

William Shoemaker

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## COVER STORY

# benchmarking tools for reducing costs of care

In the face of the nation's economic challenges, hospitals are under increasing pressure to reduce costs. Benchmarking is key to achieving that goal.

Today's economic challenges have had at least one salutary effect for the nation's healthcare system: They have helped to better focus our collective attention on the need to reduce costs and improve efficiencies in health care.

In all likelihood, the effects of this national focus on performance improvement are being felt in your organization. Hospital financial leaders, in particular, have been intensifying their efforts to identify the specific steps their organizations can take that will make a difference. To this end, one of the most important steps you can take to identify opportunities for improvement is to examine

your organization's performance around diagnostic groups. All that you require is a practical approach to proceed with this analysis.

To illustrate such an approach, and demonstrate effective analytical techniques, the following discussion focuses on diagnostic groups that represent important lines of business for most of the nation's hospitals and health systems. For purposes of comparison, the analysis uses publicly available data on national average costs of routine care, special care, and ancillary services. Using such data, you can compare your facility's costs with peer group averages to determine whether your costs differ in any areas to a degree that warrants investigation. Costs for a particular procedure or treatment can be driven up by operational problems in a single cost center, overutilization of services, excessive supply costs, or many other potential issues. Addressing these issues can lead to more efficient operations and measurable savings.

## Identifying Lines of Business

A good starting place for analysis is to look at the most frequent diagnostic groups for Medicare, as defined by Medicare severity-based diagnosis-related groups (MS-DRGs). Typically, you would

## AT A GLANCE

- > Publicly available data provide an excellent resource for benchmarking a hospital's performance around diagnostic groups.
- > The benchmarking analysis should seek to identify any unexpected differences in a hospital's average costs relative to those of similar hospitals.
- > A good starting place for such analysis is the most frequent diagnostic groups for Medicare, as defined by Medicare severity-based diagnosis-related groups.
- > A finding of higher-than-expected costs relative to those of peers can provide an impetus for further investigation.

For a case example of the application of a benchmarking analysis, go to [www.hfma.org/hfm](http://www.hfma.org/hfm).

want to look at the “base” MS-DRGs that combine levels of severity. The five most frequent base MS-DRGs, representing more than 20 percent of total Medicare discharges during the first three quarters of FY08, are:

- > Heart failure and shock
- > Simple pneumonia and pleurisy
- > Chronic obstructive pulmonary disease
- > Major joint replacement or reattachment of lower extremity
- > Septicemia without mechanical ventilation 96+ hours

Although there is a place for small group comparisons, it is generally preferable to use larger, carefully selected peer groups.

Starting with the most frequent diagnoses makes good sense in analyzing costs because performance improvement with respect to any of these five diagnoses could have considerable impact for many hospitals. After addressing these groups, a hospital could extend the analysis in a number of directions, including proceeding to other high-volume diagnoses, selecting other high-revenue services that may not necessarily have high volumes, or focusing on known areas of difficulty.

Selecting a Peer Group for Comparison

A benchmarking analysis should seek to identify any unexpected variations in your average costs when compared with those of similar hospitals. For such a comparison to be meaningful, it is important to choose peer hospitals carefully. For some hospitals in metropolitan areas, it might make sense to compare the facility with others in town. Some hospitals, however, may prefer a different approach.

For example, if your organization is a teaching hospital, you might want to compare it with other teaching hospitals in a region. Similarly, if your organization is a hospital that specializes in a particular medical service, you may want to compare it only with other hospitals having the same specialization.

Depending on your operational interests, other general selection criteria can also be used, such as bed size, type of facility (e.g., for-profit versus not-for-profit), services provided, system affiliation, and competitive market. Selecting the appropriate peer group is important and should reflect your intentions.

