Reducing Waste through Anti-Fraud Enforcement: Evidence from Hospital Admission Cases

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David H. Howard
Department of Health Policy and Management
Emory University
david.howard@emory.edu

Jetson Leder-Luis
Questrom School of Business
Boston University and NBER
jetson@bu.edu

Abstract: The use of federal anti-fraud laws to address unnecessary medical care is controversial. Targeted providers frequently argue that, in their judgment, the treatment in question was appropriate. We examine the effects of anti-fraud litigation against hospitals for over-admitting patients from the emergency department, using 100% Medicare claims for 2005-2019 and a design based on the staggered rollout of these lawsuits. We find that anti-fraud lawsuits reduced admission rates by 3.6 percentage points without increasing mortality rates. We estimate five-year savings to Medicare of $1.3 billion. Our results suggest that anti-fraud enforcement can be successful in reducing costly, unnecessary care.

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1. Introduction

Federal prosecutors frequently pursue anti-fraud cases against physicians, hospitals, and other providers accused of billing public insurance programs for unnecessary medical care. Allegations revolving around medical necessity account for a large share of fraud and abuse cases (Leder-Luis and Malani, 2025), but the application of federal fraud and abuse statutes in this area is controversial (Howard, 2020). Medical treatment decisions are often subjective, and necessity ultimately depends on physician judgment.[1] While these cases have been successfully prosecuted as a matter of law, it is difficult to know whether providers are systematically overtreating patients *ex ante.* Moreover, patients may be harmed if anti-fraud efforts lead providers to reduce the provision of effective treatments.

In this study, we assess the impact of anti-fraud cases where the medical necessity of hospital admissions from the emergency department is at issue. Hospital care is an intensive and expensive form of treatment, accounting for over $1.5 trillion in spending per year (CMS 2026). Patients treated in the emergency department may be discharged, kept for observation, or admitted as inpatients. Hospitals receive substantially higher payments for patients who are admitted. Given the difference in reimbursement for inpatient versus outpatient care, hospitals face incentives to admit patients, especially in instances where hospitals' costs for inpatient and outpatient care are similar. For example, admission of a patient who would otherwise spend several days in an observation unit would be particularly profitable.

According to whistleblowers' allegations, administrators at some hospitals have pressured clinicians to admit patients against their judgement. The Department of Justice has pursued cases against three large, for-profit systems and a handful of smaller systems, winning over $476 million in settlements. The Department's enforcement actions may have discouraged wasteful care. However, it is possible, as

[1] For example, Medicare covers hospice care only for patients with life expectancies less than six months, and many hospices have faced discipline for admitting patients who have survived longer than six months (Gruber et al, 2025). While most hospices settled these allegations, one successfully fought its case in court by arguing that its clinicians *believed* that patients had shorter life expectancies (United States of America versus Aseracare 2019).

administrators at some hospitals claimed[2], that the admissions in question were appropriate. In that case, enforcement could have caused hospitals to under-admit patients, leading to adverse outcomes.

Using case records from the Department of Justice, we identified eight hospital systems that settled cases between 2005 and 2017 where the government alleged that the hospitals admitted ineligible patients. These systems owned 205 hospitals and treated almost 700,000 Medicare beneficiaries in their emergency departments annually. Using a difference-in-differences design, we evaluate the impact of these cases on treatment, outcomes, and spending. We find that admission rates declined by 3.6 percentage points (or about 10%) in the targeted hospitals following the investigations. Mortality rates did not increase. Medicare spending per patient treated at the targeted hospitals' emergency departments declined by $380. Total savings are about $1.3 billion over a five-year period, or more than twice the amount recovered in settlements.

Our work relates to two strains of literature. First, a growing body of work has considered the effects of anti-fraud enforcement on spending and health outcomes (Gruber et al 2025; Howard and McCarthy 2020; Leder-Luis 2025; Eliason et al 2024). Generally, these studies have found that anti-fraud enforcement changes provider behavior, but most have not assessed patient outcomes. Our study contributes to this literature by measuring treatment, outcomes, and costs related to the choice of whether to admit patients from the emergency department, a particularly high-stakes decision for both patients and insurers. Consistent with past work (Howard and McCarthy, 2020; Leder-Luis, 2025), we find that valuing anti-fraud efforts based on legal settlements alone understates the true value by a wide margin.[3]

Second, we contribute to the literature on the value of inpatient care. Overuse of hospital care is a longstanding concern, dating back to at least Shain and Roemer

[2] 60 Minutes aired a segment, "Hospitals: The Cost of Admission," on the case against HMA on December 2, 2012.

[3] Leder-Luis (2025) considers some but not all of the hospitals who faced unnecessary admission allegations as one of many case studies, but only considers net savings estimates using a synthetic control design. The effects on patient health are not identified in that paper, nor does it consider hospital propensities to admit or conduct any patient-level analysis.

(1959) ("a hospital bed built is a bed filled.") Carroll (2025) shows that rural hospital closures reduce spending but increase mortality, and Obermeyer et al. (2017) find that patients treated in the emergency departments of hospitals with low admission rates also have higher mortality rates. By contrast, Shi (2024) and Gupta (2011) find, like we do, that government interventions (i.e., audits, readmission penalties) that led to reductions in admission rates did not adversely affect mortality. Almond and Doyle (2011) show that longer hospital stays, induced by insurance coverage, do not improve outcomes. Together, these findings suggest that the value of hospital care depends on the context, but that government programs to reduce low-value admissions have been well-targeted.

