

Utilizing Workers' Compensation Data to Evaluate Interventions and Develop Business Cases ¹

James W. Collins, PhD, MSME, Jennifer L. Bell, PhD
National Institute for Occupational Safety and Health

Introduction

Workers' compensation statutes have been enacted in all 50 United States and Washington D.C. to provide compensation for injured employees to pay for lost wages, medical costs, and rehabilitation for persons who become ill or injured as a result of their employment. Data collected through the workers' compensation process are not only used to manage work-related injury claims, but are also used in aggregate with other data to develop prevention strategies and to manage work disability. This paper describes two NIOSH studies that used workers' compensation data to: 1) conduct descriptive epidemiologic analyses to characterize the injury problem, 2) benchmark baseline injury rates, 3) develop injury prevention strategies, 4) evaluate the effectiveness of prevention strategies in rigorous intervention trials, 5) develop a business case based on the economics of the injury problem and the intervention, 6) contribute to the evidence-base of science supporting interventions addressing the leading causes of workers' compensation in the Health Care Industry, and, 7) market the research findings to key opinion leaders, policy makers, educators and practitioners to gain support for implementation of "best practices", curriculum development, standards development and legislative initiatives to stimulate industry wide implementation of the prevention programs (Collins, Bell & Grönqvist 2010).

Methods

This paper summarizes two intervention trial studies in health care workers (Collins et al., 2004; Bell et al., 2008). The first study was a nine-year intervention trial that evaluated a

"best practices" safe patient handling injury prevention program in a dynamic cohort of nursing personnel (Collins et al., 2004). The intervention was implemented in six nursing homes. Injury rates, costs, and lost and restricted workdays were compared for the three-year pre-intervention period (1995-1997) and the six-year post-intervention period (1998-2003).

In the second study, a multidisciplinary research team (Bell et al., 2008) designed, implemented, and evaluated a comprehensive "best practices" STF prevention program in three hospitals based on the findings from an analysis of historical worker injury data, hazard assessments, and laboratory studies. The field study, conducted in conjunction with a hospital corporation, examined the injury experience of a cohort of approximately 17,000 hospital staff for a 10-year period from 1996-2005.

Both studies were pre-post long-term intervention trials that evaluated "best practices" injury prevention programs in large cohorts of health care workers to identify ways to effectively reduce exposures, identify "best practices," and to evaluate intervention effectiveness in real world settings. The initial analysis of workers' compensation injury claims data was conducted for each study to examine the injury problem. Narrative information from the injury report was used to code the injuries and identify injury events that could be targeted for intervention.

As a precursor to the two field studies described in this paper, laboratory studies were

¹The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health

conducted to examine: 1) reductions in the physical exposures associated with proposed patient lifting interventions (Zhuang et al., 1999; Zhuang et al., 2000) and, 2) the friction characteristics of promising slip-resistant shoes and hospital flooring surfaces when dry and contaminated with water, oil, and cleaning solutions (Collins, Bell, and Grönqvist 2010).

Results

This paper describes the process of how workers' compensation data were used to conduct comprehensive multi-disciplinary research studies addressing the leading causes of workers' compensation claims among health care workers. In the SPH nursing home study, there was a 61% reduction in the workers' compensation claims rate (adjusted rate ratio (0.39, 95% CI: 0.29-0.55) and a 66% reduction in the lost workday injury rate (rate ratio=0.34, 95% CI: 0.20-0.60) for musculoskeletal injuries associated with resident handling after the intervention was introduced. A business case for safe patient handling programs was developed by determining that the initial investment (\$158,566) for lifting equipment and worker training was recovered in less than three years based on post-intervention annual savings (\$55,000) in direct medical and indemnity workers' compensation costs. Because, this health care system was self-insured, workers' compensation savings were realized immediately. In the hospital STF study, the STF workers' compensation claims rate declined by 59% (adjusted rate ratio (0.41, 95% CI: 0.33-0.54; 1.66 claims per 100 FTE to 0.76 claims per 100 workers per year). Due to the need for brevity in this paper and the extensive findings from these two research studies, readers are referred to the main papers resulting from these studies (Collins et al., 2004; Bell et al., 2008; Collins, Bell, & Grönqvist, 2010) for additional details. Study findings were also incorporated into user-friendly documents designed to facilitate implementation of safety measures in the workforce (Collins et al. 2006, Bell et al. 2010).

Strengths and Limitations of Using Workers' Compensation Data in Research Studies

There are at least two strengths inherent to the use of workers' compensation data. The first is the minimal cost to obtain workers' compensation data. Because workers' compensation records are routinely collected for purposes other than research, the cost of obtaining workers' compensation data is not expensive. Second, is the ability to examine the economic factors associated with the intervention. When the cost to implement the intervention can be shown to be less than the savings in reduced medical and indemnity expenses, those who make decisions about funding prevention programs can more easily justify allocating resources to make changes.

As a research tool, workers' compensation data are not without limitations. The narrative text describing the injury causing event can lack important specificity about the circumstances of an event. In the two NIOSH studies, the narrative text from other injury data systems (first reports of injury, occupational health nurse logs, and OSHA logs) was used to provide additional information on the nature of the injury and circumstances of the incident. Another potential limitation to using workers' compensation data is underreporting; we don't know if everyone who was injured at work filed a workers' compensation claim. People who were injured at work but treated outside the system would be missed.