There is one important limitation to keep in mind. Comparing your facility with a single hospital or a small number of hospitals offers little benefit as there would not be adequate

MOST FREQUENT MEDICARE SEVERITY-BASED DIAGNOSIS-RELATED GROUPS (MS-DRGs) AND THEIR PERCENTAGES OF TOTAL DISCHARGES		
MS-DRGs	Base MS-DRG Description	% Total
291-292-293	Heart failure and shock	5.0
193-194-195	Simple pneumonia and pleurisy	4.2
190-191-192	Chronic obstructive pulmonary disease	4.0
469-470	Major joint replacement or reattachment of lower extremity	3.9
871-872	Septicemia without mechanical ventilation 96+ hours	3.0

volumes to establish “normative” benchmarks; any variations between your hospital and the peer group would simply indicate differences—not variations with a significant number of peer hospitals. Although there is a place for small group comparisons, it is generally preferable to use larger, carefully selected peer groups.

### Categories of Cost

Hospital-specific data for routine care, special care, and departmental costs can be taken from publicly available Medicare claims data and cost reports. The Medicare Provider Analysis and Review (MedPAR) file contains categorized charges for 100 percent of all Medicare fee-for-service claims. The examples cited here are based on claims in the MedPAR file for discharges during the first nine months of FY08, which was the most recent reported time period.

Departmental cost-to-charge ratios are taken from hospital cost reports that correspond most closely to the billing period. (MedPAR data are provided for each federal fiscal year, while hospital cost report periods vary by hospital.) The hospital-specific cost-to-charge ratios are used to allocate costs based on departmental charges. Only short-term acute care hospitals are included and patients treated in distinct part units are excluded. The MedPAR file categorizes charges into a dozen areas, but only a few key areas are included here.

The exhibit below shows categorical costs as a percentage of total cost for simple pneumonia (MS-DRGs 193, 194, and 195). It includes major ancillary services, routine services (i.e., room charges), and special services (e.g., ICU and CCU). This presentation format facilitates comparison of the distribution of costs among various service areas. The case mix index (CMI) for the three MS-DRGs measures the mix of patients with complications and major complications (CCs and MCCs). As expected, larger hospitals had a higher mix of complicated cases. Not surprisingly, larger hospitals also had increasingly higher costs in laboratory, radiology, and special care. That larger hospitals pay a lower percentage of total costs for medical/surgical supplies may reflect the greater purchasing power of larger institutions.

It should be noted that the comparative data used for this discussion use national averages for four different ranges of bed size. This cross section of hospitals is used only to demonstrate the process and is not intended to indicate the best peer group for most hospitals.

### Other Reporting Formats

Comparative information can also be expressed as average costs per case for ancillary areas and average costs per day for routine care and special care. One disadvantage to using this approach is

**DEPARTMENTAL COSTS AS A PERCENTAGE OF TOTAL COSTS FOR SIMPLE PNEUMONIA AND PLEURISY, NATIONAL**

Bed Sizes	Case Mix Index	Laboratory	Radiology	Inhalation Therapy	Med/Surg Supplies	Routine Care	Special Care
≤50	1.0016	7.4%	3.5%	7.0%	6.4%	47.1%	8.0%
51-150	1.0247	7.6%	3.9%	5.6%	6.4%	40.7%	12.6%
151-500	1.0446	7.7%	4.3%	4.4%	5.4%	38.3%	15.8%
>500	1.0552	7.9%	4.6%	3.5%	4.7%	37.7%	16.1%

that gross charges for a service or supply item vary among hospitals and the use of cost-to-charge ratios is an imperfect way to allocate costs. Nevertheless, the approach is usually adequate to identify significant variations between a hospital and a peer group that may warrant investigation. Also, the use of allocated costs can be adjusted for factors such as differences in CMI and local area wages.

The exhibit below illustrates a format for this approach. In this example, four, individual, not-for-profit facilities are chosen, each with more than 500 acute care beds, at least 75 intensive care beds, a teaching program, and a common core-based statistical area (CBSA). The exhibit shows three methods of reporting average departmental costs for treating simple pneumonia among four peer hospitals.