2. Background

2.1 The False Claims Act

The False Claims Act establishes civil and criminal penalties for firms that make a false claim for payment from the federal government. Violators are liable for three times the value they were paid plus fines. About 55% of all False Claims Act cases focus on Medicare, Medicaid, and other federal health programs. Cases can be initiated by whistleblowers or directly by the Department of Justice. Leder-Luis (2025) provides a more in-depth institutional background and a theoretical analysis of the Act.

Some defendants have successfully challenged the use of the False Claims Act to sanction unnecessary medical care, arguing that claims are not "false" if clinicians believed that the services were necessary. The government maintains that claims for unnecessary care are false as long as providers display a "reckless disregard" for the truth. There is a circuit court split on the matter, i.e. appellate courts have ruled differently, and so if and until the Supreme Court weighs in, there are different standards in different parts of the country. Our results illustrate the effects of using the False Claims Act to reduce unnecessary care.

2.2 The admissions decision

There are 139 million emergency department visits annually, of which 18 million result in admission to the hospital (National Center for Health Statistics 2025). The decision to admit is typically based on a joint consultation between emergency medicine physicians and hospitalists, the physicians who assume responsibility for patients once admitted. There are guidelines that describe the situations under which admission is appropriate, but patients present at hospitals with a wide range of conditions, symptoms, and comorbidities. Any admission algorithm must necessarily leave physicians with a high degree of discretion.

The rise of minimally-invasive surgery and the development of observation units (Ross et al. 2013) (outpatient units where patients with uncertain prognoses can be monitored) have expanded options for treating patients in the outpatient setting. These developments are reflected in admission rates. In our data, the average hospital-level admission rate declined from 41.1% in 2005 to 31.8% in 2019.

Medicare payment rates for inpatient and emergency department care are set by different fee schedules. The payment for inpatient care is about $3,000 to $4,000 higher than the comparable payment for services provided in the emergency department, including observation care (Office of Inspector General 2013; MedPAC 2015).

Medicare covers inpatient care if the patient is expected to stay two midnights (the so-called “two midnight” rule) or if admission is medically justified based on patient complexity or “current medical needs”. In response to concerns about unnecessary admission, Medicare directed its contractors to audit short-stay hospital admissions beginning in 2011; Shi (2024) studies these audits and finds they were effective at eliminating short-stay hospitalizations. However, the audit program was suspended following complaints from the hospital industry. In 2019, Medicare spent $4.8 billion on inpatient stays spanning only 0 or 1 midnight (Office of Inspector General 2024).

The government has used the False Claims Act to sanction hospitals that admit patients unnecessarily, the focus of our analysis. In prior cases, whistleblowers

alleged that managers attempted to influence physicians' admissions decisions by creating admissions targets, providing feedback reports comparing admission rates among physicians, and threatening to fire physicians with below-target rates. Despite its clinical complexity, the admissions decision is well-suited to managers' use of yardstick competition: case volumes are large, and patients are more or less randomly assigned to physicians.

Administrators set up systems and defaults to favor admission. For example, some Health Management Associates administrators allegedly provided physicians with pre-filled admission forms (United States of America versus Health Management Associates 2011). Health Management Associates hospitals used a proprietary emergency department software package that required physicians to make additional clicks if they wanted to discharge a patient the system had flagged as a candidate for admission. Administrators discouraged sending patients to observation units, and some even went so far as to monitor medical records and comment on the appropriate management of individual patients.[4]

Increasing admissions was often an intentional part of corporate strategy. For example, Community Health Systems executive Larry Cash, speaking at an investor conference (Oppenheimer & Co., November 3, 2009), said

> ER has been an initiative. When we came to the company -- most of management came in late in 1997. The admit rate out of the ER was 10% or 11%. Today, it's 15%, which means we've done a good job of adding services and a better job of taking care of patients and identifying those, and keeping them there inside the hospital.

In general, administrators created a company culture and clinical environment that favored admission.

Although hospitals' settlements with the Department of Justice may seem like prima facie evidence that they over-admit patients, or at least did so in the past, health

care providers face tremendous pressure to settle False Claims Act lawsuits rather than engage in prolonged, costly, and risky litigation. And even if managers directed physicians to increase admission rates, it does not necessarily follow that they complied. Attempts by administrators to influence physician behavior often fail, even when they try to shift behavior in a pro-social direction (Accordino et al. 2018; Geerligs et al. 2018; Gerber et al. 2014; Grol 2001).

The pattern of conduct depicted in the False Claims Act litigation runs counter to the conventional wisdom that only patients with private insurance and patients undergoing complex surgical procedures are profitable. Instead, defendants encouraged admissions across-the-board, including admissions of non-surgical Medicare patients. Admission of a Medicare patient could in theory displace a more profitable patient; however, while some hospitals struggle with high occupancy rates, the aggregate hospital occupancy rate is only 67% (MedPAC 2024). The marginal admission can be highly profitable, particularly if the alternative is to leave a hospital bed unfilled. Payment-to-cost ratios for one-day admissions of Medicare beneficiaries for high-volume, non-surgical diagnoses range from 1.32 for chest pain to 2.99 for sepsis (MedPAC 2015).

3. Data

3.1 Identifying investigated hospitals

We identified hospital systems that were the subject of False Claims Act lawsuits for admitting patients unnecessarily using data from Leder-Luis (2025), who conducted a Freedom of Information Act request. We supplemented this request with a review of Department of Justice press releases. We identified eight hospital systems with a total of 205 hospitals that reached settlements with the Department of Justice between 2007 and 2017 (see Appendix A, Table 1 for details).[5]

[5] Many hospitals have also been sued for admitting ineligible patients for scheduled surgeries. We do not consider these cases here because they address a distinct clinical scenario, and we focus instead on unnecessary admissions from the emergency department.

