

## Small hospitals and performance measurement: implications and strategies

**Terry R. Lied**

Division of Program Analysis and Performance Measurement, Health Care Financing Administration (HCFA), Department of Health and Human Services, Baltimore, Maryland, USA

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Performance measurement, Accountability, Kaizen, Benchmarking

### Abstract

Hospitals are held increasingly accountable for the services they provide. While small hospitals may often lack resources to meet performance measurement mandates, generally, they are not exempt from requirements to submit performance data to accrediting and regulatory bodies. Presents an approach to obtaining, developing, and evaluating performance indicators that may be useful to small hospitals in meeting their mandates for public accountability and quality improvement. Takes into account resource limitations faced by these hospitals, both human and technological, and suggests a number of measures that are potentially useful for demonstrating accountability, benchmarking, and quality improvement.

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### Introduction

The efforts of insurers, accreditation agencies, public advocates, employer groups, and regulatory bodies have resulted in an increased emphasis on accountability for health care providers. Providers are held accountable, not only for how they provide care, but also for their patients' clinical outcomes and satisfaction with care.

Efforts to measure the performance of health care providers and to furnish useful consumer performance information are laudable. Nevertheless, the ability to develop useful performance measures still has many obstacles (Eddy, 1998; Davies, 1998; Roper and Cutler, 1998; Palmer, 1996). There are at least four reasons why it is still uncertain the extent to which performance measurement in health care will ultimately lead to increased quality of care and more public accountability. First, the reliability and validity of many current measures of performance remains to be established. Until performance measures are better aligned with what is really important in rendering health care, reliability and validity questions will remain. Second, performance measurement at the organizational level is still in its infancy and needs further development to realize its potential. Third, even when organizational performance is validly measured, a link between measurement activities and long-term performance improvement is not well documented; in fact, such a link only rarely appears in the literature (Hannan *et al.*, 1994; Kazandjian and Lied, 1998). In other words, while this link is often assumed, it is rarely reported. Fourth, many of the performance measures are based on rates (numerators over denominators) which are suitable for comparative purposes only if the

denominators (at-risk populations) are relatively large.

The problem of low denominators is not unique to small hospitals but is an issue any time the small size of "at-risk" populations jeopardizes the reliability of statistical measures. For example, a recent study (Hofer *et al.*, 1999) indicated that physician report cards for diabetes, a highly prevalent condition, did not reliably detect true practice differences principally because of low denominators. In this study, a physician would have needed to provide care for more than 100 patients with diabetes in a panel for profiles to have a reliability of 0.80 or better. However, more than 90 per cent of the primary care physicians at the health maintenance organization that was studied had fewer than 60 patients with diabetes. The researchers concluded that the use of individual physician profiles may foster an environment in which physicians can avoid penalties by deselecting patients with prior histories of high cost, poor adherence, or poor treatment response.

Not only denominators, but also numerators have to be sufficiently large to detect reliably true differences in provider performance. It is clear that much work still needs to be done in developing tools and strategies to help small health care organizations measure their performance, to enable them to compare themselves with other organizations, and to allow them to determine if their performance is improving over time.

### Small hospitals and performance measurement

According to the *Annual Survey of Hospitals* (American Hospital Association, 1996-97), there were 5,194 hospitals in the USA in 1995.

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Approximately 45 per cent of these hospitals had fewer than 100 beds. The mean number of reported yearly admissions for hospitals with fewer than 100 beds was approximately 1,400. A population of this size, in its aggregate, may represent a large enough denominator for calculating certain types of performance rates such as unadjusted inpatient mortality. However, it is evident that the denominator will dwindle precipitously when using performance measures related to specific procedures, diagnostic groups, or principal procedures. The smallest of the small hospitals, for example, those with fewer than 50 beds, will have the greatest difficulty in arriving at performance measures with denominators large enough to be statistically meaningful. Any attempt at stratification by variables other than the most fundamental patient characteristics (sex, broad age groups) in order to improve precision will result in further reduced denominators.

One alternative for small hospitals interested in measuring performance may be to use performance indicators designed for ambulatory services such as those provided in emergency rooms or outpatient surgical suites. However, while, in some cases, the numbers may be larger for these kinds of services, they still may not be large enough for statistical validity. A related concern is that management information systems that capture ambulatory data in small hospitals are often inadequate by today's standards. While most hospitals, even those with fewer than 100 beds, are likely to have some kind of an automated data system for reporting inpatient data, comparable systems are often not in place for outpatient, emergency room, and other ambulatory data. Until such systems are in place, the development of ambulatory performance measures will not meet the reporting needs of many small hospitals.

