



Predictive Analytics: Turning your Data into Intelligence

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Agenda

- What are “Analytics”?
- Why do you need them?
- Medicaid Fraud Applications



What are Analytics?

- **Statistical & Quantitative Analysis**
- **Exploratory & Predictive Models**
- **Forecasting**
- **Data & Text Mining**
- **Optimization**

**fact-based
decision
making**

in contrast to...

- **Static Reports**
- **Summary Statistics**
- **Graphs, Charts**
- **OLAP, slicing & dicing**

facts



Queries vs. Analytics

- Query: Which physicians billed Medicaid the most this month?
 - Answer: list of physicians
- Data Mining Question: Is this type of Medicaid billing suspicious?
 - Answer: list of outliers, reasons why they are outliers



Types of Medicaid Fraud

- Upcoding
- Services not rendered
- Unbundling
- Kickbacks or Collusion



Query and Reporting

- Review highest billers
- Review largest beneficiaries
- Flagging exceptions to obvious rules:
 - Time between procedures
 - Timed procedures
 - Many deviations away from peers



Exploratory vs. Predictive

- Predictive Analytics:
 - Take the fraud you know about and find more cases like it
- Exploratory Analytics
 - What kind of fraud is going on that you don't know about?

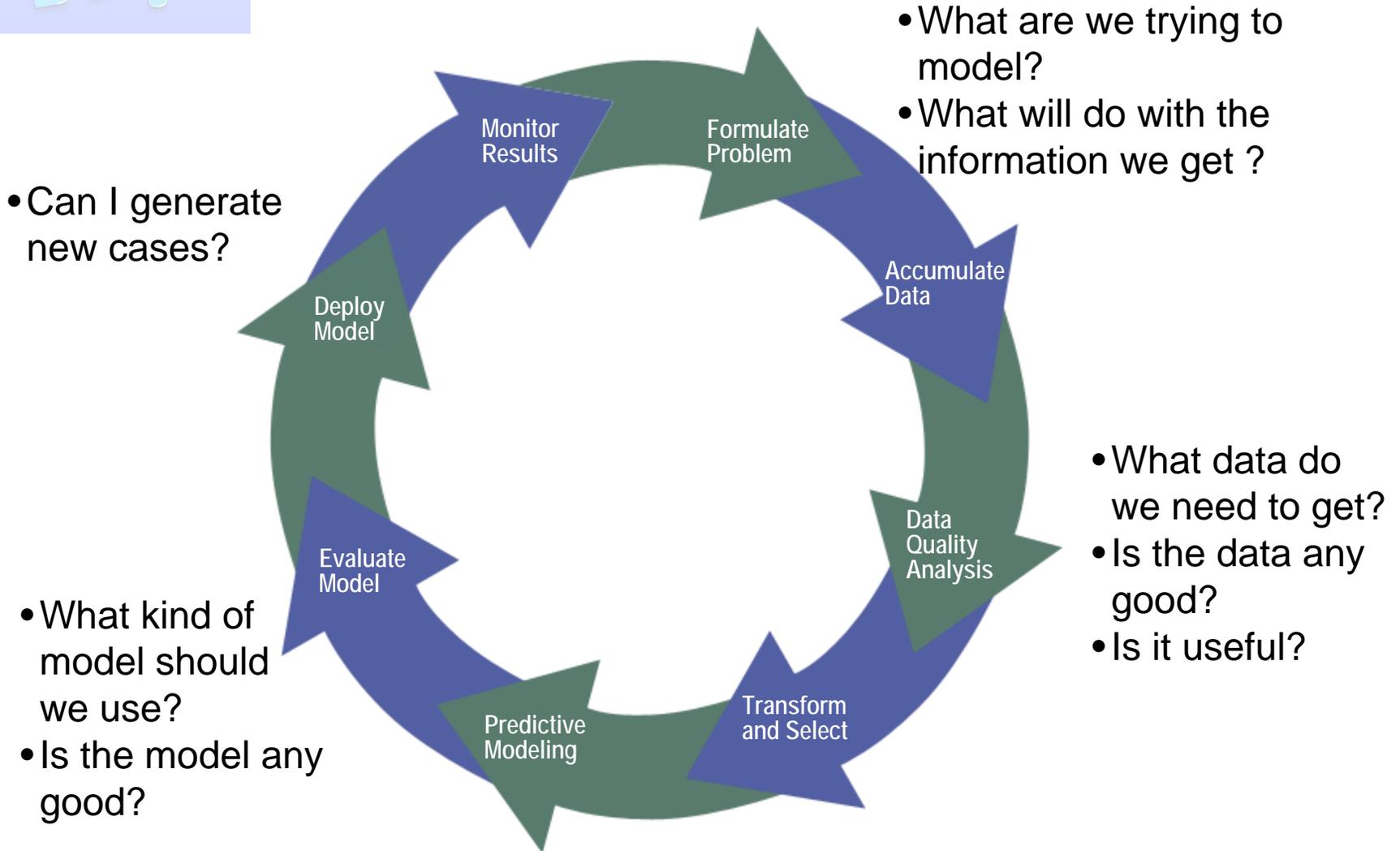


Predictive Analytics

- Build a model on known cases of fraud
- Predict if a provider is fraudulent based on variables such as:
 - Procedure modifiers
 - Total units
 - Action codes
 - Unique recipients
 - Allowed services



