Overview of APR DRGs and Potentially Preventable Readmissions

Minnesota Hospital Association
June 2018
Our Agenda Today

1. APR DRGs: Definition and Methodology Overview
2. Risk Adjustment and Reporting with APR DRGs
3. PPRs: Definition and Methodology Overview
4. Risk Adjustment and Reporting with PPRs
APR DRGs: Definition and Methodology Overview
Quick Summary: All Patient Refined DRGs

- **Applicable sites of service:** Hospital inpatient stay
- **Data required:** Hospital inpatient claims
- **Definition:** A system of classifying patients by their reason of admission, severity of illness, and risk of mortality. DRGs comprise classes of patients who are similar clinically and in consumption of hospital resources.
- **Uses:** Payment, hospital management, reporting, risk adjustment for quality measures

![Figure 4: Distribution of Potentially Preventable Hospital Admissions by Condition, 2012](source: Minnesota Department of Health, An Introductory Analysis of Potentially Preventable Health Care Events in Minnesota, www.health.state.mn.us/healthreform/allpayer/potentially_preventable_events_072115.pdf)
Input and Output: APR DRGs

**INPUT**

*Data source: hospital inpatient claims*
- Diagnoses and POA indicators
- Procedures and Px dates
- Discharge status
- Age and gender

**3M APR DRG Grouper**

Available in:
- Mainframe version
- Core Grouping Software
- Grouper Plus Content Serv
- Coding & Reimbursement System
- 360 Encompass

**OUTPUT**

- Major Diagnostic Category
- Base APR DRG (admission and discharge)
- Severity of Illness (admission and discharge)
- Risk of Mortality (admission)
- Relative weights

**Input Pearls**
- Check completeness, accuracy, and formatting on diagnosis, present on admission, procedure and procedure date fields
- Search for and verify extreme values of charges, payment, length of stay, and Px/Dx code counts

**Output Pearls**
- Check records with error codes
- Admission and discharge DRGs are used for different purposes
- Dx and Px “affect” fields show impact on grouping
- Choice of relative weights: charge-based vs HSRV

Not all input and output fields are shown. Input and output pearls are only the most important of many steps needed for valid analysis.
Assigning the Base APR DRG

- Definitions Manual available to licensees on 3M customer care site
- Suggestions welcome!

**MDC 5 Diseases and disorders of the circulatory system**

**In this section**
- Flowchart of MDC 5 logic
- Assignment of diagnosis codes
- Reassigning to MDC 07
- Reassigning to MDC 08
- Reassigning to MDC 11

**DRG 190 Acute Myocardial Infarction**

**Principal Diagnosis**
- [Diagnosis codes and related procedures]

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18 Steps to Assign Severity of Illness and Risk of Mortality

- Severity of illness and risk of mortality subcategories are calculated separately and may differ
- SOI and ROM depend on the patient’s reason for admission (i.e., the base APR DRG)
  - No single CC or MCC list
- High SOI and ROM reflect multiple serious diseases and their interaction
The severity of illness and risk of mortality subclass are calculated separately and may be different from each other.
Comparing Medicare DRGs and 3M APR DRGs

<table>
<thead>
<tr>
<th>Methodology developer</th>
<th>Medicare DRGs</th>
<th>APR DRGs</th>
<th>Key Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>3M for CMS</td>
<td>3M for CMS</td>
<td>3M</td>
<td></td>
</tr>
</tbody>
</table>

| Population for methodology   | Medicare fee-for-service population | All patient population |          |
| OB, pediatrics, newborns     | Very low prevalence (0.4% of stays) | High prevalence (27% of stays) |          |

| Data requirements            | Diagnoses, procedures, age, sex, discharge status | Diagnoses, procedures, age, sex, discharge status* |          |

| Major Diagnostic Categories  | Pre-MDC and 25 MDCs | Pre-MDC and 25 MDCs |          |
| OB, pediatrics, newborns     | Minimal attention to grouping logic | Extensive analysis |          |

| Number of DRGs               | 759 (757+ 2 error DRGs) | 1,272 (318 base DRGs x 4 subclasses + 2 error) |          |

| Severity of illness          | • Standard list of CCs and MCCs across base DRGs | • SOI calculation varies, depending on base DRG and on interaction of comorbidities  |          |
|                              | • Some base DRGs stand alone; some have base DRG + CC; some have base + CC + MCC | • Each base DRG has four severities of illness: minor, moderate, major, extreme |          |

| Analysis of mortality        | Not possible because discharge status 20 (expired) may affect DRG assignment | DRG assignment is independent of mortality. Benchmark risk of mortality parameters calculated for each APR DRG. |          |

| Present on admission (POA) indicator | Used only for evaluation of HACs | Used for admission APR DRG assignment |          |