One solution to the small numbers problem is to aggregate data across a year or even longer so that denominators (and numerators) are sufficiently large to allow for meaningful and valid comparisons. From a strictly reporting point of view, this seems reasonable. From a quality improvement perspective, this approach may not be very useful and can even be misleading. For quality improvement initiatives to be effective, the information must be timely. Under some circumstances in which the environment is relatively stable, it may be possible to use data aggregated over a year to construct performance measures. From a continuous quality improvement (CQI) perspective, accumulating a year's worth of data will usually be too long a period for the

data to be of much use. Processes change, the hospital experiences staff turnover, patient populations change, and what seemed important to measure may no longer be so. The goals of improved reporting through aggregation of numbers over time and those of CQI appear antagonistic.

What can be done to measure performance at present when most small hospitals are functioning with limited resources, without state-of-the-art information systems, and with small populations? This is a critical question given requirements from oversight and regulatory bodies for hospitals to provide performance data. Moreover, even without such official requirements, there is a need for hospitals to get feedback on the quality of care that they provide, to benchmark their performance, and to examine performance trends.

### **A reasonable approach to measuring performance in small hospitals**

There is considerable variation in the resources available for supporting a performance measurement system in small hospitals. The limitations facing a hospital with 30 beds are generally far greater than those facing small hospitals with 90 or 100 beds. Given the range of available resources, no one approach to measuring performance will be suitable for all small hospitals.

### **Technical considerations**

As a general rule, it is more cost-effective to use performance measures that have already been developed and validated than it is to try to develop one's own performance measures. In most cases, resources and personnel efforts can be more effectively employed in selecting an established performance measurement system, taking into account what is feasible in terms of costs and what is desirable in terms of the product, instead of spending those resources on development. Moreover, there is no assurance that one's own developed measures will be acceptable to accrediting or regulatory organizations. Indicators developed strictly for purposes of internal quality improvement and not for public accountability or comparison with other hospitals frequently do not involve extensive resources or costs. There is one exception: a small hospital that is interested in indicators solely for internal quality improvement (as opposed to public accountability) may consider developing its own measures.

### **The importance of knowing why performance is measured**

There are a number of reasons why a hospital decides to adopt a performance measurement system, and choosing the right system should be based on a consideration of all of these.

Performance measurement systems vary greatly in costs, both up front and hidden, as well as the sophistication of the product. Small hospitals must be sure about why they are deciding to adopt a performance measurement system. Is it to help them with their internal quality improvement initiatives, to benchmark with other providers, to meet accreditation mandates, or to meet reporting requirements of payers of care? Identifying the reasons why one is measuring performance is crucial in selecting an approach. If one is choosing a performance measurement system to meet regulatory requirements, then one must make sure that the performance measurement system is acceptable to the regulatory organization.

### **Useful indicators of performance**

Useful performance indicators are those that help an organization to improve its delivery of health care services or to help it in its efforts toward accountability. Useful indicators possess desirable statistical properties (reliability and validity) and frequently reflect those areas of health care service delivery in which there are evidence-based standards. Typically, the events that are measured occur frequently and involve sizeable "at-risk" populations. If rates are reported, they usually have relatively large numerators (events) and denominators (at-risk populations). If continuous measures are reported, such as patient satisfaction, then the performance measure must demonstrate desirable psychometric properties, including internal consistency, content validity, and construct validity.

Since virtually all hospitals report administrative data, selecting performance measures using data elements from an administrative database is a reasonable option for most small hospitals. Data elements from administrative data that are potentially useful in developing performance measures include patient length of stay, source of payment, primary and secondary diagnoses, principal and secondary procedures, major diagnosis category, and patient demographics. Such data elements are included in many performance measurement systems, even a number of those that are not based solely or primarily on administrative data. Moreover, despite some limitations of administrative data in

allowing for clinical inferences, rates based on administrative data elements have often been accepted by regulatory, insurer/payer and accreditation organizations in order to meet performance requirements.

Frequently, administrative data are considered inadequate for measuring clinical performance, and medical record data are the preferred alternative. The technologies by which clinical services are offered and recorded, however, may differ substantially between small and large hospitals. In small hospitals, collecting the data elements is largely a manual process; in large hospitals, collection of these data elements may involve some automated processes. Obviously, then, the degree of automation is a factor to take into account in deciding whether or not to use medical records as a data source for performance measures.

While limitations in data availability, small numbers, and technology inadequacies can hamper the development of measures of small hospital performance, these factors, alone, do not rule out the possibility of developing useful performance indicators. Acknowledging limitations and being realistic about remaining possibilities comprise the mindset needed to succeed in arriving at useful indicators of performance for small hospitals.

