

Cracking down on government fraud with data analytics

New data tools are giving government agencies the upper hand in taming fraud, waste, and abuse. Lessons from scaled approaches show how to capture the hundreds of billions of dollars at stake.

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Crime, the old saying goes, does not pay. Or does it? Within US federal government programs, for example, fraud, waste, and abuse (FWA) are widespread, largely unmeasured, and a growing drain on taxpayers and citizens, reducing the effectiveness of government services. Given how difficult it is to identify and measure fraudulent activity, the precise extent of monetary losses is not known. Yet consider that the US government each year makes more than \$140 billion¹ of improper payments—defined broadly as those funds that go to the wrong recipient, for the incorrect amount, for which documentation is not available, or that

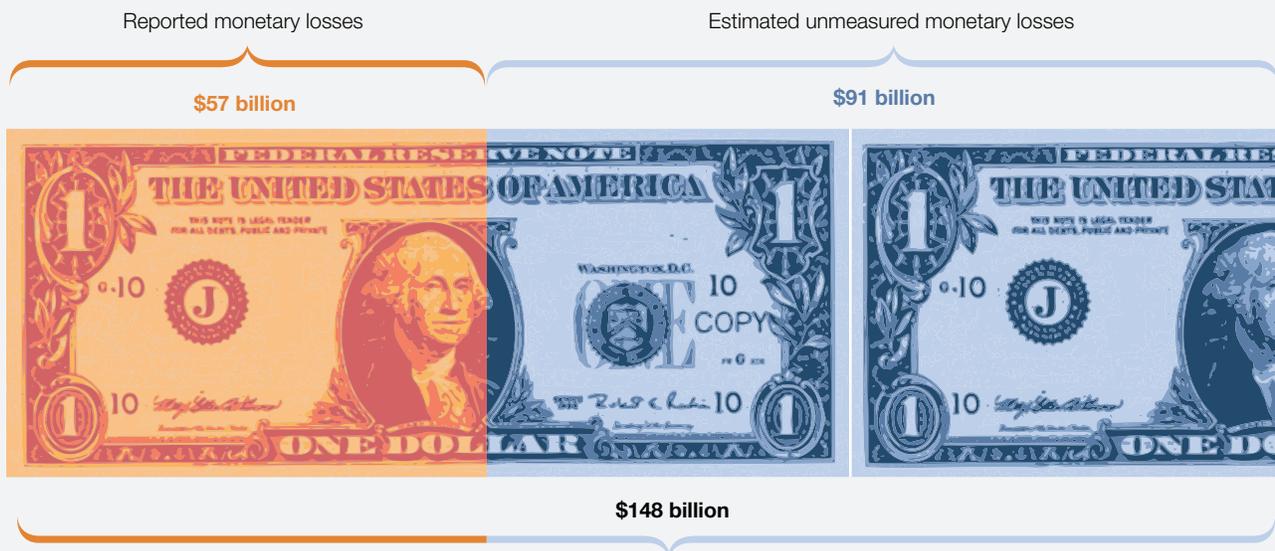
the recipient uses improperly. Many of these payments are essentially paperwork errors, but about 40 percent result in a monetary loss to the government. Add in payments that are intentionally misspent or directed to the wrong recipient, and some experts estimate federal government losses from potential fraud at nearly \$150 billion (Exhibit 1).

Such estimates frame the size of the opportunity that better policing could capture for governments everywhere. In the United States, fraud, waste, and abuse against federal agencies takes many forms, including identity theft by criminals who submit

Exhibit 1

More than half of monetary losses to fraud, waste, and abuse go undetected.

A breakdown of missing US government funds through fraud, waste, and abuse in 2017, \$ billion



Analytics can both prevent and treat measured loss more efficiently and detect additional unmeasured loss.

