April 11, 2023

The Honorable Kevin McCarthy
Speaker
House of Representatives
Washington, DC 20515

Dear Speaker McCarthy:

I am respectfully submitting the enclosed Report to Congress entitled, *Healthcare Fraud Prevention Partnership Report on Real-Time Analytics*. This report describes the feasibility of the Healthcare Fraud Prevention Partnership (HFPP) to expand current data analyses to include real-time analytics.

Section 124 of the Consolidated Appropriations Act, 2021 [P.L. 116-260] requires the Secretary of the Department of Health and Human Services (HHS) to conduct a study and submit to Congress a report on the feasibility of the HFPP to: (1) establish a system to conduct real-time analysis to proactively identify ongoing as well as emergent fraud trends for the entities participating in the partnership; and (2) provide such entities with real-time feedback on potentially fraudulent claims regarding the potential expansion of public-private partnership analyses. In addition to the above information, this report includes the estimated cost of and any potential barriers to establishing such a system.

I hope you find this information helpful. I also am sending a copy of the report to the President of the Senate. Please do not hesitate to contact me at 202-690-7627 if you have questions or concerns.

Sincerely,

Melanie Anne Egorin, PhD
Assistant Secretary for Legislation

Enclosure

April 11, 2023

The Honorable Kamala D. Harris
Vice President of the United States
President
United States Senate
Washington, DC 20510

Dear Madam Vice President:

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Enclosure

U.S. Department of Health and Human Services

Centers for Medicare & Medicaid Services

REPORT TO CONGRESS

Healthcare Fraud Prevention Partnership Feasibility Report on Real-Time Analytics

April 2023

Persons with disabilities experiencing problems accessing portions of any file should contact CMS through the following email.

Executive Summary

The Healthcare Fraud Prevention Partnership (HFPP) is a voluntary, public-private partnership between the Federal Government, state agencies, law enforcement, private health insurance plans, and healthcare anti-fraud associations. The goal is to identify and reduce fraud, waste, and abuse (FWA) across the health care sector through data acquisition and aggregation, cross-payer research studies, and collaborative information sharing. Given the HFPP's broad membership, encompassing a variety of stakeholders involved in the detection of FWA in the health care system, it is uniquely positioned to examine emerging trends in fraud and suspicious billing activity, as well as develop key recommendations and strategies to address them.

In December 2020, the President signed into law H.R.133 - the Consolidated Appropriations Act, 2021 (CAA), which amended Section 1128C(a) of the Social Security Act (42 U.S.C. 1320a–7c(a)) providing explicit statutory authority for the HFPP, including the potential expansion of the public-private partnership analyses. Section 124(b) of the CAA outlines the requirements of a feasibility report and states the following:

> "(b) POTENTIAL EXPANSION OF PUBLIC-PRIVATE PARTNERSHIP ANALYSES.—Not later than 2 years after the date of the enactment of this Act, the Secretary of Health and Human Services shall conduct a study and submit to Congress a report on the feasibility of the partnership (as described in section 1128C(a)(6) of the Social Security Act, as added by subsection (a)) establishing a system to conduct real-time data analysis to proactively identify ongoing as well as emergent fraud trends for the entities participating in the partnership and provide such entities with real-time feedback on potentially fraudulent claims. Such report shall include the estimated cost of and any potential barriers to the partnership establishing such a system."

This Feasibility Report addresses the requirements above. The potential approach described in this report would generate a risk score that may range in sophistication from business rules to advanced fraud detection derived from machine learning (ML).

Payers may incorporate the risk score in their claims adjudication process to take actions appropriate to their program, which may include pre-payment review or automatic denial of the claim. The Trusted Third Party (TTP), which supports the operations of the HFPP, can work with HFPP data-sharing Partners (also referred to as participating entities) to develop a process outside of the closed systems in which healthcare claims are processed to pilot a real-time, pre-payment analytics initiative. The Partners would configure their claims processing system to access a secure Application Program Interface (API) within the TTP system. Within this access point, a real-time risk score would be assigned and returned to the Partner. This real-time exchange of risk scoring information, similar to processes used in financial industries to detect fraud, would be used to detect suspicious billing patterns prior to adjudication (i.e., before processing the health claim and payment).

Initial costs to the Federal Government to pilot such a real-time analytics framework with a single HFPP Partner that shares data are estimated to be between $4-$8 million, depending on the volume of daily transactions and the sophistication of the risk score.[1] Although membership within the HFPP is free, participating entities could expect to incur internal costs associated with system configuration and claims review as a result of their participation in a real-time, pre-payment approach. If the pilot expands to include more HFPP Partners, costs would increase as necessary. Future costs are also dependent upon the scope and sophistication of the risk scoring conducted.

The core barrier to the adoption of such a system is the potential implementation costs that healthcare payers will incur. Automatic denial or rejection of suspect claims is more cost effective to implement than flagging transactions for manual review. However, payers normally require that an explicit policy violation be identified to deny the claim without human review, which can be costly.