* Birthweight is an important input to APR DRGs. It can be submitted either as a diagnosis code or a value code (preferred)
Risk Adjustment and Reporting with APR DRGs
Overview of Expected Values Using APR DRGs

The expected value is the average value of the resource or outcome variable (e.g. LOS, readmission rate) that would result if the health plan or provider’s mix of patients within each unit of comparison (e.g. DRG) had been treated at the average value of the resource or outcome variable in a reference norm population

- Indirect rate standardization
- Method of case mix/risk adjusting

Source: 3M Performance Matrix Hospital Compare
Indirect Standardization Used to Compute Expected Values

- Expected values are calculated separately for each 3M APR DRG and severity level.
- Expected values are based on all hospitals selected for ‘in expected list’ (e.g. a statewide data set).
- The expected value for the 3M APR DRG is the weighted average of the values across all 4 severity levels.
- Expected values for all metrics (costs, charges, ALOS, etc.) are calculated the same way.
Facility Comparisons Using Expected Values

<table>
<thead>
<tr>
<th>Facility</th>
<th>Total Admissions</th>
<th>Average Length of Stay</th>
<th>Expected Average Length of Stay</th>
<th>Length of Stay, % Diff from Exp</th>
<th>Average Cost</th>
<th>Expected Average Cost</th>
<th>Cost, % Diff from Exp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>136,330</td>
<td>4.03</td>
<td>4.03</td>
<td>-0.00%</td>
<td>$8,315</td>
<td>$10,058</td>
<td>-17.57%</td>
</tr>
<tr>
<td>Samaritan Medical Center</td>
<td>22,473</td>
<td>3.94</td>
<td>3.90</td>
<td>1.08%</td>
<td>$15,523</td>
<td>$11,837</td>
<td>31.14%</td>
</tr>
<tr>
<td>Atlantic Practice</td>
<td>21,169</td>
<td>4.40</td>
<td>4.47</td>
<td>-1.47%</td>
<td>$0</td>
<td>$10,524</td>
<td>-100.00%</td>
</tr>
<tr>
<td>MidState General</td>
<td>18,693</td>
<td>3.54</td>
<td>3.73</td>
<td>-4.99%</td>
<td>$9,149</td>
<td>$10,821</td>
<td>-15.45%</td>
</tr>
<tr>
<td>Southwest Regional Medical Center</td>
<td>19,094</td>
<td>3.87</td>
<td>3.79</td>
<td>2.05%</td>
<td>$6,228</td>
<td>$9,033</td>
<td>-31.06%</td>
</tr>
<tr>
<td>Covenant General Hospital</td>
<td>11,014</td>
<td>3.96</td>
<td>3.79</td>
<td>4.57%</td>
<td>$6,748</td>
<td>$10,015</td>
<td>-32.63%</td>
</tr>
<tr>
<td>St. Jude's Medical Center</td>
<td>11,094</td>
<td>3.46</td>
<td>3.68</td>
<td>-5.56%</td>
<td>$9,402</td>
<td>$9,034</td>
<td>4.55%</td>
</tr>
<tr>
<td>Albany County Memorial</td>
<td>9,453</td>
<td>3.50</td>
<td>3.56</td>
<td>-1.65%</td>
<td>$9,751</td>
<td>$9,202</td>
<td>-4.92%</td>
</tr>
<tr>
<td>Mountain View Internal Medicine</td>
<td>3,600</td>
<td>5.58</td>
<td>5.33</td>
<td>4.62%</td>
<td>$16,440</td>
<td>$15,591</td>
<td>5.44%</td>
</tr>
<tr>
<td>Delaware Memorial Med Center</td>
<td>1,403</td>
<td>2.39</td>
<td>2.68</td>
<td>-10.62%</td>
<td>$6,295</td>
<td>$4,840</td>
<td>30.06%</td>
</tr>
<tr>
<td>Strong Medical Center</td>
<td>3,148</td>
<td>2.55</td>
<td>2.84</td>
<td>-10.13%</td>
<td>$5,075</td>
<td>$4,844</td>
<td>4.77%</td>
</tr>
<tr>
<td>Sunnyvale General</td>
<td>2,493</td>
<td>2.76</td>
<td>2.66</td>
<td>3.86%</td>
<td>$5,716</td>
<td>$5,764</td>
<td>-0.83%</td>
</tr>
<tr>
<td>Rock Creek Med Center</td>
<td>1,607</td>
<td>7.47</td>
<td>7.05</td>
<td>5.97%</td>
<td>$17,827</td>
<td>$12,966</td>
<td>37.48%</td>
</tr>
<tr>
<td>St. James Community Hospital</td>
<td>1,165</td>
<td>2.65</td>
<td>2.75</td>
<td>3.81%</td>
<td>$5,432</td>
<td>$4,226</td>
<td>28.55%</td>
</tr>
<tr>
<td>City General</td>
<td>1,002</td>
<td>3.16</td>
<td>3.01</td>
<td>4.94%</td>
<td>$5,873</td>
<td>$5,083</td>
<td>15.50%</td>
</tr>
<tr>
<td>Westside Medical Group - South</td>
<td>897</td>
<td>3.05</td>
<td>6.68</td>
<td>-40.91%</td>
<td>$5,223</td>
<td>$11,856</td>
<td>-55.95%</td>
</tr>
<tr>
<td>Bywater Community Hospital</td>
<td>647</td>
<td>3.92</td>
<td>5.87</td>
<td>-33.26%</td>
<td>$2,407</td>
<td>$9,474</td>
<td>-74.60%</td>
</tr>
<tr>
<td>St. Joseph's County Clinic</td>
<td>615</td>
<td>8.07</td>
<td>7.60</td>
<td>6.24%</td>
<td>$33,782</td>
<td>$17,601</td>
<td>91.54%</td>
</tr>
<tr>
<td>Spencer City Pediatrics</td>
<td>584</td>
<td>6.13</td>
<td>6.59</td>
<td>-6.94%</td>
<td>$3,217</td>
<td>$11,027</td>
<td>-70.82%</td>
</tr>
</tbody>
</table>

