

CENTER FOR HEALTH
INFORMATION AND ANALYSIS

MASSACHUSETTS HOSPITAL PROFILES

DATA THROUGH FISCAL YEAR 2012

MARCH 2014



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INTRODUCTION

This report provides an overview of the Massachusetts hospital industry and includes statewide and national information where possible for comparison and context to further understanding of Massachusetts hospitals. It accompanies individual financial and clinical profiles of each of the 68 acute and 27 non-acute hospitals in the Commonwealth.¹

Hospitals play a central role in the Massachusetts health care system, and are critical to achieving the Commonwealth's goals of controlling costs while maintaining or improving the quality of care delivered. Spending for hospital services represents a large portion of the health care dollar. In 2012, Massachusetts commercial payers reported that hospital care made up 41% of their total medical expenses—17% on inpatient care, and 24% on outpatient care.² Spending on hospital services is also a key contributor to the relatively higher cost of health care in Massachusetts. A recent analysis by the Massachusetts Health Policy Commission (HPC) demonstrated that Massachusetts spends 36% more on personal health care expenditures than the United States as a whole, and spending on hospital care accounted for 42% of this difference.³

In 2012, Massachusetts commercial payers reported that hospital care made up 41% of their total medical expenses.

OVERVIEW OF THE MASSACHUSETTS HOSPITAL INDUSTRY

There are 95 hospitals in Massachusetts: 68 acute facilities and 27 non-acute facilities. The Massachusetts Department of Public Health (DPH) and Department of Mental Health (DMH) are responsible for licensing hospital services, and issue licenses by the type of hospital service, such as medical-surgical, intensive care unit, psychiatric, and rehabilitation.⁴ State law defines “acute hospitals” as hospitals with “a majority of medical-surgical, pediatric, obstetric and maternity beds,” and the teaching hospital of University of Massachusetts Medical School.⁵ Non-acute hospitals in Massachusetts are those that do not meet these criteria, and have a majority of their beds licensed as rehabilitation, chronic, psychiatric, or substance abuse beds.⁶ Note that many acute hospitals have non-acute units, such as rehabilitation or psychiatric units, within their hospitals. For this report, those units located within the acute hospitals are included in the acute hospital data. While the Center for Health Information and Analysis (Center) has included profiles for both acute and non-acute hospitals, the remainder of this report will focus primarily on acute hospitals.

¹ There are individual profiles for 69 acute hospitals. Saints Medical Center merged with Lowell General Hospital in FY12; however, Saints Medical Center is profiled for data prior to the merger. State-operated non-acute hospitals were not included in these profiles, as data for these hospitals was not available at the time of publication.

² Massachusetts Center for Health Information and Analysis, Massachusetts Total Medical Expenses: Results from 2010-2012: Chartbook (October 2013). Available at: <http://www.mass.gov/chia/docs/r/pubs/13/cy2010-cy2012-tme-chartbook.pdf> - (accessed on March 28, 2014).

³ Massachusetts Health Policy Commission. 2013 Cost Trends Report. Available at: <http://www.mass.gov/anf/docs/hpc/2013-cost-trends-report-final.pdf> - (accessed on March 28, 2014).

⁴ See 105 CMR 130.020.

⁵ MGL c. 118E § 8A.

⁶ DMH licenses non-acute psychiatric beds. DPH licenses all other bed types at non-acute hospitals.

The Massachusetts hospital market has undergone significant change in recent years. Since 1990, eighty percent of existing acute hospitals were involved in some consolidation, affiliation, or acquisition.⁷ As shown in Table 1, nearly two-thirds of Massachusetts hospitals today are affiliated with a multi-hospital system and owned by a parent organization.

Table 1: In FY2012, 67% of hospitals in Massachusetts were non-profit entities

Hospital Type	Acute Non-Profit*	Acute For-Profit	Non-Acute Non-Profit	Non-Acute For-Profit	TOTAL
Multi-Hospital System	29	14	9	10	62
Individual	25	0	1	7	33
TOTAL	54	14	10	17	95

Data Source: Hospital Audited Financial Statements

* Includes Cambridge Health Alliance, the only municipally-owned hospital in Massachusetts

In addition to their memberships with hospital systems, many hospitals have affiliations with other organizations. Each academic medical center and teaching hospital is affiliated with one of the four medical schools in the Commonwealth. Also, many community hospitals have clinical affiliations with larger teaching hospitals, and will often refer patients to these institutions. Some hospitals additionally have strong ties to specific health plans. For example, BMC HealthNet and Health New England health plans were founded by the parent organizations of Boston Medical Center and Baystate Health System, respectively. Neighborhood Health Plan is owned by Partners HealthCare, which is the parent organization for nine acute and three non-acute hospitals in Massachusetts. Tufts Health Plan recently acquired Network Health, previously a subsidiary of Cambridge Health Alliance. Most recently, Tufts Medical Center and Vanguard Health Systems launched Minuteman Health.

Since 1990, eighty percent of existing acute hospitals were involved in some consolidation, affiliation, or acquisition.

The Massachusetts market is also characterized by relatively few public hospitals compared to other states.⁸

⁷ Massachusetts Health Policy Commission, 2013 Cost Trends Report, p. 16. Available at: <http://www.mass.gov/anf/docs/hpc/2013-cost-trends-report-final.pdf> (accessed on March 28, 2014).

⁸ Kaiser Family Foundation, State Health Facts: Hospitals by Ownership Type. Available at: <http://kff.org/other/state-indicator/hospitals-by-ownership/> (accessed on March 28, 2014).

HOSPITAL SERVICES

Acute hospitals provide inpatient and outpatient medical and surgical services, typically with 24 hour emergency care. Of the state's 68 acute hospitals, 47 provide maternity care. A number of acute hospitals also operate psychiatric and rehabilitation units. Table 2 summarizes the number of acute hospital beds by service type. Many hospitals additionally operate health centers in locations away from their main hospital campuses.

