Scand J Work Environ Health 2005;31(5):401-403

<https://doi.org/10.5271/sjweh.924>

Issue date: Oct 2005

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Key terms: [injury prevention](#); [opinion](#); [research collaboration](#); [work](#); [workplace](#)

This article in PubMed: www.ncbi.nlm.nih.gov/pubmed/16273967

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Opportunities and challenges for collaboration in research and practice in injury prevention across work and other settings

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Breslin FC, Shannon H. Opportunities and challenges for collaboration in research and practice in injury prevention across work and other settings. *Scand J Work Environ Health* 2005;31(5):401–403.

Even though injuries at work and in other settings (homes, roads, etc) commonly involve similar mechanisms, research and prevention are usually specific to each setting. The potential benefits of addressing common features of injury prevention are noted across setting, while some unique features of the work environment are acknowledged. Further integration is recommended using the following approaches: (i) organization of research questions by injury mechanisms and (ii) support of comparative research across settings by funding agencies.

Key terms workplace.

Despite important similarities across injury settings, research on and prevention for occupational injuries are typically considered separately from other injury problems (1–3). In this commentary, we review the similarities between work and nonwork settings. We argue for more integration across the settings while noting the differences that pose challenges to such integration.

Similarities across injury settings

Many work and nonwork injuries involve similar mechanisms (2). For example, workers' compensation and emergency department records indicate that a substantial proportion of the events leading to compensable work injuries, such as falls and contact with objects or equipment, also occur in homes, schools, and recreational settings (4, 5).

Complementing these epidemiologic similarities across settings are overlaps in conceptual frameworks. In both work and nonwork settings, public health frameworks hold that injuries result from a complex interplay of physical, psychosocial, economic, and societal factors (6–12). Psychosocial concepts from these frameworks, such as risk perception and perceived social norms, are used to explain the variation in preventive behavior (13), although such behavior takes a different form across injury settings.

With regard to practice, the Haddon matrix (10), with its emphasis on countermeasures before, during,

and after the injury event, has been applied in many injury settings for several decades. Similarly the “three E’s” of injury prevention—engineering, education, and enforcement—are as fundamental to workplace safety as to other settings. As a consequence of the similar multifactorial concept of injury risk, discussions about whether behavioral change is more useful than instituting passive measures to prevent injury (ie, engineering that ameliorates a hazard) also occur in most, if not all, injury prevention areas (14).

Differences across injury settings

Despite important similarities across injury settings, the following three aspects of the workplace differentiate it from other injury settings in ways that may limit the integration of prevention efforts: (i) the fast-changing nature of work, (ii) the large scale of production in many workplaces, and (iii) the other desired outcomes being balanced against safety.

Even though nonwork settings and associated hazards are not static, changes in the workplace continue to occur rapidly. Over the next 20 years, technological progress in areas such as information and automation technologies are expected to change production processes, job activities, and even locations of work (3, 15). Changes in the nature of work over the last few decades have already led to a decline in acute traumatic injuries and an increase in musculoskeletal injuries (eg,

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overexertion, sprains, and strains) (16, 17). In 2003, 45% of claims for wage replacement (lost-time claims) among Canadian workers were due to overexertion, while only one in five were due to falls (18).

As the occupational injury burden has shifted towards musculoskeletal problems with a more chronic course, acute traumatic injuries remain the major problem in nonwork settings. Canadian hospital data suggest that falls are the most common cause of unintentional injuries, accounting for about 46% of injuries requiring hospitalization [Health Canada. Canadian injury data; mortality—1997 and hospitalizations—1996–97. Ottawa (ON): Health Canada; 1999. Available at: <http://www.hc-sc.gc.ca/hpb/lcdc/brch/injury/cid98/indexe.html>]. These differences between work and nonwork injuries do not preclude the integration of injury prevention efforts across settings. However, they do limit common ground and reduce incentives for combined research and intervention. In addition, the rapid pace of change at work may increase the need for time-dependent and flexible injury prevention strategies in the workplace when it is compared with other settings.

