Research Synthesis: Evidence on the Effects of OSHA Activities
Appendix A: Classification of studies

The Department of Labor's Clearinghouse for Labor Evaluation and Research (CLEAR) conducted a systematic review of studies examining the causal effect of Occupational Safety & Health Administration (OSHA) enforcement activities. CLEAR reviewers evaluated 27 studies designed to estimate the causal impact of OSHA activities on injury rates and other outcomes. Both the quality of the causal evidence presented in the paper and the applicability of the paper to current OSHA decision making (current relevance) were systematically assessed. Note that a study's causal evidence and current relevance are two separate dimensions and are not related.

The causal evidence classifications indicate our level of confidence that the effects estimated in the study were caused by OSHA inspections and not some other factor, as follows:

- *High Causal Evidence.* This means we are confident that the study estimated the causal effect of OSHA inspections. This rating is given only to well-conducted randomized controlled trials (RCTs).
- *Moderate Causal Evidence.* This means we have some confidence that the effects estimated in the study are attributable at least in part to OSHA inspections. However, other factors not accounted for in the study could have contributed to the estimated effects. Designs that could receive this rating include well-implemented nonexperimental designs and RCTs with high attrition that demonstrate comparability of the treatment and control groups.
- *Low Causal Evidence.* This means we are not confident that the effects estimated in the study reflect the causal effect of OSHA inspections. Designs that do not receive a high or moderate causal evidence rating receive this rating.

The current relevance assessment indicates the level of relevance of the study findings to the current policy environment. OSHA's priorities and activities have changed over time, and studies using more recent data are thus more relevant. In addition, studies conducted on broader samples and with a replicable intervention are likely more applicable than those that focused on a narrow study population or a less clearly defined intervention. The levels are as follows:

- *Strong Current Relevance.* This means that evidence provided in the study is likely highly relevant to current OSHA decision making. These studies typically used recent data and evaluate well-defined interventions.
- *Some Current Relevance.* This means the evidence provided in the study is likely somewhat relevant to current OSHA decision making. These studies typically used data from the last 20 years but may focus on poorly defined interventions or a narrow grouping of firms.
- *Little Current Relevance.* This means the evidence provided in the study is likely not relevant to current OSHA decision making. These studies typically used much older data, from a period in which OSHA used different guidelines and procedures.

Research Synthesis: Evidence on the Effects of OSHA Activities
Appendix B: Identification strategies providing moderate causal evidence

This appendix reviews the identification strategies used by the five studies that provided moderate causal evidence of the effectiveness of OSHA inspections (see Table B.1 for a summary). Because no study provided high causal evidence, these studies provide the best information available on the causal effects of OSHA enforcement activities. All studies analyze injury rates as the key variable of interest.

Analyzing Programmed Inspections Using a Difference-in-Differences Approach

Levine et al. (2012) analyzed the effect of programmed inspections on injury rates and other outcomes using a difference-in-differences strategy with propensity-score matching. OSHA prioritizes inspections to firms based on evidence of imminent danger, fatal accidents, complaints, and referrals. It also conducts programmed inspections, which are not triggered by any specific adverse event. Rather, these inspections are targeted at industries, workplaces, or occupations that have been identified as high risk based on observable characteristics, including past injuries and citations. Conditional on these factors, OSHA chooses some firms at random for programmed inspections and inspects others with certainty (see OSHA [2002] for more details). Thus, the set of all inspected firms is likely fundamentally different from the set of all non-inspected firms because of non-programmed inspections. But, depending on firm and industry characteristics, firms that receive a programmed inspection may be comparable to non-inspected firms.

Using this logic, Levine et al. compared changes in outcomes for firms chosen for programmed inspections to a group of non-inspected firms that had similar characteristics. The authors demonstrated that the groups that did and did not receive programmed inspections had similar characteristics and levels of and changes in injury rates before the inspections. Therefore, we can be confident that the impacts estimated in this study are attributable, at least in part, to the OSHA inspections. However, because it was not an RCT, other factors not controlled for in the study might have contributed to the estimated effects.[1]

Notably, this is the only study that provided moderate causal evidence and strong current relevance. Furthermore, this study used higher quality data than many others in the literature. Most analyses we reviewed for this topic area used survey data, in which firms self-report injuries. This study uses administrative data from Workers' Compensation records, which may better capture actual injury rates.

