

*Sustaining Excellence—Making Progress*

# Use the Power of Real -Time Predictive Modeling and Other Essentials to Reshape Your Anti-Fraud Strategy

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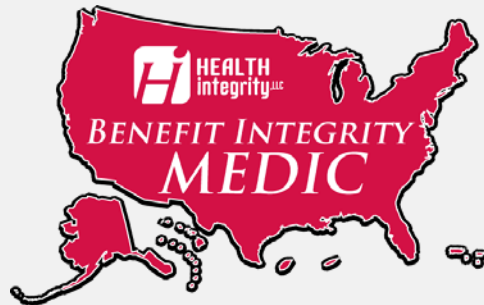


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# Agenda

- Current Medicaid anti-fraud strategy
- Use the power of Predictive Modeling to rethink and prioritize your anti-fraud strategy effort
- Improve anti-fraud effort through collaboration with MFCU
- Collaborate with other states
- Pilots sponsored by Health Integrity to help you “test our proprietary predictive modeling stream engine”

# Introduction to Health Integrity— A proven CMS prime contractor



Health Integrity manages CMS work nationwide

- Zone Program Integrity Contractor
- Audit Medicaid Integrity Program—34 States and the District of Columbia
- National Benefit Integrity MEDIC Program Parts C & D
- National Provider Site Visit Team Member
- National Predictive Modeling Contractor Team Member

***Parent Company—Quality Health Strategies has 40 years experience supporting CMS programs***

# Current Medicaid Anti-Fraud Strategy

- Pay and Chase
- Both programs were designed to enroll "any willing provider" and to reimburse claims quickly for services provided.
- Enormous volume of transactions: MACs process about 4.5 million every business day from 1.5 million providers; 30,000 enrollment applications per month.
- The historical emphasis on rapid payment, coupled with the vast numbers of claims and providers and resource strapped program integrity entities are a recipe for improper payments.
- GAO has designated Medicare and Medicaid as being at "high risk" for fraud, abuse, and improper payments.

# Peel Back the Layers of the Onion

## (Or, What Comprises Improper Payments)

- CMS defines healthcare **Fraud** as making false statements or representations of material facts to obtain some benefit or payment for which no entitlement would otherwise exist. These acts may be committed either for the person's own benefit or for the benefit of some other party. In other words, fraud includes the obtaining of something of value through misrepresentation or concealment of material facts.
  - Services not rendered
  - False front providers
  - Kickbacks in connection with services

# Peel Back the Layers of the Onion

## (Or, What Comprises Improper Payments)

- CMS defines healthcare **Abuse** as practices that, either directly or indirectly, result in unnecessary costs to the Medicare Program. Abuse includes any practice that is not consistent with the goals of providing patients with services that are medically necessary, meet professionally recognized standards, and are fairly priced. Another area, “**Waste**,” refers to health care that is not effective.
- Examples of abuse include:
  - Misusing codes on a claim or up-coding;
  - Charging excessively for services or supplies;
  - Services not medically necessary.

# Chopping and Dicing the Onion

## (Or, What to do about Improper Payments)

- Both fraud and abuse can expose providers to criminal and civil liability.
- Were rules broken or bent a bit?
- Criminal intent, reckless or willful disregard
- Criminal, Civil and Administrative remedies
- Mitigating Factors
  - *Egregiousness – patient harm, dollars, numbers of services, states*
  - *Jurisdiction and Venue*
  - *Investigative & prosecutive resources and aggressiveness*
  - *Prior provider education*

# Cooking the Onion

## (Or, What to do about Improper Payments)

- 1965: Medicare and Medicaid enacted; only one provision in the law prohibiting the making of false statements to obtain a reimbursement.
- 1977: Medicare-Medicaid Anti-Fraud and Abuse Amendments; established MFCUs (mandatory for states after 1995).
- 1986: Congress passed amendments to the False Claims Act.
- 1996: Health care fraud itself--and not just the making of false statements--was criminalized, when the federal Health Care Fraud and Abuse Control Program was enacted as part of the antifraud provisions of the Health Insurance Portability and Accountability Act (HIPAA).



