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# Payment Policy Based on Measurement of Health Care Spending and Outcomes

Marco D. Huesch, MBBS, PhD

**M**EASURING VARIATION IN SPENDING AND OUTCOMES is a critical component of reforming physician and hospital payment policy. Analysis of area and hospital variations has a storied history<sup>1</sup> and is increasingly common in media reports.<sup>2</sup> If higher spending does not lead to better outcomes, health care could be delivered far more cost-effectively. But if approaches to measuring costs and outcomes are flawed, reductions in spending might yield worse outcomes.

The 2 perspectives—look back and look forward—in measuring hospital outcomes and hospital resource use<sup>3-5</sup> have conceptual shortcomings in assessing hospital performance. Both approaches also distract from the original population-based perspective first proposed in early work by the Dartmouth Atlas founder and central to the related analyses.<sup>1</sup> Considering this community-based perspective in conjunction with hospital-based perspectives can avoid biases in the measurement of health system performance and thus better inform payment policy.

The discussion on measurement methods matters for policy because different techniques may lead to divergent findings. The look back analyses have consistently demonstrated that spending variations are not correlated with outcomes.<sup>6</sup> A variant of the Dartmouth Atlas technique has found instead that higher end of life treatment intensity in Pennsylvania was associated with small mortality benefits.<sup>7</sup> A major look forward analysis showed that teaching hospitals in California with higher resource use had lower heart failure mortality.<sup>5</sup> Dartmouth investigators counter that using the look forward approach for all Medicare inpatients with a diagnosis of acute myocardial infarction shows that higher resource use hospitals had modestly worse 1-year mortality.<sup>4</sup>

Both the look back and the look forward perspectives count costs and outcomes in different ways for different patients, as patients and their physicians decide on more conservative care in the community or more intensive care in the hospital.

The Dartmouth Atlas hospital-specific end-of-life measures start with a series of decedents and count expenditures for them, whether treated conservatively outside of hospitals or intensively in hospitals.<sup>3,6</sup> This approach excludes survivors, who benefited from resources used in their treatment, but includes conservatively treated decedents.<sup>3,5</sup> Because the Dartmouth Atlas considers only fee-for-service Medicare decedents, spend-

ing among non-Medicare patients who did not die during the period may not correlate well with measured spending.<sup>5</sup> The different look forward method has the opposite features. It starts with an index admission and measures outcomes for those patients who lived or died.<sup>5</sup> It misses patients treated outside the hospital when their cohort peers were admitted, but includes survivors of the index admission (FIGURE).

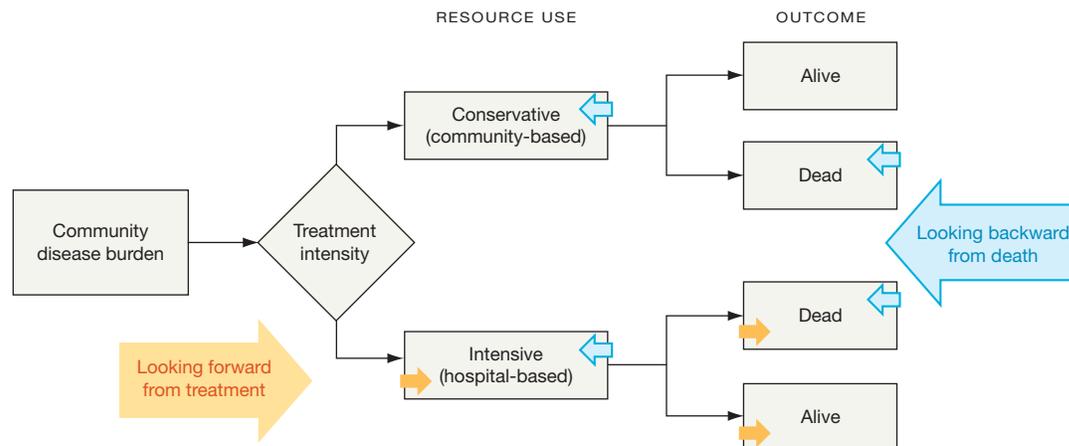
These differences matter. The sample studied retrospectively is technically conditioned on an endogenous outcome (death). The sample studied prospectively is conditioned on a potentially endogenous event (the decision to admit). In consequence, neither approach may allow unbiased inferences of hospital performance; separately, neither may permit accurate inferences of community performance.

Hospital performance measurement will be most biased if the decision to admit varies systematically across hospitals and regions. Such variation may reflect greater illness levels in the population. However, higher utilization also may be due to a lower threshold for admission,<sup>8</sup> driven for example by higher per capita supply of specialists and hospital beds.<sup>1,6,8</sup> In such hospitals, sufficient slack capacity allows physicians to work “down an appropriateness curve” in their admission decisions. Once patients who are very sick have been admitted, such hospitals may tend to admit patients in better general health with an expected good response to treatment. Such selection means these admitted patients are more likely to do well and consume fewer resources on average. In another hospital, a higher threshold for admission would lead to the opposite phenomenon. Selection now makes it more likely that those patients who are admitted tend to do poorly and consume more costly care.

As a result, the first hospital appears to be a more careful steward of resources and a better performer than the other hospital. Looking forward sees lower costs and better outcomes after an index admission, because of better selection of hospitalized patients. Looking back sees lower end-of-life spending for all local decedents, because proportionately more decedents did not consume hospital-based intensive care or other expensive services. Hospitals do appear to be ranked similarly on spending regardless of which approach is used.<sup>4</sup>

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**Figure.** Different Perspectives to Measuring Health Care Spending and Outcomes

Simply considering the average nonhospitalized patient cannot correct for such biased measures of hospital performance. Suppose the catchment areas of both hospitals were identical as to underlying health status and incident diagnoses, and that the hospitals classified patients based on risk. Each time the hospital with the lower admission threshold admits an additional patient, it draws the sickest individual from the pool of nonhospitalized patients in its catchment area. This inpatient is now the least sick among the hospitalized patients and the inpatient average improves. Paradoxically, the withdrawal of the relatively sickest individual also improves average sickness among the nonhospitalized patient group.<sup>8</sup> This Will Rogers phenomenon renders data on the average nonhospitalized patient less informative.<sup>9</sup>

Community performance measurement seeks an answer to a different, but equally important question as hospital performance measurement.<sup>1</sup> Policy makers must consider all individuals with a particular disease—those who lived and those who died, and those who received hospital treatment and those who did not. A community level or population-based perspective considers the expenditures and outcomes in an area, conditioned on individual and area characteristics. However, both hospital performance measurement approaches currently miss patients who did not receive an initial hospital-based intensive treatment yet did survive over the study period (Figure, alive outcome). Depending on what costs were incurred and what outcomes were attained in the community by these individuals, one or both of the hospital performance perspectives may fail to provide a consistent, unbiased view of community performance.

Difficulties in collecting and compiling data to be used in accurate hospital and population-level perspectives must be weighed against the fragility of policy driven by an overemphasis on just one perspective. Going forward, investments in health information technology and the use of all-

payer databases may help by yielding data on currently unobserved inpatient characteristics. This can help to control for selection biases in hospital-level perspectives. Additionally, emphasizing a complementary community-based view can help to control for differences in costs and outcomes between hospital and outpatient care, and between patients treated intensively and conservatively. By looking outwards in this way, a more robust payment policy could build on and extend the logic of hospital-initiated episodes of care and accountable care organizations.<sup>3,4,10</sup>

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