

# WHITE PAPER

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## MEASURING THE VALUE OF HEALTHCARE **ANTI-FRAUD EFFORTS**

The Healthcare Fraud Prevention Partnership  
would like to thank participating Partners  
for their contributions.

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# EXECUTIVE SUMMARY

Healthcare fraud imposes a large burden on insurance systems. Efforts to combat fraud are critical to the long-term financial sustainability of health insurance programs and for patient safety. Payers, including governmental agencies and private payers, undertake extensive efforts to combat fraud, including conducting pre-payment and post-payment reviews<sup>1</sup>, educational efforts, criminal and civil litigations, and regulations directed at eliminating fraud.<sup>2</sup>

When evaluating the effectiveness of anti-fraud efforts, return on investment (ROI) is a key metric, measuring net value against costs. Healthcare anti-fraud efforts can be thought of as investments, in which payers and law enforcement agencies spend money with the goal of lowering long-term spending based on fraud, waste, and abuse and increasing the quality of healthcare. To evaluate the success of anti-fraud efforts and determine where to invest for future initiatives, it is important to accurately measure ROI.

The financial value of anti-fraud efforts takes the form of both recovery and deterrence. For anti-fraud efforts, recovery is money recouped after fraud has occurred, through mechanisms such as future payment offsets, fines, settlements, administrative actions, or civil restitution orders. In contrast, deterrence (sometimes referred to as avoidance) is money saved by prevention efforts, through pre-payment detection and post-enforcement changes in fraudulent behavior. Cost savings from deterrence may also improve patient welfare over time because dollars not spent on fraud can be put to better use in the healthcare system. The cost saving effects of deterrence are an important consideration when computing ROI and when allocating resources for future anti-fraud efforts.

In this paper, we discuss a recommended way to measure the value of anti-fraud efforts with a focus on ROI. Both the benefits and costs of anti-fraud work are required to compute ROI, but the accurate measurement of these values – particularly the benefit of these efforts – is not necessarily obvious. We demonstrate the importance of including deterrence values in ROI computations and provide a methodology by which to do so.

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<sup>1</sup> Definitions of pre- and post-payment can be found in the Introduction, on page [6 – final location may change].

<sup>2</sup> While healthcare misreporting may also occur unintentionally, the focus of this paper is on healthcare fraud.

We conducted interviews with Healthcare Fraud Prevention Partnership (HFPP) Partners to capture how ROI calculations are currently approached with a focus on deterrence. Among interviewed Partners, the measurement of ROI exhibited wide variation in whether deterrence was included and, if included, how deterrence was measured. A common issue noted with including deterrence in ROI was calculating accurate deterrence estimates. Because deterrence cannot be directly measured, in contrast to recovery, there may be lower confidence that estimates of deterrence are correct. When deterrence was included in ROI, conservative estimates were used to address concerns about accuracy.

This paper provides a framework to solve the challenging problem of measuring deterrence when evaluating anti-fraud efforts. We show, through both theoretical and data-driven results, that the monetary value of deterrence over time can far outweigh recovery dollars. Without disruption or prevention efforts, fraudulent activities may continue for years into the future. There is often a greater monetary impact with savings through prevention than through recovering dollars after fraud has occurred. This white paper summarizes insights from interviews with HFPP Partners on improving ROI measurements by including deterrence, engaging with leadership to communicate the importance of deterrence, addressing barriers to measuring deterrence, and other sources of value for anti-fraud efforts, such as health equity. It also illustrates the proposed methodology for measuring deterrence through three case studies involving cardiology fraud. Among these case studies, when both deterrence and recovery were included in returns, ROI was higher by a factor of 2 to 10 using a conservative calculation for the impact of deterrence compared to only including recovery in returns.

In the shift from a “pay and chase” model to a preventive model, organizations need to be able to demonstrate and communicate the value of preventing fraud. If ROI calculations exclude or undercount deterrence, then anti-fraud efforts are undervalued. This white paper proposes a data-driven methodology for measuring deterrence. Adoption of this standardized approach would facilitate meaningful comparisons of ROI across settings and support evidence-based decision making.

# INTRODUCTION

## Background

The Healthcare Fraud Prevention Partnership (HFPP) is a voluntary, public-private partnership between the federal government, state and local government agencies, law enforcement, private health insurance plans, and anti-fraud organizations that seek to identify and reduce fraud, waste, and abuse across the healthcare sector.<sup>1</sup> The HFPP facilitates the sharing of information and data across Partners, driving innovation to combat healthcare fraud.

The HFPP white paper series was developed to share information on issues relevant to fraud prevention with a broad audience. The series includes papers on fraud associated with COVID-19, genetic testing, clinical laboratory services, opioids, and telehealth. This white paper focuses on accurately capturing the value of efforts to combat healthcare fraud with a focus on return on investment (ROI) and deterrence.

## Objectives

Anti-fraud efforts are driven by the mission to ensure that resources are appropriately allocated to improve the delivery and cost of healthcare. Efforts to combat healthcare fraud are resource intensive, requiring investments in staff salaries, data analytics tools, legal costs, and other expenses. Anti-fraud efforts are fundamentally investments that generate financial returns and focus the delivery of healthcare on patient welfare. ROI captures net value relative to costs, is used to evaluate the performance of investments, and is calculated as net financial returns as a percent of costs. This metric helps inform how resources may be allocated for future anti-fraud efforts.

In this context, financial returns reflect both recovery and deterrence. For anti-fraud efforts, recovery refers to money reclaimed after fraud has occurred (e.g., administrative recoupment and settlements, offsets, and judgments). Recoveries may occur both during and after the payment process. Deterrence refers to money saved by stopping or preventing fraud through pre-payment detection, as well as changes in fraudulent behavior by providers post-enforcement due to the threat of being caught. An enforcement action may deter the type of fraud it specifically targeted, which is

## CONCEPTS OF FRAUD, WASTE, AND ABUSE

The concepts of fraud, waste, and abuse have significant overlap. Here, “fraud” refers to behavior in which information is intentionally misrepresented to increase earnings. We do not limit the definition of fraud to its use in the legal context. This behavior may involve the performance of inappropriate healthcare services, such as medically unnecessary procedures, and may impact the health of patients. Therefore, preventing fraud may concurrently save money and improve the quality of care for patients. When healthcare misreporting occurs unintentionally, it is not considered to be fraud.

referred to as “specific deterrence,” as well as healthcare fraud beyond the focus of the enforcement action, referred to as “general deterrence.”<sup>ii,iii</sup> An enforcement action may impact fraud broadly by bringing attention to the fact that fraud is being monitored and penalized.

Because enforcement actions may result in long-term reductions in fraud, savings from deterrence can far exceed recovery. Academic literature has confirmed these findings. Howard and McCarthy found that enforcement actions against implantable cardiac defibrillator fraud led to cost savings that were 10 times larger than the settlements received by the Department of Justice over 10 years.<sup>iv</sup> Similarly, Leder-Luis estimated that deterrence from a sample of whistleblower Medicare False Claims Acts lawsuits was nearly 10 times the amount of recovery over the first five years following each lawsuit.<sup>iii</sup>

It is less straightforward to measure the effects of deterrence than it is to measure recovery. Among interviewed HFPP Partners, there was wide variation in whether deterrence was included in ROI calculations and, if included, how it was captured. If deterrence is undercounted, it is difficult to demonstrate the importance and impact of program integrity efforts to executives and policymakers. This may result in program integrity and enforcement receiving inefficiently low funding and undermine efforts to assess how resources should be allocated to optimize these essential programs and initiatives. Moreover, as enforcement actions and pre-payment reviews become more sophisticated at detecting and reducing fraud, deterrence will increase relative to recovery, which can exacerbate the mismeasurement of ROI if deterrence is excluded. Moving towards a more standardized approach to measuring deterrence would help to address these issues, as well as allow for meaningful comparisons across different settings and facilitate healthcare payers learning from one another.