Table 2: In FY2012, Medical/Surgical beds represented over half of total hospital beds in the state

Type of Staffed Bed	Total	% Total
Medical/Surgical	8,443	57%
Pediatric	737	5%
Obstetric	1,052	7%
Psychiatric	1,269	9%
Skilled Nursing Facility	84	1%
Other Acute	269	2%
Intensive Care Unit	1,629	11%
Newborn Nursery	1,012	7%
Special Care Nursery	134	1%
Chronic+Rehabilitation	103	1%
Total Beds*	14,732	100%

Data Source: Hospital 403 Cost Reports

* Bed counts do not include Shriners Hospitals for Children.

Note: Percentage calculations may not sum to 100% due to rounding.

Massachusetts has eight specialty hospitals that provide specialized care to specific populations:

- Boston Children's Hospital specializes in pediatric care;
- Dana-Farber Cancer Institute (Dana-Farber) is the state's only freestanding hospital specializing in cancer treatment;
- Massachusetts Eye and Ear Infirmary provides specialized services for disorders of the eye, ear, nose, and throat, including a 24-hour emergency department for these conditions;
- New England Baptist Hospital specializes in orthopedic care;
- Shriners Hospitals for Children in Boston and Springfield provide specialized care for pediatric burns, orthopedics, and cleft lip and palate.
- Kindred Hospital-Boston and Kindred Hospital-Boston North Shore specialize in providing long-term acute services, such as acute cardiac and pulmonary medicine, dialysis, wound care, infectious disease, and rehabilitation services following long-term illness.

The size of acute hospitals varies widely, from 993 staffed beds at Massachusetts General Hospital, located in the Metro Boston region, to 19 staffed beds at Nantucket Cottage Hospital, located in the Cape and Islands region. The Commonwealth's largest hospitals are academic medical centers and teaching hospitals, most of which are located in the Metro Boston region, while the smallest hospitals tend to be located in less densely populated parts of the state. Most acute hospitals in Massachusetts are located within the proximity of an urban area; however, there are a few hospitals that have a special status among public payers due to their rural or relatively isolated locations. In FY2012, Cape Cod Hospital was considered by the Centers for Medicare and Medicaid Services (CMS) as a Sole Community Hospital, and Athol Hospital, Fairview Hospital, and Martha's Vineyard Hospital were considered by CMS as Critical Access Hospitals.⁹

Statewide, maternity and delivery cases account for the largest single reasons for admissions to acute hospitals, representing 16% of the state's discharges in FY2012. Table 3 lists the top ten reasons for inpatient care in FY2012:

Table 3: Maternity and delivery cases were the most common reasons for inpatient admissions in FY2012

Rank	DRG	Description	Discharges*	% All Discharges
1	540, 560 and 640	Delivery DRGs, including newborns	132,857	16%
2	194	Heart Failure	20,331	2%
3	139	Other Pneumonia	19,926	2%
4	720	Septicemia & Disseminated Infections	18,472	2%
5	140	Chronic Obstructive Pulmonary Disease	17,986	2%
6	302	Knee Joint Replacement	15,533	2%
7	201	Cardiac Arrhythmia & Conduction Disorders	15,073	2%
8	383	Cellulitis & Other Bacterial Skin Infections	14,760	2%
9	463	Kidney & Urinary Tract Infections	13,525	2%
10	753	Bipolar Disorders	12,417	1%
		All other cases	548,300	66%
		TOTAL DISCHARGES	829,180	100%

Data Source: Hospital Discharge Database (HDD)

Note: Total discharges reported by hospitals in the HDD may vary from total discharges reported by hospitals in the Hospital 403 Cost Reports. See Technical Appendix for more information.

* Discharge data does not include the acute care Kindred Hospitals, as HDD data was not available for these hospitals. Shriners Hospitals for Children were also not included.

⁹ A Sole Community Hospital is a hospital that is located in a rural area or in an area where it is difficult to access another hospital quickly. A Critical Access Hospital is a hospital that has no more than 25 acute beds, is located in a rural area, and is more than a 35-mile drive from the nearest hospital or more than a 15-mile drive in areas with mountainous terrains or secondary roads.

Some hospitals specialize in certain conditions and may often have a disproportionate number of inpatient discharges for a particular diagnosis in their region. Some notable examples from FY2012 include:

- Within the Metro Boston region:
 - Boston Medical Center treated 46% of all Sickle Cell Anemia Crisis cases
 - Massachusetts General Hospital treated 40% of all Craniotomy cases and 33% of all Chemotherapy cases
 - Steward St. Elizabeth's Medical Center treated 58% of all Alcohol and Drug Dependence with Rehabilitation cases
- Within the Pioneer Valley/Franklin region:
 - Baystate Medical Center treated 100% of all Percutaneous Cardiovascular Procedures with AMI cases
 - Mercy Medical Center treated 100% of all Alcohol and Drug Dependence with Rehabilitation or Rehabilitation/Detoxification Therapy cases
- Within the Central Massachusetts region:
 - UMass Memorial Medical Center treated 74% of all Percutaneous Cardiovascular Procedures with AMI cases

The acuity and severity of patient conditions also vary widely between hospitals. A hospital's case mix index (CMI)¹⁰ measures the acuity and severity of illness of a hospital's patients. Dana-Farber had the highest CMI in the state at 2.53, while Nantucket Cottage Hospital had the lowest CMI at 0.55. The statewide average CMI in FY2012 was 1.06.