The authors found that programmed inspections had a substantial effect on firm safety; they caused injury rates to drop by nine percent and injury-associated costs to decline by 26 percent (both changes were statistically significant). They also found that firm performance—measured using data on sales, payroll, employment, creditworthiness, and firm survival—did not change after a firm received a programmed inspection.

[1] Although firms are chosen for programmed inspections randomly, conditional on industry, some firms that are randomly selected for an inspection are not visited for various reasons. Thus, this study cannot be treated as an RCT.

Comparing Firms Inspected Early and Late in the Year

Three studies compared the injury rates of firms inspected earlier in the year to those inspected later in the year. The idea behind this identification strategy is that, if inspections lead injury rates to decline soon after an inspection occurs, then firms inspected in March or April should have a lower annual injury rate than firms inspected in November or December of the same year.[2] This identification strategy only captures changes in injuries that occur one to nine months after an inspection. It cannot be used to detect longer-run effects of OSHA inspections.

This strategy is valid if firms inspected earlier or later in the calendar year are otherwise similar and if the timing of inspections doesn't depend on the characteristics of the firms. An examination of OSHA policies suggested that this was likely true only before 1978; as a result of the Supreme Court's ruling in *Marshall v. Barlow's Inc.,* in 1978 OSHA created a system for prioritizing inspections so that firms more likely to be unsafe were inspected earlier in the year. This suggests that, before 1978, firms inspected early and late in the year were likely not systematically different. However, from 1978 on, we cannot be confident that firms inspected early and late in the year are comparable.

Two of the three studies using this design provide moderate causal evidence of the effectiveness of OSHA inspections. Smith (1979) examined injury rates in manufacturing firms using data from 1973–1974. The model also controlled for injury rates in the prior year, employment rates, and industry. The study found that, in 1973, early (March/April) OSHA inspections were associated with a statistically significant decline in the annual injury rate of 16 percent, when compared with later inspections (November/December). But in 1974, early OSHA inspections had a smaller and statistically insignificant impact.

McCaffrey (1983) also used this strategy but included data from 1976–1978, running a separate analysis for each year.[3] Mirroring Smith's 1974 results, McCaffrey found that, relative to late OSHA inspections, early OSHA inspections were not associated with a statistically significant reduction in injury rates within the year of inspection.

Finally, Ruser and Smith (1991) also used this identification strategy but applied it to data from 1980–1985. As this period is after *Marshall v. Barlow's Inc,* it is unlikely that the firms compared are similar. Thus, the study provides low causal evidence.

Sequence Number Studies

Four of the reviewed studies tracked a panel of firms over time to see how many citations firms received at their first, second, and subsequent inspections. This method focuses on comparing firms only at the point they are inspected, arguing that firm conditions should be similar during these various OSHA visits. Study authors focused on the sequence number of an inspection, defined as the number of times a firm has been inspected in the past (including the current inspection). As inspections with higher sequence numbers were preceded by a greater number of inspections, if inspections make firms safer, the number of citations should fall with the sequence number. In other words, the change in citations from inspection n to inspection n+k measures the effect of inspections n to n+k-1. For example, the difference in the number of citations received between the first and second inspections is interpreted as the impact of the first inspection.

---

[2] Note that these studies focus on variation across the calendar year. In some cases, OSHA programmed inspections are timed in accordance with the OSHA program year. This does not affect the causal evidence ratings of these studies.

[3] Only the analysis of injuries from 1976 and 1977 provides moderate causal evidence. The 1978 analysis provides low causal evidence.

In the two most rigorous sequence number studies, Gray and Jones (1991a, 1991b) provided moderate causal evidence of the impact of inspections in manufacturing firms. These studies controlled for firm-level fixed effects, which means they examined within-firm changes in citations over time. They found that the number of workplace hazards cited decreased with each additional inspection, with the greatest drop occurring between the first and second inspections.

Two additional studies used the sequence number approach but provided low causal evidence. Weil (2001) and Ko et al. (2010) attempted to use the sequence number to identify effects of past OSHA inspections on the number of citations at the current inspection. However, these studies did not include appropriate firm- or plant-level fixed effects and thus do not compare differences in citations within a given firm or site. Therefore, we are less confident in the strength of the causal evidence they provide (though both studies receive a higher current relevance rating than the earlier work of Gray and Jones).