# The Cost of Onions

- The true annual cost of fraud and abuse in health care is not known.
- FY 2011 Medicare spent \$565 billion on behalf of its 48.7 million beneficiaries
- Federal and state Medicaid agencies served 70 million people at a combined cost of \$428 billion.
- CMS estimated that in FY 2010 these two programs made more than \$65 – \$75 billion in improper federal payments.

# **Real-time, Real-world Examples of Fraud, Waste & Abuse**



# Hospice

- Unnecessary services?
- Focus on eligibility for hospice service level
- For the terminally ill—life expectancy is 6 months or less if illness runs its normal course
- Hospice Medical Director certifies life expectancy
- Disease progression not reversible, progressive functional decline, no curative treatments (except children under ACA)
- Focus on Hospice Medical Director's certification(s) of hospice eligibility
- Is the disease terminal or chronic?
- Related issues—Hospice benefits paid outside of the hospice package (e.g., Rx) and Hospices paying nursing facilities a higher rate than 95% for room and board (Anti-kickback)

# One-Day & Zero-Day Stays

- Could be services not rendered, unnecessary or misrepresented services (coded incorrectly)
- Focus—should the short hospital stay been furnished on Observation Basis or Outpatient Setting or Not At All?
- Conduct medical necessity reviews of one-day and zero-day inpatient hospital stays
- Exclude from audit labor and delivery claims, patient death claims, and other non-productive claims

# Drug Diversion

- **“Drug diversion” is best defined as the diversion of licit drugs for illicit purposes. It involves the diversion of drugs from legal and medically necessary uses towards uses that are illegal and typically not medically authorized or necessary.**

# Drug Diversion

- The National Drug Threat Assessment report further states that, “The most commonly diverted CPDs are opioid pain relievers...”
- In addition to opioids, significant diversion is occurring with high cost antipsychotic and mental health drugs, such as aripiprazole (Abilify), ziprasidone (Geodon), risperidone (Risperdal), quetiapine (Seroquel), and olanzapine (Zyprexa), as well as benzodiazepines such as alprazolam (Xanax), clonazepam (Klonopin) and lorazepam (Ativan).

# Drug Diversion

- Impact: goes beyond just the cost of the prescription drugs.
- Also: costs associated with doctor's visits, emergency department (ED) treatment, rehabilitation centers, and other health care needs, not to mention the human toll.
- In 2008, SAMHSA estimated that prescription or over-the-counter drugs used non-medically were involved in 1.0 million ED visits.

# Drug Diversion

- As cited by CMS in a report on drug diversion, a 2010 National Drug Threat Assessment reported that “The threat posed by the diversion and abuse of controlled prescription drugs (CPDs), primarily pain relievers, is increasing, as evidenced by the sharp rise in the percentage (4.6 percent in 2007, 9.8 percent in 2009) of state and local law enforcement agencies reporting CPDs as the greatest drug threat in their area.” Increased abuse of CPDs has led to elevated numbers of deaths related to prescription opioids, which increased 98 percent from 2002 to 2006.



# Pharmacy

- Lovenox<sup>®</sup> prescriptions that were billed based on the number of syringes dispensed rather than the number of milliliters.
- Kit billing errors – kits should be billed as one unit regardless of the number of units in the kit – unbundling.
- Refilled to soon or without prior authorization.

# DRG Outliers

- At least 42 States use DRG-based payment systems for Medicaid inpatient hospital payments.
- DRG payment systems may vary from State to State but basically use a predetermined payment amount based on beneficiary's admission diagnosis.
- All States with DRG systems pay additional amounts, known as outlier payments, for longer lengths of stay or excessive costly stays.
- DRG Outlier audits entail a review of the financial and medical documentation for the outlier stays based on State policies.

