Comparative effectiveness

What is it and why is everyone talking about it?

EFFICACY: how well something works in an ideal or controlled setting, such as a clinical trial

EFFECTIVENESS: how well something works under real-world conditions
How did we get to “comparative effectiveness”?

- Early studies of health care delivery exploring geographic variations in care
- Studies looking at the quality of care
- Studies examining accessibility of services
- The relentless adoption of new, often more expensive treatments without evidence that they were improving care
Prior iterations of similar notions

- The outcomes movement
- Reducing geographic variations
- Measuring and assuring quality
- Eradicating medical errors
- Eliminating health disparities
- Promoting cost-effectiveness in health care
For sizable proportions of measures, minorities and the poor receive lower quality care compared to Whites and those with high incomes respectively.

Hispanics and low income individuals receive lower quality care on about 60% of core measures.

Source: Agency for Healthcare Research and Quality, “2008 National Healthcare Disparities Report” (March 09)
Geographic variation in commercial HEDIS® cardiac care performance

Commercial HEDIS® rates for diabetes care are higher in the New England and the Middle Atlantic. The quality scores are lowest in the South Central region.

Source: NCQA’s “State of Health Care Quality 2009”
Percentage of patients who receive recommended care

Overall, people receive 55% of recommended care.

All demographic groups, not just minorities or the poor, are at risk for poor quality health care.

The differences among socio-demographic subgroups in quality of health care are small in comparison to the 42% - 45% gap between what everyone needs and the care everyone is receiving.

Health plan performance variation

There is substantial variation in care between the national average and the 90th percentile of health plans and between plans at the 90th percentile and recommended best practices.

- On average, commercial health plan enrollees with diabetes received the recommended eye tests from their health plan 57% of the time.
- On average, blood pressure is under control for 63% of cardiac patients in commercial health plans nationally.
- Improvements were made in all categories since 2007.

Source: NCQA’s “State of Health Care Quality 2009”
Consequences of health plan performance variation

Results Assuming All Care Provided at the Level of the Top 10% of Health Plans

<table>
<thead>
<tr>
<th>Selected measures</th>
<th>Avoidable Deaths</th>
<th>Avoidable Hospital Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood pressure control</td>
<td>14,000-34,000</td>
<td>$425 million - $1.8 billion</td>
</tr>
<tr>
<td>Smoking Cessation</td>
<td>7,000-11,000</td>
<td>$712 - $783 million</td>
</tr>
<tr>
<td>HbA1c control - diabetes</td>
<td>3,100-12,000</td>
<td>$1.3 - $1.7 billion</td>
</tr>
<tr>
<td>Breast Cancer Screening</td>
<td>500 - 1,900</td>
<td>$212 - $232 million</td>
</tr>
<tr>
<td>All Selected Quality Measures (Top 11)</td>
<td>38,000-88,900</td>
<td>$1.9 - $3.5 billion</td>
</tr>
</tbody>
</table>

Source: NCQA’s “State of Health Care Quality 2009”
Risk adjusted rates of adverse events/complications of care per 10,000 patients

Compared to White elderly patients:
- Minority patients were more likely to acquire infections in the hospital.
- Black patients were more likely to suffer blood clots in their legs or lungs following surgery.
- Black and Hispanic patients were more likely to develop pressure sores.

Higher Medicare spending not associated with quality

Adjusted Medicare spending data shows an inverse correlation ($r = 0.65$) between Medicare spending per enrollee and state quality rankings.

Source: Cooper, Richard A. “States With More Health Care Spending Have Better Quality Health Care: Lessons About Medicare” *Health Affairs*, Jan/Feb2009  Vol. 28 Issue 1, p103-w115
Non-Medicare spending associated with better quality

Unlike the Medicare spending trend, non-Medicare spending per capita has a positive association with states’ quality ranks ($r = 0.62$)

Source: Cooper, Richard A. “States With More Health Care Spending Have Better Quality Health Care: Lessons About Medicare” *Health Affairs*, Jan/Feb2009 Vol. 28 Issue 1, p103-w115
Regional variation in spending by state is associated with variation in quality:

- **Best Quality**: New England, Upper Midwest, and Northwest.
- **Worst Quality**: Southern Tier states, extending from GA and FL across to TX and OK, and in CA.