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[1] See "Costs" section.

Table of Contents

Table of Figures

Introduction

HFPP Background

In July 2022, the Healthcare Fraud Prevention Partnership (HFPP) celebrated its 10th year as a leader strengthening the nation's fight against healthcare fraud, waste, and abuse (FWA). At its inception in 2012, the Partnership consisted of 21 Partners. The HFPP has now grown to over 270 Partners across the Federal Government, state agencies, law enforcement, private health insurance plans, and healthcare anti-fraud associations. Over the past 10 years, Partners have supported and shaped the program into today's unparalleled data-sharing Partnership. Some key accomplishments include:

- Growth in membership over the last 10 years by over 1,095% to more than 270 Partners
- Establishment of a unique cross-payer healthcare claims database and the expansion from professional claims data, including Medicare & Medicaid data from the Centers for Medicare & Medicaid Services (CMS), to incorporate institutional claims data in 2019 and pharmacy claims data in 2021, enabling more comprehensive analytic insights
- Expansion from original claims data, to now conducting analyses against adjusted claims to detect industry-wide fraud schemes more precisely

The Partnership's purpose is to exchange facts and information between the public and private sectors and enable the performance of sophisticated data analytics against its unique cross-payer dataset to reduce the prevalence of healthcare fraud. The HFPP does this by encouraging Partners to voluntarily share information and data with the Trusted Third Party (TTP). The TTP is a Federal contractor that supports the day-to-day operations of the HFPP. With oversight from CMS, the TTP delivers subject matter expertise in data analytics, facilitates the design and execution of all studies, provides a secure environment for acquiring and hosting data, ensures confidentiality and non-attribution for all HFPP Partners who contribute data or share outcomes, and communicates and shares information on behalf of the HFPP. The TTP functions as a "common data aggregator" under the Health Insurance Portability and Accountability

Act (HIPAA) Privacy Rules, conducting cross-payer data aggregation and analysis services to identify potential fraud across payers, while ensuring that each Partner only has access to its own claims data.[2]

The HFPP publishes studies and reports, including white papers and issue papers, focused on current and emerging FWA topics. The research done for these publications highlights commonly observed FWA schemes, discusses important strategies and actions HFPP Partners and other healthcare stakeholders can take to counter them, and illustrates best practices guidelines.

Consolidated Appropriations Act, 2021 (H.R.133)

Section 1128C(a) of the Social Security Act 1128 states that, as part of establishing a Fraud and Abuse Control Program, the Secretary of HHS and Attorney General shall consult with and arrange for the sharing of data with representatives of health plans. H.R. 133 - the Consolidated Appropriations Act, 2021 (CAA) further amended Section 1128C(a) of the Social Security Act to provide statutory authority for the HFPP. Section 124(b) of the CAA requires "the Secretary of Health and Human Services [to] conduct a study and submit to Congress a report" on "the feasibility of the partnership establishing a system to conduct real-time data analysis to proactively identify ongoing as well as emergent fraud trends for the entities participating in the partnership and provide such entities with real-time feedback on potentially fraudulent claims. Such report shall include the estimated cost of and any potential barriers to the partnership establishing such a system.[3]"

This report contains a potential approach that aligns with the CAA's mandated request to evaluate the feasibility of a system that conducts data analysis in real-time to identify potential FWA in healthcare claims amongst participating members of the HFPP. This includes an assessment of real-time streaming of claims, or daily batch processing of claims, prior to payment. Additionally, this report looks at the ability of real-time

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[2] CMS Annual Report to Congress – Medicare and Medicaid Integrity Programs – FY 2019. Retrieved from Medicare and Medicaid Program Integrity (cms.gov)
[3] R.133 - 116th Congress (2019-2020): Consolidated Appropriations Act of 2021. (2020, December 27)

analytics to generate a risk score that can inform the adjudication disposition on potentially fraudulent claims.

Existing Framework

This report offers a feasible approach that incorporates fraud detection via real-time analytics. It also reviews the existing framework and outlines current efforts to speed existing HFPP analyses through automated post-payment analytics.

Historically, health insurance payers have operated their own independent FWA detection systems. Fraud detected or prevented by one payer may not have been known to other healthcare payers, even when perpetrated by the same biller. To address this challenge, the HFPP has successfully unified data from Partners to generate analytics and outcomes that demonstrate cross-payer FWA trends.

The TTP, on behalf of the HFPP, receives claims data in batched submissions from private and public payers. The TTP performs analytics on historical claims that have been paid, also known as the post-payment phase of a claim's lifecycle. An historical claim in this context refers to a claim that has been previously adjudicated.