The National Health Care Anti-Fraud Association (NHCAA) has done important work to support the standardization of ROI methodologies for Special Investigations Units (SIUs) of private health insurers for use in their fraud investigations. Their published definitions of ROI terms and guidelines encourage consistent calculations of ROI across SIUs.<sup>vi</sup> This white paper builds on NHCAA’s work with a specific focus on deterrence. The objectives of this paper are to:

1. Summarize current approaches to measuring deterrence
2. Present a straightforward, defensible, and standardized method for measuring deterrence
3. Identify strategies for engaging with leadership on the value of fraud prevention
4. Discuss non-financial sources of value for anti-fraud efforts

## CONCEPTS OF PRE-PAYMENT AND POST-PAYMENT

**Pre-payment review** refers to efforts to eliminate waste and fraud conducted before a claim is paid, such as checking eligibility for services or enforcing prior authorization requirements.

**Post-payment review** is conducted after payment for a claim is completed. Examples include audits or administrative actions that review past claims.

# HFPP PARTNER PERCEPTIONS AND PRACTICES REGARDING DETERRENCE

We held interviews with a diverse set of HFPP Partners on their approach to calculating ROI for anti-fraud efforts. We interviewed executive leadership and key staff of federal, state, and private payers, healthcare anti-fraud associations, and law enforcement. The interviews focused on the measurement of costs, recovery, and deterrence. Interviews also addressed broader considerations for ROI, such as health equity and patient safety (discussed further in the Suggested Actions section).

During interviews, many Partners indicated that while deterrence is a larger driver of value than recovery, organizational priorities continue to emphasize recovery over deterrence; an example of this is budget structures that reward investigative units based on recovery. This practice has led to measurements of deterrence that downplay its value and undermine the effectiveness of ROI calculations as a tool for decision making.

## Prevention versus “Pay and Chase”

Most interviewed HFPP Partners discussed the importance of preventing fraud through deterrence rather than relying on “pay and chase,” a term which refers to recovering losses after fraud has occurred.<sup>vii</sup> One Partner shared, “We would fail if we were only going to focus on recoveries, because that is just not where the money is going to be saved. You need to be proactive and not reactive.” There was a broad consensus that deterrence is a driver of value for anti-fraud efforts.

Many interviewed HFPP Partners experienced challenges in presenting the importance of deterrence within their organizations. The challenges included both communicating the idea that deterrence effects matter and concerns that deterrence cannot be accurately measured. The first obstacle was captured in one Partner’s statement, “When you talk about dollars never spent as value, it is hard to get policymakers and legislators to appreciate that is something of value. Real money in anybody’s mind is what actually gets spent.” Another Partner expressed a similar sentiment, indicating that within the industry, they were aware of organizational pressures to focus on hard dollar recoveries. One Partner who found that there were reservations regarding the validity of deterrence measurements, shared, “Recoveries is always what the finance department likes to see because they can see the dollars in the bank.” While the Partners emphasized the importance of deterrence, many found that the value of deterrence was not universally recognized across or within organizations.

If deterrence is not captured in ROI, successes in preventing dollars from being spent on fraud may create the false perception of reduced effectiveness. In practice, the fewer dollars that are spent on fraud due to effective deterrence, the fewer dollars there are to recoup as recoveries. One HFPP Partner, whose ROI measurement did not include deterrence, observed their ROI dropping over time. They found the cause was “that we’re stopping more money before it goes out.” As an emphasis on prevention gains traction, it is important that its value is reflected in any ROI calculations.



## Conservative Methodologies for Measuring Deterrence

A common theme among the interviews was providing low estimates of deterrence savings to bolster their credibility and to counter skepticism about the amount. Several interviewed HFPP Partners expressed that the estimates may be too low, not fully representing the value of deterrence. One Partner stated, “I actually think we are probably overly conservative, because we don't want people to think we just made stuff up.” Another explained, “In all these categories we tried to be conservative, so we could defend the numbers. But we know there's probably additional savings beyond what we're tracking.” While it is appropriate to implement robust, defensible methodologies, reporting low measures of deterrence may undermine the understanding of the value of anti-fraud efforts. Moving towards an industry standard for measuring deterrence will assist in garnering support to apply accurate measures of deterrence and improved ROI calculations, which more fully capture the value of anti-fraud efforts.

## Funding Anti-Fraud Efforts

Organization funding structures for anti-fraud efforts may also reward recovery over deterrence. This is particularly true if departments are funded through recoveries. This may penalize prevention efforts as there are fewer dollars to recover if less fraud occurs due to deterrence or fewer fraudulent claims are paid. Ideally, organization resources would be allocated for anti-fraud efforts according to the value a program delivers, which includes both recovery and deterrence, and not in ways that favor “pay and chase” over prevention.

## Current Practices in Deterrence Measurement

Specific deterrence is measured by comparing an estimate of what spending would have been in the absence of an enforcement action (i.e., pre-period) to actual spending following an enforcement action (i.e., post-period). Spending on the relevant category of care in a pre-period is used to estimate what spending would have been in the absence of the enforcement action in a post-period.

Among interviewed HFPP Partners, while the measurement of costs and recovery were relatively similar, there was a wide variation in how they measured deterrence. As there are many components used in the measurement of deterrence, it is susceptible to a range of variances – particularly since there is not an industry standard for this measurement. Variation in how deterrence was measured included which enforcement actions deterrence is calculated for, how pre- and post-periods are defined, and how relevant spending is defined. Table 1 shows examples of deterrence measurements provided during Partner interviews. For each of these examples, the estimate of spending in the absence of the enforcement action was spending in the pre-period. That is, it was assumed that spending would not have changed between the pre-period and the post-period in the absence of an enforcement action.

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<sup>6</sup>HIPAA [Privacy](#) and [Security](#) Rules  
[State Medicaid & CHIP Telehealth Toolkit](#): Policy Considerations for States Expanding Use of Telehealth; COVID-19 Version.

**Table 1: Examples of Deterrence Considered by Interviewed HFPP Partners**

Enforcement Action	Pre- and Post-Periods Used	Relevant Spending
Termination of a provider from a network	1 year pre- and post-periods	Claims for patients who received care at the terminated provider in the pre-period
Termination of a provider from a network	1 year pre-period, 10 years post-period	Claims billed by the terminated provider
Sanction against a provider	Baseline period 12-6 months prior to the sanction Post-period 6-12 months following the sanction	Claims billed by the sanctioned provider
Revocation of a provider's billing privileges	Post-period: lesser of the length of the action and 3 years	Claims for patients who historically received care at the relevant provider
Claims edit	NHCAA standard: lesser of the length of the scheme and 1 year	Claims affected by the edit
Rate setting audits for cost-based reimbursement	Not specified	Claims affected by the rate change
Referrals to law enforcement	1 year post-period	A fraction of the estimated exposure; the fraction reflects the share of cases which have historically resulted in a success
Provider educational letters	1 year pre- and post-periods	Claims from the billing provider

This table reflects the wide variance in how interviewed Partners calculated deterrence. Notably, Partners calculated deterrence for different sets of enforcement actions and measured deterrence over different time periods. For certain Partners, post-periods reflected how long fraud would have been expected to continue in the absence of the enforcement action, while others used fixed time periods across all enforcement actions. This contrasts with the measurement of costs and recovery, which was generally standardized across Partners.

