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Predicting Key Healthcare Outcomes

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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. chiropracty)?
  - 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.
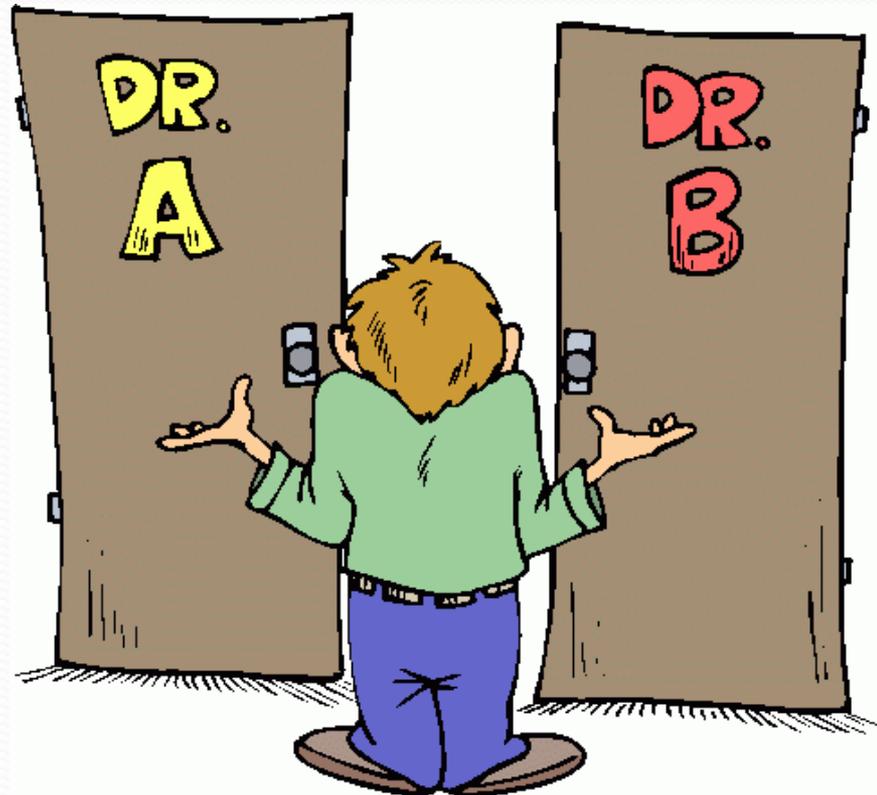
Risk adjustment goal: To enable useful comparisons in health care

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"
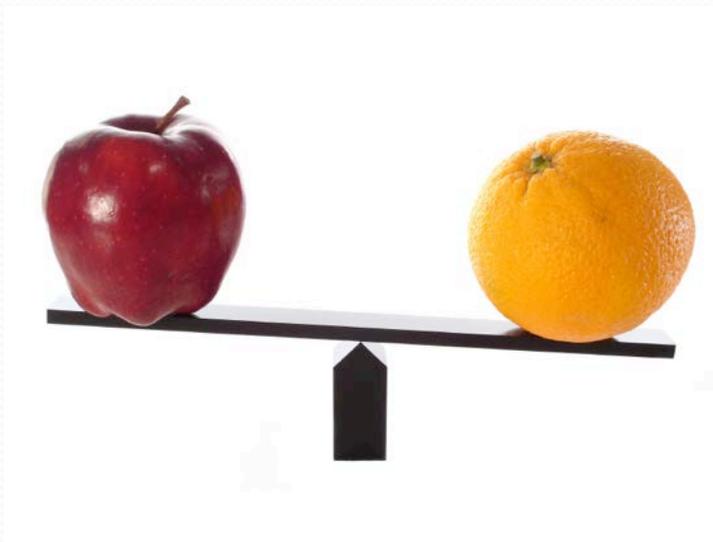
Example: Mortality rates for open heart surgery