Source: 3M Performance Matrix (Demo)

- % differences: observed values variance from expected values
Pearls for Success in Using APR DRGs

1. APR DRGs are applicable to the full range of acute hospital inpatients
   • Not intended for outpatient care, nursing facilities, etc.
   • Can be used for psychiatric, rehabilitation, LTAC stays – with caveats
2. APR DRGs are much more than a means of payment
3. Version control: grouper, mapper, relative weights, and benchmarks
   • Grouper version, relative weights and benchmarks should all match
   • Code mapping enables crosswalks between APR DRG and ICD-10 versions
   • V30-33 have similar logic and same list of APR DRGs; changes from V34 on
   • V33 and onward are ICD-10 only groupers
4. Don’t compare severity levels across DRGs; compare relative weights instead
5. Present on admission, hospital acquired conditions, and complications of care
   • Distinct concepts with distinct applications
PPRs: Definition and Methodology Overview
Potentially Preventable Readmissions Defined

3M PPRs are:
- Return hospitalizations that may result from deficiencies in the process of care and treatment or lack of post discharge follow-up.

- Assumptions:
  - Not all readmissions are preventable
  - Patients who have had a problem with the quality of inpatient care or outpatient care following discharge will be more likely to be readmitted
  - Discharged too sick, too quick
  - Poor discharge planning
  - Poor follow-up care

3M PPRs are based on and use:
- **3M™ All Patient Refined DRG (APR DRG) Classification System** as the foundation
- **3M™ Potentially Preventable Readmission (PPR) Grouper**
Quick Summary: Potentially Preventable Readmissions

- **Unit of analysis**: Hospital inpatient stay and readmissions
- **Applicable sites of service**: Hospital inpatient care
- **Risk adjustment**: APR DRG, age, presence of major mental health/substance abuse comorbidity
- **Data required**: Hospital inpatient claims linked by patient ID
- **Uses**: Pay for outcomes, reporting, hospital management, population health, managing MCOs

- Example: in Rhode Island, an all-payer analysis generated actionable data to be used in reducing readmissions
PPRs: Based on Research, Used to Enable Insight and Change

Redesigning the Medicare Inpatient PPS to Reduce Payments to Hospitals with High Readmission Rates

Will Hospital Peer Grouping by Patient Socioeconomic Status Fix the Medicare Hospital Readmission Reduction Program or Create New Problems?