### Use of Return on Investment in Decision Making

The measurement of deterrence matters because ROI informs how resources are allocated. When there are accurate and standardized measures of ROI across projects and teams, ROI can be used to help effectively allocate resources. If deterrence is not accurately measured, it can cause distortions in how value is perceived and incentivize recovery over total cost-savings.

Interviewed HFPP Partners reported and engaged with ROI in a multitude of ways. Not all Partners calculated a formal ROI. Among those who did, there was a wide spectrum in how ROI was used in decision making. Some Partners built ROI directly into the decision-making process. Several Partners used ROI to determine where to allocate staff or to support requests for more staff or resources for specific activities. One Partner found, “When we're asking for new positions, we are often asked what the impact of those positions are likely to be, so we can justify getting more positions.” While some Partners regularly used ROI metrics to help guide the allocation of resources, this was not universally true.

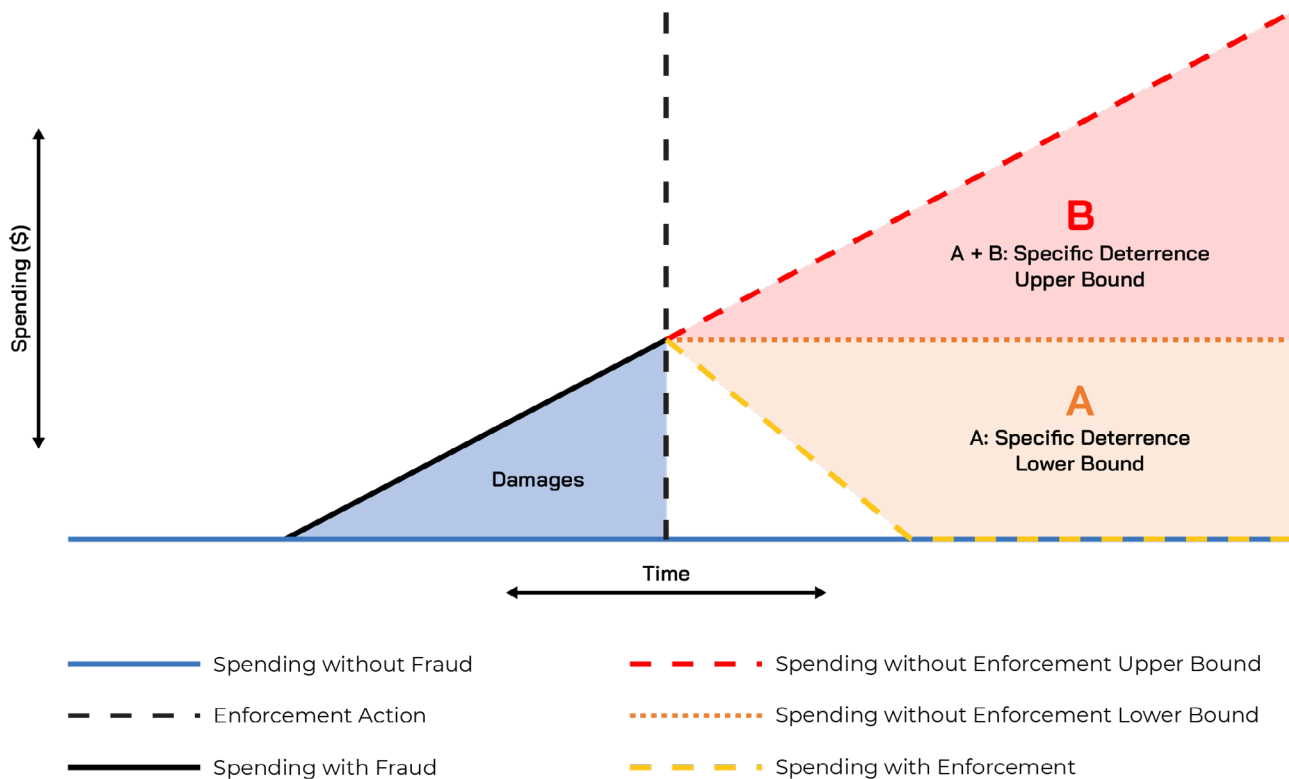
# UNDERSTANDING DETERRENCE: ECONOMIC THEORY AND PRACTICE

The next sections seek to provide guidance on how to think about, understand, and measure deterrence, using both economic theory and case studies. These case studies are followed by a practical guide for how Partners can implement this study's methodology for their own measurements.

## Economic Model

Figure 1 provides a theoretical framework to understand the relative value of deterrence and recovery. Since deterrence may prevent fraud for many years and affect activity beyond the focus of an enforcement action, it can exceed the value of recovery.

**Figure 1: Cost Savings from Enforcement Actions**



Notes: Figure 1 presents a framework for understanding the relationship among spending, damages, and specific deterrence. Spending with fraud increases over time, up to the point of the enforcement action (the vertical dashed line). After the enforcement action, spending decreases. Damages are the amount of money spent before the enforcement action above the level that would have been spent without fraud. Using the shaded areas A and B, we can estimate how much more would have been spent absent enforcement. As those costs were averted due to the enforcement action, they are estimated bounds for the specific deterrence amount.

In Figure 1, time is represented along the horizontal axis. Spending on a given category of care in which fraud occurs is represented along the vertical axis. Spending increases over time after fraud begins and decreases after the enforcement action.<sup>3</sup>

When fraud occurs, the payer incurs the financial loss of the difference between spending with fraud and what spending would have been in the absence of fraud. This amount corresponds to the blue triangle labeled “Damages.” In the case of successful enforcement, recoveries are dollars recouped from the damages and often include additional penalties. Damages may still be greater than recoveries if recoupment efforts are not successful for all parties engaged in fraud.

There may be a reduction in fraud in response to the enforcement action, which generates a deterrence effect. Specific deterrence is the difference between what spending would have been in the absence of the enforcement action and actual spending after the enforcement action. To estimate specific deterrence, we need to estimate what spending would have been in the absence of the enforcement action. We cannot directly observe this. One straightforward approach is to place upper and lower bounds on what that level of spending would have been.

One possibility is that in the absence of the enforcement action, spending would have remained constant (i.e., would not continue to grow). This flat line projection is a lower bound on what spending would have been in the absence of the enforcement action under this assumption. The shaded area A in Figure 1 is the corresponding lower bound on specific deterrence.

In the absence of the enforcement action, spending would potentially plateau over time. A linear projection is an upper bound on what spending would have been in the absence of the enforcement action. The sum of the shaded areas A and B is the corresponding upper bound on specific deterrence.