Predictive Analytics Process





Exploratory Analytics

- No data on what you want to predict
- Looking for fraud that you don't know about
- Use methods such as:
 - Outlier detection
 - Visualization of abnormal patterns
 - Association analysis
 - Clustering



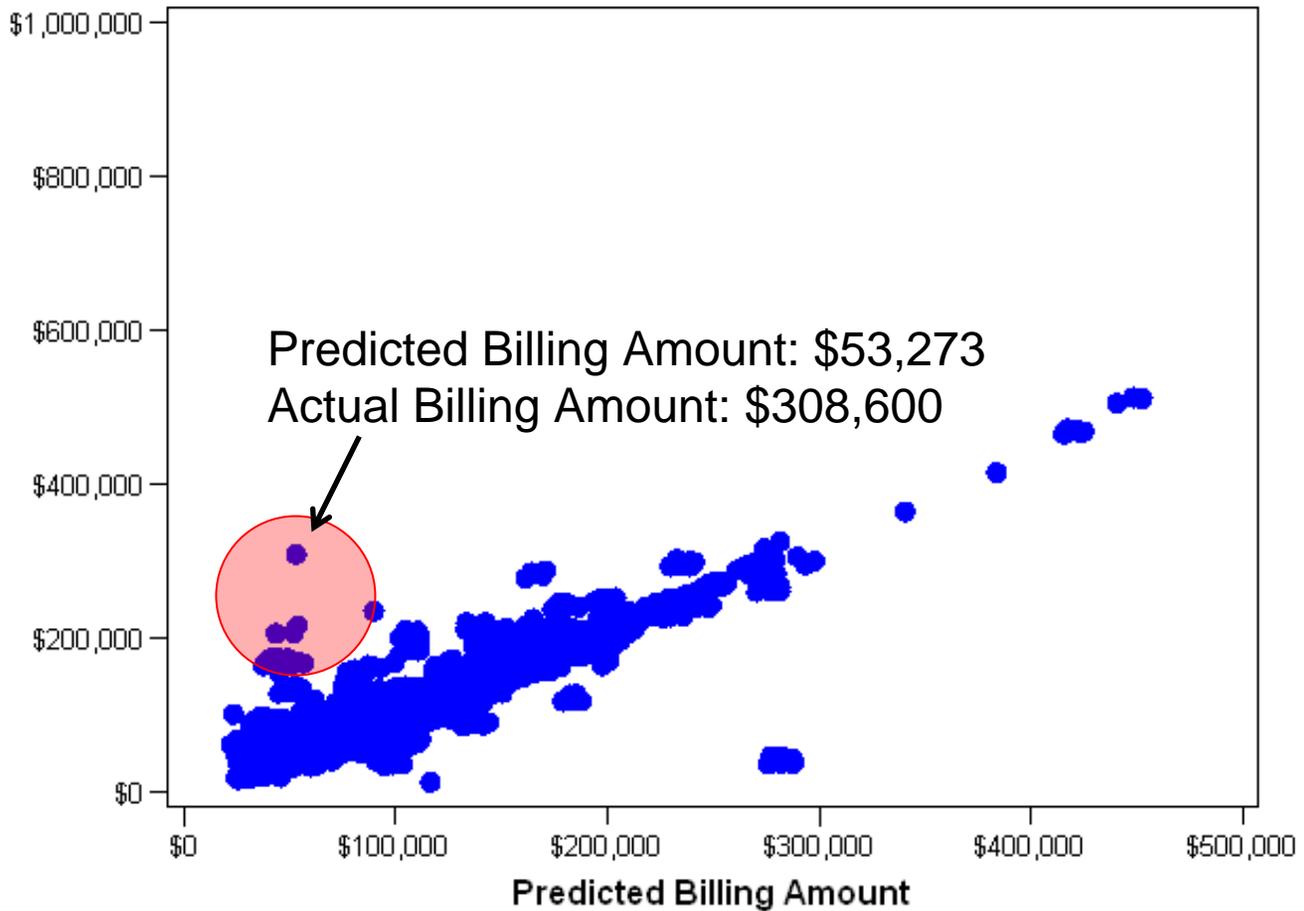
Outlier Detection

- Predict something you do have
- Look for outliers
- For example:
 - Predict how much a provider should be making
 - Independent variables are things like patient volume
 - Detect providers who are outliers from this model



