
D3.4

Title: Explaining State-Level Variations in Construction Fatality Rates

Authors: [John Mendeloff](#), [Wayne Gray](#)

Background: Recent studies have shown two-fold and greater long-term differences in fatality rates in the construction sector across states in the United States. Differences this large deserve to be studied to see whether they arise from factors that can be affected by public and private policy choices. We focus on states as the unit of analysis because several public policies that may affect fatalities are determined at the state level. These include workers' compensation (WC) programs and the enforcement of occupational safety and health standards (for the 21 states that operate their own enforcement program in the private sector). We focus on fatalities because states appear to vary considerably in their underreporting of non-fatal injuries. We focus on construction because of the sector's contribution to overall occupational deaths in the economy as a whole and the persistence of high rates of fatalities in the industry relative to other industries. The relatively high number of fatalities in construction also allows statistical identification of correlates with fatalities given the stochastic nature of fatal occupational injuries.

Methods: The fatality data we use come from the Census of Fatal Occupational Injuries (CFOI), a data set collected by the U.S. Bureau of Labor Statistics since 1992. To obtain state identifiers, we carried out the work at the BLS Headquarters. We examine deaths through 2014 and exclude deaths due to either highway accidents or violence because these are less likely to involve traditional construction safety issues. Because of limitations on the use of data when there were fewer than 3 deaths in a state/ year, our analysis looks at 32 states for 23 years. The policy variables we look at include the frequency of inspections and the size of penalties and the magnitude of workers' compensation costs. We also consider a set of control variables.

Results/Discussion: An increase from the sample mean of 6 inspections per hundred construction establishments to 9 inspections is associated with a reduction in the fatality rate of about 0.6 per 100,000, about 5%. In 2013 and 2014 inspection rates varied from only 2% in Florida to 16% in Minnesota. The other significant policy variable was the length of the waiting period before a

worker could receive indemnity benefits. Those with 7-day waiting periods had substantially higher fatality rates than states with 3-day waiting periods. However, this variable is clearly capturing other features that we need to examine further.

Session D4

Title: Shift Work and Injury

Moderator: [John Violanti](#)

D4.1

Title: Association Between Hour of Work and Injury Occurrence and Severity in the Oregon Construction Industry: Analysis of Workers' Compensation Disabling Claims, 2007-2013

Authors: [Liu Yang](#), [Adam Branscum](#), [Ellen Smit](#), [David Dreher](#), [Karen Howard](#), [Laurel Kincl](#)

Background: Despite ample research on extended shiftwork and working overtime, studies on the hourly trend of work-related injuries and illnesses have been limited, especially for workers in the construction industry. This study was to determine the distribution of work-related injuries and illnesses by hour of work and estimate the association between hour of work and injury severity among Oregon construction workers using workers' compensation data.

Methods: De-identified Oregon workers' compensation accepted disabling claims data in the construction industry from 2007 to 2013 were analyzed. A new variable, hour of work, was created by calculating the difference between two existing variables in the dataset: time the claimant started the shift on date of injury and time the injury occurred. Cases with more than 12 for the hour of work were excluded from analyses to reduce misclassifications. Numbers of claims in each hour of work were tabulated to determine the frequency distribution. Linear regression models were used to examine the association between hour of work and injury severity (measured as medical cost, log-transformed in the models), adjusted for age, gender, construction sector, occupation, weekly wage, and injury nature. Medical cost and weekly wage were standardized to the 2013 US dollar in these analyses. Construction sector, occupation, and injury nature was coded using standard codes, including NAICS, SOC, and OIICS (v1.01).

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