What Will Become Of The Medical Mecca? Health Care Spending In Massachusetts

Do the benefits of a concentrated academic medical infrastructure justify higher health spending?

by Robert E. Mechanic

ABSTRACT: Massachusetts has been called a “medical mecca.” It has also been called the world’s most expensive health care market. This paper concludes that claims of excess costs in Massachusetts are overstated. Massachusetts hospitals have lower inpatient costs than peer institutions in other states, yet the state’s concentration of academic hospitals tilts the system toward higher spending. In markets like Massachusetts, there is growing pressure to demonstrate tangible benefits to justify the additional costs of academic health centers (AHCs). Applying new information technologies to proactively manage patients with expensive chronic illnesses is a critical area for future collaboration between payers and AHCs.

Massachusetts has been called a “medical mecca.” It is home to some of the nation’s most prestigious teaching hospitals and medical schools and a place where state-of-the-art clinical services and groundbreaking scientific discoveries are a source of civic pride. Spurred by reports with titles such as The World’s Most Expensive Hospitals, though, many view the Massachusetts health care system as wasteful and inefficient.¹ This perception is bolstered by commonly cited national data sources that show per capita hospital and health spending in Massachusetts to be far above the national average. But users of these data typically fail to control for important market characteristics such as high labor costs or the substantial hospital-based medical research costs that are not borne by patients or health plans. This paper examines a range of health spending data sources and concludes that differences between Massachusetts and other regions are far less than have been previously asserted. It also finds that Massachusetts hospitals actually have lower average costs than peer institutions in other states.

Health care spending in Massachusetts is influenced by the state’s unique mar-
ket structure. With four medical schools and six academic health centers (AHCs), in a state with six million residents, Massachusetts has one of the largest concentrations of academic medicine in the country. A decade ago the prevailing theory was that managed care would draw patients away from more costly teaching hospitals, but AHCs in Massachusetts have actually gained market share. This creates vexing questions for policymakers: first, whether the potential benefits of a concentrated academic medical infrastructure—quality of care, economic development, or academic missions—justify higher health care spending; second, whether market competition will promote appropriate use of community-based health resources; and finally, whether academic systems will be able to develop comparative advantages in health care informatics and chronic disease management that could slow long-run health care spending growth while improving quality.

This paper first examines the assertion that Massachusetts has the world’s most expensive health care system. It reviews changes in the market during the 1990s and examines comparative regional spending measures. Then, because continued double-digit health spending growth is unsustainable, it examines how academic health systems, health plans, and purchasers might address long-run affordability issues.

**Competition Comes To Massachusetts**

In December 1991 the Massachusetts legislature signed a bill into law to deregulate the state’s hospital pricing system, freeing institutions to negotiate with insurers. Thus began an era of aggressive competition, consolidation, and downsizing across the hospital sector. Between 1991 and 2001 Massachusetts hospitals closed beds and reduced inpatient utilization faster than the rest of the country (Exhibit 1). By 2001 inpatient utilization had declined to the national average, although outpatient utilization remained high.

Consolidation was not limited to hospitals. A wave of health plan mergers left three dominant health plans. By 2002 Blue Cross and Blue Shield of Massachusetts, Tufts Associated Health Plan, and Harvard Pilgrim Health Care controlled approximately 75 percent of the private health insurance market. While most plan members are in some form of managed care, the three major insurers offer broad provider networks in which enrollees typically exercise free choice of doctors and hospitals without financial consequences. Because of this, health plans’ cost containment has focused primarily on controlling medical prices.

