NASCIO 2015 State IT Recognition Awards

**Preventing Healthcare Fraud through Predictive Modeling**

*Category: Improving State Operations*

Commonwealth of Massachusetts

Executive Office of Health and Human Services

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MassIT

## Executive Summary

Massachusetts's Medicaid program, known as MassHealth, provides healthcare coverage to 1.4 million residents and processes ~65 million claims per year across a network of 40,000 providers.

Delivery of this critical service – at both the state and federal level across the country – however, faces a significant and ongoing challenge in the form of fraud, waste, and abuse. Estimates put the cost to taxpayers each year in the billions of dollars.

When state officials in Massachusetts decided that the traditional pay-and-chase model for addressing fraudulent claims – in which claims are paid first, then investigated – was no longer enough, they sought an innovative, proactive way to enhance the traditional approach with a preventative one. After determining that no other state had implemented a pre-payment, predictive approach for this purpose, Massachusetts went ahead to become the first. We adapted a predictive modeling solution used in other industries to meet our healthcare needs, integrated it with our systems, and rolled out the nation's first-of-its-kind predictive modeling and fraud detection system for healthcare provider claims.

Today, before they are paid, all MassHealth claims are subjected to sophisticated analytics – much like those used by private sector financial and credit card companies – to identify suspicious claims and billing patterns in near-real time.

The system:

- Detects, prevents, and decreases improper payments associated with fraud,
- Identifies inconsistencies, errors, and needed enhancements in related systems,
- Increases the efficiency of our state's claims processing operations, and
- Improves our ability to identify and mitigate potential payment risks and program vulnerabilities.

Payments to providers suspected of fraud or abuse are frozen until the claims are investigated and resolved.

Since launch, more than $10.5 million in cost savings – through prevention of payment, as well as expedited post-payment recoveries – have been directly attributed to the system. In addition, during the 2015 fiscal year, MassHealth saw claims for duplicative services drop by 45%, signaling the strength of the system's deterrent effect. As the system continues to learn from the information it gathers, we expect these benefits to increase over time.

Thanks to the state's innovative approach, we are minimizing the impact of fraud, waste, and abuse in Massachusetts's Medicaid payments, while helping ensure that healthcare benefits continue to be delivered to those who need them most.

## Business Problem and Solution Description

### *Business Problem*

Massachusetts's Medicaid Management Information System (MMIS) underpins the work of our MassHealth program, which processes ~65 million claims per year across a network of 40,000 providers in the course of delivering healthcare coverage to 1.4 million residents.

In keeping with the traditional pay-and-chase model employed by states to detect healthcare fraud, state employees examine claims after they have been paid using a random selection process, searching for fraud patterns on their own, and following up on tips they receive.

Our Executive Office of Health and Human Services (EOHHS) sought to augment MassHealth's post-payment review process with proactive work to detect and prevent fraud, waste, and abuse before it could occur. The goal was a system that would enhance our ability to identify claims that were inappropriately billed before payment and lead us to providers engaging in suspect behavior.

To gain a better understanding of how other states use technology to tackle this challenge, EOHHS reached out to the Medicaid agencies of the forty-nine other states. We learned that no other state Medicaid agencies had already addressed this challenge with the innovative use of technology.

By early in 2012, a handful of states had issued related requests for information, but we were unable to identify a state that had progressed to the point of issuing a request for responses, let alone implemented a pre-payment, predictive modeling solution.

### *The Solution*

EOHHS and MassHealth issued a request for quotes in April of 2012 to solicit proposals for a pre-payment predictive modeling solution that would integrate with our existing MassHealth MMIS claims processing system, analyze MassHealth claims data, and provide real-time or near real-time fraud detection.

In July of 2012, the Commonwealth contracted with Dynamic Research Corporation vendor to integrate a predictive modeling solution into our existing MassHealth system.

The solution is founded on technology capable of deploying algorithms and analytical processes to examine claims by member, provider, service, and other attributes with the goal of identifying and assigning an alert and risk score that prioritizes claims for further review.

### *How it Works*

The integrated system uses sophisticated algorithms and social networking analysis to analyze all claims as soon as they are submitted to the system by healthcare providers for payment.