General deterrence is not present in Figure 1. Suppose, for example, that a provider committing fraud on Procedure A is criminally prosecuted; Figure 1 would show how to measure *specific* deterrence for Procedure A. However, if other providers who conduct a different procedure (Procedure B) learn about this enforcement and decide to stop committing fraud on Procedure B (or not to start in the first place) due to the threat of being caught, this general deterrence effect would be an additional value that is challenging to quantify and further not reflected in Figure 1. General deterrence is challenging to measure but is also a potentially large benefit of anti-fraud efforts.<sup>iii</sup> The fact that general deterrence is not measured means that the specific deterrence values presented in this methodology are, broadly, lower-bound estimates of the total savings that enforcement actions provide for the healthcare system.

Importantly, Figure 1 raises the question of which types of care are measured as related to spending. Table 1, which details examples of interviewed HFPP Partner measurement methodologies, includes examples where Partners only used claims from the entity subject to fraud enforcement. Deterrence effects can expand beyond entities directly subject to anti-fraud efforts. For example, other entities may alter their behavior due to changes in the perceived risk of being caught and penalized. It is important to consider the full range of spending that could be altered by the enforcement action, such as the

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<sup>3</sup>This structure is relevant for fee-for-service settings, rather than capitated payment settings.

total regional spending on a procedure where fraud was known to occur.

## Case Studies

To illustrate the proposed methodology for measuring deterrence, and to provide a practical reference, we conduct three case studies. Two are included in the body of the paper, with an additional case study in the Appendix, showing how the proposed methodology can be used even when spending is decreasing prior to the enforcement action. We use Medicare cardiology fraud as the setting for our example case studies and begin with a large, nationwide enforcement action. The second and third case studies focus on more limited enforcement actions targeting a single provider. The proposed methodology is appropriate for anti-fraud efforts of any scale. A detailed methodology is provided below the case studies.

These case studies show the importance of measuring deterrence and its inclusion in ROI. In these case studies, ROI increases by a factor of 2 to 10 (lower bound) when deterrence is included, relative to only including recoveries.

## Data

We identified potential case studies by conducting keyword searches of press releases from the Department of Justice<sup>x</sup> and the U.S. Department of Health and Human Services Office of Inspector General,<sup>x</sup> as well as the List of Excluded Individuals and Entities from federally funded healthcare programs.<sup>xi</sup> We supplemented information from these sources using court records from the Public Access to Court Electronic Records (PACER) database.<sup>xii</sup> For the analysis, we used data from the Centers for Medicare & Medicaid Services Integrated Data Repository (IDR), which includes Medicare Parts A, B, C, D, and durable medical equipment (DME) enrollment and claims files.<sup>xiii</sup> We selected case studies where there was sufficient data prior to and following the enforcement action in the IDR to establish a long-term trend.

## Implantable Cardioverter Defibrillators

For this first case study, we find that the measured ROI of the enforcement action is up to roughly 10 times higher when deterrence is included, as compared to only including amounts recovered.

Implantable cardioverter defibrillators (ICDs) are surgically implanted medical devices used in patients with arrhythmia, a cardiac disorder characterized by irregular heartbeats. An ICD continuously monitors a patient's heart rate and administers an electric shock to the heart if it detects an irregular rhythm. A whistleblower lawsuit was filed in 2008 against hundreds of hospitals for submitting false claims to Medicare for medically inappropriate ICDs. The lawsuit was filed under seal, and defendants were not notified until 2013. The lawsuit resulted in two rounds of settlements. In October 2015, settlements were reached with approximately 500 hospitals totaling over \$250 million.<sup>xiv</sup> In February 2016, settlements were reached with an additional 51 hospitals for over \$23 million.<sup>xv</sup> Notably, other researchers have also studied ICD overuse and measured ROI using data from Florida; we discuss how our results relate at the end of this section.<sup>iv</sup>

We consider the effect of the lawsuit on spending on the implantation, removal, and revisions of ICDs. ICDs are commonly inserted during elective outpatient procedures but may also be inserted during acute hospitalizations, such as for heart failure.<sup>xvii</sup> We focus on outpatient procedures, where there is a larger scope for discretion. We do not observe a response in inpatient dollars to the whistleblower lawsuit filed in 2008.

A reduction in one type of care in response to an enforcement action may result in a shift to substitute care. Wearable cardioverter defibrillators are devices that may be used for patients who are not appropriate candidates for ICDs.<sup>xviii</sup> There was not an increase in the use of wearable cardioverter defibrillators after the lawsuit. Therefore, we focus on the effect of the lawsuit on ICDs. We include the details for how relevant claims are identified in the footnote below.<sup>4</sup>

