Divergent trends in work-related and non-work-related injury in Ontario

This *Issue Briefing* summarizes findings of a recent Institute for Work & Health (IWH) study comparing the incidence of occupational injury and non-occupational injury among working-age adults in Ontario from 2004 to 2011. The briefing draws on lessons from this work to highlight opportunities to improve the monitoring of injury across all Canadian provinces and territories.

Injury is the leading cause of death for Canadians aged one to 44 and is a leading cause of hospitalization for Canadians of all ages (PHAC, 2013a; PHAC, 2013b). A recent Canadian surveillance study found that the proportion of all deaths attributed to injury has actually increased over the period of 2001 to 2007 (Chen *et al.*, 2013). The absence of progress in the prevention of injuries should be a national concern. For many Canadians, injury results in ongoing impairment and disability. Our publicly funded health-care systems devote substantial resources to the clinical management of injury. For Canadian society, injury represents an economic burden equivalent to that of cancer or cardiovascular disease (Health Canada, 2002).

This *Issue Briefing* describes strongly diverging trends in the annual incidence of occupational and non-occupational injury presenting for treatment in emergency departments in the province of Ontario. In the emergency department records, the incidence of occupational injury declined by more than 30 per cent among working-age adults over the eight-year observation period. In contrast, no reduction was seen in the incidence of non-occupational injury over this period. Similar trends were seen in the incidence of injury reported by Ontario respondents to five waves of a national health interview survey.

With lessons learned from the study of injury trends in Ontario, this *Issue Briefing* then outlines how enhanced use of two existing data sources could strengthen capacity to monitor national occupational and non-occupational injury trends.

KEY MESSAGES

- Data from hospital emergency departments in the province of Ontario indicate that the incidence of occupational injury declined by more than 30 per cent among working-age adults over the period 2004-2011.
- The emergency department records indicate that there was no reduction in the incidence of non-occupational injury over this period.
- This divergence in trends for occupational and non-occupational injury in Ontario was also seen in the data from the Canadian Community Health Survey.
- Enhanced use of these two data sources could strengthen capacity to monitor national occupational and non-occupational injury trends.

Study on trends in occupational and non-occupational injuries in Ontario

An observational study by Chambers *et al.* (2015) compared trends in the incidence of occupational and non-occupational injury in Ontario from 2004 to 2011. The study drew on two population-based sources of injury among Ontario adults: records of emergency department visits obtained from the National Ambulatory Care Reporting System (NACRS), and self-reported injury episodes reported by survey respondents participating in one of five waves of the Canadian Community Health Survey (CCHS), a national cross-sectional health interview survey.

NACRS is a national database maintained by the Canadian Institute for Health Information (CIHI). Since 2000, the Ontario Ministry of Health and Long-Term Care has mandated the submission of records of all emergency department visits to NACRS. In a typical year in Ontario, more than 800,000 emergency department visits for the treatment of injuries experienced by working-age adults are recorded.

The study by Chambers *et al.* obtained extracts of injury-related emergency department records for the period 2004 to 2011. Where emergency department clinical staff determine that an injury occurred at work, the electronic record of the emergency department visit contains a 'responsibility for payment' code indicating the Workplace Safety and Insurance Board (WSIB). The WSIB is the single payer of disability benefits for work-related injury and illness in Ontario, and the clinical determination of work-relatedness is independent of the registration or acceptance of a workers' compensation claim. Of the more than 6.7 million emergency visit records over the eight-year study period, 845,000 were classified as injuries arising at work, and 5,926,000 were classified as injuries arising from non-occupational exposures.

Beginning in 2000, Statistics Canada has administered the Canadian Community Health Survey (CCHS), a cross-sectional survey that collects information from a large representative sample of Canadians on their health status, health behaviours and health-care utilization. The CCHS operates on a two-year collection cycle. CCHS respondents are asked if they have experienced an injury in the past 12 months serious enough to limit their normal activities. Respondents reporting an activity-limiting traumatic injury are asked if the injury occurred in the course of employment and whether they received medical attention for the treatment of the injury. Using the five waves of the CCHS, Chambers *et al.* estimated the incidence of occupational and non-occupational injury requiring medical attention among working-age adults in Ontario.

These two data sources are both population-based and provide information on injuries arising at work and injuries attributed to non-work activities. In addition, the emergency department records contain detailed information on the external cause of injury (for example, whether the injury was due to a motor vehicle collision or a fall). We used the survey data to supplement the information contained in emergency department records, enabling the study to examine the concordance in trends between occupational and non-occupational injury in two independent data sources.