Cohort Services

The Center assigned each hospital to a cohort of similar hospitals: academic medical centers, teaching hospitals, community hospitals, and community-Disproportionate Share Hospitals (DSH)¹¹. Specialty hospitals are not identified with a distinct cohort.¹²

Hospital services vary considerably by cohort. Academic medical centers and specialty hospitals may sometimes be the only providers of highly specialized services. For example, four of the state's academic medical centers performed heart and lung transplants in 2012. Also, 70% of the non-trauma craniotomy cases were performed at academic medical centers in 2012, mostly at Massachusetts General Hospital. Community hospitals, on the other hand, treat a significant share of the state's less complex cases. Over half of the state's deliveries and 73% of chronic obstructive pulmonary disease cases are treated at community hospitals.

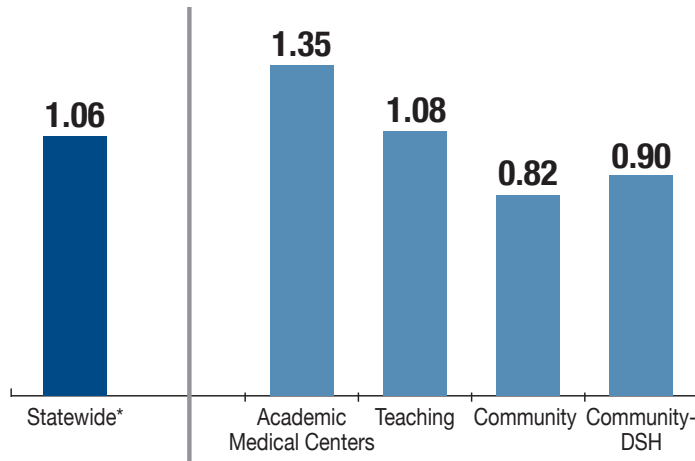
¹⁰ Case Mix Index (CMI) is a relative value assigned to a hospital's mix of patients to determine the overall acuity of the hospital's patients compared with others. The Center calculated CMIs using HDD data, grouped by the 3M™ All Patient Refined (APR) grouper, version 26.1 with Massachusetts-specific baseline cost weights.

¹¹ A Disproportionate Share Hospital (DSH) is defined in M.G.L. c. 6D, Section 1 as a hospital with a minimum of 63% of patient charges attributed to Medicare, Medicaid, and other government payers, including Commonwealth Care and the Health Safety Net.

¹² For definitions of each cohort and hospitals assigned to each cohort, see Technical Appendix.

These service differences among the cohorts reflect differences in the patient acuity and severity profiles. As shown in Figure 1, academic medical centers and teaching hospitals have the highest CMIs in the state.

Figure 1: In FY2012, average patient severity levels varied across hospital cohorts



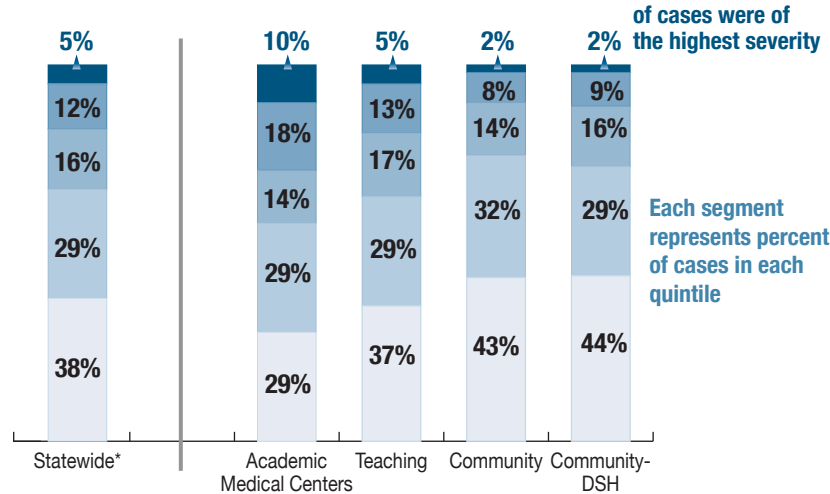
Data Source: Hospital Discharge Database (HDD)

* Statewide Average CMI includes Specialty hospitals, but does not include the acute care Kindred Hospitals, as HDD data was not available for these hospitals, or Shriners Hospitals for Children.

To evaluate the distribution of cases at each hospital, severity quintiles were developed by ranking all possible discharges by severity. Each hospital's cases were then distributed into the corresponding severity quintiles. Approximately 75% of the cases seen in community hospitals fell into the lowest two severity quintiles. At academic medical centers, 58% of cases were also of lower severity – a significantly lower proportion than the community hospitals, but still a majority of overall cases. Nearly 30% of cases at academic medical centers were in the two highest severity quintiles. Figure 2 illustrates the case severity distribution by quintile across hospital cohorts.

At academic medical centers, 58% of cases were of relatively low severity – a significantly lower proportion than the community hospitals, but still a majority of overall cases.

Figure 2: Academic medical centers treated the greatest proportion of higher-severity cases, while community hospitals treated the greatest proportion of lower-severity cases in FY2012



Data Source: Hospital Discharge Database (HDD) and the 3M™ APR-DRG 26.1 All Patient Refined Groupers
 * Statewide excludes Specialty hospitals.

Note: Percentage calculations may not sum to 100% due to rounding.

HOSPITAL UTILIZATION

Massachusetts hospitals have experienced a shift from inpatient care to outpatient care in recent years. Between 2008 and 2012, per capita inpatient admissions declined by 4.6%, while per capita outpatient visits increased by 1.2%.¹³ This is consistent with trends on a national level, where between 2008 and 2011, per capita inpatient admissions declined by 5%, while per capita outpatient visits increased by 2.6%.¹⁴

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Utilization by Hospital Cohort

Massachusetts residents use hospitals more than national norms. For inpatient care, the Massachusetts rate of inpatient admissions per 1,000 persons is 10% higher than the national average, after adjusting for age differences.¹⁵ This higher inpatient utilization is not necessarily driven by inpatient capacity. On a per capita basis, Massachusetts has slightly fewer beds per 1,000 persons than the nation as a whole: 2.4 beds per 1,000 in Massachusetts compared to 2.6 beds per 1,000 nationally.¹⁶ For outpatient care, Massachusetts residents use hospital-based non-emergency department outpatient services 72% more often than the national average¹⁷

Massachusetts residents use hospital-based non-emergency department outpatient services 72% more often than the national average.