**Figure 2: Deterrence Effect of Enforcement Action: Implantable Cardioverter Defibrillators**

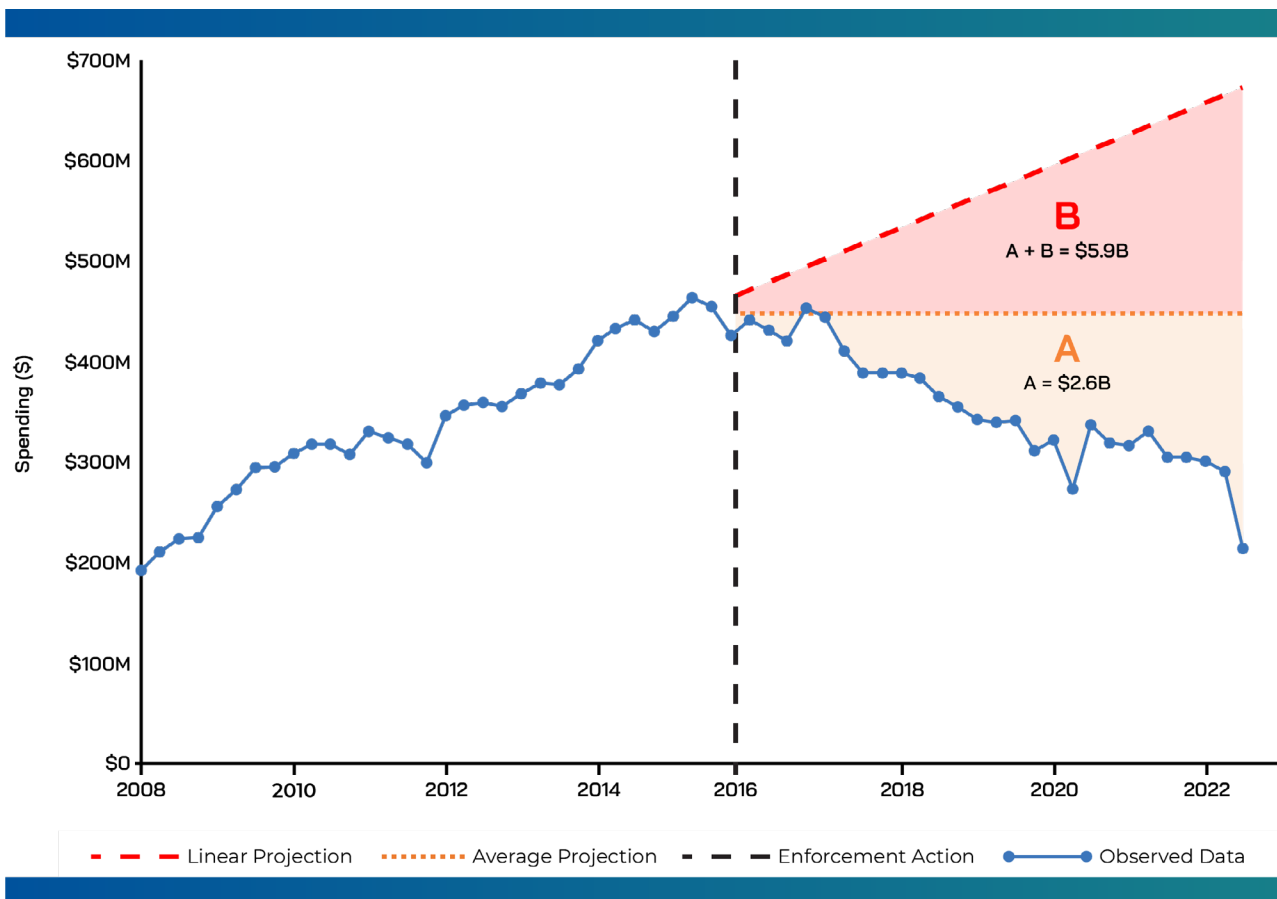


Figure 2 illustrates the specific deterrence effect of the lawsuit among all providers in the database – that is, the savings from the prevention of medically unnecessary ICDs that would have continued in the absence of the lawsuits. For smaller scale enforcement efforts, it may be appropriate to only consider the providers directly targeted by the enforcement action and other providers in the local region.

Time is represented along the horizontal axis, and spending is represented along the vertical axis. The black vertical dashed line marks the first round of settlements in October 2015. The blue dotted line indicates actual spending on ICDs over time.

<sup>4</sup>We identify claims for ICD implantation using the CPT codes 33223, 33230, 33231, 33240, 33249, 33270, and 33271. We identify claims for ICD removal using CPT codes 33240-33244, 33262-33264, and 33272. We identify claims for revisions using the CPT code 33273. The spending was driven by ICD implantations.

The orange dashed line is the average of spending from October 2014 through October 2015. It is a lower bound on what spending would have been in the absence of the lawsuit. The orange shaded area A, which is the difference in spending below that average, is a lower bound of the specific deterrence effect of the lawsuit. Over six years, the lower bound on specific deterrence was approximately \$2.6 billion.

The red dashed line is a linear projection of spending from January 2008 to October 2015. It is an upper bound on what spending would have been in the absence of the lawsuit. The sum of the orange shaded area A and the red shaded area B is an upper bound of the specific deterrence effect of the lawsuit, which is the difference between the upper bound of estimated spending and the actual spending. Over six years, the upper bound on specific deterrence is approximately \$5.9 billion.

If deterrence is not included, the ROI would only include the \$275 million recovered from the settlement as the value of the enforcement, weighed against the costs of the enforcement action. If the lower bound of deterrence (an additional \$2.6 billion) is included, the measured ROI of the enforcement action is roughly 10 times higher when compared to the same costs. If the upper bound of \$5.9 billion is included, the ROI is roughly 21 times higher. These results are consistent with a previous study, which finds similar magnitudes of deterrence in a case study of ICD fraud using data from Florida.<sup>iv</sup> In addition to ROI, the potential for patient harm from unnecessary ICDs is another important consideration, though beyond the scope of this study.

## Implantable Cardiac Monitors

For the implantable cardiac monitor (ICM) study, ROI is up to almost double when deterrence is included, as compared to only including recovery.

An ICM is a medical device used for diagnosing arrhythmia and can continuously monitor heart rhythm for up to three years. Beginning in 2014, ICMs small enough to be considered “injectable” were introduced to the market. The reduction in size of these devices made them easier to implant.<sup>xx</sup> Other research found a significant increase in the number of ICM placements in 2014 in a national sample of commercial claims.<sup>xxi</sup>

In March 2017, a whistleblower filed a lawsuit against Tenet Healthcare Corporation and its hospital, Desert Regional Medical Center, for billing Medicare for medically unnecessary ICMs. The alleged fraud occurred between 2014-2017, and the case was settled in February 2020 for \$1.41 million.<sup>xxii</sup> The beginning of the alleged fraud aligns with the introduction of “injectable” ICMs. We study the effect of the lawsuit on spending for ICMs and include spending on the implantation, removal, and evaluation of ICMs.

The closest category of care to ICMs are external electrocardiogram (ECG) monitoring devices. Although they are unable to record for as long as ICMs, they are less invasive and less expensive.<sup>xxiii</sup> In our review of the data, we do not find evidence of a simultaneous shift to external ECG monitoring devices. Therefore, we focus on the effect of the lawsuit on ICMs.<sup>5</sup>

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<sup>5</sup> We identify claims for the implantation of ICMs using CPT codes 33282 and 33285. We identify claims for the removal of ICMs using CPT codes 33284 and 33286. We identify claims for the evaluation of ICMs, to ensure the devices are functioning properly, using CPT codes 99285, 93291, 93298, 93299, G2066, and 0650T.



