Leveraging Big Data for the Next Generation of Health Care

Ken Cunningham, VP Analytics
Pam Jodock, Director Business Development

December 6, 2012

Risk Solutions

LexisNexis®

Health care spending to Reach 20% of U.S. Economy by 2020

Alex Wayne
Bloomberg.com
June 12, 2012

Government accounts for ~46% of all health care spending…expected to reach full 50% by 2021.

Alex Wayne
Bloomberg.com
June 12, 2012

Accountable Care Organizations Could Save Medicare as much as $960 million over 3 years.

HealthCare.gov
"Accountable Care Organizations: Improving Care Coordination for People with Medicare
March 12, 2012

What is an ACO

Wikipedia Definition

- Health care organization characterized by a payment and care delivery model that ties provider reimbursement to quality of care metrics and reductions in total cost of care for an assigned population of patients.

PPACA Definition

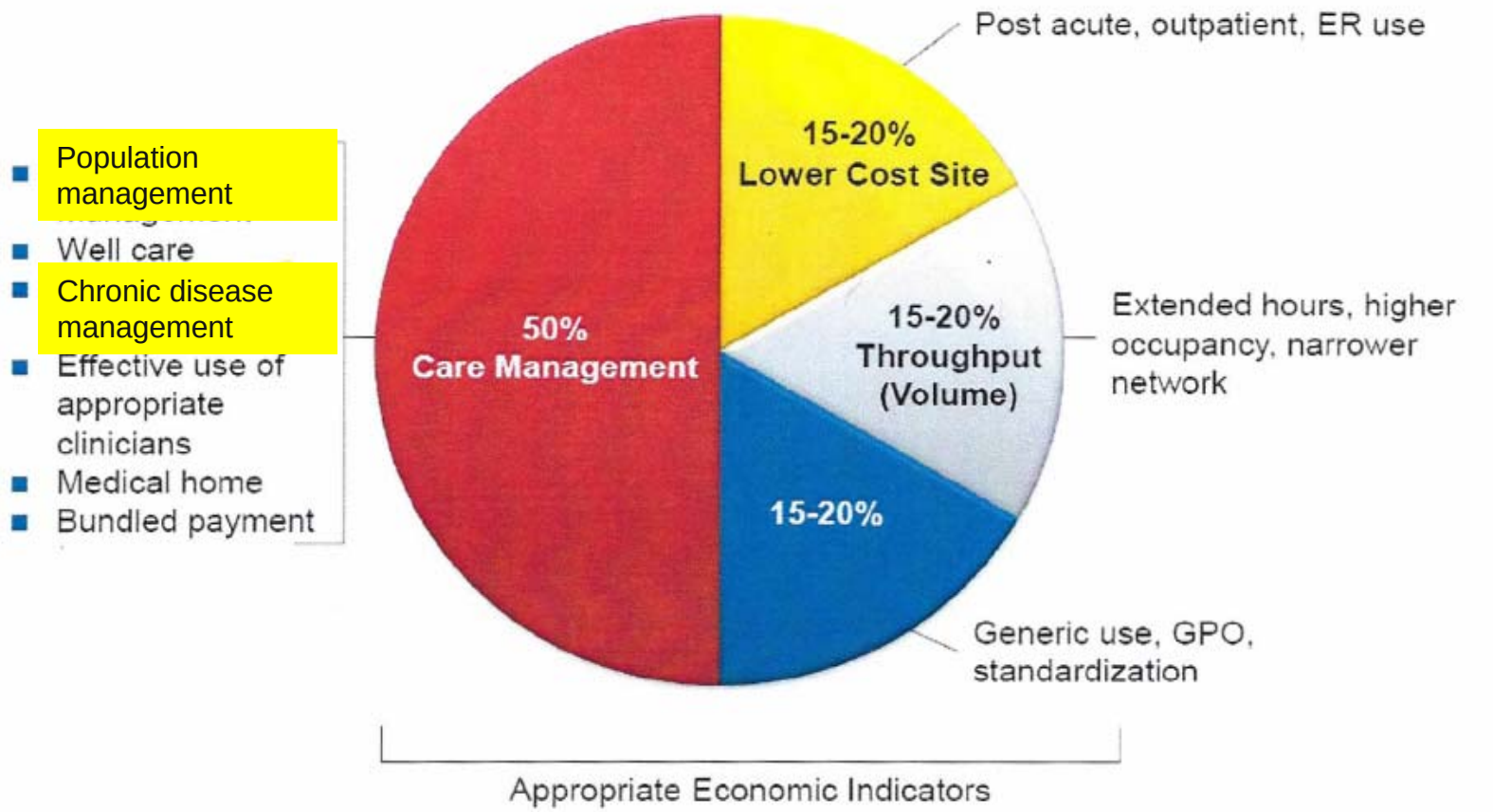
- An organization whose primary care providers coordinate care for at least 5,000 Medicare beneficiaries
- May include group practices, networks or practices, hospitals, hospital-physician joint ventures, and other groups