¹³ Calculated using 403 Cost Report and United States Census Bureau data.

¹⁴ American Hospital Association, Trendwatch Chartbook 2014: Supplementary Data Tables, Utilization and Volume Table 3.1: Trends in Utilization in Community Hospitals, 1992-2012; Table 3.4: Outpatient Utilization in Community Hospitals, 1992-2012. Available at: <http://www.aha.org/research/reports/tw/chartbook/ch3.shtml> (accessed on March 28, 2014).

¹⁵ Massachusetts Health Policy Commission, 2013 Cost Trends Report, p. 10. Available at: <http://www.mass.gov/anf/docs/hpc/2013-cost-trends-report-final.pdf> (accessed on March 28, 2014).

¹⁶ Kaiser Family Foundation, Hospital Beds per 1,000 Population. Available at: <http://kff.org/other/state-indicator/beds/> (accessed on March 28, 2014).

¹⁷ Massachusetts Health Policy Commission, *ibid.*

A hospital's average occupancy rate measures the percent of the hospital's inpatient staffed beds that have been occupied over the course of a year. Statewide, the median acute hospital occupancy rate is equal to the national average—both at 65%. However, both the academic medical center and teaching hospital cohorts have higher occupancy rates than other cohorts, as shown in Table 4:

Table 4: Occupancy rates were higher at academic medical centers and teaching hospitals than at other cohorts in FY2012

Cohort	FY2012 Occupancy Rate
Academic Medical Centers	84%
Teaching	74%
Community	62%
Community-DSH	61%
Specialty*	64%

Data Source: Hospital 403 Cost Reports

* Shriners Hospitals for Children were not included in this analysis.

Because academic medical centers and teaching hospitals are among the largest hospitals in the state, they account for nearly half of all discharges from Massachusetts hospitals.

As shown in Table 5, the number of statewide acute hospital inpatient discharges declined by 2% between FY2008 and FY2012. Teaching hospital discharges declined by 3.5%, the largest decline of the four cohorts. Community hospitals were the only cohort that did not see a decline in discharges during this period.

Table 5. Discharges declined in all cohorts except community hospitals between FY2008 and FY2012

Cohort	Number of Hospitals	FY2008 Discharges	FY2012 Discharges	Percent of Statewide FY2012 Discharges	Change, FY2008 to FY2012
Academic Medical Centers	6	236,261	231,506	28%	-2.0%
Teaching	9	152,016	146,702	17%	-3.5%
Community	22	209,978	210,962	25%	0.5%
Community-DSH	23	229,350	222,589	27%	-2.9%
Specialty*	6	28,237	26,888	3%	-4.8%
TOTAL STATEWIDE	66**	855,842	838,647	100%	-2.0%

Data Source: Hospital 403 Cost Reports

Note: Total discharges reported by hospitals in the 403 Cost Reports may vary from total discharges reported by hospitals in the Hospital Discharge Database (HDD). See Technical Appendix for more information.

* Shriners Hospitals for Children were not included in this analysis.

** In FY12 there were 66 hospitals included. In FY08 there were 67 hospitals (Saints Medical Center was a separate hospital in FY08, but merged with Lowell General Hospital in FY12).

While statewide outpatient visits have increased significantly in recent years, most of the outpatient growth has occurred at academic medical centers. As shown in Table 6, academic medical centers and teaching hospitals experienced the largest and most consistent growth in outpatient visits between FY2008 and FY2012.

Table 6: Between FY2008 and FY2012, growth in the average cohort hospital's volume of outpatient visits was greatest at academic medical centers and teaching hospitals

Cohort	Average Change in Outpatient Visits – Cumulative From FY2008			
	FY2008-FY2009	FY2008-FY2010	FY2008-FY2011	FY2008-FY2012
Academic Medical Centers	4.0%	5.6%	7.0%	10.6%
Teaching	1.5%	-1.6%	0.9%	8.1%
Community	-0.8%	2.5%	-2.7%	-0.2%
Community-DSH	-0.2%	0.7%	-3.2%	-0.1%

Data Source: Hospital 403 Cost Reports

Note: The percent change in volume of outpatient visits was averaged for the subject-cohort hospitals between the applicable year and FY08 (base year) to determine the average experience for the cohort.

Hospital Payer Mix and Relative Prices

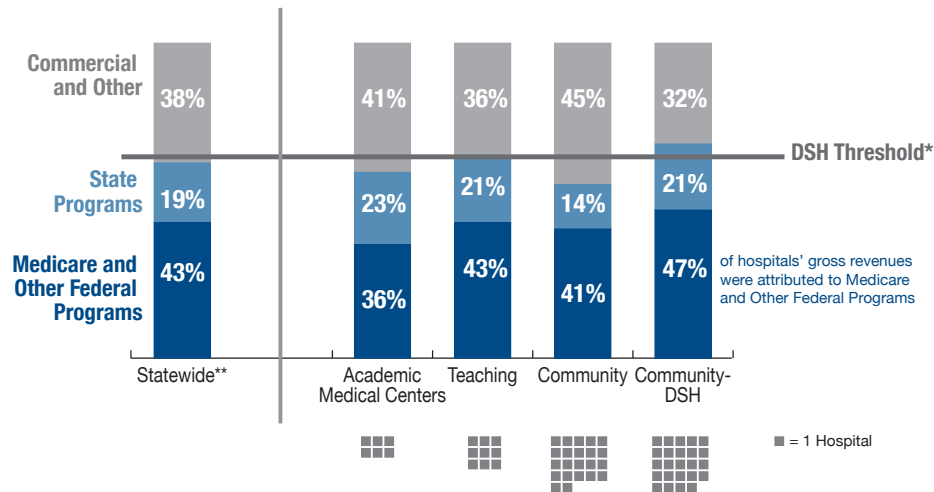
A hospital's payer mix is an important aspect of a hospital's revenue stream and cost structure. Public payers typically pay lower rates than commercial payers.¹⁸ Additionally, commercial payers generally pay different prices to different hospitals for the same services. Higher-priced hospitals received a substantially greater proportion of commercial hospital payments in 2012: 84% of inpatient payments and 75% of outpatient payments.¹⁹