Outlier Detection

Actual Billing Amount



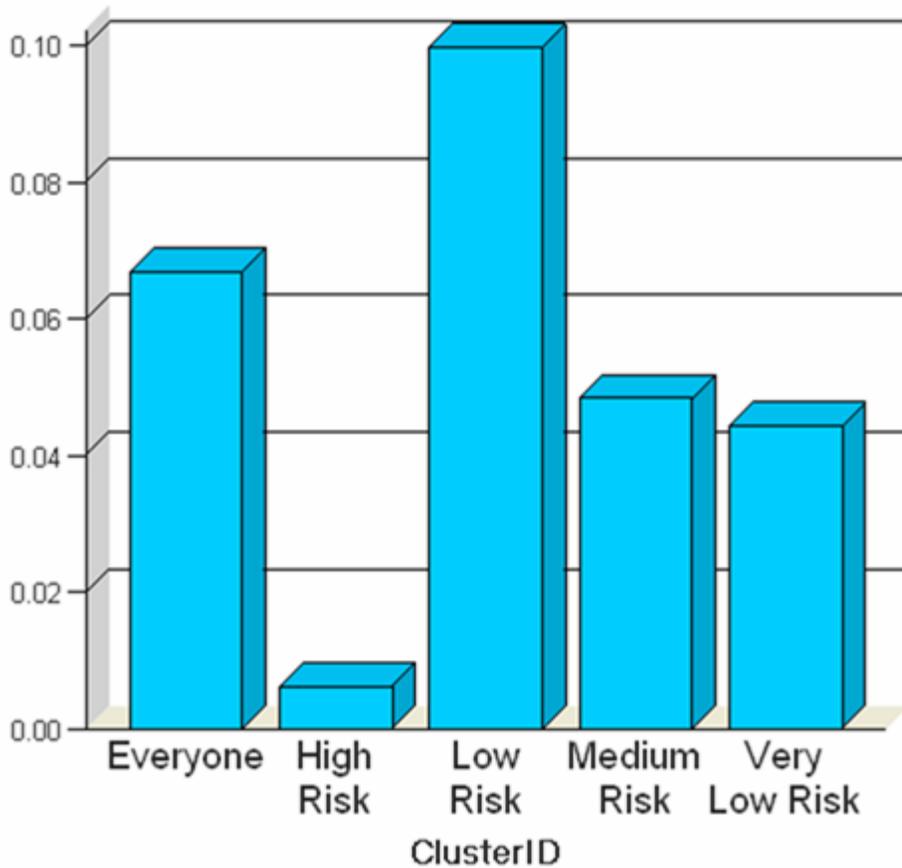


Clustering

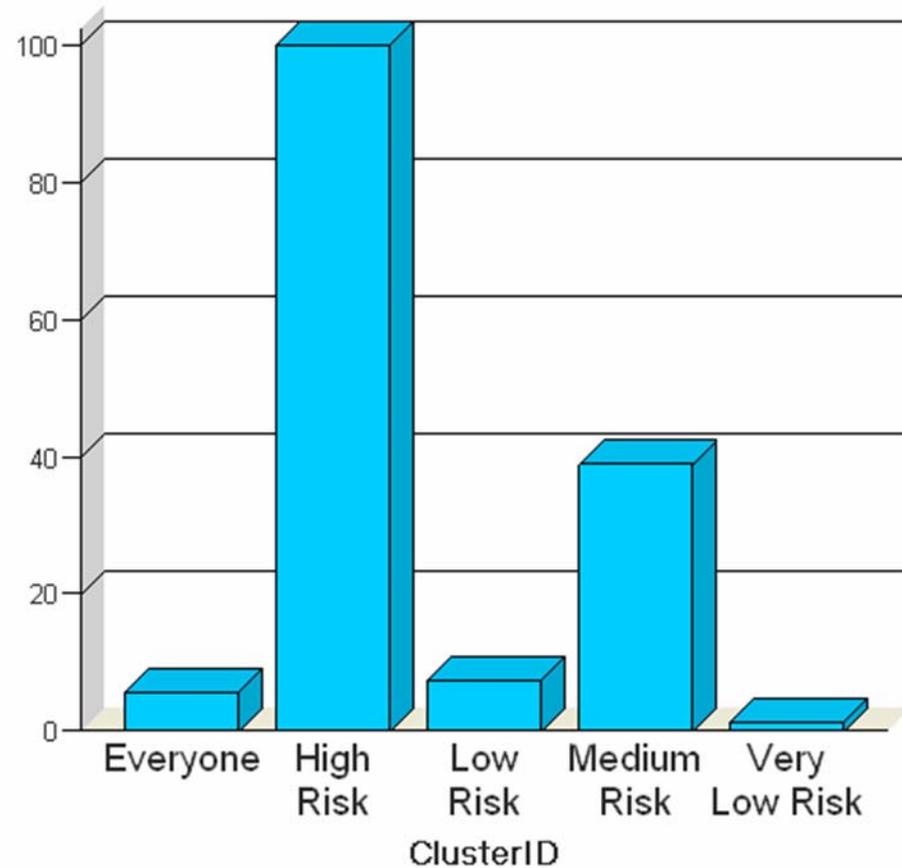
- Organize observed data into meaningful segmentations called clusters
- For example, organize providers into clusters by:
 - Number of unique patients served
 - Number of billing codes not under their specialty
 - Ratio of denied services to billed services
 - Number of treatment locations
 - Percentage of charges billed in last week of billing cycle