**Unadjusted average costs by department.** These costs are calculated from MedPAR billing data and cost report data for the hospital. Average charges from billing data are multiplied by corresponding departmental cost-to-charge ratios from the cost report. Average costs per day for routine and special care services are calculated by dividing average costs by corresponding days from the billing data.

**Wage-adjusted average costs.** These costs are calculated to adjust for differences in labor costs among hospitals. When all hospitals are within the same area (i.e., the same CBSA), this adjustment may not be necessary. It is useful, however, when hospitals are from different areas.

#### DEPARTMENTAL COSTS PER CASE/DAY FOR SIMPLE PNEUMONIA AND PLEURISY, SMALL PEER GROUP

Provider	Provider CMI	Local Area Wage Index	Routine Cost/Day	Special Care Cost/Day	Laboratory Cost/Day	Radiology Cost/Day	Inhalation Therapy Cost/Day	Med/Surg Supplies Cost/Day
Unadjusted								
1	1.0449	1.3003	\$857	\$1,329	\$451	\$320	\$336	\$634
2	1.0838	1.3003	\$810	\$7,370	\$551	\$492	\$264	\$190
3	1.0961	1.323	\$850	\$1,085	\$460	\$330	\$360	\$92
4	1.0765	1.323	\$604	\$1,371	\$368	\$231	0	0
Wage-Adjusted								
1	1.0449	1.3003	\$719	\$1,115	\$537	\$381	\$400	\$755
2	1.0838	1.3003	\$680	\$6,183	\$657	\$587	\$314	\$227
3	1.0961	1.323	\$705	\$901	\$555	\$398	\$433	\$111
4	1.0765	1.323	\$501	\$1,138	\$444	\$278	0	0
Wage- and CMI-Adjusted								
1	1.0449	1.3003	\$688	\$1,067	\$514	\$365	\$383	\$723
2	1.0838	1.3003	\$627	\$5,705	\$606	\$541	\$290	\$210
3	1.0961	1.323	\$643	\$822	\$506	\$363	\$395	\$101
4	1.0765	1.323	\$466	\$1,057	\$412	\$258	0	0

The adjustment is calculated in three steps. First, the unadjusted average costs are broken into labor and nonlabor portions. The labor portion is a percentage corresponding to the inpatient prospective payment system (IPPS) regulations for the year being studied. (In FY08 it was 69.7 percent.) The labor portion is then divided by the local area wage index, as also contained in the IPPS regulations. (The exhibit shows the wage index for each hospital.) Finally, the adjusted labor portion and the nonlabor portion are added back together.

**Wage- and CMI-adjusted average costs.** These costs are calculated to adjust both for differences in labor costs and for differences in the average severity of patients. (Costs can also be CMI adjusted without being wage adjusted.) If a single MS-DRG is being analyzed, it is not necessary to adjust for CMI. If a base MS-DRG that contains multiple MS-DRGs is being studied, however, it is best to adjust for the mix of severity levels among hospitals. Similarly, if a broad category of patients (e.g., cardiovascular services) is being studied, it is essential to adjust for the mix of MS-DRGs among hospitals.

The adjustment is calculated in two steps. First, the CMI of the MS-DRGs being studied is calculated by averaging the relative weights of all cases being studied. (The exhibit shows the CMI for each hospital.) Second, the wage-adjusted average cost is divided by the CMI.

Wage adjustment is less meaningful in large area studies, such as national averages. It is important, however, in smaller studies where peers are from diverse locations. CMI adjustment is advisable in all circumstances (except the study of a single MS-DRG).

The exhibit also reveals one of the problems in working with public Medicare data. The cost

**If analysis discloses that your costs are higher than expected in comparison with those of peers, you may use the finding as an impetus to investigate the situation—thus taking an important step toward reducing your organization's costs,**

report for Hospital 4 contained missing data that made it impossible to determine average costs for inhalation therapy and for medical-surgical supplies. Data that were reported also look suspicious or unreasonable for some other areas. Thus, a caveat is that although reliable data are available for most facilities, it is important to identify and adjust for hospitals with problems in their reporting.