Lowest Medicare spending was found in those states with high quality and high non-Medicare spending; highest Medicare spending was found in those regions with lower quality and lower non-Medicare spending (California, Southern Tier States).

Source: Cooper, Richard A. “States With More Health Care Spending Have Better Quality Health Care: Lessons About Medicare” *Health Affairs*, Jan/Feb2009 Vol. 28 Issue 1, p103-w115
Supply-induced demand

U.S. states with higher primary care/population ratios have reduced costs and better quality:

Source: Medicare claims data; and Area Resource File, 2003
Total Spending on Health Care as a Percentage of Gross Domestic Product, 1965 to 2005 in USA
A general trend in wealthy countries, perhaps more so in the US
Why might growth rate and fraction of GDP be higher in the US?

<table>
<thead>
<tr>
<th>Country</th>
<th>Per Capita (2005 dollars)</th>
<th>As a Percentage of GDP</th>
<th>Average Real Annual Growth (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1975 to 1985</td>
</tr>
<tr>
<td>United States a</td>
<td>6,401</td>
<td>15.3</td>
<td>4.9</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>5,563</td>
<td>7.9</td>
<td>3.9</td>
</tr>
<tr>
<td>Norway</td>
<td>4,364</td>
<td>9.1</td>
<td>4.6</td>
</tr>
<tr>
<td>Switzerland</td>
<td>4,177</td>
<td>11.6</td>
<td>2.3</td>
</tr>
<tr>
<td>Austria</td>
<td>3,519</td>
<td>10.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Iceland</td>
<td>3,443</td>
<td>9.5</td>
<td>5.4</td>
</tr>
<tr>
<td>Belgium</td>
<td>3,389</td>
<td>10.3</td>
<td>4.1</td>
</tr>
<tr>
<td>France</td>
<td>3,374</td>
<td>11.1</td>
<td>4.2</td>
</tr>
<tr>
<td>Canada</td>
<td>3,326</td>
<td>9.8</td>
<td>3.5</td>
</tr>
<tr>
<td>Germany</td>
<td>3,287</td>
<td>10.7</td>
<td>2.8</td>
</tr>
<tr>
<td>Australia</td>
<td>3,218 b</td>
<td>9.5 b</td>
<td>1.5</td>
</tr>
<tr>
<td>Netherlands</td>
<td>3,183 b</td>
<td>9.2 b</td>
<td>1.4</td>
</tr>
<tr>
<td>Denmark</td>
<td>3,108</td>
<td>9.1</td>
<td>2.2</td>
</tr>
<tr>
<td>Sweden</td>
<td>2,918</td>
<td>9.1</td>
<td>2.5</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2,724</td>
<td>8.3</td>
<td>2.4</td>
</tr>
<tr>
<td>Italy d</td>
<td>2,532</td>
<td>8.9</td>
<td>n.a.</td>
</tr>
<tr>
<td>Japan</td>
<td>2,426 b</td>
<td>8.0 b</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Source: Congressional Budget Office based on data from the Organisation for Economic Co-operation and Development.
Is high growth rate and amt. spent on health as fraction of GDP a problem?

Crowds out other spending
Causes financial hardship – ~60% of personal bankruptcies in US due to medical bills
(Am J Med 142, 721 (2009))
Do consumers make free, informed choices of how much to spend on health care?
How might their decisions be distorted?
Factors distorting markets in health care

Knowledge asymmetry - providers know more than consum. can be a problem if they have different interests

Conflicts of interest (“agent” problem) – physicians, hospitals, insurers, pts. don’t have same interests (e.g. why do physicians charge uninsured ~2-5x more than insured patients)

Adverse selection (“cherry picking”) - insurers try to select healthier pts., don’t cover pre-existing conditions

Moral Hazard – insureds over-consume because someone else pays
Why are health care costs increasing?


