2. Hospital Operating Expenses

Hospitals in Massachusetts vary greatly in their level of operating efficiency, with some capable of delivering high-quality care with lower operating expenses.

Hospitals face significant operating expenses in delivering care. Improving the operating efficiency of hospitals enables them to deliver care more affordably. If hospitals with higher expense structures could successfully implement strategies to reduce operating expenses, then the overall health care system could maintain equal or better quality of care while reducing total expenditures.

To this point, our focus has been on payer and consumer payments to providers for delivering health care services. In this chapter we shift to an examination of the expenses of acute hospitals[i] in providing those services, or operating expenses. We first compare hospital operating efficiency by examining differences in expenses and quality performance (see sidebar **"What does operating efficiency mean for hospitals?"**). We then examine the different margins hospitals earn from public and commercial payers and the variation of these margins across hospitals. Finally, we examine the composition of hospital operating expenses and discuss strategies that hospitals may use to improve their efficiency.

What does operating efficiency mean for hospitals?

We use operating efficiency in this chapter to describe how productively hospitals make use of their input resources – such as facilities, labor, and supplies – to deliver care. We describe a hospital that is able to deliver similar services at equivalent quality while incurring fewer expenses than another hospital as being relatively efficient. There are many practices that hospitals may use to reduce operating expenses and improve efficiency (see sidebar "**What types of strategies are hospitals pursuing to reduce their operating expenses?**").

2.1 Variation in hospital operating efficiency

Operating expenses vary greatly by hospital. Analysis of cost reports submitted by Massachusetts hospitals illustrates this variation[ii] (see **Technical Appendix B1: Data sources** for discussion of the hospital cost reports data set). Even after adjusting for the varying complexity of needs of patients treated by each hospital and for different regional wage levels, hospitals with higher levels of operating expenses spent 23 percent more to provide the same services than those with lower levels of operating expenses (**Figure 2.1**).[iii] This difference represented thousands of dollars in additional expenses per hospitalization for those hospitals with higher expense structures.

One oft-cited theory for the cause of this variation is that certain types of hospitals, such as those that teach physician residents and fellows, must incur additional expenses to support their mission.[iv] However, the difference in median expenses per discharge between teaching hospitals and all hospitals ($1,030) was less than the difference between individual teaching hospitals ($3,107 between the 75th percentile and 25th percentile teaching hospitals).[v] Moreover, there were a number of teaching hospitals that incurred fewer expenses per discharge than the statewide all-hospital median of approximately $9,000 per discharge (**Figures 2.1, 2.2**). A similar analysis for disproportionate share hospitals (DSH)[vi] found that these hospitals had a median operating expense level comparable to the median for all hospitals ($9,055 compared with $9,053), but that there was broad variation between DSH hospitals ($2,060 between the 75th percentile and 25th percentile).

Evaluating efficiency also requires understanding the impact of operating expense level on the quality of care

[i] Those hospitals licensed under MGL Chapter 111, section 51, for whom a majority of beds are medical-surgical, pediatric, obstetric, or maternity.

[ii] While hospital cost reports have known limitations and accounting approaches differ from hospital to hospital, these data represent the best information available at a statewide level for analysis of hospital operating expenses. Analyses presented here describe general trends and are not intended to characterize the performance of individual institutions.

[iii] In describing the degree of variation, we used the 25th and 75th percentile hospitals to exclude outliers.

[iv] Medicare provides graduate medical education (GME) funding to support resident training expenses.

[v] We define teaching hospitals based on the Medicare Payment Advisory Commission (MedPAC) definition of major teaching hospital. Major teaching hospitals are those that train at least 25 residents per 100 hospital beds.

[vi] DSH refers to hospitals with 63% or more of patient charges attributed to Medicare, Medicaid, and other government payers, including Commonwealth Care and Health Safety Net.

Figure 2.1: Inpatient operating expenses per discharge* for all Massachusetts acute hospitals
Dollars per case mix- and wage-adjusted discharge, 2012