We identified a "treatment" year for each hospital system. False Claims Act cases are filed under seal, and the investigations initially proceed behind the scenes. The target may receive a subpoena that requests patient or administrative records but does not otherwise provide information about the case. Later, the file is unsealed and the target and the government enter into settlement negotiations.[6] The time between when cases are filed and settled may last four or more years.

Conceptually, we would like to identify a treatment year and post period that corresponds to the date when administrators at each system realized that they were facing a credible False Claims Act lawsuit and would probably have to enter into settlement talks. Since this date is unknowable, we coded the treatment year for each system as the final year covered by the settlement. We count a hospital as being part of a treated system if it was part of the system two years before the treatment date for that system. The number of hospitals per system ranged between 1 and 123.

3.2 Data and Descriptive Statistics

Our main data sources are 100% Medicare inpatient and outpatient claims for 2005 to 2019. We also use home health and skilled nursing facility claims, Medicare chronic conditions data, Medicare enrollment files, 2013 zip code-level median income from the Census Bureau[7], and American Hospital Association Annual Survey data from 2012.

Using Medicare claims from 2005 to 2019, we identified emergency department encounters in the inpatient and outpatient files. using revenue codes 0450-0459 and 0981,[8] by fee-for-service beneficiaries ages 65 and older. We excluded patients in hospital-years when the hospital-level admission rate was less than 1% or greater than

[6] False Claims Act cases are costly to litigate, and the potential penalties are large. Conditional on the DOJ choosing to proceed with a case, many healthcare providers who are sued under the Act choose to settle.

[7] United States Census Bureau. 2013: ACS 5-year Estimates Subject Tables. Income in the Past 12 Months (in 2023 Inflation-Adjusted Dollars). https://data.census.gov/table/ACSST5Y2013.S1901?q=Income%20by%20Zip%20code%20tabulation%20area

[8] https://resdac.org/articles/how-identify-hospital-claims-emergency-room-visits-medicare-claims-data

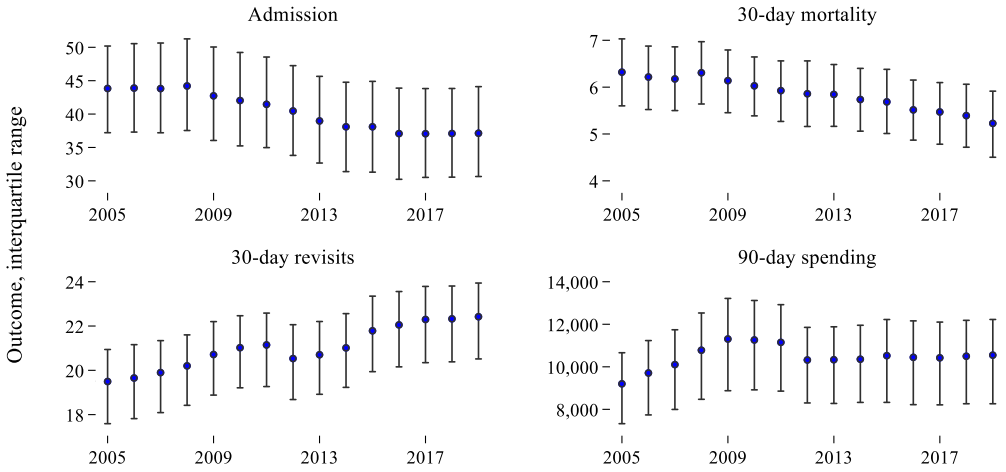
99% or when the hospital treated fewer than 365 Medicare patients. We refer to the initial encounter as the "index visit". Patients may have more than one visit. The main outcome was admission to inpatient status. Patients who had inpatient claims with emergency department revenue codes were classified as admitted. The sample includes 238,072,576 emergency department visits, of which 95,398,553 (40.1%) resulted in admission.

We also examine the impact of False Claims Act investigations on 30-day patient mortality, 30-day revisit rates, and 90-day episode spending. All are measured from the first date of the index encounter. Revisit rates include additional visits to the emergency department, including visits where the patient was admitted.

The episode spending measure includes spending for the index visit, spending on additional emergency room encounters (including encounters that resulted in admission), and post-acute care (skilled nursing and home health care). In 2013, 42% of Medicare beneficiaries admitted as inpatients received post-acute care following discharge (MedPAC 2015). We used a 90-day window because some patients receive post-acute care more than 30 days after the index visit (Werner and Konetzka 2018). Spending was winsorized at the 99th percentile. Spending is stated in 2019 dollars based on the annualized change in the Medicare Outpatient Prospective Payment System conversion factor and the Inpatient Prospective Payment System base payment rate (see Appendix A Table 2 for details).

Figure 1 summarizes hospital-level outcomes by year. The circles represent averages and the bars interquartile ranges. Estimates are weighted by the annual number of emergency department visits by fee-for-service Medicare enrollees. Admission rates have declined over time, potentially due to the availability of observation units that serve as a close substitute for inpatient care (Ross et al. 2013). However, the volume of visits has increased over time, from 14.5 million in 2005 to 16.2 million in 2019.