The system analyzes against a wealth of data not previously accessible through one tool, including public information and state and federal data, including the state's master death file and the Office of Inspector General's provider exclusion list. If someone has died or a healthcare provider has been excluded (from eligibility for payment) for example, that information will be factored into pre-payment review of the claim, instead of waiting for post-payment review.

As claims enter the MMIS, they are checked against rules which allow for automatic payment, denial, or suspension for review. The system flags suspicious or high-risk claims and re-directs them to a team of specialized analysts which reviews each claim and provider via an interactive web-based user interface.

If reviewers determine that the claim is legitimate, they approve it and release it back into the system for prompt payment. If reviewers determine that a claim should be denied, they attach a denial reason code, which is used in tracking and reporting to minimize potential future fraud.

When fraud is suspected, EOHHS works collaboratively with state investigators and law enforcement as appropriate to seek resolution.

### *System Capabilities and Functionality*

The system successfully underwent rigorous testing, including unit testing, user testing, parallel testing, performance testing, security vulnerability testing, and ADA testing. It meets the Commonwealth's robust accessibility and security requirements.

Additional highlights of the system's capabilities and functionality include its ability to:

- Use statistically sound, empirically-derived predictive modeling technologies designed to prevent improper payments of high-risk and suspect claims and identify suspect relationships, patterns, trends, and billing behavior;
- Integrate seamlessly into the existing MassHealth MMIS claims processing system, ensuring no undue disruption in the processing of claims;
- Optimize itself genetically for improved performance – maximizing accuracy and minimizing incidences of false positives and false negatives – through continuous validation, recalibration of scoring models, and regular updates through a feedback loop;
- Provide workflow management tools for users to systematically track scores, reason codes, and actions for transactions scored as high-risk; and

- Provide tracking and reporting features with metrics designed to reconcile claims and evaluate and measure performance.

The federal government welcomed the proposed project as a forerunner in states' approach to reducing healthcare fraud and provided funding for the bulk of the project's cost. Of the total $6.9 million cost, federal funds were used for $6 million with the Commonwealth assuming responsibility for the remaining $900,000. As with the state's overarching MMIS, ongoing maintenance and support of the predictive modeling and fraud detection solution will be funded through a combination of federal and state funds.

***Fraud Detection in Action – An Example***

In one instance, a provider submitted a claim that billed two codes. Such a situation can be allowable, but only in certain circumstances. The claim was flagged for review. Upon review, it was determined that one of the codes was for a higher-cost office visit – entitling the provider to a higher rate of reimbursement – which superseded the second cost, rendering it not allowed. MassHealth took immediate action and denied the claim, preventing payment.

Research into this particular claim led not only to denial of that specific claim, but to identification of a pattern of behavior across a number of providers. By relying solely on the traditional pay-and-chase method, we would not have discovered this fraud – and others like it – until at least a year after such claims were paid. We would have paid providers perpetrating fraud and then, assuming each instance was retroactively caught, we would have attempted to recoup payments after the fact.

Thanks to our system's advanced capabilities, in this case we prevented one specific instance of fraud and gained insight that informs prevention of future fraud attempts.

## Significance of the Project

In Massachusetts, healthcare providers conduct ~90% of their day-to-day business online with MassHealth through our MMIS. A range of services – from adjudicating claims from providers to transacting reimbursements and maintaining member files – is delivered through the system in near real-time.

Healthcare fraud, waste, and abuse cost taxpayers billions of dollars each year. When fraud is perpetrated by healthcare providers – by billing for tests or other services *not delivered*, for example – it can put the health of intended beneficiaries at risk. Inappropriate payments further strain federal and state budgets already impacted by ever-increasing healthcare costs across the nation. This project builds upon the strong program integrity measures already in our MassHealth system. Instead of waiting for post-payment analysis to detect anomalies and suspicious behavior however, we are now able to prevent overpayment before it happens.

As a result, the Commonwealth has evolved from a strictly pay-and-chase model to one that incorporates both prevention and more timely and robust post-payment recovery.

We can now identify providers engaging in inappropriate or fraudulent behavior earlier in the process and prevent them from carrying out fraudulent activity.