**Figure 3: Deterrence Effect of Enforcement Action: Implantable Cardiac Monitors**

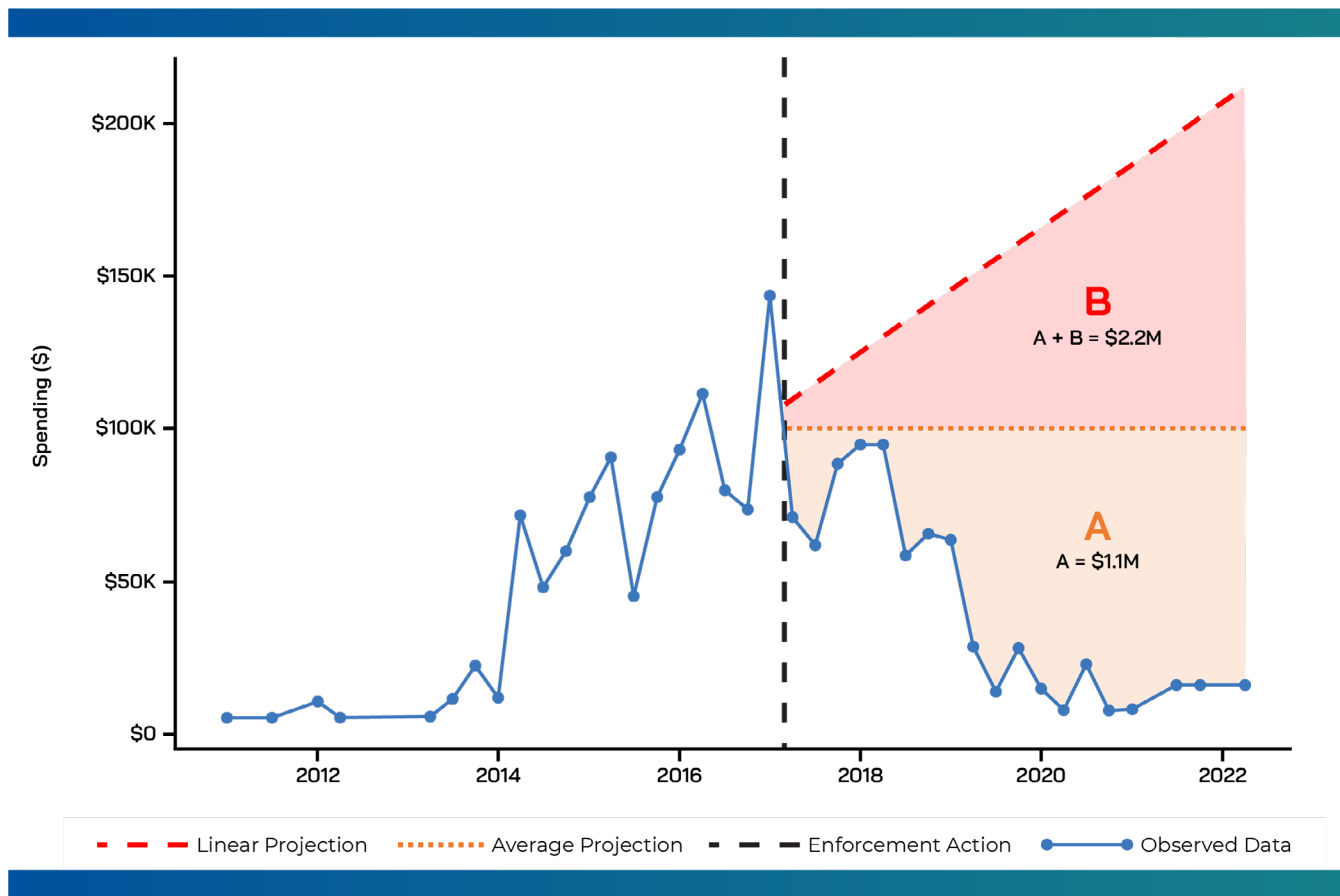


Figure 3 illustrates the effect of the lawsuit on spending on ICMs at the Desert Regional Medical Center. We did not find evidence that other providers in the same geographic region responded to the settlement.

The figure follows the same format as the previous case study figure. Time is represented along the horizontal axis, and spending is represented along the vertical axis. The black vertical dashed line marks the filing of the lawsuit in March 2017, and the blue line shows spending on ICMs at the indicated medical facility over time.

The orange dashed line shows the spending average from March 2016 – March 2017. It is a lower bound on what spending would have been in the absence of the lawsuit. The orange shaded area A is a lower bound of specific deterrence effect of the lawsuit, which is the difference between the lower bound of what spending would have been and actual spending. Over five years, the lower bound on specific deterrence was approximately \$1.1 million. This is in addition to recoveries of approximately \$1.4 million from the settlement.

The red dashed line is a linear projection of spending from January 2014 – March 2016. We do not include earlier years with negligible spending on ICMs as they are not relevant for predicting future spending. This linear projection is an upper bound on what spending would have been in the absence of the lawsuit. The sum of the orange shaded area A and the red shaded area B is an upper bound of the specific deterrence effect of the lawsuit. Over five years, the upper bound on specific deterrence is approximately \$2.2 million.

If specific deterrence were not included, the ROI for this case would only be the \$1.41 million settlement minus costs, divided by the cost of the case. However, if we include the lower bound of deterrence of \$1.1 million in the return value, the ROI is nearly doubled. If we include the upper bound of deterrence, \$2.2 million, it is four times as high. In addition to increased ROI, deterrence can provide the additional benefit of reducing the potential for patient harm from unnecessary ICMs.

## Summary of Methodology for Measuring Deterrence

Next, we detail how similar methodology can be applied for measuring ROI for anti-fraud efforts.

1. For a given enforcement action, pull relevant data for spending affected by the fraud.
  - a. Depending on the context, it may be appropriate to include both spending from the targeted entity and from other entities in the same geographic area. It is appropriate to include all entities whose spending changed at the time of enforcement. There may be mechanisms by which an enforcement action taken against one entity is expected to affect the behavior of other entities. These include publicity, such as press releases or news exposure, educational outreach, and the sharing of information by the targeted entity. It is important to critically examine the data for its appropriateness for predicting future spending. For example, there may be early years of low utilization, which should be excluded.
  - b. Enforcement actions that reduce spending on one type of care may result in increases in a separate, substitutable type of care. This should be assessed using clinical guidance and data analysis. One HFPP Partner suggested checking for newly billed procedure codes. If this is the case, the outcome should be total spending on both types of care.
2. Visually inspect the long-run trend for a sudden change following the enforcement action.
  - a. Interviewed HFPP Partners expressed concern about being able to isolate the effects of an enforcement action on spending, with the potential for other factors to affect spending. Analysts can check for other sources of change, such as changes in billing codes or payment rates.
  - b. Even without sophisticated statistical techniques, visual inspection of trends in spending can be highly informative.
3. To estimate one bound of the deterrence effect, create a linear projection of historical spending prior to the enforcement action. In the case that historical spending was increasing, this represents a reasonable upper bound on what spending would have been in the absence of the enforcement action. In the case that historical spending was decreasing, this represents a reasonable lower bound on what spending would have been in the absence of the enforcement action.<sup>6</sup> The bound of the deterrence effect is the area between the linear

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<sup>6</sup> See the Appendix for an example where spending was decreasing before the enforcement, and therefore, the linear projection forms a lower bound.

projection and actual spending following the enforcement action.

4. To estimate a second bound of the deterrence effect, create the average (mean) projection of historical spending from the year prior to the enforcement action. In the case that historical spending was increasing, this represents a reasonable lower bound on what spending would have been in the absence of the enforcement action. In the case that historical spending was decreasing, this represents a reasonable upper bound on what spending would have been in the absence of the enforcement action. The bound of the deterrence effect is the area between the average projection and actual spending following the enforcement action.
5. Interviewed HFPP Partners also expressed concern about identifying the appropriate timeframe to measure deterrence. This will depend on the specific context of the enforcement action. It should reflect the time the fraud would be expected to continue in the absence of the enforcement action. Other research by Leder-Luis uses a five-year window to estimate deterrence effects from Medicare fraud whistleblower lawsuits, in recognition that spending on a given type of fraud may level out over time.<sup>iii</sup> Present-value discounting may be used for funds across long time periods in alignment with accounting standards.

# IMPORTANCE OF DATA AND ANALYTICS

The case studies above highlight the importance of using data for successfully measuring ROI and deterrence. Interviewed HFPP Partners shared a number of challenges they face when implementing anti-fraud efforts due to the complexities of working with health data and the challenging nature of statistical analysis.

Complete and accurate data, analyzed correctly, is critical for the successful valuation of anti-fraud efforts. When incomplete data is used, it can distort calculations, rewarding certain categories of cost savings over others. When there are such limitations, it is important to account for them when interpreting and presenting ROI. Differences in ROI calculations are most informative when they reflect differences in true return, rather than differences in data or methodology. Data sharing initiatives, such as those by the HFPP, can be valuable resources. While it takes resources to produce analytics to support ROI calculations, there is a large upside to having actionable information.

Data completeness includes capturing return across the entire length of an initiative. One HFPP Partner used the example of an investigation, which may have a long life cycle that includes appeals and court actions. While costs can accumulate across time, there may also be different cost savings along the life cycle of an initiative. While a project may begin with a negative return, it may generate a positive return across time, which highlights the importance of tracking ROI across the full span of an initiative.