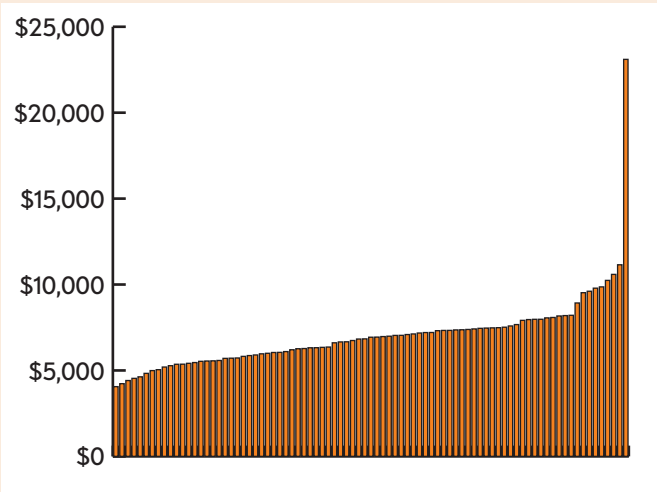
Hospitals should bear in mind that correct and complete Medicare cost reports are of utmost importance. With the implementation of MS-DRG based reimbursement in 2008 came fully cost-based relative weights for the new system. Making certain that your facility is accurately accounting for costs on the Medicare cost report will not only contribute to more accurate benchmarking using the methodologies explained here, but also contribute to more accurate calibration of relative weights and, thus, more appropriate Medicare reimbursement.

### **Variability and What It Means**

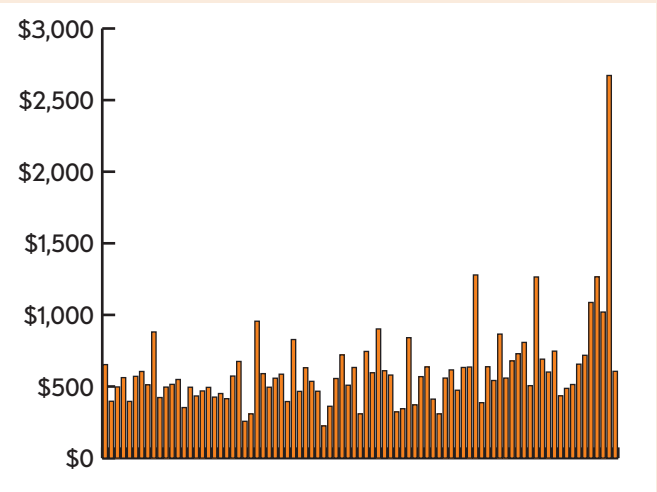
A large group analysis helps to illustrate the variability in costs among hospitals. This variability results in part from differences in areas such as the utilization of services, medical practice patterns, formularies, and purchasing power. Such an analysis is not to be interpreted as a standard

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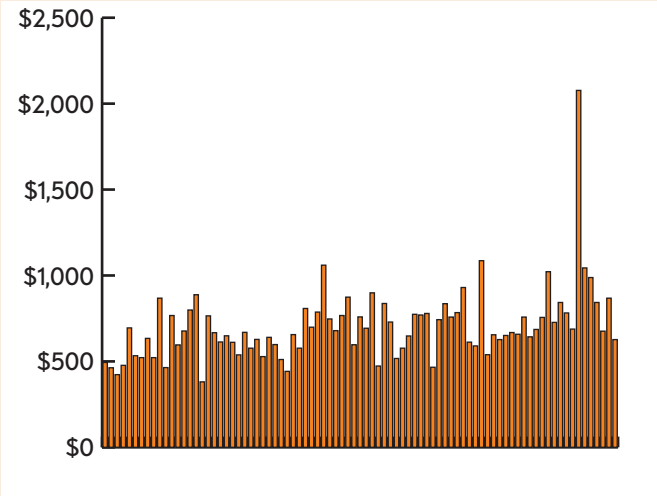
TOTAL COST PER CASE