EOHHS has a robust partnership with law enforcement partners who investigate and prosecute member and provider fraud. Through our partnership and collaborative work – coupled with the innovative use of advanced technology – we continue to build public trust in the Commonwealth's MassHealth and better safeguard public funds while promoting the health and well-being of MassHealth members.

## Benefits of the Project

Each year, MassHealth processes ~65 million fee-for-service claims; each of those claims now passes through our predictive modeling and fraud detection solution.

***Reducing Healthcare Fraud and Safeguarding Public Funds***

Since launching our predictive modeling solution in 2013, over $10.5 million in cost savings can be directly attributed to the predictive modeling solution.

The savings have more than covered the initial $6.9 million cost – $6 million of which was provided via federal funding. The savings are attributed to stopped payments, cost avoidance, potential recoveries, and system alerts identifying issues and discrepancies with the MMIS system.

Another notable statistic is the 45% reduction in members receiving duplicative services in FY2015. This implies a strong deterrent effect is now in place that is resulting in a significant reduction in billing for overlapping services. Although the deterrent effect is difficult to quantify at this point in time, the Predictive Modeling team has many examples of providers improving their billing accuracy after up-front denials of claims.

As the system is refined and continually learns from the information it gathers, we expect the levels of both prevented payments and expedited post-payment recoveries to increase over time.

This important work has a direct and positive impact on a number of beneficiaries, from the federal and state government levels to healthcare providers and constituents who rely on their services. By limiting the ability of potential fraudsters, MassHealth ensures that funds are not misdirected, keeping costs down and helping to ensure that constituents receive the care they need from providers who bill appropriately.

Highlights of additional business benefits delivered through use of the system follow:

***Enables Compliance with Federal Prompt Payment Rules:*** Because the system provides a rapid, real-time, or near-real-time solution, it limits the amount of manual effort and review time needed for each suspect claims, enabling MassHealth to conform to federal Prompt Payment regulations;

***Greater Visibility:*** It allows MassHealth unprecedented visibility into data and data analysis so that patterns of excessive usage, unusual patterns, and comparisons to peers are identified, scored, and addressed rapidly;

***Fast Feedback:*** It provides a user-friendly feedback loop for analysts to enter the final resolution of high-risk and suspect claims into the system. When reviewers determine a claim is appropriate for payment, it quickly reenters the claims process so there is no disruption in the release of payment; and

***Continuous Learning:*** The system quickly accommodates modifications and enhancements via a change control process that reacts to changing patterns of behavior. It builds profiles of providers with suspicious billing patterns; inherent learning and genetic features of the solution enhance its performance and accuracy over time.

In the absence of these sophisticated capabilities, MassHealth would forgo opportunities in proactive fraud detection, prevention of loss, and more rapid resolution.

Although the predictive analytics solution is not a cure-all for the elimination of fraud, it identifies risk which allows us to take necessary steps toward stopping fraudulent behavior before it costs the state money. The system puts data in the driver's seat and empowers staff to take proactive corrective action.

***Moving the Commonwealth Forward***

As we continue to build the system, we are adding new detection scenarios and data sources to further strengthen its capabilities. Increasingly, healthcare providers and members who attempt to take advantage of the MassHealth program will not succeed.

In short, the project improves program integrity while lowering operational cost through increased efficiencies and proactive fraud detection. The Commonwealth estimates that the initial investment in the system will be recouped within the first two to three years following implementation. The project also represents a repeatable implementation model from which other states can benefit.

By leveraging advanced technology and collaboration among state partners, the Commonwealth is taking an unprecedented step forward in reducing healthcare fraud. For the first time, MassHealth can stop the cycle of pay-and-chase by blocking the payment of suspicious claims before the check goes out the door.

The project embodies a number of the State CIO priorities identified by NASCIO, from optimizing existing services to focusing on budget and cost control. By creating a model that other states can follow, the Commonwealth's work also represents a meaningful step forward in helping the federal government reduce healthcare fraud nationwide.

Thanks to this innovative technology, we are ensuring that healthcare benefits are delivered appropriately and efficiently and are available for those who need them most.