



# Data Brief

## COMMISSION ON A HIGH PERFORMANCE HEALTH SYSTEM

### Measuring Hospital Performance: The Importance of Process Measures

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THE COMMONWEALTH FUND

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**ABSTRACT:** Providers and patients agree that high-quality care is an essential component of a high performance health system, a position supported by The Commonwealth Fund’s Commission on a High Performance Health System. However, recent debate has focused on how best to define “high quality” in the hospital setting. Recent journal articles have found only a “modest relationship” between performance on Hospital Quality Alliance (HQA) process measures and short-term mortality. Despite the lack of a more robust connection, the authors of this data brief contend that these HQA measures represent actionable items that can have an impact on quality and health outcomes and identify specific activities hospitals can work on to improve performance. Developing new process measures to reduce mortality and other poor outcomes, while improving performance on the current measures, can help move the nation toward achieving higher-quality health care and a high performance health system.

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#### Introduction

While most providers and patients agree that high-quality care is an essential component of a high performing health system, there has been much recent debate regarding how to best define “high quality” in the hospital setting. Much of the discussion focuses on whether the process measures of the Hospital Quality Alliance (HQA)—a national public-private collaboration designed to encourage hospitals to voluntarily collect and report hospital quality performance information—are valuable. This data brief reviews the findings of recent studies on the HQA measures, and finds that while additional quality measures are necessary, providers should not hesitate to take action to improve performance on the current measures. The Commonwealth

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Fund’s Commission on a High Performance Health System—launched in 2005 to develop strategies to promote a health system that provides all Americans with affordable access to high-quality, safe care while maximizing efficiency—has identified high-quality care as one of the core goals of a high performing health system.<sup>1</sup>

Since 2005, the Centers for Medicare and Medicaid Services (CMS) has been publicly reporting hospital-specific HQA performance measures on processes of care. These process measures assess whether certain care processes recommended in clinical guidelines are administered, such the administration of an aspirin within 24 hours of a heart attack (Table 1). As demonstrated in the Commission’s national and state scorecards, there is wide variation on these measures across the country (Figure 1).<sup>2,3</sup>

This variation in performance indicates an opportunity for providers to improve, and also allows consumers to identify higher- and lower-performing hospitals. However, the benefit is dependent on the validity of the measures—that is, whether they truly reflect quality of care. In contrast to mortality rates, which directly measure a

**Table 1. Current Hospital Quality Alliance Process Measures**

**Heart attack**

- *Aspirin at arrival*
- *Aspirin at discharge*
- *ACE inhibitor or ARB for LVS dysfunction*
- *Beta blocker at arrival*
- *Beta blocker at discharge*
- Fibrinolytic medication within 30 minutes of arrival
- PCI received within 90 minutes of hospital arrival
- Smoking cessation advice/counseling

**Heart failure**

- *Evaluation of LVS function*
- *ACE inhibitor or ARB for LVS dysfunction*
- Discharge instructions
- Smoking cessation advice/counseling

**Pneumonia**

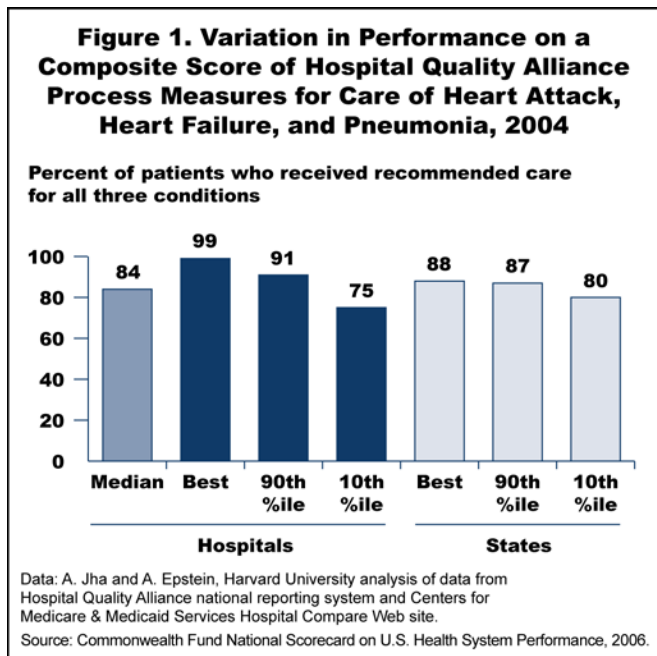
- *Oxygenation assessment*
- *Initial antibiotic timing*
- *Pneumococcal vaccination*
- Influenza vaccination
- Blood culture performed in the emergency department prior to initial antibiotic received in hospital
- Appropriate initial antibiotic selection
- Smoking cessation advice/counseling