Accountable Care Organizations (PPACA)

Medicare Shared Savings Program

- Establishes Medicare Accountable Care Organizations (ACOs)
- Eligible ACOs will have a minimum of 5,000 Medicare participants
- Contracts are for three years with a start date of January 1 of any given year
- Medicare FFS beneficiaries who receive the bulk of their care from primary physicians within an ACO will be retroactively assigned to that ACO based on utilization of primary care services during a performance year
- CMS will *not* notify beneficiaries of their ACO assignment
- ACO must develop a process to promote evidence-based medicine, patient engagement and coordination of care
- ACO must have system to identify high risk beneficiaries and develop individual care plans for target populations
- ACOs who meet quality goals will be able to split with CMS any savings that exceed a minimum threshold

How might an ACO generate savings?



Source: Steven Valentine, The Camden Group

The need for better analytics is immediate

- 66% of Medicare budget spent on patients with five or more chronic medical conditions.
- Cost of diabetes alone could hit $3.4 trillion by 2020*
- 7 out of 10 Americans who die each year die of a chronic disease**
- Costs of treating chronic diseases accounts for 75%+ of the nation's $2.5T medical care costs
- Targeting the right individuals at the right time *before* an adverse event occurs is critical in the cost-avoidance model
- Identifying ways to engage individuals who are eligible for a DM program but choose not to participate or comply will immediately increase cost-savings

Source: *UHC; **Department of Health and Human Services, CDC Chronic Disease Overview: http://www.cdc.gov/NCCdphp/overview.htm

The need for better analytics is immediate

Big data analytics can help doctors and case managers impact the behavior of patients with chronic diseases.

- Identify individuals most likely to benefit from a particular type of DM/WM program;
- Identify individuals most likely to actively participate in a particular disease management program and what level of outreach will be required to ensure that participation;
- Identify data points that impact an individual's adherence and compliance; and
- Identify the specific types of outreach and support most likely to impact an individual's behavior and .

Big data and population management: Keeping people as healthy as possible

Population Management:

- Looks beyond the individual to identify groups that need a specific type of care
- Focuses on strategies that will minimize the need for expensive interventions
- Extends beyond high-risk patients to include preventive and disease management activities aimed at reducing health care costs across the span of time
- Takes a more holistic view of the patient; includes factors outside the realm of health care that may impact a patient's overall health (income, education, social support, stress level)
- Changes relationship between patient and provider; requires providers to have on-going communication with *all* of their patients
- Changes level of patient responsibility; success requires patients to be more deliberate about managing their health
- Changes relationship between payer and provider; better alignment of goals
- Creates the need for greater collaboration among health care providers and the community at large

Population management: More than just medical care

- The Care Continuum Alliance suggests that a population health program should have three components*:
  1. Central care delivery and leadership roles of the primary care physician
  2. Patient activation, involvement and personal responsibility; and
  3. Patient focus and care coordination provided through wellness, disease and chronic care management programs
- Provider's role changing:
  - Providers will need to maintain regular contact with their patients in between visits
  - Providers will need to support their patients' efforts to manage their own health