Figure 1: Volume-weighted averages and interquartile ranges of key outcomes across hospitals



Revisits include inpatient admissions and emergency department visits that occur within 30 days of the index encounter.
Spending, in 2019 dollars, incudes payments for inpatient services that originated in the emergency department, emergency department visits, and skilled nursing and home health services.
The bars represent interquartile ranges.

In our patient-level analyses, we include controls for age, sex, race/ethnicity, pre-encounter chronic conditions, whether the encounter was preceded by another emergency department visit within the prior 30 days, dual Medicaid enrollment, median zip code-level income, and quarter of the year in which the index visit occurred. Chronic conditions are indicators for major, common conditions (for example, ischemic heart disease, depression, asthma) that were recorded in Medicare claims in the calendar year prior to the index visit. Median zip code-level income was re-coded to $50,000 for the small share of observations where it was missing. We include quarter of year indicators to adjust for differences in the length of time between the prior calendar year and the index visit. Appendix A Table 3 summarizes outcomes and patient characteristics by year.

We did not adjust for patients' primary diagnosis or comorbidities on the index visit in our baseline analysis for several reasons. First, some of the hospitals accused of unnecessarily admitting patients were also accused of "upcoding": misrepresenting or falsifying patients' diagnoses to increase reimbursements for admitted patients.[9] Second, admission may change what diagnoses are recorded on claims. Hospitals

[9] Medicare payment for inpatients depends on patients' diagnoses. Medicare payment for outpatient care depends only on which services were provided.

have an incentive to record diagnoses on inpatient claims, and admitted patients may undergo more tests and examinations to identify the root cause of their symptoms.

4. Empirical specification

We estimate the impact of False Claims Act investigations on admission rates and other outcomes in two steps. First, consider a traditional, two-way fixed effects specification:

$$y_{iht} = \alpha D_{h,t>T} + \beta X_i + \delta_t + \gamma_h + \epsilon_{iht}. \quad [1]$$

The outcome is a binary indicator for whether patient *i* in hospital *h* in year *t* was admitted, y_{iht}. The variable $D_{h,t>T}$ is an indicator for whether hospital *h* is treated at time *t*. The model includes year, δ_t, and hospital, γ_h, fixed effects and a vector of patient characteristics related to the likelihood of admission, X_i.

The model is difficult to estimate in a single stage given our sample size (over 200 million observations), and so we use an alternative specification that replicates the model in two steps. First, we estimate the following model, separately for each year:

$$y_{iht} = \beta_t X_i + \eta_{hy} + \nu_{iht}. \quad [2]$$

Coefficient estimates are available in Appendix B. We recover hospital fixed effects from this model, $\hat{\eta}_{hy}$. These can be interpreted as estimates of the difference between hospitals' observed and expected admission rates, given the types of patients they treat (as captured by X_i).

Next, we use the estimated fixed effects as the outcomes in a second, two-way fixed effects specification, where observations are at the hospital-year level

$$\hat{\eta}_{hy} = \alpha D_{h,t>T} + \delta_t + \gamma_h + \epsilon_{ht}. \quad [3]$$

We estimate a first-difference version of the model so that we can weight hospital-year observations by the number of emergency department visits at each hospital.

$$\hat{\eta}_{hy} - \hat{\eta}_{h,y-1} = \alpha\left(D_{h,t>T} - D_{h,t-1>T}\right) + (\delta_t - \delta_{t-1}) + (\epsilon_{ht} - \epsilon_{h,t-1}). \quad [4]$$

Time-invariant hospital fixed effects γ_h are differenced out.

Weighting by visit volume is necessary to produce estimates that are as close as possible to those we would obtain from model 1. The unweighted estimate from model 3 would yield the average hospital-level change in admission rates due to anti-fraud investigations, giving equal weight to changes at large and small hospitals. The weighted estimate from model 4 (and the estimate from a patient-level model like model 1) yields the change in admission rates among patients treated at the investigated hospitals.

Treatment in this case is staggered, and as shown in the event studies below, the impact is not instantaneous. However, because there are many more control hospitals than treated hospitals, and because most of False Claims Act investigations occurred within a narrow window, there will be relatively few negative-weight comparisons between treated units at meaningfully different times post-investigation (Sun and Abraham 2021; de Chaisemartin and d'Haultfoeuille 2020). Thus, we can interpret the estimates from model [2] as the impact of an False Claims Act investigation relative to the counterfactual of no investigation.

