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Predicting Key Healthcare Outcomes

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Risk adjustment is needed to make health care data informative

- Which treatment costs more?
- Can we identify “quality” through patient outcomes?
  - After a heart attack: 30-day or 1-year survival rates
  - Pain levels, level of physical functioning, or health-related quality of life at 1 year for low back pain (e.g., for patients receiving surgery vs. chiropractic)?
  - Do patients with diabetes understand what their meds are for and how to take them? Do they take them?
  - Are patients [who experienced treatment X] happy with their care?
- Which treatments/institutions/systems/doctors *add* the most value?
Patients are not “well-controlled animal models.” We don’t randomly assign them to treatments/providers.
Risk adjustment goal: To enable useful comparisons in health care

In health care, both a patient’s *initial conditions* (severity of the main problem/presence of comorbidities/frailty…) *and quality of care* matter

Performance measures should address patients’ different “starting positions”
Example: Mortality rates for open heart surgery

- For uncomplicated cases it would be shocking if a facility has mortality within 30 days as high as 2%. For complex patients (often, those who have the most to gain from CABG), mortality might be as high as 50%.

- We can measure many factors that make a patient sicker and quantify their effects on that patient’s expected outcome.

- Key principle: It is fair and useful to compare actual vs. expected outcomes for groups of patients.
Open heart surgery in Boston

Mass General Hospital typically takes the most complicated cases; Mount Auburn Hospital, the simplest

- The same doctors admit lower-risk CABG patients to Mount Auburn and more complicated ones to MGH
- Asking which hospital is the better place to go for CABG surgery is fairly meaningless
- We can ask if a hospital does better (worse) than expected with the kinds of patients that it treats
Open heart surgery (cont’d)

Asking if Hospital A is better than Hospital B only makes sense if there is a lot of overlap in the kinds of patients they see.

With little overlap, no technical adjustment can tell which is better.

- That would be like asking: Is Usain Bolt a better runner than Michael Phelps is a swimmer?
- Medicare’s “Hospital Compare” compares each hospital to its expected outcome.
- Comes with an (easily missed) warning: don’t compare non-comparables!
Comparing hospitals

Mount Auburn and MGH may both be doing well

- Each may get excellent results with the kinds of patients it sees
- BUT the measures don’t tell you, say, how a complicated patient would fare at Mount Auburn

In looking at raw (unadjusted) outcomes, Mount Auburn will do better, because it starts with lower-risk cases

After risk adjustment, either could look better …
Potential confounders

- What is the principal question we want to answer?
- What is the stuff we try to “not get fooled by”?
  - Factors that might fool us: “potential confounders”
  - These include: age & sex, severity & comorbidity
- What kinds of things should we not “adjust for”?
  - A surgical mishap (which “explains” the bad outcome, but itself reflects poor quality)
- What factors are controversial (as risk adjusters)?
  - Socio-economic factors, race
A system administrator might be interested in questions like:
- Do hospitals that are in poor financial shape have worse outcomes? And, if so,
- Do particular financially-stressed hospitals perform better or worse than similarly-situated hospitals?

However, a patient considering elective surgery at a nearby hospital wants to know whether that hospital gets worse- or better-than-expected outcomes *with patients like her*

Different questions require different models and different reporting formats
If hospitals in financial distress typically have worse outcomes, should we penalize hospitals that do well given their finances, even though they do less well than better-financed hospitals?

- Will taking money away improve their performance?

Same question for hospitals that treat many poor people, who typically have worse outcomes.

- We could measure and risk adjust for ‘poverty’ or not
- This is a hot controversy (google: nqf risk adjustment)

Bottom Line: How you adjust for risk really matters!
Questions?

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