



Data Analytics to Fight Fraud, Waste and Abuse at HHS-OIG

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What HHS-OIG Does

We fight **fraud**, **waste**, and **abuse** in Medicare,
Medicaid, and more than 100 other HHS
programs



Audit



Evaluate



Investigate

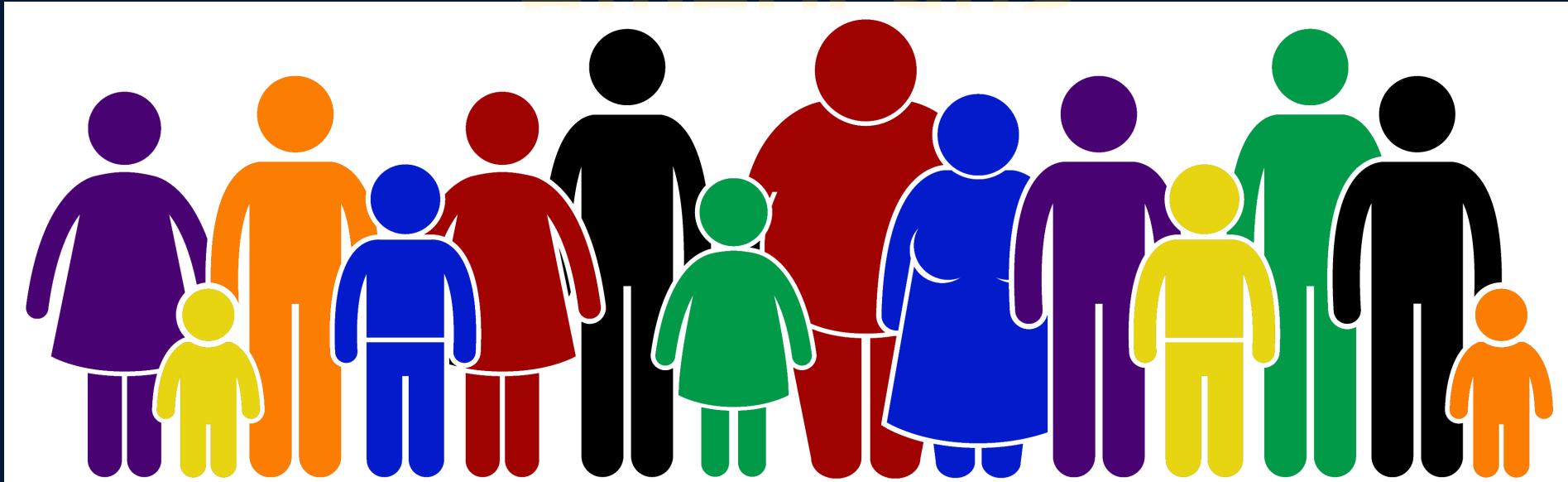


Counsel



Medicare and Medicaid

1 in 3
Americans

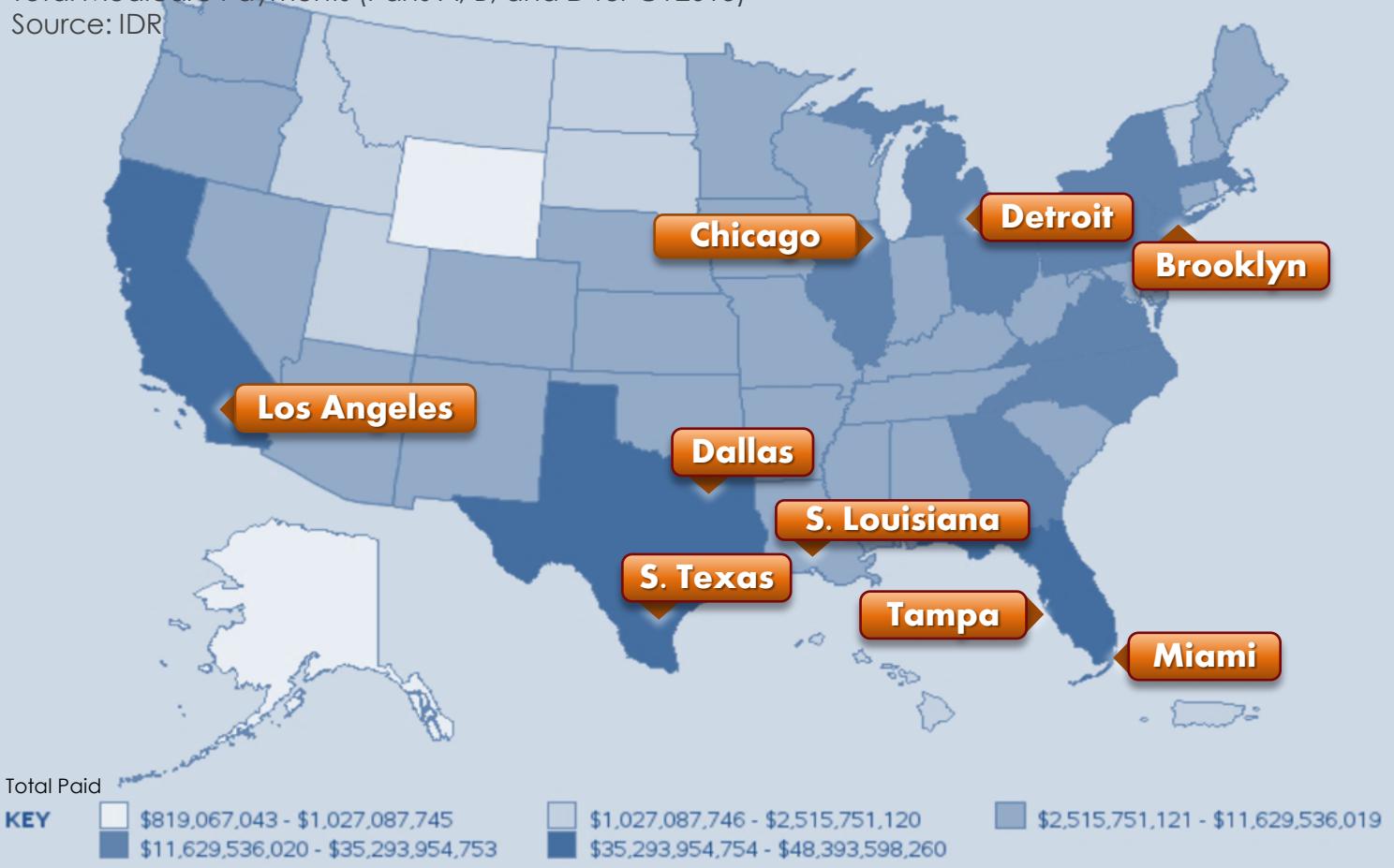




Medicare Payments

Total Medicare Payments (Parts A, B, and D for CY2015)

Source: IDR



Indicates Strike Force Location



What the Chief Data Office does

Provide more and better access to data and analytics to support OIG's mission

Accelerate data analytics for use in audits, investigations, evaluations, and compliance oversight

Enhance our use of data to make more informed decisions

Serve as an enabler and accelerator

Improve access to internal and external data

- Reduce the time it takes for auditors, investigators, evaluators, attorneys, analysts, executives, managers and others to access quality data



Data Science Activities

Obtaining the data you need

Manipulating the data to fit your analytic needs

Conducting the analysis

Turning data into action



Data Analytics: The Teams

Advanced Audit Techniques Staff

Technical Support Staff

Consolidated Data Analysis Center

- Providing **data extracts**, **data matches**, **sampling frames**, and other data analyses in close adherence to government auditing standards
- Obtain, store and analyze claims, provider, beneficiary and other data sources
- Perform data mining techniques to identify audit risk areas
- Support **statistical sampling** used throughout the audit process and investigative process
- Identify significant **changes in observed trends**
- Utilize **innovative approaches** for meeting data and analysis needs, including the use of the latest platforms and technology
- Design and develop **mathematical statistical models**, methods, and/or techniques
- Provide **training** and support to analysts in the use of software and other platforms
- Develop new **self-service analytic systems and tools** (e.g., IDR client applications for investigators, auditors and evaluators)
- Develop fraud detection methods and **predictive analytics**
- Produce proactive data analyses to **identify potential targets**



People

What is the right blend of talent for your data analytics team – domain expertise, computer science, mathematics?