Hospital Readmission Rates
The Impacts of Age, Payer, and Mental Health Diagnoses

Identifying Potentially Preventable Readmissions

Potentially Preventable Readmissions in Texas
Medicaid and CHIP Programs
Measurement Period: Fiscal Year 2013
How 3M Develops PPR Logic

1. Focus on Preventable Readmissions Difference

All Condition Focus

READMISSIONS

Planned

Unplanned

NOT Clinically Related

Clinically Related

NOT Preventable

Preventable

3M PPR Focus

2. Develop Clinical Decision Rules

<table>
<thead>
<tr>
<th></th>
<th>Medical Readmit</th>
<th>Surgical Readmit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Admit</td>
<td>PPR except for clearly unrelated acute events</td>
<td>Not PPR unless initial medical event clearly should have resulted in surgery</td>
</tr>
<tr>
<td>Surgical Admit</td>
<td>PPR except for clearly unrelated conditions</td>
<td>PPR if related to complications of prior surgery</td>
</tr>
</tbody>
</table>

3. Determine Potentially Preventable Readmissions

- 112,470 possible pairs of index admission APR DRG and readmission APR DRG were evaluated as indicating a PPR or not, and why
- Additional logic for situations such as transfers
**Input and Output: PPRs**

**INPUT**
- Data source: hospital inpatient claims tied by unique patient identifiers
  - Diagnoses and POA
  - Procedures
  - Discharge status
  - Age and gender

**3M PPR Grouper**
- Available in:
  - Core Grouping Software
  - Grouper Plus Content Serv
  - Coding & Reimbursement System
  - 360 Encompass

**OUTPUT**
- Unique patient identifier
- APR DRG
- PPR record type (only admission, initial admission, PPR etc.)
- PPR chain number
- Clinical reason for PPR
- Mental health status

**Input Pearls**
- Accurate patient identifiers and discharge disposition data ("patient status") are essential
- Check completeness, accuracy, and formatting on diagnosis, POA, and procedure fields
- Check list of hospital providers for anomalies such as rehab units, hospice, nursing facilities etc.

**Output Pearls**
- Check records with error codes
- Check findings for reasonableness against similar studies done on other populations
- Be mindful of difference between PPR candidates, PPR chains, and individual readmission cases.

Not all input and output fields are shown. Input and output pearls are only the most important of many steps needed for valid analysis.
The PPR Grouper Classifies All Admissions

<table>
<thead>
<tr>
<th>Type Code</th>
<th>PPR Type Code Desc</th>
<th>Use of Column in Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE</td>
<td>Error DRG</td>
<td>Error - Exclusion</td>
</tr>
<tr>
<td>HV</td>
<td>Human immunodeficiency virus DRGs</td>
<td>Exclusion</td>
</tr>
<tr>
<td>LA</td>
<td>Left against medical advice admission</td>
<td>Exclusion</td>
</tr>
<tr>
<td>IA</td>
<td>Initial admission</td>
<td>Initial Admission at risk, with one or more PPRs</td>
</tr>
<tr>
<td>MH</td>
<td>Mental health exclusion</td>
<td>Optional Exclusion</td>
</tr>
<tr>
<td>MA</td>
<td>Malignancy admission</td>
<td>Exclusion</td>
</tr>
<tr>
<td>MM</td>
<td>Major/metastatic malignancy admission</td>
<td>Exclusion</td>
</tr>
<tr>
<td>NE</td>
<td>Non-event admission</td>
<td>Exclusion</td>
</tr>
<tr>
<td>NM</td>
<td>Non-Event Malignancy/Other Diseases</td>
<td>Exclusion</td>
</tr>
<tr>
<td>NT</td>
<td>Neonatal admission</td>
<td>Exclusion</td>
</tr>
<tr>
<td>OA</td>
<td>Only admission-alive</td>
<td>Initial Admission at risk, without PPRs</td>
</tr>
<tr>
<td>OD</td>
<td>Only admission-died</td>
<td>Exclusion</td>
</tr>
<tr>
<td>OG</td>
<td>Other globally excluded APR-DRGs</td>
<td>Exclusion</td>
</tr>
<tr>
<td>PL</td>
<td>Palliative Care</td>
<td>Optional Exclusion</td>
</tr>
<tr>
<td>RA</td>
<td>Readmission</td>
<td>PPR linked to IA</td>
</tr>
<tr>
<td>RT</td>
<td>Readmission-transfer</td>
<td>Transfer PPR linked to IA (ends chain)</td>
</tr>
<tr>
<td>SA</td>
<td>Substance abuse exclusion</td>
<td>Optional Exclusion</td>
</tr>
<tr>
<td>TA</td>
<td>Transfer admission</td>
<td>Exclusion</td>
</tr>
<tr>
<td>UK</td>
<td>No Code</td>
<td>User created code - to avoid blanks in data</td>
</tr>
</tbody>
</table>