A limitation in the approach used to create the business case in the safe resident lifting study was that the business case did not consider indirect costs and was based on direct costs only and did not attempt to estimate indirect costs. The reductions in direct costs were so substantial that the original capital expenses to purchase mechanical lifting equipment and provide worker training were recovered in slightly less than three years. The return on investment would have been shorter if savings in indirect costs were considered (for example, lost wages, cost of hiring and training replacement workers, etc.).

Discussion

Although workers' compensation systems are not designed for primary prevention, these two studies demonstrate how workers' compensation data can be utilized to identify significant worker injury problems and to design, implement and evaluate "best practice" injury prevention programs. The analysis of the workers' compensation data also informed our decisions about what interventions to implement, in what populations, and how they should be implemented.

Intervention effectiveness studies often report outcomes measures such as rate ratios, confidence intervals, p-values, and statistical significance to make inferences about the impact of interventions on injury rates. A background in statistics is generally required for meaningful interpretations of these outcome measures. One of the distinct advantages of using the cost data that can be obtained from workers' compensation records is the ability to report on the cost implications of the intervention. The direct costs associated with return on investment and business case findings based on intervention costs balanced with medical and indemnity expenses can be readily interpreted by most people. Pre- and post-intervention medical and indemnity expenses can be compared to estimated savings in direct costs attributed to the intervention. This information can be used to develop business cases that have meaning to those who are making decisions about which prevention programs their company should invest. Corporate leadership has an interest in protecting workers, but when a business case can be presented to management that demonstrates a prevention program significantly reduced worker injuries and also paid for itself, this sends a powerful message that is likely to lead to replication of the prevention program in other settings.

The objective of this paper was to describe the use of workers' compensation data as part of two intervention trials that provided practical information for owners of healthcare facilities, administrators, nurse managers, and safety

and health professionals who are interested in replicating these types of programs in their facilities. The research demonstrated that "best practices" safe patient lifting and slip, trip, and fall prevention programs decrease caregiver injuries, lost workdays, and workers' compensation costs and improves employee recruitment and retention, employee morale, and quality of care for residents (Collins et al., 2004; Nelson et. al., 2008; Bell et al., 2008). Using workers' compensation data as part of a comprehensive evaluation of prevention programs makes good business sense and can help inform decisions about reducing worker risk. The hospital corporation participating in this research was self-insured so the cost of insurance premiums was a not an issue in these studies: if an injury was prevented, savings in workers' compensation costs were realized immediately. It is hoped that the evidence-base of science demonstrating the effectiveness of STF and patient lifting prevention programs will facilitate widespread replication of these types of programs in other healthcare facilities, leading ultimately to national declines in the leading causes of work-related injuries among health care workers.

References

- Bell JL, Collins JW, Dalsey E, Sublet V (2010). Slip, Trip, and Fall Prevention for Healthcare Workers. DHHS (NIOSH) Publication No. 2011-123. <http://www.cdc.gov/niosh/docs/2011-123/pdfs/2011-123.pdf>
- Bell JL, Collins JW, Wolf L, Grönqvist RA, Chiou S, Chang W-R, Sorock GS, Courtney TK, Lombardi DA, Evanoff B (2008). Evaluation of a Comprehensive Slip, Trip, and Fall Prevention Programme for Hospital Employees. *Ergonomics* 51(12):1906-1925.
- Bureau of Labor Statistics (BLS). 2011. Table R8. Incidence rates for nonfatal occupational injuries and illnesses involving days away from work per 10,000 full-time workers by industry and selected events or exposures leading to injury or illness, 2010.

Bureau of Labor Statistics, U.S. Department of Labor, Washington, DC. Survey of Occupational Injuries and Illnesses in cooperation with participating State agencies. Accessed October 2, 2012 at: www.bls.gov/iif/oshwc/osh/case/ostb2832.txt

Collins JW, Nelson A, Sublet V (2006). Safe Lifting and Movement of Nursing Home Residents. DHHS (NIOSH) Publication No. 2006-117. <http://www.cdc.gov/niosh/docs/2006-117/>

Collins JW, Bell, JL, and Grönqvist, R (2010). Developing Evidence-Based Interventions to Address the Leading Causes of Workers' Compensation Among Healthcare Workers. *Rehabilitation Nursing*, 225-235.

Collins, JW and Bell, JL (2010). Translating Injury Prevention Research into Workplace Practice. Conference Proceedings, Keynote address for the 46th Annual Conference for the Australian Human Factors and Ergonomics Society, pp. 1-10.

Collins JW, Wolf LD, Bell J and Evanoff, B. (2004). An Evaluation of a "Best Practices" Back Injury Prevention Program in Nursing Homes. *Injury Prevention*, 10;206-211.

Nelson A, Collins JW, Siddharthan K, Matz M, Waters T (2008). Link Between Safe Patient Handling and Patient Outcomes in Long-Term Care. *Rehabilitation Nursing*, 33, 1;33-43.

Zhuang Z, Stobbe TJ, Collins JW, and Hsiao H. "Psychophysical Evaluation of Assistive Devices for Transferring Residents." *Applied Ergonomics*, 31 (2000) 35-44.

Zhuang Z, Stobbe TJ, Hsiao H, and Collins JW. "Biomechanical Evaluation of Assistive Devices for Transferring Residents." *Applied Ergonomics*, 30 (1999) 285-294.

Use of Workers' Compensation Data for Occupational Safety and Health: Proceedings from June 2012 Workshop

Department of Health and Human Services
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health



Use of Workers' Compensation Data for Occupational Safety and Health: Proceedings from June 2012 Workshop

David F. Utterback and Teresa M. Schnorr, Editors

Department of Health and Human Services
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

May 2013