Table B.1. Studies Providing Moderate Causal Evidence on the Effect of OSHA Inspections

Study Short Reference	Comparison Made	Data (Location; Type of Injury Data)	Firm Types	Time Period	Findings	Association with Injuries (*=significant)	Current Relevance
Smith (1979)	Firms receiving inspections early and late in the year	Multiple states; BLS survey	Form 103 compliant	1972–1974	Inspections led to significant declines in injuries in 1973 but not 1974.	Reduced, mixed sig.	Little
McCaffrey (1983)	Firms receiving inspections early and late in the year	Multiple states; BLS survey	Manufacturing and construction	1976–1978	There is no clear evidence that OSHA inspections reduced injury rates within the year of inspection.	Mixed	Little
Gray and Jones (1991a)	First, second, and later inspections to the same site	Multiple states; OSHA IMIS	Manufacturing	1972–1983	The number of workplace hazards cited decreased with each additional inspection, with the greatest drop occurring after the first inspection.	Reduced*	Little
Gray and Jones (1991b)	First, second, and later inspections to the same site	Multiple states; OSHA IMIS	Manufacturing	1972–1983	The number of workplace hazards cited significantly decreased as the number of past inspections increased.	Reduced*	Little
Levine et al. (2012)	Firms randomly chosen for inspection and uninspected firms	Single state; WC	Subject to OSHA	1996–2006	Inspections resulted in significant reductions in injuries but no significant change in firm performance.	Reduced*	Strong

Notes: BLS survey = Bureau of Labor Statistics Survey of Occupational Injuries and Illness or associated antecedents and tabulations; OSHA IMIS = OSHA Integrated Management Information System; WC = Workers' Compensation claims data.

Research Synthesis: Evidence on the Effects of OSHA Activities
Appendix C: Studies providing low causal evidence

This appendix contains tables on several important characteristics of the studies reviewed by CLEAR in the evaluation of the literature on OSHA enforcement activities. Studies were allocated to tables based on the question of interest and identification strategy. Each table contains key information on the question considered by and the overall findings of the reviewed studies. We also list several important characteristics of the data used: whether the data were from a single site, single state, or multiple states; the type of data used to measure outcomes (that is, survey data or administrative records); the level of aggregation (if applicable); and the time period for the analysis. Finally, each table includes the studies' current relevance rating, as a guide to how useful findings may be for current decision making.

Tables C.1 and C.2 contain key characteristics of studies examining OSHA activities using firm-level (or plant-level) data and more aggregate data, respectively. These studies typically provide low (and not moderate) evidence because they do not account for the fact that firms subject to OSHA enforcement activities are not necessarily comparable to firms that do not receive this attention. For example, many of the studies in Table C.1 compare firms receiving OSHA inspections to those not receiving an inspection. Likewise, Table C.2 contains comparisons of industries with higher and lower inspection rates.

OSHA conducts inspections for a variety of reasons, many of which are non-random. In fact, OSHA prioritizes inspections to firms where there is either evidence of danger, a catastrophe or fatal accident has occurred, or there has been a complaint or referral (OSHA 2002). This suggests that inspected firms (and industries that have higher inspection rates) are fundamentally different than uninspected firms (industries with low rates of inspections).

One type of inspection, known as a programmed inspection, is not triggered by any specific adverse event in a workplace. These inspections are targeted at industries, workplaces, or occupations that have been identified as high risk. Industries and firms are selected for these inspections based on observable characteristics but there is also some random variation in which firms are inspected under this program (see OSHA [2002] for more details). Because of the random component of the selection process, a careful examination of programmed inspections alone, which includes a rich set of control variables, might not suffer from comparability issues. However, none of the studies focusing on the effects of inspections listed in Tables C.1 or C.2 separately analyzed programmed and non-programmed inspections. When random and non-random inspections are combined, the comparison of inspected and non-inspected firms cannot provide causal evidence.

Other studies in Table C.1 examined differences between firms that were inspected and received a penalty or citation from OSHA and those that either were not inspected or were inspected but received no sanction. Similarly, the studies in Table C.2 compare industries with high and low rates of OSHA citations and penalties. However, firms that received penalties or citations likely have more safety hazards (or more problematic safety hazards) than other firms. Thus, a comparison of firms that did not receive a penalty or citation to those that did has low causal validity.

Finally, Table C.3 details studies that examined changes in OSHA policies, practices, or procedures (for example, which authority administers OSHA inspections or how firms are selected for inspection). Studies typically compare outcomes for firms subject to the policy change to those for firms not subject to the change. However, none of these studies provided evidence that, in the absence of the policy change, the treatment and comparison groups would have had similar outcomes. Thus, these studies can only provide low causal evidence.