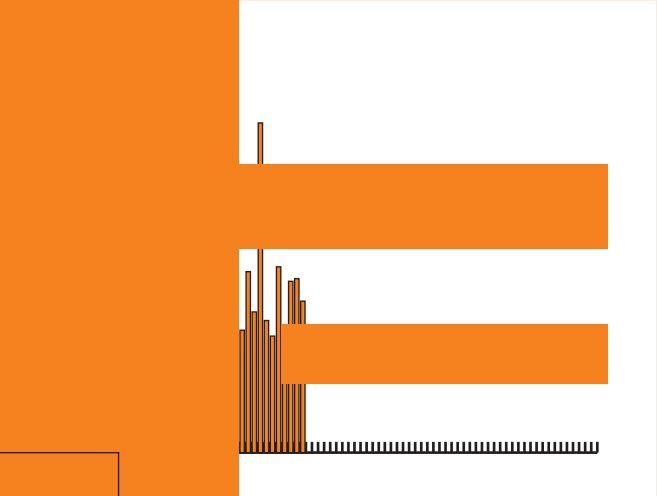
LABORATORY COST PER CASE



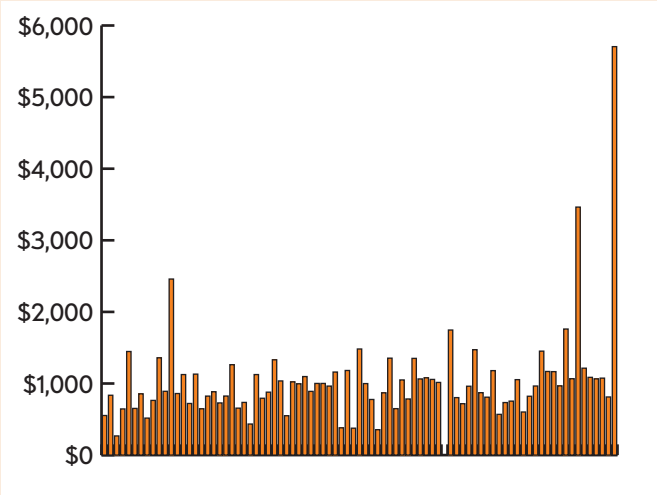
ROUTINE COST PER DAY



RADIOLOGY COST PER CASE



INTENSIVE CARE COST PER DAY



## CMI-ADJUSTED AVERAGE DEPARTMENTAL COSTS FOR HIGHEST-VOLUME BASE MS-DRGs

Bed-Size Group	CMI	Routine Cost/Day	Special Care Cost/Day	Laboratory Cost/Day	Radiology Cost/Day	Inhalation Therapy Cost/Day	Med/Surg Supplies Cost/Day	Total Cost/Day
Heart failure and shock (MS-DRGs 291-292-293)								
≤ 50	1.0383	\$720	\$986	\$137	\$46	\$63	\$87	\$1,434
51-150	1.0594	\$691	\$797	\$128	\$47	\$52	\$84	\$1,450
151-500	1.0778	\$693	\$585	\$118	\$49	\$41	\$70	\$1,420
500+	1.0849	\$745	\$538	\$121	\$53	\$35	\$61	\$1,452
Simple pneumonia and pleurisy (MS-DRGs 193-194-195)								
≤ 50	1.0016	\$738	\$990	\$104	\$50	\$100	\$91	\$1,415
51-150	1.0247	\$697	\$841	\$109	\$55	\$80	\$90	\$1,420
151-500	1.0446	\$679	\$660	\$105	\$59	\$61	\$75	\$1,377
500+	1.0552	\$713	\$661	\$112	\$66	\$50	\$67	\$1,423
Chronic obstructive pulmonary disease (MS-DRGs 190-191-192)								
≤ 50	0.9292	\$770	\$983	\$110	\$42	\$141	\$104	\$1,507
51-150	0.9399	\$744	\$865	\$108	\$47	\$125	\$102	\$1,520
151-500	0.9511	\$739	\$679	\$101	\$51	\$107	\$90	\$1,493
500+	0.9561	\$767	\$664	\$105	\$58	\$100	\$82	\$1,527
Major joint replacement or reattachment of lower extremity (MS-DRGs 469-470)								
≤ 50	2.0137	\$572	\$675	\$39	\$13	\$14	\$1,043	\$2,267
51-150	2.0415	\$372	\$529	\$42	\$16	\$13	\$825	\$1,869
151-500	2.0438	\$344	\$415	\$41	\$16	\$9	\$883	\$1,880
500+	2.0454	\$343	\$388	\$40	\$18	\$8	\$780	\$1,792
Septicemia without mechanical ventilation 96+ hours (MS-DRGs 871-872)								
≤ 50	1.6257	\$457	\$738	\$78	\$37	\$37	\$56	\$964
51-150	1.6529	\$445	\$669	\$83	\$40	\$34	\$58	\$1,021
151-500	1.6708	\$437	\$548	\$82	\$42	\$30	\$57	\$1,008
500+	1.6769	\$466	\$541	\$88	\$46	\$26	\$50	\$1,045

