Impacts of the 9th SOW QIO Program Care Transitions Theme on Condition-Specific Readmission Rates

Mathematica Policy Research

Jelena Zurovac • Arnold Chen • Sue Felt-Lisk • Myles Maxfield

QualityNet Conference | Baltimore, MD
December 13 – 15, 2011

Follow us on Twitter: @QualityNet11
Tweet with our conference hashtag: #QualityNet11
Content Slide

• Background, Objective, and Scope
• Summary
• Qualitative Analysis
• Quantitative Analysis
  – Methods
  – Data
  – Impacts
• Comparison of Mathematica and CFMC Methodology
• Questions
Background, Objective, and Scope

• Background
  – IOM Report called for an independent evaluation
  – ASPE/NORC report offered an evaluation design
  – The Administrator committed to an independent evaluation

• CMS contracted with Mathematica Policy Research to conduct an independent evaluation of the 9th SOW

• Objective and scope
  – Estimate effect of the theme on all-cause readmission rates, using the most rigorous methodology
  – Estimate value added of the 9th SOW
Summary

• Qualitative analysis results suggest that providers highly valued QIO services and used them to make changes in patient care
• However, we found no impacts of the Care Transitions theme on all-cause readmissions based on discharges for AMI, HF, pneumonia
• Lack of impacts in quantitative analyses may be due to several factors
Qualitative Analysis

Follow us on Twitter:
@QualityNet11
Tweet with our conference hashtag:
#QualityNet11
Data Collection for CT Theme

• Qualitative Analysis/Surveys
  – Survey of QIO directors and theme leaders (13 responded)
  – Site visit discussions with QIOs directors and theme leaders in 5 CT communities
  – Discussions with 63 Highly Involved QIO Collaborating Organizations and Providers (conducted by SSS)
Insights: QIO Director and Theme Leader Survey and Interviews

- Only 58% of the originally included providers actively participated (Source: survey)
- Some hospitals saw reducing readmissions as losing revenue (Source: interviews)
- Early in 9th SOW QIOs felt they were ahead of the field; later, providers more generally agreed with goals of the theme (Source: interviews)
Insights: Interviews with Participating Providers

- Providers highly valued QIO services and used them to make a wide range of changes
  - Most common: transitions coaching, universal transfer tool, scheduling post-discharge with provider
- A major theme was the enhanced communication between “siloed” providers
  - Some identified benefits beyond readmissions such as medication reconciliation
Quantitative Analysis

Follow us on Twitter:
@QualityNet11
Tweet with our conference hashtag:
#QualityNet11
Methods

• Comparison group selection
  – Identify treatment counties from treatment community zip codes
  – Identify comparison counties by matching on county-level characteristics
    • Nearest neighbor propensity score matching

• Impact estimation
  – Patient-level difference-in-difference regression
    • Risk-adjusted for patient characteristics
    • Reported: regression-adjusted means
Outcomes

• All-cause readmission within 30 days of a discharge for
  – Acute myocardial infarction (AMI)
  – Congestive Heart Failure (CHF)
  – Pneumonia
  – AMI, CHF, or pneumonia

• Focus on these measures because they are
  1. Targeted quality measures in the 9th SOW
  2. Widely used and endorsed by various entities
     • Chosen by CMS for public reporting on Hospital Compare
     • Endorsed by the National Quality Forum and MedPAC
Data Sources and Measurement Periods

- **Data Sources**
  - Readmissions: patient-level files used to construct CMS Hospital Compare measures
  - County characteristics: Area Resource File (ARF) and Community Health Status Indicators (CHSI)

- **Measurement Period**

<table>
<thead>
<tr>
<th>Baseline</th>
<th>Followup CT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul 2007</td>
<td>Jul 2008</td>
</tr>
<tr>
<td>Jul 2009</td>
<td>Oct 2009</td>
</tr>
<tr>
<td>Jul 2010</td>
<td>Sep 2010</td>
</tr>
<tr>
<td>Jul 2011</td>
<td></td>
</tr>
</tbody>
</table>

QIO 9th SOW
Care Transitions Theme Communities and Propensity-Score Matched Comparison Areas

Note: This map was prepared by Mathematica Policy Research to show the service areas of QIO Care Transitions Communities and the location of comparison areas.
## Impacts on Readmissions: Regression-Adjusted Predicted Means at Follow-Up (Percentages)

