D2.3

Title: Testing the Associations Between Leading and Lagging Indicators in a Contractor Safety Pre-Qualification Database

Authors: Jack Dennerlein, Justin Manjourides

Background: Many available tools for assessing and prequalifying construction subcontractors based on safety management procedures and performance rely on lagging indicators such as injury rates. Recent prequalification tools include leading safety indicators that are predictive antecedents to accidents and injuries, such as organizational safety management systems. Our goal was to determine the associations between leading and lagging indicators collected in a subcontractor pre-qualification assessment procedure that includes both leading indicators related to company-level safety policies and programs and lagging indicators related to company-level injury rates.

Methods: Data in this study were extracted from the ConstructSecure, Inc (Marlborough, Massachusetts) contractor safety assessment program of self-reported and validated company-level safety data. These surveys include measures of organizational systems of safety including Safety Management System; Safety Programs; Potential Hazards; Special Elements related to drug and alcohol programs; Non-drug and alcohol related Special Elements. Lagging injury indicators include all recordable injury cases (RC) and injuries involving days away, restricted, or transfer (DART). Companies also reported number of hours worked and number of employees. To examine associations between leading and lagging indicators of safety we fit Zero-Inflated Poisson models (due to a large number of companies reporting no injuries) to predict the company specific rates of DART or RC rates (DART per 100 Full-time Equivalents (FTEs), RC/100FTEs).

Results: In total, 2148 companies had up-to-date and complete data and reported greater than 10 FTE employees. Companies reported an average safety management score of 14.2 (Standard deviation (SD)=3.0), 4.6 hazards (SD=4.0), and 14.3 safety programs (SD=2.4). Companies also reported an average of three drug and alcohol screen programs (SD=1.2) and 1.1 additional safety special elements (SD=0.9). While over 75% of companies reported zero OSHA citations over the past 3 years, the average number of citations equaled 0.4 (SD=0.9). The average DART rate among companies was 3.0 per 100 FTEs (SD=4.4), with 914 companies reporting 0 DART events. The average recordable case rate was 1.8 per 100 FTEs (SD=2.9), with 701 companies reporting 0 recordable cases. Crude ZIP models showed consistent statistically significant associations between Safety Management Systems (SMS) and Drug and Alcohol Special Elements (SE.D) and both RC and DART rates. Each one-point increase in a company's SMS score, was significantly associated with a 34% reduction in the odds of a recordable case event occurring (Odds ratio (OR): 0.66, 95% Confidence Interval (CI): (0.57, 0.79)), and a 9% reduction in the rate of recordable cases, if one does occur (Risk Ratio (RR): 0.91, 95% CI: (0.88, 0.94)). Similarly, each one-point increase in SMS score was significantly associated with a 28% reduction in the odds of DART incident (OR=0.72, 95%CI (0.56, 0.91)), and a 9% reduction in DART rate, if one does occur (RR=0.91, 95%CI (0.87, 0.95)). Associations in models that were fully adjusted for all leading safety indicators were generally consistent to those from crude models.

Discussion: Through this cross-sectional analysis, we have identified several organizational leading safety indicators that are associated with safety performance in the construction industry. More safety management systems were inversely associated with RC and DART rates, and companies with higher SMS scores were more likely to report no incidents. Similarly, the inclusion of drug and alcohol policy elements was associated with improved recordable case and DART rates. The associations documented here support the need for the implementation of safety management systems across the board in contractors small to large.

D2.4

Title: Preventable: Social Marketing to Reduce Preventable Injuries

Authors: Ian Pike, Jennifer Smith, Kevin Lafreniere

Background: The objective was to determine the efficacy of the Preventable social marketing campaign (www.preventable.ca) to raise awareness, change attitudes and behaviours to reduce the number and severity of injuries among workers aged 25–54 in British Columbia, Canada.

Methods: A multi-year, multi-faceted social marketing campaign, utilising TV, radio, print, signage, guerrilla events and social media launched in June, 2009, fol-

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