# Physicians at Teaching Hospitals (PATH)

- PATH Medicare initiative originated by OIG.
- Inadequate documentation in medical records regarding the teaching doc's involvement in services provided by residents.
- More specifically, a physician was not personally performing a service on a patient or personally supervising the services performed by an intern or resident in the attending physician's presence.

# PATH

- The audits determined that some teaching physicians had “up-coded” their claims—that is, billed for more complex and, therefore, more expensive services than were provided.
- The OIG did not conduct *Medicaid* PATH audits.
- However, 42 CFR Chapter IV Section 482.1(a)(5) states that hospitals receiving payments under Medicaid must meet the requirements for participation in Medicare.

# Medicaid Managed Care-Overview

- About 75% of Medicaid beneficiaries enrolled in a variety of Medicaid Managed Entities
- Majority of those enrollees are in fully capitated Medicaid MCOs (Managed Care Organizations)
- States with Medicaid Expansions in 2014 under ACA (Affordable Care Act) will add further to managed care enrollment
- Only 3 States (AK, WY, and NH) without any managed care enrollment, although NH will require managed care enrollment on December 1, 2013
- While Medicaid managed care enrollment covers all populations, families and children are the primary enrollees.

# Medicaid Managed Care-Audits & Investigations

- States use Medicaid managed care systems for savings and predictability of future expenditures.
- Are States getting what they expected in the past, present, and future?
- Are the capitation rates appropriate for the services furnished?
- Are the plans' encounter data reliable and routinely provided?
- Are the encounter data static or do they reflect changes in beneficiary health/cost over time?

**Use the power of real-time Predictive Modeling to rethink and prioritize your anti-fraud strategy effort**



# What is Predictive Modeling

- ❑ **Predictive modeling** is the process by which a model is created or chosen to best predict the probability of an outcome. An example of the outcome can be fraudulent billing for controlled substances schedule II drugs.
- ❑ There are two classes of statistical modeling methodologies that are more innovative than rule-based algorithms:
  - Supervised learning - looks at historical data for relationships between predictors (e.g., attributes of pharmacies, prescribers and/or members) and outcomes (e.g. fraudulent billing for controlled substances schedule II drugs).
  - Unsupervised learning - identifies patterns in predictors without the benefit of historical data. Unsupervised learning focuses on identifying anomalies in the data that might indicate fraud, waste and abuse.



# Supervised & Unsupervised Learning in Modeling



## **(Logistic) Regression Analysis**

Models relationships between predictors and outcomes

Might use regression to estimate relationships with certain characteristics and non-compliance/fraud



## **Classification Trees (Random Forest)**

Cull through a set of predictor variables and successively split a data set into subgroups in order to improve the prediction or classification of an outcome

Can profile the behavior of pharmacies previously revoked for past fraudulent behavior and predict unknown outcomes



## **Support Vector Machine**

Chooses a line, a hyperplane, or a set of hyperplanes in a high or indefinite dimensional space that best classifies a data set into one category or the other

Might profile providers using past fraudulent outcomes, and then score the behavior of other providers based on their similarities



## **Artificial Neural Networks (ANN)**

These non-linear predictive models learn through training and resemble biological neural networks in structure and also focus on previously proven fraud & abuse

Build provider profiles that establish the norms of providers and identify the providers that deviate from the norms



## **Bagging (Bootstrap Aggregating)**

This machine learning ensemble meta-algorithm improves the stability and accuracy of machine learning for classification and regression models. Also reduces variance and helps to avoid over-fitting of the information

Can profile the behavior of owners who were previously convicted for fraudulent behavior and predict unknown outcomes



## **Naïve Bayes Classifier**

This simple probabilistic classifier is based on applying Bayes' theorem (from Bayesian statistics)

It classifies a data set into one category or the other through profiling providers using prior proven fraud and abuse scenarios

### Supervised Learning Methods



## **Cluster Analysis**

Reveals natural groupings within a collection of data. For example, we might cluster billing behavior by geographic location

