedures to test the comprehensiveness of fulfillment of requirements
- Periodically surveying a group of workers about their view of an organization's policies and procedures and workers' ability to speak up on matters related to health and safety

To assess different dimensions of occupational health and safety vulnerability in federally regulated workplaces, we recommend employing the Institute for Work and Health's recently developed 29-item measure that captures information on hazard exposure, occupational health and safety policies and procedures, OH&S awareness and empowerment to participation in injury prevention. This new measure of OH&S vulnerability can identify workers who are at risk of injury and provide information on the dimensions of work that may increase this risk.

A summary of this 29-item measure is included as Appendix 3.

Further, a study on the development of the questionnaire that has since been published in the journal *Accident Analysis & Prevention* (Vol. 82, pp. 234-243) is included as appendix 1-C(1).

This measurement should be undertaken at one point in time to compare vulnerability across groups, or be undertaken at multiple time points to examine changes in dimensions of OH&S vulnerability, for example, in response to a primary prevention intervention. This instrument is the result of a rigorous process of item generation that involved both a systematic search of existing instruments and focus group discussions. The reduction of items involved a transparent and independent selection process that included the

investigator team and various OH&S stakeholders.

The items included in the survey are:

How often do you

1. Have to manually lift, carry or push items heavier than 20 kg at least 10 times during the day?
2. Have to do repetitive movements with your hands or wrists for at least three hours during the day?
3. Have to perform work tasks, or use work methods, that you are not familiar with?
4. Interact with hazardous substances such as chemicals, flammable liquids and gases?
5. Have to work in a bent, twisted or awkward work posture?
6. Experience pain or discomfort as a result of your job?
7. Work at a height that is two metres or more above the ground or floor?
8. Work in noise levels that are so high that you have to raise your voice when talking to people less than one metre away?
9. Face being bullied or harassed at work?
10. Have to stand for more than two hours in a row?
11. Come to work feeling fatigued?

Response options are: Never, once a year, every six months, every three months, every month, every week or every day.

Policies and procedures

How strongly do you agree or disagree with the statement: At my workplace

12. Everyone receives the necessary workplace health and safety training when starting a job, changing jobs or using new techniques.
13. There is regular communication between employees and management about safety issues.
14. Systems are in place to identify, prevent and deal with hazards at work.
15. Workplace health and safety is considered to be at least as important as production and quality.
16. There is an active and effective health and safety committee, and /or worker health and safety rep.
17. Incidents and accidents are investigated quickly in order to improve workplace health and safety.
18. Communication about workplace health and safety procedures is done in a way that I can understand.

Worker awareness

How strongly do you agree or disagree with the statement: At my workplace

19. I am clear about my rights and responsibilities in relation to workplace health and safety.
20. I am clear about my employer's rights and responsibilities in relation to workplace health and safety.
21. I know how to perform my job in a safe manner.

22. If I became aware of a health or safety hazard at my workplace, I know who (at my workplace) I would report it to.
23. I have the knowledge to assist in responding to any health and safety concerns.
24. I know what the necessary precautions are that I should take while doing my job.

Empowerment

How strongly do you agree or disagree with the statement: At my workplace

25. I feel free to voice concerns or make suggestions about workplace health and safety at my job.
26. If I notice a workplace hazard, I would point it out to management.
27. I know that I can stop work if I think something is unsafe and management will not give me a hard time.
28. If my work environment was unsafe, I would not say anything and hope that the situation eventually improves (reverse scored).
29. I have enough time to complete my work tasks safely.

Secondary strategy for the use of metrics: From Appendix 2 (literature review):

“One more study that did not fit with our review framework but is nonetheless relevant and important to discuss is a study by Wurzelbacher and Jin. The researchers developed and tested a tool for predicting future worker compensation outcomes. They defined groups of metrics that could be used to assess interventions that address injury or illness events directly (termed “primary prevention”), as well as interventions to detect injury or illness early before it progresses in severity (“secondary prevention”) and interventions that reduce the duration of time off work following an injury or illness (“tertiary prevention”). They grouped their metrics according to predictive ability: “leading metrics” that indicate risk or potential causes of injury and are thus useful for predicting what might occur in future, or “trailing metrics” that describe what has happened previously, but are not necessarily reliable for projecting into the future. This project was accomplished through a preliminary literature review to define key injury prevention program elements, then, detailed questionnaires administered to participating companies. The researchers successfully demonstrated the application of the tool, predicting worker compensation cases based on metrics applied to the occupational health and safety programs of these companies.”

Objective 2: A finalized framework that can be used to identify key indicators of youth risk of occupational injury

Based on an analysis of the factors that may impact youth injuries, an environmental scan of youth injury prevention strategies and a literature review of metrics that could be used to measure youth injury, below is a framework that should be employed in assessing youth risk of occupational injury in federally regulated spaces:

Tenure of employment	There is a higher risk of occupational injury in shorter tenure employment relationships
Perceptions of work demands	High work demands are associated with a greater work injury risk
Vulnerability of the Worker	New to the industry, new to the country and other risk factors that encompass vulnerability as described below
Occupation and industry of employment	This is a proxy for hazard exposure: how often a worker is exposed to hazards such as the use of dangerous equipment or materials, work in dangerous locations, or undertaking work activities where there is a potential for injury.
Perceptions of supervisor attention to worker health protection	Includes specific policies or supports that address power differentials within the workplace such as the presence and effectiveness of OH&S or representative within the workplace; or the active collection of OH&S concerns from employees.
Number of prior injuries at specific workplace	Companies that have had injuries and do not address the issues continue to have more injuries.

Recent work by the Institute for Work & Health has proposed an approach to defining and measuring vulnerable workers. Vulnerable workers are those employees with higher exposures to hazardous working conditions and who lack the power to alter those conditions. Vulnerable workers include new workers, young workers, immigrants and non-permanent residents, workers in temporary employment relationships or with very low earnings and workers in inherently hazardous jobs.

The Institute for Work & Health's 2015 review conceptualizes four related, but distinct dimensions as the key features of occupational health and safety vulnerability:

- 1) Level of hazard potential faced by the worker
- 2) Workplace/organization-level protections and policies
- 3) Worker awareness of occupational hazards
- 4) Worker empowerment to participate in injury prevention

The framework notes that many young workers are new workers, and that short employment tenure is a prominent risk factor for work-related injury across all age

groups. The increased risk of work injury among short-tenure workers is attributed to: insufficient/inadequate safety training before beginning a job, inexperience with the work environment and more hazardous working conditions.

The two recently published reports on defining and measuring vulnerability are provided in Appendix 1 - C.