Post-Payment Analytics

The existing HFPP framework follows the lifecycle illustrated in Figure 1 below.
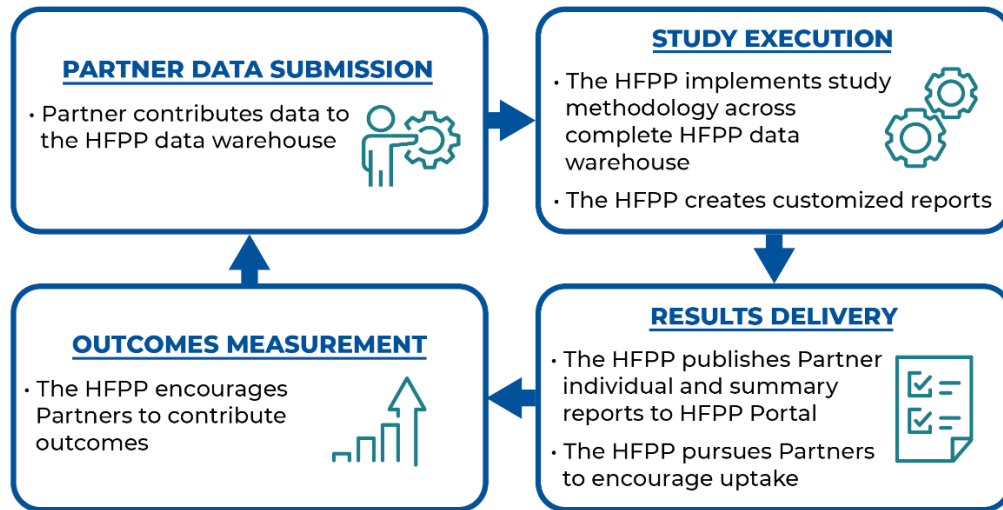
Figure 1: Existing HFPP Lifecycle

The TTP currently collects, processes, and analyzes Partner-submitted bulk files, which contain large volumes of adjudicated (post-payment) claims. Pre-payment claims data are not currently collected. The adjudicated claims data are analyzed for suspicious patterns, and these insights are delivered to participating entities. Partners report the outcomes of any fraud intervention activities they may take to the TTP.

The following opportunities exist to minimize turnaround time from the ingestion of Partner data to the generation of study results and the collection of outcomes:

- Automating ingestion and quality assurance processes
- Enhancing data pipeline efficiency by flowing through pre-built analytic models
- Presenting insights through a live, secure, and web-enabled presentation layer
- Leveraging the user interface to collect Partner outcomes through customized Partner prompts based on previously identified providers and claims

Partner Data Submission

Data submission occurs when the Partner delivers data to the TTP. Upon deciding to participate in HFPP studies, Partners are provided a list of data elements that are to be submitted for cross-payer analyses. The TTP ingests the Partner data submission and loads it into the cross-payer data warehouse. Currently, Partners submit claims through Secure File Transfer Protocol (SFTP), directly via a cloud platform, or through the

HFPP Portal, which is a secure web-based platform. Under this existing framework, refresh cycles could be increased to monthly, weekly, or greater, and would be limited only by how frequently HFPP Partners are able to update their data feed.[4]

Study Execution

Currently, the HFPP implements study methodology across the complete HFPP data warehouse. This is done once the TTP, on behalf of the HFPP, analyzes the health insurance claims data voluntarily submitted by participating entities, typically on a timeframe of several months for new studies which includes study design through delivery of results.[5] The study process includes data acquisition, normalization, merging, quality assurance, cross-payer analysis, documentation, and reporting. Depending on the type of question posed by a study, the types of analyses may include quantitative, qualitative, and outlier analyses; grouping and entity resolution; trending, time series, and networking analyses; as well as statistical summation.[6]

Results Delivery

Research methodologies are applied to claims data, and trends are analyzed throughout the cross-payer environment. After the analyses are complete, the TTP develops one or more of the following: a general summary (for all HFPP Partners), provider summary reports (for all Partners that submitted claims data), and detailed reports (individualized for Partners with results in a study). Results are aggregated prior to recommendations and insights being published in summary reports. The above-mentioned reports are de-identified to prevent determination of the original data source(s).

Monthly correspondence and newsletters are sent to Partners, wherein study results are linked from the HFPP Portal for their use. The HFPP Portal provides Partners

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[4] As the underlying HFPP claims database continuously changes, insights reported about a claim are subject to change over time as claims are adjusted, more claims are collected, or other FWA intelligence becomes available.
[5] CMS-10501 - HFFP Supporting Statement - Final 2018
[6] CMS-10501 - HFFP Supporting Statement - Final 2018

access to their dashboards and study results to get a holistic view of study outcomes and impending study designs.

Outcomes Measurement

The HFPP encourages Partners to submit information quarterly on 12 metrics, which Partners view as having resulted from HFPP participation. These metrics[7] fall under the two categories of *Savings* and *Other Outcomes* and include the following:

Savings	
Hard Dollars Saved	**Soft Dollars Saved**
Other Outcomes	
Cases Opened	**Provider Warnings**
Payment Suspensions and Terminations	**Revocations**
Indictments	**Convictions and Judgments**
Private Settlements and Arbitrations	**Convictions**
Restitution Orders	**Notable Outcomes**

Figure 2: Savings and Other Outcomes

The process of measuring outcomes relies on the information submitted by Partners. Evaluation of the proposed pre-payment analytics approach will similarly rely on outcomes reported by Partners.