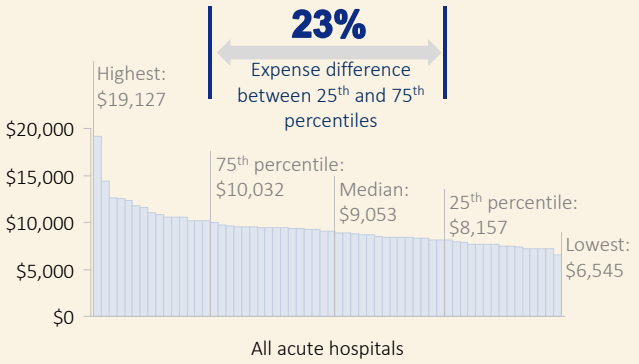
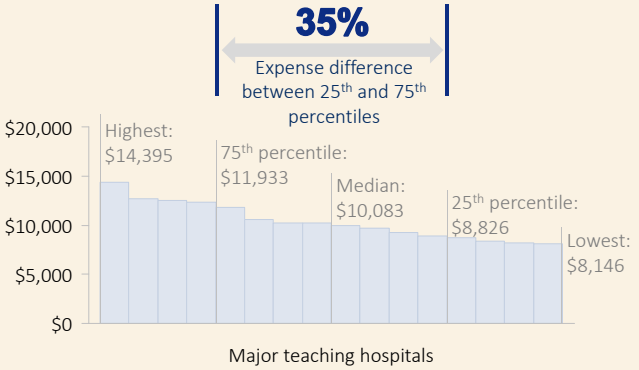


Figure 2.2: Inpatient operating expenses per discharge* for major teaching hospitals in Massachusetts
Dollars per case mix- and wage-adjusted discharge, 2012



*Inpatient patient service expenses divided by inpatient discharges. Adjusted for hospital case mix index (CHIA 2011) and area wage index (CMS 2012).

SOURCE: Center for Health Information and Analysis; Centers for Medicare & Medicaid Services; HPC analysis

delivery and patient safety. We examined performance by Massachusetts hospitals across select indicators of quality: excess readmission ratio, mortality rate, and process-of-care measures. For each measure of hospital quality, certain hospitals achieved better performance while maintaining lower operating expenses (**Figures 2.3, 2.4, 2.5**). Opportunities exist across all measures examined for hospitals to achieve higher quality performance at their current operating expense level or to reduce operating expenses while sustaining quality performance. These results suggest that some hospitals may have structures or practices that allow them to deliver care more efficiently. For example, studies have demonstrated that hospitals practicing effective management techniques have lower mortality rates and stronger financial performance.[1] Lower-efficiency hospitals could benefit from critical examination of their cost structures and should consider adopting evidence-based practices to reduce their operating expenses while maintaining or improving quality (see sidebar **"What types of**

Figure 2.3: Quality performance relative to inpatient operating expenses per admission: excess readmission ratio
Excess readmission ratio versus dollars per case mix-adjusted discharge*

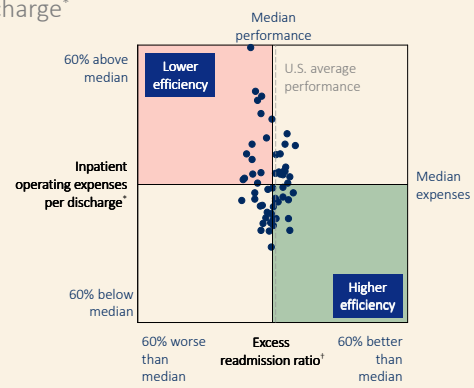


Figure 2.4: Quality performance relative to inpatient operating expenses per admission: mortality rate
Composite mortality rate versus dollars per case mix-adjusted discharge*

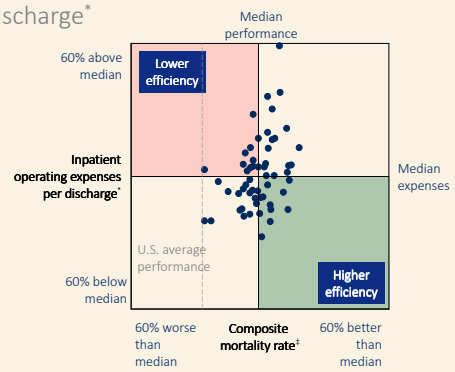
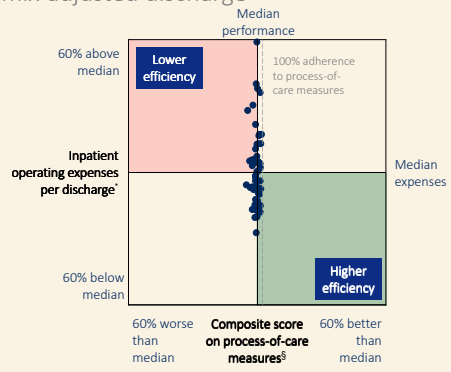


Figure 2.5: Quality performance relative to inpatient operating expenses per admission: process-of-care measures
Composite of process-of-care measures versus dollars per case mix-adjusted discharge*



*2012 inpatient patient service expenses divided by inpatient discharges. Adjusted for hospital case mix index (CHIA 2011) and area wage index (CMS 2012).

