

Government and Professional Sources of Information on Data Mining and Analysis

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This resource handout contains resources on information system and data security, data mining and analysis, and predictive analytics of use to physicians, other health care professionals, other health care entities, and State Medicaid agencies. This list is not all-inclusive, and particular sources may not apply to a given situation.

Information System and Data Security

- Centers for Medicare & Medicaid Services (CMS). CMS Policy for Information Security and Privacy.

https://www.cms.gov/Research-Statistics-Data-and-Systems/CMS-Information-Technology/InformationSecurity/Downloads/IS_Policy-.pdf

Articulates policy and procedure promulgated and practiced to protect data confidentiality and integrity when storing, processing, and using information.

- CMS. Information Systems Security & Privacy Awareness Training.

https://www.cms.gov/Research-Statistics-Data-and-Systems/CMS-Information-Technology/InformationSecurity/Downloads/Information_Systems_Security_and_Privacy_Awareness_Training.pdf

Trains CMS employees, contractors, and others on how to protect information systems and sensitive data from internal and external threats, and fulfills the Federal Information Security Management Act of 2002 training requirement.

- CMS. Medical Privacy of Protected Health Information.

<https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/SE0726FactSheet.pdf>

Clarifies provisions of the Health Insurance Portability and Accountability Act of 1996 (HIPAA).

- CMS. Security Risk Analysis Tipsheet: Protecting Patients' Health Information.

https://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Downloads/SecurityRiskAssessment_FactSheet_Updated20131122.pdf

Information on criteria, safeguards, and measures, with focus on electronic health records (EHR).



- U.S. Department of Health and Human Services (HHS). Rules of Behavior for Use of HHS Information Resources.
<http://www.hhs.gov/ocio/policy/hhs-rob.html>
Provides the rules governing the use of HHS information resources by federal employees, contractors, and other system users.
- National Institute of Standards and Technology (NIST). Computer Security Resource Center.
<http://csrc.nist.gov/>
The primary gateway to NIST computer security publications, standards, and guidelines on security tools and practices, Web resources, and support for industry, government, and academia.
- NIST. Fair Information Practice Principles.
<http://www.nist.gov/nstic/NSTIC-FIPPs.pdf>
Articulates the national strategy for identity protection in cyberspace.
- U.S. Congress. Federal Information Security Management Act of 2002.
<http://csrc.nist.gov/drivers/documents/FISMA-final.pdf>
Provides key definitions and operational criteria for the storage, transfer, and use of electronic information.
- HHS. HHS Office of the Chief Information Officer (OCIO) Policies, Standards and Charters.
<http://www.hhs.gov/ocio/policy/>
Contains information on HHS Information Technology system standards, policy, procedure, and uses.
- U.S. Government Accountability Office (GAO). Assessing the Reliability of Computer-Processed Data. [GAO 09-680G].
<http://www.gao.gov/assets/80/77213.pdf>
Provides highly detailed procedures for auditing data reliability.

Basic Data Mining and Analysis

- American Institute of Certified Public Accountants (AICPA). Statements on Auditing Standards.
<http://www.aicpa.org/research/standards/auditattest/pages/sas.aspx>
Pronouncements and technical guidance from the Auditing Standards Board, the senior technical body of the AICPA that issues pronouncements on auditing matters.
- Azevedo, A., Santos, M.F. (2008). KDD, SEMMA, and CRISP-DM: A Parallel Overview.
<http://dis.unal.edu.co/profesores/eleonguz/cursos/md/documentos/metodologias.pdf>
Describes, compares, and contrasts these three common approaches to data mining.
- CMS. Medicaid Management Information System (MMIS).
<http://medicaid.gov/medicaid-chip-program-information/by-topics/data-and-systems/mmis.html>
Overview of the MMIS and links to sources of additional related information.

- CMS. New Strategic Direction and Key Antifraud Activities.
<https://www.cms.gov/Medicare-Medicaid-Coordination/Fraud-Prevention/MedicaidIntegrityProgram/downloads/cpiinitiatives.pdf>
Overview of the structure, function, and direction of CMS anti-fraud initiatives.
- GAO. Data Mining. Federal Efforts Cover a Wide Range of Uses. [GAO-04-548].
<http://www.gao.gov/new.items/d04548.pdf>
Surveys data mining systems and activities in federal agencies, identifies planned and actual data mining efforts, and describes their characteristics.
- GAO. Quantitative Data Analysis: An Introduction. [GAO/PEMD-10.1.11].
<http://www.gao.gov/assets/80/76118.pdf>
Summary of quantitative methods in auditing.
- GAO. Using Structured Interviewing Techniques. [GAO/PEMD-10.1.5].
<http://www.gao.gov/assets/80/76090.pdf>
Describes designing and testing a structured interview, training interviewers, conducting interviews, and analyzing interview data.
- Joudaki, H., Rashidian, A., Minaei-Bidogli, B., Mahmoodi, M., Geraili, B., Nasiri, M., A. Mohammad. (2015). Using Data Mining to Detect Health Care Fraud and Abuse: A Review of Literature. Global Journal of Health Science. Volume 7, Number 1.
<http://www.ccsenet.org/journal/index.php/gjhs/article/view/37879/22169>
Summarizes state-of-the-art methods in health care data mining.
- NIST. Engineering Statistics Handbook.
<http://www.itl.nist.gov/div898/handbook>
Comprehensive database of statistical analysis tools, examples, and resources.
- Office of Inspector General (OIG). Notices. OIG Compliance Program for Individual and Small Group Physician Practices. 65 Fed. Reg. 59435, 59436.
<http://www.oig.hhs.gov/authorities/docs/physician.pdf>
Describes the general structure and function of a compliance program and gives general information data gathering and analysis.
- Statistics How To. Misleading Graphs: Real Life Examples.
<http://www.statisticshowto.com/misleading-graphs/>
Primer on the inappropriate use of graphic presentations.
- U.S. Geological Survey. (2002). Statistical Methods in Water Resources. September 2002.
<http://pubs.usgs.gov/twri/twri4a3/pdf/twri4a3-new.pdf>
Ordered and comprehensive summary of the general flow of the data analysis process as it relates to a single professional discipline.