The current HFPP analytics lifecycle, described above, supports the existing HFPP framework of post-payment analytics. It provides a foundation upon which the proposed pre-payment analytics approach can be based.

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[7] For detailed descriptions of each metric, see the Outcomes Metrics Definitions section within the appendices of this report.

Framework: Pre-Payment Analytics Approach

The following framework is outlined as a feasible approach for implementing real-time, pre-payment analytics that is accessible to participating health care payers during claims adjudication, before payment is made. This approach is contingent on the outcomes of the various components in the framework described in this section.

The system for a pre-payment analytics approach could be housed centrally within the TTP's environment. The HFPP could utilize its modern, cloud-based information technology infrastructure to identify and provide cross-payer fraud risk scores to participating Partners before the claim is paid. In this way, Partners would be able to make informed decisions about claims transactions before an expenditure is made. Leveraging the HFPP to build, operate, and maintain the infrastructure increases the feasibility of implementing such a system and reduces the burden of requiring participating HFPP Partners to develop and maintain the infrastructure necessary to implement a real-time, pre-payment, cross-payer analytics framework in their own systems.

Interoperable Pre-Payment Analytics

The HFPP could implement a system that generates risk scores for each incoming transaction, prior to payment, according to specific data elements on the claim. While many risk scoring mechanisms have been developed within the healthcare industry, all are limited to a single-payer environment. Providers, though, submit claims to a wide range of payers, such as Medicare, state Medicaid programs, and private insurers. Therefore, no single payer represents a provider's entire book of business, and, in the current healthcare environment, the billing patterns of providers with other health plans are not visible. However, Partners who share data with the TTP receive insights into providers' cross-payer billing and risk exposure. At present, HFPP analytics are conducted only against post-payment claims that have already been processed and adjudicated by data-sharing Partners.

To successfully implement a pre-payment analytics approach, the HFPP must shift the paradigm in FWA analytics from proprietary pre-payment analytics to an open, cloud-

hosted analytic framework. This approach would allow for real-time risk scoring prior to the claim being paid while still leveraging the HFPP's capability to detect suspicious patterns across data-sharing Partners.

Pilot Phase: Pre-Payment Analytics Approach

The HFPP could pilot this process with one of the existing HFPP data-sharing Partners who are interested in testing a real-time, pre-payment analytics initiative with the TTP. The Partner selected for this initiative should be willing and able to invest organizational resources into the technical architecture that is required to conduct the pilot program. As a result of the generated risk score, the selected Partner should also be prepared to apply the risk score to their program integrity practices (e.g., implement a clinical review process for the claims flagged as risky). Another consideration is the mechanism by which the Partner exchanges data — Partners who currently share data via the cloud would be preferred to better facilitate the sharing of information in real time. The pilot phase would provide a basis for cost estimates and implementation timelines relating to a broader rollout of the approach across the HFPP Partnership. Additional Partners could be added based on expressed Partner interest in participating and sufficient funding to support expansion of the approach.

Risk scoring indicates the degree of risk posed by a transaction. A risk score can take a variety of forms. It can be relatively simple and utilize the most basic data elements, such as flagging a provider who submits a claim while being excluded from government health programs. Risk scoring can also be more sophisticated. For instance, machine learning (ML) models can extract less obvious risks using a greater variety of claim data elements and more complex approaches to risk modeling. Ultimately, a risk score is an additional data point that a payer can use when determining whether to pay a pending healthcare claim.

With appropriate investment and Partner engagement, the HFPP could provide a service that Partners could access from their claims systems via a sub-second Application Program Interface (API) call through a secure connection. This service would use the same technology by which credit card transactions are risk scored for

fraud risk in sub-seconds and then accepted or denied. Healthcare claims differ from credit card transactions in that claims may be submitted for payment after the potential service or product is rendered; however, once the claim is received, payments are intended to be processed as quickly as they are received while preventing payment for fraudulent or highly suspicious transactions. Therefore, the risk scoring processes could be applied similarly. An illustration of this proposed workflow is presented in Figure 3.
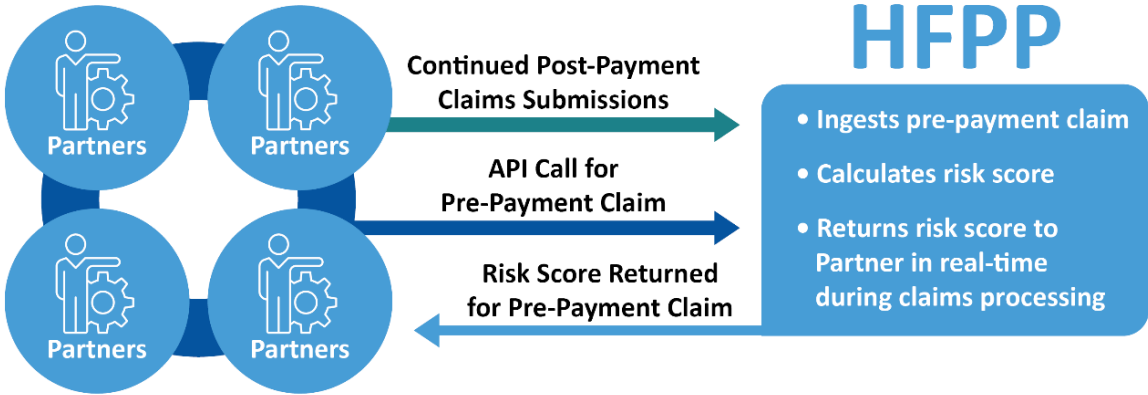