†Composite of risk-standardized 30-day Medicare excess readmission ratios for acute myocardial infarction, heart failure, and pneumonia (2009-2011). The composite rate is a weighted average of the three condition-specific rates.

‡Composite of risk-standardized 30-day Medicare mortality rates for acute myocardial infarction, heart failure, and pneumonia (2009-2011). For each condition, mortality rates were normalized so that the Massachusetts average was 1.0. The composite mortality rate is a weighted average of the three normalized, condition-specific mortality rates.

§Average across 10 process-of-care measures (CMS 2012): SCIP-Inf-1; SCIP-Inf-2; SCIP-Inf-3; SCIP-Inf-9; SCIP-Inf-10; AMI 2; AMI 8-a; PN 6; HF 2; and HF 3. Detail on measures available in Technical Appendix A2: Hospital Operating Expenses.

SOURCE: Center for Health Information and Analysis; Centers for Medicare & Medicaid Services; HPC analysis

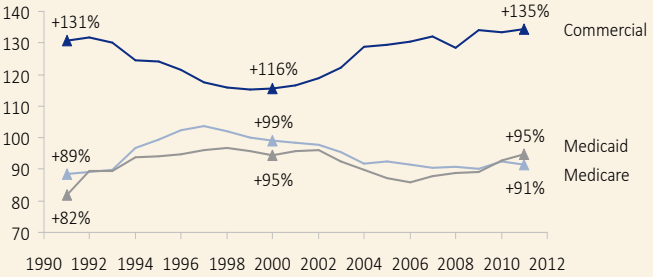
strategies are hospitals pursuing to reduce their operating expenses?").

2.2 Operating margins by payer and hospital market position

Hospitals' operating expenses and operating margins are influenced by market dynamics and the level of payments they receive from public and commercial payers. Differences in the level of payments made to hospitals by commercial payers compared with those paid by the public payers (Medicare and Medicaid) have been well-documented. Nationally, hospitals have typically made money on their commercial business while losing money on their Medicare and Medicaid business (**Figure 2.6**).

Figure 2.6: Aggregate U.S. hospital payment-to-cost ratios for commercial payers, Medicare, and Medicaid*

Percent of total expenses, 2011



* Medicaid and Medicare figures include disproportionate share payments.

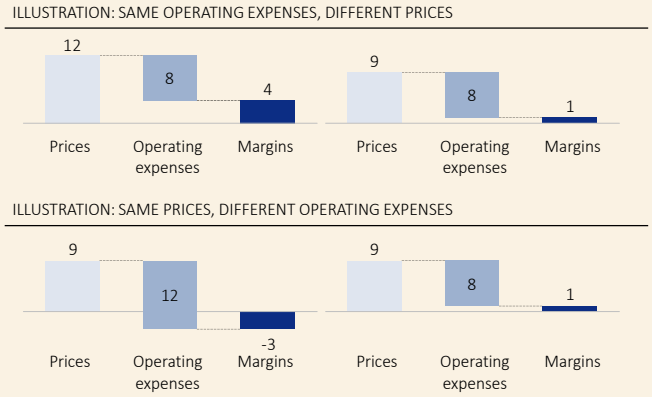
SOURCE: Avalere Health analysis of American Hospital Association Annual Survey data, 2011, for community hospitals

Massachusetts hospitals experience similar differences, but operating margins vary materially by hospital for both commercial and public payer business. Differences in the operating margins between hospitals can be driven by differences in the revenues they receive for services, by differences in the expenses they incur to deliver those services, or by both factors (**Figure 2.7**). For public payers, price levels are comparable across hospitals because Medicaid and Medicare set fee schedules based on established formulas.[vii] As a result, differences in operating margins between hospitals for public payers are largely driven by differences in expenses.

For commercial payers, the differences in margins include large differences in prices paid. CHIA's relative price reporting and analyses by the AGO have demonstrated a wide variation in commercial prices paid to Massachusetts hospitals[2,3]

[vii] These formulas account for factors like regional wages, costs associated with a teaching mission, and the case mix of patients using the hospital.

