Can Information Technology Transform Health Care?

The RAND Study of Potential Costs and Benefits of Electronic Medical Record Systems

Richard Hillestad, Ph.D.
RAND
September 16, 2005
Bottom Line

- At 90% adoption, potential EMR-S-enabled savings high (~$77B/yr health care efficiency savings)

- Costs are modest relative to savings (~$10B/yr)

- Potential health and safety benefits also large and could double the savings

- Government should act now
What Is an Electronic Medical Record System?

• EMR -- replaces the paper medical record

• EMR-S adds functions:
  – Clinical decision support
  – Patient tracking and reminders
  – Personal health records
  – Computerized physician order entry
  – Regional health information networks

• EMR, in some form, now in only 20-25% of hospitals and 10-15% of physicians’ offices
What If EMR-S Transformed Health Care as IT Has Done in Telecoms?

Cumulative Savings of $5.2–$12.2 Trillion over 15 Years

- 1.5% annual productivity improvement from IT (like retail industry)
- 4% annual productivity improvement from IT (1/2 of telecom industry increase)

Annual health expenditures (trillions)

Year


Official CMS projection of healthcare cost growth

4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0

Official CMS projection of healthcare cost growth

1.5% annual productivity improvement from IT (like retail industry)

4% annual productivity improvement from IT (1/2 of telecom industry increase)
The RAND Study of EMR-S

• Very limited published evidence of EMR-S benefits

• RAND study developed computer models to estimate potential benefits, assuming
  – Widespread adoption (90%)
  – Interoperability (across providers)
  – Related health care process changes, for example:
    • Team care for chronic disease
    • Restructured hospital and physician office workflow
Major Conclusions

• At 90% adoption, potential EMR-S enabled savings high (~$77B/yr health care efficiency savings)
Data Suggest Potential Efficiency Savings of ~$77B/yr After 90% Adoption

- Inpatient: $57.1B/yr
- Outpatient: $20.4B/yr

Efficiency
- Length of stay
- Nursing administrative time
- Medical records administration
- Drug utilization
- Lab and radiology utilization
- Chart administration
Major Conclusions

• At 90% adoption, potential EMR-S enabled savings high (~$77B/yr health care efficiency savings)

• Costs are modest relative to savings (~$10B/yr)
Costs Are Modest Compared to Potential Savings

<table>
<thead>
<tr>
<th></th>
<th>Total cost (15 years)</th>
<th>Total savings (15 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td>97.4</td>
<td>468.5</td>
</tr>
<tr>
<td>Physician offices</td>
<td>17.2</td>
<td>159.0</td>
</tr>
<tr>
<td>Connectivity</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$120.6B</strong></td>
<td><strong>$627.5B</strong></td>
</tr>
</tbody>
</table>
**Major Conclusions**

- At 90% adoption, potential HIT-enabled savings high (~$77B/yr health care efficiency savings)

- Costs are modest relative to savings (~$10B/yr)

- Potential safety and health benefits also large and could double the savings
  - Safety benefits include:
    - Fewer errors from illegible handwriting
    - Reduced adverse events from dosage, drug-drug interaction, allergies
Significant Savings from Increased Safety -- Medicare Share ~40%

Adverse Drug Events Avoided in Physician Offices

- Millions of events
- $3.1B
- 65+
- 0–64

Adverse Drug Events Avoided in Hospitals

- Thousands of events
- $0.9B
- 65+
- 0–64

Solo practice

Total

All hospitals
Major Conclusions

• At 90% adoption, potential HIT-enabled savings high (~$77B/yr health care efficiency savings

• Costs are modest relative to savings (~$10B/yr)

• Potential safety and health benefits also large and could double the savings
  – Health benefits include:
    • Better delivery of preventive care
    • Better management of chronic diseases
**EMR-S Can Promote Prevention with Guidelines, Reminders, and Outreach**

<table>
<thead>
<tr>
<th>Target population</th>
<th>% Population not now compliant</th>
<th>Cost/yr for 100% compliance</th>
<th>Health benefits with 100% compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast cancer screening</td>
<td>Women 40 and older</td>
<td>30%</td>
<td>$1.5B</td>
</tr>
<tr>
<td>Colorectal cancer screening</td>
<td>50 and older</td>
<td>66%</td>
<td>$4.0B</td>
</tr>
<tr>
<td>Influenza vaccination</td>
<td>65 and older</td>
<td>37%</td>
<td>$0.2B</td>
</tr>
<tr>
<td>Pneumococcal vaccination</td>
<td>65 and older</td>
<td>47%</td>
<td>−$0.1B</td>
</tr>
</tbody>
</table>

- **50K cancers detected early, 4K fewer deaths/yr**
- **23.5K fewer deaths**
- **7.5K fewer deaths/yr**
- **21K fewer deaths/yr**
**Chronic Disease Management**

**Better Disease Management Can Reduce Acute Episodes**

Upper Bound:
Assumes 100% participation in management of emphysema, asthma, CHF, and diabetes.

Reduced ER visits and hospital stays

<table>
<thead>
<tr>
<th>% reduction</th>
<th>Inpatient stays</th>
<th>ER visits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14</td>
<td>7</td>
</tr>
</tbody>
</table>

RAND
Chronic Disease Management

Net Result Is a Savings but Hospitals Lose Revenue

Revenue and Savings

<table>
<thead>
<tr>
<th>Total savings</th>
<th>Physician revenue</th>
<th>Drug costs</th>
<th>Hospital revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>$B$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

RAND
Major Conclusions

• At 90% adoption, potential HIT-enabled savings high (~$77B/yr health care efficiency savings

• Costs are modest relative to savings (~$10B/yr)

• Potential health and safety benefits also large and could double the savings

• Government should act now
Why Should the Government Intervene?

• *EMR-S enabled changes could moderate unsustainable health care cost growth and improve quality*

• *The market is not working well*

• *The government is the largest employer and health care payer*

• *Incentives will be most effective now*
  – Opportunity to steer adoption toward standardized, interoperable systems
  – High leverage from pay-for-use incentives