Table C.1. Studies Rated Low Examining the Effect of OSHA Inspections and Related Activities on Injuries Using Plant- or Firm-Level Regression Analysis

Study Short Reference	OSHA Activity	Data (Location; Type of Injury Data)	Firm Types	Time Period	Findings	Association with Injuries or Other Outcomes (*=significant)	Current Relevance
Robertson and Keeve (1983)	Inspections; citations	Multiple states; Reports to OSHA	Manufacturing	1973–1980	Plants had fewer injuries in the years in which they received a citation; however, citations in past years did not significantly affect current year injuries.	Reduced*	Little
Ruser and Smith (1991)	Inspections (early vs. late in year)	Multiple states; BLS survey	Manufacturing	1980–1985	There is no clear evidence that OSHA inspections reduced injury rates within the year of inspection.	Mixed	Little
Gray and Scholz (1993)	Inspections with penalties	Multiple states; BLS survey	Manufacturing	1981–1985	Inspections with penalties resulted in significant reductions in injuries. Benefits accrued over three years.	Reduced*	Little
Nelson et al. (1997)	Citations	Single state; WC	Construction	1989–1993	Construction employers that were cited for violating the falls in construction standard were significantly more likely to experience a reduction in injury claim rates than construction employers that were not cited.	Reduced*	Little
Weil (2001)	Inspections (sequence number)	Multiple states; OSHA IMIS	Construction	1987–1993	The probability of compliance increased significantly between the first and second inspection received by a contractor at a site. Subsequent site inspections had smaller effects on predicted compliance.	Reduced*	Some
Baggs et al. (2003)	Consultations and inspections	Single state; WC	Subject to OSHA	1997–2000	Inspections, but not consultations, were associated with significant declines in injury claim rates.	Inspections: reduced* Consultations: reduced	Little
ERG (2004)	Notifications of increased chance of inspection; inspection	Multiple states; ODI survey	Manufacturing	1994–2001	Letters indicating a firm has been targeted were associated with significant decreases in injuries. Letters followed by inspections were associated with larger declines.	Reduced*	Strong
Gray and Mendeloff (2005)	Inspections with or without penalties	Multiple states; BLS survey	Manufacturing	1979–1998	OSHA inspections (with and without penalties) were associated with reductions in injuries in early, but not later, periods.	Reduced, mixed sig.	Strong

Study Short Reference	OSHA Activity	Data (Location; Type of Injury Data)	Firm Types	Time Period	Findings	Association with Injuries or Other Outcomes (*=significant)	Current Relevance
Mendeloff and Gray (2005)	Inspections with penalties	Multiple states; BLS survey	Manufacturing	1992–1998	OSHA inspections that resulted in a penalty were associated with statistically significant decreases in injuries, both for injury types believed to be related to OSHA standards and for injury types believed to be unrelated to OSHA standards.	Reduced*	Some
Haviland et al. (2010)	Inspections with penalties	Single state; WC	Manufacturing	1997–2005	Inspections resulted in significant declines in injuries both related and not related to OSHA standards.	Reduced*	Little
Ko et al. (2010)	Inspections (sequence number)	Multiple states; OSHA IMIS	Manufacturing	1972–2006	The number of violations fell significantly between first- and higher-order inspections; the number of violations increased with time since last inspection.	Reduced*	Some
Foley et al. (2012)	Consultations and inspections	Single state; WC	Subject to OSHA	1999–2009	Inspections were associated with significant decreases in workers' compensation claims. Evidence on consultations is mixed.	Inspections: reduced* Consultations: mixed	Some
Haviland et al. (2012)	Inspections with or without penalties	Single state; WC	Manufacturing	1998–2005	Inspections with penalties significantly reduced injuries in the two years following the inspection.	Reduced*	Strong

Notes: BLS survey = Bureau of Labor Statistics Survey of Occupational Injuries and Illness or associated antecedents and tabulations; ODI = OSHA Data Initiative Survey; OSHA IMIS = OSHA Integrated Management Information System; WC = Workers' Compensation claims data.