Source: The Association of Certified Fraud Examiners annual fraud, waste, and abuse (FWA) report, 2018; independent analysis of government programs; Paymentaccuracy.gov

fraudulent tax forms to steal someone else’s refund, wasted procurement and healthcare spend due to devious third-party providers, and an inability to identify redundant payments or payments for services that did not occur. More than 70 percent of these losses come from programs that involve payments to citizens or third-party providers (Exhibit 2).

Stemming these losses is important for ensuring a well-functioning, credible government. They erode the government’s efficacy and the public’s trust,

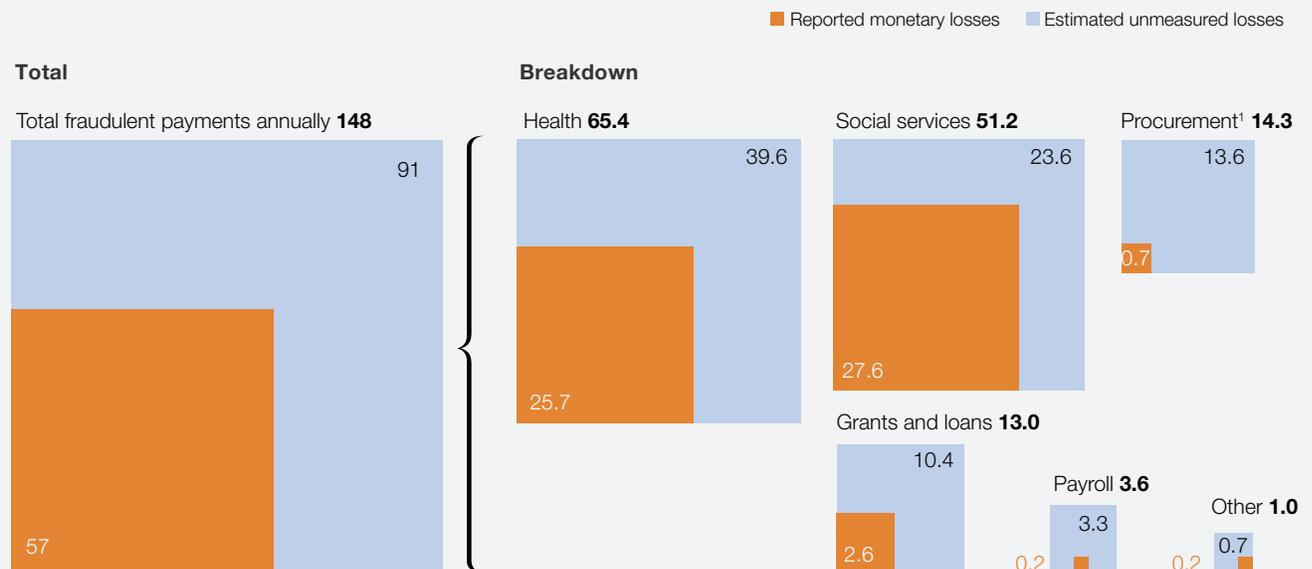
wasting money and preventing agencies from properly fulfilling their missions to citizens, businesses, and partners in government. Further, the risk of inaction is high: as private organizations tighten their defenses, criminals increasingly turn their focus to target government programs, as evidenced by the surge in identity-theft attempts against the Internal Revenue Service (IRS) in the early 2010s.

The good news is that a number of government agencies have had success focusing on combating

Exhibit 2

Today, we estimate most government programs detect less than half of monetary loss due to fraud, waste, and abuse.

Detected and undetected monetary loss, by US government area, \$ billion



¹ Procurement estimates exclude procurement waste and inefficiencies, which may contribute an additional 15–50% loss in payments to third-party vendors or states, due to duplicate or unneeded services.

Note: Figures may not sum, because of rounding.

Source: The Association of Certified Fraud Examiners annual fraud, waste, and abuse (FWA) report, 2018; independent analysis of government programs; Paymentaccuracy.gov

the negative effects of fraud, waste, and abuse by using more advanced analytical methods to detect additional unmeasured losses and prevent and treat measured losses more effectively. Organizing to make effective use of these tools and the required skills isn't always easy. However, when the work is done well, we've seen returns on investment ranging from 10:1 to 15:1. These stories provide a road map for successfully improving detection and prevention that is applicable across a wide range of institutions.