- All cases are assigned type codes
- Initial admissions (IA, OA) are those at risk for one or more clinically related readmissions (RA, RT)
- PPR rates for hospitals are based on chains / at risk initial admissions: IA / (IA + OA)
# Examples of PPR Clinical Logic

<table>
<thead>
<tr>
<th>Patient</th>
<th>Clinical Scenario (By APR DRG)</th>
<th>Potentially Preventable Readmission?</th>
<th>Comment</th>
</tr>
</thead>
</table>
| 1       | Admission 1: 139 Pneumonia (OA)  
          Admission 2: 340 Fracture of Femur (OA)  
          | No                                                                                                                                                                   | Readmission not clinically related   |
| 2       | Admission 1: 136 Resp. Malignancy (NM)  
          Admission 2: 139 Pneumonia (OA)  
          | No                                                                                                                                                                   | Global exclusion 136                |
| 3       | Admission 1: 139 Pneumonia  
          Discharge status 07: Left against medical advice (LA)  
          Admission 2: 139 Pneumonia (OA)  
          | No                                                                                                                                                                   | Patient left against medical advice  |
| 4       | Admission 1: 139 Pneumonia  
          Discharge status 02: Transfer to another acute care hospital (TA)  
          Admission 2: 194 Heart Failure (OA)  
          | No                                                                                                                                                                   | Transfers are not readmissions      |
| 5       | Admission 1: 139 Pneumonia (IA)  
          Admission 2: 194 Heart Failure (RA)  
          | Yes                                                                                                                                                                   | Readmission possibly clinically related |
| 6       | Admission 1: 139 Pneumonia  
          Discharge status 02: Transfer to another acute care hospital (TA)  
          Admission 2: 139 Pneumonia (IA)  
          Admission 3: 203 Chest pain (RA)  
          | Admission 2: No  
          Admission 3: Yes  
          | Admission 3 counts as a PPR from the second hospital                                                      |
| 7       | Admission 1: 225 Appendectomy (OA)  
          Admission 2: 240 Digestive malignancy (NM)  
          | No                                                                                                                                                                   | Global exclusion 240                |
| 8       | Admission 1: 225 Appendectomy (IA)  
          Admission 2: 251 Abdominal Pain (RA)  
          | Yes                                                                                                                                                                   | Readmission possibly clinically related |

Note: All admissions are assumed to be within the designated window, e.g., 15 days or 30 days
Risk Adjustment and Reporting with PPRs
Example of Risk Adjustment for PPRs

Table 1: Sample PPR Expected Calculations Based on Statewide Data

<table>
<thead>
<tr>
<th>3M APR DRG/SOI</th>
<th>Description</th>
<th>Observed PPR Chains</th>
<th>Candidate Cases</th>
<th>All Hospital PPR Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>175-1</td>
<td>Percutaneous Cardiovascular procedures without AMI</td>
<td>70</td>
<td>1,000</td>
<td>7.0%</td>
</tr>
<tr>
<td>221-2</td>
<td>Major Small and Large Bowel procedures</td>
<td>80</td>
<td>1,600</td>
<td>5.0%</td>
</tr>
<tr>
<td>282-1</td>
<td>Disorders of Pancreas except malignancy</td>
<td>20</td>
<td>200</td>
<td>10.0%</td>
</tr>
</tbody>
</table>

Table 2: Application of PPR Expected Values to Sample Hospital Data

<table>
<thead>
<tr>
<th>3M APR DRG/SOI</th>
<th>Description</th>
<th>Observed PPR Chains</th>
<th>Candidate Cases</th>
<th>Hospital PPR Rate</th>
<th>PPR Expected Rate</th>
<th>Variance From Expected Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>175-1</td>
<td>Percutaneous Cardiovascular procedures without AMI</td>
<td>9</td>
<td>130</td>
<td>6.9%</td>
<td>7.0%</td>
<td>-1.1%</td>
</tr>
<tr>
<td>221-2</td>
<td>Major Small and Large Bowel procedures</td>
<td>10</td>
<td>160</td>
<td>6.3%</td>
<td>5.0%</td>
<td>25.0%</td>
</tr>
<tr>
<td>282-1</td>
<td>Disorders of Pancreas except malignancy</td>
<td>7</td>
<td>80</td>
<td>8.8%</td>
<td>10.0%</td>
<td>-12.5%</td>
</tr>
</tbody>
</table>