As health maintenance organization (HMO) enrollment grew, Massachusetts hospitals, anxious not to be left out of provider networks, came to the table ready to bargain. A feeding-frenzy atmosphere was fueled by expectations that capitation would become a dominant form of reimbursement. In 1996 the state’s largest insurer, Blue Cross and Blue Shield, lost $90 million and began to pursue substantial rate reductions from contracted hospitals. At the time, hospitals could offer deep discounts because of earnings on Medicare business. By 1999 Massachusetts
hospital reimbursement from private payers was estimated to be 4 percent below the cost of services, compared with the U.S. average of 12 percent above cost.\textsuperscript{7} Excess capacity and the negotiating power of the state’s “big three” insurers kept payments flat through the late 1990s. The federal Balanced Budget Act of 1997 placed additional pressure on hospital revenues. Both community and teaching hospitals were forced to become more efficient. By 2000 average Medicare inpatient costs per discharge for the state’s AHCs, major teaching hospitals, and community hospitals were 8–16 percent lower than peer hospitals nationally (Exhibit 2).\textsuperscript{8} Prior analyses have also shown Massachusetts hospitals to be more efficient than their peers, based on multivariate regression models.\textsuperscript{9} However, 47 percent of Massachusetts hospital inpatient days are in AHCs or major teaching hospitals, compared with a U.S. average of 21 percent. AHC and major teaching hospital costs are much higher than those of nonteaching community hospitals.\textsuperscript{10} Despite lower average costs within each peer group, the mix of hospitals tilts the Massachusetts system toward higher overall spending.

**Developing More Accurate Regional Cost Comparisons**

Many analysts use per capita health spending as an indicator of the comparative health system efficiency across geographic areas. This is problematic in Massachusetts. First, the high concentration of academic hospitals and physicians results in a health care “product” that is distinct from the U.S. norm. Second, Massachusetts hospitals face higher input prices than those in most other regions. Finally, a variety of “accounting issues” related to hospital-based clinical research results in national data showing higher costs than those actually borne by Massachusetts patients and payers. Data sources commonly used to evaluate variation in

### Exhibit 1

<table>
<thead>
<tr>
<th></th>
<th>Massachusetts</th>
<th>United States</th>
<th>% Change</th>
<th>Massachusetts</th>
<th>United States</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td>101</td>
<td>80</td>
<td>-20.8</td>
<td>5,342</td>
<td>4,908</td>
<td>-8.1</td>
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<td>Beds (thousands)</td>
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<td>16</td>
<td>-23.8</td>
<td>924</td>
<td>825</td>
<td>-10.6</td>
</tr>
<tr>
<td>Admissions (thousands)</td>
<td>821</td>
<td>766</td>
<td>-6.6</td>
<td>31,084</td>
<td>33,813</td>
<td>8.8</td>
</tr>
<tr>
<td>Inpatient days (thousands)</td>
<td>5,771</td>
<td>4,382</td>
<td>-24.1</td>
<td>222,964</td>
<td>194,106</td>
<td>-12.9</td>
</tr>
<tr>
<td>Outpatient visits (thousands)</td>
<td>10,647</td>
<td>18,778</td>
<td>76.4</td>
<td>322,048</td>
<td>538,480</td>
<td>67.2</td>
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<tr>
<td>Length-of-stay (days)</td>
<td>7.0</td>
<td>5.7</td>
<td>-18.6</td>
<td>7.2</td>
<td>5.7</td>
<td>-20.8</td>
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<tr>
<td>Area population</td>
<td>6,022</td>
<td>6,379</td>
<td>5.9</td>
<td>253,493</td>
<td>284,797</td>
<td>12.3</td>
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**Beds per 1,000**

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<th>Massachusetts</th>
<th>United States</th>
<th>% Change</th>
<th>Massachusetts</th>
<th>United States</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.6</td>
<td>2.6</td>
<td>-28.0</td>
<td>3.6</td>
<td>2.9</td>
<td>-20.4</td>
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<tr>
<td>Admissions per 1,000</td>
<td>136.4</td>
<td>120.2</td>
<td>-11.9</td>
<td>122.6</td>
<td>118.7</td>
<td>-3.2</td>
</tr>
<tr>
<td>Days per 1,000</td>
<td>958</td>
<td>687</td>
<td>-28.3</td>
<td>880</td>
<td>682</td>
<td>-22.5</td>
</tr>
<tr>
<td>Visits per 1,000</td>
<td>1,768</td>
<td>2,944</td>
<td>66.5</td>
<td>1,270</td>
<td>1,891</td>
<td>48.8</td>
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</tbody>
</table>