Figure 3: Model Workflow of HFPP Real-Time Risk Scoring for Partners' Claims Processing

Partners would determine whether to process claims flagged in this real-time, pre-payment analytics framework. High risk scores, indicative of a greater potential risk of fraud, would be considered as part of the Partners' claims review process and could influence the adjudication of the claim and, ultimately, payment. For example, an HFPP Partner could choose to automatically deny a claim based upon violation of a known and tested business rule (i.e., "auto-deny edit"). Additionally, HFPP Partners could route claims flagged as high risk to pre-payment administrative or medical review (i.e., "pre-payment audit"). Partners may choose to issue payment while continuing to monitor the submitter's ongoing billing (i.e., "monitor"). Given the spectrum of these responses by Partners, a claim that is risk scored prior to making payment to the provider allows each Partner to govern its response according to its own business requirements and risk tolerance.

Architecture: Pre-Payment Analytics Approach

The architecture of this pre-payment analytics approach can best be described as a combination of three interconnected components: (1) data ingestion, (2) the scoring engine, and (3) the repository, each described below.

<u>Data Ingestion</u>

The data ingestion component is the pipeline whereby the data elements of a healthcare transaction are submitted by a Partner to the TTP and loaded into the data warehouse. The existing HFPP architecture for ingesting post-payment claims data would continue to be used with the addition of an API to support the ingestion of transaction data during a Partner's claims adjudication process. A two-way API, by which a participating Partner can submit a significant volume of transactions during adjudication and the TTP can return a risk score, is the mechanism that would ingest the data for pre-payment claims and the return of a risk score to the Partner. This approach is more flexible and less costly than attempting to embed rules and modeling engines within each payer's unique claims processing system. The API access point for this exchange of information would need to be robust enough to ingest pre-payment transactions in real time at a sufficient volume, as to not affect the payer's adjudication timeliness requirements. Likewise, the API would need to be able to return the risk score in less than a second after the Partner has submitted the transaction for scoring, including the time necessary for the TTP to compute the risk score itself.

<u>Scoring Engine</u>

The scoring engine would generate the risk score indicating whether the claim is suspicious. The scoring engine could be configured to assess for risk based on straightforward rules (e.g., is the provider excluded from government health programs, has the provider surpassed a specific outlier threshold in their billing across multiple payers). The scoring engine can also be configured to calculate and apply ML driven risk scores based upon models that have been trained across the many billions of records that already exist within the TTP cross-payer data warehouse. The engine must perform the scoring with sufficient speed to enable a risk score to be returned to

the payer in less than one second. For more sophisticated risk scores, such as those generated by ML models, the computational demands to meet the sub-second turnaround requirement are significant.

<u>Repository</u>

Finally, the repository would house pre-payment transactions submitted for real-time risk scoring. These transactions would be archived for use in the ML models for scoring new, incoming data. In addition to contributing to the training of the ML models, the repository for housing the submitted pre-payment transactions supplements the existing post-payment data warehouse currently maintained by the TTP and used for the post-payment analytics conducted today.

Potential Barriers

Certain requirements, as outlined below, must be considered prior to the implementation of real-time, pre-payment analytics.

The five key factors that could impact successful implementation of the real-time, pre-payment risk scoring approach include:

- Partner buy-in and participation
- Costs
- Privacy and security compliance
- Quantification of outcomes
- Anticipated return on investment (ROI)

Partner Buy-in and Participation

Federal Partners, law enforcement, state Medicaid Partners, private payers, other state and local Partners, as well as associations, all play an important role in the implementation of fraud preventive technologies. From input on study topics, to the latest FWA patterns that they may have encountered, Partner involvement is necessary for the HFPP to be effective in receiving claims data and gaining valuable insights on common patterns of behavior in targeted data attributes or billing scenarios.

Successful implementation of the pre-payment approach requires Partner buy-in and active participation. Partner confidence in the value of the system and the ROI it can deliver are also important. Implementation will require Partners to consider how they will utilize the TTP-provided risk score in order to minimize instances of false positive rates, which could be costly. Given the spectrum of actions a Partner may choose to take based upon a high-risk score for a particular transaction, the level of effort invested into investigating a particular flagged, high-risk transaction will vary greatly across Partners. Partners who choose to conduct a full pre-payment review of medical documentation would incur the highest costs. On the other end, Partners who implement lower-effort interventions, such as auto-deny edits, will experience lower costs. Partners may also incur costs to modify their systems and increase the frequency of their data submissions.