Building a data pipeline for the measurement of deterrence can also provide positive spillovers onto other efforts, such as the use of machine learning. Machine learning is a powerful tool to support the optimization of anti-fraud efforts. One HFPP Partner leveraged machine learning and data on outcomes to optimize which fraud leads they pursue. They stated: "If we had a lead picked up, what are all the actions that take place? And did they end up with an outcome like an administrative action that was taken? And then ultimately ... what is the true financial savings [?]" The more accurate the information used as an input for machine learning algorithms, the more accurate the results.

# SUGGESTED ACTIONS

Interviewed HFPP Partners shared challenges they faced in calculating ROI and communicating the importance of deterrence, data, and ROI measurement, along with strategies for addressing those challenges. We summarize recommendations, informed by insights from interviewed HFPP Partners, below.

## Recommendations

If an organization does not currently calculate ROI, it can begin by focusing on incremental steps, such as gaining data access, measuring costs, and measuring changes in claims payments. If ROI is already regularly used in an organization, it is important to standardize ROI computation across different settings and ensure that like-to-like comparisons are made across all projects and teams. Ultimately, standardizing ROI across organizations would provide the opportunity for analysis across diverse settings. It is also crucial to continue to build robust data pipelines and teams capable of analyzing them. When calculating ROI, we suggest including deterrence and adopting the methodology for estimating it presented in this paper. The proposed methodology is defensible, straightforward, and offers a standardized approach across different settings. Even if alternative approaches are used, this study shows that deterrence cannot be ignored without potentially serious distortions to ROI estimates.

Interviewed Partners also highlighted the need to communicate the value of prevention versus the “pay and chase” model. They suggested centering discussions on how measuring ROI supports the organization in meeting its overall goals. This approach will support the case to capture the value of fraud prevention in ROI.

Finally, interviewed Partners discussed how to integrate ROI into the decision-making process as it provides evidence-based direction. One approach is to leverage real-time and ad hoc analyses tailored to the needs of decision makers. ROI may be used to improve how funding is allocated across teams and projects. When using ROI for decision making, Partners also referred to the need to consider ROI within the context of other priorities, such as health equity and patient safety (discussed further in the Health Equity and Patient Safety sub-section).

We further expand on issues related to engaging with leadership and non-financial considerations for anti-fraud efforts below.

## Engaging with Leadership

Interviewed HFPP Partners emphasized the importance of actively engaging with leadership on issues affecting anti-fraud efforts. Several Partners also discussed the importance of connecting ROI with larger organization goals. One Partner focused on making it clear how “the investments that are being made are driving activities that we're taking and resulting in real-world success.” Another valuable strategy is to integrate analytics into the decision-making process. One Partner stressed the importance of human-centered design, providing numbers in real time, and having the flexibility to produce ad hoc analysis to support decision makers. Actively communicating the value

of deterrence and identifying ways to integrate ROI calculations into decision making processes may facilitate buy-in from executives and policymakers.

Interviewed HFPP Partners also shared that moving towards an industry-wide standard for measuring deterrence would improve the confidence of leadership in the validity of the estimates. This may reduce the pressure to further discount deterrence estimates. One Partner stated, “If there was a standardization, then there could be more buy-in around what you’re delivering on prevention and being able to capture more of that.” Adoption of the methodology proposed in this paper would help move towards an industry-wide framework for measuring deterrence.

## Health Equity and Patient Safety

Executives and policymakers charged with running health insurance programs often must consider topics beyond ROI in evaluating the effects of anti-fraud efforts. Health equity, including access to care, is a major concern that is not directly reflected in ROI. Anti-fraud efforts could either undermine or improve health equity. Interviewed HFPP Partners emphasized that it was important to identify and mitigate potential negative consequences of anti-fraud efforts. This included having an awareness of the different communities impacted by fraudulent activity. A common concern among interviewed Partners was geographic access to providers and network adequacy. Anti-fraud efforts may limit patient access to care, such as when a provider is terminated from a network. This is particularly a concern in rural areas. Many interviewed Partners considered the effects of access to care when choosing enforcement actions. Anti-fraud efforts can also advance health equity, such as when dollars that are diverted from fraud become available to fund better care (e.g., increased access to care or additional funding for social services). Fraud also erodes trust in the healthcare system, which can adversely affect access, particularly among vulnerable populations. Leaders should consider the equity effects of anti-fraud efforts alongside ROI calculations.

Patient safety is another non-financial consideration that must be weighed alongside ROI for anti-fraud efforts. Fraudulent behavior may cause harm to patients, such as when risky and unnecessary procedures are performed for the sole purpose of billing additional claims. This is particularly true for cases where patient harm is the central issue. Examples of patient harm include the over-prescription of opioids and adverse effects from unnecessary procedures. Rather than cost savings, the primary motivation in pursuing potential fraud cases involving patient harm is to support the patient. One Partner shared, “From a budget context too, everybody always asks about the numbers, but the quality of life that’s being impacted is massive.” Improving the quality of life of patients was central to the mission of all the Partners we interviewed.

# CONCLUSION

When considering the ROI of anti-fraud efforts, policymakers must be aware that the cost-saving effects of deterrence over many years can far outweigh recovery. Among the case studies in this white paper, deterrence increased the measured ROI by a factor of 2 to 10 (lower bound), consistent with previous academic estimates. As anti-fraud policies shift toward prevention instead of a “pay and chase” model, the inclusion of deterrence in ROI calculations becomes important for exhibiting the value that anti-fraud actions provide. If deterrence figures are not captured, improvements to prevention resulting in lower recoveries may be interpreted as worsening performance.

Within conducted interviews for this report, another consideration beyond simple ROI computation was pursuing prevention activities that do not have directly measurable deterrence value. This includes activities to maintain deterrence across all areas of a program. One interviewed HFPP Partner recognized the value in funding activities that, “Maybe they can't produce a direct return, but they're needed to make the whole plan and approach foolproof.” Another Partner emphasized, “I've said time and time again that we need to partake in activities throughout all areas of the program.” This ties to the previous discussion on “general deterrence”: activities that deter fraud can have large, though hard-to-measure, effects. Examples include educational campaigns and press releases that detail civil settlements or criminal sentences for fraud.

An industry-wide standard for measuring deterrence would support the use of ROI to help effectively allocate resources for anti-fraud efforts and facilitate learning across organizations by allowing for meaningful comparisons of ROI. The NHCAA has established a strong foundation for this through their published definitions of ROI terms and guidelines.<sup>vi</sup> However, our work differentiates itself from the NHCAA guidelines in its focus on deterrence, its data-driven approach for estimating deterrence directly, and the idea that deterrence is potentially greater than recovery – particularly over time. This paper proposes a standardized methodology for measuring deterrence, building on interviews from HFPP Partners, who represent multiple industry perspectives. Adoption of the proposed standardized methodology aligns with the movement to focus on prevention rather than “pay and chase” in the healthcare fraud space and will support evidence-based decision-making capabilities.

# APPENDIX

## Nuclear Stress Tests

Here, we present an additional case study that allows for a computation of deterrence. Notably, spending was decreasing prior to enforcement, which provides an important example that may be instructive for future applications of this method.