Work settings, especially medium-to-large firms, can also be distinguished from nonwork settings such as the home by their larger economies of scale. For example, personal protective equipment used to reduce lacerations in meatpacking plants is rarely if ever worn in home kitchens.

Finally, the desired outcomes aside from injury prevention differ between work and nonwork settings. For workplaces in developed countries, occupational health and safety regulations specify the roles that government, employers, and employees and employee groups play in preventing injuries. The employer's perspective is critical because the financial costs of safety measures are typically borne by the employer, and costs associated with safety improvements may compete with other desired outcomes, such as productivity and cost efficiency (8, 19). Because employers incur various costs from work injuries (eg, high insurance premiums, lost productivity), one might expect the situation to provide sufficient motivation for all employers to improve work safety. However, workers' lack of information on health and safety risks, employers' incomplete knowledge of the full costs of work injuries, and unequal bargaining power between workers and employers may allow firms to avoid some of the costs of work injuries (20–22). To the degree that firms avoid the costs of injury, they are more likely to underinvest in prevention. This underinvestment in work safety can result in these costs being borne largely by workers, their families, and society at large.

For nonwork settings, there is a wider range of concerned parties, including governments, community groups, families, teachers, product manufacturers, po-

lice departments, and coaches or referees. Like employers, when governments or communities choose to enact policies affecting public safety, they face making trade-offs between safety and other public services or needs (eg, more public libraries versus safer playgrounds), but the incentives for improving safety may be more diffused among stakeholders. Similarly, home safety measures may compete with the practical and recreational needs of household members (eg, replacing floors to prevent slips and trips versus spending the money on a family trip). Taken together, the differences in incentives and disincentives for prioritizing safety in each setting may mean that interventions need to be substantially tailored to meet the needs of relevant parties.

Integrating work and nonwork injury research

Despite the differences we have noted, the similarities suggest that there is a clear potential for collaborative research. Funding agencies have an important role in fostering injury research encompassing both work and nonwork settings by supporting research on injury mechanisms and the social context of injury prevention. The overlap in mechanisms of injury across settings suggests that organizing research questions by injury mechanism may be a useful initial step. Such a framing would lead to such questions as how the role of footwear and contaminated walkways differs across settings. In addition, funding for comparative research across settings on social or economic relations would help us understand, for example, how the context influences how safety is prioritized relative to other desirable outcomes.

The mandate of some injury prevention research centers already includes occupational health services (23) and therefore may increase the opportunities for this kind of cross-setting research. Another model is that of Sweden, which has recently established the Swedish Centre for Lessons Learned from Incidents and Accidents, specifically aiming to improve safety through cross-setting research [Swedish Rescue Services Agency. NCO—Swedish Centre for lessons learned from incidents and accidents. Stockholm: Swedish Rescue Services Agency, 2005. Available at: http://www.srv.se/templates/SRV_Page____2195.aspx]. In Canada, a vision of establishing research centers has recently been proposed and provides an opportunity to address explicitly this issue of how best to pursue cross-setting injury research [National Scientific Advisory Committee. Listening for direction on injury: identifying priorities for research and capacity development in injury as a multi-institute strategic initiative within the Canadian institutes of health research. Canadian Injury Prevention Strategy; 2004. Available at: http://www.injurypreventionstrategy.ca/downloads/LFDI_FinalReport-Summary.pdf, 1–29.]. Additional discussions need to take place if conceptual

models and research questions are to be developed that span these injury prevention areas.

The potential benefits are clear. Better linkage between researchers and practitioners across settings should provide the opportunity to benefit from different competencies in each setting. Specialization can provide a focus on unique issues in each setting, but it should not limit our ability to see the larger context and enhance intervention effectiveness by addressing the common features of injury prevention.

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