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Cohort Hospital Payer Mix

Hospital cohorts vary in terms of their payer mix. While Medicare is the largest payer for hospital services in the Commonwealth, commercial payers represent a substantial source of hospital revenues. State programs, which include MassHealth, Commonwealth Care, and the Health Safety Net, represent on average slightly less than 20% of statewide hospital payer mix. As Figure 3 illustrates, community-DSH hospitals are highly dependent on public payers, most notably Medicare, which accounts for approximately 47% of their gross revenues, compared to the statewide figure of 43%.

Figure 3: In FY2012, community-DSH and teaching hospitals had higher public payer mix



Data Source: Hospital 403 Cost Reports

* Hospitals have DSH status if they have 63% or more of gross revenues (GPSR) attributable to Medicare, Medicaid, and other government payers, including Commonwealth Care and the Health Safety Net.

** Statewide excludes Specialty hospitals.

¹⁸ Reinhardt, U (2006). "The Pricing of US Hospital Services: Chaos Behind a Veil of Secrecy." Health Affairs 25(1): 57-69.

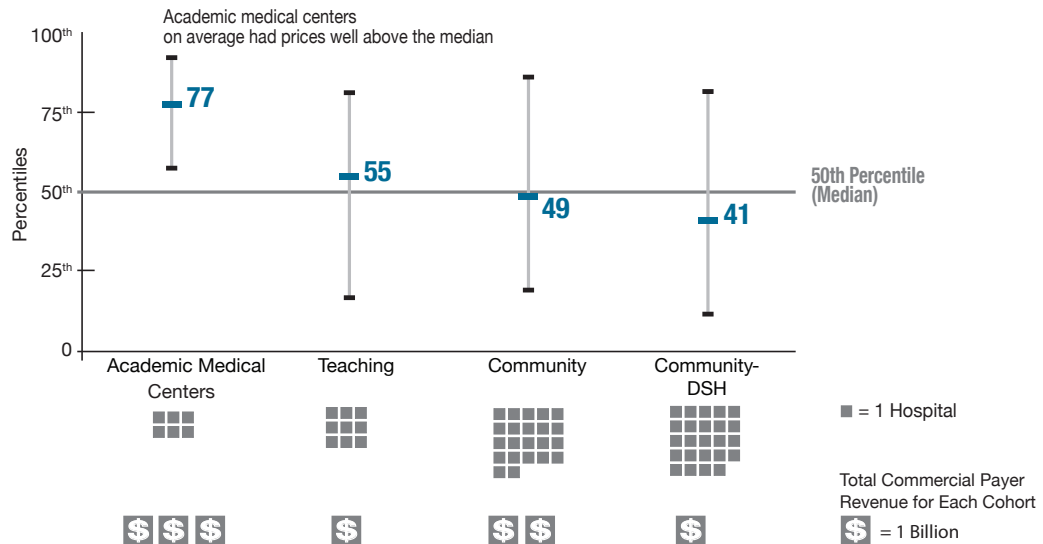
¹⁹ Massachusetts Center for Health Information and Analysis, Data Supplement: 2012 Relative Price Data (October 2013). Available at: <http://www.mass.gov/chia/docs/r/pubs/13/rp-2012-data-supplement.pdf> (accessed on March 28, 2014).

In Massachusetts, Boston Medical Center, an academic medical center, and Cambridge Health Alliance, a teaching hospital, had the largest percentages of Medicaid and other state programs in FY2012. Both of these hospitals were also considered DSH hospitals. Boston Children’s Hospital, a specialty hospital, and Newton-Wellesley Hospital, a community hospital, had the largest percentage of commercial revenue, at 67% and 62% respectively. Due to its focus on specialized pediatric care, Boston Children’s Hospital had very little Medicare revenue.

Cohort Hospital Commercial Relative Prices

Commercial payers’ prices vary considerably among hospitals, and clear trends can be seen among the cohorts. Academic medical centers are paid substantially higher prices by commercial payers relative to the teaching and community hospital cohorts even when comparing similar services. As shown in Figure 4, academic medical centers are paid higher prices on average than the prices paid to community hospitals. In particular, hospitals with a higher public payer mix tend to have lower commercial relative prices. Community-DSH hospitals have the lowest composite relative price percentile of the four cohorts. Also, Boston Medical Center and Cambridge Health Alliance, mentioned above as the two hospitals with the highest public payer mix in the state, have the lowest composite relative price percentiles within their cohorts.

Figure 4: In 2012, academic medical centers had higher commercial payer price levels relative to other hospital cohorts



Data Source: Payer data reported in accordance with 957 CMR 2.00

Note: Commercial payer relative price levels represent the range and average of the cohort hospitals’ blended composite relative price levels, expressed as percentiles, for all Massachusetts payers in Calendar Year 2012.

This finding is consistent with another recent study that examined characteristics of high-priced hospitals elsewhere in the country. The study found that hospitals with higher prices were more likely to be large hospitals, have significant market share, have teaching programs, and offer specialized services.²⁰ These are each common attributes that are generally shared by the Massachusetts academic medical centers and teaching hospitals with the highest relative prices.