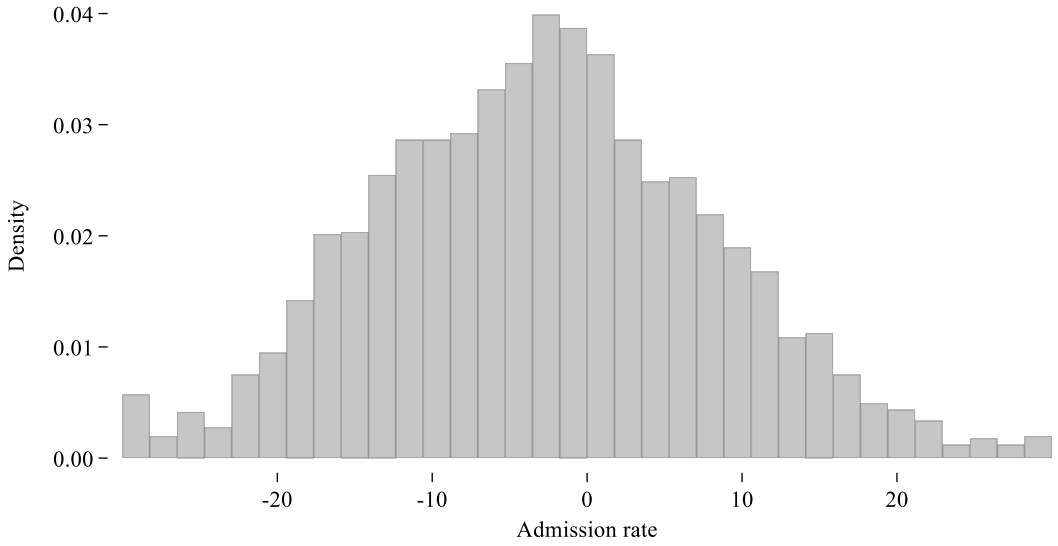
We manually calculate standard errors for model 4 using the cluster-robust sandwich estimator, setting the degrees of freedom equal to the sample size minus the number of left-hand side variables and implicit fixed effects. We clustered standard errors at the hospital-system level, i.e., the level at which treatment is assigned. We estimate the model via ordinary least squares, even when the outcome is binary, to facilitate estimation with a large sample and the recovery of hospital-year-level fixed effects from model 2.

The main difference between the estimate from model 1 and that from model 4 is that model 4 allows for the effect of patient characteristics to vary annually, while

model 1 holds them fixed. As we show below, omitting controls for patient characteristics does have a meaningful effect on the estimates.

Figure 2 presents a histogram of 3,072 hospital-level fixed effects for admission rates in 2008. These fixed-effects can be interpreted as the difference between actual and expected hospital-level admission rates given the observable characteristics of patients treated at the hospital in that year. The standard deviation is 11.1 percentage points, indicating that admission rates conditional on patient characteristics vary widely, consistent with prior studies in the medical literature.

Figure 2: Histogram of hospital fixed effects for admission in 2008



Fixed effects were Winsorized at -30 and 30 for purposes of display.

5. Results

5.1 Relative trends in admission rates at large for-profit systems.

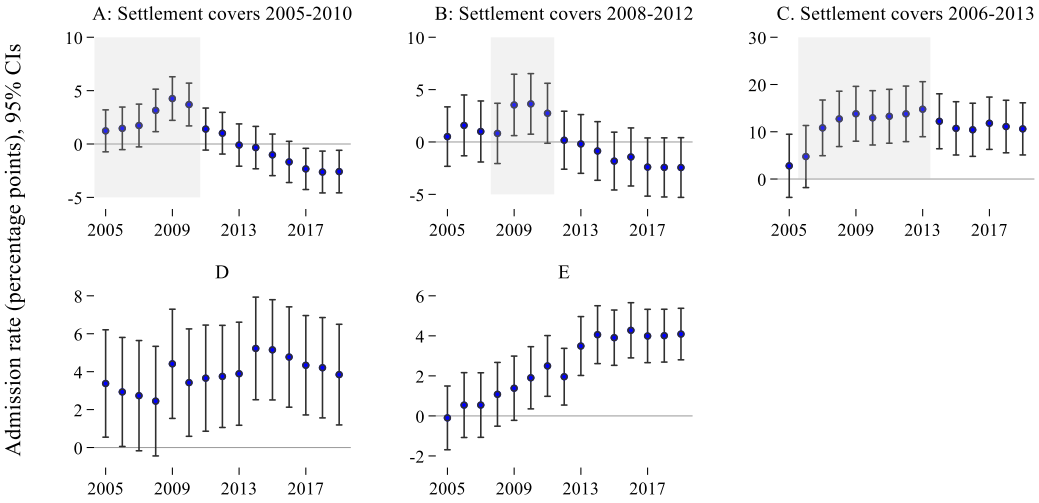
Before assessing the causal effects of the False Claims Act investigations, we present descriptive evidence of admission rates at five large, for-profit chains. Three of the chains settled False Claims Act lawsuits and are included in the group of treated hospitals. The other two did not, but have been the subject of False Claims Act

lawsuits for over-admitting patients. For each chain, we estimate a separate regression where hospital-level fixed effects from equation [1] are the outcome and the independent variables are year indicators and year-indicators interacted with an indicator for the chain. The regression also controls for bed size to account for hospital scale effects, but this turns out not to have a meaningful effect on admission patterns. The sample includes hospitals in the chain and control group hospitals. We present the coefficients on the year-chain interactions graphically in Figure 3. These indicate whether adjusted admission rates (i.e, the difference between observed minus expected admission rates) were higher at the chain in a given year compared to control group hospitals. The shaded areas for systems A-C indicate the periods covered by the settlements with the Department of Justice.

Adjusted admission rates in chains A and B display a consistent pattern: they increased and were greater than expected up until around 2010, after which they declined and were no greater than expected from about 2013 onward. Admission rates in chain C declined slightly after 2013, the last year of the period covered by its settlement with the Department of Justice, but remain well-above expected levels. Rates at chains D and E increased over the study period and were greater than 5 percentage points above expected levels at the end of the period.

We draw two conclusions from this initial analysis of admission rate trends. First, admission rates declined at targeted hospitals following False Claims Act investigations. Second, the investigations do not appear to have deterred chains D and E from increasing their admission rates, indicating the effects of the lawsuits are localized to the treated hospitals.

