Improving Population Healthcare Through Data Analytics, Visualization, and Reporting Tools

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Improving Population Healthcare Through Data Analytics, Visualization, and Reporting Tools

LTSS Waiver Services in Massachusetts

Rick Perro
Commonwealth Medicine,
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Massachusetts 1915c Frail Elder Waiver

• Administered by MA Executive Office of Elder Affairs

• Many Services
  – Adult Day Health     Skilled Nursing     Home Health Aide
  – Chore Service       Companion Service   Transportation

• Multiple Information Needs
  – Operations monitoring
  – Efficiency opportunities
  – Quality assessment and reporting
  – Program integrity
  – Expanded service planning
Approach

- The University of Massachusetts Medical School has been working with Elder Affairs on analyzing Waiver data since 2012
- Agency Partnership
- Focus on the Data and Analytics
- Low-Touch Implementation
  - Minimize Development of Custom Applications
  - Utilize Commercial and Open Source tools
    - SQL Server
    - Tableau
    - Web Portal
    - R
Agency Partnership

• Agency
  – Sets priorities
  – Outlines information needs; clarifies processes and procedures

• Data Analytics Team
  – Provides analytic consultation including:
    • Analytic design
    • Reporting metrics
    • Benchmarking

• Data Management Team
  – Develops data analysis environments
  – Implements data analytics, visualizations and reports
Objectives

- Plan for projected increasing demand for services
- Improve operational efficiency
- Deliver the right services to the right individuals at the right time
- Provide operational and program management with timely, actionable information
Reporting and Analytics

• Transforming the data into actionable information
• Progression of Analytics

• Reports being delivered to Elder Affairs and Service Delivery organizations
Descriptive Analytics

- Current State
- Trend

Demographic Analytics

Health and Welfare 1—Abuse and Neglect Trends
Health and Welfare 1: Home Care consumers were assessed every six months to identify their concerns about assessment status (%): Question answered in required time frame (%)
Program(s): All

Demo Data
Predictive Analytics

• What do we expect to happen?

Fall Probability by County

Norfolk | Bristol | Worcester | Essex | Barnstable | Plymouth | Berkshire | Middlesex | Nantucket | Franklin | Dukes | Hampden | Hampshire | Suffolk

![Bar chart showing fall probability by county]

Alzheimers Disease
- (All)
- No
- Yes

Fall in Year 2013
- (All)
- No
- Yes

Gait and Balance Problems
- (All)
- No
- Yes

Risk Level (High: >30% Probability of Fall)
- (All)
- High risk
- Lower risk

Demo Data
Moving from Predictive to Prescriptive

Lists of individuals that should be monitored more closely

Falls Risk Assessment for Agency AAA 19

<table>
<thead>
<tr>
<th>Person Id</th>
<th>Fall in Year 2013</th>
<th>Gait and Balance Problems</th>
<th>Alzheimers Disease</th>
<th>Assessment Date</th>
<th>Case Manager</th>
<th>Risk Level (High: &gt;30% Probability of Fall)</th>
<th>Fall Probability</th>
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<tr>
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<td>0.3935</td>
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</tbody>
</table>

Demo Data
Data Management

• Multiple Sources
  – Medicaid claims and enrollment
  – Waiver case management
  – MDS Assessment

• Time spent in the data, far less on visualization

• Characterization
  – Data: Two Components
    • Value
    • Meta/Quality Information

• Transformation (Business Rules)
  – What was done
  – Traceable
Implementation

- Moved from building data warehouses to data marts
- Moving to on-demand data and transformations
Next Steps

• Continue low-touch implementation approach
• More data integration
  – Consumer profiles combining Medicaid claims and HCBS data
  – Currently working with the MA Department of Transitional Assistance, integrating SNAP data with the Waiver data
• More predictive and prescriptive analytics
Thank you

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