Helps scrutinize providers occupying sparsely-populated clusters that could indicate suspicious behavior



## **(Multivariate) Outlier Detection**

Analyzes the distributions of key variables in the data and determines the threshold levels above which a reported value will be considered very unusual

Might examine providers that claim an abnormally large number of prescriptions



## **Association Algorithm (Link Analysis)**

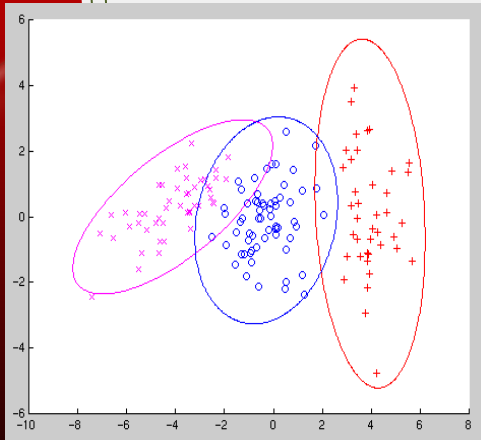
Looks for patterns or clusters among a number of items

We might search for uncommon groupings of referring providers and compromised beneficiaries as a sign of possible fraud or abuse

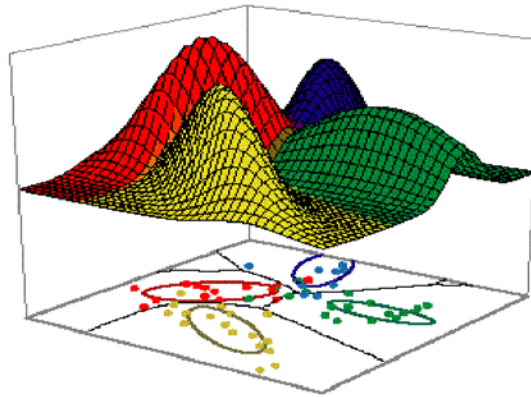
### Unsupervised Learning Methods

# Examples of Statistical and Computational Learning Algorithms We Use and More

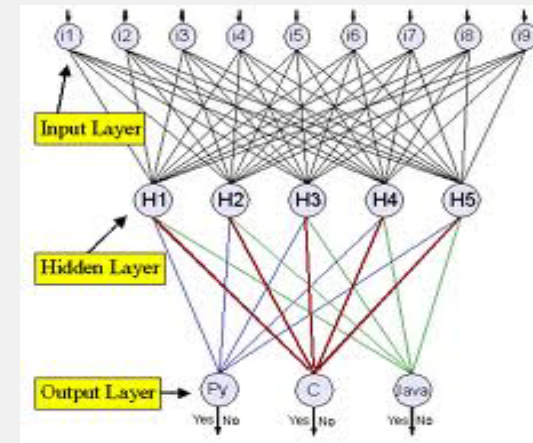
## Clustering



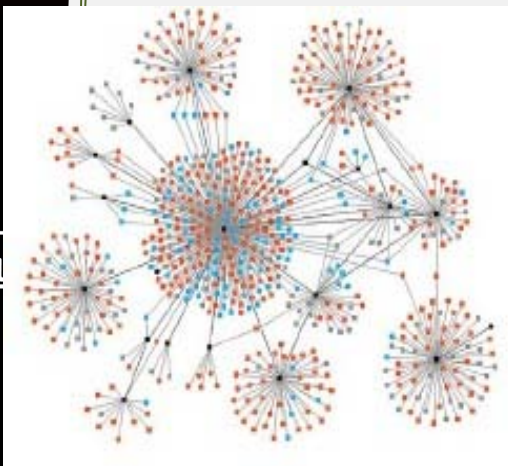
## Support Vector Machine



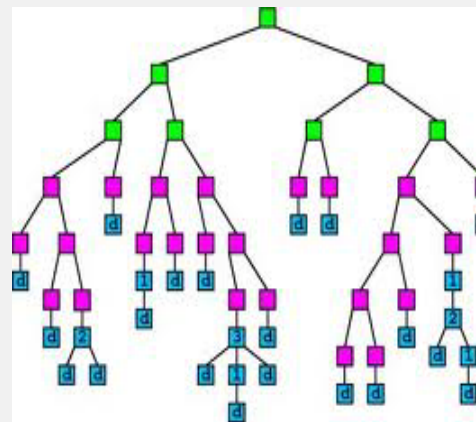
## Neural Network



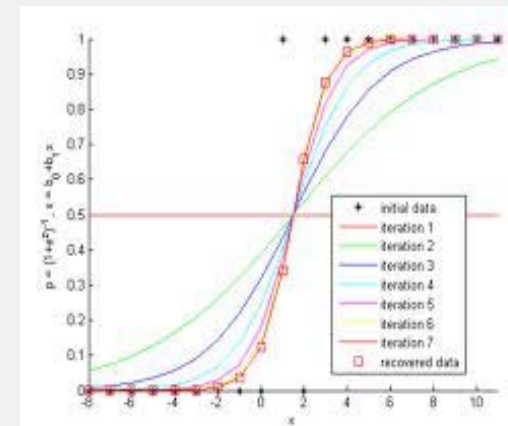
## Link Analysis



## Decision Tree



## Logistic Regression



# Risk Factors Turned into Computational Statistics

## Health Integrity excels at determining weights and predictors

*Represents the weighting*

$$Y = \beta_0 + \beta_1 x_{1, i} + \dots + \beta_M x_{m, i}$$

*Represents the prediction of interest*

*Represents the risk factors*

Fraud probability of a Pharmacy = Intercept + Owner with Criminal Record + 2 \* Retail Pharmacy on Empty Lot (via Google Map Image Recognition) + 3 \* Prescribers without Prescribing Authorities + 1.5 \* Overlapping CS II Prescriptions + 2 \* CS II Refills + 3.5 \* Located in High Fraud Area