**Surgical care improvement/  
surgical infection prevention**

- Prophylactic antibiotic received within one hour prior to surgical incision
- Prophylactic antibiotics discontinued within 24 hours after surgery end time
- Prophylactic antibiotic selection

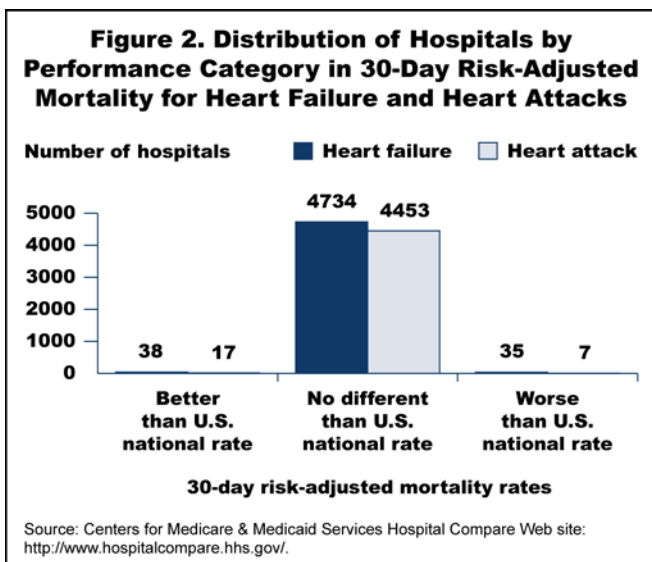
Notes: Starter set of 10 measures are italicized. ACE = angiotensin-converting enzyme; ARB = angiotensin-receptor blocker; LVS = left ventricular systolic; PCI = percutaneous coronary intervention.

Source: Centers for Medicare & Medicaid Services Hospital Compare Web site: <http://www.hospitalcompare.hhs.gov>.



vital patient outcome, it is more difficult to tell whether a process measure is an appropriate measure of quality of care.

In June 2007, CMS and HQA began publicly reporting hospital performance on 30-day risk-adjusted mortality for patients admitted for heart attacks and heart failure, publishing this information on the Medicare Hospital Compare Web site ([www.hospitalcompare.hhs.gov](http://www.hospitalcompare.hhs.gov)). The appeal of mortality rate data is clear: it is easy to understand that a patient is better off at a hospital with a low mortality rate than a high one. However, when CMS separated hospitals into performance categories of: “better than U.S. national rate” (i.e., better than the national average), “worse than U.S. national rate,” and “no different than U.S. national rate,” more than 98 percent of the hospitals fell into the “no different” category (Figure 2).



### Examining the Hospital Quality Alliance Process Measures

Although the evidence supporting the individual care processes captured in the HQA quality measures is strong, there is a need to evaluate these

measures in the field, as they become widely adopted for public reporting programs such as Hospital Compare, as well as for pay-for-performance programs. Over the past year, there have been two journal articles that examined the relationship between the HQA measures and mortality.

The most recent [article](#), written by Ashish Jha and colleagues and supported by The Commonwealth Fund, was published in *Health Affairs* in July 2007.<sup>4</sup> The article compared performance on HQA process measures for heart attack, heart failure, and pneumonia with risk-adjusted mortality for those areas. The authors created an aggregate performance score for each condition for each hospital. Examining the full range of performance by quartiles, their analysis revealed a consistent relationship of higher performance on the process measures with lower risk-adjusted mortality (Table 2).