In measuring performance in small hospitals, it may occasionally be necessary to strike a compromise between what is most desirable to measure and what can be measured, given the available resources. Many good indicators are available through some of the most widely used performance measurement systems. Perhaps, some examples of useful indicators for small hospitals would be helpful – indicators that do not have prohibitive data collection requirements. One such indicator is *length of stay* (LOS). LOS, although not a novel indicator, is easy to collect and report. LOS is frequently a very good performance indicator, especially as an indicator of complications that may relate to quality of care. LOS can also be an indicator of efficiency. While not a pure measure – there are many variables that influence the length of stay – LOS can point to some areas of care that need further examination. LOS has the advantage of being uniformly available, and large databases containing comparative LOS information by procedures and diagnoses are available.

Another useful indicator, available to many small hospitals, is readmission rates. This indicator can point to areas in need of improved patient management based on high rates of readmission, especially for such

conditions as congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), and diabetes. Readmission rates are a measure of efficiency that can be used in conjunction with LOS information to determine if premature discharge contributes to readmission. Inpatient mortality can be an indicator of the quality of care if it is risk-adjusted or, at the very least, stratified by high volume diagnoses categories involving patients with similar risk profiles.

Acute myocardial infarction (AMI) mortality can be an outcome indicator for emergency or inpatient critical care units of the hospital. In addition, for AMI patients, average time from arrival at the hospital to administration of treatment (e.g., thrombolytic therapy) can be an important process indicator. Other indicators that may prove valuable as process or outcome measures include patient falls and use of physical restraints. If obstetrical services are provided in the small hospital, Cesarean section rates can comprise a useful indicator.

There are a number of potentially useful *ambulatory* indicators that apply to small hospitals with emergency or outpatient departments. Ambulatory indicators related to AMI include prescribing beta blocker and/or aspirin therapy for discharged AMI patients (patients without contraindications to these therapies). Many indicators are suitable to both large and small hospitals. These include wait times and returns to a hospital's emergency department for the same or a related condition (within specified time periods such as 72 hours), and leaving an emergency department early (prior to completion of treatment). While this type of ambulatory data may not be available on automated systems, developing and implementing a simple system of non-automated reporting for these indicators need not be resource intensive.

All performance measures require at least some outlay of resources, both human and technological. The indicators listed here, for the most part, do not require extensive resources to implement. Moreover, in addition to quality indicators, there are financial and administrative indicators that can be used to measure other aspects of organizational performance. Such indicators complement clinical measures in forming a general picture of organizational performance.

Patient satisfaction, an important piece in the puzzle of performance assessment, merits consideration as a performance measure appropriate for small hospitals. Patient perceptions of quality of care are increasingly central in conceptual and operational models of performance

measurement (Lied and Kazandjian, 1999). Finding the resources to implement patient satisfaction reporting in a small hospital can be problematic, especially if a large portion of the total patient population is surveyed. Judicious sampling can be used as an alternative so that there are data available on patient satisfaction.

### **Tools for collecting and evaluating performance measures**

The quality indicators developed by the Healthcare Cost and Utilization Project (HCUP) of the Agency for Healthcare Policy and Research (AHCPR) in the USA, now called the Agency for Healthcare Research and Quality (AHRQ), consist of 33 clinical performance measures. A number of these measures may be useful for assessing performance in small hospitals. Additional details on the HCUP quality indicators are available elsewhere (Ball *et al.*, 1998).

CONQUEST, downloadable from the Internet, is another potentially useful tool for small hospitals in collecting and evaluating performance measures (Agency for Healthcare Policy and Research, 1997). CONQUEST is the acronym for *Computerized Needs-Oriented Quality Measurement Evaluation System*. It includes interlocking databases with an interface allowing users to create reports on performance measures, measure sets, or conditions. CONQUEST now has over 50 measure sets in its database, consisting of well over 1,000 clinical performance measures developed by public and private-sector organizations.

The *National Library of Healthcare Indicators* (NLHI) is a catalogue of more than 200 measuring instruments designed to assist providers and health plans in selecting performance indicators that meet their needs (Joint Commission on Accreditation of Healthcare Organizations, 1997). The four generic categories of performance indicators in this framework are clinical, health status, patient satisfaction, and administrative/financial. Domains of clinical performance are appropriateness, availability, continuity, effectiveness, efficacy, efficiency, prevention/early detection, respect and caring, safety, and timeliness. NLHI may be a useful reference source of information for small hospitals that are selecting performance measures for use in accreditation, accountability, and quality improvement.

### **Summary and discussion**

The development of performance measures that are suitable for small hospitals presents

a number of challenges. The most formidable challenge is, perhaps, the small size of the *Ns* that are found in both the numerators and denominators when rates are used as measures of performance. Other challenges include limitations in personnel and technology.

Despite the inherent difficulties in performance assessment in small hospitals, there are potentially useful approaches to identifying performance indicators that are appropriate to small hospitals. Such approaches recognize the limitations of data collection and reporting systems in these hospitals but do not view these limitations as insurmountable to developing measures that can be used in benchmarking and other performance improvement processes.