*Institute for Health Technology Transformation. "Population Health Management: A Roadmap for Provider-Based Automation in a New Era of Healthcare. 2012

Population management: More than just medical care

- Overlaying what the physician knows with information they don't have, such as public data will play a key role in their success
  - Correct contact information
  - Identification of social support available outside the office
  - Notification of high-stress events, such as divorce, bankruptcy or other legal proceedings

*Institute for Health Technology Transformation. "Population Health Management: A Roadmap for Provider-Based Automation in a New Era of Healthcare. 2012

Population management: An example

"HotSpotting"*

- Dr. Jeffrey Brenner, Camden, NJ
- 1% of population responsible for 30% of medical costs; 5% responsible for 60% of medical costs
- Data showed this top 1% came from the same two residential buildings
- Patients had multiple medical conditions, but the data indicated the top five presenting conditions for E.R. visits were primary care issues
- Most expensive patients were getting the least effective care
- Began taking care to the patient instead of waiting for the patient to come to the care
- Program has an annual budget of $250k; delivering an estimated 40-50% reduction in hospital visits and medical costs

Critics Say….

- Small number of patients involved lead to large variations in results
- Conditions of study make it difficult to replicate in real world
- Problems being addressed are not medical problems; they're social problems

*"Doctor Hotspot." Frontline: Live Chat with Atul Gawande and Jeffrey Brenner, M.D. 07/27/2011. http://www.pbs.org/wgbh/pages/frontline/doctor-hotspot/

Population management: Looking beyond the individual

Using Big Data in an ACO setting offers an opportunity to answer concerns raised by critics…

- Camden = Mini-ACO
  - 2 hospitals
  - 3 emergency rooms
  - 12 primary care physicians
- As of July 2012 there are 154 ACOs participating in Medicare Share Savings initiative; serving a total of >2.4 million individuals*
- 3 year commitment
- Less controlled environment
- Emphasis on population management demands better coordination between the community (social problems) and physicians (medical problems)

…and provides a reimbursement model that encourages the investment

- ACOs will share in the savings they achieve

*"HHS announces 89 new ACOs have begun operating." Nurse.com. 07092012. http://news.nurse.com/article/20120709/NATIONAL02/107090025

Population management and big data: Keeping people as healthy as possible

"You can't fix a hard problem unless you have a way of counting the hard problem."

- Big Data gives us a way of counting the problem
- Data analytics and predictive modeling give us a way of "addressing" the problem

Information gathered from hotspotting could be used to build predictive models that could be used to:

- Develop individualized plans of care for chronic conditions
- Design consumer-directed benefit plans
- Create healthier communities

Our Vision

Big Data Value Proposition

Improve management of chronic disease populations by applying advanced modeling and lifestyle data to clinical profiles for more efficient and effective member targeting, outreach and management.

- Leverage demographic and lifestyle data to proactively identify additional risk attributes which may adversely affect a member's current health state
- Improve cost savings and resource utilization by identifying which members benefit from low or high-touch outreach programs
- Improve operational efficiencies and by easily integrating member risk scores into existing outreach workflow tools`

Creative and effective use of big data to drive health care efficiency and quality represents a $300 billion value and could reduce national health care expenditures by approximately 8 percent.