# *One Example of Modeling Output Statistically significant predictors based on training data*

**Analysis of Maximum Likelihood Estimates**

Predictor	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-3.4514	0.2056	281.7524	<.0001
High Fraud Area	1	0.1457	0.0208	48.9151	<.0001
Suspicious Ownership	1	0.2278	0.0168	183.5564	<.0001
Suspicious Affiliation	1	0.1185	0.0257	21.2078	<.0001
Small Office Space (Google Map)	1	0.4966	0.07	50.2979	<.0001
Owner Filed Bankruptcy	1	0.2275	0.0687	10.9807	0.0009
High Fraud Products/Services	1	0.19	0.0808	5.5251	0.0187
Co-locate with Other Medicaid Providers	1	0.3033	0.0652	21.6658	<.0001
Unanswered Business Phone	1	0.4134	0.0704	34.4665	<.0001
Far from Benes	1	0.5759	0.1356	18.0341	<.0001
Suspicious Bank Account	1	0.5901	0.0677	75.8728	<.0001
Suspicious Registered Agent	1	0.0148	0.00245	36.5716	<.0001
Not Listed on Yellow/White Pages (Web Scraping)	1	0.6129	0.0935	42.991	<.0001
Suspicious LinkedIn/Facebook "Friends"	1	1.3951	0.0702	395.4419	<.0001
Billing in 4 Consecutive Quarters	1	-0.164	0.0662	6.1338	0.0133
Complaints on Telemarketing	1	0.2738	0.0638	18.4329	<.0001

# Model Refinement and Testing

- ❑ We will continuously monitor and refine our risk score models to calibrate model accuracy to continuously improve the accuracy of the risk scores.
- ❑ Our quantitative evaluation approach will minimize false positives and maximize detection of risky providers and pharmacies.
  - By raising or lowering the threshold, we can tune the model to balance trade-offs between the false positive rate and the true positive rate.
  - We will use Receiver Operating Characteristic (ROC) curves to quantify these tradeoffs and establish thresholds that meet the agreed upon definition of effective.