Costs

The pilot phase of the pre-payment analytics approach would serve as the baseline for estimating a future system. Currently, two different sources have been used to estimate or compare costs with varying degrees of granularity, both of which are outlined below.

<u>Cost Estimate: Pilot Phase</u>

While the approach framework leverages the existing analytics and infrastructure developed for the HFPP, the TTP would require additional funding, notably for the process of analyzing claims. The volume of daily claims processed by existing HFPP Partners varies greatly. Future costs would be dependent upon a variety of factors, such as the volume of submitted data to process and retain, the necessary processing power to return sub-second results to Partners, and the sophistication of the risk scoring conducted.
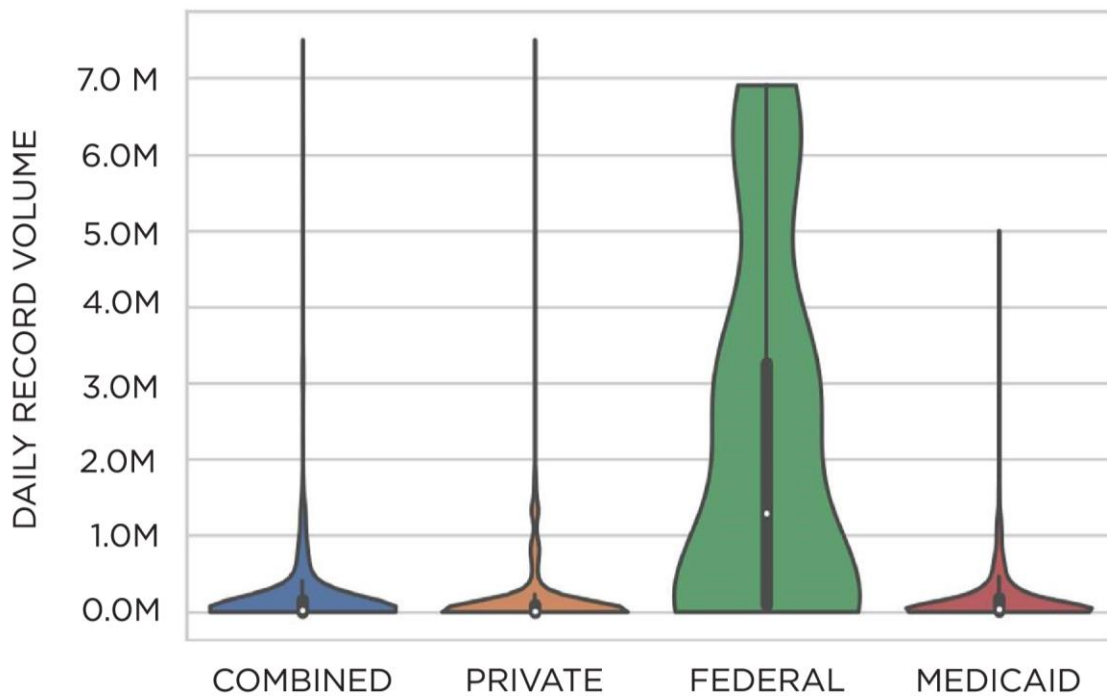
Figure 4: Daily Claims Volume by Adjudication Date and Payer Type [8]

Figure 4 displays the distribution of daily record volume by adjudication date for 63 data-sharing HFPP Partners in the month of August 2020. In the above figure, the length of the vertical line represents the volume of individual records plotted on the axis to the left; the width of the shaded portion is the estimated probability of that volume of records for a given day. The "combined" category on the left displays all Payer types, which are displayed individually to the right (Private N = 24, Federal N = 2, Medicaid N = 37). The variability of daily record volume is quite large, even within the same payer, ranging from near zero in some instances to as high as 7.5 million claim lines with a single adjudication date. While the very large volume dates may represent batch re-processing and may not be truly representative of the typical daily claims volume, even the Federal payer type, by far the most homogenous, displays a large variance. These data demonstrate the wide variety of payers currently sharing data with the HFPP in

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[8] The sample month was chosen based upon the availability of Partner data during the timeframe, as some Partners have more current data than others. The records were selected from within the professional claim type, and do not include institutional or pharmacy claim types, using a kernel density estimator to highlight the distributional probability.

terms of record volume. As such, cost estimates for the pre-payment system would vary according to which payers adopted the system, the sequence in which it was adopted by various payers from large to small, and how many Partners would ultimately participate.

The cost of the pilot phase for the pre-payment analytics approach is estimated to be between $4 and $8 million using the existing HFPP infrastructure and an interoperable framework with a single HFPP Partner. If the pilot were to expand to include more HFPP Partners, costs would increase. The estimate assumes that a real-time, pre-payment analytics system deployed to the cross-payer environment would be adopted gradually. A pilot would provide important datapoints to refine cost estimates and project ROI. From there, additional HFPP Partners would likely begin to participate, and the system would be scaled accordingly.