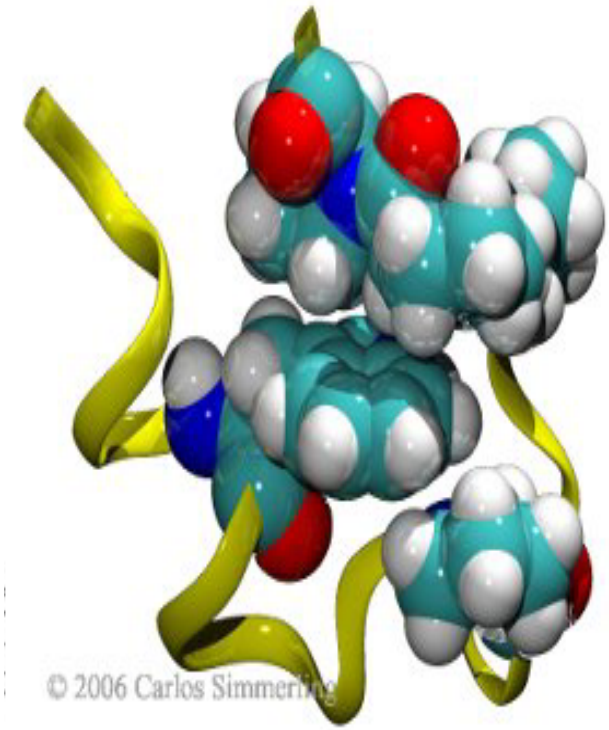
McKinsey Global Institute
"Big Data: the next frontier for innovation, competition, and productivity
June 2011

Big Data Analytics In Practice

LexisNexis®

Use of Data Supercomputing

- Rapidly becoming accessible to typical organizations
- Enables analysis that is simultaneously broad and deep
  - Allows locally successful analysis to be expanded to national scope
  - Highlights entities “working” across geographies
- Enables rapid recomputation of derived data
  - Ensures timely identification of emerging and bust-out activity
- Enables previously unthinkable operations on BIG data



The complete big data value chain

Collection – collecting structured, unstructured and semi-structured data

Ingestion – consuming vast amounts of data including extraction, transforming and loading

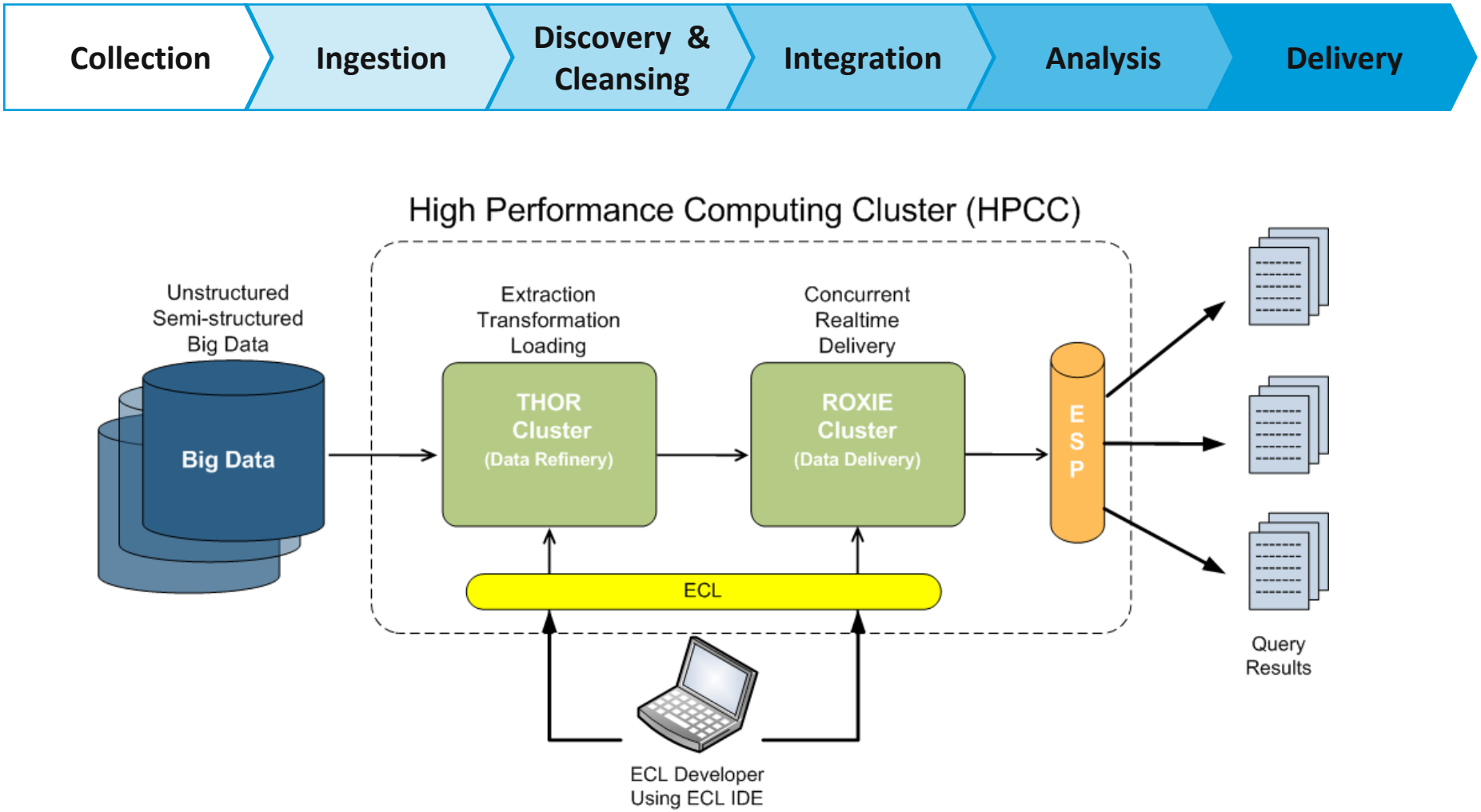
Discovery & Cleansing - clean up, formatting and statistical analysis of the data