Predictive Analytics

- CMS. CMS Data Navigator.
<https://dnav.cms.gov/>
Access to search tool for CMS data and information on Medicare and Medicaid or specific health care topics.
- CMS. Data Analytic Capabilities Assessment for Medicaid Program Integrity.
<https://www.cms.gov/Medicare-Medicaid-Coordination/Fraud-Prevention/FraudAbuseforProfs/Downloads/data-analytic-assesstoolkit-092214.pdf>
Overview of, and answers to, frequently asked questions about predictive analytics.
- CMS. Report to Congress, Fraud Prevention System, Second Implementation Year.
<https://www.stopmedicarefraud.gov/fraud-rtc06242014.pdf>
Provides an overview of the progress and challenges of ongoing implementation of the CMS anti-fraud system.
- International Network for Social Network Analysis.
<http://www.insna.org/>
Links to sources of information on the function and use of social network analysis.
- SAS Institute, Inc. Decision Trees for Analytics Using SAS® Enterprise Miner™.
http://www.sas.com/storefront/aux/en/spdectree/63319_excerpt.pdf
Description and examples of decision trees in statistical analysis system (SAS).
- SAS Institute, Inc. Link Analysis Using SAS® Enterprise Miner™.
<https://support.sas.com/rnd/app/data-mining/enterprise-miner/papers/2014/linkAnalysis2014.pdf>
Description and examples of the link analysis module in SAS.
- SAS Institute, Inc. Data Mining Using SAS Enterprise Miner: A Case Study Approach, Second Edition.
http://support.sas.com/documentation/onlinedoc/miner/casestudy_59123.pdf
Overview of data mining processes and procedures in SAS with cases and examples.
- SAS Institute, Inc. SAS/STAT Software. Cluster Analysis.
<http://support.sas.com/rnd/app/stat/procedures/ClusterAnalysis.html>
Description of, and links to, software resources on cluster analysis.

Federal Legislation and Regulations

- Program Integrity: Medicaid. Definitions. 42 C.F.R. § 455.2.
http://www.ecfr.gov/cgi-bin/text-idx?SID=d2e5d75d7c7347f1bef3ff19a254b046&mc=true&node=se42.4.455_12&rgn=div8
Legal definitions of key terms relevant to Medicaid Program Integrity.

- Rights & Protections.
<https://www.healthcare.gov/health-care-law-protections/>
Sources of general information about the Affordable Care Act.
- Read the Affordable Care Act
<https://www.healthcare.gov/where-can-i-read-the-affordable-care-act/>
Link to the full text of the law.

Other Resources

The following organizations may also be sources of useful contacts and information:

- American Accounting Association (AAA).
<http://aaahq.org/>
- American Institute of Certified Public Accountants (AICPA).
<http://www.aicpa.org/Pages/default.aspx>
- American Statistical Association (ASA).
<http://www.amstat.org/>
- Association of Certified Fraud Examiners (ACFE).
<http://www.acfe.com/>
- Association of Inspectors General (AIG).
<http://inspectorsgeneral.org/>
- Health Care Compliance Association (HCCA).
<http://www.hcca-info.org/>
- Information Systems Audit and Control Association (ISACA).
<https://www.isaca.org/Pages/default.aspx>
- National Association of Medicaid Fraud Control Units (NAMFCU).
<http://www.namfcu.net/>
- National Association for Medicaid Program Integrity (NAMPI).
<https://nampi.net/>
- National Association of Medicaid Directors (NAMD).
<http://medicaiddirectors.org/>
- National Health Care Anti-Fraud Association (NHCAA).
<http://www.nhcaa.org/>
- The Institute of Internal Auditors (IIA).
<https://na.theiia.org/Pages/IIAHome.aspx>

To see the electronic version of this resource handout and the other products in the “Basic Data Mining and Analysis for Program Integrity: A Primer for Physicians and Other Health Care Professionals” Toolkit, visit the Medicaid Program Integrity Education page at <https://www.cms.gov/Medicare-Medicaid-Coordination/Fraud-Prevention/Medicaid-Integrity-Education/edmic-landing.html> on the CMS website.

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