**NOTE:** Massachusetts data include 26,473 net admissions by out-of-state residents after subtracting out-of-state admissions by Massachusetts residents.
regional health care costs include (1) hospital expenses; (2) personal health care spending; (3) Medicare spending; and (4) employer health insurance premiums.

Hospital expenses. On an unadjusted basis, data from the American Hospital Association (AHA) annual survey show 2001 Massachusetts per capita hospital expenses to be 40 percent above the U.S. average. This difference falls to 11.6 percent with several adjustments to improve data comparability (Exhibit 3).

Research grants. In 2001 Massachusetts institutions received nearly five times the national average in research awards from the National Institutes of Health (NIH) per state resident. Most NIH grants are awarded to medical schools and universities and are not reflected in hospital budgets. But Massachusetts hospitals received more than $700 million in NIH funding. Private contracts elevated hospital-based research funding to more than a billion dollars. These research-related revenues and expenses are reported on hospital income statements and on the AHA annual survey. Yet research costs are not borne by the Massachusetts residents who make up the “denominator” of the per capita spending calculation. Comparing patient revenue rather than total hospital expense is one way to filter out research costs.

Out-of-state revenues. In 2001 more than 26,000 net out-of-state patients were treated in Massachusetts facilities. AHA statistics reflect the location of hospitals
rather than patients’ state of residence. Per capita hospital expenses should be adjusted to reflect the net flow of patients across state boundaries. Massachusetts hospitals also received $360 million in 2001 Medicare graduate medical education (GME) payments, nearly three times the per capita average nationally.

Labor costs and input prices. Hospital wages in Massachusetts are about 12 percent above the U.S. average. Medicare recognizes that wage levels affect variation in hospital costs and adjusts payments to reflect these differences. General costs of doing business are also high—Boston’s cost of living is 37 percent above the U.S. average. These factors must be acknowledged in regional hospital cost comparisons.

Personal health spending. Estimates developed by the Centers for Medicare and Medicaid Services (CMS) show that 1998 Massachusetts personal health expenditures were 28 percent above the U.S. average. The estimates are not intended to include medical research, but because they incorporate total hospital revenues from the AHA survey, more than a billion dollars in Massachusetts research-related funding is included. The CMS also does not adjust for wage differences across states. Exhibit 4 presents personal health expenditures for Massachusetts and the United States by type of service. It also calculates the impact of removing nonpatient hospital revenues and adjusting for geographic wage differences. With these modifications, per capita Massachusetts personal health spending declines to 19.3 percent above the U.S. average, and per capita hospital spending declines to 11.4 percent above average.

Medicare spending. There is less variation in Medicare spending across states because Medicare statistics reflect an insured patient population and a uni-
form national payment structure. Medicare data are adjusted for state border crossing and do not include research grants. Precise comparisons of Medicare spending per beneficiary can be made with data published in the *Dartmouth Atlas of Health Care*, which adjusts fee-for-service Medicare reimbursements for age, sex, race, illness, and local price factors. It analyzes data from hospital referral regions—geographic units that reflect where patients actually receive care—which are more appropriate for regional comparisons than political boundaries. Exhibit 5 shows 1996 Medicare spending per beneficiary in twelve hospital markets that are top recipients of NIH research funding. Compared with the twelve-region average, total Medicare spending for Boston is 7 percent higher, inpatient spending is 4 percent lower, hospital outpatient spending is 24 percent higher, and professional and laboratory spending is 9 percent lower. Taken together, the combination of outpatient and professional spending in Boston is nearly identical to the twelve-region average. Therefore, high hospital outpatient use may reflect a “substitution” for services delivered in physicians’ offices or clinics in other regions.