<table>
<thead>
<tr>
<th></th>
<th>Beneficiaries in Intervention Counties with CT Intervention</th>
<th>Beneficiaries in Intervention Counties without CT Intervention (Counterfactual)</th>
<th>Difference</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-Cause Readmission Following a Discharge for AMI, HF, or Pneumonia</td>
<td>23.5</td>
<td>23.4</td>
<td>0.1</td>
<td>0.949</td>
</tr>
<tr>
<td>Number of Beneficiaries</td>
<td>26,472</td>
<td>35,460</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All-Cause Readmission Following a Discharge for AMI</td>
<td>20.9</td>
<td>21.2</td>
<td>-0.3</td>
<td>0.698</td>
</tr>
<tr>
<td>Number of Beneficiaries</td>
<td>5,284</td>
<td>7,501</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All-Cause Readmission Following a Discharge for HF</td>
<td>27.9</td>
<td>27.5</td>
<td>0.4</td>
<td>0.582</td>
</tr>
<tr>
<td>Number of Beneficiaries</td>
<td>12,526</td>
<td>16,504</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All-Cause Readmission Following a Discharge for Pneumonia</td>
<td>19.2</td>
<td>19.2</td>
<td>0.0</td>
<td>0.941</td>
</tr>
<tr>
<td>Number of Beneficiaries</td>
<td>10,317</td>
<td>13,565</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Series of Sensitivity Analyses Confirm Main Analyses Findings

• There were no impacts of the program on treatment areas:
  – That were “mostly” covered with target zip codes
  – With high overlap of proportions of beneficiaries discharged from the hospital who also reside in the target region
  – With the highest quality of the match to comparison
Comparison of Mathematica and CFMC Methodology

Follow us on Twitter: @QualityNet11
Tweet with our conference hashtag: #QualityNet11
Comparison of Approaches

- Many differences in methodology
  - Measurement period
  - Readmission outcome measure
  - Selection of comparison communities
  - Methods used in impact analysis
### Outcome Measures

<table>
<thead>
<tr>
<th></th>
<th>Mathematica/PIHOEM*</th>
<th>CFMC</th>
</tr>
</thead>
</table>
| **Measurement period**   | Baseline: July 2007 – June 2008  
                          | Follow-up: Oct 2009 – March 2010                  |
| **Definition of readmission** | Based on index admission for AMI, HF, pneumonia | Based on all index admissions                     |
| **Handling of readmissions** | First readmission within 30-day period counted, not subsequent readmissions | First and all subsequent readmissions counted. Each readmission also counted as new index admission |
| **Denominator population** | Beneficiaries discharged for one of the three conditions | All Medicare beneficiaries residing in the community (not just those with discharges) |
Definition of Readmission

READMISSION – MATHEMATICA (PIHOEM)

- Principal dx= AMI, HF, pneu

Index Admission

Readmission

Neither readmission nor index admission

Index Admission

April 1st 2006

April 10th

April 25th

May 1st

May 10th

May 30th

30 days must elapse between index admissions

READMISSION(S) - CFMC

- Principal dx= unrestricted

Index Admission

Readmission and a new index admission

Readmission and a new index admission

Readmission and a new index admission

April 1st 2006

April 10th

April 25th

May 1st

May 10th

May 30th
# Methods: Comparison Communities and Impact Analyses

<table>
<thead>
<tr>
<th>Method for selecting comparison communities</th>
<th>Mathematica/PIHOEM*</th>
<th>CFMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method for selecting comparison communities</td>
<td>Propensity score matching based on 28 characteristics</td>
<td>Relative difference and dissimilarity measures based on 3 characteristics</td>
</tr>
<tr>
<td>Defining treatment communities</td>
<td>All counties that span collection of Care Transitions zip codes. County where beneficiaries live.</td>
<td>Zip code community based on beneficiary ZIP code at the time of service.</td>
</tr>
<tr>
<td>Defining comparisons</td>
<td>Counties</td>
<td>Hospital Service Areas (HSAs) for each comparison county</td>
</tr>
<tr>
<td>Selecting comparisons</td>
<td>Comparison counties selected as part of matching</td>
<td>Final comparison HSAs selected by QIOs</td>
</tr>
<tr>
<td>Impact analysis</td>
<td>Difference-in-difference regression risk-adjusting for a multitude of beneficiary characteristics</td>
<td>Comparison of aggregate, community-level, unadjusted rates in CT and comparison communities</td>
</tr>
</tbody>
</table>
Questions and Discussion