20 White, C et al (2014). “Understanding Differences Between High- And Low-Price Hospitals: Implications for Efforts to Rein in Costs.” Health Affairs 33(2): 324-331.

HOSPITAL COSTS

Acute hospitals reported total patient care costs of nearly \$20 billion in FY2012. These costs were primarily wage and benefit costs, but also included expenses for equipment, supplies and materials, and capital-related expenses, such as leases and depreciation. A hospital's cost structure is likely to be influenced by a number of factors:

- Patient acuity may drive costs higher, because more complex and severely ill patients will require additional resources, such as staff time or specialized skills and equipment;
- Academic medical centers and teaching hospitals incur additional expenses operating residency and other teaching programs;
- Rural and geographically isolated hospitals typically have higher per unit costs because they have significant fixed costs that may be comparable to other hospitals, but have lower patient service volume over which to spread these costs.

However, even after adjusting for differences in patient case mix, direct medical education costs, and physician compensation costs, there is wide variation in the inpatient cost per case mix adjusted discharge (CMAD). In FY2012, there was more than a 23% variation between the 25th percentile cost hospital and the 75th percentile cost hospital.

Hospital costs incurred to care for patients have increased in recent years. Statewide, the median inpatient hospital cost²¹ per CMAD increased by 2.3% between 2009 and 2012 while inpatient volume decreased by 2.7%. This suggests that hospitals were able to contain inpatient costs below general inflation levels during this period.

Total outpatient costs, which unlike inpatient costs were not adjusted²², increased by 13.7% during this period. These trends are consistent with a broad, industry-wide shift moving care from inpatient to outpatient settings.

Comparing hospital-reported costs to payer experience suggests that the net effect of these changes is an increase in total hospital spending (inpatient plus outpatient). Overall, commercial payers reported a 4.2% increase on spending for hospital services between 2010 and 2012, while overall growth of total medical expenses during this period was 5.8%.²³

Cohort Costs

Among the cohorts, academic medical centers comprised the largest share of Massachusetts hospital costs in FY2012, accounting for 40% of total statewide hospital costs. This is largely due to their large share of patient service volume. After adjusting for: patient case mix, direct medical education costs, and physician compensation costs, academic medical centers had the highest inpatient cost per CMAD, with an average 10.7% higher than the statewide average. Figure 5 illustrates the range in inpatient cost per CMAD by cohort. Note that some of the outlier values are rural hospitals with low patient service volumes.

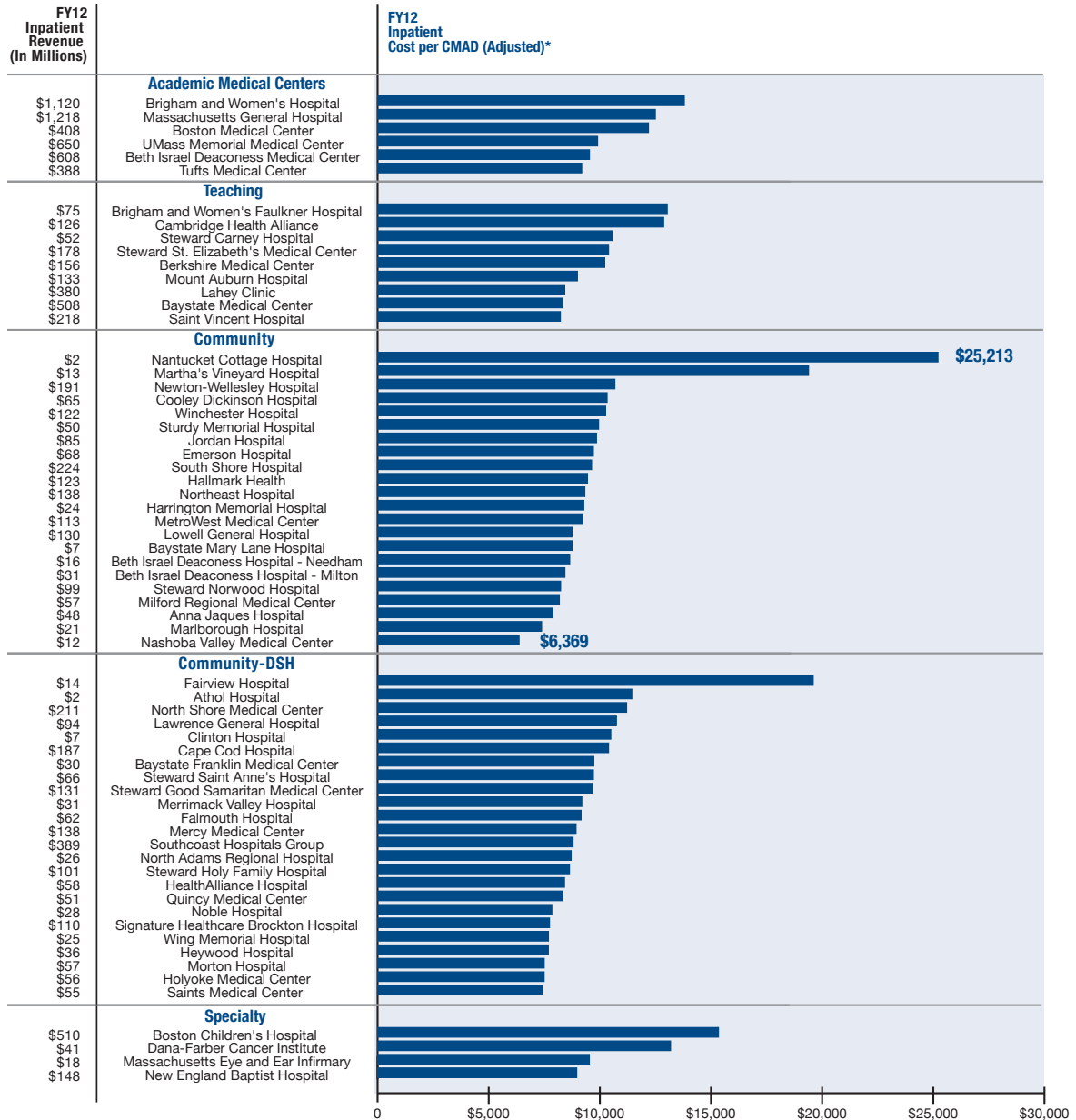
Even after adjusting for differences in patient case mix, direct medical education costs, and physician compensation costs, there is wide variation in the inpatient cost per case mix adjusted discharge among hospitals.

