

Citation

Gray, W., & Jones, C. (1991). Are OSHA health inspections effective? A longitudinal study in the manufacturing sector. *Review of Economics and Statistics*, 73(3), 504–508.

Highlights

- The study's objective was to examine the effect of past Occupational Safety & Health Administration (OSHA) health inspections on the number of violations found in subsequent inspections.
- The study used regression models to compare the number of hazards found at the first, second, and higher-order inspections conducted by OSHA from 1972 to 1983. Although OSHA no longer operates as it did during the period of this study, the study provides interesting historical context.
- The study found that the number of workplace hazards cited decreased with each additional OSHA inspection. The largest drop occurred between the first and second inspections.
- The quality of causal evidence presented in this study is moderate because the study used a well-conducted nonexperimental design. This means we have confidence that the estimated effects are attributable at least in part to OSHA inspections. However, as with any nonexperimental design, other factors not accounted for in the study could also have contributed to the estimated effects.

OSHA Enforcement Activities and Outcomes

OSHA no longer operates as it did during the period of this study. Nevertheless, the study provides interesting historical context. At the time of this study, OSHA conducted inspections for four reasons: as part of a general schedule of inspections targeted to high-hazard firms; if a complaint had been filed by employees or their representatives; if there had been an injury or fatality; or as a follow-up to a previous inspection. The authors noted that complaint and follow-up inspections were generally less intensive than general inspections. An inspector could issue citations for violations of safety standards observed during the inspection. Depending on the nature of the violation(s), the inspector might also issue a monetary penalty. Those firms with more violations were more likely to receive subsequent inspections to determine whether the violations had been corrected.

The outcomes of interest to the study were the number of hazards at later OSHA reinspections of the same firm and the number of test samples collected at the inspection that exceeded permitted exposure limits as an outcome of interest.

Features of the Study

The authors estimated regression models to compare the number of hazards found at the first, second, and higher-order inspections conducted by OSHA in manufacturing firms from 1972 to 1983. The specific models selected by the authors were chosen to fit the context of the analysis and included Poisson, negative binomial, and log-linear models with firm-fixed effects. Fixed effects control for non-time-varying differences across firms that could influence both their compliance behavior and the probability of being

reinspected. The models also controlled for the source of an inspection, whether a general inspection or all other inspection types. Finally, the models included indicators for presidential administration; these accounted for prominent changes in OSHA inspection procedures over the period of study.

The authors used data from OSHA's Integrated Management Information System for 12,592 plants with two or more inspections from 1972 to 1983. There were 35,426 observations, each representing an inspection.

Findings

- The study found that the number of hazards identified decreased sharply from the first to the second OSHA inspection.
- The average firm inspected two or more times from 1972 to 1983 experienced a reduction in citations of 50 percent and a reduction in overexposures of 42 percent over this period.

Considerations for Interpreting the Findings

The authors' empirical strategy relied on comparing the change in hazards identified from one inspection to the next within the same firm, giving us confidence that the observed effects were caused by the inspection and not underlying differences between firms. Given that inspections occurred for different reasons, the authors also included controls for the type of inspection. And, because inspections with higher sequence numbers necessarily occurred later in time, the authors also accounted for secular changes in inspection procedures over time. To do this, they included controls for presidential administration, using indicator variables for inspections during the Nixon/Ford presidencies and the Carter presidency. Ko et al. (2010) demonstrated that, although there were small changes in OSHA activities within presidential administrations, the largest changes occurred after the election of a new president.¹

The empirical approach and carefully selected set of control variables employed in the analysis give us confidence that the authors have attempted to account for the likely sources of bias. In other words, conditional on the control variables, there is little reason to believe that inspections with different sequence numbers differ in any systematic way within the same firm.

Causal Evidence Rating

The quality of causal evidence presented in this study is moderate because the study used a well-conducted nonexperimental design. This means we have confidence that the estimated effects are attributable at least in part to OSHA inspections. However, as with any nonexperimental design, other factors not accounted for in the study could also have contributed to the estimated effects.

¹ See Figure 1 of 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.