Combating FWA through better analytics

Let's be blunt: in our experience, agencies looking to ferret out FWA often measure what they can but not what matters most. In some cases, such as measuring improper payments, they focus on what's simplest to measure, for instance administrative errors (such as the lack of proper signatures), which often do not result in monetary loss. In other cases, the fraud that agencies do identify, often after the payment has gone out the door, is difficult for them to recover. In still others, there is a significant amount of fraud that agencies are simply not currently able to measure, in part because it reflects intentional misrepresentation by vendors or benefit recipients, sometimes as the result of organized criminal schemes.

Granted, it is not exactly straightforward to establish a comprehensive approach to tackling FWA that employs analytical tools and data sources to improve detection, and then to organize and scale the institution to deploy that approach. Data are often unstructured, incomplete, and located in silos across the institution. Staff are likely working in a resource-constrained environment—even while we find that tackling fraud, waste, and abuse generates impressive savings for the US Treasury, those savings rarely result in a bigger agency budget to fund the fight. With competing priorities, many agencies simply fail to drive the organizational

changes and sustain the momentum needed to achieve impact.

Yet some have overcome these challenges by tapping into new analytics tools and treatments, establishing the organizational changes needed, and recruiting new skill sets to transform their anti-FWA programs in an environment of constrained resources. Armed with more—and more-timely—data, better analytical tools, and enhanced processing power, agencies have an opportunity to identify new types of fraud, including major schemes and networks. For example, the US Securities and Exchange Commission (SEC) has leveraged new tools to pull in and connect large amounts of disparate internal and external data to identify new patterns of insider trading. The agency has also turned to machine learning and text-analysis techniques to apply analytics to what were once paper-based enforcement and compliance reviews.

Or consider the US Department of Health and Human Services' Centers for Medicare and Medicaid Services (CMS). CMS built the Fraud Prevention System (FPS), which uses advanced analytics to identify, prevent, and stop payments that match certain suspicious patterns and to raise the priority of other suspect payments for investigation. FPS helped CMS prevent \$527 million in losses to fraud in fiscal year 2016 as part of a suite of program-integrity efforts that saved CMS almost \$18 billion a year at a return on investment of 12.4:1.² Or consider the Department of Veterans Affairs (VA), where a focused effort applies analytics to healthcare payments by scanning for incorrect treatment combinations, unbundling of procedures, duplicate payments, outliers, and other questionable activities in payments to external providers.

We also see global examples of analytics-led efforts to reduce FWA through targeted, low-cost

interventions. In Australia, the Department of Health has seen a 19.5 percent reduction in urgent after-hours Medicare billing, which has saved the federal government about \$12 million, by using analytics to identify 1,200 high-claiming doctors and sending them letters to “voluntarily acknowledge” incorrect claiming of urgent items and encouraging them to shift their claiming behavior away from urgent items to standard items. This behavioral-economics approach, seeded in the theory that targeting the provider by assessing their holistic claiming patterns rather than managing individual claims through rules and alerts, is evidence of the effectiveness of prevention-focused, low-cost techniques. Making the most of these interventions depends on accurate advanced analytics, and ensuring that the right clustering techniques are deployed to ensure providers are compared on an “apples to apples” basis.

Scaling up and cracking down at the IRS

In the early years of this decade, the commissioner of the IRS determined that increasing the use of data and analytics would be one of the agency’s six key goals. A cornerstone of the effort was the creation of the Office of Compliance Analytics (OCA), an analytics center of excellence reporting directly to the commissioner that integrated state-of-the-art analytics talent deeply into day-to-day operations. The center also employed “test and learn” pilots to quickly gauge the effectiveness of innovations and refine them with less risk.

