Journal of Safety Research xxx (2018) xxx–xxx

Contents lists available at ScienceDirect

Journal of Safety Research

journal homepage: www.elsevier.com/locate/jsr

Characteristics of construction firms at risk for future workers' compensation claims using administrative data systems, Washington State

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ARTICLE INFO

Article history:
Received 28 June 2017
Received in revised form 19 December 2017
Accepted 26 February 2018
Available online xxxx

Keywords:
Construction firms
Workers' compensation
Work-related injury

ABSTRACT

Objectives: Construction is a high-hazard work, and continually ranks among the industries with the highest workers' compensation (WC) claim rates in Washington State (WA). However, not all construction firms are at equal risk. We tested the ability to identify those construction firms most at risk for future claims using only administrative WC and unemployment insurance data. *Methods:* We collected information on construction firms with 10–50 average full time equivalent (FTE) employees from the WA unemployment insurance and WC data systems (n = 1228). Negative binomial regression was used to test the ability of firm characteristics measured during 2011–2013 to predict time-loss claim rates in the following year, 2014. *Results:* Claim rates in 2014 varied by construction industry groups, ranging from 0.7 (Land Subdivision) to 4.6 (Foundation, Structure, and Building Construction) claims per 100 FTE. Construction firms with higher average WC premium rates, a history of WC claims, increasing number of quarterly FTE, and lower average wage rates during 2011–2013 were predicted to have higher WC claim rates in 2014. *Conclusions:* We demonstrate the ability to leverage administrative data to identify construction firms predicted to have future WC claims. This study identified characteristics that may be used to further refine targeted outreach and prevention to construction firms at risk. This study should be repeated to determine if these results are applicable to other high-hazard industries.

1. Introduction

Extensive work has been done to characterize occupational injury and illness risk by industry and occupation. This has allowed for a foundational understanding of the types of work that put workers at risk, and provides rationale for why specific industries and occupations have higher injury rates than others. For example, firms within construction continually rank among the highest private industry sectors for non-fatal injuries and illnesses (Bonauto et al., 2006; Bureau of Labor Statistics, 2014, 2015, 2016; Wurzelbacher, Al-Tarawneh, Meyers, Bushnell, et al., 2016). Differences in type of work do not, however, explain all of the risk workers face. Research has found substantial variation in injury rates among firms within the same industry, where workers are performing similar tasks (Rosenman, Kalush, & Reilly, 2007; Shannon & Vidmar, 2004).

Recent research has begun to describe the factors beyond work tasks that significantly influence occupation injury and illness risk. Younger and less experienced workers are at increased risk for injuries at work, as well as workers not provided with adequate training (Bena et al., 2013; Breslin & Smith, 2006; Holcroft & Punnett, 2009; Lay et al., 2016; Shannon, Robson, & Sale, 2001). Research has also revealed important relationships between safety and psychosocial factors at work such as, work–family interference, perception of job insecurity, high turnover, organizational culture around occupational safety and health or safety climate, and lack of control over work pace (Holcroft & Punnett, 2009; LaMontagne et al., 2012; Probst & Brubaker, 2001; Shannon et al., 2001; Smith & DeJoy, 2012). These risk factors may in part explain the variation of injury and illness rates observed among firms involved in similar work.

Though there is evidence that occupational injury risk is influenced by factors beyond tasks performed by the firm, prevention and enforcement resources are largely apportioned based on hazard associated with type of work being performed and past injury experience. These resources are limited, and their full utilization requires effective allocation. Therefore, we aim to leverage administrative data to distinguish level of risk among firms within a similar industry. Firm's characteristics found to portend future workers' compensation (WC) claims could then be used to concentrate outreach and regulatory activities where they are needed most.

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https://doi.org/10.1016/j.jsr.2018.02.005
0022-4375/

2. Methods

2.1. Data sources

Washington (WA) WC and unemployment insurance (UI) data were used for all analyses here. A detailed description of the WA WC system and the linkage process to the UI data has been previously published (Wuellner, Adams, & Bonauto, 2016). WA UI data were only available from 1994 and later, limitations noted below.

2.2. Sample

All accounts classified as firms in the construction sector using the North American Industry Classification System (NAICS) with an average of 10–50 Full Time Equivalent (FTE) employees (1 FTE = 2,000 annual hours) during the baseline period, 2011–2013, were considered for inclusion in the sample (see Fig. 1). Eligible firms identified in the UI data were linked to the workers' compensation data as described previously (Wuellner et al., 2016), and those that aligned in both systems were included for analysis (n = 1228). Construction firms were selected for the current study because they perform hazardous work, and consistently have relatively high claims rates. Additionally, firms with 10–50 FTE were the focus of this initial study because they represent a large number of somewhat homogenous firms—being large enough so that claims aren't rare events, but generally small enough so that they typically don't have the same institutionalized safety procedures and dedicated safety staff that are common among large employers. Firms were excluded if they did not report hours during all quarters of the baseline period.