The HFPP currently performs post-payment analytics on behalf of 75 data-sharing Partners at a cost of approximately $18 million annually, of which $11.5 million is associated with infrastructure, data collection, and analytics. Produced studies include both rule-based and risk scoring methodologies with ML capabilities. Extending the existing capabilities to include real-time, pre-payment analysis on, at least, a daily basis for the pilot participant would require additional investment in system architecture and technical staff. Considering the other cost factors to the government for the existing TTP approach, namely marketing and communications, security, project management, and compliance, the total cost to pilot a real-time, pre-payment analytics approach for a single Partner would be approximately $4 million per year. A single Partner submitting a larger volume of daily transactions may entail higher costs (i.e., up to $8 million annually) depending on the complexity of the risk score offered.

Privacy and Security Compliance

Protecting the privacy and confidentiality of proprietary information is essential. It is a standard ethical and regulatory requirement within the healthcare industry. The HFPP maintains compliance with privacy and security laws by incorporating six methods to minimize vulnerabilities and prevent a breach of confidentiality.

All confidential information is protected by the Security and Privacy Program (S&PP) within the TTP. The S&PP protects all sensitive and proprietary information of Partners while providing the constant surveillance of emerging threats and vulnerabilities. The HFPP has six methods of maintaining the privacy and security of sensitive information. These methods include:

1. A secure and interactive portal accessible only to Partners via 2-factor authentication
2. Infrastructure that is protected and scalable
3. Recurring security assessments and audits that sustain the Authorization to Operate
4. Privacy and security features (identity management, role-based access control, data encryption, data de-identification, data access and change auditing, appropriate archiving, and data disposal)
5. Use of Amazon Web Services for infrastructure and the protection of data, as well as threat detection, access, and identity management
6. Automated, real-time monitoring of potential security vulnerabilities

These methods serve as fundamental elements of meeting system security-related compliance as mandated by CMS. Additional elements include the HIPAA regulations for electronic healthcare transactions, code sets, unique health identifiers, and various security measures.

Quantification of Outcomes

The measurement of effect and quantification of outcomes are highly dependent on the metrics collected from HFPP Partners. These metrics work in tandem to provide an overview of the impact and effectiveness the HFPP program has on fraud detection and prevention.

To establish ROI, outcomes measurements must be collected. The HFPP collects a consistent set of metrics from Partner organizations. These metrics, along with qualitative feedback from Partners, assist the Partnership and the Government in evaluating the effectiveness of the HFPP program. The HFPP established an

Outcomes Measurements Committee to identify and develop metrics that would meaningfully demonstrate the HFPP's impact. The Committee identified 11 metrics to assist in quantifying the impact of Partner participation in the HFPP, described earlier in this report. Collectively, these outcomes measurements contribute to the assessment of the ROI achieved by HFPP anti-fraud efforts.

Anticipated Return on Investment

Fraud detection and prevention strategies demonstrate excellent ROI based on historical data. Certain service delivery models may be particularly incentivized to participate in a cross-payer, real-time analytics initiative due to their payment structures.

As of 2020, the United States healthcare spending is estimated to be in excess of $4 trillion.[9] Estimates of ROI for fraud prevention and detection initiatives vary but are overall positive. For example, the ROI from the implementation of CMS' Fraud Prevention System (FPS) has been positive each year since its inception, as noted in Figure 6 below.

Implementation	Fiscal Years	ROI	Savings
1st	2012	3:1	$115.4M
2nd	2013	5:1	$210.7M
3rd	2014	10:1	$454M
Full	2015	11.3:1	$654.8M
Post	2016	6.3:1	$527.1M

Figure 5: FPS Implementation ROI6[10]

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[9] National Health Expenditure Data CMS (2021)

[10] All ROI and savings information was pulled from the 2012-2015 Implementation Reports to Congress [on the] Fraud Prevention System; 2016 and 2018 Annual Reports to Congress on the Medicare and Medicaid Integrity Programs; and U.S. Department of Health and Human Services, Office of Inspector General (OIG) Report A-01-13-00510

HFPP data-sharing Partners are responsible for a significant proportion of the total U.S. healthcare expenditure. If only a small percentage of that annual expenditure could be conserved by preventing fraudulent or abusive claims from payment, it is anticipated that the real-time, risk scoring approach would achieve a significant ROI similar to the ROI figures from the CMS FPS program.