Follow us on Twitter:
@QualityNet11
Tweet with our conference hashtag:
#QualityNet11
Contact Information

• Jelena Zurovac
  – jzurovac@mathematica-mpr.com

• Arnold Chen
  – achen@mathematica-mpr.com

• Sue Felt-Lisk
  – sfelt-lisk@mathematica-mpr.com

• Myles Maxfield
  – mmaxfield@mathematica-mpr.com
Additional Slides

Follow us on Twitter:
@QualityNet11
Tweet with our conference hashtag:
#QualityNet11
Explaining Lack of Impacts

- A limited number of providers participated
- Year-long followup period begins 12 months into the SOW
- There might have been a loss of fidelity in replication of the evidence-based CT interventions
<table>
<thead>
<tr>
<th>All-Cause Readmission Following a Discharge for AMI, HF, or Pneumonia</th>
<th>Beneficiaries in Intervention Counties with CT Intervention</th>
<th>Beneficiaries in Intervention Counties without CT Intervention (Counterfactual)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-Cause Readmission Following a Discharge for AMI</td>
<td>0.3</td>
<td>0.4</td>
<td>-0.1</td>
</tr>
<tr>
<td>Number of Beneficiaries</td>
<td>26,472</td>
<td>35,460</td>
<td></td>
</tr>
<tr>
<td>All-Cause Readmission Following a Discharge for HF</td>
<td>0.3</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Number of Beneficiaries</td>
<td>12,526</td>
<td>16,504</td>
<td></td>
</tr>
<tr>
<td>All-Cause Readmission Following a Discharge for Pneumonia</td>
<td>0.0</td>
<td>0.3</td>
<td>-0.3</td>
</tr>
<tr>
<td>Number of Beneficiaries</td>
<td>10,317</td>
<td>13,565</td>
<td></td>
</tr>
</tbody>
</table>
Results of Subgroup Analyses

- No impact on subgroups
  - Underserved or non-underserved beneficiaries
  - Communities with high or low collaboration
  - Communities with newly or previously engaged providers, except
    - Readmission after AMI discharge for previously engaged providers
**Readmissions in Underserved Beneficiaries: Regression-Adjusted Predicted Means at Followup (Percentages)**

<table>
<thead>
<tr>
<th>Readmission Following a Discharge for AMI, HF, or Pneumonia</th>
<th>Minority Beneficiaries in Intervention Counties</th>
<th>Minority Beneficiaries in Comparison Counties</th>
<th>Impact on Minority Beneficiaries</th>
<th>Non-Minority Beneficiaries in Intervention Counties</th>
<th>Non-Minority Beneficiaries in Comparison Counties</th>
<th>Impact on Non-Minority Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readmission Following a Discharge for AMI</td>
<td>27.0</td>
<td>25.9</td>
<td>1.1</td>
<td>22.7</td>
<td>22.8</td>
<td>-0.1</td>
</tr>
<tr>
<td>Number of Beneficiaries</td>
<td>4,534</td>
<td>4,495</td>
<td></td>
<td>19,928</td>
<td>30,965</td>
<td></td>
</tr>
<tr>
<td>Readmission Following a Discharge for HF</td>
<td>31.5</td>
<td>29.3</td>
<td>2.2</td>
<td>27.2</td>
<td>26.8</td>
<td>0.4</td>
</tr>
<tr>
<td>Number of Beneficiaries</td>
<td>2,388</td>
<td>2,308</td>
<td></td>
<td>9,155</td>
<td>14,196</td>
<td></td>
</tr>
<tr>
<td>Readmission Following a Discharge for Pneumonia</td>
<td>2.0</td>
<td>22.2</td>
<td>-0.2</td>
<td>18.4</td>
<td>18.5</td>
<td>-0.1</td>
</tr>
<tr>
<td>Number of Beneficiaries</td>
<td>1,607</td>
<td>1,638</td>
<td></td>
<td>7,959</td>
<td>11,925</td>
<td></td>
</tr>
</tbody>
</table>
Neither readmission nor index admission must elapse between index admission and a new index admission. 30 days must elapse between index admissions.

**Principal dx:**
- AMI, HF, pneu
- Unrestricted

**Admission Dates:**
- Index Admission: April 1st 2006
- Readmission: April 10th
- Readmission: April 25th
- New Index Admission: May 1st
- New Index Admission: May 10th
- New Index Admission: May 30th

**Learn. Act. Improve. Spread.**