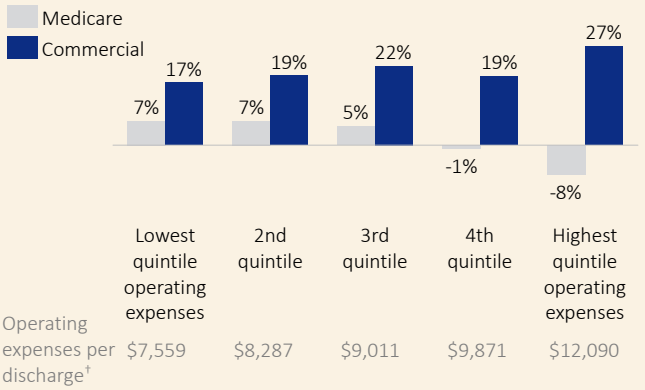
Figure 2.7: Illustrative examples of margin differences driven by prices and operating expenses



Hospital cost reports suggest that some Massachusetts hospitals earn positive margins from public payers, while others lose more than 30 cents per dollar of revenue on the same payers.[viii] Similarly, some hospitals earn more than 30 cents per dollar of revenue on commercial payers, while others earn just a fraction of that. In Massachusetts, when grouped by expense levels, the groups of hospitals that earn the largest margins on revenue from commercial payers often report the largest losses on revenue from public payers (**Figure 2.8**).

Figure 2.8: Operating margins by payer type for hospitals at different operating expense levels

Operating income as proportion of net patient service revenue,* 2012



*Operating income defined as total net patient service revenue less total patient service expenses. Payer-specific expenses are estimated by applying hospital-specific cost-to-charge ratios to hospital's charges by payer.

†2012 inpatient patient service expenses divided by inpatient discharges. Adjusted for hospital case mix index (CHIA 2011) and area wage index (CMS 2012).

SOURCE: Center for Health Information and Analysis; HPC analyss

[viii] This is on a fully allocated expense basis determined by average costs, factoring in indirect expenses and overhead. In some cases where negative margins are reported on a fully allocated expenses basis, Medicare and Medicaid payments may exceed direct care expenses.

What types of strategies are hospitals pursuing to reduce their operating expenses?

Hospitals in Massachusetts and around the nation are implementing various efforts to improve their operational efficiency with the goal of delivering high-quality care while incurring lower expenses. Below we discuss three examples of strategies that have been successfully implemented at certain hospitals. For a particular hospital, opportunities may be different than those described below, but these examples demonstrate the range of levers that are available to hospitals to improve their operating efficiency.

Procurement and supply chain management

Hospitals purchase a large variety and volume of goods, materials, and equipment. Purchased items range from surgical gloves to drugs, imaging machines, and major surgical implants. The procurement of these items is often encumbered by various forms of inefficiency, including[4]:

- Lack of coordination across hospitals in a system, with duplicative purchasing and materials management departments that fail to leverage system scale to negotiate lower prices,
- Lack of alignment across clinicians in a department, resulting in orders of similar products from different companies, thereby missing opportunities to save through bulk-volume purchasing, and
- Ineffective inventory management, resulting in stock-outs or delays for some items and large inventory levels for others.

Reducing inefficiencies in procurement can substantially reduce the expenses of delivering care. Orthopedic and cardiac implants, for instance, can represent 50 to 80 percent of the total expenses of an acute procedure.[5] Through improved management, hospitals can potentially reduce the spending across their entire supply chains by an estimated five to 15 percent.[6]

Lean operations

"Lean" management principles are most widely associated with the Toyota Production System, which seeks to reduce waste in the production process to increase value for the customer. Over the past decade, a number of organizations have translated the same lean principles to the hospital setting. The benefits of lean processes – including fewer medication errors, a decrease in health care-associated infections, less nursing time away from the bedside, faster operating room turnover, improved care-team communication about patients, and faster response time for emergency cases – not only improve patient care but also increase employee engagement, labor productivity, and operating margins.[7] Successful implementations of lean programs in hospital systems outside Massachusetts have shown significant improvements in efficiency, with one hospital system reporting savings equivalent to three to five percent of its annual revenue within three years and another achieving a 36 percent improvement in labor productivity.[8,9]

Still, the literature contains many cases of (and explanations for) hospitals' failures in implementing lean principles, and statistically rigorous evidence of the potential impact is limited.[10,11] Some systems that have achieved great success in improving efficiency in their core markets have encountered difficulties in trying to scale their approach to new markets.[12] Although efforts to adopt lean principles do not guarantee success, with careful implementation Massachusetts hospitals may realize efficiencies through established successful lean programs.

