Competing Risks: Implications for Readmission Policy

KAREN E. JOYNT, MD, MPH
HARVARD SCHOOL OF PUBLIC HEALTH, BRIGHAM AND WOMEN’S HOSPITAL, AND VA BOSTON HEALTHCARE SYSTEM

NATIONAL HEALTH POLICY FORUM, JUNE 2013
Hospital Readmissions Reduction Program

- Penalizes hospitals with excess readmissions for AMI, CHF, and pneumonia
- Successful in shifting hospital paradigm
  - Pushing hospitals to look beyond their walls
  - Helping to incent real changes in outpatient care
- Concerns raised about:
  - Small numbers problem / calculation of penalties
  - Relationship between readmissions and socioeconomics
  - Competing clinical risks
What are “competing clinical risks”?

- Potential outcomes of a hospitalization:
  - In-hospital death
  - Post-discharge death
  - Readmission
- The “denominator” for readmissions only includes patients that survive to discharge, and patients that die after discharge can’t be readmitted
  - Therefore, the two outcomes are linked
- So what do the data show us?
For heart failure, readmission rates are negatively correlated with mortality rates.

Figure shown is a regression analysis of mortality and readmission rates for heart failure. From Gorodeski et al, NEJM 2010.
### Competing Clinical Risks: Correlations

Correlations between mortality and readmissions are zero or negative for all three conditions.

<table>
<thead>
<tr>
<th></th>
<th>Heart Attack Readmissions</th>
<th>Heart Failure Readmissions</th>
<th>Pneumonia Readmissions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heart Attack</strong></td>
<td>0.00</td>
<td>-0.02</td>
<td>-0.02</td>
</tr>
<tr>
<td>Mortality Heart Attack</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Heart Failure</strong></td>
<td>-0.23*</td>
<td>-0.19*</td>
<td>-0.19*</td>
</tr>
<tr>
<td>Mortality Heart Failure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pneumonia</strong></td>
<td>-0.09*</td>
<td>-0.07*</td>
<td>-0.01</td>
</tr>
<tr>
<td>Mortality Pneumonia</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*=significant at the <0.01 level

Numbers shown are correlations between mortality and readmission rates. From MedPAC Report to the Congress, June 2013.
• Another way of looking at the same phenomenon: hospitals with low mortality have similar or higher readmission rates than those with high mortality.
Why might we see this relationship?

- Competing hypotheses...
- Hospitals with low mortality rates are the ones that save very ill patients
  - These patients are then more likely to be readmitted
- Hospitals with low mortality rates are the ones that admit the least sick patients
  - The “propensity to admit” explains both low mortality rates and high readmission rates
- Readmissions and mortality measure different things
  - Relationship seen is confounding by race, or outpatient care
What do changes over time tell us?

- Over time, mortality has fallen for heart failure while readmission rates have risen

Numbers shown are trends over time for patients with heart failure. From Bueno et al, JAMA 2010.
What do changes over time tell us?

- Length of stay is also falling, and the number of patients discharged to nursing homes is rising.

Numbers shown are trends over time for patients with heart failure. From Bueno et al, JAMA 2010.
Why might we see these relationships?

- We are keeping the sickest patients alive longer
  - And getting them out of the hospital faster...
- More of these patients need post-acute care
- More of these patients are readmitted

- Is this a win or a loss?
Potential Solutions: All-Condition Measure

- Instead of focusing on individual conditions, broaden measure to include all discharges

- **Pros:**
  - Less negative correlation between readmissions and mortality rates (-0.02)
  - Other benefits like higher sample size for small hospitals

- **Cons:**
  - Doesn’t solve, and may exacerbate, the problem if this pattern exists for other conditions as well and if case mix differs across hospitals
Potential Solutions: Risk Adjustment

- Improve risk adjustment model by adding variables such as prior hospitalizations, clinical information

**Pros:**
- Recognizes differences across hospitals in medical complexity of patient population for any condition
- Could be an iterative process

**Cons:**
- Very difficult to do well
- Resource-intensive if anything beyond billing data added
Potential Solutions: Combination Measure

• Create a combination measure that includes both death and readmission as outcomes

• Pros:
  ○ Deals with competing risks explicitly
  ○ Clinically straightforward for patients and policymakers

• Cons:
  ○ May value death and readmission equally, while patients may feel they are not equal in importance
Potential Solutions: Different Measure

- Move away from thinking about readmissions and instead focus on days alive out of hospital

- Pros:
  - More patient-centered
  - Applies measure to all patients, not just those that have been in the hospital in a certain time frame

- Cons:
  - Requires a population-based denominator
  - Requires much more shared accountability across inpatient and outpatient settings
  - Requires new legislation
Conclusions

- The HRRP has caused a shift in thinking about readmissions
- The relationship between readmission and mortality is complex and incompletely understood
  - Better data on mechanism could help influence choice of fix
- There are many potential solutions
  - Some feasible in the short term, some more long-term ideas
Thank You!