Does your team:

- have the technical know how?
- have a “can do” attitude in a client/customer focused environment?
- have critical thinking skills and are willing to learn?
- have the right motivation and a creative nature?

MODERN DATA SCIENTIST

Data Scientist, the sexiest job of the 21th century, requires a mixture of multidisciplinary skills ranging from an intersection of mathematics, statistics, computer science, communication and business. Finding a data scientist is hard. Finding people who understand who a data scientist is, is equally hard. So here is a little cheat sheet on who the modern data scientist really is.

MATH & STATISTICS

- ★ Machine learning
- ★ Statistical modeling
- ★ Experiment design
- ★ Bayesian inference
- ★ Supervised learning: decision trees, random forests, logistic regression
- ★ Unsupervised learning: clustering, dimensionality reduction
- ★ Optimization: gradient descent and variants

PROGRAMMING & DATABASE

- ★ Computer science fundamentals
- ★ Scripting language e.g. Python
- ★ Statistical computing packages, e.g. R
- ★ Databases: SQL and NoSQL
- ★ Relational algebra
- ★ Parallel databases and parallel query processing
- ★ MapReduce concepts
- ★ Hadoop and Hive/Pig
- ★ Custom reducers
- ★ Experience with xaaS like AWS



DOMAIN KNOWLEDGE & SOFT SKILLS

- ★ Passionate about the business
- ★ Curious about data
- ★ Influence without authority
- ★ Hacker mindset
- ★ Problem solver
- ★ Strategic, proactive, creative, innovative and collaborative

COMMUNICATION & VISUALIZATION

- ★ Able to engage with senior management
- ★ Story telling skills
- ★ Translate data-driven insights into decisions and actions
- ★ Visual art design
- ★ R packages like ggplot or lattice
- ★ Knowledge of any of visualization tools e.g. Flare, D3.js, Tableau



Data Sources

How many data sources do you have?



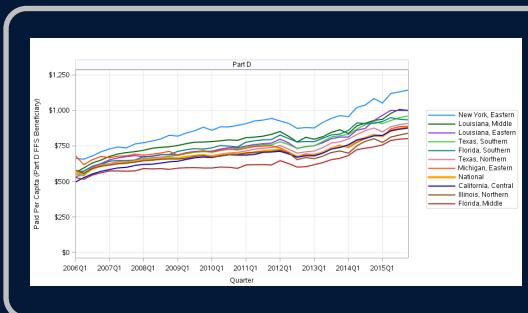
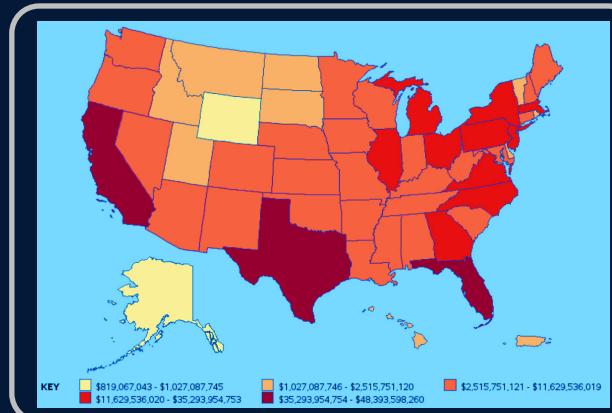
- Claims and Payment Data, Beneficiary and Provider Data, Drug Data, Reference Data