²¹ Costs were adjusted to exclude direct medical education costs and physician compensation costs.

²² Unlike the inpatient cost per CMAD metric, outpatient costs were not adjusted for volume, patient case mix, service mix, direct medical education costs, or physician compensation costs.

²³ Massachusetts Center for Health Information and Analysis, Massachusetts Total Medical Expenses: Results from 2010-2012: Chartbook (October 2013). Available at: <http://www.mass.gov/chia/docs/r/pubs/13/cy2010-cy2012-tme-chartbook.pdf> (accessed on March 28, 2014).

Figure 5: In FY2012, the academic medical center cohort had the highest inpatient cost per CMAD, although some rural hospitals in other cohorts had much higher inpatient costs per CMAD



Data Source: Cost and discharge data were sourced from the Hospital 403 Cost Reports. Case mix data was sourced from the Hospital Discharge Database.

Note: The acute care Kindred Hospitals were not included in this analysis, as case mix data was not available for these hospitals. Shriners Hospitals for Children were also not included.

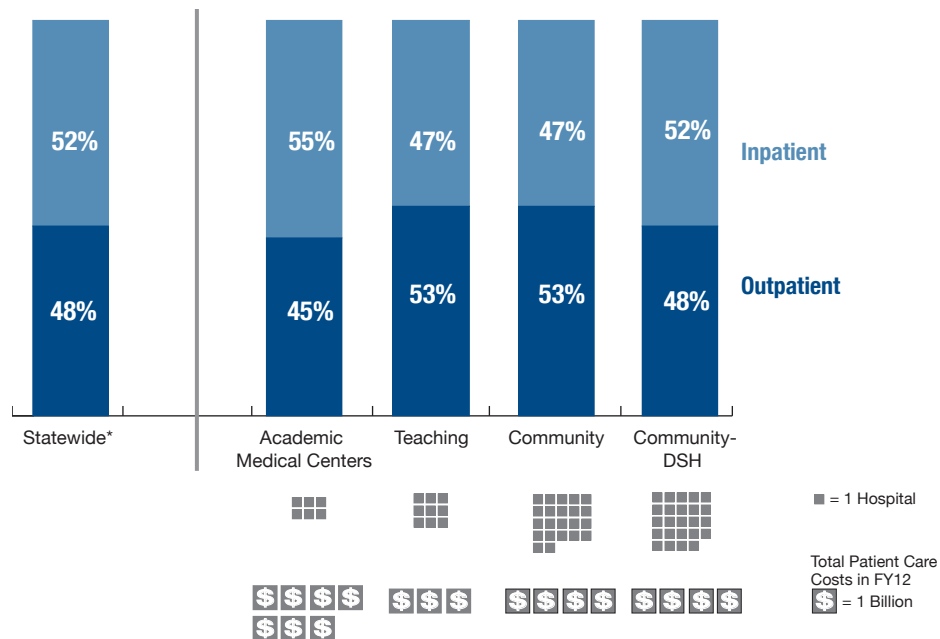
* Costs were adjusted to exclude direct medical education costs and physician compensation costs. Inpatient costs can vary among hospitals depending on a number of factors, including these cost categories. Adjusting for these cost categories facilitates better comparison between hospitals that have these costs and those that do not. Excluding these costs, however, does not reveal the true cost for inpatient care, which may be higher for hospitals with medical education costs and physician compensation costs. For more information on these cost categories, see Databook.

Figure 5 also shows the significant variation in inpatient costs within each cohort. Even excluding the low-volume outliers, variation within each cohort ranged from 45% (Community) to 58% (Teaching).

Among the cohorts, the average inpatient cost per CMAD increased the most at community hospitals, increasing by approximately 6.2% between FY2009 and FY2012, while teaching hospitals saw a decrease of 2.4% during this same time frame. Community-DSH hospitals and academic medical centers had increases of 4.9% and 0.4%, respectively, during this period.

Statewide, outpatient services represented 48% of total hospital patient costs. As shown in Figure 6, however, academic medical centers had a higher proportion of costs attributable to inpatient care compared to the other cohorts.

Figure 6: In FY2012, academic medical centers had a greater share of their total costs attributable to inpatient care



Data Source: Hospital 403 Cost Reports
 * Statewide excludes Specialty hospitals.

FINANCIAL PERFORMANCE

Acute Hospital Financial Performance

Overall, Massachusetts hospitals' financial performance has been improving steadily since FY2008. The statewide²⁴ median total margin²⁵ in FY2008 was 0.8%, while in FY2012 it had increased to 3.4%. This change is largely attributable to increases in hospital revenue, rather than a reduction in overall hospital costs. Between FY2008 and FY2012, total hospital costs increased by 14% (3.4% compound annual growth rate), while total hospital revenues increased by 17% (4.1% compound annual growth rate) over the same period. In FY2012, operating margins increased for most acute hospitals. A contributing factor to overall profitability was enhanced Medicare payments as a result of the rural floor rule, which increased Medicare inpatient payments by nearly 9%.²⁶

²⁴ Statewide median total margin does not include Shriners Hospitals for Children.