Table C.2. Studies Rated Low Examining the Effect of OSHA Inspections and Related Activities on Injuries Using Industry-Level Regression Analysis

Study Short Reference	OSHA Activity	Data Source	Level of Aggregation	Industries Included	Time Period	Findings	Association with Injuries or Other Outcomes (*=significant)	Current Relevance
Viscusi (1979)	Inspections; penalties	BLS survey	Two- or three-digit industry	Manufacturing and similar industries	1971–1975	OSHA inspections and proposed penalties did not have a significant effect on industry-level current health and safety investments, planned health and safety investments, or injuries.	Reduced	Little
Robertson and Keeve (1983)	Inspections; citations	Reports to OSHA	Two-digit industry, by state	Manufacturing	1973–1980	Additional OSHA inspections were associated with reductions in injuries within state-industry categories.	Reduced*	Little
Bartel and Thomas (1985)	Inspections; penalties	BLS survey	Three-digit industry, by state	Manufacturing	1974-1978	OSHA inspections that resulted in a penalty were associated with statistically significant decreases in lost-workday injuries.	Reduced*	Little
Viscusi (1986)	Inspections; penalties	BLS survey	Two-digit industry	Manufacturing	1973–1983	Some estimates suggest a relationship between OSHA activities and injuries but evidence is mixed and not robust.	Reduced, mixed sig.	Little

Notes: All studies examined data from multiple states. BLS survey = Bureau of Labor Statistics Survey of Occupational Injuries and Illness or associated antecedents and tabulations.

Table C.3. Studies Rated Low Examining the Effect of Policy Changes on Injuries and Related Outcomes

Study Short Reference	Policy	Data (Location; Type of Injury Data)	Observations	Time Period	Comparisons Made Across	Findings	Association with Injuries or Other Outcomes	Current Relevance
Curington (1986)	OSHA	Single state; WC	Manufacturing industries	1964–1976	Time	The introduction of OSHA did not significantly affect the frequency or severity of all injuries (when taken together).	Mixed (sign and sig.)	Little
Ruser and Smith (1988)	OSHA record-check procedure	Multiple states; BLS survey	Manufacturing firms	1979–1985	Industries that are and are not subject to record check; states that are and are not implementing procedure; time	The implementation of the record-check procedure led to significant declines in reported injuries.	Reduced*	Little
Levin et al. (1997)	Construction lead-level standard	Single site; RC	Construction workers	1993–1994	Time	Some estimates suggest that blood-lead-levels significantly declined after standard was in place, but evidence was mixed.	Reduced; mixed sig.	Little
Smitha et al. (2001)	Four state-level safety regulations	Multiple states; BLS survey	Manufacturing industries, by state	1992–1997	Variation in exposure to initiatives across time, industry, and states	Mandatory safety committee requirements were associated with statistically significant decreases in injury rates; other initiatives were not.	Safety committee: reduced*; Loss control, safety program: reduced; Targeting: increased	Some
LaMontagne et al. (2004)	EtO exposure standards	Multiple states; RC	Hospital workers	1984–2001	Time	Exposures declined steadily for the first several years after OSHA standards were set.	Reduced*	Some
Bradbury (2006)	State vs. federal OSHA enforcement	Multiple states: NIOSH	Fatalities in a state	1981–1995	States; time	State OSHA programs are associated with significantly fewer deaths than federally administered OSHA programs.	Reduced*	Some

Notes: BLS survey = Bureau of Labor Statistics Survey of Occupational Injuries and Illness or associated antecedents and tabulations; EtO = ethylene oxide; RC = Researcher-collected data on exposure levels; NIOSH = National Institute for Occupational Safety and Health's National Traumatic Occupational Fatalities (based on death certificates); WC = Workers' Compensation claims data.

Baggs, J., Silverstein, B., & Foley, M. (2003). Workplace health and safety regulations: Impact of enforcement and consultation on workers' compensation claims rates in Washington State. *American Journal of Industrial Medicine, 43*(5), 483-494.

Bartel, A., & Thomas, L. (1985). Direct and indirect effects of regulation: A new look at OSHA's impact. *Journal of Law and Economics, 28*(1), 1-25.

Bradbury, J. (2006). Regulatory federalism and workplace safety: Evidence from OSHA enforcement, 1981-1995. *Journal of Regulatory Economics, 29*(2), 211-224.

Curington, W. (1986). Safety regulation and workplace injuries. *Southern Economic Journal, 53*(1), 51.

ERG. (2004). Evaluation of OSHA's impact on workplace injuries and illnesses in manufacturing using establishment-specific targeting of interventions: Programmed inspections vs. high hazard notification letters. Lexington, MA: Author.