- 3M also makes an adjustment to expected values for mental health conditions
# Application of Risk Adjusted Rates to Hospital Data

*Source: 3M Performance Matrix Hospital Compare*
Where There Is Variation, There Is Opportunity

- The chart shows A/E ratios for 222 Texas hospitals (excluding low-volume hospitals)
- 29 hospitals had A/E ratios < 0.75 (much better than expected)
- 30 hospitals had A/E ratios > 1.25 (much worse than expected)
- Variation in case mix-adjusted performance indicates room for hospitals to learn from each other

Pearls for Success in Using PPRs

1. PPRs are measures both of hospital quality and of follow-up care in the community (e.g., MCO, ACO, primary care practice)

2. “Potentially Preventable Readmissions” means that not every readmission was preventable. It is a mistake to, for example, deny payment for every PPR

3. Keep in mind the difference between PPR chains, PPR stays, and PPR cost

4. Risk adjustment is essential for accuracy and fairness in any comparison
   • The comparison is always between actual and expected, where “expected” reflects the case mix of the population being analyzed
   • (Actual – Expected)/Expected, (Actual / Expected), and (Risk Adjusted Rates per 1,000 Members) are just alternative ways to present the same underlying results

5. Do not over-interpret results based on small cell sizes
   • A PPR rate for a hospital with 100 stays at risk of a PPR would be accurate but not meaningful

6. Financial analysis should take into account impacts other than the defined PPR
   • For example, what resources were needed to achieve improved PPR rates?
## Readmissions: Comparing Medicare and 3M PPRs

<table>
<thead>
<tr>
<th>Population Used to Develop Methodology</th>
<th>Medicare Readmissions</th>
<th>3M Potentially Preventable Readmissions</th>
<th>Key Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population Used to Develop Methodology</strong></td>
<td>Medicare fee-for-service population age 65 and over</td>
<td>All patient population (excluding newborns)</td>
<td>*</td>
</tr>
<tr>
<td><strong>Conditions Included</strong></td>
<td>Focus on seven common Medicare conditions + hospital-wide measure (4)</td>
<td>All</td>
<td>*</td>
</tr>
<tr>
<td><strong>Readmissions Included</strong></td>
<td>All unplanned readmissions</td>
<td>Only those with a plausible clinical connection to the index admission</td>
<td>*</td>
</tr>
<tr>
<td><strong>Readmission Window</strong></td>
<td>30 days</td>
<td>User defined; 15 and 30 days are typical</td>
<td></td>
</tr>
<tr>
<td><strong>Methodology</strong></td>
<td>Regression</td>
<td>Categorical</td>
<td></td>
</tr>
<tr>
<td><strong>Drill-Down Analysis</strong></td>
<td>Not possible (3)</td>
<td>Possible (3)</td>
<td>*</td>
</tr>
<tr>
<td><strong>Methodology Developer</strong></td>
<td>Yale University for CMS</td>
<td>3M Health Information Systems</td>
<td></td>
</tr>
<tr>
<td><strong>Risk Adjustment</strong></td>
<td>Diagnoses within past year, age</td>
<td>APR DRG (reason for admission and severity), age, MH/SA co-morbidity (5)</td>
<td></td>
</tr>
<tr>
<td><strong>Also Used By</strong></td>
<td>N/A</td>
<td>FL, IL, MD, MN, NY, TX, others (6)</td>
<td>*</td>
</tr>
</tbody>
</table>

**Notes**
2. APR DRG = All Patient Refined Diagnosis Related Group; MH/SA = mental health/substance abuse
3. "Drill-Down Analysis" refers to the opportunity to start from summary results and then drill down to understand readmission patterns for specific diagnoses, time periods, or sub-populations. In general, categorical methodologies enable drill-down analysis while regression-based methodologies do not.
4. The seven conditions are acute myocardial infarction, heart failure, pneumonia, chronic obstructive pulmonary disease, total hip and knee arthroplasty, coronary artery bypass graft and stroke
5. APR DRG reason for admission is as determined, after study, at time of discharge
6. The nature of usage varies, with some payers adjusting payment based on PPR performance while other organizations use PPRs for reporting and enabling learning collaboratives.
Questions?