²⁵ Total margin measures a hospital's overall profitability. Operating margin is another, more focused measure that reflects only the hospital's profit or loss from patient care activities. Both total margin and operating margin data is available in the Databook.

²⁶ Under Medicare rules, a state's urban areas cannot have a lower wage index than its rural areas. In FY12, Massachusetts received a combined total increase of nearly \$274 million in Medicare revenue. See <http://www.mass.gov/chia/docs/r/pubs/13/acute-hospital-financial-performance-annual-report-fy12.pdf>.

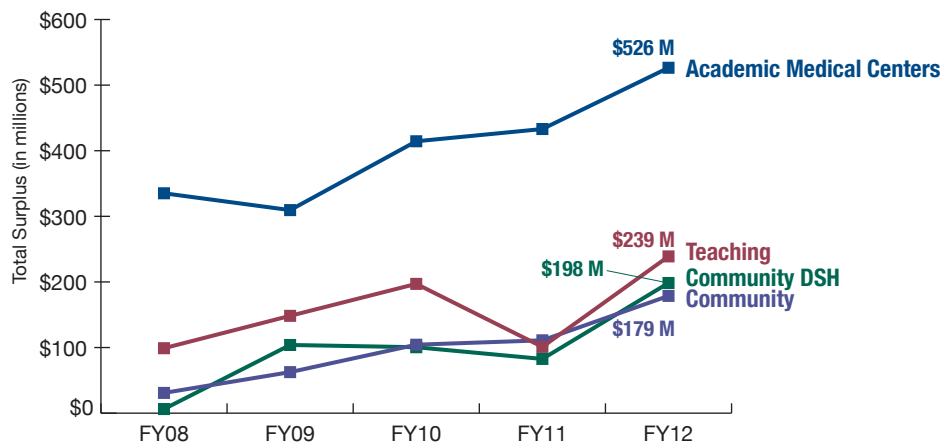
Financial performance varied considerably among the hospitals. Athol Hospital, which is a small, rural, Critical Access Hospital, had the lowest total margin in FY2012 at -11.2%. Massachusetts Eye and Ear Infirmary reported the highest total margin at 13.6%.

Cohort Financial Performance

In terms of aggregate dollars, academic medical centers saw the largest share of statewide surplus. As shown in Figure 7, in FY2012, 42% of total statewide surplus²⁷ was reported by academic medical centers. Two hospitals, Massachusetts General Hospital and Brigham and Women's Hospital, accounted for nearly one-third of the statewide surplus in FY2012. The greater share attributable to academic medical centers is driven by a number of factors, including their higher share of patient service volume and their higher commercial relative prices.

In FY2012, 42% of total statewide surplus was reported by academic medical centers.

Figure 7: Academic medical centers had the greatest share of statewide surplus every year from FY2008 to FY2012

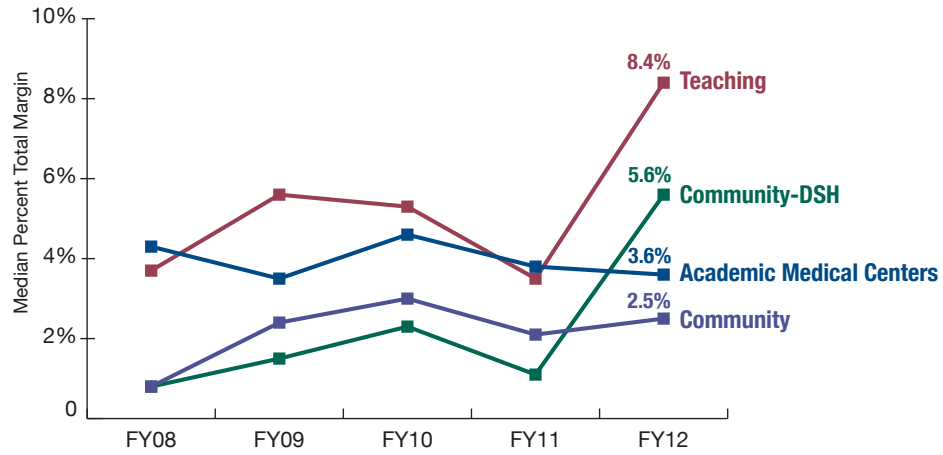


Data Source: Hospital Standardized Financial Statements

Among the four hospital cohorts, teaching hospitals had the highest median total margin in FY2012, at 8.4%, compared to the statewide median of 3.4%. As shown in Figure 8, community-DSH hospitals had the largest overall improvement since FY2008, with the FY2008 median total margin of 0.7%, increasing to 5.6% in FY2012. As discussed previously, both community-DSH hospitals and teaching hospitals have higher relative proportions of Medicare; therefore the increased Medicare revenue from the rural floor policy change contributed to these improvements. Only one cohort, academic medical centers, saw a decline in its median total margin, from 4.3% in FY2008 to 3.6% in FY2012.

²⁷ Total surplus does not include Shriners Hospitals for Children.

Figure 8: Between FY2008 and FY2012, teaching and community-DSH cohorts had the greatest growth in median total margin



Data Source: Hospital Standardized Financial Statements

CONCLUSION

Individual hospital performance varies widely among Massachusetts' hospitals on multiple measures including service, utilization, cost, and financial performance. By comparing hospital performance along these dimensions, this report facilitates a deeper understanding of the similarities and differences among hospitals and hospital cohorts. The Center will continue to monitor and provide meaningful analysis on hospitals in the Commonwealth for those seeking to improve health care quality, affordability, access, and outcomes.

Acknowledgments

The Center wishes to acknowledge the analytic support provided by Michael Grenier, Senior Associate at the Center for Health Law and Economics at the University of Massachusetts Medical School.

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Publication Number 14-90-CHIA-01