### Insurance premiums

Insurance premiums are the most direct health care outlay for businesses and consumers. The Agency for Healthcare Research and Quality’s (AHRQ’s) Medical Expenditure Panel Survey (MEPS) publishes data on health insurance premiums from more than 29,000 establishments. In 2000, family premiums in Massachusetts firms with fifty or more workers were 5 percent above the U.S. average, while single-coverage premiums were 1 percent below the average.
These results are consistent with 2002 surveys by private employee benefit firms. Controlling for wage levels would lower Massachusetts premiums relative to those of other areas, while adjusting providers’ operating margins up to national averages would increase them.

The bottom line. A decade of price competition has yielded large reductions in hospital inpatient capacity, provider and health plan consolidation, and improved cost-efficiency. This has led to average Massachusetts inpatient costs that are below those of peer institutions in other states. Health spending is similar to spending in other large urban areas once wage levels and external funding sources are considered, and employer health insurance premiums are consistent with those in other large states. But competition has also created a system that has become increasingly concentrated around academic health systems with fewer low-cost community care options.

The Rationale For Supporting The Medical Mecca

Purchasers will keep trying to reduce health care spending unless they can be convinced that the system generates benefits that justify additional costs. Sources of value commonly attributed to teaching hospitals include quality of care, economic development, and academic missions such as physician training, research, and indigent care.

Quality of care. Teaching hospitals are recognized for their advanced technol-
ogy, specialized services, medical research, and treatment of patients with complex conditions. But the majority of patients treated at teaching hospitals receive routine services that are also available at many nonteaching institutions. A recent review of the literature concluded that for common conditions, major teaching hospitals generally offer better care than nonteaching hospitals do.18 Purchasers support the notion of paying for higher quality since they generally believe it will result in lower long-run health care costs.19 But publicly available data that allow payers and patients to compare the quality of specific services across specific institutions are scarce. Furthermore, there is little evidence that patients use the quality information that is available now.20 Development and dissemination of quality data that patients can actually use should be a priority for providers, payers, and government agencies. Without data, reputation holds sway and patients’ demand for teaching hospitals will remain strong.

■ Economic development. AHCs are large employers, and AHC research programs are often said to stimulate spinoff life science businesses. In Massachusetts, health care and closely related sectors employ 420,000 people and represent 13 percent of total state employment.21 This provides a stabilizing influence during volatile economic times. The health sector gained more than 10,000 jobs between October 2000 and October 2002, while the nonhealth sector lost nearly 86,000 jobs.22 Economic forecasters estimate that every ten new Massachusetts health care jobs stimulate eight jobs in other economic sectors.23

Research programs in Massachusetts AHCs and universities help to create a

## EXHIBIT 6
### Premiums For Single And Family Health Insurance In Private-Sector Establishments With 50 Workers Or More, By Most Costly State, Fourteen States And U.S. Average, 2000