Conclusion

This report discusses an approach that could create a real-time, pre-payment analytics system, which utilizes and benefits from the HFPP's unique cross-payer health claims dataset. Initial funding of $4-$8 million would be needed to begin a pilot phase to demonstrate the potential and value for a real-time, pre-payment fraud detection and prevention approach. The existing TTP cloud-native architecture, currently used by the HFPP, is scalable to encompass the transformation to real-time, pre-payment analytics. A pilot participant who is motivated to utilize the pre-payment risk scoring can be identified among the existing pool of HFPP data-sharing Partners. ROI could be measured using data received during the pilot phase prior to an investment being made into the expanded pre-payments analytics approach. Existing HFPP analytics already oriented to the cross-payer environment would be leveraged. In addition, current legal agreements permitting the sharing of sensitive healthcare data and secure infrastructure could be modified to include the provision of real-time, pre-payment functionality. Additional requirements for expanding the project include key performance indicators and ROI metrics to demonstrate value before the program is expanded.

Definitions

Data analytics[*] is a broad category of data assessment approaches and tools. Data analytics includes predictive modeling, as well as other approaches, such as link analysis, ML, graph pattern analysis, scoring, trend analysis, spike analysis, and cluster analysis. Some of these techniques are more appropriately applied to post-payment than pre-payment analysis.

Machine learning is the use of computer algorithms to model data to identify patterns or make predictions. Performance of ML models can be reinforced and improved over time with new data, much like human learning.

Medicaid is a program funded jointly by the states and the Federal Government and provides health coverage to Americans, including eligible low-income adults, children, pregnant women, elderly adults, and people with disabilities.

Medicare is a Federal health insurance program for people who are 65 or older, younger people with disabilities, and people with End-Stage Renal Disease (also referred to as permanent kidney failure requiring dialysis or a transplant). It is comprised of four parts: Part A covers inpatient hospital stays, care in a skilled nursing facility, hospice care, and some home healthcare; Part B covers certain doctors' services, outpatient care, medical supplies, and preventive services; Part C is referred to as Medicare Advantage and is a Medicare-approved plan from a private company that offers an alternative to original Medicare for health and drug coverage; and finally, Part D covers the cost of prescription drugs (including many recommended shots or vaccines).

Providers include healthcare providers and suppliers enrolled in healthcare programs who submit claims for payment.

Real-time can be defined as the sub-second response to the API call.

Risk score is a value assigned to a specific observation representing its potential for fraud, waste, or abuse, given a set of measured risk factors. In healthcare claims, a risk score may be used by a payer to indicate the likelihood of suspicious billing activity.

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[*] The definitions for *data analytics, predictive analytics,* and *predictive modeling* were taken from the Data Analytic Capabilities Assessment CMS (2014). p. 4

Acronyms and Abbreviations

API	Application Program Interface
CAA	Consolidated Appropriations Act, 2021
CMS	Centers for Medicare & Medicaid Services
EDI	Electronic Data Interchange
FPS	Fraud Prevention System
FWA	Fraud, Waste, and Abuse
HFPP	Healthcare Fraud Prevention Partnership
HHS	Department of Health and Human Services
HIPAA	Health Insurance Portability and Accountability Act
ML	Machine Learning
OIG	Office of Inspector General
ROI	Return on Investment
S&PP	Security and Privacy Program
TTP	Trusted Third Party

HFPP Outcomes Metrics Definitions

The definitions included below are used for HFPP purposes to measure individual Partner outcomes from the Partnership's anti-fraud initiatives.

- **Hard Dollar Savings** (i.e., recoveries) - The dollars actually recovered or received by a Partner.
- **Soft Dollar Savings** (i.e., avoidances) - The dollars calculated and anticipated by a Partner to be recovered or collected at a future date.
- **Cases Opened -** The number of cases, also referred to as investigations, opened by a Partner within the defined reporting period.
- **Provider Warnings -** The number of provider warnings issued by a Partner within the defined reporting period.
- **Payment Suspensions and Terminations -** The number of payment suspensions and terminations – to include denial of network or program entry – implemented by a Partner within the defined reporting period. Each Partner calculates the total number of implemented payment suspensions and terminations; it is not by unique number of cases.
- **Revocations -** The number of revocations implemented by a Partner within the defined reporting period. The intent is to count the number of providers/suppliers impacted by a revocation as opposed to the number of individual revocations.
- **Indictments -** The number of indictments filed by a law enforcement Partner within the defined reporting period. The intent is to count the number of providers/suppliers indicated as opposed to the number of cases.
- **Civil Settlements and Judgments -** The number of civil settlements and judgments achieved by a law enforcement Partner within the defined reporting period.
- **Private Settlements and Arbitrations -** The number of private settlements and arbitrations achieved by a private payer Partner within the defined reporting period.
- **Convictions -** The number convictions achieved by a law enforcement Partner within the defined reporting period.
- **Restitution Orders -** The number of court ordered restitutions received by a law enforcement Partner within the defined reporting period. The intent is to count the number of provider(s)/supplier(s) ordered to pay restitution as opposed to the number of individual restitution orders.
- **Notable Outcomes -** The number of instances within the defined reporting period where a Partner considered an associated HFPP activity to have contributed to their efforts in a notable, impactful way. Each Partner determines for themselves what was notable. In addition to indicating the number of instances of notable outcomes, each Partner will be asked to briefly state what the notable outcome(s) was (e.g., rapidly received NPI list from a Federal takedown).