Integration – linking, indexing and data fusion

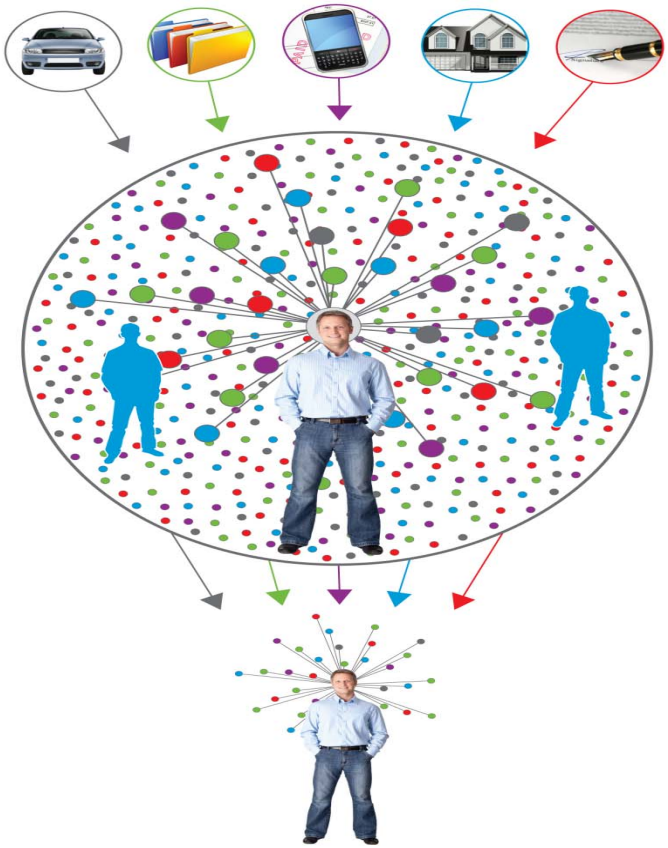
Analysis – statistics and machine learning

Delivery – querying, visualization, and redundancy, enterprise-class availability