of care or as an identification of “best practices.” It is a tool for determining whether your hospital is an “outlier” relative to other, similar facilities. It identifies diagnoses and/or departments that may need closer examination to determine whether there are opportunities to reduce costs.

Such an analysis might indicate that certain members of your medical staff use more services than their peers in treating a particular diagnosis. It may mean that your lengths of stay or ICU/CCU utilization are higher than might be expected. It might indicate operational difficulties in particular ancillary areas or in the costs of supplies. It is

COMPARISON OF ONE HOSPITAL'S COSTS WITH AVERAGE COSTS FOR A PEER GROUP

	<b>Routine Cost/Day</b>	<b>Special Care Cost/Day</b>	<b>Laboratory Cost/Case</b>	<b>Radiology Cost/Case</b>	<b>Inhalation Therapy Cost/Case</b>	<b>Med/Surg Supplies Cost/Day</b>
Hospital Studied	\$786	\$1,306	\$365	\$266	\$120	\$107
Peer Group	\$685	\$958	\$618	\$330	\$291	\$383

impossible to determine with certainty whether a problem exists with such an analysis. Likewise, it is impossible to determine what the cause is of an unexpected variation. Variation simply means that certain costs are different from what might be expected and helps to define candidates for detailed study and possible improvement.

The six exhibits on page VI show findings of a large group analysis of 85 not-for-profit hospitals with more than 150 and fewer than 500 acute care beds each, as well as more than 75 special care beds. These facilities are geographically dispersed, and their average cost data have been both wage- and CMI-adjusted. In all exhibits, the hospitals are arranged in left-to-right order from the lowest overall costs to the highest.

For all except supply costs, there are similar departmental costs among most hospitals, with just a few showing either remarkably low or remarkably high costs. Unfortunately, many hospitals have not been reporting medical and surgical supplies correctly. This problem could be addressed by CMS, because incorrect reporting interferes with the calibration of cost-based relative weights for MS-DRGs.

Exhibits such as these provide a good format for comparing your hospital with a peer group. By simply including or inserting your hospital in the graphs, you can see at a glance your costs in relation to those of others.

Alternatively, you can compare your costs with average costs for the entire group, as shown in the exhibit above.

### Analysis to Action

The exhibit on page VII presents CMI-adjusted average departmental costs for the five highest-volume base MS-DRGs for four different sizes of hospital, based on data in the national MedPAR file. A benchmarking analysis that is based on such data can enable you to make a cursory comparison of your organization's departmental costs for the most common diagnoses.

If such an analysis discloses that your costs are higher than expected in comparison with those of peers, you may use the finding as an impetus to investigate the situation—thus taking an important step toward reducing your organization's costs, and contributing to the national effort to improve the efficiencies of our overall healthcare system. ●

### About the author



#### William Shoemaker

is senior vice president, American Hospital Directory, Louisville, Ky.  
(wshoemaker@ahd.com).