Cost accounting

In their efforts to reduce operating expenses, hospitals are often limited by the information available from their established cost accounting practices. Many Massachusetts hospitals have not implemented detailed cost accounting systems, and thus the operating expenses associated with a particular procedure are often not measured directly.[3] Rather, the hospitals calculate a hospital- or department-wide ratio of total expenses to total charges and then multiply this ratio by the amount billed for that procedure to obtain an expense value. Some hospitals attempt a more accurate allocation by using internally developed relative value units based on the complexity of the procedure, but such allocation methods introduce other measurement errors. Without direct measurement of expenses in delivering care, hospitals encounter difficulties in managing and improving their expenses. To remedy these problems, several health systems have been pursuing more rigorous approaches to expense measurement, using actual data on the time spent by clinicians and support personnel, and also of the space, equipment, and supplies used to treat patients for a specific condition.[13,14]

In the future, improved accounting practices will become increasingly important as hospitals seek to reduce their per-procedure operating expenses to enable more affordable care delivery. Benchmarking data available through state reporting programs or provider data consortiums can also support operational improvement efforts.

Some hospitals seek to negotiate greater payments from commercial payers to make up for these public payer shortfalls. Previous analyses have shown that hospitals are not uniformly successful in realizing this shift in source of revenue (often referred to as "cost-shifting"), as Massachusetts hospitals with high public payer mix on average receive *lower* relative commercial prices than hospitals with low public payer mix.[2] Whether a hospital is able to negotiate higher commercial prices when it faces a decline in public payer revenue is most closely linked to the hospital's relative market leverage, not its relative mix of public payer reimbursement.[15]

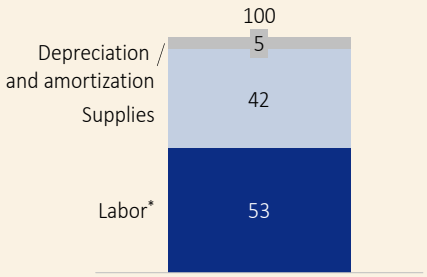
This impacts operating expenses over time as hospitals with stronger market leverage can earn higher revenues from commercial payers and therefore have less pressure to constrain their expenses.[16,17] Meanwhile, hospitals with limited market leverage receive lower rates of commercial payer reimbursement and, under greater financial pressure, tend to be more aggressive at maintaining lower operating expenses.[ix] Nationally, hospitals with lower expense structures fare better at Medicare and Medicaid levels of reimbursement. Analysis of the hospital cost reports in Massachusetts shows consistent results. These findings reinforce the importance of monitoring overall market performance and competitiveness.

2.3 Composition of hospital operating expenses

In 2012, spending on labor constituted more than half of all operating expenses for Massachusetts hospitals (**Figure 2.9**).[x] In some hospitals, the staff is directly paid for by the hospital in the form of salaries and benefits; in others, hospitals outsource certain roles to companies and pay for the labor through a purchased services contract.

It is important to better understand the relationship of labor expenses, supply expenses, and other operating expenses with quality of care in order to assess how hospitals can become more efficient. Current information, however, is limited for conducting such an analysis. Available cost reports contain only spending within a hospital, excluding expenses incurred through affiliated provider organizations in the hiring of medical staff and other personnel.n the current structure, hospitals report similar expenses differently. Moreover, available data on hospital capital expenses are limited. Improved data are needed to further analyze high-efficiency models and best practices, which could support provider organization improvement efforts through actionable benchmarks. In the future, we will continue to examine this area as improved data become available through CHIA data collection efforts and other programs.

Figure 2.9: Breakdown of hospital operating expenses
Percent of direct expenses by category, 2012



* Labor expense category is composed of salaries and benefits, physician compensation paid directly by hospitals, and purchased services.

SOURCE: Center for Health Information and Analysis; HPC analysis

2.4 Conclusion

Hospitals vary greatly in their level of operating efficiency, with some capable of delivering high-quality care with lower expenses. These differences between higher- and lower-expense hospitals amount to several thousand dollars per discharge. There are multiple strategies to reduce operating expenses that are being explored around the country, which, if adopted, could enable Massachusetts hospitals to deliver high-quality care at more affordable prices.

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[ix] Some reductions in operating expenses may reflect efficiency improvements, while others may be of potential concern. For example, hospitals with limited revenue may maintain lower operating expenses by deferring investment in facilities and equipment, which could deepen competitive disadvantages over time.

[x] Labor expenses shown here include direct spending on salaries and benefits, spending on purchased services, and spending on physician compensation that is paid directly by the hospital, rather than a separate physician organization.

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