# We learn together and add to Fraud Detection

## *Model Communication and Testing with the State*

- The results of model development and testing, including the algorithms, proposed actions and expected results are shared and reviewed with all parties (e.g., the State).

# Features of Real Time Scoring Engine

- ❑ Data points will continuously stream changing the risk scores.
- ❑ The real time scoring engine will compare a risk score to a threshold and flag the leads for investigation if the risk score is above the threshold.
- ❑ Providers of all levels of risks will be evaluated real-time in the risk scoring system.
- ❑ Risk scores derived from predictive models will be updated real-time upon integration of new data points (e.g., new claims, bankruptcy data, social media data) which can update the risk levels of new and existing providers.

# New Data Sources to Generate Risk Factors

- ❑ HI pursues broad range of data sources:
  - Public records (for example, ownership, criminal records, bankruptcy, incarceration)
  - Web scraping (for example, social media, Google map, negative web news)
  - Fraud Investigation Database (FID)
  - Postal Address
  - Suspicious Bank Accounts



# HI uses more comprehensive approach

- ❑ **Adds Real Time** dimension to scoring. Not rely on periodic reporting - quarterly, annually
- ❑ **Continuously Adds New Data** sources and data points (e.g. public records such as Secretary of State business records, property ownership records, bankruptcy records, social media, Google Maps)
- ❑ **Leverage Predictive Modeling** to uncover what we can't see or don't know (e.g. hidden relationships in data) and ***PRIORITIZE RISK***

# Applications

- States use Medicaid managed care systems for savings and predictability of future expenditures. Use predictive modeling system driven by advanced analytics to:
  - Assess fraud, waste and abuse
  - Assess appropriateness of capitation rate which is usually driven by service cost
- Extremely important for States and managed care plans to implement predictive modeling system to assess the program integrity issues thoroughly especially with Medicaid expansion

# Applications

- Use predictive modeling system to improve health outcomes. For example:
  - Predict patients at risk of hospital readmission within 30 days
  - Predict patients at risk of medication non-compliance
  - Predict which intervention strategy options will work with certain patient population
- Extremely important to leverage predictive modeling system as a tool to best target the patient population at risk and implement appropriate intervention strategies in order to drive down the cost and achieve better health outcomes

# Stop at our booth for live demo on Health Integrity Predictive Modeling Solution

Home Suppliers ▾ Beneficiaries ▾ Pharmacies ▾ Setup ▾

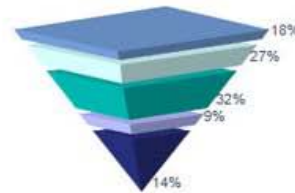
## Rolling Trend by Risk Category

1d 1w 1m 3m 6m 1y

Risk	Pharmacies (in Thousands)	Prescribers (in Millions)	Benes (in Millions)
Low	68.5 (-2%)	3.15 (+1%)	27.95 (+2%)
Medium	23.4 (+1%)	0.75 (-2%)	4.12 (+1%)
High	1.0 (-3%)	0.28 (+2%)	2.26 (+3%)
Total	92.9 (+1%)	4.18 (0%)	34.33 (-1%)

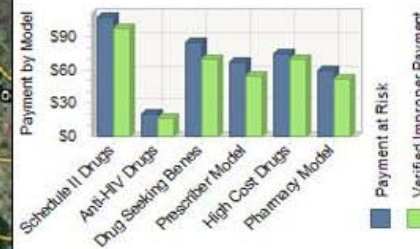


## Common Risk Factors



- Prescribers without Prescribing Authorities
- % Paper Claims
- % Compound Prescriptions
- % Benes with Overlapping CS II Prescriptions
- Owner of Pharmacy Has Criminal Record

## Model Performance



## Risk Models

### Supplier

- Schedule II Drugs
- Anti-HIV Drugs
- Prescriber Model
- High Cost Drugs

Results

### Beneficiary

- Drug Seeking Benes

Results

## Following

## Featuring

### Most Viewed Topics

- [Drug Diversion](#)
- [Duplicate E&M Payment](#)