Foley, M., Fan, J., Rauser, E., & Silverstein, B. (2012). The impact of regulatory enforcement and consultation visits on workers' compensation claims incidence rates and costs, 1999-2008. *American Journal of Industrial Medicine, 55*(11), 976-990.

Gray, W., & Jones, C. (1991a). Are OSHA health inspections effective? A longitudinal study in the manufacturing sector. *Review of Economics & Statistics, 73*(3), 504.

Gray, W., & Jones, C. (1991b). Longitudinal patterns of compliance with Occupational Safety and Health Administration health and safety regulations in the manufacturing sector. *Journal of Human Resources, 26*(4), 623-653.

Gray, W., & Mendeloff, J. (2005). The declining effects of OSHA inspections on manufacturing injuries, 1979-1998. *Industrial and Labor Relations Review, 58*(4), 571-587.

Gray, W., & Scholz, J. (1993). Does regulatory enforcement work? A panel analysis of OSHA enforcement. *Law & Society Review, 27*(1), 177-213.

Haviland, A., Burns, R., Gray, W., Ruder, T., & Mendeloff, J. (2010). What kinds of injuries do OSHA inspections prevent? *Journal of Safety Research, 41*(4), 339-345.

Haviland, A., Burns, R., Gray, W., Ruder, T., & Mendeloff, J. (2012). A new estimate of the impact of OSHA inspections on manufacturing injury rates, 1998-2005. *American Journal of Industrial Medicine, 55*(11), 964-975.

Ko, K., Mendeloff, J., & Gray, W. (2010). The role of inspection sequence in compliance with the US Occupational Safety and Health Administration's (OSHA) standards: Interpretations and implications. *Regulation and Governance, 4*(1), 48-70.

LaMontagne, A., Oakes, J., & Turley, R. (2004). Long-term ethylene oxide exposure trends in US hospitals: Relationship with OSHA regulatory and enforcement actions. *American Journal of Public Health, 94*(9), 1614-1619.

Levin, S., Goldberg, M., & Doucette, J. (1997). The effect of the OSHA lead exposure in construction standard on blood lead levels among iron workers employed in bridge rehabilitation. *American Journal of Industrial Medicine, 31*(3), 303–309.

Levine, D., Toffel, M., & Johnson, M. (2012). Randomized government safety inspections reduce worker injuries with no detectable job loss. *Science, 336*(6083), 907-911.

McCaffrey, D. (1983). An assessment of OSHA's recent effects on injury rates. *Journal of Human Resources, 18*(1), 131-146.

Mendeloff, J., & Gray, W. (2005). Inside the black box: How do OSHA inspections lead to reductions in workplace injuries? *Law and Policy, 27*(2), 219-237.

Nelson, N., Kaufman, J., Kalat, J., & Silverstein, B. (1997). Falls in construction: injury rates for OSHA-inspected employers before and after citation for violating the Washington State Fall Protection Standard. *American Journal of Industrial Medicine, 31*(3), 296-302.

Robertson, L., & Keeve, J. (1983). Worker injuries: The effects of Workers' Compensation and OSHA inspections. *Journal of Health Politics, Policy and Law, 8*(3), 581-597.

Ruser, J., & Smith, R. (1988). The effect of OSHA records-check inspections on reported occupational injuries in manufacturing establishments. *Journal of Risk and Uncertainty, 1*(4), 415–435.

Ruser, J., & Smith, R. (1991). Re-estimating OSHA's effects: Have the data changed? *Journal of Human Resources, 26*(2), 212-235.

Smith, R. (1979). The impact of OSHA inspections on manufacturing injury rates. *Journal of Human Resources, 14*(2), 145-170.

Smitha, M., Kirk, K., Oestenstad, K., Brown, K., & Lee, S. (2001). Effect of state workplace safety laws on occupational injury rates. *Journal of Occupational Environmental Medicine, 43*(12), 1001-1010.

Viscusi, W. (1979). The impact of occupational safety and health regulation. *Bell Journal of Economics, 10*(1), 117-140.

Viscusi, W. (1986). The impact of occupational safety and health regulations, 1973-1983. *RAND Journal of Economics, 17*(4), 567-580.

Weil, D. (2001). Assessing OSHA performance: evidence from the construction industry. *Journal of Policy Analysis and Management, 20*(4), 651-74.