<table>
<thead>
<tr>
<th>State</th>
<th>Family coverage premium ($)</th>
<th>Difference from U.S. average (%)</th>
<th>State</th>
<th>Single coverage premium ($)</th>
<th>Difference from U.S. average (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Jersey</td>
<td>7,458</td>
<td>10.5</td>
<td>Illinois</td>
<td>2,898</td>
<td>11.7</td>
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<tr>
<td>Illinois</td>
<td>7,286</td>
<td>7.9</td>
<td>New Jersey</td>
<td>2,784</td>
<td>7.3</td>
</tr>
<tr>
<td>Maryland</td>
<td>7,260</td>
<td>7.5</td>
<td>New York</td>
<td>2,716</td>
<td>4.7</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>7,089</td>
<td>5.0</td>
<td>Michigan</td>
<td>2,705</td>
<td>4.2</td>
</tr>
<tr>
<td>New York</td>
<td>6,836</td>
<td>1.2</td>
<td>Georgia</td>
<td>2,674</td>
<td>3.0</td>
</tr>
<tr>
<td>Florida</td>
<td>6,831</td>
<td>1.2</td>
<td>Maryland</td>
<td>2,621</td>
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<tr>
<td>Texas</td>
<td>6,818</td>
<td>1.0</td>
<td>Virginia</td>
<td>2,599</td>
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<tr>
<td>Michigan</td>
<td>6,800</td>
<td>0.7</td>
<td>North Carolina</td>
<td>2,587</td>
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<tr>
<td>Virginia</td>
<td>6,712</td>
<td>−0.6</td>
<td>Massachusetts</td>
<td>2,572</td>
<td>−0.9</td>
</tr>
<tr>
<td>Georgia</td>
<td>6,666</td>
<td>−1.3</td>
<td>Florida</td>
<td>2,558</td>
<td>−1.4</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>6,628</td>
<td>−1.8</td>
<td>Ohio</td>
<td>2,550</td>
<td>−1.7</td>
</tr>
<tr>
<td>Ohio</td>
<td>6,622</td>
<td>−1.9</td>
<td>Texas</td>
<td>2,538</td>
<td>−2.2</td>
</tr>
<tr>
<td>North Carolina</td>
<td>6,606</td>
<td>−2.2</td>
<td>Pennsylvania</td>
<td>2,397</td>
<td>−7.6</td>
</tr>
<tr>
<td>California</td>
<td>6,235</td>
<td>−7.7</td>
<td>California</td>
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</tr>
<tr>
<td>U.S.</td>
<td>6,752</td>
<td></td>
<td>U.S.</td>
<td>2,595</td>
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</table>

**SOURCE:** Agency for Healthcare Research and Quality, 2000 Medical Expenditure Panel Survey.
beneficial climate for the state’s biotechnology industry, which added 12,000 new jobs between 1996 and 2001. Approximately 8 percent of the world’s pipeline of new drugs now comes from Massachusetts-based companies, and many large pharmaceutical companies have established local research operations there. Most recently, global giant Novartis relocated its research headquarters to Cambridge. Economists have identified life sciences as one of Massachusetts’s most promising sectors, and state officials are actively discussing ways to attract more life sciences investment to the state. While the health care sector’s economic benefits are compelling to many, it remains difficult to quantify the trade-offs between health spending levels and economic development.

**Academic missions.** AHC missions—education, clinical research, specialty services, and care for low-income patients—have been documented extensively. These missions are partially supported by government funding, including Medicare direct and indirect GME payments, Medicaid disproportionate-share hospital (DSH) payments, and federal research grants. AHCs also finance mission-related activities with clinical revenues, although recent reimbursement cuts erode these cross-subsidies. While businesses may see value in AHCs’ social missions, most believe that support should come from broad-based tax revenues instead of higher premiums.

**Little Consensus On Addressing Rising Costs**

In spring 2003 Massachusetts health plans announced rate increases of 15–20 percent for July 2003 contract renewals. A task force made up of Massachusetts’s most senior political and health system leaders recently debated how to control health spending while maintaining access to care and a financially viable delivery system. In its final report, the task force supported the concept of delivering more care at lower-cost, clinically appropriate sites. But aside from expanded state monitoring, the task force did not endorse a formal government role.

In the absence of government intervention, responsibility falls to the private sector. The three largest plans in Massachusetts finance a much larger volume of health care services than state government does. Massachusetts payers have historically been reluctant to limit provider networks, and the national consumer backlash against managed care controls makes it unlikely that they will soon move in this direction. In the past year, however, both Blue Cross and Blue Shield and Tufts Health Plan announced products that will charge higher copayments to patients who select more expensive hospitals. Although a logical way to enhance the public’s price-consciousness, the move has stirred concern that patients with valid geographic or clinical reasons to use these hospitals will be penalized. It is
still unclear whether these types of products will gain sizable market share.

