Data Analytics: It's Hip to be Square

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Big data. Data explosion. Predictive analytics. Population health. Data management. Chronic disease monitoring. Natural language processing. As though healthcare was not struggling enough to keep up with acronyms, synonyms, abbreviations, and poorly defined buzzwords, we have entered the era of Big Data.

Healthcare is constantly changing, adding new technologies, tools, and initiatives. At the forefront of the industry today is the call for meaningful data. It is no longer enough just to have the data, the data must be meaningful. In order to be meaningful, one must understand the language. To understand the language of data analytics we might just need to spend some extra time in the library. In the immortal words of Huey Lewis and the News:

> "But don't you try to fight it
>
> An idea whose time has come
>
> Take it from me
>
> It's hip to be square"

Managing health data is not new. The volume of data, ease of retrieval, and need for new skills and knowledge have changed how that data is managed. Not all of the current language will be a surprise to you. Here are some oldies—but goodies—that every analyst should know.

- **Accountable care:** used as a catch-all phrase for the financial changes within healthcare reimbursement models such as value-based purchasing, pay for performance, and quality measurement reporting.
- **Clinical decision support:** a technology or tool that provides timely information to clinical providers at the point of care such as medication allergy pop-up reminders, drug-to-drug interaction alerts, or reminders for preventive care.
- **Current Procedural Terminology (CPT)**: the American Medical Association's standard for code assignment.
- **Electronic health record (EHR):** an electronic record of a patient's complete healthcare condition and treatment.
- **Health Maintenance Organization (HMO)**: an organization that provides managed healthcare on a prepaid basis.
- **The International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM):** a system used by physicians and other healthcare providers to classify and code all diagnoses, and symptoms recorded in conjunction with hospital care in the United States.
- **The International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS):** a system developed by 3M for use in acute care facilities to classify procedure codes or health interventions taken by medical professionals.
- **Logical Observation Identifiers Names and Codes (LOINC)**: the Regenstrief Institute's standard for laboratory and clinical observations.
- **Master Patient Index:** software to provide correct matching of patients across multiple software systems, typically within a health enterprise.
- **MEDCIN:** a proprietary vocabulary of point-of-care terminology, intended for use in electronic health records maintained by Medicomp Systems.
- **National Drug Codes (NDC):** The Food and Drug Administration's numbering system for all medications commercially available in the United States.
- **Protected Health Information (PHI):** any health or health-related information that can be related back to a specific patient, subject to HIPAA regulations.
- **Systemized nomenclature of Medicine (SNOMED):** a comprehensive, hierarchical health terminology system.

The industry has since marched forward with new payment models, implementation of ICD-10-CM and ICD-10-PCS, and other healthcare cost reduction efforts. Data became more prolific from EHRs, the Internet of Things became a daily tool, smart phone apps burst onto the scene, and pulling analytics from one or two data bases turned into three or four systems and a few more terms were added to the data analytics field.

- **Chronic Disease Management:** an integrated care approach to managing illness which includes screenings, check-ups, treatment coordination, and patient education.
- **Coordination of Care:** the integration of health and social care services for a patient that includes communication between multiple providers and organizations who participate in the patient's treatment.
- **Data Mining:** the process of extracting and analyzing large volumes of data from a database for the purpose of identifying hidden and sometimes subtle relationships or patterns and using those relationships to predict behaviors.
- **Data Warehouse:** a central repository for the data collected by the various electronic systems of the enterprise.
- **Descriptive Statistics:** a set of statistical techniques used to describe data such as means, frequency distributions, and standard deviations.
- **Information Governance:** is an organization-wide framework for managing information throughout its lifecycle and supporting the organization's strategy, operations, regulatory, legal, risk, and environmental requirements
- **Interoperability:** a term referring to the ability of two or more healthcare systems or components to exchange and use data.
- **Population Health Management:** an approach to healthcare to improve the health and wellbeing of an entire population, including health outcomes of the group.
- **Predictive Analytics:** an approach to healthcare that strives to predict what will happen to a specific patient population by using multiple data sets, historical data, and possible external data.
- **Prescriptive Analytics:** an analytics process that synthesizes data in order to anticipate what will happen to a patient population and why it may happen.

But why stop there? Every day holds the possibility of new learning experience. New technologies blast onto the scene to make retrieval of data faster, better, and easier. In addition, new regulations and rules are adopted, changing the type of data needed. To stay on top of your game, try out these up-and-coming terms.

- **Blockchain:** a method of distributing data across a number of locations, with a standard agreement regarding authorization and authentication between all locations.
- **Cassandra:** a popular choice of columnar database for use in big data applications. It is an open source database managed by The Apache Software Foundation.
- **Clojure:** a dynamic programming language based on LISP that uses the Java Virtual Machine (JVM). It is well suited for parallel data processing.
- **Data Dumpster:** a repository filled with raw, unfiltered data—rendering the data useless for data analytics. As organizations sort through volumes of data, they struggle to determine what to do with the data that "falls out." Maybe a field is blank, or the field is free text and no exact match was found rending the data unusable and dumped into a repository for further analysis at a later time.
- **Data Scientist:** a professional who incorporates data visualization, computer programming, data mining, machine learning, and database engineering to solve complex problems. Called the "sexiest job of the 21st century" by *Harvard Business Review*, this position is growing in population as a C-Suite executive just itching to make a data discovery.
- **Medication Noncompliance:** the failure of a patient to take medications as prescribed by their physician. Up to 50 percent of medications are not taken as prescribed, costing the US healthcare system approximately $289 billion annually. Analysts are being challenged to compare coded data, pharmacy formularies, discharge orders, and medication education to identify these patients and form hypotheses on corrective management.
- **Pig:** a data flow language and execution framework for parallel computation.

Healthcare organizations continue to take a variety of approaches to get their arms around data. As EHRs produce more data, organizations will increase the focus on building analytics capabilities to provide a competitive advantage. The need to proactively contain costs, identify outliers, and predict patient severity coupled with changes to the reimbursement methodology will increase the need for analytics professionals, as well as our time at the library.

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