Clustering Example

Avg Percentage Charges Billed in Last Week



Average Denied Units

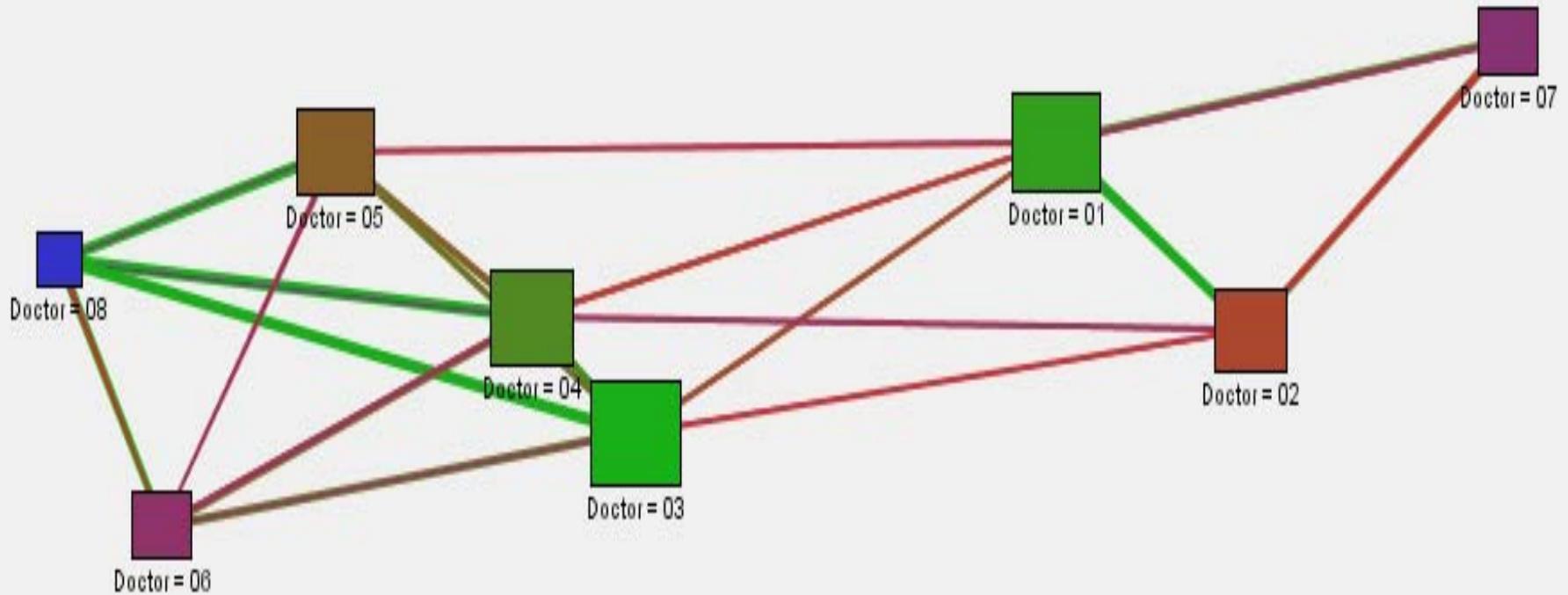




Association Analysis

- Reveal potential collusion and/or kickbacks
- Detect excessive referrals between physicians
- Detect patients seeing a possibly excessive number of physicians

Association Analysis





Taking it Further

- Predict differences between abuse and fraud
- Determine what types of processes are effective in reducing fraud



Advanced Analytics

- Everybody's doing it!
 - Junk mail
 - Political campaigns
 - Credit card approve/decline decisions
- What might you discover in your data ?



Questions?