HPCC Systems



Create a unique ID

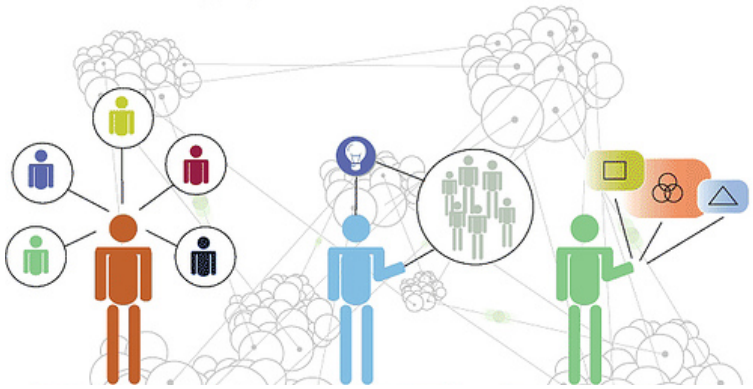


LexID℠ assigns a unique and persistent identifier to a person

- Dynamic – updates as new public records are available.
- Extremely Accurate - based on multiple public record and insurance sources

Connects to information maintained in other LexisNexis data sources: Public Records, Carrier Discovery, and Claims Discovery

Addition of External Data



- Mixes first-party data with public and third-party data sources
- Adds fidelity to existing entities
- Adds new linkages into the analysis
- Ads new entities into the analysis
- Exposes ring leaders and brokers that don't directly participate

Big data technologies enable new insights

Make intelligent information connections beyond the obvious by drawing insights from both traditional and new sources of data.

Personal Information	Socio-Economic Information
• Other names, aliases • DOB • SSN (actual and associated) • Current and historical addresses • Landline & wireless phone #'s	• Bankruptcies, liens, judgments • Family members • Shared address, business association

Leverage for processing large amounts of data to help you gain **actionable** information more quickly and confidently.

Power of Derived Data

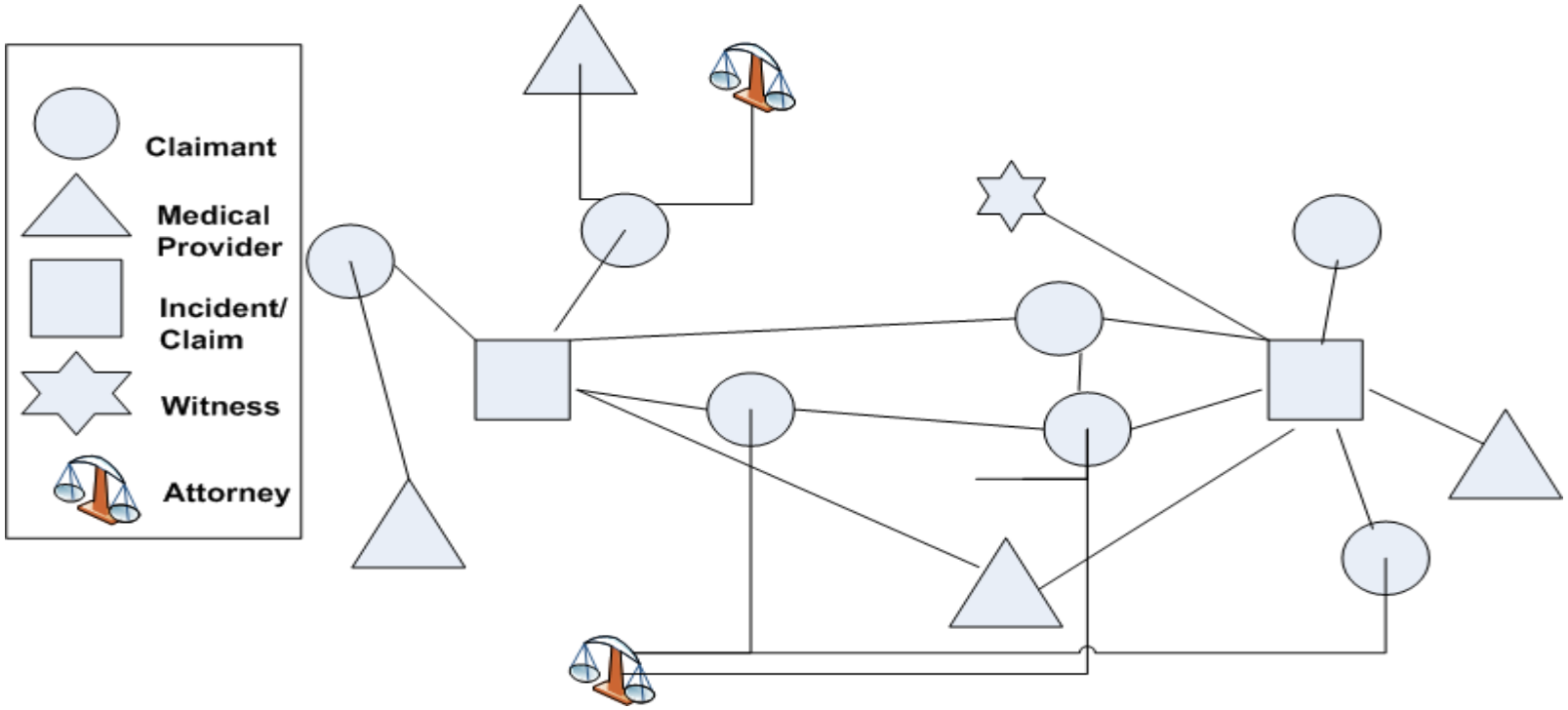
- Transform “straw” into “gold”
  - Process numerous discrete data points into high-value data
- LexisNexis® LexID℠ (example)
  - Resolve numerous names, addresses, phones, and other info into a “Person ID”
  - Better accuracy than other resolution techniques
  - Resilient to name, address, and other info changes (i.e. stable over time)
- Improves detection, simplifies processing, enables scoring and ranking, and makes results easier to understand

