



Caveats to Consider When Calculating Healthcare Value

Concerns about the impact of healthcare costs on the economy and the exploration of new reimbursement models have colluded to encourage a transition “from volume to value” in US healthcare. “Volume” meant that healthcare providers received a payment for providing a particular service, regardless of outcomes or need; healthcare reimbursement has been volume-based for 50 years.

Value, which explicitly incorporates outcomes, is broadly defined as outcomes divided by costs:

$$\text{Value} = \frac{\text{Patient outcomes}}{\text{Costs expended to obtain those outcomes}}$$

Patient outcomes include aspects of the healthcare delivery process that affect patients (eg, satisfaction with care) and clinical and functional outcomes (eg, whether a procedure was completed without complications and whether it worked to improve a patient’s functional level, respectively). Need for the healthcare delivered is implicit in the equation, because value-based care removes incentives to provide care that is not anticipated to have a measureable positive impact on patient outcomes. Costs are defined as all costs—including opportunity costs—incurred in the healthcare delivery process. There are 2 ways to improve value: improve outcomes measures at a faster rate than costs increase or decrease outcomes at a slower rate than costs decrease.

Although measurement challenges inherent in this equation have been articulated by Snyder et al,¹ the value equation, despite its apparent simplicity, is dogged by 3 additional questions that need to be answered before its widespread use and interpretation.

Value for whom? Because of the way healthcare is funded in the United States, it is important to define the beneficiary of value creation.² There are 3 candidates with quite different perspectives and interests: the society as a whole,

insurers, and patients who are receiving the benefits (Table 1). Society has a long-term horizon (across multiple generations); insurers have a short-term horizon (the time that the patient is insured); and patients have medium-term horizons (their lifetimes). Consider heart disease, the most costly and deadliest disease in the United States. To maximize healthcare value for society would require transitioning efforts to combat heart disease from healthcare delivery to preventive healthcare services (which, in aggregate, consume ~3% of the healthcare dollar, currently). Value for insurers might be increased by maintaining current outcomes and negotiating with healthcare providers for lower per-unit prices or lowering their own costs by transferring costs directly to patients. Finally, improving healthcare value for patients requires provision of only the care the patient wants and needs in a cost-effective manner. Because of third-party payment, most patients likely focus on the immediate out-of-pocket costs of care, which are a fraction of the overall costs of care; therefore, to curtail overall healthcare costs, methods should be used to curtail the possibility that patients will pursue low-value care because it is inexpensive, for them.³

Value for what? Just as healthcare value requires an object, it requires a subject. There are a variety of segments of healthcare delivery for which value can be calculated. For instance, is healthcare value being assessed for the hospitalization component of a single hip replacement surgery? Is it being assessed for the 30 days after that surgery as well? Or is it to be calculated for treatment of hip osteoarthritis, for which hip replacement might be a relatively infrequent event? These distinctions matter because the outcomes of interest, as well as the mechanisms that can be used to enhance value, differ, depending on which components of healthcare delivery are included in the value equation. If value is limited to hospitalization, outcomes can be improved by adhering to best practice guidelines and providing care in high-volume hospitals; the denominator can be improved by standardizing which implants are used and by moving the patient quickly to a rehabilitation hospital for follow-up care. When considering a care package that includes 30 days of follow-up care, limiting patient populations to those at low risk for getting complications might improve the numerator; substituting inpatient rehabilitation with other methods of rehabilitation and increasing the

Funding: None.

Conflict of Interest: None.

Authorship: Both authors had access to the data and played a role in writing this manuscript.

Requests for reprints should be addressed to William B. Weeks, MD, MBA, The Dartmouth Institute for Health Policy and Clinical Practice, 35 Centerra Parkway, Room 208, Lebanon, NH 03766.

E-mail address: wbw@dartmouth.edu

Table 1 Defining Healthcare Value from Three Perspectives

	Perspective		
	Society	Insurer	Patient
Time Horizon	Very Long Term	Short Term	Medium Term
How to improve the numerator	Invest in preventive care	Limit care to high-performance networks	Get more care; use higher performance care
How to improve the denominator	Replace acute care capacity with preventive interventions	Negotiate with providers; limit benefits; increase out-of-pocket costs	Reduce out-of-pocket costs; reduce opportunity costs

number of surgeries would spread the fixed costs of hospitalization across a larger denominator and reduce average costs of care. If, on the other hand, value is calculated for care of hip osteoarthritis, efforts to decrease the number of hip replacement surgeries might both reduce costs and improve outcomes (because surgical intervention always carries a higher risk of adverse outcomes).

Value, when? Despite the fact that different beneficiaries have different timelines, a common timeframe for value creation must be established to be able to compare performance of healthcare delivery systems. In general, it will be easier to manipulate and distort value calculations when shorter time periods and narrowly defined healthcare delivery components are used.⁴ It is more difficult to tinker with mortality rates as the time horizon moves from leaving the operating room, to leaving the hospital, to those occurring 30 or 365 days after discharge. On the other hand, if excessively long time periods are used, it will be difficult to capture the relationships between a particular intervention and the outcome of interest, because most such outcomes have multiple levers that can influence them, including changes in the economy and construct of the service population.

Only by measuring value creation can consumers—whether society, insurers, or patients—understand the returns of their investments in healthcare and make strategic decisions about where and when to invest additional scarce resources.⁵ But these measures need a common grounding for interpretation and comparison.

Crafting a comprehensive construct for value creation across multiple perspectives will require alignment of incentives, transparent display of all costs incurred in healthcare production, and multiple timeframes. It will be challenging work. But until common measures of value are determined, efforts to achieve the triple aim will be disjointed, due to the fact that efforts to marginally improve outcomes might be too expensive, and efforts to reduce costs might unnecessarily impair attainment of optimal outcomes.

William B. Weeks, MD, MBA^{a,b}

James N. Weinstein, DO, MS^{a,b,c}

^aThe Dartmouth Institute for Health Policy and Clinical Practice
Lebanon, NH

^bThe Geisel School of Medicine
Hanover, NH

^cDartmouth-Hitchcock Health System
Lebanon, NH

References

1. Snyder CF, Aaronson NK, Choucair AK, et al. Implementing patient-reported outcomes assessment in clinical practice: a review of the options and considerations. *Qual Life Res.* 2012;21:1305-1314.
2. Fisher ES, Shortell SM. Accountable care organizations: accountable for what, to whom, and how. *JAMA.* 2010;304:1715-1716.
3. Colla CH. Swimming against the current - what might work to reduce low-value care. *N Engl J Med.* 2014;371:1280-1283.
4. Freeman T. Using performance indicators to improve health care quality in the public sector: a review of the literature. *Health Serv Manage Res.* 2002;15:126-137.
5. Murray C, Frenk J. A framework for assessing the performance of health systems. *Bull World Health Organ.* 2000;78:717-731.