Study results: Strongly diverging trends

The study found strongly diverging trends in the annual incidence of occupational injury and non-occupational injury. In the NACRS emergency department records, the incidence of occupational injury declined by approximately six per cent per year over the period 2004-2011, and by more than 30 per cent over the eight-year observation period. In contrast, the incidence of non-occupational injury did not decline. As a result of these diverging trends, the percentage of all injuries attributed to occupational causes in the emergency department records decreased from 20 per cent in 2004 to 15 per cent in 2011.

The study found similarly diverging trends in the CCHS survey data. The incidence of occupational injury declined by approximately seven per cent per year between 2001 and 2010, while the incidence of non-occupational injury increased by approximately one per cent per year. The percentage of all injuries attributed to occupational causes decreased from 28 per cent in 2001 to 17 per cent in 2010.

Using information on the external cause of injury available in the emergency department records, the study found that the leading causes were similar for occupational and non-occupational injury. The three leading causes of occupational injury were inanimate mechanical forces (52 per cent), falls (16 per cent) and overexertion (14 per cent). In the case of non-occupational injury, the three leading causes were inanimate mechanical forces (29 per cent), falls (23 per cent) and overexertion (nine per cent).

Emergency department records were also used to examine trends in injury incidence across 15 categories of injury causation. For the large majority of causes, the incidence of occupational injury declined much more substantially than the incidence of non-occupational injury. For example, among injuries arising from falls, the annual percentage change for occupational injury was -3.5 per cent, whereas the annual percentage change for non-occupational injury was 0.8 per cent. Among injury arising from inanimate mechanical forces, the annual percentage change for occupational injury was -7.0 per cent, compared to -0.8 per cent for non-occupational injury.

In the case of injuries attributed to motor vehicle collisions, the study observed a similar decline in the annual incidence of occupational injuries (-4.4 per cent per year) and non-occupational injuries (-3.6 per cent per year) presenting to Ontario emergency departments. This parallel reduction in injury burden arising from occupational and non-occupational motor vehicle collisions speaks to the effectiveness of vehicle safety design standards, enforcement and road engineering investments in injury prevention.

When we look for explanations for these diverging trends, it is important to consider the influence of workplace investments and regulatory standards in worker health protection. Employer investments in the protection of the health of their employees in Canada can be substantial, and are supplemented by prevention expenditures provided by regulatory authorities and provincial workers' compensation authorities. In contrast, public health expenditures per capita in Canada are low, and only a small fraction of this investment is directed to provincial or national injury prevention strategies.

The study by Chambers *et al.* demonstrates the important value of two sources of information on the burden of injury among Ontario adults. The two data sources available to this study provide a robust and complementary picture of occupational and non-occupational injury in Ontario. The description of diverging trends in injury incidence raises challenging questions about the adequacy of injury prevention investments in non-work settings.

The surveillance capacity available in Ontario is not, unfortunately, fully available in most Canadian provinces. But it could be. In the remainder of this *Issue Briefing*, we highlight opportunities to strengthen injury surveillance capacity in Canada (including work-related injury), towards the goal of establishing a pan-Canadian resource for monitoring trends in the incidence of injury and for measuring our progress towards a reduction in the social and economic burden of preventable injury.

A route to strengthened injury surveillance capacity in Canada

In public health, the routine collection and analysis of important adverse health outcomes is called 'surveillance'. The objective of surveillance in public health and occupational health is the systematic and ongoing assessment of population health status, based on the timely collection, analysis and dissemination of information on health status and health risks. Optimal characteristics of public health surveillance programs include continuity of measurement over time, consistency of measurement over time, population-based sampling and reliability in the measurement of health status.

How would we assess the current capacity in Canada to monitor and describe the incidence of injury in the Canadian population? Death certificates registered with provincial vital statistics authorities are an accurate source of information on deaths due to unintentional or intentional injury. Unfortunately, electronic records of death certificates do not record information on the occupation of the deceased or indicate whether the death occurred in the course of employment. Hospital discharge abstracts, while they do collect information on the incidence of severe work-related injury requiring hospital admission, do not record information on occupation.

Our capacity in Canada to monitor the incidence of work-related injury and illness has historically relied on administrative records from provincial workers' compensation authorities. In some provincial settings, there are concerns about the reliability of these records as a source of surveillance information on the incidence of work-related injury and illness. These concerns centre on the possibility of under-reporting of certain types of injuries or among particular groups of workers. There are also concerns about some classes of workers (self-employed and independent contractors) who are excluded from insurance coverage (Institute for Work & Health, 2014).

A brief overview of the data sources used by Chambers *et al.* highlights important ways in which the expansion and consistent use of existing information resources could provide improved Canada-wide injury surveillance to support strengthened injury prevention efforts in Canada.