- 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
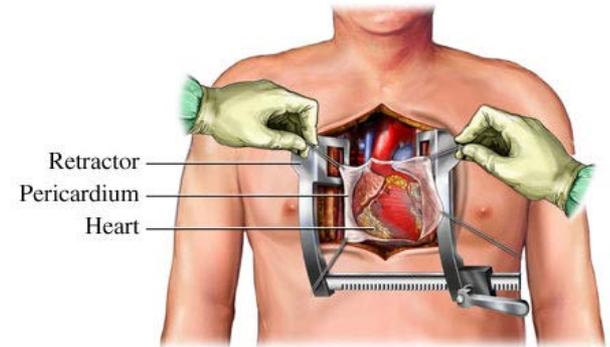
- The same doctors admit lower-risk CABG patients to Mount Auburn and more complicated ones to MGH

- 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
- Comes with an (easily missed) warning: don't compare non-comparables!
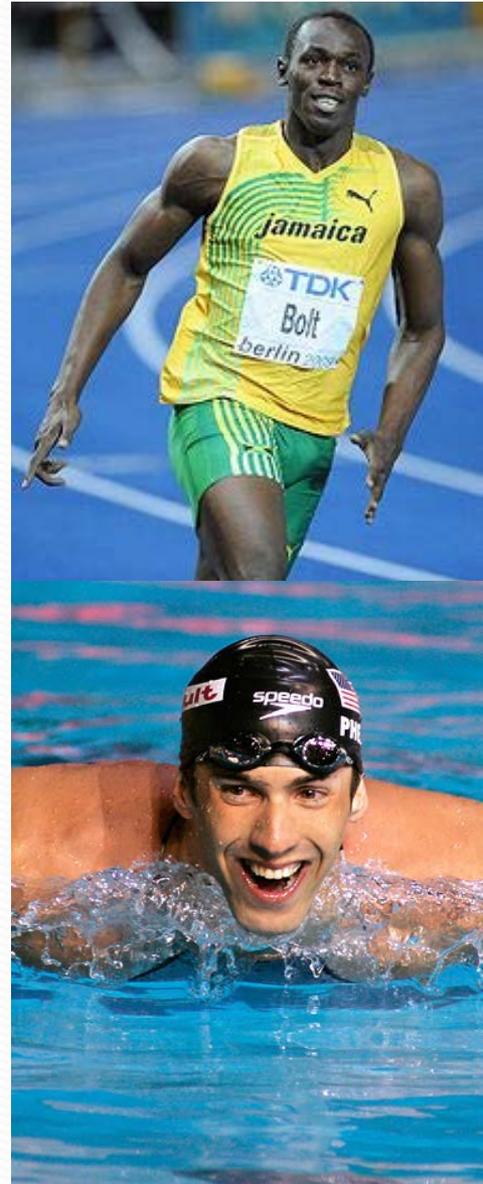
Comparing hospitals

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
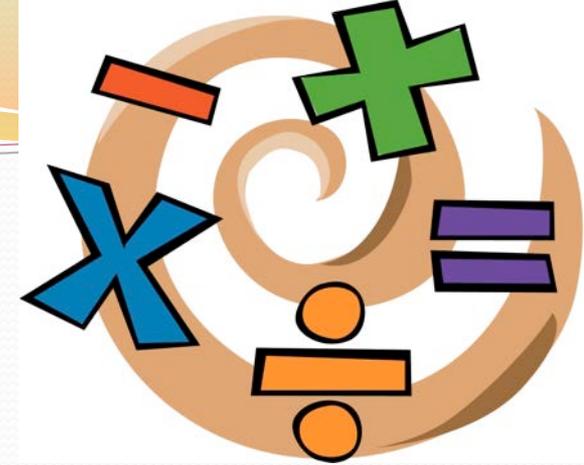
- What is the principal question we want to answer?
- What is the stuff we try to "not get fooled by"?
  - Factors that might fool us: "potential confounders"
  - These include: age & sex, severity & comorbidity
- What kinds of things should we *not* "adjust for"?
  - A surgical mishap (which "explains" the bad outcome, but itself reflects poor quality)
- What factors are controversial (as risk adjusters)?
  - Socio-economic factors, race

System vs. patient perspectives

- 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

Health policy perspective

- 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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