Figure 3: Admission rates at five for-profit systems relative to control group hospitals

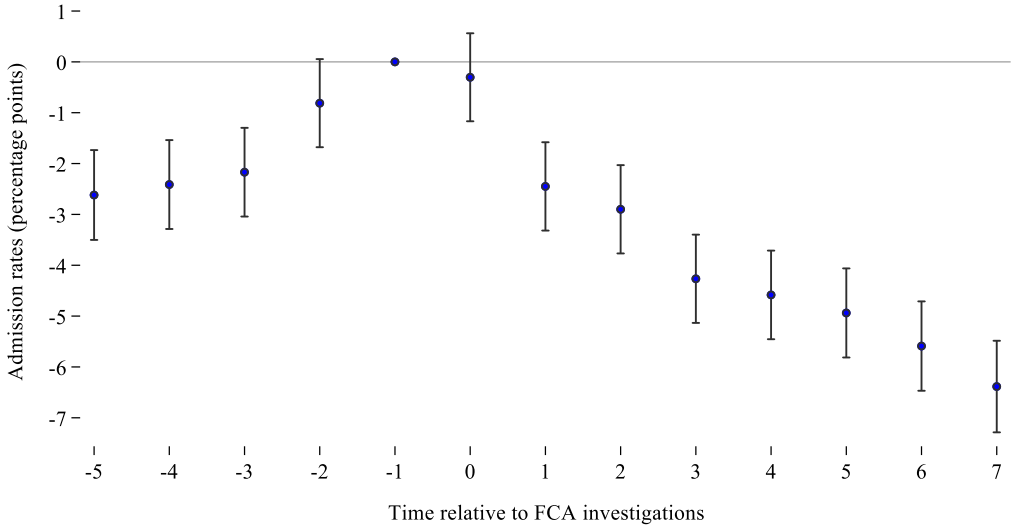


Systems A-C were the subject of False Claims Act investigations. The grey shading represents the period starting with the year covered by the settlement and ending with the earliest of the end of the period covered by the settlement or the year when administrators became aware that the system was being investigated. The bars represent 95% confidence intervals

5.2 Effects on admission rates and other outcomes

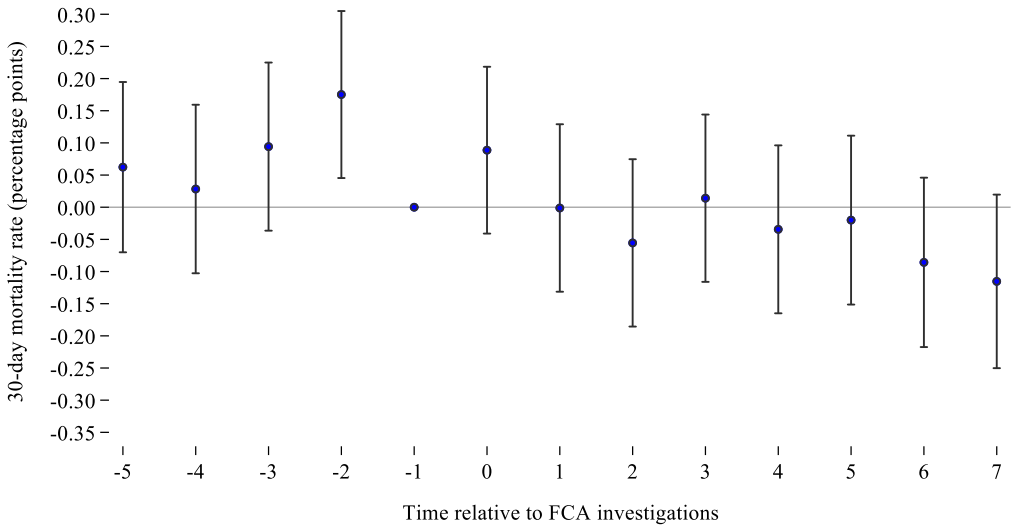
Figures 4a-4d present event studies for the main outcomes. As shown in Figure 4a, admission rates at treated hospitals peaked in year -1 before the False Claims Act investigations and then declined. Pre- False Claims Act investigation trends in treated and control hospitals differ, but that is to be expected. Treated hospitals allegedly adopted policies to increase admission rates. Admission rates started increasing shortly before time 0 (recall that the lawsuits were filed under seal before or at year 0), suggesting that the False Claims Act induced whistleblowers to step forward fairly quickly after administrators implemented these policies.

Figure 4a: Event study of admission rates



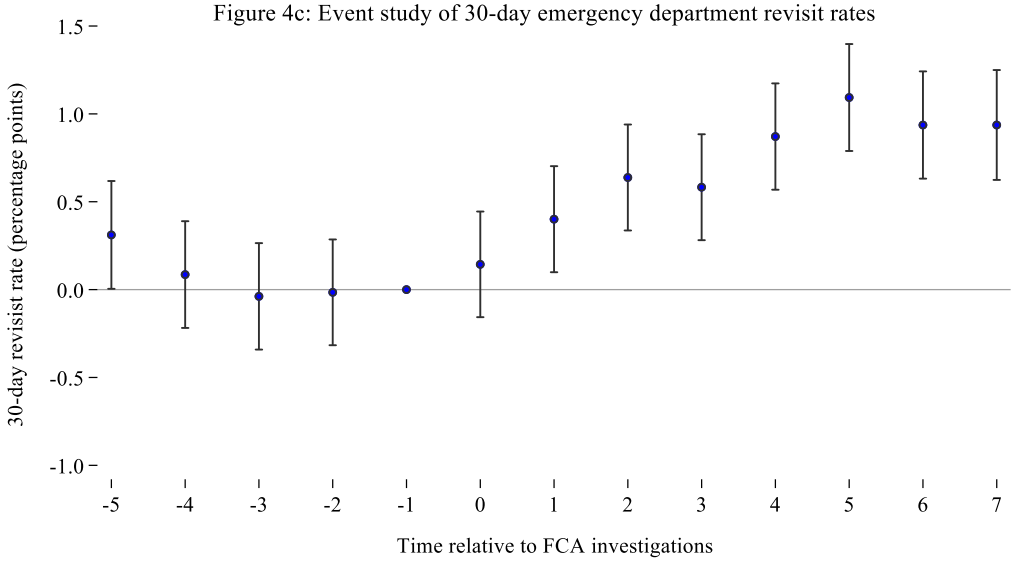
Brackets indicate 95% confidence intervals.