National Ambulatory Care Reporting System

The NACRS information infrastructure was established in 1997 by CIHI (CIHI, 2011). NACRS's reporting standards ensure very high data quality, and the information elements reported to NACRS are compliant with recommendations of the Canadian Emergency Department Information Systems Working Group (Innes *et al.*, 2001). While a small number of health-care facilities voluntarily submit records of emergency department visits to NACRS, only two provinces have mandated the submission of all such emergency department records. Ontario first mandated the reporting of emergency department and urgent-care centre visits to NACRS in 2000, and subsequently the reporting of outpatient clinic visits and day surgeries in 2003 (CIHI, 2011). Alberta mandated the reporting of all ambulatory care data to NACRS in 2010 (CIHI, 2011).

In recent years, CIHI has acknowledged that the information requirements of NACRS has been a barrier to its pan-Canadian adoption for the reporting of emergency department visits. Many provinces have reported to CIHI that they are concerned that the capacity of medical record departments in many acute-care hospitals operating emergency departments may not be sufficient to participate in the NACRS program. To address these concerns, CIHI has implemented a three-level system of data reporting. Levels 1 and 2 accept the submission of more limited information elements than what is required for Level 3 (which is the level of record standard that has been mandated by Ontario and Alberta).

Towards the goal of a pan-Canadian injury surveillance infrastructure, we recommend that provinces mandate the reporting of all emergency department encounters to the Level 1 standard of the CIHI NACRS, with the additional requirement to provide coding of diagnostic fields to describe the nature of the illness or injury requiring medical attention (i.e. using ICD10 coding). An alternative strategy would have provinces adopt a mandate to submit emergency department records to the Level 3 standard specifically for those encounters associated with the treatment of intentional or unintentional injury (i.e. ICD10 S or T).

Canadian Community Health Survey (CCHS)

The CCHS, first administered in 2000, operates on a two-year collection cycle and interviews a large, representative sample drawn from all Canadian provinces (Statistics Canada, 2013). The CCHS survey instrument has approximately 100 content 'modules' that obtain information from respondents on specific dimensions of their health status, health behaviours and use of health-care services.

Some of the modules are defined as 'core' content and are administered to all respondents in all CCHS survey waves. Examples of core content include self-reported physical activity, smoking and the use of health-care services in the previous 12 months. Other modules are defined as 'optional' content, and may be included in the CCHS survey at the request of a provincial ministry of health. So, for example, the province of Ontario has consistently included optional content concerning the use of smoking cessation aids by residents of the province of Ontario, while the province of British Columbia has not requested the collection of this information from residents of British Columbia.

A subset of 'core' content modules are termed 'theme' content. Theme content is administered at intervals greater than every two years. The injury module was defined as core content in the first three waves of the CCHS (2001, 2003 and 2005) and, as a result, was administered to representative

samples of all Canadian provinces and territories at two-year intervals. Subsequently, the injury module has been administered as 'theme' content, and the administration interval has been increased from every two years to every four years.

While it is necessary for Statistics Canada to be vigilant in limiting the respondent burden among Canadians participating in the Canadian Community Health Survey, the justification for reducing the frequency with which we can describe the frequency and nature of injuries experienced by Canadians seems ill-advised. In the absence of a pan-Canadian commitment to adopt the NACRS standard for the reporting of emergency department visits, the CCHS is the only surveillance capacity available in Canada to provide timely information on the burden of injury.

Next steps for improved injury surveillance and reporting

Gaps in national population coverage in information systems documenting the use of emergency department services has been identified as a weakness in Canada's health-care system (Kennedy *et al.*, 2008). Over the past 15 years, investments in the Canadian Community Health Survey and in the National Ambulatory Care Reporting System have laid a foundation for important progress in addressing these gaps.

It is an attainable goal to establish comprehensive pan-Canadian capacity to monitor the burden of injury in Canada. Systematic surveillance of injury caused by both occupational and non-occupational exposures is vital to understand the frequency and causes of injury in the Canadian population. Better understanding of injury trends would improve the planning and delivery of health-care services and inform the development of evidence-based approaches to injury prevention in the workplace and at home.

To reach this goal of a comprehensive pan-Canadian injury surveillance capacity, we look to the following bodies to lead the way forward:

1. We look to the Canadian Institute for Health Information for continued leadership in identifying innovative approaches to increasing the adoption of the NACRS standard. To improve monitoring of the population burden of ill health attributed to injury, all provinces and territories should consider joining Ontario and Alberta in mandating the reporting of emergency department visits to NACRS.
2. We look to provincial ministries of health to provide consistent direction to Statistics Canada concerning the priority to be given to the regular administration of the CCHS injury module on a two-year cycle.
3. We look to provincial chief medical officers of health to provide committed stewardship of the attainable goal of strengthening pan-Canadian injury surveillance capacity.

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