While the IRS recruited the new unit’s leadership externally, the focus was on building sufficient analytics capabilities within the agency to be able to solve some of the agency’s toughest problems. Another key design element was tight integration with the operating divisions. Executives from the businesses were detailed to OCA to lead the projects in their home units, ensuring the analytics answers were both relevant to and actionable by the business.

Agency leaders took part in selecting OCA’s portfolio to create a balance: quick wins that established credibility, longer projects to demonstrate big impact, and selected fire-fighting support to build goodwill with divisions under pressure.

When moving from modeling to action, OCA focused on rigorous testing using randomized controlled trials to tease out and validate the best combinations of analytics models and operational approaches. For instance, to deter tax preparers from coaching clients to misstate items on tax returns, the OCA team launched a series of different tactics, from “nudge” letters to in-person visits by IRS investigators. By maintaining control groups during implementation, the team continually measured proof of impact. With the help of sophisticated modeling techniques and tight integration with operations, OCA was able to effectively address a diverse range of issues, from identity theft to small-business cash underreporting to abuse of the earned income tax credit. Collectively, OCA’s projects delivered more than \$30 billion worth of improved tax compliance annually by its third year of operation.

Keys to success

Analytics-driven FWA programs are examples of US government efforts to create nimble and effective approaches to keep technologies and workforce skills current.³ Few agencies have tackled fraud problems with comprehensive transformation efforts, which in our experience can take years and as much as \$10 million annually to address \$100 million worth of fraud, waste, and abuse. But even gradual programs, executed well, can deliver success and savings for agencies and taxpayers.

While many agencies have the pieces needed to succeed, the most difficult step is bringing these together to achieve a sustained and successful effort that can be scaled. Almost all agencies, when

they think about launching an analytics program, correctly consider the need to acquire analytics technology, hire and train staff in analytics, and make data more easily available. However, as evidenced by many of the case examples, there are five other factors that, when taken together, form the essential core of enablers needed to drive a successful analytics program:

- ***Analytics tools and skills.*** There are many advanced analytical techniques that allow agencies to identify FWA, such as artificial intelligence, cluster analysis, outlier analysis, network analysis, machine learning, “fuzzy matching,”⁴ and others. For instance, the IRS has used network analysis to use identified types of fraud to uncover groups of related bad actors. Taking advantage of these techniques often involves using an agile approach to build analytics “sandboxes” and expanding or elevating existing analytics expertise. While external parties can help jump-start an advanced-analytics program, agencies should focus in parallel on consolidating and elevating existing analytics efforts, and recruiting or raising the skills of individuals who can fill required roles: data engineers, data scientists, test designers, and “translators” who can bridge business and technical staff.
- ***Access to broad sets of quality data.*** Data are the lifeblood of analytics, and for maximum impact, the relevant data need to be made available in near real time at the point of decision making in order to stop fraudulent or abusive payments before they go out the door. Many agencies have siloed data or incompatible data sets across the organization, so a robust data-management capability is necessary to improve data collection, maintenance, storage, and integration. Some agencies have built “data lakes” before really knowing what actions they

intend to take—and therefore what analytics will be needed. This can be very costly in terms of time and money, with little to show in regard to impact. We find that an agile approach to data—focusing on only the limited data required to achieve a particular goal—can deliver results much more quickly and cost-effectively. The SEC, for example, has successfully made data management a major priority for the commission, through robust communities of interest regarding analytical approaches, new initiatives to streamline governance of core data sets, and the creation of a data catalog to enable awareness of the use case and access points of data, as well as other initiatives to drive value and reduce cost.

- ***Domain expertise.*** Many analytics-led efforts fail to show impact because the team is insufficiently familiar with the business processes their model must affect. This often results in the team solving the wrong problem or coming up with a solution that can’t be implemented. Thus, it is important to partner the analytics team with leaders and frontline managers from the operations team on the ground, who will be driving the change. This expertise can come from internal or external sources, depending on the situation. For example, the Federal Emergency Management Agency built upon insights it gleaned from payment-card providers to shut down an identity-theft ring in its emergency-support program. Rigorous information exchange between the analytics and operations teams strengthens efforts to continuously refine the analytics goal and help work through implementation hurdles.
- ***Ability to operationalize insights.*** Translating insight into action is another common point of failure for analytics efforts. Many successful programs begin with an end goal in mind and aim the entire effort at achieving that action.