### Most Commented Topics

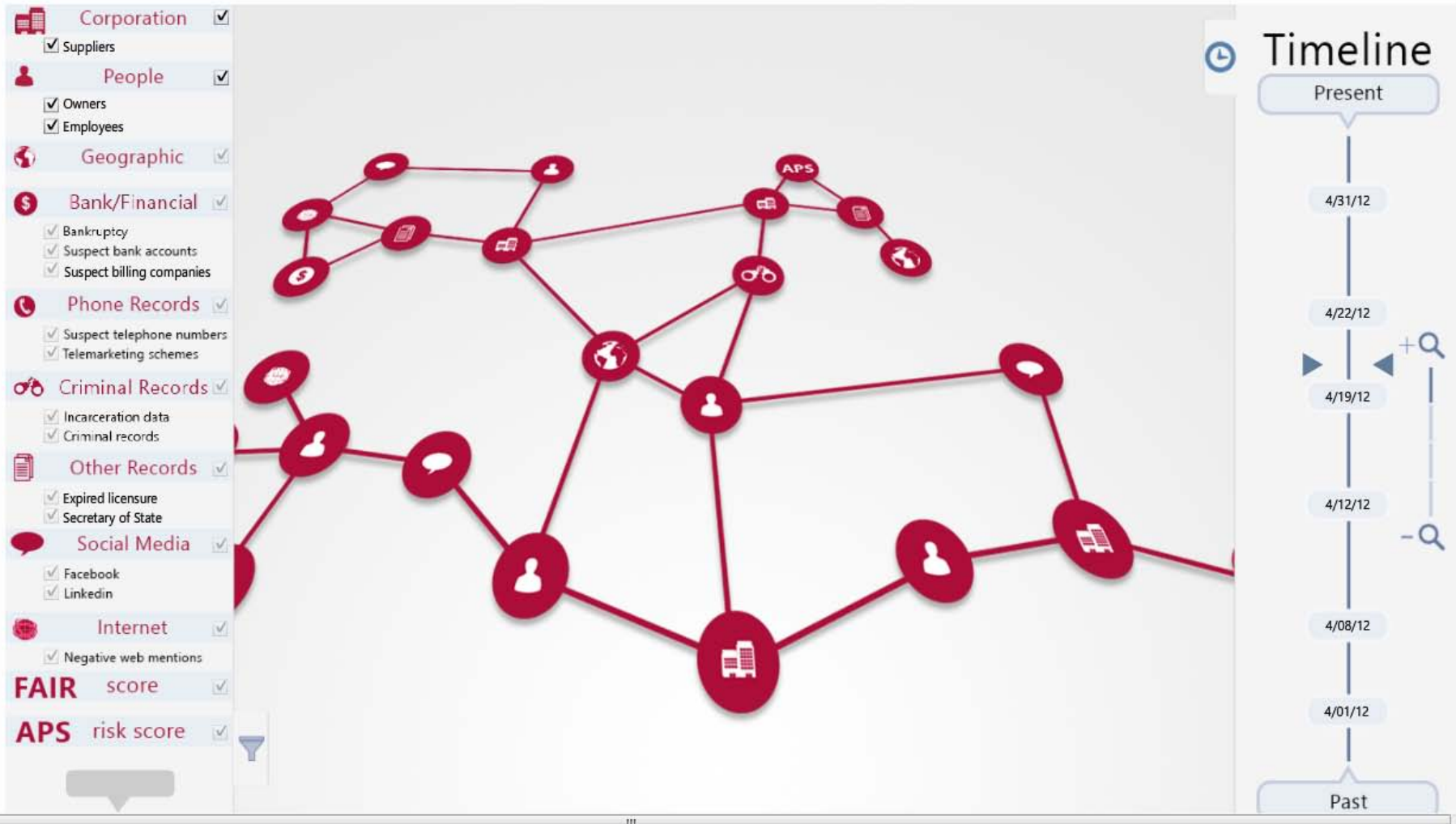
- [Stolen Patient Identity](#)
- [Off-Label Use of Antipsychotic Medications](#)