A number of measures were suggested that could be used in most small hospitals to assess performance. These include: length of stay (LOS) by diagnosis, AMI mortality, time from arrival until therapy is received for AMI, use of physical restraints, emergency department wait times, Cesarean sections, patient falls, and patient satisfaction. Doubtless, there are other measures that can be useful to small hospitals and are well suited for data collection and reporting mechanisms in these facilities. Potentially useful information on performance measures is available from US governmental agencies (especially the Agency for Healthcare Research and Quality), from accreditation organizations such as the Joint Commission on Accreditation of Healthcare Organizations, or from proprietary organizations. Some selection tools, such as CONQUEST, can be downloaded without fee from the Internet. A number of useful performance indicators are available through purchase from proprietary organizations.

Will the future be brighter for small hospitals *vis-à-vis* performance measurement, given the pressures toward accountability from accreditation organizations, employer groups, and payers of health care? This question is a difficult one to answer given the current fluidity of health care systems, financing mechanisms, and accountability structures. One thing appears certain: there are few signs that the rate of change in health care is subsiding. Health care performance measurement will continue to evolve as long as the mechanisms that are driving rapid changes in health care evolve. These mechanisms stem from burgeoning technology, increased public and societal expectations, and expansion of medical knowledge. How these factors will affect small hospitals is uncertain. Will they

force some hospitals out of existence or will they breathe new life into them? There appears to be little empirical basis to answer these questions at the present time.

One thing appears almost certain in the near future: health care organizations, whether large or small, will need to show evidence of meeting performance requirements if they are going to continue to operate. The forces for accountability are increasing rather than subsiding, and to be accountable, organizations must offer evidence of having done something that leads to desirable outcomes in a cost-effective manner. Small hospitals, especially if they are located in largely rural and isolated communities, provide critical care to patients who would otherwise have no access to medical services. In holding these hospitals accountable for the care they provide, therefore, the question arises as to what is an appropriate basis for evaluating services and patient outcomes. In the absence of other medical providers in the service area, it may be useful for these hospitals to focus on measuring internal performance trends to improve their quality of care. By using these data to improve quality, small hospitals can demonstrate accountability even if they find it difficult to identify all of the appropriate external benchmarks for performance comparison.

## References

- Agency for Healthcare Policy and Research (1997), *The CONQUEST User's Guide*, Agency for Healthcare Policy and Research, AHCPR Pub. No. 97-R001, AHCPR Publications Clearinghouse, Silver Spring, MD.
- American Hospital Association (1996-97), *Hospital Statistics: Emerging Trends in Hospitals*, American Hospital Association, Chicago, IL.
- Ball, J.K., Elixhauser, A. and Johantgen, M. (1998), *HCUP-3 Quality Indicators: Methods, Version 1.1: Outcome, Utilization, and Access Measures for Quality Improvement*, Healthcare Cost and Utilization Project (HCUP-3) Research Note, (AHCPR Publication No. 98-0035), Agency for Health Care Policy and Research, Rockville, MD.
- Davies, H.T.O. (1998), "Performance management using health outcomes: in search of instrumentality", *Journal of Evaluation in Clinical Practice*, Vol. 4, pp. 359-62.
- Eddy, D. (1998), "Performance measurement: problems and solutions", *Health Affairs*, Vol. 17, pp. 7-26.
- Hannan, E.L., Kumar, D., Racz, M., Sui, A.L. and Chassin, M.R. (1994), "New York State's cardiac surgery reporting system: four years later", *Annals of Thoracic Surgery*, Vol. 58 No. 6, pp. 1852-7.

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- Hofer, T.P., Hayward R.A., Greenfield, S.,  
Wagner, E.H., Kaplan, S.H. and Manning, W.  
(1999), "The unreliability of individual  
physician report cards for assessing the costs  
and quality of care of a chronic disease",  
*Journal of the American Medical Association*,  
Vol. 281 No. 22. pp. 2098-105.
- Joint Commission on Accreditation of Healthcare  
Organizations (1997), *National Library of  
Health Indicators*, Oakbrook Terrace, IL.
- Kazandjian, V.A. and Lied, T.R. (1998), "Cesarean  
section rates: effects of participation in a  
performance measurement project", *Joint  
Commission Journal on Quality Improvement*,  
Vol. 24 No. 4, pp. 187-96.
- Lied, T.R. and Kazandjian, V.A. (1999),  
"Performance: a multi-disciplinary and  
conceptual model", *Journal of Evaluation in  
Clinical Practice*, Vol. 5 No. 4, pp. 393-400.
- Palmer, H. (1996), "Measuring clinical  
performance to provide information on  
quality improvement", *Quality Management  
in Health Care*, Vol. 4, pp. 1-2.
- Roper, W. and Cutler, C. (1998), "Health plan  
accountability and reporting. Issues and  
challenges", *Health Affairs*, Vol. 17, pp. 152-5.