Consistent with the main results in the paper, inclusion of deterrence makes the ROI for this case study nearly four times higher, relative to only including amounts recovered. Cardiac stress tests monitor how the heart performs during exercise or pharmaceutically induced cardiovascular stress. These tests are used in the diagnosis of certain cardiovascular diseases. Nuclear stress tests are a type of cardiac stress test involving the injection of a radioactive tracer to allow for imaging of coronary blood flow.

Nuclear stress tests are appropriate to be used as follow-up testing for patients with suspected heart disease.<sup>xxvi</sup> A complaint was made against the California-based Cardiovascular Consultants Heart Center, alleging that between 2010 and 2015, they referred patients for nuclear stress tests annually without first determining medical necessity. The U.S. Department of Health and Human Services Office of Inspector General was involved in an investigation into the provider, which resulted in a \$1.2 million dollar settlement, signed in November 2017.<sup>xxvii</sup> We explore the effect of the settlement on spending on nuclear stress tests.<sup>7</sup>

The clearest candidate for substitute care for nuclear stress tests is cardiac stress tests without nuclear imaging. We did not find evidence that there was a shift to cardiac stress tests without nuclear imaging in response to the settlement.

The figure below illustrates the effect of the investigation on spending on nuclear stress tests at the Cardiovascular Consultants Heart Center. We did not find evidence that other providers in the same geographic region responded to the investigation.

The figure follows the same format as the figures from the previous two case studies. Time is represented along the horizontal axis, and spending is represented along the vertical axis. The black dashed vertical line marks the approximate beginning of the investigation in January 2016. The blue line indicates spending on nuclear stress tests at the Cardiovascular Consultants Heart Center over time. While there was a slow decline in spending before the investigation, there is a significant drop-off at the beginning of the investigation. This is suggestive of spending declining more rapidly than it would have in the absence of the investigation.

The red dashed line is a linear projection of spending from January 2008 to January 2016. It is a lower bound on what spending would have been in the absence of the investigation. The area B reflects the difference between this estimate and actual spending. Over 4 years, the lower bound on specific deterrence was approximately \$3.6 million.

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<sup>7</sup>We identify claims for nuclear stress tests using both CPT codes for cardiac stress tests and CPT codes for nuclear imaging. If cardiac stress tests and nuclear imaging occur on the same day for the same patient, we consider the grouped claims to be a nuclear stress test. We identify cardiac stress tests claims using CPT codes 93015-93018. We identify nuclear imaging claims using CPT codes 78451-78454, 78460, 78461, 78464-78466, 78468, 78469, 78472, 78473, 78478, 78480, 78481, 78483, 78494, and 78496.

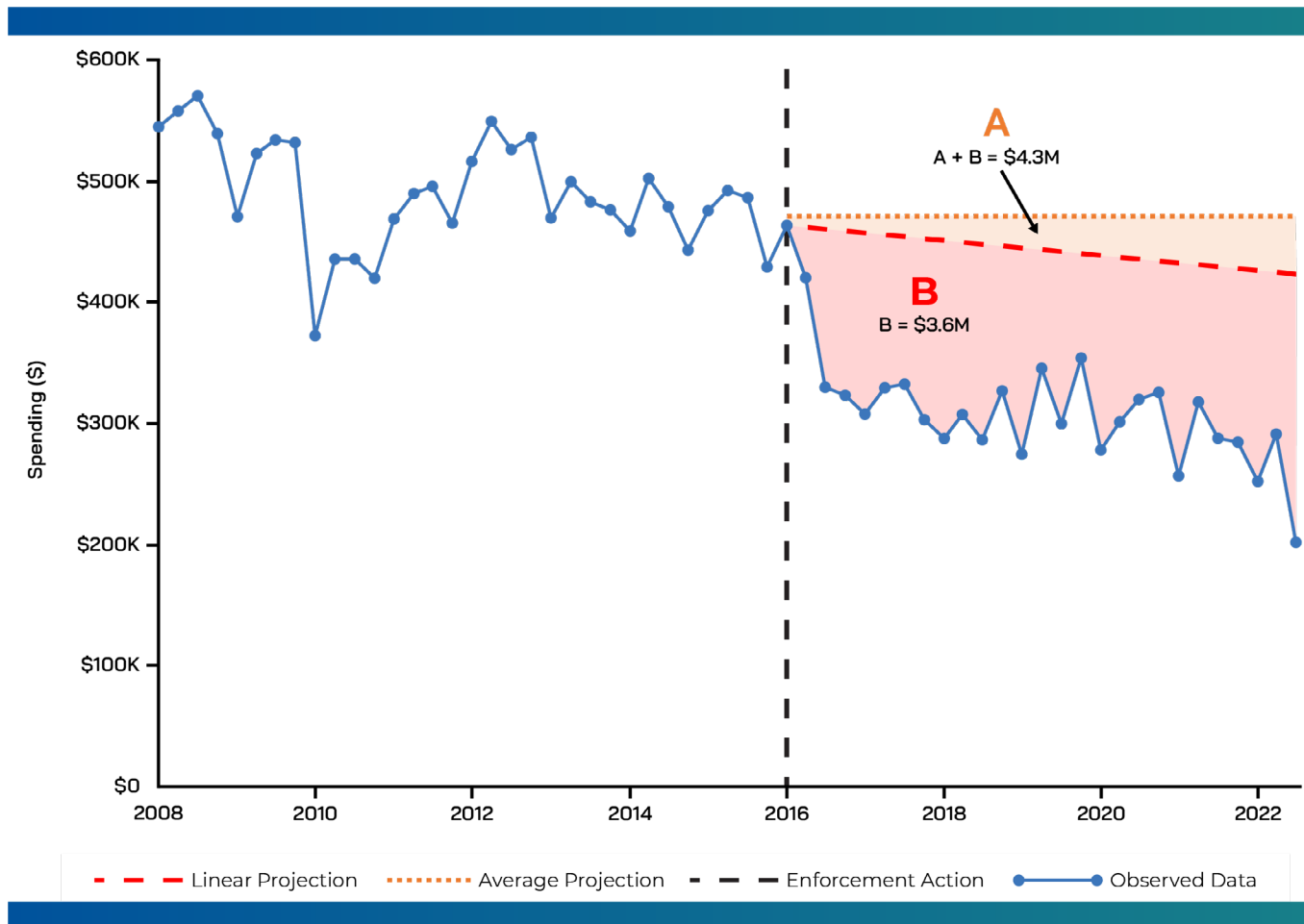


The orange dashed line is the average (mean) of spending from January 2015 to January 2016. It is an upper bound on what spending would have been in the absence of the investigation. The sum of the orange shaded area A and the red shaded area B is an upper bound of the specific deterrence effect of the investigation. Over four years, the upper bound on specific deterrence is approximately \$4.3 million. This is relative to recoveries of approximately \$1.2 million from the settlement.

If specific deterrence was not included, the ROI for this case would be the difference between the settlements and costs, or \$1.2 million minus the cost of the case, divided by the cost of the case. If we include the lower bound of deterrence of \$3.6 million, the ROI is up to nearly four times higher. This deterrence action has value beyond ROI by reducing the potential for patient harm from unnecessary nuclear stress tests.

In contrast to the case studies above, note that when spending is decreasing before the intervention, the same methodology can be used; however, the linear projection gives the lower bound, while the average (mean) projection gives the upper bound because the linear projection is below the average.

**Figure A1: Deterrence Effect of Enforcement Action: Nuclear Stress Tests**



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