Once fraud, waste, or abuse is detected, agencies should develop, test, and refine scalable and cost-efficient interventions. Advanced analytical approaches are likely to unearth large new instances of fraud, waste, and abuse, so agencies need to be prepared to address the problem in volume. If the agency responds with a new action—for example, by preemptively stopping payments suspected of stemming from identity theft—then an iterative test-and-learn approach is crucial to analyzing and scaling a response. The IRS, for instance, was able to stop more than one million identity-theft tax returns a year by shifting the burden for verifying identity from the IRS to the likely thief, relying on models that generated a sufficiently low rate of errors in stopping refunds.

- **Strong executive sponsorship.** While many FWA-analytics programs demonstrate impressive returns on investment, such efforts still require executive sponsorship and interest, given the investment involved. Successful programs also involve setting priorities for hiring and matching analytical talent with staffers close to operations. Ensuring program impact requires senior leadership to actively champion FWA as an institutional priority, create sufficient room in the budget for a sustained effort at scale, define clear lines of authority and responsibility, and rigorously measure and monitor results. For instance, when one state instituted an analytics unit to address FWA in its Medicaid program, it established the unit just two levels below the agency's director.

Getting started

Whether an FWA effort is big or small, there are several approaches critical to organizing it and building and managing critical enabling capabilities. First, it's important to set aspirations correctly from the beginning. Agencies start to attack FWA from

many different places—they may have the talent, but not the tools; the tools, but not usable data; the data but not the executive sponsorship needed. Leadership must first identify the kind of impact the agency wants to have, as well as its level of maturity across the important enabling capabilities, and progress with a roughly equal emphasis across all five factors.

A diagnostic that builds an independent fact base on current performance can help. An agency can quickly scan the current environment, assess the available data, evaluate current FWA detection and prevention infrastructure, and better understand the current use of analytics throughout the organization. From there it is possible to help identify and size the potential value of an analytics-led FWA effort and set priorities for specific areas of focus.

When the effort moves into the execution phase, agencies can consider adding experts with real-world, relevant experience to jump-start the effort, possibly private-sector leaders from the finance or high-tech sectors. In addition, we find that a strategy that focuses on delivering—and measuring—quick wins from analytics is important for building momentum and support. Aiming to deliver value in the first three or four months can help secure funding for future phases of a program. For instance, an agency paying benefits could initially focus on identifying situations where a large number of beneficiaries appear to share a bank account and evaluate it for possible identity theft, or, as CMS does, look for service providers billing for more services than are possible to deliver, such as doctors billing for more than 24 hours in a day. These demonstration cases can illustrate the analytics techniques, innovative treatments, integration with operations, and test-and-learn processes that underpin success in analytics, all while delivering value and building staff capabilities.



Governments have a tremendous opportunity for both near- and long-term fraud, waste, and abuse savings. By leveraging advanced-analytics tools, new treatment mind-sets and staff skills, agencies can prevent billions of dollars of losses. ■

¹ “Government efficiency and effectiveness: Opportunities to address pervasive management risks and challenges while reducing federal costs,” US Government Accounting Office, May 17, 2017, gao.gov.

² Annual report to Congress on the Medicare and Medicaid Integrity Programs, Centers for Medicare & Medicaid Services, 2016, cms.gov.

³ “President’s management agenda,” President’s Management Council and the Executive Office of the President, March 2018, whitehouse.gov.

⁴ “Fuzzy matching” refers to a technique where partial matches are used to link records together. For instance, a social-security number with transposed digits would match seven of nine digits, and in combination with an exact match on address could be sufficient to assume the records should be linked.

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