"In short, our health-care system, formerly a social service that was the responsibility of dedicated professionals and not-for-profit facilities, has become a vast, profit-oriented industry. [Were the good old days really that good?] The revenue of this industry constitutes the country's health-care costs. As in any other industry, providers constantly strive to increase their profitable sales, but unlike other industries, consumers exercise little control over their consumption of products and services. It should not be surprising that such a system is afflicted not only with relentless inflation but also with neglect of the needs of the uninsured and with failure to promote the use of valuable but unprofitable health services."
Does incr. spending -> health gains?  

Yes, by some measures

death rate from cor. dis. has declined ~30% in 15 years acc. to AHA
dialysis pts. die without it

how much disability is relieved by surg., at what cost; how much could be elim. with weight loss?
Does increased spending -> health gains?

No, by other measures compare health outcomes in countries that spend different amounts on health

<table>
<thead>
<tr>
<th>Infant mortality (deaths in 1st year per 1000 live births)</th>
<th>US</th>
<th>UK</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>% of GDP spent on health (2005)</td>
<td>15</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>
Life expectancy
Japan vs US

Average =? quality measure

Variance =? fairness measure

These comparisons are affected by cultural/environmental differences, e.g. diet, but is this reason to discount the results?

8 % of GDP spent on health

15 % of GDP spent on health
More difficult question is whether we get adequate value for extra money spent on health

While it is unambiguously preferable to have better health or a higher level of responsiveness [to people’s needs], it is not always better to spend more on health because at high levels of expenditure there may be little additional health gain from more resources. WHO report on Health Systems 2000


How can we answer “cost-effectiveness” questions? Funding for cost-effectiveness studies is part of health care reform act of 2010
Examples of cost-effectiveness estimates

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Cost per QALY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorcycle helmets, seat belts, immunizations</td>
<td>Cost saving</td>
</tr>
<tr>
<td>Anti-depressants for people with major depression</td>
<td>$1000</td>
</tr>
<tr>
<td>Hypertension treatment in older men and women</td>
<td>$1000–$3000</td>
</tr>
<tr>
<td>Pap smear screening every 4 years (vs none)</td>
<td>$16,000</td>
</tr>
<tr>
<td>Driver’s side airbag (vs none)</td>
<td>$27,000</td>
</tr>
<tr>
<td>Chemo in 75 yo woman with breast CA (vs none)</td>
<td>$58,000</td>
</tr>
<tr>
<td>Dialysis in seriously ill patients hospitalized with renal failure (vs none)</td>
<td>$140,000</td>
</tr>
<tr>
<td>Screening and treatment for HIV in low risk populations</td>
<td>$1,500,000</td>
</tr>
</tbody>
</table>

What is a “quality-adjusted life year” saved?

Is the quality adjustment problematic? Does this matter if diff. are large?

Richards-Kortum, ch. 5
Definition of comparative effectiveness research from the Institute of Medicine

• “Comparative effectiveness research is the generation and synthesis of evidence that compares the benefits and harms of alternative methods to prevent, diagnose, treat, and monitor a clinical condition or to improve the delivery of care. The purpose of CER is to assist consumers, clinicians, purchasers, and policy makers to make informed decisions that will improve health care at both the individual and population levels”
Parsing the definition

• “Generation and synthesis of evidence”:
  – Implies both original research and systematic reviews

• “Alternative methods”:
  Implies making head-to-head comparisons of different approaches in study populations typical of daily practice
Parsing the definition (2)

- “To make informed decisions”
  - Implies a focus on data that helps to decide between alternatives

- “To treat, diagnose, monitor, a clinical condition”
  - Implies the analyses of the full range of interventions used for individual patients
Parsing the definition (3)

- “…or to improve the delivery of health care”
  - Implies the analyses of the availability and the delivery of care and its adequacy at the level of individual patients, providers, and health systems

- “at both the individual and population levels”
  - Same point
Pitfalls and chasms

• The addiction of the population to care
• The vested interests of those who profit from the current arrangements
  – Specialists, manufacturers, insurers, hospitals
• Political expediency
  – “socialized medicine”
  – “death panels”
  – “entitlement”