Figure 4b: Event study of patient mortality



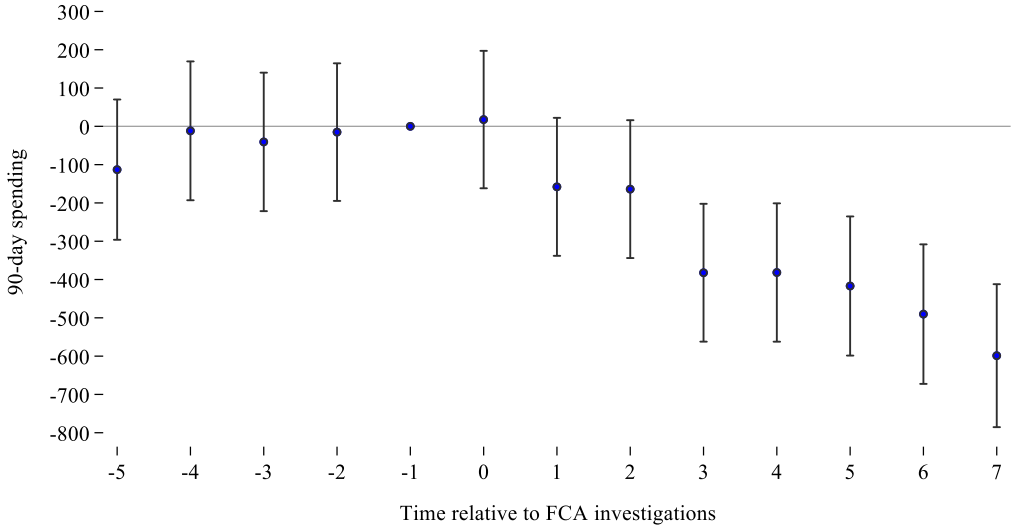
Brackets indicate 95% confidence intervals.

Figure 4c: Event study of 30-day emergency department revisit rates



Brackets indicate 95% confidence intervals.

Figure 4d: Event study of Medicare spending



Brackets indicate 95% confidence intervals.

Table 1 presents estimates from two-way fixed effects models (equation 4). The pre-period begins at -2 in our baseline specification, reflecting the short gap between when administrators successfully increased admission rates and when False Claims Act lawsuits were filed (as shown in Figure 4a). Estimates indicate that the False

Claims Act investigations reduced admissions by 3.58 percentage points (9.7% of the sample mean). The effect is similar when the outcome includes admission or transfer to another hospital (a 3.4 percentage point reduction).

As shown in Figure 4b and Table 1, mortality rates declined by 0.13 percentage points (-2.3%). Patients who are admitted to the hospital may be exposed to nosocomial infections and other iatrogenic injuries (Bates et al. 2023). However, the effect seems too large to be explained solely in terms of admissions.[10] The False Claims Act investigations may have led to other changes to patient care at treated hospitals that caused mortality rates to decline. Regardless, we can rule out adverse effects of the investigations and subsequent declines in admission rates on patient mortality.

Revisit rates increased by 0.74 percentage points (3.4%), implying that the marginal admission reduces revisit rates by 20.6 percentage points (Figure 4c and Table 1). The False Claims Act investigations may have led clinicians to deny admission to some patients who could have benefited. There is also a mechanical "incapacitation effect" that explains much of the result: patients who are in hospital beds cannot visit the emergency department. The average length of stay among admitted patients in 2019 was 5.6 days. Among patients who were *not* initially admitted: 27.9% of revisits occurred within 5 days and 18.8% occurred within three days. Had these patients been admitted, most of these revisits would not have occurred. We separately examined revisits that resulted in admission to try to reconcile the opposite-signed estimates for mortality and revisit rates. Here, the effect is negative, -0.12 percentage points, though not significant ($p = 0.13$). This result suggests that patients are not returning to the emergency department for serious conditions.

[10] The effect, stated in terms of the increase in mortality per marginal admission, is a decrease of 3.7 percentage points (= 0.13 ÷ 3.58).

Table 1: Two-way fixed effects estimates of the impact of

	Admission	30-day mortality	30-day revisits	90-day spending
Post × Treat	-3.58 ***	-0.13 ***	0.74 ***	-380 ***
	(0.44)	(0.04)	(0.10)	(90)
Mean	36.70	5.74	21.66	9,657
N	47,164	47,164	47,164	47,164
Unit	Percentage points			2019 USD

*p<0.05, **p<0.01, ***p<0.001.
Observations are at the hospital-year level.

Episode spending, not including spending on physician care or scheduled outpatient or inpatient services, declined by $380 per patient (-3.9%). This estimate implies that the marginal admission increases Medicare spending for the episode by $10,617. Spending on the initial encounter declined by $290, accounting for three-quarters of the reduction in episode spending.