In the *Journal of the American Medical Association*, Rachel Werner and Eric Bradlow performed a similar but more limited analysis, also using the HQA database, with findings consistent with Jha and colleagues.<sup>5</sup> Across all three conditions, the authors found that hospitals performing in the top quartile on each composite score had lower risk-adjusted mortality rates than those performing in the lowest quartile.

Two other recent studies examined the relationship between process measures and patient outcomes, using measures closely related to the HQA measures. Elizabeth Bradley and colleagues examined the relationship between heart attack process measures from the National Registry of Myocardial Infarction and mortality, and found that the measures explained a small proportion of the variation in mortality.<sup>6</sup> Gregg Fonarow and colleagues examined the relationship between the American College of Cardiology/American Heart Association heart failure performance measures and mortality, and found no relationship with in-hospital mortality risk for each individual measure. Only the use of angiotensin-converting enzyme

**Table 2. Adjusted Mortality Rates, Stratified by Hospital Performance on Hospital Quality Alliance (HQA) Summary Scores**

HQA performance	Predicted mortality rate (95% confidence interval)		
	AMI	CHF	Pneumonia
First quartile	10.0% (9.7, 10.4)	4.6% (4.4, 4.8)	7.1% (6.9, 7.4)
Second quartile	10.2% (10.0, 10.5)	4.9% (4.8, 5.1)	7.4% (7.2, 7.6)
Third quartile	10.6% (10.3, 10.9)	5.0% (4.8, 5.2)	7.5% (7.2, 7.7)
Fourth quartile	10.8% (10.5, 11.2)	5.0% (4.8, 5.1)	7.9% (7.6, 8.1)
<i>p</i> value for trend	<0.001	0.005	<0.001

Notes: Adjusted for patient age, sex, race, and the presence or absence of each of 30 comorbidities.

AMI = acute myocardial infarction; CHF = congestive heart failure.

Source: A. K. Jha, E. J. Orav, Z. Li et al., “[The Inverse Relationship Between Mortality Rates and Performance in the Hospital Quality Alliance Measures](#),” *Health Affairs*, July/Aug. 2007 26(4):1104–10.

inhibitor/angiotensin-receptor blocker for left ventricular systolic dysfunction and beta-blocker use at discharge were associated with mortality or rehospitalization at 60 to 90 days.<sup>7</sup> Fonorow found no relationship between other measures, such as discharge instructions or smoking cessation counseling (both of which are part of the current set of HQA measures), with the outcomes they studied.

### Commentary

Across these studies, it appears that performance on the initial set of HQA process measures has a modest relationship to short-term mortality, and that some individual measures included in the current HQA data set are not related to short-term mortality at all. Some of the more vocal responses to these findings are troubling, particularly the criticism that since the HQA measures do not have a large effect on mortality, they also have limited usefulness for informing consumers about quality of care, helping providers improve outcomes, or guiding payers seeking value in pay-for-performance

programs.<sup>8</sup> We believe this line of argument is misguided. Instead, we offer the following response:

- Although the relationship between the HQA measures and mortality is modest and there are clearly other factors that predict mortality, the HQA measures represent actionable items that can have an impact. As per Jha et al., if hospitals in the lowest quartile of performance had the mortality rates of the top quartile, approximately 2,200 deaths could have been avoided. Moving all hospitals to the top decile of performance would improve this rate substantially. Even though the measures included in the HQA do not represent all the process steps that might reduce mortality, they are an important foundation for reductions in mortality. Although we should continue to search for additional performance measures, we believe that these measures should continue to be used by providers, consumers, and payers.

- Demonstrating that a process measure has a relationship to reduction in short-term mortality is desirable, but it not the only criteria by which we should judge whether it is useful. For instance, Fonarow et al. found no association between mortality and indicators that measure whether heart failure patients received smoking cessation counseling. However, we would argue that these processes should nevertheless be performed. Even minimal counseling (less than three minutes) by a physician has been shown to be effective in reducing smoking,<sup>9</sup> and smoking cessation is related to risk reduction for heart disease, lung cancer, and stroke.<sup>10</sup> Decreased mortality is not the only desired outcome of good medical care. Other important outcomes for patients and payers are decreased morbidity, including fewer in-hospital and post-hospital complications; fewer rehospitalizations; improved understanding of conditions, leading to better longer-term care and outcomes; and decreased costs.