Cynics might conclude that in the absence of viable options, public and private Massachusetts payers will fall back on their most effective tool: unit price controls. Rate negotiations have become increasingly acrimonious. Yet the predominant driver of hospital spending growth in 2001 and 2002 was utilization rather than prices. Instead of simply fighting over rates, payers and providers should collaborate to reduce unnecessary service volume.

**Future Directions For The Medical Mecca**

A growing body of research documents the need for dramatically better health care system performance. In response, organizations are developing a range of tools to identify high-risk patients early, transmit information to clinicians at the point of care, and help people manage their chronic conditions outside of formal care settings. AHCs could lead the movement to reframe medical science and information technology toward managing the small population of high-cost people that constitute the majority of health care expenditures each year. But changes in organizational culture and behavior necessary to support such improvements will come slowly under current health care financing structures. Sanders Williams and colleagues make this point eloquently in a recent *Science* magazine editorial:

> Personalized health planning to anticipate and minimize each individual's risk for the onset and progression of disease is what our health care future will require. These capabilities are at hand, yet nothing at all like this happens today in U.S. clinics and hospitals. Worse, current payment systems punish providers who try to practice in a manner consistent with the best science. For example, a recent pilot program launched by our institution improved outcomes and reduced annual expenses for the care of patients with congestive heart failure from approximately $23,000 to $14,000 per patient. The financial consequences for our health care system under current payment principles however, were strongly negative because patients stayed out of the hospital and avoided procedures that are relatively well reimbursed, while incurring somewhat greater expenses for ambulatory visits and patient education, for which payments do not meet costs.

Massachusetts hospitals are ahead of their peers in implementing systems that can accelerate performance improvements. Brigham and Women’s Hospital is a national leader in using computerized physician order entry (CPOE) systems to reduce medical errors. Both the Partners and CareGroup health systems have implemented electronic patient records that are broadly accessible across system hospitals and affiliated medical groups. While electronic health care information is now shared only within systems, mechanisms such as the New England Healthcare EDI Network (NEHEN), now used to transmit administrative data, could eventually facilitate much broader clinical data integration. While still years away, statewide clinical data linkages could facilitate greater use of community care settings supported by electronic connections to downtown specialists.

Electronic clinical information can also support more robust quality analysis, reporting, and feedback than now exists. As these systems develop, Massachusetts AHCs will have a chance to document the “value added” from care in the Medical Mecca. This is both an opportunity and a risk, since market advantages
built on reputation could diminish in the face of potentially ambiguous quality metrics.

Massachusetts hospitals have made efficiency gains under the current model of care. Whether this can continue is unclear. The largest source of untapped value in the Medical Mecca is the potential to lead “proactive” health care initiatives that improve clinical outcomes and patients’ experiences. Yet current reimbursement structures make it difficult for providers to make a “business case” for programs that would otherwise produce favorable results for purchasers, patients, and society. Progress will require that public and private payers work with providers to move beyond the current financial gridlock and develop new health care financing and delivery models. Massachusetts, with its tradition of innovation, concentration of scientific knowledge, and increasingly integrated systems of care, would do well to move rapidly in this direction.

NOTES
2. AHCs are defined as teaching hospitals under common ownership with a medical school and those in which the majority of the chiefs of service also serve as department chairs at the medical school. Based on 1999 data, Massachusetts has a higher proportion of inpatient hospital days in AHCs than all states except the District of Columbia. New York State has a higher proportion of days in AHCs and major teaching hospitals combined.
8. Major teaching hospitals are defined as institutions with twenty-five or more residents per 100 staffed beds. AHCs are treated as a distinct category.
11. In a review of 2001 audited financial statements of eight Boston hospitals, the author identified research revenues of approximately $1.1 billion.