The Social Network Analytics Engine

1. Assigns a Unique ID
2. Creates Clusters
3. Augments ‘in house’ data – Public Records, Associate Data, Insurance Contributory data
4. Adds Aggregate Data
5. Systematically Identifies Important Clusters
6. Systematically Trims Links
7. Outputs Visualization Files

Create clusters

After assigning a LexisNexis Unique ID to person data, the engine will create clusters of claims. A cluster equals a group of claims and persons that are connected.



Social Network Analytics: Making sense of big data

- Social Network Analytics leverages big data and advanced linking to reveal relationships that providers might otherwise remain unaware of – relationships that could indicate the level of support available to a patient through familial or social relationships

- Social Network Analytics
  1. Connects claims, parties, and vehicles to create groups of claims (clusters).
  2. Groups of claims are augmented with public records information, associate data, medical data, and contributory data.
  3. Analytics is used to find interesting investigation points and highlight the most important relationships.

Social Network and other analytics

- Social Network Analytics can help identify the presence or absence of support systems for patients
- The addition of public records data can help point to financial stress, legal problems, criminal activity, etc. that may impinge on a patient's adherence to a treatment regimen
- Big data can also be used to determine the best methods to contact at risk patients as well as the best contact information
- Unusual or aberrant diagnosis, treatment, and billing patterns can be identified early and addressed
- These tools are powerful if used wisely and in a timely manner

Big data analytics – not a perfect science

- Unreasonable expectations
- “Bad data”
- Processing challenges
- Unclear objectives
- Failure to fit the workflow

BUT, these problems can be addressed **AND** the potential reward is great

Questions?

In Summary: Key message

LexisNexis® solutions for health care payers deliver information-rich analytic tools that address key challenges including identity management, fraud, waste and abuse prevention, and data enrichment.

Ken Cunningham
VP Analytics
LexisNexis Risk Solutions
Ken.cunningham@lexisnexis.com
(312) 560-7354

Pam Jodock
Director, Business Development
LexisNexis Risk Solutions
pamela.jodock@lexisnexis.com
(412) 234-6231

Linked In Group: LexisNexis Health Care Solutions
Twitter: LexisHealthCare
Blog: http://blogs.lexisnexis.com/healthcare/