2.3. Workers' compensation claims

All claims used in this study were claims for which both medical and indemnity (non-medical) costs — including time-loss compensation, permanent disability awards, survivors' benefits, funeral expenses, and/or pension benefits — were paid. To qualify for time-loss compensation in WA, the injured worker must have been medically certified as unable to perform normal work duties beyond a three calendar day waiting period not including the day of injury.

2.4. Firm characteristics

Information was gathered on firm-level characteristics during the baseline period, 2011–2013, to determine their utility in predicting the firms' 2014 claim rates using a retrospective cohort design. See Table 1 for descriptions of these characteristics measured during the baseline period. These indicators were chosen to test hypotheses based on previous studies' findings (Bena et al., 2013; Breslin & Smith, 2006; Holcroft & Punnett, 2009; McCaughey, McGhan, Kim, & Brannon, 2012; Ruseckaite & Collie, 2011; Smith & DeJoy, 2012) and institutional knowledge of risk factors. The tested indicators were limited to those available in the administrative data systems. Continuous indicators were grouped into categories to describe the distribution of firms, but were kept as continuous predictors in all regression modeling.

Geographic location of firms was used as a proxy for where the firm hires and where the employees reside, though is not necessarily a good indicator of where the firm's work is actually performed, given the transient nature of construction work. The association of location of firm in county with high unemployment rate and future claim rate was investigated to test the hypothesis that workers with less economic mobility or employment options are at risk for injury.

Work-related musculoskeletal disorders (WMSDs) were also considered for this study. WMSDs affect the soft tissues of the body and arise from chronic exposures such as awkward postures, performing repetitive forceful tasks, heavy physical work and lifting, and vibration (da Costa & Vieira, 2010; National Institute for Occupational Safety and Health (NIOSH), 1997). We hypothesized that WMSD exposures may be more prevalent within a firm, affecting more workers, and

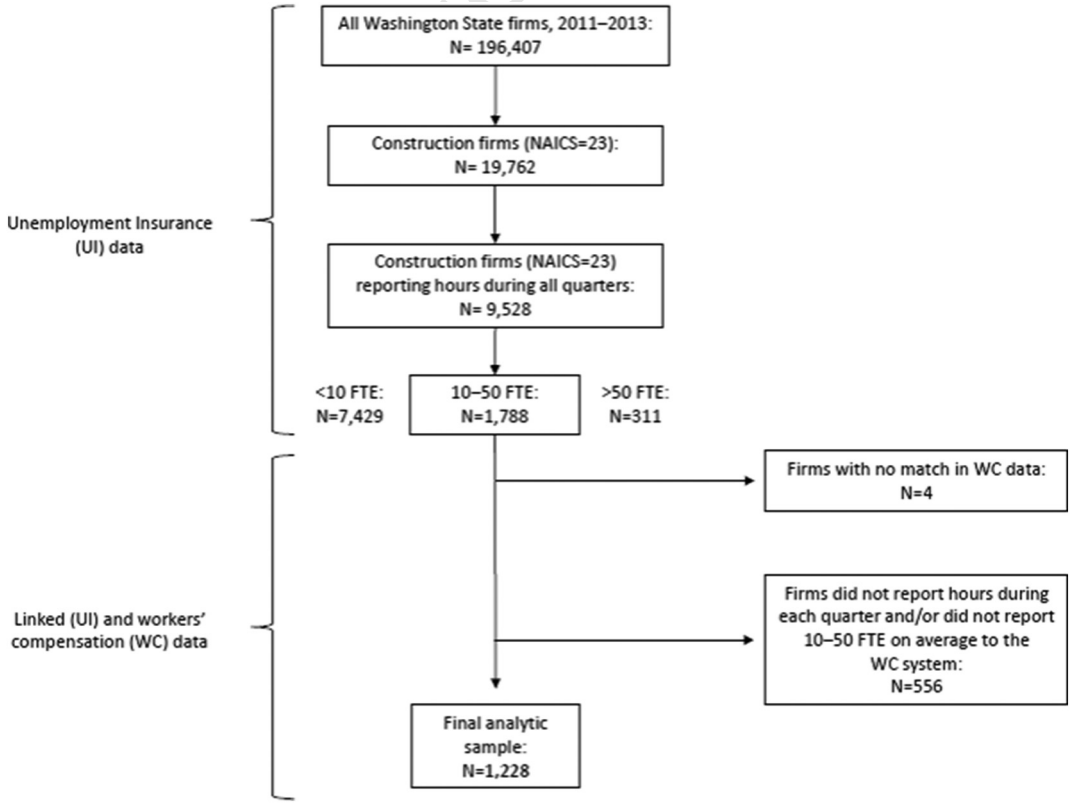

Fig. 1. Sample inclusion and exclusion criteria.