### Most Followed Topics

- [Service Not Rendered](#)
- [False Front Provider](#)

## Recent

# Stop at our booth for live demo on Health Integrity Predictive Modeling Solution



## 3-Month Pilot

### Modeling and Risk Scoring Engine Development

*Pilots sponsored by Health Integrity to help you “test our proprietary predictive modeling stream engine”*

Month 1	Month 2	Month 3
Build supervised learning predictive models	Build supervised & unsupervised learning predictive models	Continue to build supervised & unsupervised learning predictive models
Incorporate new data sources	Continue to incorporate new data sources	Continue to incorporate new data sources
Set up real time application to stream data	Stream data (e.g. claims, external data sources)	Stream data (e.g. claims, external data sources)
Deploy role-based web user interface	Deploy approved predictive models to the web user interface	Deploy approved predictive models to the web user interface
	Train and support users	Train and support State users
		Model refinement



# **Improve anti-fraud effort through collaboration with MFCU**



# MFCU Data Mining Opportunities

- **OIG Final Rule Issued May 17, 2013**
- **Lifted Prohibition for FFP for Data Mining**
- **Requires Coordination Between MFCU, State Agency, OIG and CMS**
- **Great Opportunity For Enhanced Fraud Fighting Opportunity With Great ROI; Advanced Fraud Analysis**
- **Health Integrity Very Experienced With Data Mining**
  - **Expert in Predictive Modeling**
  - **Staff of Former OIG, MFCU and CMS Employees**





# MFCU Data Mining Opportunities

- MFCUs and State Medicaid agencies must fully coordinate the MFCUs' use of data mining and the identification of possible provider fraud.
- A MFCU must identify methods for addressing three critical elements in its agreements with the State Medicaid agency:
  - ✓ Coordination with the State Medicaid agency;
  - ✓ Programmatic knowledge; and,
  - ✓ Training.

# MFCU Data Mining Opportunities

- For example, MFCUs should consult with the State Medicaid agencies in considering data mining priorities that may also be subject to program integrity and audit reviews. Similarly, State Medicaid agencies and MFCUs should coordinate data mining projects with activities of other organizations, such as “review contractors” that are selected by the Centers for Medicare & Medicaid Services (CMS) and are responsible for identifying providers subject to audits or program administrative actions.

# False Claims Act Cases

- The DRA encourages states to adopt their own false claims laws and provides states with financial incentives to do so. Those states adopting false claims laws are required to include in the state laws provisions to protect employees who initiate lawful actions under state false claims law from retaliation.
- The OIG, in consultation with the Attorney General, determines whether States have false claims acts that qualify for an incentive under section 1909 of the Social Security Act. Those States deemed to have qualifying laws receive a 10-percentage-point increase in their share of any amounts recovered under such laws.

# Collaborate with other states



# Drill, baby, Drill

- Providers with national and multi-state footprints
- CMS Command Center Missions
- Consider referrals to law enforcement
  - Criminal Investigations
  - Civil False Claims Act prosecutions
  - Civil Monetary Penalty actions
- Medi-Medi as an option

# Cross State Eligibility

- Medicaid beneficiaries may be eligible in only one State at a time, which is usually specified on a monthly basis.
- Federal statutory requirements - State residency is a condition of Medicaid eligibility.
- States are required to enter Medicaid beneficiary enrollment into the PARIS system (Public Assistance Reporting Information System) on a routine basis.
- This issue is further exacerbated when beneficiaries are in a managed care system for which the plan is paid a monthly capitation premium for beneficiaries incurring no services as they are residing in another State.

**Pilots** sponsored by Health Integrity to help you “test our proprietary predictive modeling stream engine”



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