## Conclusion

Both outcomes measures, such as mortality rates, and process measures are useful for improving quality of care.<sup>11</sup> Mortality rates may seem to represent “the bottom line,” but there are numerous factors, many beyond providers’ control, that contribute to mortality. Risk-adjustment methods to account for these factors are improving, but as the recent public reporting effort for heart attack and heart failure mortality demonstrates, it is difficult to discriminate among providers using only mortality rates. In addition, mortality rates alone do not point to the specific actions providers must undertake to improve care. Process measures derived from clinical guidelines, such as those in the HQA, identify specific activities hospitals can work to improve. Guidance for improving these processes is available through private entities such

as the Institute for Healthcare Improvement or through government-sponsored programs such as Medicare’s Quality Improvement Organizations, which operate in each state.

The real “bottom line” means not taking a simplistic approach to measurement and improvement. We must continue to generate evidence to evaluate new process measures that may help reduce mortality and other poor outcomes; work hard to improve performance in the current suite of HQA measures; and periodically check to assess the impact of improved implementation of existing and new measures on outcomes. This approach will put us well along the path to achieving higher-quality health care and a high performance health system.

## NOTES

- <sup>1</sup> The Commonwealth Fund Commission on a High Performance Health System, *Framework for a High Performance Health System for the United States* (New York: The Commonwealth Fund, Aug. 2006).
- <sup>2</sup> The Commonwealth Fund Commission on a High Performance Health System, *Why Not the Best? Results from a National Scorecard on U.S. Health System Performance* (New York: The Commonwealth Fund, Sept. 2006).
- <sup>3</sup> J. C. Cantor, C. Schoen, D. Belloff, S. K. H. How, and D. McCarthy, *Aiming Higher: Results from a State Scorecard on Health System Performance* (New York: The Commonwealth Fund, June 2007).
- <sup>4</sup> A. K. Jha, E. J. Orav, Z. Li et al., “[The Inverse Relationship Between Mortality Rates and Performance in the Hospital Quality Alliance Measures](#),” *Health Affairs*, July/Aug. 2007 26(4):1104–10.
- <sup>5</sup> R. M. Werner and E. T. Bradlow, “Relationship Between Medicare’s Hospital Compare Performance Measures and Mortality Rates,” *Journal of the American Medical Association*, Dec. 13, 2006 296(22):2694–2702.

- <sup>6</sup> E. H. Bradley, J. Herrin, B. Elbel et al, “Hospital Quality for Acute Myocardial Infarction: Correlation Among Process Measures and Relationship with Short-Term Mortality,” *Journal of the American Medical Association*, July 5, 2006 296(1):72–78.
- <sup>7</sup> G. C. Fonarow, W. T. Abraham, N. M. Albert et al., “Association Between Performance Measures and Clinical Outcomes for Patient Hospitalized with Heart Failure,” *Journal of the American Medical Association*, Jan. 3, 2007 297(1):61–70.
- <sup>8</sup> S. D. Horn, “Commentary: Performance Measures and Clinical Outcomes,” *Journal of the American Medical Association*, Dec. 13, 2006 296(22):2731–32.
- <sup>9</sup> M. C. Fiore, D. W. Wetter, W. C. Bailey et al., *Smoking Cessation Clinical Practice Guideline* (Rockville, Md.: Agency for Health Care Policy and Research, U.S. Dept. of Health and Human Services, 1996).
- <sup>10</sup> *The Health Benefits of Smoking Cessation: A Report of the Surgeon General*. DHHS Publication No. (CDC) 90-8416 (Rockville, Md.: Centers for Disease Control, U.S. Department of Health and Human Services, 1990).
- <sup>11</sup> S. C. Schoenbaum, “Outcomes Measurement: The End or the Beginning?” in S. C. Schoenbaum, ed., *Measuring Clinical Care: A Guide for Physician Executives* (Tampa, Fla.: American College of Physician Executives, 1995), pp. 169–74.



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