Tools

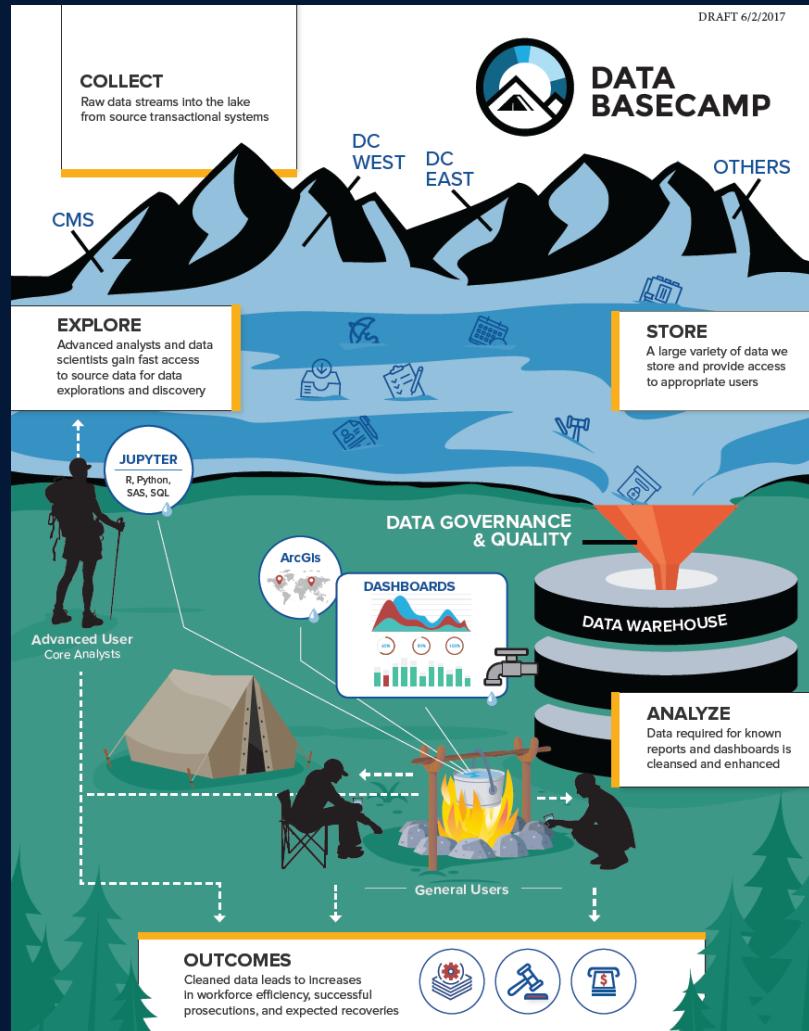
- Tool suite: SAS, JMP, ACL, Maptitude, ArcGIS, R Studio, Python, Modeler, RATSTATS, TOAD, uReveal, Looker, etc...
- We are focused on empowering the organization to conduct analytics themselves with self-service tools

- Payments by Geographic Area
- Provider Profile
- Trend Tool
- Peer Comparison
- Dashboards





Evolving Analytics Environment





July 2017 National Takedown: 412 defendants, \$1.3B in Losses



2017 NATIONAL HEALTH CARE FRAUD TAKEDOWN

TAKEDOWN By The Numbers

- 412** Defendants Charged, Including
- 115** Medical Professionals
- \$1.3** Billion in Losses
- 41** Federal Districts
- 30** Medicaid Fraud Control Units
- 295** Exclusion Notices
- 350** OIG Agents

Source: DOJ and HHS OIG



Using data analytics

Leverage diverse talent

Investigators

Evaluators

Attorneys

Auditors

+ Federal, State, Local and Private
Partners

With Data Analytics

Programmers

Mathematicians

Data Scientists

Statisticians

+ New Data Sets and Analytic Tools

*Harness data
analytics to develop
new approaches to
identify unknown,
undetected, and
emerging patterns*

Prevent and
combat new and
existing fraud,
waste, and abuse

Bring skills, authorities and tools together in a multi-disciplinary team approach to take a fresh look at the problem and capitalize on innovative ways of looking at data



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What's New

August 10, 2015

Podcast: Not All of the Federally Facilitated Marketplace's Internal Controls Were Effective in Ensuring That Individuals Were Properly Determined Eligible for Qualified Health Plans and Insurance Affordability Programs

Not All of the Federally Facilitated Marketplace's Internal Controls Were Effective

Latest Enforcement Actions

August 7, 2015; U.S. Department of Justice
Miami-Area Pharmacy Owner Pleads Guilty to Role in \$1.6 Million Medicare Fraud Scheme

August 6, 2015; U.S. Attorney, Northern District of Illinois
CEO Of Chicago-Based Health Care Company Charged With Billing Medicare For Phony And

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Questions