The episode spending estimate implies a reduction in annual Medicare spending of $277 million based on the number of Medicare beneficiaries treated in the emergency departments of treated hospitals in 2011. The present value over a 5-year period at a discount rate of 3% is about $1.3 billion, or more than twice the amount recovered by the Department of Justice in penalties ($476 million). This estimate does not consider general deterrence effects or spillovers to other insurers.

5.3 Identification checks

The model is identified under the assumption that there were no policies or factors that could have caused outcomes in treated and control hospitals to diverge other than the False Claims Act investigations. We are interested in studying how the False Claims Act investigations affected administrative and clinical decisions within treated hospitals. To interpret estimates accordingly, we require an additional

assumption: that the False Claims Act investigations affected admission rates and other outcomes only via their impact on administrators' and clinicians' decisions. This assumption could be violated if the investigations changed patients' decisions about where to seek care and the patients who switched to other hospitals were disproportionally those more or less likely to be admitted.

To investigate this possibility, we evaluate the impact of the investigations on hospitals' patient volume and average predicted admission risk, which is calculated from observable patient characteristics and the estimated coefficients, $\hat{\beta}_t$, from model 2. Table 2 presents two-way fixed effects estimates from model 4.

Table 2: Two-way fixed effects estimates of the impact of FCA investigations, validity checks

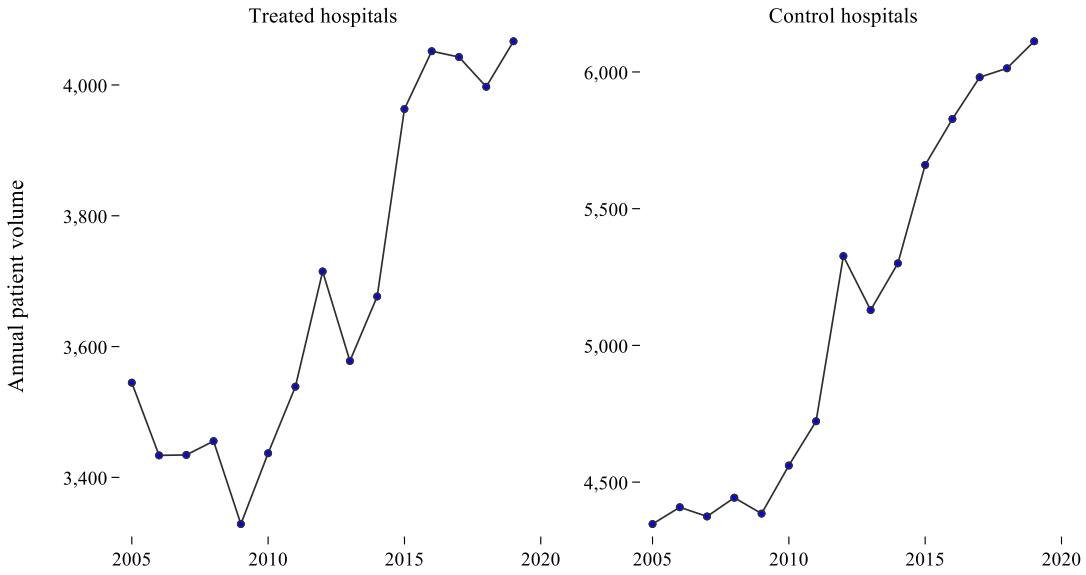
	Patient volume	Predicted admission risk
Post × Treat	-318	-0.45 *
	(262)	(0.22)
Mean	5,132	39.50
N	47,164	47,164
Unit	Patients	Percentage points

*p<0.05, **p<0.01, ***p<0.001.

Observations are at the hospital-year level.

The estimates indicate that there was a non-significant differential decrease in patient volume at treated hospitals (-352 patients per year) following False Claims Act investigations (column 1). However, as shown in Figure 5, volume increased at both treated and control hospitals. It increased more rapidly and from a larger base at control hospitals. As shown in column 2 of Table 2, there was only a trivial change in admission risk (-0.45 percentage points, or 1.1% of the sample mean). Of course, we cannot rule out a change in unobservable patient risk.

Figure 5: Trends in average annual emergency department patient volumes



Appendix A, Table 4 provides further specification checks, including models that adjust for patients' primary diagnosis, omit all controls for patient characteristics, and vary the event study window. Under a broad range of specifications, our results consistently show statistically significant savings through deterred admissions with no harms to patients.

6. Conclusion

False Claims Act lawsuits against hospitals for over-admitting patients from the emergency department reduced admissions and Medicare spending without increasing mortality. Consistent with prior work, we find that savings to the government from reductions in health care use are large in relation to settlement amounts. Estimating the effects of the investigations on admission patterns at non-investigated hospitals is difficult because there was a secular decline in admission rates over this period. However, relative admission rates increased at several large, for-profit systems, suggesting that general deterrence effects were small or non-existent.

The application of the False Claims Act to unnecessary care is controversial, but we find that it is effective. False Claims Act lawsuits were filed shortly after admission rates started increasing at targeted hospitals. There was a large decline in rates after the targeted hospitals became aware they were being investigated. These results suggest that administrators at these hospitals were encouraging inappropriate admissions and the government's decision to investigate them was correct. More broadly, the results indicate that anti-fraud lawsuits are effective in disciplining hospital and provider behavior. As the United States continues to target wasteful and fraudulent spending, litigation appears to be high-value option that does not necessarily harm patients.

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